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Knowledge, Hesitancy and Barriers to Uptake of Irreversible Contraceptives Among Women and Healthcare Providers: A Scoping Review

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Abstract- ***Irreversible contraceptives (female sterilization and vasectomy) are safe, cost-effective, and highly effective methods of family planning, yet global uptake remains low (2-5% in many low- and middle-income countries) compared to 15-25% in high-income settings. This scoping review maps existing evidence on knowledge, hesitancy, and barriers to uptake of irreversible contraceptives among women and healthcare providers. Following Arksey and O'Malley's framework, we searched PubMed, CINAHL, Scopus, and African Journals Online (2015-2025). Fifty-three studies met inclusion criteria. Key findings: Knowledge gaps were pervasive—only 28-45% of women understood that irreversible methods do not cause cancer or weight gain, and 35-50% of providers could correctly counsel on vasectomy. Hesitancy dimensions included fear of regret (reported in 68% of studies), partner opposition (62%), religious/cultural prohibitions (54%), and concerns about surgical pain (48%). Barriers at health system level included lack of trained providers (72% of studies), absence of equipment/consumables (58%), and high out-of-pocket costs (44%). Only 19% of studies evaluated interventions to address barriers, and only 12% measured uptake as a primary outcome. Major gaps include underrepresentation of male partners (only 16% of studies included men), absence of validated hesitancy measurement tools, and lack of implementation research on provider-focused interventions. This review highlights the need for multi-level interventions addressing knowledge deficits, provider biases, and health system constraints.***

Index Terms: ***Irreversible Contraceptives, Female Sterilization, Vasectomy, Knowledge, Hesitancy, Barriers, Uptake, Scoping Review***

I. INTRODUCTION

Irreversible contraceptives female sterilization (tubal ligation or bilateral tubal occlusion) and vasectomy are the only family planning methods designed as permanent. They are highly effective (>99%), require no ongoing user action, and are cost effective over a lifetime [1 3]. Despite these advantages, global uptake remains low, particularly in low- and middle-income countries (LMICs). Worldwide, female sterilization is used by approximately 19% of married/in union women, but this masks wide variation: 30 40% in parts of Latin America and Asia, versus <5% in most of sub-Saharan Africa [4,5]. Vasectomy is even less common, used by only 2 3% of couples globally, with some countries reporting <0.5% [6].

The World Health Organization (WHO) includes irreversible methods in its Medical Eligibility Criteria for Contraceptive Use and recommends that they be offered without unnecessary medical or administrative barriers [7]. However, multiple factors limit uptake. These can be organized into three broad domains: knowledge (awareness and accurate understanding of methods, effectiveness, side effects, permanence), hesitancy (psychological, cultural, or relational reluctance, distinct from simple lack of knowledge), and barriers (health system, provider related, financial, or logistical obstacles) [8 10].

Knowledge deficits are common: many women and men incorrectly believe sterilization causes weight gain, hormonal imbalance, or cancer; others are unaware that vasectomy does not affect sexual function [11,12]. Hesitancy encompasses fear of regret, spousal opposition, religious prohibitions, and perceived loss of femininity/masculinity [13,14]. Barriers include lack of trained providers (particularly for vasectomy), absence of equipment (e.g., laparoscopes for tubal ligation), high costs, and

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restrictive policies (e.g., age or parity requirements, spousal consent laws) [15,16].

Problem statement: Existing literature examines knowledge, hesitancy, or barriers separately, but no comprehensive synthesis maps all three domains together across both female and male irreversible methods. Furthermore, the interplay between provider knowledge/attitudes and client uptake remains poorly integrated.

Objective: This scoping review aims to:

1. Synthesize evidence on the level and correlates of knowledge about irreversible contraceptives among women, men, and healthcare providers.
2. Map the dimensions and prevalence of hesitancy toward irreversible methods.
3. Identify health system, provider, and policy barriers to uptake.
4. Examine the extent to which studies assess relationships among knowledge, hesitancy, barriers, and actual uptake.
5. Identify gaps and recommend future research and programmatic priorities.

II. BACKGROUND AND RATIONALE

A. Irreversible Contraceptives: Methods and Epidemiology

Female sterilization is typically performed via laparoscopic tubal occlusion, mini laparotomy (postpartum), or hysteroscopic occlusion (e.g., Essure, now discontinued in many countries). Vasectomy is a minor outpatient procedure involving vas deferens excision or occlusion. Both are immediately effective (though vasectomy requires a 3 month confirmation) [1,2].

Table 1 shows global and regional prevalence.

Table 1: Global Prevalence of Irreversible Contraceptives (married/in union women aged 15 49, latest available)

Region	Female sterilization (%)	Vasectomy (%)
World	19.1	2.4
Sub-Saharan Africa	2.3	0.1
South Asia	22.5	0.8
Latin America/Caribbean	27.8	2.2
Europe	7.5	4.1
North America	18.2	6.7

Source: UN World Contraceptive Use 2022 [4]

B. Knowledge as a Determinant

Knowledge includes awareness that irreversible methods exist, understanding of their mechanism, permanence, side effect profile, and distinction from emergency contraception or abortion. Studies using standardized knowledge scales report that correct knowledge is lower for vasectomy than female sterilization, and lowest among younger, less educated, and rural populations [11,17].

C. Hesitancy: Beyond Lack of Knowledge

Hesitancy, a state of indecision or reluctance despite available information, has been studied extensively for vaccines but less so for contraceptives [18]. In the irreversible contraceptive context, hesitancy dimensions include:

- Regret fear: Concern about future desire for children (particularly in low parity women).
- Social/cultural: Belief that sterilization diminishes womanhood/manhood; religious opposition (e.g., Catholic doctrine against permanent birth control).
- Partner related: Spousal nonsupport or fear of relationship breakdown.
- Medical mistrust: Historical abuses (e.g., coerced sterilization of marginalized groups) leading to distrust.

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D. Barriers to Uptake

Barriers are categorized into client level (cost, travel, time), provider level (lack of training, refusal on religious/moral grounds, misinformation), and health system level (supply chain gaps, policy restrictions such as age/parity rules or spousal consent requirements) [15,19].

E. Rationale for a Scoping Review

A scoping review is appropriate because the literature spans multiple disciplines (public health, nursing, demography, health policy) and uses diverse methodologies (surveys, qualitative interviews, cross sectional analyses) without prior comprehensive mapping.

III. METHODOLOGY

A. Scoping Review Framework

We followed Arksey and O'Malley's five stage framework [20]: (1) identifying research questions; (2) identifying relevant studies; (3) study selection; (4) charting the data; (5) collating, summarizing, and reporting results.

B. Search Strategy

We searched PubMed, CINAHL, Scopus, and African Journals Online from January 2015 to December 2025. Search terms combined: ("irreversible contraceptives" OR "female sterilization" OR "tubal ligation" OR "vasectomy" OR "permanent contraception") AND ("knowledge" OR "awareness" OR "attitudes") AND ("hesitancy" OR "reluctance" OR "fear" OR "refusal") AND ("barriers" OR "obstacles" OR "uptake" OR "acceptance"). Hand searching of reference lists was performed.

C. Inclusion and Exclusion Criteria

Inclusion: Original research (quantitative, qualitative, mixed methods); addressed knowledge, hesitancy, or barriers to irreversible contraceptives among women, men, couples, or healthcare providers; reported primary data; English language; published 2015 2025.

Exclusion: Case reports, conference abstracts, editorials, systematic reviews without primary data; studies focused exclusively on reversible methods; studies of forced sterilization or sterilization abuse without voluntary uptake context; pediatric or non human studies.

D. Study Selection and Data Extraction

Two reviewers independently screened titles/abstracts, then full texts. Disagreements resolved by consensus. Data extracted: author/year/country, study design, population (women, men, providers, couples), sample size, knowledge measurement tool, hesitancy dimensions, barriers identified, whether uptake was measured, and key findings.

E. Data Synthesis

Findings were summarized narratively and using descriptive statistics (frequency of studies reporting each variable). No meta analysis was performed.

IV. RESULTS

A. Study Selection

The search yielded 1,045 records. After deduplication (n=763), title/abstract screening excluded 602, leaving 161 full text articles. Of these, 108 were excluded (no primary data on knowledge/hesitancy/barriers n=42, reversible methods only n=38, no uptake relevance n=16, other reasons n=12). Final included: 53 studies.

Table 2: Characteristics of Included Studies (N=53)

Characteristic	Number (%)
Region	
Sub-Saharan Africa	18 (34.0)
South Asia	12 (22.6)
North America	10 (18.9)
Europe	7 (13.2)
Latin America	4 (7.5)
Southeast Asia	2 (3.8)

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Characteristic	Number (%)
Study design	
Cross-sectional (quantitative)	34 (64.2)
Qualitative (interviews, FGDs)	15 (28.3)
Mixed-methods	4 (7.5)
Population	
Women only	29 (54.7)
Men only	8 (15.1)
Both women and men	9 (17.0)
Healthcare providers only	5 (9.4)
Couples (dyadic)	2 (3.8)
Irreversible method focus	
Female sterilization only	31 (58.5)
Vasectomy only	12 (22.6)
Both methods	10 (18.9)

B. Knowledge Findings

Knowledge levels were consistently low, especially for vasectomy. The proportion of women who had heard of female sterilization ranged from 45 85%, but correct knowledge (permanence, no hormonal effects, does not cause cancer) was much lower.

Table 3: Knowledge Indicators (pooled across studies)

Knowledge item	% correct/aware (range)	Number of studies
Heard of female sterilization	68% (45-85)	28
Know female sterilization is permanent	52% (32-74)	22
Know sterilization does not cause cancer	38% (22-56)	14
Know sterilization does not cause weight gain	31% (18-48)	12
Heard of vasectomy	32% (15-62)	18
Know vasectomy does not affect sexual function	28% (12-50)	15
Know vasectomy is not castration	24% (10-44)	11
Provider knowledge: correct counseling points	42% (28-65)	8

C. Hesitancy Dimensions

Hesitancy was reported in 89% of studies (n=47). The most common dimension was fear of regret (68% of studies), followed by partner opposition (62%).

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Table 4: Hesitancy Dimensions and Prevalence

Hesitancy dimension	% of studies reporting	Illustrative quotes/themes
Fear of future regret (especially low parity)	68%	"What if my child dies and I cannot have another?"
Partner opposition (spouse refusal)	62%	"My husband says no – he wants more sons."
Religious/cultural prohibitions	54%	"The church says permanent birth control is sinful."
Fear of surgical pain/complications	48%	"I am afraid of the knife – people die from operations."
Medical mistrust (historical abuse)	41%	"They sterilized women without consent in the past."
Perceived loss of femininity/masculinity	36%	"A man who has vasectomy is not a real man."
Misinformation from social network	33%	"My neighbor said sterilization made her bleed heavily."

D. Barriers to Uptake

Barriers were categorized into client, provider, and health system levels. Health system barriers (lack of trained providers) were most frequently reported (72% of studies).

Table 5: Barriers to Uptake (≥30% of studies)

Barrier level	Specific barrier	% of studies
Health system	Lack of trained providers (especially for vasectomy)	72%
	Absence of equipment/consumables (laparoscopes, suture)	58%
	No vasectomy services at primary care level	52%
	Long waiting lists or travel distance	44%
Provider-related	Provider refusal on religious/moral grounds	40%
	Provider bias against young/nulliparous women	38%
	Poor counseling (information withheld)	36%
	Male providers unwilling to perform vasectomy	32%
Client-related	High out-of-pocket costs (direct/indirect)	44%
	Transport costs to referral facilities	40%
	Spousal consent requirements	38%
	Age/parity restrictions (e.g., ≥25 years, ≥3 children)	36%

E. Uptake Outcomes

Only 12% of studies (n=6) measured actual uptake (proportion of women/men who received

sterilization/vasectomy) as a primary outcome. Uptake ranged from 1.2% to 8.7% in study populations, consistently lower than expressed interest. A larger proportion (28%, n=15) measured intention or willingness, which was higher (35 70%) but poorly correlated with actual uptake.

F. Relationships among Knowledge, Hesitancy, Barriers, and Uptake

Only 17% of studies (n=9) examined multivariate relationships. Key findings:

- Higher knowledge was associated with lower hesitancy (all 6 studies that examined this, $p<0.05$).
- Hesitancy mediated the relationship between knowledge and intention (3 studies, SEM).
- Provider refusal was independently associated with zero uptake in facilities offering other methods (4 studies).

Table 6: Summary of Relationship Analyses

Relationship examined	Number of studies (%)	Significant association (n)
Knowledge → hesitancy	6 (11%)	6 (100%)
Knowledge → intention	11 (21%)	9 (82%)
Hesitancy → intention	10 (19%)	8 (80%)
Barriers (provider) → uptake	4 (8%)	4 (100%)
Multivariate mediation	3 (6%)	2 (67% of those)

G. Interventions to Address Barriers

Only 19% of studies (n=10) evaluated an intervention. Interventions included:

- Provider training on counseling for permanent methods (5 studies)
- Community based education campaigns targeting men (3 studies)
- Mobile outreach vasectomy camps (2 studies)
- Removal of spousal consent policies (2 studies, policy analysis)

None were randomized controlled trials. Uptake increases ranged from 2 to 5-fold in pre post designs.

H. Gaps Identified

1. Population gaps: Only 16% of studies included men, and only 4% included couples dyadically. Providers were underrepresented (9%).
2. Method gaps: No validated scale for irreversible contraceptive hesitancy exists; most studies used ad hoc items.
3. Outcome gaps: Only 12% measured actual uptake; most measured knowledge or attitudes alone.
4. Intervention gaps: No implementation science studies using frameworks (e.g., CFIR, RE AIM) to evaluate barrier reduction strategies.
5. Geographic gaps: Vasectomy was severely understudied in LMICs (only 22% of vasectomy focused studies from LMICs).

V. DISCUSSION

A. Principal Findings

This scoping review of 53 studies reveals that knowledge deficits about irreversible contraceptives are pervasive, hesitancy is multidimensional (fear of regret, partner opposition, religious concerns), and health system barriers (lack of trained providers, equipment) are as important as individual level factors. Critically, only a minority of studies measure actual uptake, and even fewer evaluate interventions. The disconnect between expressed interest (often >50%) and actual uptake (<10% in many settings) suggests that addressing knowledge alone is insufficient; structural and provider level barriers must be tackled simultaneously.

B. Comparison with Existing Literature

Our findings align with earlier narrative reviews on contraceptive sterilization barriers [15,21] but extend them by quantifying the frequency of specific hesitancy dimensions and by identifying provider

refusal as a major barrier (40% of studies). A 2020 systematic review of vasectomy in LMICs found similar supply side gaps [22]. However, our review uniquely maps the relationship between knowledge, hesitancy, and uptake, showing that hesitancy mediates the knowledge uptake pathway a finding with important programmatic implications.

C. Clinical and Programmatic Implications

For healthcare providers: Training should move beyond technical skills to include bias free counseling that addresses hesitancy (e.g., regret risk communication, partner involvement). Providers should also understand that their own moral objections should not block access; referral systems are needed.

For program managers: Interventions should be multi-level: (1) community-based knowledge campaigns targeting couples; (2) hesitancy reduction counseling tools (e.g., decision aids); (3) health system strengthening (vasectomy training for mid-level providers, mobile services, removal of restrictive policies).

For researchers: Future studies should:

- Develop and validate a Irreversible Contraceptive Hesitancy Scale (ICHS).
- Conduct dyadic studies (couples) to understand partner dynamics.
- Use implementation science frameworks to evaluate barrier reduction interventions.
- Measure actual uptake, not just intention, with longer follow up.

D. Limitations of This Review

The scoping review did not assess study quality or perform meta-analysis. Language restriction to English may have missed relevant non-English literature (e.g., French language studies from West Africa). Grey literature (program reports, policy briefs) was not included.

VI. CONCLUSION

This scoping review maps existing evidence on knowledge, hesitancy, and barriers to uptake of irreversible contraceptives among women and healthcare providers. Knowledge gaps are widespread, particularly for vasectomy. Hesitancy is driven by fear of regret, partner opposition, and religious/cultural norms. Health system barriers—especially lack of trained providers—are consistently reported. However, only a small fraction of studies measures actual uptake or evaluate interventions. Researchers and program implementers should prioritize multi-level, theory driven interventions that address knowledge deficits, hesitancy, and structural barriers simultaneously, with rigorous measurement of uptake outcomes.

VII. ACKNOWLEDGMENT

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