RESEARCH PAPER

"Socioeconomic And Cultural Determinants Of Iron And Folic Acid (IFA) Compliance: A Global Scoping Review"

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Abstract

Background: Anaemia remains a major global public health concern, particularly among women of reproductive age and during pregnancy. Iron and Folic Acid (IFA) supplementation is a well-established, cost-effective strategy for preventing and reducing maternal anaemia. Despite widespread policy adoption and programme implementation, compliance with IFA supplementation continues to be inconsistent across regions. Emerging evidence suggests that adherence is shaped not only by biomedical factors but also by socioeconomic and cultural influences. This scoping review aimed to map the global evidence on socioeconomic and cultural determinants of IFA compliance.

Methods: A scoping review was conducted following the Arksey and O'Malley framework and reported in accordance with the PRISMA-ScR guidelines. A comprehensive search of PubMed, Scopus, Web of Science, CINAHL, Embase, and Google Scholar was undertaken for studies published between 1995 and 2025. Studies examining socioeconomic and/or cultural determinants of IFA compliance among women of reproductive age were included. Data were charted and synthesised using thematic mapping and narrative analysis.

Results: Fifty-six studies were included. Reported compliance rates varied widely, ranging from low adherence in resource-limited and rural settings to higher compliance in urban and better-resourced populations. Socioeconomic determinants consistently associated with improved adherence included maternal education, household income, urban residence, and access to antenatal care services. Cultural beliefs, misconceptions about IFA, dietary practices, gender norms, and family decision-making dynamics frequently emerged as barriers. Health system factors, particularly supplement availability and counselling quality, further influenced compliance. The findings highlight the multifactorial and context-specific nature of IFA adherence.

Conclusion: IFA compliance is shaped by complex interactions between socioeconomic conditions, cultural contexts, individual perceptions, and health system performance. Strategies to improve adherence must move beyond tablet provision alone and incorporate culturally sensitive education, strengthened health systems, and equity-focused interventions.

Keywords: Iron and Folic Acid, Compliance, Adherence, Anaemia, Socioeconomic Determinants, Cultural Determinants, Pregnancy, Maternal Health.

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INTRODUCTION

Anaemia continues to be one of the most pressing public health challenges worldwide, particularly among women of reproductive age and during pregnancy. It not only increases maternal morbidity and mortality but also contributes to adverse neonatal outcomes such as low birth weight, prematurity, and impaired cognitive development in children (1-5)Iron and Folic Acid (IFA) supplementation is a well-established, cost-effective intervention recommended by the World Health Organization (WHO) to prevent and reduce the burden of anaemia, especially during pregnancy (6,7). Despite the proven benefits of IFA supplementation, adherence remains inconsistent, with compliance rates varying widely across different regions and population groups (8-10).

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The reasons behind poor adherence extend beyond biomedical explanations. While side effects, dosage, and supply-related issues are often highlighted, the influence of socioeconomic and cultural factors is equally profound but less systematically explored. A woman's level of education, household income, and access to healthcare facilities directly shape her capacity to begin and sustain IFA intake (11,12). At the same time, cultural

beliefs, gender roles, food taboos, and familial decision-making dynamics can strongly determine whether women accept or reject supplementation, even when it is freely available Such realities remind us that compliance with IFA is not merely a clinical act but one embedded within broader social and cultural contexts(13,14).

Although numerous studies have investigated barriers and facilitators of IFA adherence in specific countries or regions, a comprehensive global synthesis that foregrounds socioeconomic and cultural determinants is lacking. Most existing reviews focus on clinical and programmatic issues, leaving a gap in our understanding of the lived realities that influence women's health behaviours. Addressing this gap is critical, as it may guide the design of context-sensitive strategies that resonate with local communities and improve maternal health outcomes worldwide.

The present review, therefore, aims to map the global evidence on socioeconomic and cultural determinants of IFA compliance, highlighting commonalities, regional variations, and gaps in the literature. By doing so, it seeks to inform future research, guide policy development, and support the implementation of interventions that not only supply IFA tablets but also enable women to take them in ways that are feasible, acceptable, and culturally respectful.

METHODOLOGY

This review adopted a scoping review approach, guided by the methodological framework developed by Arksey and O'Malley (15) and further refined by Levac and colleagues (16). The reporting followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist to ensure methodological transparency and reproducibility.

Search Strategy

A comprehensive literature search was undertaken to identify peer-reviewed studies examining socioeconomic and cultural determinants of Iron and Folic Acid (IFA) compliance. The following electronic databases were searched: PubMed, Scopus, Web of Science, CINAHL, Embase, and Google Scholar. Search terms were developed using Medical Subject Headings (MeSH) and free-text keywords, combined with Boolean operators. Key terms included *"iron folic acid", "compliance", "adherence", "determinants", "socioeconomic", "cultural"*, and *"global"*. Reference lists of included studies were also screened to capture additional relevant publications.

Inclusion Criteria Studies were eligible for inclusion if they: focused on women of reproductive age, particularly pregnant women, examined socioeconomic determinants (e.g., education, income, occupation, healthcare access, affordability),examined cultural determinants (e.g., beliefs, norms, gender roles, dietary practices, and traditional influences),employed quantitative, qualitative, or mixed-methods designs and were published in English (due to resource limitations)between 1995 and 2025, to capture both historical and contemporary evidence.

Exclusion Criteria: Studies were excluded if they: focused solely on biomedical or pharmacological determinants without addressing socioeconomic or cultural factors or were review papers, editorials, or commentaries without primary data.

Data Extraction and Charting A structured data extraction form was developed to capture key variables. extracted information included: author(s) and year of publication, country/region of study, study design and methodology, population characteristics and sample size, reported socioeconomic and cultural determinants, main findings relating to IFA compliance/adherence. Two reviewers independently extracted and charted the data to minimise bias, with discrepancies resolved by consensus.

Data Synthesis The data were synthesised using thematic mapping, allowing the grouping of findings under major domains of socioeconomic determinants (e.g., education, income, access to healthcare) and cultural determinants (e.g., beliefs, traditions, gender norms). A geographical mapping of the evidence was also undertaken to illustrate regional variations and identify under-researched contexts. Narrative synthesis was employed to summarise patterns, commonalities, and gaps across studies.

FINDINGS

Study Selection: The database search identified *199* records, with an additional *14* retrieved through manual reference searches. After removing duplicates, *85,213* records were screened by title and abstract, of which *63* were excluded for not meeting eligibility criteria. Full-text assessment was conducted for *65* studies, with *9* excluded for lack of focus on IFA adherence, absence of socioeconomic or cultural determinants, or being secondary reviews. Ultimately, *56* studies were included and thematically synthesised **(Figure 1).**

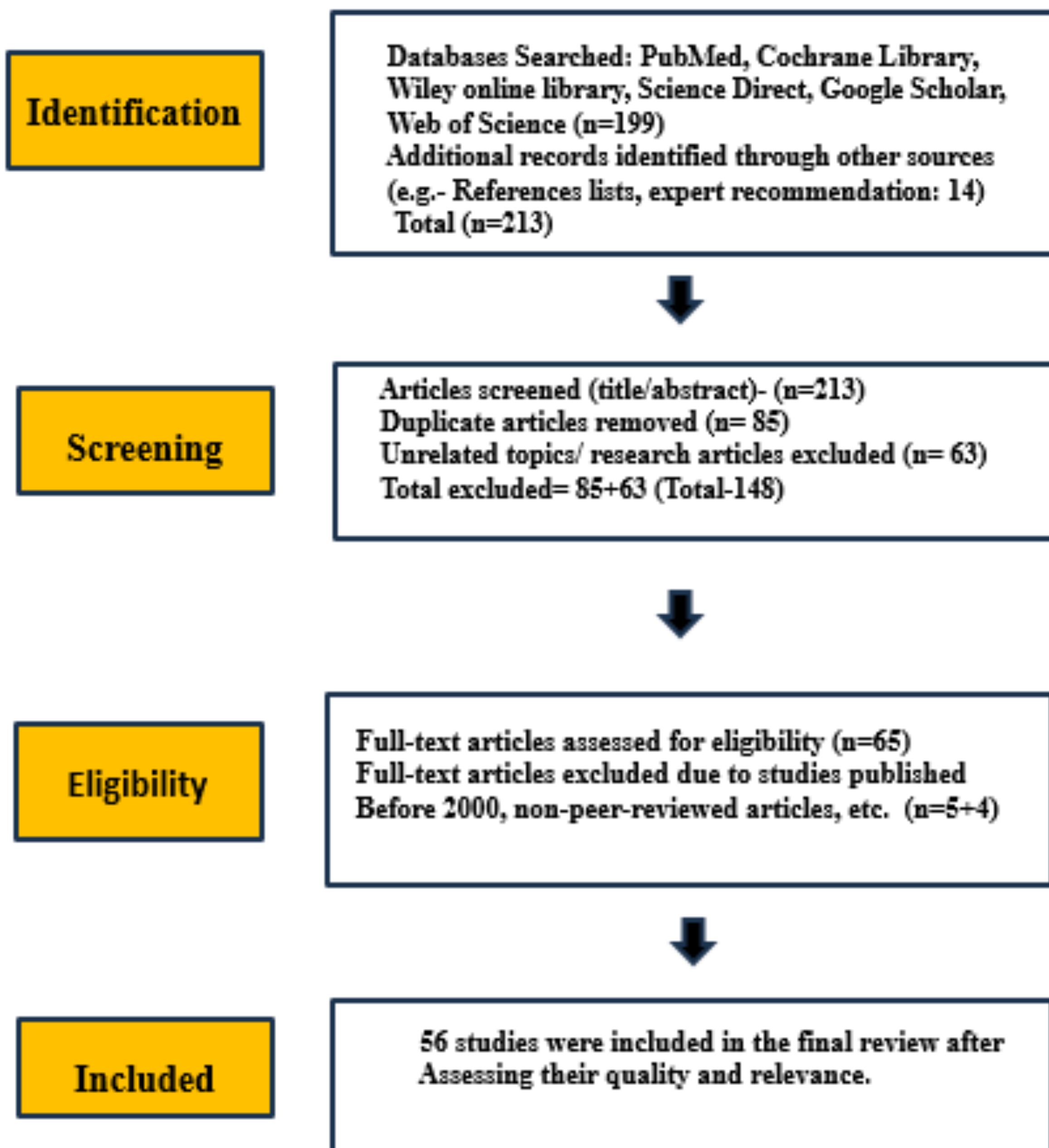

Figure 1: PRISMA-ScR Flow Diagram – Study Selection Process

Study Characteristics: The included studies encompassed a diverse range of regions, with a substantial proportion conducted in low- and middle-income countries (LMICs) across Asia (India, Bangladesh, Vietnam, Pakistan, Nepal), Africa (Ethiopia, Tanzania, Senegal, Kenya, Cambodia), and multi-country/global analyses, reflecting the worldwide burden of anaemia and IFA supplementation challenges. Publication years ranged from 1995 to 2025, indicating both historical and contemporary perspectives on maternal iron-folic acid compliance. The majority of studies employed cross-sectional (n≈15) or observational designs (n≈04), while several incorporated qualitative approaches (n≈4) to explore cultural perceptions, methodological (n≈2), cohort and pooled analysis and mixed method one each, Review-based studies- (n=11). Reports guideline//policy reviews (n=9 and others were interventional, including randomised controlled trials (n≈6) and community-based interventions (n≈2). Population sizes varied widely, ranging from small qualitative samples of 50–200 participants to large-scale surveys exceeding 20,000

women, predominantly focusing on pregnant women, with a few studies including lactating women or mother-child dyads. The studies collectively captured a broad spectrum of socioeconomic and cultural contexts, enabling a comprehensive examination of factors influencing IFA adherence globally. **(Table No. 1)**

Table No 1: Characteristics of Included Studies on IFA Compliance Among Pregnant Women

S. No.	Author (Year)	Country /Region	Study Design	Population (n)	Socioeconomic Determinants	Cultural Determinants	IFA Compliance (%)	Main Findings
1	WHO, 2021	Global	Data report	Women of reproductive age	N/A	N/A	N/A	Provided global anaemia estimates
2	Stevens et al., 2022	Global	Pooled analysis	Women & children	Income, education	N/A	N/A	National and regional anaemia prevalence trends
3	Cogswell ME et al., 2015	Cleveland	Randomized controlled trial	Pregnant women,	Education, income	Cultural beliefs	N/A	Prophylactically IFAS Reduce the health cost
4	Nisar & Dibley, 2014	Nepal, Pakistan	Observational	Pregnant women, n=3,200	SES, education	Family support, traditions	60%	Early IFA initiation reduced neonatal mortality
5	Nisar & Dibley, 2016	Pakistan	Propensity analysis	Pregnant women, n=2,800	SES	Cultural beliefs	58%	IFA reduced neonatal and under-5 mortality
6	WHO, 2012	Global	Guideline	Pregnant women	N/A	N/A	N/A	Daily IFA supplementation recommendation
7	Kanal et al., 2005	Cambodia	Process evaluation	Women, n=900	SES	Community norms	63%	Social marketing improved weekly IFA uptake
8	Mithra et al., 2013	India	Cross-sectional	Pregnant women (n=400)	Income, education	Family support	55%	Compliance influenced by counselling and awareness
9	Nguyen et al., 2017	Bangladesh	Mixed-method	Pregnant women (n>3,000)	SES, household wealth	Family influence, traditions	54%	Family support enhanced adherence
10	Lutsey PL et al., 2008	Phillippines	Cross-sectional	Pregnant women,	Education	N/A	Variance	Maternal education, No. of children, Health programme Knowledge
11	Taye et al., 2015	Ethiopia	Cross-sectional	Pregnant women	Education, income	Cultural beliefs	39%	Low adherence in rural, low SES populations

				(n=634)				
12	Sauer C et al., 2025	Cambodia	Cluster-randomized noninferiority trial	Pregnant women	N/A	N/A	N/A	IFA and multiple micronutrient supplements were highly acceptable
13	Ogundipe et al., 2012	Tanzania	Cross-sectional	Pregnant women (n=21,889)	Income, education	Misconceptions	50%	Adherence affected by supply, counselling, and beliefs
14	Galloway et al., 2002	8 LMICs	Qualitative	Pregnant women (n=150)	Education, income	Misconceptions, traditional beliefs	Not quantified	Cultural perceptions influenced IFA adherence
15	Arksey & O’Malley, 2005	N/A	Methodology	N/A	N/A	N/A	N/A	Proposed scoping review framework
16	Levac et al., 2010	N/A	Methodology	N/A	N/A	N/A	N/A	Advanced scoping review methodology
17	Srivastava et al., 2015	India	Community intervention	Pregnant women, n=400	SES	Community involvement	62%	Community-based intervention improved IFA demand
18	Yassin MA et al., 2024	Southern Ethiopia	Cross-sectional	Pregnant Women, n=378	SES, occupation	Community norms	65%	Social marketing and mobilization improved adherence
19	Paramashanti BA et al., 2024	Indonesia	Secondary Analysis	Pregnant women, 12455	Income, household wealth	Family influence, traditions	59% (Urban) and 47.8% (Rural Areas)	Higher maternal education was significantly linked to IFAS adherence
20	Kavle & Landry, et al. 2018	LMICs	Review	Women	SES, access	Cultural norms	Variable	Community-based distribution improved compliance
21	Tegodan E et al 2021	Ethiopia	Cross sectional	Pregnant Women, n=403	Education	N/A	62.30 %	Maternal educational status, knowledge about anemia, exposure to information, experiencing of health problems, and forgetfulness were associated with adherence behavior.
22	Seidu H et al.2024	Ghana	Cross-sectional	Pregnant women	Education	Knowledge and education	N/A	pregnant women to have early ANC visits and educating them on how to manage side effects.

23	Jasti S et al., 2003	Global	Review	Pregnant women	SES	Cultural beliefs	Variable	Cultural considerations in supplement use
24	Siekmans et al., 2018	LMICs	Review	Pregnant women	Income, education	Cultural beliefs	Variable	Barriers/enablers summarized
25	Galloway & McGuire, 1994	LMICs	Review	Pregnant women	SES	Side effects, psychology	Variable	Supplies, side effects, psychosocial factors affect compliance
26	Seck & Jackson, 2008	Senegal	Observational	Pregnant women, n=300	Education, income	Traditions	50%	Determinants included education, family support
27	Sununtnasuk et al., 2015	Multi-country	Cross-sectional	Pregnant women	SES, ANC access	Cultural beliefs	Variable	Multi-country barriers in IFA distribution
28	Mamo TT et al., 2022	South Ethiopia	Cross-Sectional	Pregnant women	Education	N/A	43.40%	History of previous anemia, frequency of ANC visits, knowledge of IFA supplement, and knowledge of anemia were the factors associated with adherence to IFA supplement.
29	Bresani et al., 2013	Tanzania	Cluster-RCT	Pregnant women, n=600	Income, education	Family involvement	73%	Home-based counselling significantly improved adherence
30	Muthuraj LP et al., 2023	India	Cross-sectional	Pregnant women,	Income, education	Family influence	56.80%	FGDs were the sociocultural factors, lack of awareness, and drug-related factors.
31	Chakraborty A et al., 2025	Global	Systematic review	Women	SES	Cultural factors	Variable	Summarised prevalence, causes, interventions
32	Yekta et al., 2008	Iran	Cross-sectional	Pregnant women, n=250	Education, income	Family support	57%	Family support and education improved intake
33	Uneke CJ et al., 2016	LMICs	Review	Pregnant women	SES, access	Traditions	Variable	Barriers to evidence-based practices
34	Gautam et al., 2008	India	Observational	Pregnant women, n=200	SES, education	Dietary beliefs	50%	Rational prescription improved adherence
35	Haidar et al., 2003	Kenya	RCT	Lactating women, n=180	SES	Cultural practices	68%	Daily supplementation prevented iron deficiency anaemia
36	WHO tailorin	Global	Guideline	Pregnant	SES	Cultural context	N/A	Behavioural and cultural program tailoring

	g guide, 2023			women				
37	NITI Aayog, PPP infrastructure, 2025	India	Policy review	N/A	SES	N/A	N/A	Public-private partnerships for health program support
38	Smith C, et al., 2016	British Columbia	Population-based retrospective cohort study	Pregnant women	Education	N/A	Variable	Maternal and Perinatal Morbidity and Mortality Associated With Anemia in Pregnancy
39	Fischer R et al., 2024	Global	Conceptual	N/A	SES	Cultural beliefs	N/A	Challenges in adapting behavioural interventions
40	Mengistu T et al., 2023	Wondo district	cross-sectional study	Pregnant women,	Education, income	Cultural norms	44.30 %	Cultural perceptions influenced IFA adherence
41	Ekström et al., 1996	Tanzania	Observational	Pregnant women, n=500	SES, education	Cultural norms	65%	Adherence affected by supply consistency, maternal knowledge
42	Chourasia A et al., 2017	High focus states of India	based on NFHS-3, 2005-06) data	Delivered women	SES/Education	Cultural context	N/A	Higher education and lower birth order infer to more iron consumption among pregnant women.
43	Nguyen et al., 2013	Bangladesh, Vietnam, Ethiopia	Cross-sectional	Mother-child pairs	Household wealth, maternal education	Cultural dietary practices	55%	Maternal and child dietary diversity associated with IFA compliance
44	WHO, 2024	Global	Guideline	Pregnant women	N/A	N/A	N/A	Updated daily IFA recommendations
45	Abdullahi H et al., 2014	Sudan	cross-sectional study	Pregnant women,	SES	Dietary beliefs	65.4% %	High rate of IFAs was beneficial in preventing anaemia in expectant mothers and infants of LBW.
46	Bohren MA, 2021	LMICs	Review	Women	Income, education	Cultural beliefs	Variable	Barriers/facilitators of maternal care
47	Balarajan et al., 2011	LMICs	Review	Women	Income, education	Dietary and cultural norms	Variable	Anaemia prevalent among low-income women
48	Ramezanzadeh M et al., 2024	LMICs	Scoping review	Pregnant women	Income, access	Cultural norms	Variable	Barriers and enablers of maternal health services

49	Culturally adapted interventions, 2021	Global	Systematic review	Minority populations	SES	Cultural beliefs	Variable	Effectiveness of culturally tailored interventions
50	Chillo SL et al., 2013	LMIC	Systematic review	Pregnant women,	SES	N/A	N/A	overall level of haemoglobin in pregnancy was different between the groups.
51	Menon et al., 2016	Bangladesh	Cluster-RCT	Women & children	SES, education	Media influence, family support	60%	Combined counselling & mass media improved feeding practices
52	Bilimale A et al., 2010	India	Controlled trial study	Pregnant women n=140	SES	Cultural context	N/A	Monitoring the administration of oral iron supplementation is feasible and helps to improve compliance with oral iron tablets.
53	Kamau M, et al. 2019	Kenya	Cross Sectional	Pregnant Women n=364	Education	Cultural context	N/A	Increasing awareness, counselling, communication and community edu cation on IFAS have improved compliance
54	Nisar et al., 2014	Pakistan	Qualitative	Pregnant women, n=80	SES, education	Family support, beliefs	Not quantified	Perceptions influenced urban/rural IFA use
55	World Bank, 2021	Global	Guidance	Women	SES,	Cultural context	N/A	Guidance for anemia reduction programmes
56	Gebremedhin S et al., 2014	Ethiopia	Independent survey	Pregnant women & women who gave birth in the preceding year	Education	Cultural practices	N/A	Promoting early and frequent ANC, enhancing the quality of ANC counseling and promoting the knowledge of women on anemia

Compliance Rates and Key Determinants: Across the included studies, reported IFA compliance varied considerably, reflecting differences in regional health infrastructure, socioeconomic conditions, and cultural contexts. Adherence rates ranged from as low as 20–30% in rural or resource-limited settings to over 80% in urban areas with strong antenatal care systems and intensive health education programmes. Socioeconomic determinants, including maternal education, household income, urban versus rural residence, and occupational demands, consistently influenced adherence, with higher compliance observed among women with greater educational attainment, better financial resources, and easier access to health facilities. Cultural and traditional factors—such as dietary beliefs, perceptions of pregnancy, gender norms, and religious practices—were frequently reported barriers, while family and community support acted as facilitators. Health system factors, including the regularity of IFA supply, quality of counselling, and presence of community health workers, further shaped adherence patterns. Collectively, these findings underscore the multifactorial nature of IFA compliance, highlighting the interplay between individual, social, and systemic determinants that must be addressed to improve maternal nutrition outcomes globally.

Socioeconomic Determinants of IFA Compliance : Socioeconomic status—comprising income, education, occupation, and residence—emerged as a pivotal determinant of IFA adherence. Women from disadvantaged households or rural areas consistently

reported lower compliance compared with their urban or wealthier counterparts (17).

In Southern Ethiopia, urban pregnant women were nearly three times more likely to comply with IFA supplementation than rural women, reflecting disparities in health service access and health-related information (18) Similarly, a large study in Indonesia involving over 12,000 women found that urban residence, higher household wealth, and more frequent antenatal visits were independently associated with adherence of at least 90 days (19).

While many countries provide IFA supplements free of charge through public health systems, indirect financial burdens remain significant. These include the costs of transport, lost wages, and the purchase of supplements during stock-outs—factors disproportionately affecting low-income women. Stable spousal employment and household financial security were repeatedly linked to higher adherence. (20).

Education was another consistent predictor. In Northwest Ethiopia, women with at least primary education were over three times more likely to adhere than those with no formal schooling (21). Studies from India and Ghana further showed that educated women, with greater awareness of anaemia, were better able to appreciate the benefits of IFA, resist harmful misconceptions, and follow medical guidance (22) By contrast, low literacy, coupled with inadequate counselling and complex instructions, fuelled misunderstanding and non-compliance.

Access to quality health services was equally critical. In many low-resource settings, irregular supplement supplies, staff shortages, and long waiting times restricted opportunities for women to receive IFA and appropriate counselling (23) Rural women, in particular, faced compounded challenges of weak infrastructure, limited antenatal visits, and reduced health system engagement.

Time constraints from occupational demands also reduced compliance. Women in farming, factory, or domestic labour often struggled to attend antenatal care, forgot doses due to fatigue, or lacked workplace support for supplementation.

Collectively, socioeconomic disadvantage—including financial hardship, low education, poor healthcare access, and heavy workloads—creates interlinked barriers to IFA adherence. Addressing these issues requires not only stronger health systems but also context-sensitive, community-level approaches that improve equity and empower women.

Cultural Beliefs and Traditional Practices

Cultural perceptions strongly influenced supplement use, particularly in low- and middle-income countries. Pregnancy was often viewed as a natural event that should progress without medical interference, leading to undervaluation of preventive interventions. In South Asia and Sub-Saharan Africa, widespread misconceptions persisted that IFA tablets enlarge the baby, increasing risks of obstructed labour or caesarean section (24). These beliefs, often transmitted intergenerationally, discouraged women from initiating or sustaining supplementation.

Dietary customs further shaped adherence. Traditional diets, typically plant-based and low in bioavailable iron, frequently relied on food-based remedies for anaemia instead of supplementation. Coupled with common side effects of IFA such as nausea, constipation, and dark stools—rarely explained in detail by healthcare workers—these beliefs drove discontinuation (25).. Concerns that "chemical" medications are unnatural or unsafe were also widespread. Social structures and gender dynamics amplified these challenges. In many patriarchal contexts, husbands, mothers-in-law, or elders made healthcare decisions. Where mistrust of supplements prevailed, women were often prevented from using them. Conversely, family support and positive peer role models encouraged adherence (26).

Religious and spiritual practices also intersected with compliance. In some communities, health outcomes were viewed as divinely determined, with preference given to prayer or natural remedies over supplements. Fasting practices or concerns over animal-derived ingredients in tablets led some women to avoid IFA altogether. In such settings, the provision of vegetarian or halal-certified formulations improved acceptance.

These findings underscore the deep-rooted cultural barriers to IFA adherence. Culturally sensitive health education, engagement of religious and community leaders, and addressing misconceptions in local languages are essential to building trust and improving uptake (27).

Health System Factors and Service Delivery Gaps

The capacity of health systems to deliver uninterrupted, high-quality antenatal services was a decisive factor in IFA compliance. Persistent stock-outs, fragmented supply chains, and delayed distribution of supplements were frequently reported, forcing women to purchase IFA privately where costs were prohibitive. These disruptions not only interrupted treatment but eroded trust in public health systems. Antenatal counselling quality was often inadequate. Overloaded health workers, constrained consultation times, and insufficient communication skills limited opportunities to explain IFA's benefits, correct misinformation, or manage side effects. As a result, confusion and disinterest frequently went unaddressed (28).

Healthcare provider attitudes also influenced outcomes. Respectful, empathetic counselling improved trust and adherence, whereas hurried or dismissive interactions discouraged women from returning or complying. Community health workers (CHWs)—critical in rural areas—were often undertrained, under-resourced, and underpaid, reducing their effectiveness. (29)

Weak integration of IFA into routine maternal and child health programmes was evident. Poor coordination across health, education, and nutrition sectors led to inefficiencies and missed opportunities for early intervention. Countries like India and Bangladesh demonstrated that stronger integration—through initiatives such as the National Iron Plus Initiative and

community outreach—substantially improved haemoglobin levels and IFA uptake.

Public-private partnerships (PPPs) also showed promise. In Kenya and Ethiopia, collaborations with NGOs and pharmaceutical partners improved outreach through mobile clinics and workplace supplementation schemes. Yet without strong regulation, such approaches risk inequity and variable quality.

Overall, systemic weaknesses—supply interruptions, poor counselling, and limited frontline support—remain formidable barriers to IFA adherence.

Individual Perceptions, Knowledge, and Side Effects

Even when IFA supplements were available, individual perceptions and lived experiences shaped adherence. Many women reported limited awareness of IFA's role in preventing anaemia, supporting foetal growth, and reducing birth complications. (30) Some discontinued supplementation once they felt healthy, unaware of the need for consistent intake. Confusion about dosage and duration further reduced compliance.

Perceived side effects—gastrointestinal discomfort, constipation, or dark stools—were common reasons for discontinuation. Without clear counselling, these were often interpreted as harmful or confirmation of community myths about IFA causing pregnancy complications. Distrust in government-distributed medications and preference for traditional remedies also influenced decisions. Forgetfulness, especially when symptoms of anaemia were not visible, was a further barrier to daily adherence.

These findings highlight the importance of empathetic, tailored counselling that acknowledges women's fears, addresses side effects, and frames IFA within their cultural and experiential context.

STRATEGIES TO IMPROVE IFA COMPLIANCE ACROSS POPULATIONS

Evidence points to several strategies for improving adherence. Culturally tailored health education, delivered by CHWs in local languages, was effective in demystifying misconceptions, reinforcing benefits, and clarifying dosage (31). Storytelling, visual aids, and peer educators were particularly successful in South Asian and African contexts. Behavioural change communication (BCC) methods, including motivational interviewing and inclusion of family decision-makers, improved adherence by tackling individual fears and social dynamics. Innovations in supplementation, such as fortified foods, micronutrient powders, and mHealth reminders, reduce). Innovationslated to tolerance and forgetfulness. Mobile-based interventions in India increased adherence by over 30%. System-level reforms, including stronger supply chains, cash incentives, and digital monitoring systems, were linked to improved coverage and compliance. Multisectoral collaboration, involving health, education, agriculture, and labour sectors, enabled school-based, workplace, and food-based strategies to complement supplementation programmes.

Key gaps : Based on the synthesis of the included studies several key gaps emerge in the current literature on iron and folic acid (IFA) compliance among women of reproductive age. Firstly, despite robust evidence linking socioeconomic status to adherence, there is limited exploration of how intersecting factors—such as education, income, occupation, and rural versus urban residence—collectively influence compliance across diverse contexts. Secondly, while cultural beliefs and traditional practices are repeatedly identified as barriers, few studies have systematically examined the mechanisms through which family dynamics, gender norms, and religious practices shape women's decision-making regarding IFA use. Thirdly, health system-related challenges, including inconsistent supplement supply, inadequate counselling, and workforce limitations, are frequently reported, yet interventions targeting these structural gaps remain sporadic and poorly evaluated. Fourthly, individual-level factors such as knowledge, awareness, and experience of side effects are often assessed in isolation, with minimal attention to behavioural and psychological determinants that mediate adherence. Furthermore, most studies rely on cross-sectional designs, limiting the ability to infer causal relationships or assess long-term compliance trends. Finally, there is a scarcity of research from certain regions, particularly low-income countries in Sub-Saharan Africa and South Asia, and limited use of culturally tailored, community-based intervention studies. Addressing these gaps is crucial for developing integrated, context-specific strategies that enhance IFA adherence and ultimately reduce maternal anaemia globally.

DISCUSSION

This scoping review mapped global evidence on the socioeconomic and cultural determinants of Iron and Folic Acid (IFA) compliance among women, particularly during pregnancy. The findings emphasise that while IFA is widely promoted as an essential public health intervention to prevent anaemia and improve maternal outcomes, women's adherence remains uneven and often suboptimal. Importantly, the review underscores that barriers are rarely medical alone; rather, they are embedded in social structures, cultural norms, and economic realities that influence women's ability to consistently consume IFA tablets (32-34).

A striking observation across the reviewed literature is the persistence of socioeconomic barriers. Women from lower-income households frequently reported irregular access to supplements due to affordability, limited health infrastructure, or stock-outs at government facilities. Even when supplements were available free of cost, indirect costs—such as travel, loss of daily wages, or opportunity costs—often discouraged adherence (35-37). These findings reinforce the argument that structural inequalities and financial hardship continue to act as silent but powerful barriers to maternal health interventions.

Equally compelling are the cultural and social dynamics that shape women's decisions. In many communities,

patriarchal norms influence autonomy in health-seeking behaviour, with husbands or mothers-in-law playing a dominant role in decisions about supplement intake. Cultural beliefs, such as the fear that IFA consumption leads to "large babies" and subsequent delivery complications, were also commonly reported as deterrents (38-39). These narratives remind us that health interventions cannot be decontextualised from the sociocultural fabric within which they are implemented.
Another important determinant highlighted is education. Women with higher levels of education were consistently more likely to adhere to IFA supplementation, reflecting both increased awareness of benefits and greater capacity to navigate healthcare systems (40-42).Conversely, illiteracy or limited health literacy compounded by complex dosing regimens often led to confusion and poor compliance. Health workers' role in bridging this knowledge gap was critical, but the review also revealed considerable variation in the effectiveness of counselling services across settings.
Interestingly, trust and communication emerged as pivotal themes. Where health systems engaged women respectfully, offered clear explanations, and built rapport, adherence improved. However, instances of poor provider–patient interaction, lack of empathy, or inconsistent guidance discouraged compliance despite supplement availability. This finding highlights the human dimension of maternal healthcare, where interpersonal trust can be as important as material access.
Taken together, the findings emphasise the need to reframe IFA supplementation not merely as a clinical intervention but as a social practice influenced by multiple determinants. Addressing compliance requires a holistic approach that combines affordable and consistent supply chains with culturally sensitive health education, gender-sensitive counselling, and the empowerment of women within households and communities (43-46).
From a policy perspective, these insights carry important implications. National nutrition programmes may benefit from integrating community-based strategies that involve family decision-makers, demystify cultural misconceptions, and promote male engagement in maternal health (47-49). Moreover, tailoring interventions to the socioeconomic realities of marginalised groups is vital to ensure equity. Importantly, this review also reveals significant research gaps—particularly in low- and middle-income countries—where socioeconomic and cultural factors are most pronounced but often underexplored in empirical studies. (50-51)
Ultimately, the review demonstrates that improving IFA compliance requires a paradigm shift: moving beyond biomedical provisioning to a more human-centred, context-Sensit outcomes (52-54). Only by acknowledging and addressing the socioeconomic and cultural realities of women's lives can global health efforts meaningfully reduce anaemia and improve maternal outcomes(55,56).

IMPLICATIONS FOR PRACTICE AND POLICY

Culturally Sensitive Health Awareness: Antenatal counselling and community awareness programmes should incorporate culturally sensitive education that respects local beliefs, uses vernacular languages, and actively engages family members—including husbands and mothers-in-law—religious leaders, and community influencers. Such strategies can effectively address misconceptions and improve adherence to IFA supplementation.

Strengthening Health Systems: Sustained compliance requires uninterrupted availability of IFA supplements, consistent and empathetic counselling by trained health workers, and robust monitoring systems to track adherence and identify service gaps.

Socioeconomic Support Measures: Social protection interventions—such as transport vouchers, conditional cash transfers, or workplace supplementation programmes—can help reduce financial and logistical barriers, particularly for low-income and marginalised women .

Multi-sectoral and Community Engagement: Collaborative efforts across health, education, nutrition, and labour sectors can create enabling environments for adherence. Leveraging community health workers and peer networks can foster trust, reinforce positive behaviours, and address context-specific cultural barriers.

Research and Innovation: Supporting research on context-specific behavioural interventions, digital health tools, and alternative supplement formulations can help address side effects, misconceptions, and individual-level barriers to IFA adherence.
By implementing these integrated strategies, policymakers and practitioners can enhance IFA compliance, reduce maternal anaemia, and improve maternal and child health outcomes on a global scale.

STRENGTHS AND LIMITATIONS OF THE STUDY

This scoping review provides a comprehensive and systematic synthesis of global evidence on the socioeconomic and cultural determinants of IFA compliance, highlighting the multifaceted and context-specific barriers that extend beyond biomedical factors. By including quantitative, qualitative, and mixed-methods studies, the review captures both measurable outcomes and nuanced insights into women's lived experiences, perceptions, and decision-making processes. The use of the Arksey and O'Malley framework and adherence to PRISMA-ScR guidelines ensures methodological rigour, transparency, and reproducibility. Furthermore, the review identifies critical knowledge gaps, offering actionable guidance for policymakers, healthcare providers, and researchers seeking to design culturally sensitive, evidence-based interventions.

Despite its breadth, the review has several inherent limitations. Restricting the search to English-language publications may have introduced language and publication bias, potentially excluding relevant studies from non-English-speaking regions. Variability in study definitions of IFA compliance, diverse measurement approaches, and heterogeneity in participant populations limit the direct comparability of findings. Additionally, the reliance on published literature may overlook valuable grey literature and programme reports, which could provide further insights into implementation strategies and real-world challenges. Finally, while the review synthesises evidence across multiple regions, certain low- and middle-income countries remain underrepresented, constraining the generalisability of findings in specific cultural contexts.

CONCLUSION:

Improving iron and folic acid (IFA) compliance extends far beyond clinical prescription—it reflects the broader social, cultural, and economic environments in which women live. Despite well-documented benefits of supplementation in reducing maternal anaemia and improving birth outcomes, adherence remains suboptimal globally due to intertwined barriers, including limited health literacy, poverty, cultural misconceptions, gendered household dynamics, and health system inefficiencies. This review highlights that IFA compliance is not only a matter of availability but also one of accessibility, acceptability, and empowerment. Addressing these challenges requires holistic, context-sensitive strategies that integrate biomedical knowledge with social and cultural understanding, recognising women as active agents in their own health.

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Author-2- Data curation, Formal analysis, Supervision, Writing - review & editing Correspondence with the publishing journal.

Author-3- Data curation, Formal analysis, Supervision, Writing - review & editing

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Abbreviations:

- LMIC = Low- and Middle-Income Countries
- IFA = Iron-Folic Acid
- SES = Socioeconomic Status
- ANC = Antenatal Care
- IFAS = Iron Folic Acid Supplementation

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