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Original Article

Public Trust in Laboratory Results During Emerging Infectious Disease Alerts

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ABSTRACT

Background: Family planning programmes in underserved areas of Sindh require more than commodity availability because contraceptive decision-making is shaped by social norms, gender power, myths about side effects, women's mobility, and trust in service providers. Community-based models such as Marvi Markaz/BiB may improve acceptability by linking door-to-door counselling with safe local access points, but qualitative evidence is needed to understand how such models are experienced by women, men, frontline workers, and programme staff. Objective: This study explored perceptions of the Marvi Markaz/BiB family planning model, focusing on acceptability, barriers and facilitators, and conditions for sustainability. Methods: An interpretative qualitative endline evaluation was conducted using in-depth interviews and focus group discussions with married women of reproductive age, men, Marvi workers, and programme staff. Data were analysed using thematic analysis, with attention to patterns across participant groups and implementation perspectives. Results: Six themes were identified: trust in Marvi workers, safe local service space, myths and fear of side effects, gendered decision-making, commodity continuity, and sustainability through supervision and monitoring. Acceptability was linked to familiar local counselling, privacy, reduced travel barriers, and commodity linkage, while barriers included misinformation, male approval, household influence, and supply interruptions. Conclusion: The model was perceived as acceptable when trust, safe spaces, and commodity access worked together. Sustainability requires male engagement, refresher training, supervision, monitoring, and reliable supply systems. Keywords: family planning; Marvi Markaz; community health workers; qualitative endline evaluation; contraceptive access; Sindh; Pakistan.

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INTRODUCTION

Laboratory results are central to decision-making during emerging infectious disease alerts because they translate suspected exposure, symptoms, and population-level warnings into actionable information for individuals, clinicians, workplaces, and public health agencies (1-3). A positive, negative, inconclusive, or delayed result may influence whether a person isolates, returns to work, seeks further care, protects vulnerable family members, or accepts the credibility of a wider public health response. In this sense, laboratory testing is not only a diagnostic procedure but also a social and communicative event. During infectious disease alerts, symptoms alone may be insufficient to confirm or exclude infection, and laboratory results are therefore used to support case confirmation, surveillance, contact tracing, risk communication, and health-system response planning (1-4).

The importance of laboratory reporting extends beyond the acute phase of a public health emergency. Surveillance dashboards, case counts, pathogen monitoring, and public health recommendations remain dependent on testing availability, reporting consistency, and public understanding of what surveillance data can and cannot show. When testing becomes less frequent or reporting becomes inconsistent, official figures may be interpreted as less meaningful unless their limitations are clearly communicated to the public (2). Recent preparedness frameworks have also emphasized that detection capacity and communication credibility are inseparable components of health security. Reliable laboratory detection, timely reporting, and trusted communication with affected communities are essential to alert management and emergency response (3-8).

Laboratory preparedness is commonly discussed in terms of technical capacity, biosafety, sequencing, reference laboratory functions, internal quality control, external quality assessment, and standard operating procedures. These technical safeguards are indispensable, but they do not automatically produce public confidence. For a laboratory result to be trusted, recipients must be able to identify the source of the result, understand its meaning, judge whether it fits their symptoms or exposure history, and believe that the system producing the result is competent, fair, and accountable. Public health laboratory networks can influence behaviour only when their outputs are both technically reliable and socially intelligible (4-13).

Behavioural and social science evidence indicates that responses to infectious disease warnings are shaped by more than knowledge of pathogens or test accuracy. Individuals interpret risk through trust, social norms, political cues, perceived fairness, prior institutional experience, practical consequences, and the credibility of messengers. The same laboratory result may reassure one person and create doubt in another if it arrives late, contradicts symptoms, is communicated by an unfamiliar source, or creates consequences for employment, family care, travel, or stigma (5). Therefore, public trust in laboratory results should be understood as a situated judgement rather than a simple acceptance or rejection of science (14-19).

Uncertainty communication is especially relevant to laboratory trust. During outbreaks, evidence changes as test performance is assessed, variants emerge, surveillance strategies shift, and public health advice is revised. Trust can be protected when agencies communicate what is known, what remains uncertain, and why guidance may change over time. Conversely, confidence may weaken when provisional knowledge is presented as absolute, when trade-offs are minimized, or when changing advice is not adequately explained (6,7). Laboratory results are particularly vulnerable to this problem because the public may receive technically accurate results without sufficient explanation of sampling time, exposure history, test purpose, sensitivity, specificity, predictive value, disease prevalence, or the possibility of false-negative and false-positive findings (8,19-26).

The interpretation of negative, positive, inconclusive, and discordant results is clinically and socially complex. A negative result may be misread as proof of absence of infection despite recent exposure, while a positive result may be questioned when symptoms are absent. Molecular tests are influenced by timing after exposure and stage of infection, and false-negative probabilities can vary substantially across the infection timeline (10). Rapid antigen and point-of-care tests add further complexity because they may serve screening, access control, or clinical decision-making purposes and may not always agree with laboratory molecular tests. When the different purposes and limitations of test types are not clearly explained, discordant results can be interpreted as evidence that testing itself is unreliable (11). Turnaround time also affects trust because a delayed result may be technically valid but practically less useful for decisions about isolation, work, care responsibilities, or contact with vulnerable people. In some infectious disease control contexts, frequent testing and rapid reporting may be more useful for transmission control than test sensitivity alone (27-30).

Misinformation and socially circulating narratives further complicate how laboratory results are understood. During COVID-19, conspiracy beliefs and misleading claims about tests, case numbers, and government intentions were associated with lower uptake of protective behaviours (13). Mistrust was not limited to misunderstanding of laboratory science; it was often embedded in broader perceptions of institutional manipulation, political interest, sample mishandling, or data misuse (14). The COVID-19 information environment was widely described as an infodemic, in which accurate, inaccurate, and emotionally charged claims circulated simultaneously and competed for public attention (15). In such environments, laboratory results can become vulnerable to reinterpretation through non-expert social media narratives, especially when official communication is delayed, inaccessible, overly technical, or disconnected from people's practical concerns (23, 29).

Emergency risk communication principles emphasize speed, accuracy, empathy, transparency, and actionable guidance. These principles apply directly to laboratory reporting because recipients need to know what their result means, what remains uncertain, what action they should take, and where they can obtain further help (16). Community involvement is also important because national-level messages are interpreted locally. Clinicians, nurses, pharmacists, voluntary groups, faith organisations, employers, and community advocates may help translate laboratory information into trusted and actionable messages, particularly for populations affected by language barriers, digital exclusion, low health literacy, stigma, or prior negative institutional experiences (17,18). Digital delivery of results can improve speed but may also worsen inequity when portals are difficult to navigate, lack language support, provide limited explanation, or leave users uncertain about who can view their results (19).

Data governance and laboratory accountability are further conditions of trust. Laboratory results may be used for clinical care, contact tracing, surveillance, genomic monitoring, resource allocation, and public health planning. These uses may be legitimate, but public confidence depends on clear explanation of who can access results, how personal data may be shared, and what privacy protections exist (20). Technical governance, including validation, biosafety, internal quality control, external quality assessment, and standard operating procedures, is usually invisible to the public unless it is explained in plain language (21). Genomic surveillance similarly extends the public significance of laboratory samples because sequencing can support variant detection and global data sharing, but confidence depends on assurance that such activities are proportionate, governed, and directed toward public health benefit (22).

Overall, existing literature suggests that trust in laboratory results cannot be reduced to technical accuracy alone. It is shaped by the way results are produced, communicated, contextualised, accessed, acted upon, and governed. However, less attention has been given to how members of the public interpret laboratory results as practical information during emerging infectious disease alerts, particularly when uncertainty, misinformation, digital access, institutional credibility, privacy concerns, and social consequences intersect. This study therefore aimed to explore how adults understood and trusted laboratory results during alerts for emerging infectious diseases, with particular attention to the factors that strengthened or weakened confidence in positive, negative, inconclusive, delayed, and discordant results.

MATERIALS AND METHODS

This study used a qualitative interpretivist design to explore how adults interpreted and trusted laboratory results during emerging infectious disease alerts. An interpretivist approach was appropriate because the study examined trust as a situated judgement shaped by personal experience, perceived credibility, symptoms, timing, communication, access, privacy, and practical consequences rather than as a fixed or directly measurable attitude. The design was selected to generate in-depth understanding of how participants made sense of laboratory results in relation to COVID-19, mpox, influenza, and suspected viral haemorrhagic fever warnings.

The study included 10 adult community participants who provided semi-structured interview data. Participants were selected using purposive variation to capture differences in work context, household responsibilities, digital confidence, prior testing experience, and exposure to infectious disease alerts. The purpose of sampling was not statistical representativeness but depth and diversity of interpretation. The sample size was considered appropriate for an exploratory qualitative interview study because the aim was to identify meaning patterns across information-rich accounts rather than to estimate the prevalence of views in a wider population. Qualitative interview studies can generate useful analytic insight from smaller samples when the data are sufficiently relevant to the research question and the analytic process is transparent (23).

Eligible participants were adults from community settings who could discuss experiences, perceptions, or expectations related to laboratory testing during infectious disease alerts. Participants with relevant experience of COVID-19 testing, influenza testing, workplace screening, hospital or household testing, digital result portals, community-level health communication, or public health warnings were included to ensure variation in perspectives. Participants were identified to reflect different roles and contexts, including retail work, taxi driving, teaching, retirement, care work, student life, community volunteering, warehouse supervision, family caregiving, and self-employment. Written informed consent was obtained before participation, and participants were informed that their responses would be anonymised and used for research purposes.

Semi-structured interviews were used because this method allows a consistent set of topics to be explored while giving participants space to explain their experiences in their own terms (24). The interview topics addressed interpretation of positive, negative, inconclusive, delayed, and discordant laboratory results; the role of clinicians, nurses, public health agencies, employers, family members, community messengers, news media, and social media in shaping trust; the perceived meaning of test timing and symptoms; access to testing and digital result systems; privacy and data-use concerns; and expectations regarding laboratory quality, error handling, and public health communication. The semi-structured format allowed participants to discuss both direct testing experiences and broader perceptions of laboratory credibility during emerging infectious disease alerts.

The main outcome of interest was public trust in laboratory results as expressed through participant accounts. Trust was operationally understood as confidence in the credibility, meaning, usefulness, fairness, and governance of laboratory results. The analysis examined how participants interpreted laboratory results in relation to source credibility, prior experience, uncertainty, timing, symptoms, social and digital information environments, access barriers, privacy concerns, and visible laboratory governance. Positive, negative, inconclusive, delayed, and discordant results were treated as distinct interpretive situations because each may create different questions about reliability, action, and institutional accountability.

Data were analysed using reflexive thematic analysis. This approach was suitable because the study aimed to identify patterns of meaning across participant narratives while preserving the contextual and interpretive nature of individual accounts (25). The analytic process involved familiarisation with the interview material, generation of initial codes, development of candidate themes, review and refinement of themes, theme definition, and written interpretation. Initial coding focused on recurring concepts such as trusted clinician explanation, delayed result, negative result despite symptoms, inconclusive wording, online rumour, pressure to return to work, inaccessible portal, privacy concern, and visible quality checks. These codes were then examined for broader relationships and organised into five themes: source credibility and prior experience; uncertainty in test results and doubt; social and digital information environments; equity and access as conditions of confidence; and transparent laboratory governance.

Analytic credibility was strengthened through explicit movement from codes to themes, close attention to participant context, use of participant identifiers, and interpretation of both confidence and doubt as meaningful responses to laboratory communication. Doubt was not treated as ignorance or rejection of science; instead, the analysis examined whether uncertainty emerged from delayed results, unclear wording, discordant test types, inaccessible systems, stigma, privacy concerns, practical consequences, or unresolved questions about laboratory governance. This approach is consistent with qualitative trustworthiness principles that emphasize transparency, coherence, reflexive interpretation, and careful linkage between data and analytic claims (26).

Potential sources of bias were addressed at the design and analytic stages. Purposive variation was used to avoid reliance on a single type of testing experience or social context. The interview guide covered multiple forms of result interpretation and did not frame trust as an expected or desirable response. During analysis, attention was given to variation across participants, including accounts of high trust in clinicians, scepticism toward political messaging, concerns about workplace testing, uncertainty about digital portals, and worries about privacy or data use. Claims were restricted to qualitative interpretation of participant accounts and were not treated as population-level estimates.

Data integrity and confidentiality were maintained by anonymising participants using codes P1 to P10 and by presenting findings without personal names. Participant information was reported only to the level needed to contextualise interpretation, including broad profile, role or context, relevant testing experience, and primary trust concern. Ethical approval was obtained from Clinical Medicine, Prima Indonesia University, Indonesia, and written informed consent was obtained from all participants. The study was conducted in accordance with ethical principles for qualitative inquiry, including voluntary participation, respectful treatment of participant concerns, confidentiality, and non-judgemental interpretation of uncertainty, mistrust, and perceived risk (27).

RESULTS

The qualitative endline evaluation generated five interconnected themes describing how community members, Marvi workers, and programme staff perceived the Marvi Markaz/BiB model for improving family planning awareness, service acceptability, and commodity access. The themes reflected the interaction between household-level norms, gendered decision-making, trust in community-based workers, availability of contraceptive commodities, and the perceived sustainability of the model. Across participant groups, family planning was not described only as a matter of method availability, but as a socially negotiated decision influenced by women's mobility, spousal permission, fear of side effects, religious and cultural beliefs, confidentiality, service proximity, and the credibility of the person providing information.

Table 1. Theme matrix showing perceived strength of major themes across participant groups

Theme	MWRAs	Men	Marvi Workers	DPM/ DPWDO	Interpretive Pattern
Trust in Marvi workers and door-to-door counselling	Frequent	Moderate	Frequent	Frequent	Trust was strongest when information was delivered by familiar women from the community and reinforced through repeated household contact.
Marvi Markaz as a safe and accessible service space	Frequent	Moderate	Frequent	Frequent	The Markaz was perceived as acceptable when it reduced travel barriers, protected privacy, and provided a locally recognized point for counselling and commodities.
Myths, fear of side effects, and misinformation	Frequent	Frequent	Frequent	Moderate	Misconceptions about contraceptive methods remained a major barrier, especially when women or couples lacked repeated counselling or had prior negative experiences.
Gendered decision-making and male influence	Frequent	Frequent	Moderate	Frequent	Men's approval, couple communication, and wider household influence shaped women's ability to initiate or continue contraceptive use.
Commodity availability and continuity of services	Frequent	Moderate	Frequent	Frequent	The perceived value of the model depended on reliable commodity supply, timely referral, and continuity between counselling and actual method access.
Sustainability through supervision, refresher training, and monitoring	Moderate	Rare	Frequent	Frequent	Programme continuity was linked to worker motivation, supportive supervision, updated knowledge, commodity logistics, and routine monitoring.

The first theme concerned trust in Marvi workers and the value of repeated door-to-door counselling. MWRAs described community-based counselling as acceptable because Marvi workers were locally known, approachable, and able to discuss family planning in culturally familiar language. The trust mechanism was relational rather than purely informational: women were more receptive when counselling came from someone who understood local norms, household constraints, and privacy concerns. Marvi workers also described repeated contact as necessary because one counselling session was often insufficient to address fear, myths, or hesitation. Programme staff similarly viewed community trust as a central pathway through which the model created demand and linked women to services.

The second theme reflected the role of the Marvi Markaz as a safe, proximate, and socially acceptable service point. MWRAs and Marvi workers emphasized that proximity reduced dependence on long-distance travel and made counselling easier to access. The Markaz was perceived as especially useful when women could seek information without the discomfort associated with distant facilities or unfamiliar providers. For men, acceptability was linked less to the physical space itself and more to whether the service was viewed as reliable, respectful, and consistent with household needs. Programme staff described the Markaz as a community-level bridge between awareness generation and commodity access, particularly where routine facility access was constrained by distance, cost, mobility restrictions, or hesitation to discuss reproductive health openly.

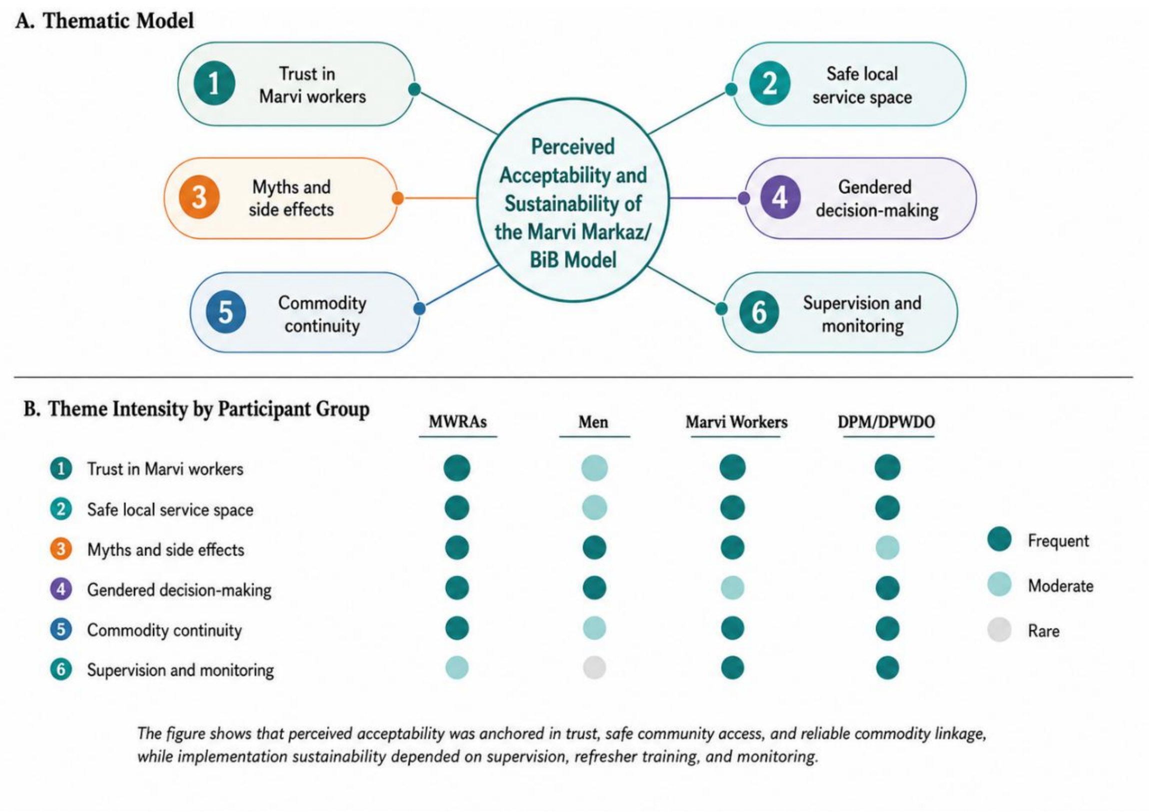
The third theme focused on myths, fear of side effects, and misinformation. Across participant groups, misconceptions about family planning methods remained a persistent barrier. Women's concerns were commonly linked to anticipated or experienced side effects, fear of weakness or infertility, uncertainty about method safety, and stories circulating within families or communities. Men's hesitation was often connected to incomplete information, religious or cultural framing, and concern about perceived harm to women's health. Marvi workers described myths as difficult to resolve when they were reinforced by relatives, neighbours, or prior negative experiences. The findings indicated that misinformation was not simply a knowledge deficit; it was embedded in social trust, lived experience, and the authority of household narratives.

The fourth theme concerned gendered decision-making. MWRAs' ability to use family planning was shaped by spousal communication, male approval, and wider household influence. Women's preferences did not always translate into method adoption when husbands or senior family members were uncertain, opposed, or insufficiently informed. Men's accounts indicated that male engagement could either facilitate or restrict contraceptive decision-making depending on whether family planning was understood as shared household planning or as a women-only concern. Marvi workers and programme staff emphasized that counselling women alone was important but not always sufficient in households where final decisions were negotiated with husbands or influenced by mothers-in-law and other family members. The findings therefore supported a couple- and household-sensitive approach rather than an exclusively women-focused communication strategy.

The fifth theme was commodity availability and continuity of care. Participants linked confidence in the model to whether counselling was followed by actual access to preferred methods. Women's trust weakened when commodities were unavailable, when referral pathways were unclear, or when continuation support was insufficient after method initiation. Marvi workers described commodity availability as essential to maintaining credibility because unmet demand after counselling could reduce confidence in both the worker and the programme. Programme staff similarly identified supply continuity, referral coordination, and routine monitoring as implementation conditions necessary for sustaining service uptake and community confidence. The results suggest that demand generation and commodity access were experienced as inseparable parts of the intervention pathway.

The sixth cross-cutting theme concerned sustainability. Marvi workers and programme staff emphasized that the model required continued refresher training, supportive supervision, timely commodity replenishment, field-level problem-solving, and routine monitoring. Training was perceived as important not only for technical knowledge but also for improving counselling confidence, responding to myths, managing sensitive conversations, and supporting referrals. Supervision was valued when it helped workers resolve field challenges rather than functioning only as administrative oversight. Programme staff viewed monitoring and management information systems as necessary for identifying gaps in commodity supply, worker performance, referral completion, and community coverage. These findings indicate that sustainability depended on maintaining both the human relationship infrastructure and the operational supply-and-supervision infrastructure of the model.

Overall, the findings indicate that the Marvi Markaz/BiB model was perceived as acceptable when it combined trusted local counselling, safe community-based access points, privacy-sensitive communication, and reliable commodity availability. Barriers remained where misinformation, fear of side effects, gendered decision-making, mobility constraints, and supply interruptions limited women's ability to act on counselling. The strongest perceived mechanisms of acceptability were trust in Marvi workers, repeated household engagement, proximity of services, and the possibility of linking counselling with commodities. The strongest implementation requirements were male engagement, myth-responsive counselling, refresher training, supervision, commodity continuity, and monitoring systems that could identify service gaps early.



	MWRAs	Men	Marvi Workers	DPM/DPWDO
① Trust in Marvi workers	●	◍	●	●
② Safe local service space	●	◍	●	●
③ Myths and side effects	●	●	●	◍
④ Gendered decision-making	●	●	◍	●
⑤ Commodity continuity	●	◍	●	●
⑥ Supervision and monitoring	◍	○	●	●

● Frequent
◍ Moderate
○ Rare

The figure shows that perceived acceptability was anchored in trust, safe community access, and reliable commodity linkage, while implementation sustainability depended on supervision, refresher training, and monitoring.

Figure 1. Thematic Model of Acceptability and Sustainability of the Marvi Markaz/BiB Family Planning Model.

The figure presents a qualitative thematic model derived from the endline evaluation of the Marvi Markaz/BiB family planning model. Panel A shows six interrelated themes contributing to perceived acceptability and sustainability: trust in Marvi workers, safe local service space, myths and side effects, gendered decision-making, commodity continuity, and supervision and monitoring. Panel B compares the perceived intensity of these themes across participant groups, showing that trust in Marvi workers, safe local service space, and commodity continuity were frequent among MWRAs, Marvi workers, and programme staff, while men showed moderate emphasis on service access and commodity continuity. Myths and side effects were frequent among MWRAs, men, and Marvi workers, indicating their continued importance as barriers to family planning acceptance. Gendered decision-making was frequent among MWRAs, men, and DPM/DPWDO participants, highlighting the role of male approval and household influence. Sustainability-related issues were most prominent among Marvi workers and programme staff, suggesting that supervision, refresher training, monitoring, and operational support are key conditions for maintaining the model. Overall, the model indicates that acceptability was anchored in relational trust, safe community-based access, and reliable commodity linkage, whereas sustainability depended on continued supervision, training, monitoring, and supply continuity.

DISCUSSION

This qualitative endline evaluation shows that the perceived acceptability of the Marvi Markaz/BiB family planning model was shaped by the interaction of trust, safe access, gendered household decision-making, myth-responsive counselling, commodity continuity, and implementation support. Participants did not describe family planning uptake as a simple result of awareness or method availability. Instead, their accounts suggested that decisions were negotiated through household authority structures, community narratives, women's mobility constraints, perceived risks of contraceptive methods, and confidence in the person or place providing services. This interpretation is consistent with evidence from Pakistan showing that contraceptive use remains constrained not only by supply-side gaps but also by social norms, fear of side effects, spousal opposition, religious framing, and limited autonomy among married women of reproductive age (1,2).

The central mechanism identified in the findings was relational trust. Marvi workers were perceived as acceptable because they were familiar local women who could enter households, speak in culturally recognizable ways, preserve privacy, and return repeatedly to address doubts. This supports the wider rationale for community health worker models, in which proximity and social embeddedness allow health messages to become more credible and actionable than facility-based information alone (3,4). In the context of family planning, this relational role is especially important because women may not be able to seek information freely from distant facilities or discuss contraception openly in mixed or unfamiliar settings. The findings therefore suggest that the Marvi worker's value lies not only in transmitting technical information but also in mediating between biomedical advice and household-level acceptability.

The Marvi Markaz was perceived as a safe local service space because it reduced travel burden, improved privacy, and created a recognizable community point for counselling and commodity linkage. This is important in rural and underserved settings where physical distance, cost of transport, women's restricted mobility, and discomfort with unfamiliar providers can delay or prevent service use. The Markaz appeared to function as a bridge between household counselling and service access, particularly when women could move from discussion to method-related guidance without navigating distant or socially intimidating systems. However, this acceptability depended on whether the Markaz remained functional, confidential, and connected to reliable supplies. A safe space that cannot provide or link women to preferred methods may generate awareness but may not sustain confidence (7, 12-16).

Myths, fear of side effects, and misinformation remained major barriers across participant groups. Concerns about weakness, infertility, menstrual disturbance, long-term harm, or religious acceptability reflected more than a lack of knowledge; they were socially reinforced through relatives, neighbours, prior experiences, and community stories. This finding aligns with earlier family planning research from Pakistan, where side-effect concerns, husband or family opposition, and perceived religious objections have repeatedly emerged as reasons for non-use or discontinuation (1,5). The implication is that counselling should not treat myths as isolated false beliefs corrected by one-time information. Instead, myth-responsive counselling requires repeated explanation, acknowledgement of women's fears, clear discussion of side effects and method switching, and opportunities for couples to ask questions without embarrassment or judgement (2, 17, 26).

Gendered decision-making was another dominant theme. Women's expressed interest in family planning did not always translate into action where husbands, mothers-in-law, or senior family members influenced reproductive decisions. Men were important not only as gatekeepers but also as potential facilitators when they understood birth spacing as a shared household responsibility. This supports the need for male engagement strategies that do not displace women's autonomy but create space for informed couple communication. In conservative and rural settings, male engagement must be carefully designed so that it reduces opposition and misinformation without increasing surveillance or control over women's reproductive choices. The findings therefore favour a dual approach: continued confidential counselling for women alongside structured, culturally appropriate engagement with men and influential family members (14, 22).

Commodity availability and continuity were critical to programme credibility. Participants linked the value of counselling to whether preferred methods were available, referrals were clear, and continuation support was provided after initiation. This is consistent with implementation evidence that community-based family planning models require dependable logistics, supervision, and referral coordination to convert demand generation into sustained service use (3,6). When commodities are unavailable after counselling, the worker's credibility may weaken and the intervention may be perceived as incomplete. Conversely, when information, method access, referral, and follow-up are aligned, the model becomes more coherent from the user's perspective. Strengthening the supply chain is therefore not only an operational requirement but also a trust-building intervention.

The sustainability theme showed that implementation quality depended on refresher training, supportive supervision, commodity replenishment, monitoring, and field-level problem-solving. Marvi workers require more than initial orientation; they need continuing support to respond to method-specific concerns, manage sensitive conversations, recognize referral needs, maintain records, and address misinformation. Supportive supervision should therefore be developmental rather than merely administrative. Routine monitoring and management information systems can help identify gaps in coverage, counselling quality, commodity availability, referral completion, and follow-up. These implementation conditions are particularly important in endline settings, where the central policy question is not only whether the model was accepted during project delivery but whether it can be maintained, adapted, and scaled without loss of quality.

The findings also indicate that the model's perceived effectiveness should be interpreted cautiously. Participants described mechanisms through which the Marvi Markaz/BiB model may support awareness, acceptability, couple discussion, and service linkage, but qualitative endline data alone cannot establish population-level changes in contraceptive prevalence or method uptake. Claims about increased use require independent quantitative service statistics, baseline-endline comparison, or routine programme data. The qualitative value of this study lies instead in explaining why the model may be acceptable, where implementation may fail, and which conditions are necessary for sustained functioning. In this respect, the findings complement demographic and programme data by showing how family planning services are experienced and negotiated in everyday community life (26-29).

The study has several limitations. As an endline qualitative evaluation, it captured participant perceptions at one point in the implementation cycle and cannot establish causal effects. Participants may have provided socially desirable responses, particularly if recruitment occurred through programme-linked channels or if respondents associated the evaluation with service providers. Translation and transcription may have led to loss of nuance in culturally specific expressions about fertility, religion, side effects, or household authority. The inclusion of multiple participant groups strengthened triangulation, but the findings remain context-specific and should be transferred to other districts cautiously. Despite these limitations, the evaluation provides useful implementation insight by identifying trust, safe access, myth-responsive counselling, male engagement, commodity continuity, and supervision as key conditions for acceptability and sustainability (21, 28, 30).

CONCLUSION

The qualitative endline evaluation suggests that the Marvi Markaz/BiB family planning model was perceived as acceptable when it combined trusted door-to-door counselling by local women, safe community-based service spaces, privacy-sensitive communication, and reliable linkage to contraceptive commodities. The strongest mechanisms of acceptability were relational trust, repeated household contact, reduced travel barriers, and the ability to discuss family planning in culturally familiar and confidential settings. Persistent barriers included myths about side effects, gendered decision-making, limited women's autonomy, mobility constraints, and interruptions in commodity availability. Sustainability depends on continued male engagement, refresher training for Marvi workers, supportive supervision, commodity replenishment, referral coordination, and routine monitoring systems that identify field-level gaps early. The model should therefore be strengthened as a community-trusted service platform rather than treated only as an awareness-raising intervention.

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