



Attitudes, Experiences and Use of Postpartum Intrauterine Contraceptive Device Service Provision in the Amhara Region Public Health Facilities in Ethiopia: Providers' Perspective

Solomon MA^{1*}, Solomon B², Yeshiwas A², Mulat A², Abebaw G¹, Tadesse G², Birtukan A¹, Masresha D², Wubetu A², Shumye A³, Solomon A² and Melkamu AGE¹

¹Department of Public Health, University of Gondar, Ethiopia

²Department of Obstetrics and Gynecology, University of Gondar, Ethiopia

³Department of Obstetrics and Gynecology, Debretabor University, Ethiopia

Abstract

Objective: Despite the provision of free family planning in Ethiopia, contraceptive uptake is still low. Provider proficiency in carrying out comprehensive counseling on postpartum contraception use is important in developing countries. The reasons for non-use of Postpartum Intrauterine Contraceptive Device (PP-IUCD) are not clear and barriers impede provider use of this approach burdening Ethiopian women's health. Hence, the aim of this study was to assess experiences and attitudes of providers about (PP-IUCD) service provision.

Methods: A facility-based cross-sectional study design was used from September 18th, 2015 to December 18th, 2016. A total of 197 health facilities and 864 health care providers, using simple random sampling techniques, were included in the study. We used a pretested and structured, self-administered questionnaire. A multilevel logistic regression model to determine factors associated with providers' attitudes towards use of IUCD.

Results: The mean (\pm SD) age of study participants was 27.8 years (\pm 5.4). IUCD was available in 168 (85.3%) of the health facilities. Attitudes towards acceptance of PP-IUCD among providers was 547 (63.4%) [95% CI: 60.3, 66.7], however PP-IUCD use was very low 100 (11.5%). IUCD use was higher among health facilities that had available guidelines for family planning counseling (AOR=8.27; 95% CI: 1.56, 43.8). Training on IUCD (AOR=7.75; 95% CI: 3.71, 16.23). Providers' with favorable attitudes towards PP-IUCD (AOR=2.47; 95% CI: 1.044, 5.87); regular Antenatal Care (ANC) counseling (AOR=11.28; 95% CI: 4.04, 31.5), and providing ANC service at a health facility (AOR=1.94; 95% CI: 1.17, 3.22) were significantly associated with receiving training on PP-IUCD. Providers who preferred to use injectable contraceptive methods were 72% less likely to accept PP-IUCD (AOR=0.28; 95% CI: 0.16, 0.49).

Conclusion: Acceptance of PP-IUCD and IUCD insertion use among family planning providers remained low in the study setting. We found that while provider training remains low among study providers, it was associated with favorable attitudes towards PP-IUCD.

Keywords: Survey; Postpartum; Intrauterine; Contraceptive device; Provider attitude; Service provision; Ethiopia

Abbreviations

CIRHT: Center for International Reproductive Health Training; IUD: Intrauterine Device; LARCS: Long Acting Reversible Contraceptives; LNG-IUS: Levonorgestrel-Releasing Intrauterine System; LNG: Levonorgestrel; OCP: Oral Contraceptive Pill; UN: united Nation; WHO: World Health Organization

Objective

The Postpartum Intrauterine Contraceptive Device (PP-IUCD) is a very convenient method of contraception and it can be inserted within 48 h after giving birth [1]. While it took over 200,000

OPEN ACCESS

*Correspondence:

Solomon Mekonnen Abebe, Department of Public Health, University of Gondar, Ethiopia,

E-mail: solomekonnen@yahoo.com

Received Date: 22 Oct 2020

Accepted Date: 04 Dec 2020

Published Date: 07 Dec 2020

Citation:

Solomon MA, Solomon B, Yeshiwas A, Mulat A, Abebaw G, Tadesse G, et al. Attitudes, Experiences and Use of Postpartum Intrauterine Contraceptive Device Service Provision in the Amhara Region Public Health Facilities in Ethiopia: Providers' Perspective. *J Gynecol Oncol.* 2020; 3(5): 1046

Copyright © 2020 Solomon MA. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

years of human history for the world's population to reach one billion, it took only 200 years more to reach 7 billion, and Sub-Saharan Africa is one of the regions reflecting this rapid population growth in our time. Maternal and child health integrated programs and others have successfully introduced PP-IUCD around the world. India, Rwanda, Kenya and Zambia are scaling PP-IUCD nationally with these services [2,3]. Currently Ethiopia has a reproductive health strategy that provides all family planning methods for free to residents, with special emphasis on long-term and permanent methods [4]. In 2012, the Maternal and Child Health Integrated Program (MCHIP) started the PP-IUCD program implementation in Ethiopia.

It is well established family planning counseling is critical for women to make informed reproductive and sexual health decisions, especially in Ethiopia where there are high unmet family planning needs and fertility is high [4]. Initiation of family planning at the time of child birth is a great opportunity, as few women in low-resource settings who give birth in a facility return for further family planning [5]. Delivery is frequently the only time when mothers come in contact with health care providers [1,6]. Long-acting contraceptive methods like IUCD are believed to be effective methods during the postpartum period [7,8].

Demand and supply-side factors contribute to the limited use of these methods. One of the major supply-side factors for low/limited PP-IUCD contraceptive use is providers' experience and knowledge. The service provider can play a critically important role in a woman's family planning utilization; offering women an informed choice. On the other hand, an uninformed provider may limit a woman's awareness of safe effective methods like PP-IUCD. Hence, training providers on PP-IUCD in order to increase knowledge and skills will support further promotion of PP-IUCD use [9,10].

Due to the low coverage of contraception, maternal and neonatal complications are problematic [11]. Studies have pointed to socio-demographic factors as well as perceived attitudes towards quality of care and other organizational factors (including availability of service for caesarean section, guidelines and materials for IUCD use, and family planning counseling services) as major determinants of PP-IUCD use in the country [4,12-16]. A retrospective study found that only 60% of women who requested an IUCD obtained the service, waiting an average of 60.5 days post-delivery for insertion [17]. Providers may limit IUCD use among women by citing concerns about infection, expulsion, and infertility [17,18]. On the other hand, providers' attitudes towards use of IUCD may motivate clients to choose long-acting family planning methods and may be a key point of intervention to address barriers to PP-IUCD uptake and use. Studies done in Ghana and South Africa show that a lack of provider knowledge, provider discomfort with insertion, and incomplete contraceptive counseling contribute to a lack of IUD uptake, indicating a need for more training and information about the IUCD [19,20]. To increase PP-IUCD use by women who do not want to become pregnant it is critical to understand clinician-related barriers and facilitators to PP-IUCD uptake, as these are modifiable [8]. To date providers' attitudes and reasons for non-use of IUCD in Ethiopia have not been explored. Therefore, this study is designed to identify provider-related factors including knowledge and attitudes towards PP-IUCD that are modifiable in order to achieve wider use of IUCD in the Ethiopian context.

Methods

Study design

This facility-based cross-sectional study was conducted at Amhara region Hospitals from September 18th, 2015 to December 18th, 2016.

Setting

The Amhara region is located in the north western and north central parts of Ethiopia. Currently, the region has a population of more than 22 million. In this region, 23.58% of women are between 15 to 49 years, and of this, pregnant women constitute about 3.24%. Currently, the region has 81 hospitals (tertiary), 856 health centers (secondary) and 3,536 (primary) health posts. A variety of health professionals including gynecologists and obstetricians, general practitioners, integrated emergency surgery and obstetrics providers, health officers, midwives, and nurses are involved in providing PP-IUCD use in the selected health facilities [21].

Study participants

The study subjects were 864 health care providers who were involved in family planning services during the data collection period in the selected health facilities, Ethiopia.

Sampling

The providers sample size was determined using a single population proportion formula. The assumptions included a 5% margin of error, 95% confidence interval, and that 50% of the providers in the population have good knowledge about PP-IUCD [21]. Considering a design effect of two and a non-response rate of 15%, the total minimum sample size was 864 health care providers. We assumed that three to five providers would be represented per each facility. About 19 hospitals and 520 health centers were included, and of these, we selected 197 health facilities considering their geographical distribution and area of coverage. A list of health professionals in all hospitals and health centers was collected. Depending on the patient load and number of providers who are directly involved in IUCD service provision, we selected 3 to 5 individuals from each facility using simple random sampling (lottery method) from the sample frame. Details of the method were published elsewhere [22].

Data collection

Data collectors were selected from health practitioners outside the working facility (health officers with a college degree, midwives, and nurses) [22]. Then three-day training was conducted for 15 data collectors and nine supervisors on the objectives of the study and how to collect the data, including two days of pre-testing the study questionnaire. All questionnaires were administered in the health facilities.

A pretested and structured, self-administered questionnaire was used to collect data from participants. Questions included items on socio-demographic factors (sex, age, educational status, marital status, and religion), available service delivery, family planning counseling, as well as a knowledge assessment [21]. In addition, the study used a checklist to audit the available instruments in the facilities. A composite scale was used to determine (outcome) attitudes towards PP-IUCD. Knowledge about IUCD was assessed with 12 questions, each worth one point. The score was dichotomized using the mean value of the sum of points from the 12 questions.

Method of analysis

Data were coded, entered, and cleaned using EPI-INFO version

Table 1: Socio-demographic characteristics of the 864 study participants by health facility and sex in Amhara regional state, Ethiopia (2016).

Characteristics	Health Center Frequency %		Hospital Frequency %		Total Frequency %
	Male	Female	Male	Female	
Providers' age (years)					
18 to 24	66 (55.5)	53 (44.5)	50 (56.8)	38 (43.2)	207 (23.9)
25 to 34	186 (53.9)	159 (46.1)	163 (72.4)	62 (27.6)	570 (65.9)
35 to 44	29 (65.9)	15 (34.1)	16 (76.2)	5 (23.8)	65 (7.50)
45 to 69	11 (68.7)	5 (31.2)	6 (100)	0 (0.00)	22 (2.60)
Marital status					
Currently Married	129 (48.3)	138 (51.7)	76 (59.8)	51 (40.2)	394 (45.6)
Not Married	163 (63.4)	94 (36.6)	159 (74.6)	54 (25.3)	470 (54.4)
Religion					
Orthodox Christian	235 (57)	177 (42.9)	210 (71.7)	83 (28.3)	705 (81.6)
Muslim	45 (51.7)	42 (48.3)	14 (46.7)	16 (53.3)	117 (13.5)
Protestant	6 (46.1)	7 (53.8)	7 (87.5)	1 (12.5)	21 (2.43)
Other	5 (44.5)	6 (54.5)	1 (33.3)	3 (66.6)	21 (2.43)
Profession					
Gynecologist	1 (100)	0 (0.00)	4 (100)	0 (0.00)	5 (0.58)
Resident	1 (100)	0 (0.00)	9 (100)	0 (0.00)	10 (1.16)
General Practitioner (GP)	1 (50)	1 (50)	48 (76.2)	15 (23.8)	65 (7.52)
Emergency surgical officer	4 (80)	1 (20)	40 (93)	3 (6.9)	48 (5.56)
Health officer	67 (69.8)	29 (30.2)	8 (88.9)	1 (11.1)	105 (12.15)
Midwife	104 (51.2)	99 (48.8)	80 (57.9)	58 (42.1)	341 (39.47)
Nurse	114 (52.8)	102(47.2)	46 (62.2)	28 (37.8)	290 (33.56)
Duration of professional experience					
Less than 5 years	154 (59.2)	106 (40.8)	179 (71.3)	72 (28.7)	511(59.1)
5 to 40 years	137 (52.1)	126 (47.9)	56 (62.9)	33 (37.1)	353 (40.9)

7 and the STATA version 14 statistical packages was used for data analysis. Frequencies, percentages, and cross tabulations were used to describe the distribution of socio-demographic factors, characteristics available during service provision, and family planning related variables. Chi-square tests were used to identify factors that were statistically associated with the outcome (attitudes, and use of IUCD). Descriptive statistics were used to summarize the data. Multilevel logistic regression was used to determine factors that were statistically associated with providers' attitudes toward acceptance of PP-IUCD and IUCD use.

Results

Of the total providers who participated (n=864), the majority 524 (60.6%) worked in health centers. The mean age (\pm SD) of the study participants was 27.8 years (\pm 5.4). Concerning the educational status of participants, the majority 736 (85.2%) of providers only had a bachelor's degree. Four hundred and seventy (54.4%) providers were not married. Over a third, 337 (39%) were female and of these, 232 (68.8%) worked in a health center. About 62% of the study participants had less than five years working experience in their health profession, with a range of one to 40 years. Additional socio-demographic characteristics of the study participants are presented in Table 1.

Facility-related factors

A total of 65 (7.6%) of the health providers used instruments for

post placental IUCD insertion; of these 82% of them reported using Kelly forceps to insert a PP-IUCD.

According to survey results, an IUCD is available in 168 (85.3%) of the health facilities. In 86.8% of the health facilities in our sample, implants were reported to be available. Among those providers who have never inserted a PP-IUCD before, 73% of them reported that they had never received specific training on IUCD insertion.

The proportion of providers with a good attitude toward PP-IUCD was 63.4% [95% CI: 60.3, 66.7] and the proportion with experience inserting IUCD and PP-IUCD are presented. Regarding the ideal time for a postpartum woman to have an IUCD insertion, 37% reported that the timing is not important, 25% indicated that the ideal time was the extended postpartum period, and another 21% reported the post placental period as the ideal time. The reasons for not providing IUCD service are presented. The preference of the health personnel regarding the most suitable type of family planning for postpartum women are summarized in Table 2. Seventy eight percent of the health personnel reported regularly counseling pregnant or postpartum women on family planning. Regarding the preference of the health professionals on the ideal timing of making decisions on post-partum family planning, 37.8% of them said during antenatal care (ANC), 37.6% of them said during a postnatal visit, 16.7% of them said right after delivery, and 5% of them said during labor. About 77.3% of providers preferred to insert IUCD followed by implants (37.3%). Details of their preferences are presented.

Table 2: Type of family planning for PP-IUCD service provision among health providers in Amhara regional state health facility, Ethiopia (2016).

Type of Family planning	Providers with any use of this contraceptive n (%)
Female sterilization	114 (13.2%)
Male sterilization	51 (5.9%)
Oral contraceptive	126 (14.6%)
IUCD	668 (77.3%)
Injectable	169 (19.6%)
Implants	322 (37.2%)
Male condom	95 (11%)
Female condom	69 (8%)
Diaphragm	36 (4.2%)
LAM (Lactational Amenorrhea)	197 (22.8%)

Factors associated with IUCD use

IUCD use was found to be 95% less likely among general practitioners [AOR=0.05; 95% CI: 0.01, 0.31], 77% less likely among health officers [AOR=0.23; 95% CI: 0.06, 0.89], and 74% less likely among nurses [AOR=0.26; 95% CI: 0.07, 0.95] compared to gynecologists after adjusting for a number of important covariates (age, marital status, knowledge about PP-IUCD, qualification, training, use, preference in methods for postpartum family planning). The use of IUCD was eight times more likely among health facilities that had available written guidelines for family planning counseling than those who did not (AOR= 8.27; 95% CI: 1.56, 43.8). Providers who received training on PP-IUCD were more likely to use IUCD than their counterparts (AOR=7.75; 95% CI: 3.71, 16.23). Use of IUCD insertion was more than 10 times higher among providers who reported having experience with PP-IUCD insertion than those who had never used it (AOR=10.79; 95% CI: 3.67, 31.9) (Table 3).

Factors associated with attitude towards acceptance of PP-IUCD

For each increase of one point in a provider's knowledge score their attitude towards acceptance of IUCD was 15% more likely (AOR=1.15; 95% CI: 1.03, 1.27) after adjusting for important covariates (age, marital status, knowledge about PP-IUCD, qualification, training, use, preference in methods for postpartum family planning) in a multivariable logistic regression. Providers who received training on PP-IUCD were more likely to have a good attitude than their counterparts (AOR=2.47; 95% CI: 1.044, 5.87). Having an accepting attitude towards IUCD was 11 times more likely among health providers who regularly counsel pregnant women than those who do not (AOR=11.28; 95% CI: 4.04, 31.5). Providers who offer ANC services at their health facility were about twice as likely to have an accepting attitude towards PP-IUCD than their counterparts (AOR=1.94; 95% CI: 1.17, 3.22). Acceptance of PP-IUCD was 72% less likely among providers who preferred to use injectable contraceptive methods for postpartum women than inserting IUCD during counseling (AOR=0.28; 95% CI: 0.16, 0.49) (Table 4).

Discussion

Our results demonstrated that providers who were knowledgeable about PP-IUCD were much more likely to counsel clients about PP-IUCD than providers with poor knowledge. Acceptance of PP-IUCD among providers was above average in our sample. However, PP-IUCD insertion practices were very low. IUCD use was higher among

health facilities that had available guidelines for family planning counseling. Providers who received training on IUCD and those who regularly counsel pregnant women at ANC were more likely to use PP-IUCD. Obstetrics and Gynecology physicians in our sample had higher knowledge scores about PP-IUCD, while the lowest knowledge score was observed in nurses.

In this study, the proportion of PP-IUCD insertion was low among providers with no training on IUCD insertion. Successful IUCD insertion requires structured training that includes skill development in counseling methods and the correct insertion techniques. Best practice training with performance outcomes has been developed and evaluated elsewhere [20,23-25]. A study done in the USA has shown that accurate knowledge of contraceptive safety and effectiveness training improves provider immediate postpartum LARC insertion rates [26]. Another qualitative study done in rural areas in Pakistan expressed the need for qualified female healthcare providers, especially for long-term family planning services at health facilities, to improve provision of IUCD use [27]. Postpartum IUCD insertion has its own peculiarities with timing and anatomic changes that occur during pregnancy, and providers are expected to know these peculiarities and the specific skills needed for appropriate insertion [28,29]. Our finding is consistent with the study done in South Africa, which showed that providers with recent training on PP-IUCD counseled more patients and delivered more of the services compared to those who were not trained [30]. Thus, any training, and providing an update on knowledge and skills for IUCD insertion and PP-IUCD in particular, will help to ensure the expanded use of this safe long-term contraceptive service as part of women's health care.

Access to PP-IUCD can be affected by affordability and availability of the IUCD instruments [31]. In this study, IUCD and implants were available but limited. This is in line with studies done in Sri Lanka, Tanzania, and Nepal that assessed health facilities' preparedness for postpartum family planning services. This study showed that you can train providers and improve accessibility and convenience, but if the medical equipment and supplies for performing IUD insertion are in short supply, women will not receive IUCD [32]. Therefore, availability of long-term family planning methods should be continuously secured to make the service provision sustainable.

The observed low overall use IUCD among general practitioners, health officers, and nurses in our study is in line with a case-control study done in India [33]. This low use can be explained by the fact that general practitioners and the health officers in Ethiopia more frequently work in internal medicine and pediatric wards and outpatient departments where they are less likely to be exposed to IUCD use [33]. Providing additional in-service training across units and departments will help to improve attitudes towards IUCD and thus its use.

The multivariable logistic regression analysis showed that for each point in a person's knowledge score, their acceptance of IUCDs was 15% more likely. This may be explained by the fact that, when someone becomes knowledgeable about IUCDs, he/she will learn about PP-IUCDs benefits, promoting acceptance of IUCD use [34]. Greater acceptance of IUCDs was higher among health facilities that regularly counseled during pregnancy than those that did not. Counseling about family planning at ANC is the preferred approach, because it gives the client ample of time to think and discuss her contraceptive options with her partner and relatives, helping her to reach her final choice [21]. Our findings show that the less desirable

Table 3: Multivariate analysis for factors associated with IUCD use among health providers in Amhara regional state, Ethiopia (2016).

Characteristics	IUCD Use n (%)	COR [95%:CI]	AOR [95%:CI]
Demographic characteristics at the provider level			
Age in years			
18 to 24	59 (28.5)	1.00	1
25 to 34	184 (32.3)	1.19 [0.84, 1.69]	1.003 [0.54, 1.85]
35 to 44	32 (49.2)	2.43 [1.37, 4.31] *	2.41 [0.84, 6.95]
45 to 69	10 (45.4)	2.09 [0.86, 5.09]	3.16 [0.62, 15.9]
Current marital status			
Married	394 (45.6)	1.00	1.00
Not married	470 (54.4)	0.79 [0.59, 1.05]	1.21 [0.72, 2.04]
Knowledge about IUCD		1.10 [1.04, 1.17] *	1.00 [0.89, 1.11]
Professional Role of Providers			
Profession			
Gynecologist and emergency Surgical officer	32 (50.8)	1	1
General practitioner	6 (9.23)	0.10 [0.04, 0.26]	0.05 [0.01, 0.31] **
Health officer	24 (22.9)	0.29 [0.15, 0.56]	0.23 [0.06, 0.89] *
Midwifery	143 (41.9)	0.70 [0.41, 1.20]	0.48 [0.13, 1.69]
Nursing	80 (27.6)	0.37 [0.21, 0.64]	0.26 [0.07, 0.95] *
Participated in PP-IUCD training			
No	156 (22.1)	1	1
Yes	129 (82.1)	16.27 [10.4, 25.4] **	7.75 [3.71, 16.23] **
Provider regularly counsels pregnant patients			
No	17 (20.2)	1	1
Yes	267 (34.5)	2.08 [1.20, 3.61] *	0.83 [0.33, 2.05]
Variables at a facility level			
Do staff from this facility attend family planning counseling			
No	16 (20.1)	1	1
Yes	179 (35.3)	1.38 [0.98, 1.94]	1.87 [0.80, 4.38]
PMTCT services are provided every day in the facility			
No	23 (26.1)	1	1
Yes	261 (33.8)	1.44 [0.88, 2.38]	2.32 [0.87, 6.14]
Facility provides caesarean section services			
No	163 (35.1)	1	1
Yes	122 (30.6)	0.82 [0.61, 1.08]	0.91 [0.48, 1.69]
Facility offers guidelines for family planning counseling			
No	43 (21.6)	1	1
Yes	236 (36.6)	2.09 [1.44, 4.04] **	8.27 [1.56, 43.8] **
Available family planning written guidelines for service			
No	37 (22.2)	1	1
Yes	242 (35.6)	0.11 [0.73, 1.61] **	0.13 [0.03, 0.69]
Available flow charts on IUCD insertion			
No	58 (2.8)	1	1
Yes	167 (37.8)	1.95 [1.37, 2.77] **	1.04 [0.52, 2.10]
Have you ever inserted an PP-IUCD			
No	195 (25.5)	1	1
Yes	90 (90.0)	26.3 [13.4 51.5] **	10.79 [3.67, 31.9] **
Those facility who support Injectable methods most suitable for postpartum women?			

No	239 (34.4)	1	1
Yes	46 (27.2)	0.71 [0.49, 1.04]	0.70 [0.37, 1.33]
Most facility counsel pregnant women on ANC			
No	53 (23.0)	1	1
Yes	232 (36.6)	1.93 [1.36, 2.73]	1.17 [0.66, 2.07]
Antenatal care services are provided every day at this facility			
No	9 (20.0)	1	1
Yes	269 (33.4)	2.00 [0.95, 4.22]	1.55 [0.43, 5.56]
FP clients are required to purchase /provide the IUCD			
No	196 (33.3)	1	1
Yes	87 (33.2)	0.99 [0.73, 1.35]	1.24 [0.01, 2.19]

* = P-value <0.05; ** = p-value <0.001 PMTCT: Prevention of Mother to Child Transmission

Table 4: Multivariate analysis for factors associated with attitudes towards PP-IUCD among health providers in Amhara regional state, Ethiopia (2016).

Characteristics	Acceptance of PP-IUCD n (%)	COR [95%:CI]	AOR [95%:CI]
Age in years			
18 to 24	133 (64.2)	1.00	1
25 to 34	355 (62.3)	0.92 [0.66, 1.28]	0.99 [0.56, 1.76]
35 to 44	48 (73.8)	1.57 [0.84, 1.97]	2.12 [0.66, 6.84]
45 to 69	13 (59.1)	0.80 [0.33, 1.97]	0.92 [0.19, 4.29]
Providers Knowledge about PP-IUCD		1.56 [1.09, 1.28] *	1.15 [1.03, 1.27] *
Current Marital status			
Married	394 (45.6)	1.00	1.00
Not married	470 (54.4)	0.99 [0.75, 1.30]	1.25 [0.77, 2.03]
Profession			
Obstetrics and Gynecologist	43 (68.2)	1.00	1.00
General Practitioner	28 (43.1)	0.35 [0.17, 0.72] **	0.42 [0.10, 1.74]
Health Officer	61 (58.1)	0.64 [0.33, 1.24]	0.43 [0.11, 1.68]
Midwifery	241 (70.7)	1.12 [0.63, 2.00]	0.83 [0.23, 3.01]
Nursing	176 (60.7)	0.72 [0.40, 1.28]	0.70 [0.19, 2.62]
The provider has been trained in PP-IUCD			
No	419 (59.3)	1.00	1.00
Yes	130 (82.8)	3.31 [2.13, 5.14] **	2.47 [1.044, 5.87] *
Provider regularly counsels pregnant patients			
No	16 (19.1)	1.00	1.00
Yes	530 (68.6)	9.27 [5.27, 16.3] **	11.28 [4.04, 31.5] **
The provider has experience inserting an IUCD			
No	333 (57.5)	1.00	1.00
Yes	216 (75.8)	2.31 [1.68, 3.18] **	1.17 [0.66, 2.09]
Have you ever inserted PP-IUCD?			
No	473 (61.9)	1.00	1.00
Yes	76 (76.0)	1.95 [1.20, 3.15] *	0.42 [0.16, 1.09]
Provider feels injectable methods are most suitable for postpartum women			
No	471 (67.8)	1.00	1.00
Yes	78 (46.2)	0.41 [0.29, 0.57] **	0.28 [0.16, 0.49] *
Those providers frequently counsel pregnant women on ANC			
No	108 (46.9)	1.00	1.00
Yes	441 (69.6)	2.58 [1.89, 3.52] **	1.94 [1.17, 3.22] *
Do staff from this facility attend family planning counseling			

No	146 (62.3)	1.00	1.00
Yes	324 (62.7)	1.01 [0.74, 1.39]	1.45 [0.74, 2.86]
PMTCT services provided every day in the facility			
No	58 (65.9)	1.00	1.00
Yes	488 (63.2)	0.89 [0.56, 1.41]	0.82 [0.35, 1.90]
Are there services for Caesarean section			
No	305 (65.6)	1.00	1.00
Yes	244 (61.2)	0.82 [0.62, 1.09]	0.87 [0.49, 1.54]
Are there available guidelines for FP counseling			
No	108 (54.3)	1.00	1.00
Yes	428 (66.4)	1.66 [1.20, 2.29] *	1.11 [0.38, 3.27]
Available FP guide lines for service			
No	90 (53.9)	1.00	1.00
Yes	448 (65.9)	1.66 [1.78, 2.34] **	1.09 [0.38, 3.17]
Available Flow charts on IUCD insertion?			
No	136 (55.7)	1.00	1.00
Yes	298 (67.4)	1.64 [1.19, 2.27] *	1.39 [0.72, 2.66]
Are antenatal care services provided every day at this facility			
No	21(46.7)	1.00	1.00
Yes	518 (64.3)	2.06 [1.12, 3.76] *	2.23 [0.80, 6.24]
Are FP clients required to purchase/provide the IUCD			
No	366 (62.2)	1.00	1.00
Yes	176 (67.2)	1.24 [0.91, 1.69]	1.39 [0.79, 2.46]

*= P-value <0.05; **= p-value <0.001

timing of counseling during labor or the immediate postpartum period is still practiced in Ethiopia, despite the obvious stress on the woman forced to make a decision while suffering labor pains. So, providing counseling at ANC on the PP-IUCD contraceptive option is optimal for the expanded utilization and practice of IUCD [35]. This study showed a significant association between low IUCD insertion use, poor provider attitude towards IUCD acceptance and low provider knowledge about IUCD, all factors that can be addressed through training to improve use of this safe, long-term contraceptive method.

Limitations of the Study

One limitation of this research was that the proportion of OBGYN providers we used in our sample was smaller than other professions (consistent with professional representation among obstetrics and gynecologists in Ethiopia) creating very wide confidence intervals for some of our estimates in the regression model. In addition, associated factors of attitude and IUCD use were hospital-based using a cross-sectional design which might not show temporal relationships with the outcome. Qualitative research is needed to more deeply understand behavioral factors associated with provider attitudes, their experiences, and their use of PP-IUCD. Longitudinal research is needed to assess the relationship between these variables over time.

Conclusion and Recommendation

Despite the acceptance of IUCD we found among providers, PP-IUCD insertion remains low in health facilities in Ethiopia. Provider training on PP-IUCD is necessary to achieve greater acceptance and use of IUCD insertion. Availability of materials for IUCD provision, providing in-service training for health officers, nurses and general

practitioners on IUCD methods, and promoting regular counseling of pregnant women at ANC, as well as at postpartum visits, will improve demand for IUCD. Our findings indicate a need for training. To ensure quality postpartum family planning service provision at every health facility, continual training for service providers on IUCD should encompass pre-service curricula, on-the-job training, and provider peer-to-peer education. Eventually this will help the Ethiopian women, their families, society, and the country to reduce maternal mortality.

Strengths and Limitations of the Study

- This study is designed to identify provider attitudes, experiences and use of postpartum intrauterine contraceptive device service provision in the Ethiopian context.
- It deals not only with the acceptance of PP-IUCD provision by providers but also availability of materials for IUCD provision, and quality of care is assessed.
- One limitation of this research was that the proportion of OBGYN providers we used in our sample was smaller than other professions creating very wide confidence intervals for some of our estimates in the regression model.
- In addition, associated factors of attitude and IUCD use were hospital-based using a cross-sectional design which might not show temporal relationships with the outcome.

Declarations

Ethical considerations

Ethical clearance was obtained from the University of Gondar

Institutional Review Board. Permission and support letters were obtained from Amhara Regional Health Bureau and health facility managers to conduct this study in the government's health facilities. The study participants were informed about the purpose of the research. Signed written consent was obtained from each study participant. The privacy and confidentiality of the participants were not disclosed; we use anonymous ID numbers, and the data are stored and locked securely in a safe place. Study participants' right to withdraw at any time from the study was respected.

Availability of data and materials

We have to abide by the data sharing policy of University of Gondar; nonetheless, we have included all important information regarding data presented (No additional data are available).

Funding

CIHRT and University of Gondar. The funder(s) had no role in the design, collecting data, analysis and writ-up, of this manuscript.

Authors' contributions

- SMA, SB, and YA designed the study;
- SMA, YA, SB, AG performed the analysis and interpretation of data; and,
- SMA, YA, SB, AG BA, SA, MA, TG, MAG, MG, WA drafted and finalized the write-up of the paper.
- All authors prepared the draft manuscript, read and approved the final manuscript.

Acknowledgment

Pre-Publication Support Service (PREPSS) supported the development of this manuscript by providing pre-publication peer-review and copy editing. The authors are very grateful for the funding provided by CIHRT to conduct this study with full support, including training every study participant at each step of the study; we would like to extend our acknowledgments to the University of Gondar Providing institutional support with available resources. We would also like to acknowledge the study participants for contributing to this research.

References

1. Tatum HJ, Beltran RS, Ramos R, Van Kets H, Sivin I, Schmidt FH. Immediate postpartum insertion of GYNE-T 380 and GYNE-T 380 postpartum intrauterine contraceptive devices: Randomized study. *Am J Obstet Gynecol.* 1996;175(5):1231-5.
2. Mackenzie D, Pfitzer A, Maly C, Waka C, Singh G, Sanyal A. Postpartum family planning integration with maternal, newborn and child health services: A cross-sectional analysis of client flow patterns in India and Kenya. *BMJ open.* 2018;8(4):e018580.
3. Yugbare Belemsaga D, Goujon A, Tougri H, Coulibaly A, Degomme O, Duysburgh E, et al. Integration of maternal postpartum services in maternal and child health services in Kaya health district (Burkina Faso): an intervention time trend analysis. *BMC health services research.* 2018;18(1):298.
4. Hrusa G, Spigt M, Dejene T, Shiferaw S: Quality of family planning counseling in Ethiopia: Trends and determinants of information received by female modern contraceptive users, evidence from national survey data, (2014- 2018). *PloS One.* 2020;15(2):e0228714.
5. Atukunda EC, Mugenyi GR, Obua C, Atuhumuza EB, Lukyamuza EJ, Kaida A, et al. Provision of family planning vouchers and early initiation of postpartum contraceptive use among women living with HIV in southwestern Uganda: A randomized controlled trial. *PLoS Med.* 2019;16(6):e1002832.
6. Pan J, Li Y, Xie L. The influence of immediate postpartum insertion of GyneFix PP-intrauterine devices on puerperal period. *Zhonghua fu chan ke za zhi.* 1998;33(1):40-2.
7. Hill AV, Nehme E, Elerian N, Puga ED, Taylor BD, Lakey D, et al. Immediate postpartum long-acting reversible contraception programs in Texas hospitals following changes to medicaid reimbursement policy. *Matern Child Health J.* 2019;23(12):1595-603.
8. Iftikhar PM, Shaheen N, Arora E. Efficacy and satisfaction rate in postpartum intrauterine contraceptive device insertion: A prospective study. *Cureus.* 2019;11(9):e5646.
9. Mishra S. Evaluation of safety, efficacy, and expulsion of post-placental and intra-cesarean insertion of intrauterine contraceptive devices (PPIUCD). *J Obstet Gynaecol India.* 2014;64(5):337-43.
10. Central statistical agency and ICF International. Ethiopia demographic and health survey: Key Findings. Calverton, Maryland, USA. 2011.
11. Ewerling F, Victora CG, Raj A, Coll CVN, Hellwig F, Barros AJD. Demand for family planning satisfied with modern methods among sexually active women in low- and middle-income countries: Who is lagging behind? *Reprod Health.* 2018;15(1):42.
12. de Jongh TE, Gurol-Urganci I, Allen E, Jiayue Zhu N, Atun R. Barriers and enablers to integrating maternal and child health services to antenatal care in low and middle income countries. *BJOG.* 2016;123(4):549-57.
13. Chee G, Pielemeier N, Lion A, Connor C. Why differentiating between health system support and health system strengthening is needed. *Int J Health Plann Manage.* 2013;28(1):85-94.
14. Sayinzoga F, Bijlmakers L. Drivers of improved health sector performance in Rwanda: A qualitative view from within. *BMC Health Serv Res.* 2016;16:123.
15. Duysburgh E, Kerstens B, Kouanda S, Kabore CP, Belemsaga Yugbare D, Gichangi P, et al. Opportunities to improve postpartum care for mothers and infants: design of context-specific packages of postpartum interventions in rural districts in four sub-Saharan African countries. *BMC Pregnancy Childbirth.* 2015;15:131.
16. Kouanda S, Yameogo WM, Ridde V, Sombie I, Baya B, Bicaba A, et al. An exploratory analysis of the regionalization policy for the recruitment of health workers in Burkina Faso. *Hum Resour Health.* 2014;12(Suppl 1):S6.
17. Ogburn JA, Espey E, Stonehocker J. Barriers to intrauterine device insertion in postpartum women. *Contraception.* 2005;72(6):426-9.
18. Stanwood NL, Garrett JM, Konrad TR. Obstetrician-gynecologists and the intrauterine device: A survey of attitudes and practice. *Obstet Gynecol.* 2002;99(2):275-80.
19. Robinson N, Moshabela M, Owusu-Ansah L, Kapungu C, Geller S. Barriers to intrauterine device uptake in a rural setting in Ghana. *Health Care Women Int.* 2016;37(2):197-215.
20. Castle S, Schroffel H, Nzau Mvuzelo JJ, Mupenda B, Mumbere J, Shapiro R. Successful programmatic approaches to facilitating IUD uptake: CARE's experience in DRC. *BMC Women's Health.* 2019;19(1):104.
21. Tsigue P, Yolande H, Suzanne A, Abdoulaye D, Blami D, Rachel W, et al. Increasing use of postpartum family planning and the postpartum IUD: Early experiences in West and Central Africa. *Glob Health Sci Pract.* 2016;4(2):S140-52.
22. Abebaw Y, Berhe S, Abebe SM, Adefris M, Gebeyehu A, Gure T, et al. Providers' knowledge on Postpartum Intrauterine Contraceptive Device (PPIUCD) service provision in Amhara region public health facility, Ethiopia. *PloS One.* 2019;14(4):e0214334.
23. Akin A, Gray RH, Ramos R. Training auxiliary nurse-midwives to

- provide IUD services in Turkey and the Philippines. *Stud Fam Plann.* 1980;11(5):178-87.
24. Stewart M, Digiusto E, Bateson D, South R, Black KI. Outcomes of intrauterine device insertion training for doctors working in primary care. *Aust Fam Physician.* 2016;45(11):837-41.
25. Hauck B, Costescu D. Barriers and misperceptions limiting widespread use of intrauterine contraception among Canadian women. *J Obstet Gynaecol Can.* 2015;37(7):606-16.
26. Jatlaoui TC, Cordes S, Goedken P, Jamieson DJ, Cwiak C. Family planning knowledge, attitudes and practices among bariatric healthcare providers. *Contraception.* 2016;93(5):455-62.
27. Mustafa G, Azmat SK, Hameed W, Ali S, Ishaque M, Hussain W, et al. Family planning knowledge, attitudes, and practices among married men and women in rural areas of Pakistan: Findings from a qualitative need assessment study. *Int J Reprod Med.* 2015;2015:190520.
28. Cwiak C, Cordes S. Postpartum intrauterine device placement: A patient-friendly option. *Contracept Reprod Med.* 2018;3:3.
29. Blumenthal PD, Lerma K. Intrauterine device expulsion after postpartum placement: A systematic review and meta-analysis. *Obstet Gynecol.* 2018;132(4):895-905.
30. Gutin SA, Mlobeli R, Moss M, Buga G, Morroni C. Survey of knowledge, attitudes and practices surrounding the intrauterine device in South Africa. *Contraception.* 2011;83(2):145-50.
31. Kanyangarara M, Sakyi K, Laar A. Availability of integrated family planning services in HIV care and support sites in sub-Saharan Africa: A secondary analysis of national health facility surveys. *Reprod Health.* 2019;16(Suppl 1):60.
32. Canning D, Shah IH, Pearson E, Pradhan E, Karra M, Senderowicz L, et al. Institutionalizing postpartum intrauterine device (IUD) services in Sri Lanka, Tanzania, and Nepal: Study protocol for a cluster-randomized stepped-wedge trial. *BMC Pregnancy Childbirth.* 2016;16(1):362.
33. Yadav V, Balasubramaniam S, Das S, Srivastava A, Srivastava A, Kumar S, et al. Comparison of outcomes at 6 weeks following postpartum intrauterine contraceptive device insertions by doctors and nurses in India: A case-control study. *Contraception.* 2016;93(4):347-55.
34. Asegidew W, Tariku B, Kaba M GS, Ketsela K. Acceptance and positive attitude increased utilization of long acting and permanent family planning methods among reproductive age group women from Debre Berhan district, Ethiopia: Quantitative and qualitative analysis. *J Community Med Health Educ.* 2016;7(4):356-63.
35. Kant S, Archana S, Singh AK, Ahamed F, Haldar P. Acceptance rate, probability of follow-up, and expulsion of postpartum intrauterine contraceptive device offered at two primary health centers, North India. *J Family Med Prim Care.* 2016;5(4):770-6.