

Implementing Youth-Friendly Health Services Through Community Health Posts: A Comparative Mixed-Methods Evaluation in Ethiopia

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Abstract

Background

Despite national policies promoting adolescent- and youth-friendly health services (YFHS), utilization remains low in many low- and middle-income countries, particularly among rural adolescents facing geographic, social, and confidentiality-related barriers. Ethiopia's Health Extension Program offers an opportunity to decentralize YFHS through community health posts, but evidence on the implementation, quality, and utilization of this model remains limited. This study evaluated YFHS delivered through community health posts in Jimma Zone, Ethiopia, using the Donabedian quality-of-care framework complemented by Proctor's Implementation Outcomes Framework.

Methods

A comparative explanatory mixed-methods study was conducted from January to March 2025 in five intervention and five comparison districts. Quantitative data were collected from 897 adolescents and young people aged 10–24 years, 66 client exit interviews, 30 health post observations, and Health Extension Worker assessments. Qualitative data were obtained through 22 key informant interviews and four focus group discussions. Service quality was assessed across structure, process, and outcome domains. Multivariable logistic regression identified factors associated with YFHS utilization, while thematic analysis explored implementation experiences, barriers, and facilitators. District-clustered robust standard errors were used in sensitivity analyses.

Results

Overall, 21.5% of participants reported utilizing at least one YFHS package during the previous 12 months. Utilization was higher in intervention than comparison districts (37.3% vs. 5.8%; $p < 0.001$). Intervention health posts demonstrated stronger structural readiness and higher process-quality indicators, including privacy, confidentiality, respectful communication, and counselling quality. More than 85% of service users reported positive care experiences. In multivariable analysis, intervention residence (AOR = 6.83, 95% CI: 4.00–11.68), youth programme participation (AOR = 9.36, 95% CI: 5.67–15.44), female sex (AOR = 2.29, 95% CI: 1.41–3.71), and marital status were independently associated with YFHS utilization. Qualitative findings indicated that trust in Health Extension Workers, confidentiality, youth engagement, supervision, and service proximity facilitated uptake, while limited awareness, stigma, and sociocultural norms remained barriers.

Conclusions

Integrating YFHS into community health posts may be a feasible strategy for improving service quality and utilization among adolescents and young people. Strengthening provider competencies, supervision, privacy-enhancing service organization, and youth engagement can support adolescent-responsive care within routine primary healthcare and offers a potentially scalable model for similar low-resource settings.

Contributions to the literature

- This study provides implementation evidence on decentralizing youth-friendly health services through community health posts within a routine primary healthcare system.
- It integrates Donabedian's quality-of-care framework with Proctor's implementation outcomes to examine readiness, fidelity, acceptability, feasibility, and penetration.
- It shows how provider training, supervision, privacy arrangements, and youth engagement can strengthen adolescent-responsive service delivery.
- It offers a transferable implementation model for expanding adolescent sexual and reproductive health services in low-resource settings.

1. Introduction

Adolescents and young people aged 10–24 years constitute nearly one-quarter of the global population and represent approximately 40% of Ethiopia's population, making them a critical demographic for social and economic development [1, 4]. Despite substantial progress in health outcomes over recent decades, adolescents in many low- and middle-income countries (LMICs) continue to face significant sexual and reproductive health (SRH) challenges, including unintended pregnancy, unmet need for contraception, sexually transmitted infections (STIs), HIV, early marriage, and gender-based violence [2, 3]. These challenges contribute to preventable morbidity and mortality and may have long-term consequences for education, employment, and overall well-being. Recognizing these risks, global frameworks such as the Sustainable Development Goals (SDGs) and the World Health Organization's Global Accelerated Action for the Health of Adolescents (AA-HA!) emphasize the importance of ensuring equitable access to quality adolescent-responsive health services [2, 4].

Youth-friendly health services (YFHS) have emerged as a key strategy for improving adolescent and youth SRH outcomes. YFHS are designed to be accessible, acceptable, equitable, appropriate, and effective for young people by ensuring confidentiality, privacy, respectful treatment, non-judgmental provider attitudes, and age-appropriate communication [8]. Evidence from diverse settings demonstrates that youth-friendly approaches can improve SRH knowledge, increase service utilization, promote safer sexual behaviours, and strengthen continuity of care among adolescents and young people [9–11]. However, the effectiveness of YFHS depends not only on service availability but also on the quality of interactions between providers and young clients, as well as the extent to which services respond to the unique social and developmental needs of adolescents and young people [17].

Despite national policy commitments, access to and utilization of YFHS in Ethiopia remain suboptimal. Ethiopia's National Adolescent and Youth Health Strategy and Health Sector Transformation Plan II prioritize adolescent-responsive service delivery and youth engagement as central components of health system strengthening [4, 6]. Nevertheless, studies conducted in different parts of the country have consistently reported low service utilization and persistent barriers, including limited awareness, concerns about confidentiality, stigma, provider bias, inadequate privacy, and sociocultural norms that discourage adolescents from seeking SRH services [5, 7, 12–15]. A recent systematic review further identified structural and interpersonal barriers as major determinants of YFHS utilization in Ethiopia [19]. While these studies have generated valuable evidence, most have focused on hospitals and health centres, leaving limited understanding of YFHS implementation at the community level. In Ethiopia, youth-friendly sexual and reproductive health services have commonly been implemented through health centres and higher-level facilities. However, this delivery model may not sufficiently address access barriers among rural and hard-to-reach adolescents and young people, particularly where distance, social visibility, and fear of being judged discourage care-seeking. Bringing services closer to communities may therefore be important for improving both access and acceptability.

Ethiopia's Health Extension Program offers a unique opportunity to expand adolescent and youth-responsive services through health posts, which constitute the most peripheral level of the primary healthcare system. Staffed by Health Extension Workers (HEWs) and embedded within local communities, health posts are often the first point of contact with the formal health system, particularly for rural and underserved populations. Their proximity to households and established community trust positions them as potentially effective platforms for delivering youth-friendly SRH services while reducing geographic and financial barriers to care [15]. However, health posts also face important constraints, including limited infrastructure, inadequate privacy, competing service demands, and variable provider capacity. Evidence regarding their ability to deliver high-quality YFHS at scale remains scarce.

Despite supportive national policies and technical guidelines, translating youth-friendly health service standards into routine practice remains challenging. Across many low- and middle-income countries, implementation is often constrained by inadequate provider training, limited supportive supervision, insufficient resources, weak monitoring systems, high staff turnover, and competing service priorities within primary healthcare [27–29]. In Ethiopia, these challenges are further compounded by geographic inequities, sociocultural barriers, concerns about confidentiality, and limited adolescent engagement in service design and delivery [4, 6, 19]. Consequently, many YFHS programmes achieve only partial implementation, resulting in inconsistent service quality and limited population coverage despite the existence of enabling policies. Addressing these implementation bottlenecks requires evidence not only on whether YFHS improve adolescent health outcomes, but also on how they can be effectively integrated, delivered, and sustained within routine primary healthcare systems. Most existing studies on youth-friendly services in Ethiopia have focused on health centres, hospitals, schools, or urban settings, leaving a gap in evidence on community-level service delivery through health posts.

To assess service quality within this context, this study draws on the Donabedian framework, which conceptualizes healthcare quality through three interrelated dimensions: structure, process, and outcomes [5, 16]. The framework has been widely applied in evaluations of adolescent health services because it captures both service readiness, such as trained personnel, infrastructure, commodities, and service organization, and the interpersonal aspects of care that are particularly important for young people, including confidentiality, respectful communication, and client-centred counselling [5, 17]. While the Donabedian framework provides a robust approach for evaluating healthcare quality, it does not fully capture how complex service delivery interventions are implemented within health systems. To complement this perspective, this study also draws on Proctor et al.'s Implementation Outcomes Framework, which conceptualizes implementation success through outcomes such as acceptability, adoption, appropriateness, feasibility, fidelity, penetration, and sustainability [27]. Together, the Donabedian and Proctor frameworks provide a comprehensive lens for evaluating both the quality of care delivered and the implementation processes through which decentralized YFHS can be integrated into routine primary healthcare delivery.

Against this background, Amref Health Africa implemented a pilot intervention in Jimma Zone to strengthen YFHS delivery through health posts by enhancing HEW capacity, supportive supervision, privacy and confidentiality arrangements, youth engagement, and service organization. This study evaluated whether integrating YFHS into community health posts improves service quality and utilization compared with routine service delivery. Using a comparative mixed-methods design guided by the Donabedian quality-of-care framework and interpreted through Proctor's Implementation Outcomes Framework, the study assessed structural readiness, process quality, service utilization, client satisfaction, and factors associated with YFHS utilization. In addition, it explored barriers and facilitators influencing service uptake through qualitative inquiry. The hypothesized implementation pathway linking implementation strategies, service quality, implementation outcomes, and YFHS utilization is presented in Fig. 1. By comparing intervention and comparison districts and integrating quantitative and qualitative evidence, this study provides implementation evidence on the feasibility of delivering adolescent-responsive SRH services through the most decentralized level of Ethiopia's primary healthcare system.

The study was primarily guided by the Donabedian quality-of-care framework to assess structural readiness, service delivery processes, and service outcomes. In addition, findings were interpreted using selected domains of Proctor's Implementation Outcomes Framework. Specifically, client satisfaction and perceptions of care informed acceptability; health post delivery by Health Extension Workers reflected feasibility; service utilization represented penetration; structural readiness and process quality indicators informed implementation fidelity; while qualitative findings related to provider and community perceptions informed appropriateness and adoption. Sustainability was considered in relation to routine integration within the Health Extension Program and discussed as an implementation implication. We hypothesized that strengthening Health Extension Worker competencies, supportive supervision, youth engagement, and privacy-enhancing service organization would improve structural readiness and provider practices, thereby enhancing adolescents' trust, satisfaction, and utilization of youth-friendly

health services. This hypothesized pathway informed both the study design and interpretation of findings.

2. Methods

2.1 Study design

This study employed a comparative explanatory mixed-methods design to evaluate the implementation, quality, and utilization of youth-friendly health services (YFHS) delivered through community health posts in Jimma Zone, Ethiopia. The study combined quantitative and qualitative methods to provide a comprehensive assessment of both service outcomes and implementation processes. A quantitative survey was first conducted to compare structural readiness, service quality, implementation outcomes, and YFHS utilization between intervention and comparison districts. Qualitative data were subsequently collected through key informant interviews (KIIs) and focus group discussions (FGDs) to explain, contextualize, and deepen understanding of the quantitative findings, particularly regarding implementation processes, barriers, facilitators, and contextual influences on service utilization.

The study was guided by the Donabedian Quality of Care Framework, which evaluates healthcare quality through structure, process, and outcome dimensions, and complemented by Proctor's Implementation Outcomes Framework, which informed interpretation of implementation success through acceptability, adoption, appropriateness, feasibility, fidelity, penetration, and sustainability. Integration of quantitative and qualitative findings occurred through a connecting and merging approach, whereby quantitative findings informed qualitative inquiry, and both datasets were triangulated during interpretation to generate comprehensive implementation insights.

2.2 Study Setting

The study was conducted in Jimma Zone, Oromia Regional State, southwest Ethiopia, between January and March 2025. Jimma Zone comprises urban, semi-urban, and predominantly rural districts served through Ethiopia's three-tier health system. Primary healthcare services are delivered through health centres and health posts under the Health Extension Program (HEP). Health posts represent the most decentralized level of the health system and are staffed by Health Extension Workers (HEWs), who provide preventive, promotive, and selected curative services to approximately 3,000–5,000 people.

The evaluation compared fifteen health posts in five intervention districts (Seka Chekorsa, Shabe, Dedo, Omo Nada, and Nide Gibe), where Amref Health Africa implemented community-based YFHS strengthening interventions, with fifteen health posts in five comparison districts (Limu Kosa, Setema, Limu Seka, Gumay, and Sigmo) that continued routine health post service delivery during the study period.

2.3 Description of the intervention

The intervention was implemented by Amref Health Africa in collaboration with the Oromia Regional Health Bureau, Jimma Zonal Health Department, and participating district health offices. Rather than creating parallel services, the intervention integrated youth-friendly health services into existing health posts through Ethiopia's Health Extension Program.

Core implementation strategies included:

- competency-based training of Health Extension Workers on national YFHS guidelines;
- regular supportive supervision and on-site mentorship;
- provision of youth-friendly counselling job aids and information, education and communication (IEC) materials;
- strengthening privacy and confidentiality arrangements within health posts;
- establishment of referral linkages between health posts and health centres;
- community mobilization and youth engagement through youth groups, community dialogues, and awareness activities.

These implementation strategies were designed to strengthen provider competency, organizational readiness, implementation fidelity, and adolescents' confidence in utilizing community-based YFHS. Implementation fidelity was monitored through structured supervisory checklists, routine programme monitoring visits, mentorship records, and periodic review meetings involving district health offices and implementing partners.

2.4 Study population

The quantitative study population comprised adolescents and young people aged 10–24 years residing in the selected intervention and comparison districts for at least one year before data collection.

The qualitative study included Health Extension Workers, district health managers, programme coordinators, community leaders, and adolescents and young people with experience accessing or attempting to access youth-friendly health services.

2.5 Sample size and sampling procedure

The quantitative sample size was determined using a two-population proportion formula based on expected differences in YFHS utilization between intervention and comparison districts, allowing for a 95% confidence level, 80% statistical power, design effect, and anticipated non-response. A total of 897 adolescents and young people participated in the survey.

A multistage sampling procedure was employed.

Stage 1: Five intervention districts implementing the YFHS programme and five comparison districts providing routine services were selected. Comparison districts were chosen based on geographic proximity, demographic similarity, and absence of programme implementation.

Stage 2: Three representative health posts were selected from each participating district.

Stage 3: Household listings prepared by Health Extension Workers were used to identify households with eligible adolescents and young people.

Stage 4: Eligible participants were selected through systematic random sampling until the required sample size was achieved within each district.

For the qualitative component, participants were selected purposively to capture diverse perspectives across programme implementers, service providers, community stakeholders, and adolescents. Recruitment continued until thematic saturation was achieved, whereby no substantially new themes emerged from successive interviews.

2.6 Data collection

Quantitative data were collected using structured interviewer-administered questionnaires adapted from the Ethiopian national Youth-Friendly Health Services guideline and relevant WHO assessment tools. The questionnaire captured socio-demographic characteristics, service utilization, structural readiness, process quality, client satisfaction, and perceived barriers and facilitators.

Facility observations assessed infrastructure, equipment, commodities, privacy arrangements, and service readiness. Health Extension Worker assessments examined provider knowledge, competency, and implementation practices.

Qualitative data were collected through semi-structured key informant interviews and focus group discussions using interview guides informed by the Donabedian Quality Framework and Proctor's Implementation Outcomes Framework. Interviews explored implementation experiences, perceived quality of care, barriers, facilitators, sustainability, and recommendations for strengthening decentralized YFHS delivery.

Data collection instruments were developed specifically for this evaluation and had not previously been published as standalone instruments. The structured quantitative questionnaire, health-post assessment checklist and client-exit interview modules were informed by and adapted from the Ethiopian national Youth-Friendly Health Services guideline and relevant World Health Organization assessment tools. The semi-structured key informant interview and focus group discussion guides were developed by the study team and informed by the Donabedian Quality of Care Framework and Proctor's Implementation Outcomes Framework. All instruments were pilot-tested and refined before data collection. English-language versions of the data collection instruments are provided in Additional file 1.

2.7 Variables and measurements

The primary outcome was utilization of youth-friendly health services, defined as self-reported use of at least one YFHS component during the previous twelve months.

Independent variables included socio-demographic characteristics, intervention status, provider-related factors, health-system characteristics, service quality indicators, and implementation factors.

Service quality was evaluated using the Donabedian framework through:

- Structure: infrastructure, trained personnel, equipment, commodities, and service readiness;
- Process: confidentiality, respectful communication, counselling quality, privacy, provider competence, and adherence to youth-friendly standards;
- Outcome: service utilization, client satisfaction, and perceived quality of care.

Implementation outcomes were interpreted using Proctor's framework. Client satisfaction reflected acceptability; routine delivery of YFHS by Health Extension Workers reflected feasibility; structural readiness and adherence to service standards reflected implementation fidelity; service utilization represented penetration; qualitative findings informed appropriateness and adoption; while integration of YFHS within the Health Extension Program informed discussion of sustainability.

2.8 Data analysis

Quantitative data were analysed using Stata version 18. Descriptive statistics summarized participant characteristics, implementation indicators, service quality measures, and utilization outcomes. Categorical variables were compared using Pearson's chi-square tests, while continuous variables were summarized using means, standard deviations, medians, and ranges as appropriate.

Bivariable logistic regression was performed to examine associations between independent variables and YFHS utilization. Variables with $p < 0.25$ in bivariable analyses, together with variables considered epidemiologically important, were entered into the multivariable logistic regression model. Adjusted odds ratios (AORs) with 95% confidence intervals were reported, and statistical significance was declared at $p < 0.05$.

Model performance was assessed using the Hosmer–Lemeshow goodness-of-fit test, receiver operating characteristic (ROC) curve analysis, and link test. Multicollinearity was assessed using variance inflation factors (VIF), with values below 5 considered acceptable. Sensitivity analyses using district-clustered robust standard errors were conducted to account for clustering of participants within intervention and comparison districts. Missing data were assessed before analysis, and complete-case analysis was performed because the proportion of missing observations was minimal.

Qualitative data were audio-recorded, transcribed verbatim, translated into English where necessary, and analysed thematically using an inductive-deductive approach. Initial coding was informed by the Donabedian and Proctor frameworks while allowing new themes to emerge inductively from participants' narratives.

Integration of quantitative and qualitative findings occurred during interpretation through triangulation, whereby qualitative findings were used to explain quantitative patterns, identify contextual influences on

implementation, and strengthen interpretation of implementation outcomes.

2.9 Trustworthiness

To enhance the credibility and trustworthiness of the qualitative findings, interview guides were pilot-tested before data collection. Coding was conducted independently by two researchers, with discrepancies resolved through discussion and consensus. Data triangulation across interviews, focus group discussions, facility observations, Health Extension Worker assessments, and household surveys strengthened the credibility and completeness of the findings.

2.10 Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki and received ethical approval from the Ethiopian Association of Anesthetists Institutional Research Ethics Review Committee (EAA-IRERC), protocol number EAA/16/30895/008, on 25 November 2024. Administrative permission was obtained from the Oromia Regional Health Bureau, Jimma Zonal Health Department, participating district health offices, and health facilities. Participation was voluntary, and verbal informed consent was obtained from participants aged 18 years and older. For participants younger than 18 years, verbal informed consent was obtained from a parent or legal guardian, together with assent from the adolescent participant. Confidentiality was maintained by replacing personal information with unique identifiers and securely managing the study data.

3. Results

3.1 Participant characteristics and YFHS awareness

A total of 897 adolescents and young people participated in the study, yielding a response rate of 99.7%. Of these, 448 participants (49.9%) were from intervention districts and 449 participants (50.1%) were from comparison districts. The mean age of participants was 18.2 years ($SD \pm 3.1$), and more than half were aged 15–19 years (54.4%). Overall, 49.5% of participants were female, 60.4% resided in rural areas, and the majority were single (80.8%). Most participants had primary education or lower (66.7%) (Table 1).

Awareness of youth-friendly health services (YFHS) was substantially higher among adolescents and young people in intervention districts than in comparison districts (59.6% vs. 23.6%; $p < 0.001$). Participation in youth programme activities was also more common in intervention districts (25.0% vs. 4.5%; $p < 0.001$). Several baseline characteristics differed significantly between intervention and comparison districts, including age group, sex, residence, educational attainment, marital status, awareness of YFHS, and youth programme participation. These differences highlight the importance of multivariable adjustment when estimating factors associated with YFHS utilization.

Among respondents who had heard about YFHS, Health Extension Workers (HEWs) were the most frequently reported source of information (80.7%), followed by healthcare providers (36.2%), peers or friends (27.1%), and community conversations (23.6%) (Supplementary Table S1). This pattern suggests that HEWs and community-based communication channels played an important role in increasing awareness of YFHS, particularly in intervention districts.

Table 1
Participant characteristics by study arm, Jimma Zone, Ethiopia, 2025 (n = 897)

Characteristic	Intervention (n = 448)	Comparison (n = 449)	Total (n = 897)	p-value
Age, years, mean (SD)	18.1 (3.3)	18.4 (3.0)	18.2 (3.1)	
Age group (years)				< 0.001
10–14	75 (16.7)	38 (8.5)	113 (12.6)	
15–19	226 (50.4)	262 (58.4)	488 (54.4)	
20–24	147 (32.8)	149 (33.2)	296 (33.0)	
Sex				< 0.001
Female	255 (56.9)	189 (42.1)	444 (49.5)	
Male	193 (43.1)	260 (57.9)	453 (50.5)	
Residence				< 0.001
Rural	275 (61.4)	267 (59.5)	542 (60.4)	
Semi-urban	161 (35.9)	90 (20.0)	251 (28.0)	
Urban	12 (2.7)	92 (20.5)	104 (11.6)	
Education				< 0.001
No formal education	18 (4.0)	15 (3.3)	33 (3.7)	
Primary (1–8)	334 (74.6)	231 (51.4)	565 (63.0)	
Lower secondary (9–10)	49 (10.9)	122 (27.2)	171 (19.1)	
Upper secondary/preparatory	29 (6.5)	62 (13.8)	91 (10.1)	
Technical/vocational	18 (4.0)	19 (4.2)	37 (4.1)	
Marital status				0.010
Living with partner/divorced	12 (2.7)	15 (3.3)	27 (3.0)	
Married	89 (19.9)	56 (12.5)	145 (16.2)	
Single	347 (77.5)	378 (84.2)	725 (80.8)	
Heard about YFHS				< 0.001
Yes	267 (59.6)	106 (23.6)	373 (41.6)	
Note: Sociodemographic characteristics, YFHS awareness, and youth programme participation among adolescents and young people in Jimma Zone, Ethiopia, 2025 (n = 897). p-values are based on comparisons between intervention and comparison districts.				

Characteristic	Intervention (n = 448)	Comparison (n = 449)	Total (n = 897)	p-value
No	181 (40.4)	343 (76.4)	524 (58.4)	
Participated in youth program activities				< 0.001
Yes	112 (25.0)	20 (4.5)	132 (14.7)	
No	336 (75.0)	429 (95.5)	765 (85.3)	
Note: Sociodemographic characteristics, YFHS awareness, and youth programme participation among adolescents and young people in Jimma Zone, Ethiopia, 2025 (n = 897). p-values are based on comparisons between intervention and comparison districts.				

3.2 Implementation fidelity and structural readiness of health posts

The implementation assessment indicated that all intervention districts delivered the core components of the YFHS strengthening package, including Health Extension Worker training, supportive supervision and mentorship, youth engagement activities, privacy and confidentiality improvements, provision of job aids and information materials, and referral linkage strengthening. Facility observations and Health Extension Worker assessments suggested that intervention health posts demonstrated greater implementation fidelity and structural readiness for YFHS delivery than comparison health posts.

Intervention health posts more consistently had trained Health Extension Workers, youth-friendly counselling materials, job aids or case-management guides, privacy arrangements, referral linkage mechanisms, and mechanisms for youth engagement. These findings suggest that YFHS delivery through health posts was feasible when integrated into the existing Health Extension Program and supported through supervision and mentorship. In Proctor's implementation outcome terms, the observed delivery of YFHS through routine health posts reflected implementation feasibility, while the presence of trained providers, job aids, supervision, privacy arrangements, and referral systems reflected implementation fidelity.

From the Donabedian perspective, these findings indicate that intervention health posts had stronger structural readiness to deliver adolescent-responsive services. However, structural gaps remained. Although intervention facilities were more likely to provide visual and auditory privacy arrangements, dedicated YFHS consultation rooms were generally unavailable. Both Health Extension Workers and young people emphasized that the absence of separate consultation space may limit privacy, confidentiality, and comfort when discussing sensitive sexual and reproductive health concerns. One Health Extension Worker from an intervention district explained: "The room for youths and adolescents needs to be separate." (29-year-old HEW, intervention district). This suggests that implementation fidelity was strengthened by provider training and service organization, but infrastructure limitations continued to constrain full youth-friendly service delivery (Table 2).

Table 2
Structural readiness of health posts by study arm, Jimma Zone, Ethiopia, 2025

Domain	Indicator	Intervention health posts (n = 15) n (%)	Comparison health posts (n = 15) n (%)	Interpretation
Provider capacity	At least one HEW trained on YFHS	14 (93.3)	6 (40.0)	Indicates provider readiness
Supportive supervision	Received YFHS-related supervision or mentorship within previous 6 months	15 (100.0)	5 (33.3)	Indicates implementation support
Guidelines/job aids	YFHS guideline, job aid, or case-management guide available	14 (93.3)	8 (53.3)	Indicates fidelity support
Information materials	Youth-specific IEC/BCC materials available	15 (100.0)	7 (46.7)	Indicates readiness for youth education
Visual privacy	Visual privacy arrangement available	13 (86.7)	4 (26.7)	Indicates privacy protection
Auditory privacy	Auditory privacy arrangement available	12 (80.0)	4 (26.7)	Indicates confidentiality protection
Dedicated space	Separate or dedicated YFHS consultation space available	13 (86.7)	2 (13.3)	Indicates infrastructure readiness
Commodities	Essential SRH commodities available	15 (100.0)	8 (53.3)	Indicates service readiness
Referral system	Functional referral linkage with health centre available	15 (100.0)	8 (53.3)	Indicates continuity of care
Youth engagement	Youth group, peer mobilization, or feedback mechanism available	11 (73.3)	4 (26.7)	Indicates youth participation
Overall readiness	Met minimum structural readiness standard	13 (86.7)	4 (26.7)	Indicates overall structural readiness
Note: HEW = Health Extension Worker; YFHS = youth-friendly health services; SRH = sexual and reproductive health; IEC/BCC = information, education and communication / behaviour change communication. Percentages were calculated using the number of assessed health posts in each study arm as the denominator.				

3.3 Process quality and youth-centred service delivery

Among the 193 adolescents and young people who utilized YFHS, process-quality indicators were generally high, suggesting that service delivery at health posts was perceived as respectful, confidential, and responsive to adolescent needs. Overall, most service users reported that Health Extension Workers listened attentively (94.3%), informed them about available services (92.2%), maintained confidentiality (89.1%), provided risk-reduction or prevention information (89.1%), ensured visual privacy (88.6%), and ensured auditory privacy (88.1%). These findings indicate that several core youth-friendly service standards were implemented during client–provider interactions.

From the Donabedian perspective, these findings reflect improvements in the process dimension of care, particularly in privacy, confidentiality, respectful communication, counselling quality, and information provision. From an implementation perspective, the high levels of reported confidentiality, respectful interaction, and counselling suggest that provider training, supportive supervision, and job aids were translated into actual service delivery practices.

Important differences between intervention and comparison districts were observed for selected process-quality indicators. Use of job aids or case-management guides was substantially higher among service users in intervention districts than comparison districts (69.5% vs. 34.6%; $p < 0.001$). Similarly, seeking permission before physical examination was more frequently reported in intervention districts (82.6% vs. 57.7%; $p = 0.002$). These differences suggest stronger implementation fidelity in intervention health posts, particularly for structured counselling and informed consent practices.

Qualitative findings helped explain why these process-quality dimensions mattered for adolescents' willingness to use services. Youth participants emphasized that respectful and discreet care increased their confidence in health post services. One female FGD participant explained: "They keep the secrets of young people. For sensitive services, they call them into a separate room." This suggests that confidentiality and privacy were not only service quality indicators but also mechanisms through which the intervention increased trust and acceptability of YFHS.

Although most process-quality indicators were favourable, some gaps remained. Audio-visual material use was reported by only 60.6% of service users, and vital signs were measured for 61.1%, suggesting opportunities to further standardize counselling support tools and clinical assessment practices. In addition, the continued absence of dedicated YFHS consultation rooms, noted in the structural readiness assessment, may limit the consistency of privacy and confidentiality during sensitive consultations. No statistically significant differences were observed for most other process-quality indicators (Fig. 2). Detailed process-quality indicators are presented in Supplementary Table S2.

3.4 YFHS utilization and service penetration

Overall, 21.5% of adolescents and young people reported using at least one YFHS package during the previous 12 months. Utilization was substantially higher in intervention districts than comparison

districts (37.3% vs. 5.8%; $p < 0.001$), indicating greater service penetration where YFHS had been integrated into health posts.

Qualitative findings suggested that the higher utilization observed in intervention districts was not explained by physical proximity alone. Adolescents described trust in HEWs, confidentiality during consultations, respectful communication, and more discreet service arrangements as important reasons for seeking care at health posts. One female participant explained: “The health extension workers keep our information confidential and treat us respectfully. That makes it easier for young people to seek services without fear.” These findings suggest that the intervention increased utilization by improving both access and perceived acceptability of services.

Despite the higher utilization in intervention districts, uptake remained below 40%, suggesting that barriers beyond service availability continued to influence adolescents’ healthcare-seeking behaviour. Among service users, the most frequently utilized YFHS packages were promotion of healthy sexual behaviours (88.6%), SRH information and counselling (88.1%), family planning information/counselling/methods (77.2%), referral linkage (69.9%), and condom promotion and provision (63.7%).

Several service components were more frequently reported among service users in intervention districts. SRH information and counselling (92.2% vs. 61.5%; $p < 0.001$), promotion of healthy sexual behaviours (91.0% vs. 73.1%; $p = 0.019$), management of sexually transmitted infections (58.1% vs. 26.9%; $p = 0.006$), and PMTCT services (18.0% vs. 0.0%; $p = 0.039$) were higher in intervention districts.

In contrast, family planning information/counselling/methods, condom promotion, HIV counselling and testing, and referral linkage did not differ significantly between study arms. Most service users reported occasional use of YFHS (63.7%), while only 16.1% reported regular use, indicating that although service penetration improved, continuity of use remained limited (Table 3). Detailed utilization of all YFHS service packages is presented in Supplementary Table S3.

Table 3
Key YFHS utilization indicators by study arm, Jimma Zone, Ethiopia, 2025

YFHS utilization indicator	Denominator	Intervention n (%)	Comparison n (%)	Total n (%)	p-value
Used at least one YFHS package	All participants, n = 897	167 (37.3)	26 (5.8)	193 (21.5)	< 0.001
SRH information and counselling	Service users, n = 193	154 (92.2)	16 (61.5)	170 (88.1)	< 0.001
Promotion of healthy sexual behaviours	Service users, n = 193	152 (91.0)	19 (73.1)	171 (88.6)	0.019
Family planning information/counselling /methods	Service users, n = 193	130 (77.8)	19 (73.1)	149 (77.2)	0.774
Condom promotion and provision	Service users, n = 193	109 (65.3)	14 (53.8)	123 (63.7)	0.364
Management of sexually transmitted infections	Service users, n = 193	97 (58.1)	7 (26.9)	104 (53.9)	0.006
Referral linkage	Service users, n = 193	117 (70.1)	18 (69.2)	135 (69.9)	1.000
PMTCT	Service users, n = 193	30 (18.0)	0 (0.0)	30 (15.5)	0.039

3.5 Determinants of YFHS utilization and explanatory qualitative findings

In multivariable logistic regression analysis, residence in an intervention district, female sex, marital status, and participation in youth programme activities were independently associated with YFHS utilization (Table 4; Fig. 3).

Adolescents and young people residing in intervention districts had nearly sevenfold higher odds of utilizing YFHS than those residing in comparison districts (AOR = 6.83, 95% CI: 4.00–11.68; $p < 0.001$). Qualitative findings helped explain this association. Participants described intervention health posts as more trusted, confidential, and responsive to adolescent needs. Youth and HEWs emphasized that privacy arrangements, respectful counselling, and peer mobilization increased adolescents' willingness to seek services. This suggests that the intervention effect likely reflected the combined influence of improved service readiness, provider behaviour, youth engagement, and trust rather than intervention exposure alone.

Participation in youth programme activities was the strongest predictor of YFHS utilization. Adolescents and young people involved in programme activities had more than nine times higher odds of utilizing YFHS compared with non-participants (AOR = 9.36, 95% CI: 5.67–15.44; $p < 0.001$). Qualitative data suggested that youth programme participation increased service use through peer mobilization, awareness creation, and improved trust between adolescents and HEWs. As one HEW from an intervention district explained: “Once they are engaged, some youth take the initiative to make changes and subsequently bring other young people to us for services.” This finding suggests that youth engagement functioned not only as a demand-generation activity but also as an implementation mechanism that increased service penetration.

Female participants were more than twice as likely to utilize YFHS compared with males (AOR = 2.29, 95% CI: 1.41–3.71; $p < 0.001$). Qualitative findings suggested that female adolescents may have been more willing to use YFHS because services were commonly delivered by female HEWs and because privacy-enhancing arrangements made it easier to discuss sensitive SRH concerns. However, some participants also indicated that male adolescents may feel less comfortable discussing reproductive health issues with female providers, suggesting the need for male-responsive engagement strategies.

Marital status was also significantly associated with service utilization. Participants who were married had almost six times higher odds of utilizing YFHS than single participants (AOR = 5.88, 95% CI: 2.82–12.27; $p < 0.001$), while those living with a partner or divorced had nearly fourfold higher odds of utilization (AOR = 3.90, 95% CI: 1.31–11.62; $p = 0.015$). Qualitative findings suggested that married adolescents and those living with partners perceived a stronger immediate need for services such as family planning, antenatal care, HIV testing, and counselling. By contrast, unmarried adolescents appeared more affected by stigma, fear of community judgement, and concerns about being seen seeking SRH services. This indicates that marital status may reflect both reproductive need and differences in the social acceptability of SRH service use.

Age group, residence, income status, and parental status were not independently associated with YFHS utilization after adjustment for potential confounders. The final multivariable model demonstrated good discrimination (AUC = 0.898) and satisfactory calibration (Hosmer–Lemeshow $p = 0.564$). Sensitivity analyses accounting for clustering at district level produced similar estimates, supporting the robustness of the findings.

Table 4
Factors associated with YFHS utilization in Jimma Zone, Ethiopia, 2025

Variable/category	COR (95% CI)	AOR (95% CI)	p-value
Age 15–19 vs 10–14	0.58 (0.35–0.97)	0.89 (0.47–1.69)	0.717
Age 20–24 vs 10–14	1.77 (1.07–2.93)	1.34 (0.61–2.94)	0.467
Rural vs urban	3.07 (1.50–6.25)	1.42 (0.54–3.73)	0.474
Semi-urban vs urban	3.46 (1.65–7.27)	1.15 (0.42–3.10)	0.787
Intervention vs comparison	9.67 (6.23–15.01)	6.83 (4.00–11.68)	< 0.001
Female vs male	3.59 (2.53–5.10)	2.29 (1.41–3.71)	< 0.001
Living with partner/divorced vs single	2.57 (1.10–6.03)	3.90 (1.31–11.62)	0.015
Married vs single	8.18 (5.54–12.08)	5.88 (2.82–12.27)	< 0.001
Youth programme participation: yes vs no	12.57 (8.29–19.06)	9.36 (5.67–15.44)	< 0.001
Own income: yes vs no	2.78 (1.98–3.90)	1.13 (0.63–2.04)	0.681
Has children: yes vs no	10.00 (6.17–16.20)	1.68 (0.73–3.87)	0.220
Note: COR = crude odds ratio; AOR = adjusted odds ratio; CI = confidence interval. The final model adjusted for age group, residence, intervention status, sex, marital status, youth programme participation, income status, and parental status.			

To integrate the quantitative and qualitative findings, we interpreted the multivariable regression results alongside participant narratives on service experience, trust, confidentiality, youth engagement, stigma, and social acceptability. The quantitative findings identified the main factors independently associated with YFHS utilization, while the qualitative findings explained the mechanisms through which these factors influenced service uptake. Residence in an intervention district was interpreted in relation to adolescents' descriptions of more confidential, respectful, and trusted services; youth programme participation was understood as both a demand-generation and peer-referral mechanism; sex and marital-status differences were interpreted through gendered comfort, perceived reproductive need, and social norms around adolescent SRH service use. This integrated interpretation suggests that YFHS utilization was shaped not only by individual characteristics or service availability, but also by implementation quality, perceived confidentiality, trust in Health Extension Workers, youth engagement, and the social acceptability of seeking care (Table 5).

Table 5
Integrated interpretation of YFHS utilization findings, Jimma Zone, Ethiopia, 2025.

Quantitative finding	Qualitative explanation	Integrated interpretation
Residence in an intervention district was strongly associated with YFHS utilization.	Adolescents described intervention health posts as more confidential, respectful, trusted, and responsive to their needs.	The intervention likely increased utilization by improving both service readiness and perceived acceptability.
Youth programme participation was the strongest predictor of YFHS utilization.	HEWs and youth described peer mobilization, awareness creation, and youth-to-youth referral.	Youth engagement acted as both a demand-generation strategy and a service-penetration mechanism.
Female adolescents were more likely to use YFHS than males.	Participants valued female HEWs and private counselling arrangements; some males felt less comfortable discussing SRH concerns.	The intervention may have been especially acceptable to females, but male-responsive adaptations are needed.
Married adolescents and those living with partners were more likely to use YFHS than single adolescents.	Married adolescents perceived stronger service need, while unmarried adolescents faced stigma and fear of community judgement.	Utilization reflected both reproductive need and social acceptability of SRH service use.
Age, residence, income, and parental status were not independently associated after adjustment.	Qualitative findings suggested that trust, confidentiality, awareness, and social norms were more salient than demographic factors alone.	Service uptake was shaped more by implementation quality and social acceptability than by individual background characteristics alone.

3.6 Barriers, facilitators, and remaining implementation challenges

Among adolescents and young people who had not utilized YFHS, the most frequently reported barrier was lack of awareness of service availability (84.5%), followed by fear of stigma and discrimination (30.7%), absence of perceived need for services (16.6%), and poor health-seeking behaviour (8.0%) (Supplementary Table S4). These findings indicate that although service availability and quality improved in intervention districts, demand-side and sociocultural barriers continued to influence service uptake.

Qualitative findings clarified why these barriers persisted despite the availability of YFHS at health posts. Adolescents described SRH service use as socially sensitive, particularly for unmarried youth, and reported concerns about being judged by community members, being seen at a health post, or having private information disclosed. These narratives suggest that awareness creation alone may be insufficient unless accompanied by visible confidentiality protections, youth-centred counselling, and broader community dialogue to normalize adolescent access to SRH services.

Several barriers differed between intervention and comparison districts. Non-users in comparison districts more frequently reported lack of awareness, fear of stigma and discrimination, and poor health-

seeking behaviour, whereas family restrictions were more commonly reported among non-users in intervention districts. This pattern suggests that the intervention may have improved awareness and perceived service acceptability, but family-level and community-level norms continued to constrain adolescent autonomy in seeking SRH services.

Participants also identified several facilitators that encouraged service use, including proximity of health posts, trust in Health Extension Workers, confidentiality during consultations, respectful provider attitudes, discreet service arrangements, and youth-centred communication. Female adolescents particularly valued the availability of female HEWs and the possibility of receiving care in private settings. These facilitators indicate that implementation success depended not only on decentralizing services to health posts but also on creating a trusted, confidential, and socially acceptable service environment.

Overall, the barrier and facilitator findings show that further scale-up should combine health-post readiness with sustained community engagement, peer mobilization, confidentiality assurance, male-responsive strategies, and mechanisms for meaningful youth participation. Addressing these remaining implementation challenges is essential for increasing service penetration beyond adolescents already reached through intervention activities.

3.7 Provider capacity, youth-centred practice, and client acceptability

Eighteen Health Extension Workers participated in the knowledge and practice assessment. Overall, HEWs demonstrated strong knowledge of core youth-friendly service principles, particularly confidentiality, privacy, respectful communication, and adolescent-centred counselling. All HEWs correctly identified confidentiality as a core YFHS principle, and most reported routinely maintaining privacy during consultations, obtaining informed consent before examination, conducting psychosocial assessment, and using individualized counselling approaches.

Provider capacity indicators were generally stronger in intervention districts than comparison districts. HEWs in intervention districts more frequently reported familiarity with national adolescent and youth health/YFHS guidelines, use of job aids or guidelines during service delivery, engagement of youth groups during outreach activities, participation in supportive supervision within the previous six months, and involvement of youth in service planning or evaluation. These findings suggest that the intervention strengthened provider readiness and implementation fidelity, particularly through training, supervision, and practical service delivery tools.

However, gaps remained in youth-centred practice. Although most HEWs engaged young people during outreach and awareness-raising activities, fewer reported involving youth in service evaluation, quality-improvement processes, or structured feedback mechanisms. This suggests that youth participation was stronger as a mobilization strategy than as a routine mechanism for service accountability and

continuous quality improvement. Strengthening structured youth feedback systems may therefore be important during future scale-up.

Client exit interview findings further supported the acceptability of health-post-based YFHS. Among the 66 adolescents and young people interviewed after service use, overall satisfaction was high (84.8%) and consistently higher among service users from intervention districts than comparison districts. Satisfaction was notably higher in intervention districts for privacy during consultation (91.5% vs. 68.4%), confidentiality maintained by HEWs (93.6% vs. 73.7%), provider respectfulness (95.7% vs. 78.9%), comfort discussing sensitive issues (85.1% vs. 57.9%), willingness to recommend the service to peers (93.6% vs. 73.7%), and overall satisfaction (91.5% vs. 68.4%). These findings indicate that adolescents perceived intervention health posts as more acceptable, respectful, and confidential, reinforcing the process-quality findings reported above.

Taken together, the HEW assessment and client exit interviews suggest that the intervention improved both the provider-side and user-side dimensions of implementation. Provider knowledge, supervision, job-aid use, and youth engagement reflected implementation feasibility and fidelity, while high client satisfaction and willingness to recommend services reflected acceptability. Detailed HEW knowledge and practice indicators and client satisfaction results are presented in Supplementary Tables S5 and S6.

4. Discussion

4.1 Principal findings

This comparative explanatory mixed-methods study evaluated the implementation, quality, and utilization of youth-friendly health services (YFHS) delivered through community health posts within Ethiopia's Health Extension Program. Guided by the Donabedian quality-of-care framework and interpreted through Proctor's Implementation Outcomes Framework, the study found that integrating YFHS into health posts was associated with stronger structural readiness, better process quality, higher client satisfaction, and substantially greater service utilization compared with routine service delivery [5, 27]. Adolescents and young people in intervention districts reported markedly higher YFHS utilization, while qualitative findings showed that trust in Health Extension Workers (HEWs), confidentiality, service proximity, respectful communication, and youth engagement were central mechanisms facilitating service uptake.

The intervention appeared to work through the combined effects of multiple implementation strategies rather than through a single component. HEW training likely strengthened provider competence and counselling quality; supportive supervision reinforced adherence to youth-friendly standards; privacy-enhancing arrangements increased adolescents' confidence in confidentiality; and youth engagement activities improved awareness, peer referral, and trust in services. This pattern is consistent with implementation science theory, which emphasizes that complex service delivery interventions are more

likely to succeed when implementation strategies operate across provider, organizational, and community levels rather than relying on training alone [27–29].

Viewed through Proctor’s implementation outcomes, the intervention demonstrated several indicators of implementation success. High client satisfaction reflected **acceptability**; delivery of YFHS through HEWs demonstrated **feasibility**; improvements in structural readiness, job-aid use, informed consent, privacy, and respectful communication indicated **implementation fidelity**; and higher utilization in intervention districts reflected greater **service penetration** [27]. Qualitative findings further suggested that adolescents and providers perceived health-post-based YFHS as appropriate to local needs, while integration within the existing Health Extension Program indicates potential sustainability if supervision, financing, and monitoring systems are maintained [4, 6, 27].

4.2 Interpretation in relation to previous evidence

The higher YFHS utilization observed in intervention districts is consistent with Ethiopian and international evidence showing that youth-friendly approaches can improve awareness, acceptability, and use of adolescent sexual and reproductive health services [12–15, 19, 20, 22, 23]. However, most previous Ethiopian studies have focused on schools, hospitals, health centres, or public facilities more broadly rather than health posts [12–15, 19, 20]. This study therefore extends the evidence base by showing that YFHS can be implemented through the most decentralized level of Ethiopia’s primary healthcare system, which may be particularly important for rural adolescents who face distance, visibility, and confidentiality-related barriers to care.

The findings also align with recent reviews of adolescent- and youth-friendly health interventions in low- and middle-income countries, which show that successful models commonly combine provider capacity building, confidentiality, community engagement, service reorganization, and youth participation [11, 22, 23]. The higher uptake observed in intervention districts suggests that community-level delivery can increase service penetration when supply-side improvements are combined with demand-generation strategies. This is particularly relevant in rural Ethiopia, where stigma, geographic barriers, fear of being judged, and concerns about confidentiality continue to discourage adolescents from seeking SRH services [19, 23].

Youth programme participation was the strongest predictor of YFHS utilization. This finding supports global and national recommendations that youth engagement should not be treated only as a mobilization activity but as a core component of adolescent-responsive service delivery [2, 8]. Qualitative findings explained this association by showing that youth engagement increased awareness, normalized service use, strengthened peer-to-peer referral, and improved relationships between adolescents and HEWs. These mechanisms are consistent with evidence that meaningful youth participation enhances service relevance, ownership, trust, and acceptability [8, 11, 22].

Female adolescents were more likely than males to utilize YFHS, consistent with previous Ethiopian and sub-Saharan African studies [13, 14, 19, 23]. This may reflect greater reproductive health needs among

female adolescents and the availability of female HEWs, which participants perceived as facilitating discussion of sensitive SRH issues. At the same time, the lower utilization among males suggests a potential equity gap. Future implementation should include male-responsive counselling and outreach strategies while preserving the privacy and gender-sensitive features valued by female clients.

Married adolescents and those living with a partner or divorced were also more likely to use YFHS than single adolescents. This likely reflects greater perceived need for family planning, pregnancy-related care, HIV testing, and counselling among sexually active adolescents. Similar patterns have been reported in Ethiopia and other sub-Saharan African settings [12, 19, 23]. However, lower utilization among unmarried adolescents may also reflect persistent stigma, limited autonomy, and sociocultural norms surrounding adolescent sexuality. This finding underscores the need for youth-friendly approaches that explicitly protect confidentiality and normalize SRH service use among unmarried adolescents.

Not all service components differed significantly between study arms. Family planning counselling, HIV testing, referral linkage, safe abortion care, and post-abortion care showed smaller or non-significant differences. This may reflect the availability of some services through routine primary healthcare, small numbers of users for sensitive or infrequently used services, or persistent stigma and fear of disclosure. These findings suggest that improving service readiness and provider competence is necessary but may be insufficient for services shaped by deeper social and normative barriers.

4.3 Quality of care, client experience, and provider capacity

The process-quality findings show how implementation translated into adolescents' service experience. More than 85% of service users reported positive experiences regarding confidentiality, privacy, respectful communication, counselling adequacy, and information sharing. These dimensions are central to adolescent-friendly care and are repeatedly identified as major determinants of adolescents' willingness to seek, disclose, and continue using SRH services [15, 17, 21, 24, 25]. Improvements in job-aid use and informed consent practices in intervention health posts suggest that training and supervision were reflected in actual provider behaviour.

Client satisfaction findings further support the acceptability of health-post-based YFHS. Adolescents in intervention districts reported higher satisfaction with privacy, confidentiality, provider respectfulness, comfort discussing sensitive issues, and overall service experience. These findings are consistent with evidence from Ethiopia, Tanzania, and South Africa showing that confidentiality, respectful treatment, privacy, and provider attitude strongly shape adolescent satisfaction with SRH services [15, 21, 24, 25]. Satisfaction is particularly important because it may influence future care-seeking, continuity of care, and peer recommendation.

HEWs played a central role in this implementation model. HEWs demonstrated strong knowledge of confidentiality, youth-friendly communication, adolescent rights, and counselling principles, and intervention-district HEWs more frequently reported using job aids, conducting psychosocial

assessments, participating in supervision, and engaging youth groups. These findings suggest that HEWs can deliver adolescent-responsive care when supported by competency-based training, mentorship, supervision, and practical tools. This is important for Ethiopia's Health Extension Program because it shows that adolescent-responsive care can be integrated into existing community health platforms rather than relying only on higher-level facilities [4, 6]. However, limited youth involvement in service evaluation and quality improvement indicates that meaningful participation remains incomplete and should be strengthened during scale-up.

4.4 Implementation and health system implications

This study contributes to implementation science by showing how YFHS can be embedded within an existing primary healthcare platform. Rather than creating a parallel adolescent health programme, the intervention strengthened routine service delivery through provider capacity building, supportive supervision, privacy arrangements, referral linkages, and youth engagement. This approach is consistent with implementation frameworks emphasizing intervention fit, organizational readiness, provider capability, and contextual influences as determinants of implementation success [27–29]. It also aligns with WHO and Ethiopian policy priorities on adolescent-responsive health systems, primary healthcare strengthening, and universal health coverage [2, 4, 6].

The persistence of awareness gaps, stigma, fear of discrimination, and sociocultural concerns indicates that implementation strategies must extend beyond the health post. Although decentralization improves physical access, utilization also depends on perceived confidentiality, social acceptability, community trust, and adolescent empowerment. Similar barriers have been documented across Ethiopia, Kenya, Nepal, and other sub-Saharan African settings [19, 21, 23, 26]. Future scale-up should therefore combine health-system strengthening with community dialogue, school and out-of-school youth engagement, parent and caregiver sensitization, and broader efforts to normalize adolescent access to SRH services.

The findings also suggest that implementation quality should be monitored as carefully as service availability. Routine monitoring should include indicators of structural readiness, confidentiality, privacy, provider communication, informed consent, youth participation, referral completion, satisfaction, and equity of access. Monitoring only service volume may fail to capture whether services are acceptable, confidential, respectful, and youth-centred. Incorporating implementation outcomes such as acceptability, feasibility, fidelity, penetration, and sustainability into routine programme review would strengthen scale-up and help identify facilities requiring additional support [27].

4.5 Strengths and limitations

This study has several strengths. It is among the first comparative mixed-methods evaluations of YFHS delivered through Ethiopia's Health Extension Program at health-post level. The study integrated community survey data, facility observations, client exit interviews, HEW assessments, KIIs, and FGDs. The Donabedian framework strengthened assessment of service quality across structure, process, and outcome domains, while Proctor's framework supported interpretation of implementation success [5, 27]. Triangulation of quantitative and qualitative findings improved explanatory depth, and sensitivity

analyses accounting for district-level clustering strengthened confidence in the robustness of the findings.

Several limitations should be considered. First, the cross-sectional design limits causal inference. Although the observed differences are consistent with the intervention pathway, temporal ordering cannot be definitively established. Second, intervention districts were purposively selected rather than randomized, creating potential for residual confounding despite multivariable adjustment and sensitivity analyses. Third, district-level clustering was addressed using robust standard errors, but the small number of districts limited precision. Fourth, self-reported utilization and satisfaction may be affected by recall and social desirability bias. Finally, implementation fidelity was assessed using routine programme monitoring and observed service indicators rather than a standardized validated fidelity instrument. These limitations mean that findings should be interpreted as strong implementation and service delivery evidence, but not as definitive causal proof.

4.6 Policy, practice, and future research implications

The findings have important implications for adolescent and youth SRH programming in Ethiopia and similar low-resource settings. Scaling up YFHS through the Health Extension Program appears feasible, but scale-up should not be limited to provider training or physical decentralization. Effective implementation requires a coordinated package of competency-based HEW training, routine supportive supervision, privacy-enhancing infrastructure, job aids, functional referral systems, meaningful youth participation, community awareness activities, and sustainable financing. Embedding these elements within primary healthcare reforms could support Ethiopia's adolescent health strategy, Health Sector Transformation Plan, and broader universal health coverage goals [2, 4, 6].

Future research should examine long-term sustainability, implementation fidelity, cost-effectiveness, scalability, and equity effects of health-post-based YFHS. Hybrid effectiveness–implementation designs, cluster-randomized trials, or stepped-wedge evaluations would provide stronger evidence on both service outcomes and implementation processes [30]. Additional research should examine how this model affects underserved groups, including unmarried adolescents, very young adolescents, out-of-school youth, males, and adolescents living in remote communities.

Overall, this study demonstrates that decentralizing YFHS through community health posts is not only a service delivery innovation but also a practical implementation strategy for strengthening adolescent-responsive primary healthcare. By improving provider capacity, supportive supervision, privacy, youth engagement, and implementation fidelity, community health posts can become acceptable, feasible, and effective platforms for delivering equitable adolescent SRH services. These findings provide actionable implementation evidence for Ethiopia and offer a potentially transferable model for other low- and middle-income countries seeking to expand adolescent-responsive care through existing primary healthcare systems.

5. Conclusions

This study provides comparative mixed-methods evidence that youth-friendly health services can be feasibly integrated into community health posts within Ethiopia's Health Extension Program when supported by trained Health Extension Workers, supportive supervision, privacy-enhancing service arrangements, youth engagement, and functional referral mechanisms. Adolescents and young people in intervention districts reported substantially higher service utilization, better process-quality experiences, and greater satisfaction than those in comparison districts. These findings suggest that improvements in confidentiality, respectful communication, counselling quality, and youth-centred service organization can strengthen acceptability, implementation fidelity, and service penetration within decentralized primary healthcare.

Despite these gains, limited awareness, stigma, sociocultural norms, and weak mechanisms for sustained youth involvement remain important barriers to service uptake. Scaling up adolescent-responsive primary healthcare should therefore go beyond physical decentralization and provider training to include routine supportive supervision, meaningful youth participation, privacy and confidentiality protections, community awareness activities, and sustained quality monitoring. Overall, health-post-based YFHS delivery represents a practical and potentially scalable model for expanding equitable adolescent and youth sexual and reproductive health services in Ethiopia and similar low-resource settings.

Declarations

Ethics approval and consent to participate

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Institutional Research Ethics Review Committee, protocol number EAA/16/30895/008, on 25 November 2024. Written informed consent was obtained from participants aged 18 years and above. For participants younger than 18 years, written parental or guardian consent and participant assent were obtained.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Author Contribution

GMA, SA, and MDM contributed to conceptualization, methodology, analysis, visualization, writing, review, and editing. GA, NG, and WY contributed to validation, interpretation, review, and editing of the manuscript. All authors read and approved the final manuscript.

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Data Availability

All data generated or analysed during this study are included in this article and its supplementary information files. De-identified datasets may also be made available from the corresponding author on reasonable request, subject to institutional approval.

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Figures

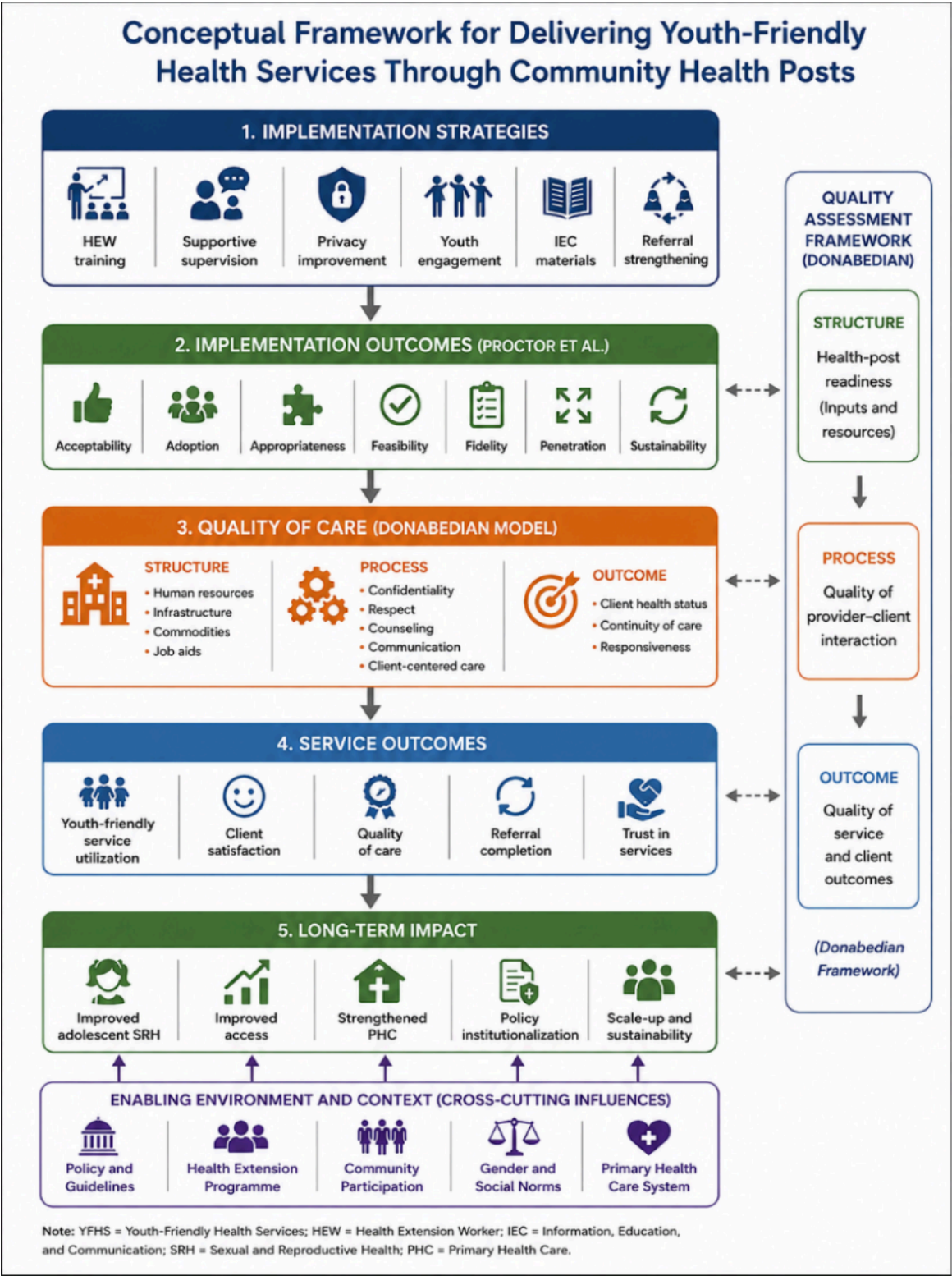


Figure 1

Conceptual framework for health-post-based YFHS implementation

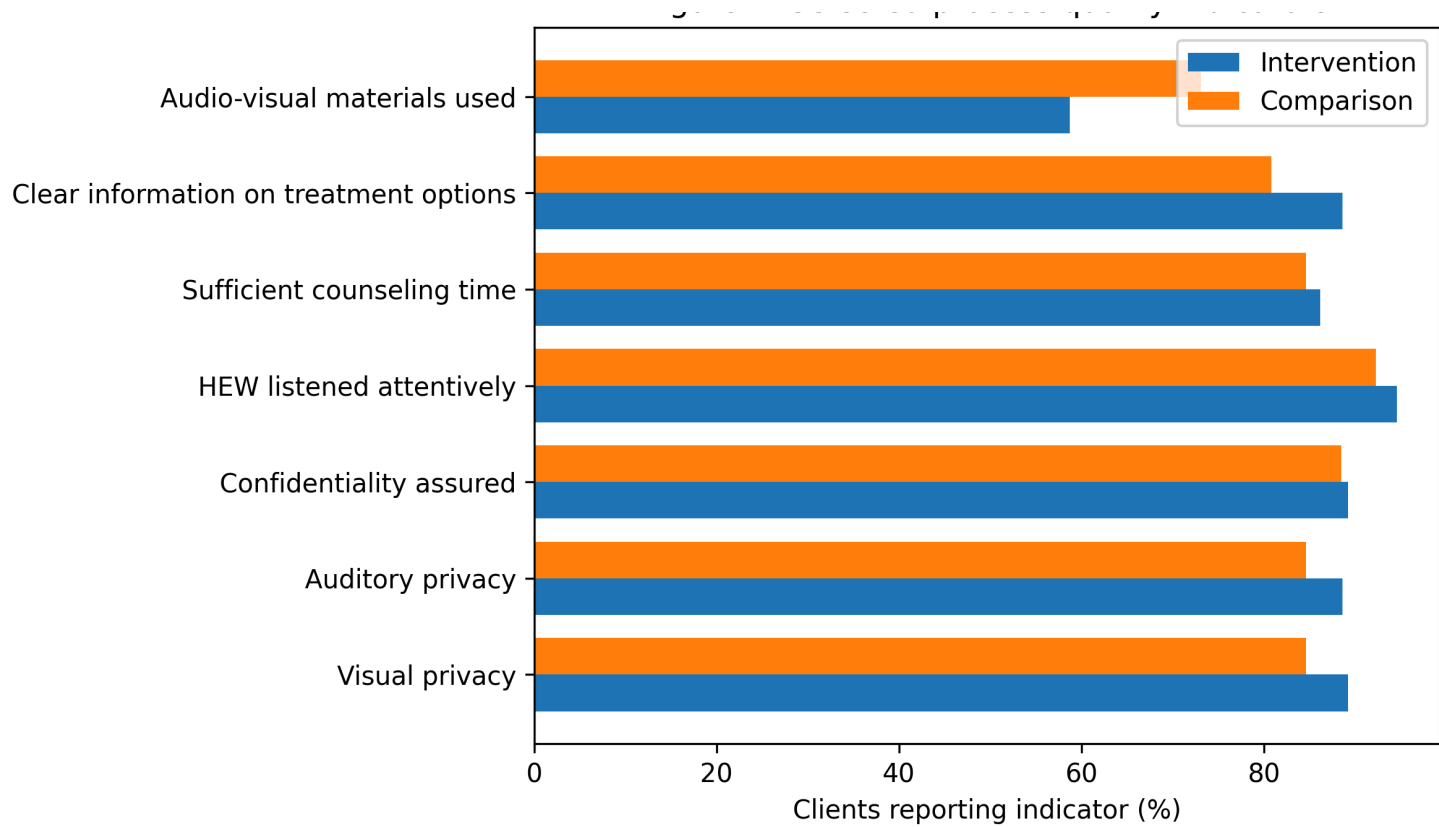


Figure 2

Selected process-quality indicators by study arm, Jimma Zone, Ethiopia, 2025

Figure 3. Factors associated with YFHS utilization

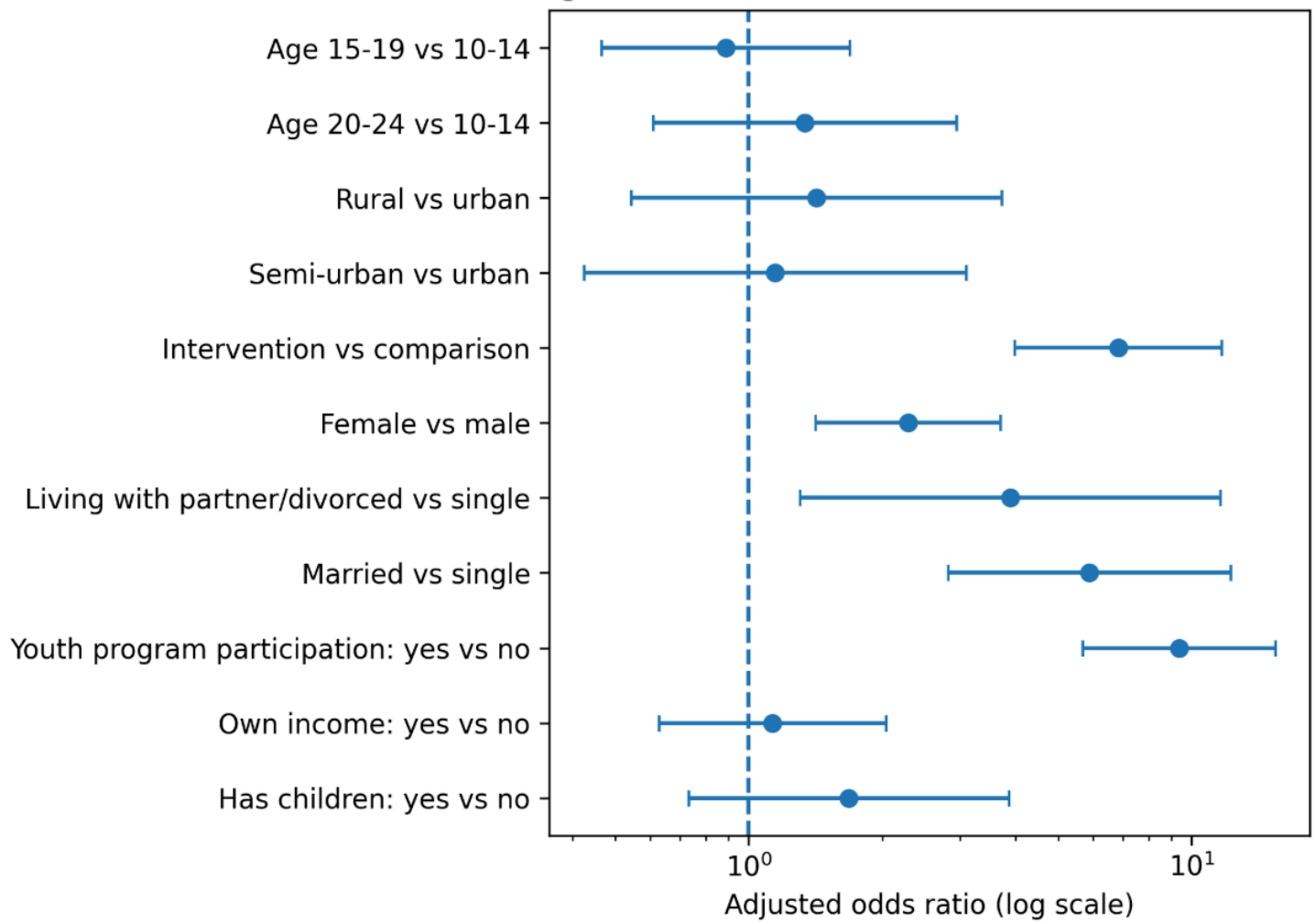


Figure 3

Adjusted odds ratios for factors associated with youth-friendly health service utilization among adolescents and youth in Jimma Zone, Ethiopia, 2025.

Supplementary Files

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- [YFHSSupplementaryMaterial.docx](#)
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