

Preconception Care Practice and Associated Factors Among Health Care Providers in Selected Public Hospitals in Addis Ababa, Ethiopia, 2020: A Cross Sectional Study

Yihalem Abeje Zewdie^{1*}, Endalew Gemechu Sendo² and Addishiwet Fantahun²

¹St. Peter Specialized Hospital, Addis Ababa, Ethiopia

²Department of Midwifery, School of Nursing And Midwifery, College of Health Sciences, Addis Ababa University, Addis Ababa, Ethiopia

Citation: Zewdie YA, Sendo EG, Fantahun A. Preconception Care Practice and Associated Factors Among Health Care Providers in Selected Public Hospitals in Addis Ababa, Ethiopia, 2020: A Cross Sectional Study. *J Integrated Health* 2024;3(2):191-199. DOI: doi.org/10.51219/JIH/yihalem-abeje-zewdie/34

Received: 22 February, 2024; **Accepted:** 15 April, 2024; **Published:** 17 April, 2024

***Corresponding author:** Yihalem Abeje Zewdie, St. Peter Specialized Hospital, Addis Ababa, Ethiopia, E-mail: yihalemabeje2008@gmail.com

Copyright: © 2024 Zewdie YA, et al., This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

ABSTRACT

Background: Preconception care (PCC) is the arrangement of biomedical, behavioral, and social wellbeing mediations to ladies and couples before conception happens. In any case, it is one of the lost components inside the continuum of maternal and child healthcare. Healthcare providers (HCPs) are at the cutting edge of screening and recognizing preconception risk factors driving to adverse pregnancy results.

Objective: To assess preconception care practice and associated factors among health care providers in selected public hospitals in Addis Ababa.

Methods: Institutional based cross-sectional study was done among 852 of HCPs using pretested structured self-administered questionnaires. Study participants were selected by a simple random sampling technique. Data entry and analysis were used by Epi-data version 4.6 software, and SPSS version 25 respectively. Descriptive statistics, bivariate, and multivariable logistic regression analysis were used to determine the association.

Results: A total of 781 study participants, 55.7% of HCPs had a good level of knowledge of PCC. The level of PCC practice (N = 775), lower practice 19.7%, medium practice 43%, and high-level practice 37.3% found in this study. Those HCPs with poor PCC knowledge had more than 5 times higher odds of not practicing PCC (AOR = 5.49 95% C.I. 3.84-7.84). Whereas, those HCPs who do not screen their clients' reproductive life plan (RPL) had more than 3 times higher odds of not practicing PCC (AOR = 3.84 95% C.I. 2.20-6.71).

Conclusion and recommendation: The findings of this study showed PCC practice was not well incorporated and consistent which indicates that PCC is not well coordinates into the study space. Creating of PCC approach and rules additionally preparing of HCPs are recommended to fortify the integration of the health care system.

Keywords: Preconception care, Knowledge, Practice, Healthcare providers

Abbreviations: ANC: Antenatal care; CDC: Centers for disease control and prevention; FMOH: Federal ministry of health; HCPs: Health care providers; HIV: Human immunodeficiency virus; PCC: Preconception care; STIs: Sexually transmitted infections; WHO: World health organization; RPL: Reproductive life plan

1. Introduction

Preconception care (PCC) is the arrangement of biomedical, behavioral, and social wellbeing mediations to ladies and couples before conception happens, pointed at progressing their wellbeing status, and decreasing behaviors and environmental variables that could contribute to destitute maternal and child health outcomes. Its extreme point is to move forward maternal and child wellbeing result¹. PCC is pointed to recognize and adjust biomedical, behavioral, and social dangers to a woman's wellbeing or pregnancy results by prevention and management².

The reason for PCC is to provide hazard screening, wellbeing advancement, and successful mediations as a portion of routine wellbeing care². Ranges tended to by the PCC are behavioral conditions, chronic illnesses, Vaccine-preventable infections, family arranging, Infertility, Female genital mutilation, and Sexually transmitted infections(STIs)^{3,4}. PCC contains a positive impact on the range of wellbeing results. It can diminish maternal and child mortality, avoid unintended pregnancies, anticipate complications and adverse results during pregnancy and delivery, and increment a chance of conception⁵.

Interventions of PCC could be creatively incorporated in current health care delivery mechanisms that are being used to get specific groups. For example, folic acid supplementation could be incorporated into family planning and provider-initiated HIV testing and counseling service. PCC could be provided in health institutions, education places, community settings, and innovative electronic and mobile technology^{4,6}. PCC could be offered for the general population, all reproductive-age individuals, individuals planning to pregnancy, and individuals with predefined high-risk groups⁷.

Roughly 810 women died with in the world every day from preventable causes related to pregnancy and childbirth⁸ and also 5.9 million children under five deaths, 2.7 million neonatal deaths⁹, largely from preventable causes. Nearly all of the adverse pregnancy results are reported from low-income countries. For instance, the vast majority (86%) of all the maternal death, more than 60% of preterm birth, 91% of low birth weight (LBW), 98% of stillbirth, and 99% of neonatal death are occurring in low-income countries¹⁰⁻¹². Studies showed that women reported more risk factors before conception than compared with pregnant women^{13,14}. The preparation of women for pregnancy is highly considered as significant for a healthy pregnancy and the next generations¹⁵. PCC could be influenced by unfavorable attitudes, lack of knowledge, lack of policy, tools, and guidelines. Improving PCC requires transformed into the knowledge, attitudes, and behaviors of the responsible body^{16,17}.

According to the 2016 national demographic health survey report, maternal mortality ratio of 412/100,000 live birth, the under-five mortality rate of 67/1000 live birth, the infant mortality rate of 45/1000 live birth, and Neonatal mortality rate of 29/1000 live birth were documented¹⁸. The government of the Federal Democratic Republic of Ethiopia (FDRE) plans to decrease maternal mortality to 199 per 100,000 live births in 2020 and 70 or less by 2030 in line with the target set by the World Health Organization (WHO). The target set by WHO is reachable because most of the maternal deaths are preventable if accessing antepartum care, intrapartum care, and postpartum care¹⁹.

Giving PCC for women before conception by HCPs is crucial management for adverse pregnancy outcomes. Reported

showed that the absence of PCC and delay entry into antenatal care (ANC) are contributing factors to infant mortality²⁰. Only one cross-sectional survey conducted among 634 HCPs working in public health institutions in Hawassa, Ethiopia, reported that only 31% of HCPs had good knowledge of PCC and while 84.7% (537/634) of them were found not practicing PCC in the study area²¹. Another cross-sectional survey conducted in one of the African countries, Egypt, reported there is poor PCC knowledge and practice among the HCP's. This study reported only 22% of HCPs had good knowledge²².

A review of prior studies reveals that there are few studies on PCC mainly on knowledge, and practice of HCPs in Ethiopia. Bearing in mind the innovation of the PCC program, we intended to conduct a study on the practice of PCC and associated factors among HCPs working in selected public hospitals in Addis Ababa, Ethiopia. The finding of this study will supply to the integration of PCC in the health care system. It will support the policymakers as inputs. It will also use as a reference and guide for researchers

2. Methods and Materials

The institution-based cross-sectional study design was conducted from March to April /2020 among health care providers in selected Public Hospitals in Addis Ababa. Addis Ababa is located in the Central part of Ethiopia and belongs to the Western highlands. The Addis Ababa City Government has 10 sub-cities. Each sub-city has an average of 10-12 woredas/districts. The Health facilities of Addis Ababa include 11 public hospitals (specialized, referral and general), 86 public health centers, and about 720 private and NGO health facilities of different levels (Hospitals, specialized centers/clinics, medium clinics, and primary clinics. Four public hospitals were selected by the lottery for this study. These are Yekatit 12 hospital Medical College (Y12HMC), St Peters specialized hospital (SPSH), Gandhi memorial hospital (GMH), and Zewditu memorial hospital (ZMH).

The sample size was calculated using a single population proportion exposure formula by using four major determinant variables for PCC Practice based on the study conducted in Hawassa, Ethiopia by Andargachew et al (21). By using Epi-Info version 7.1 at a 95% level of confidence, with a power of 80% and adding a 10% non-response rate, the total sample size calculated is **852**. The study setting was selected randomly from the eleven public hospitals in Addis Ababa. The first respective sample was allocated to selected hospitals proportionally based on the health care provider's population in each hospital. Then, again samples for each profession (medical doctors, nurses, midwives, pharmacists, and health officers) were allocated proportionally. Finally using simple random sampling (SRS) technique health care providers from each profession were taken considering the list of health care providers as a sample frame.

From selected public hospitals 2,747 health care providers were employed during this study period. Among health care providers 458 nurses, 211 medical doctors, 81 midwives, 62 pharmacists, and 32 public officers were selected randomly in this study in selected hospitals. Data were collected by using pretested structured self-administered questionnaires English version adapted from a review of related literature. It consists of socio-demographic information, knowledge, practice, and associated factors of preconception care questions. Self-administered questionnaires were distributed to the health care

providers by trained four midwives with experience on data collection, and the data was collected in the clinical area and head midwife and nurses facilitated the orientation and dissemination of the questionnaire. Finally, the filled questionnaire was checked for completeness and consistency of the data by the data collector's supervisors.

In this, study health care provider stands for medical doctors, nurses, midwives, health officer, and pharmacists. Knowledge about PCC was measured by an 18-item knowledge questionnaire adapted from previous studies. Those who scored less than the mean value were considered to have poor knowledge while those who scored greater than or equal to the mean value were considered as having good knowledge. A further 36 items were measured several elements of PCC practice, including reproductive life planning, screening practices, access to resources to practice PCC. The items were adapted from a previous study(21). Those who score less than the mean were considered to have Poor Practice while those who score greater than or equal to the mean value were considered as having Good Practice. To further classify the level of HCPs PCC practice lower practice<50%, medium practice between 50%-75% and high-level practice > 75%.

The data were entered into Epi-data version 4.6 software and exported to Statistical package for social sciences (SPSS) version 25 for statistical analysis. The first descriptive summaries including frequency, proportions, and measures of the mean were carried out for both independent and dependent variables. Next, the bivariate analysis was done to identify the association between the independent and the dependent variables. Those variables with a p-value<0.25 in the bivariate analysis were a candidate for multivariable logistic regression, and then those variables with a p-value<0.05 in the multivariable analysis were considered as having statistically significant association with PCC.

The quality of data was assured at the maximum attainable level by using a structured questionnaire adapted after reviewing related literature and following the necessary procedures to get the intended results. To ensure the quality of data, the pre-test of data collection tools was done at Dagmawi Minilik hospital before two weeks' main data collection by taking 5% of the total sample size. Data collectors and supervisors had orientation one day before data collection. The questionnaire was checked for completeness and correctness daily by immediate supervisors.

The study was conducted after full approval and ethical clearance was obtained from Addis Ababa University, College of Health Sciences, School of Nursing, and Midwifery. Written requests to conduct the study were made to the Addis Ababa Health Bureau and the permission to conduct the study was granted by Participating Hospitals in the study. Finally, each participant gave their informed written consent. Confidentiality was assured by making the questionnaire anonymous.

3. Results

3.1. Socio-demographic characteristics of the study participants

Among 852 healths care providers, 781 (91.6%) HCPs participated in this study, 71 questionnaires were excluded (50 incomplete data and 21 of the chart is not available at the time of data collection). Of which, 412(52.8%) of the study participants were females and more than half 465(59.5) of the

study participants were between the age group of 26-30 years, mean age being 30.48, SD \pm 5.67. Based on the professional category, more than (55.7%) were nurses followed by medical doctors (23.9%). Nearly half (49.9%) of the study participants were married. Two third of the study participants had a BSc degree and more than half (52.5%) had less than five years of service (**See Table 1**).

Table 1: Socio-demographic characteristics of health care providers working in selected public hospitals of Addis Ababa, 2020, Ethiopia.

Socio demographic charcterstics Frequency (n = 781)		total	
		Percent (100%)	
Sex	Male	369	47.2
	Female	412	53.8
Age	20-25	87	11.1
	26-30	465	59.5
	31-35	115	14.7
	> = 36	114	14.6
Marital status	Singel	379	48.5
	Married	390	49.9
	Divorced	9	1.2
	Widowed	2	0.3
	Living together	1	0.1
Profession	Medical doctor	187	23.9
	Nurse	435	55.7
	Midwife	74	9.5
	Public health officer	28	3.6
	Pharmacy	57	7.3
Educational level	Diploma	43	5.5
	Bsc	527	67.5
	Msc	27	3.5
	Gp.med	170	21.8
	Specialist	14	1.8
Year of experience	<5	410	52.5
	> = 5	371	47.5
Monthly salary in birr	< 4000	18	2.3
	4000.0 – 4791	72	9.2
	> 4791	691	88.5

3.2. The level of providers knowledge on preconception care

In this study, eighteen items were used to measure the level of the healthcare provider's knowledge of preconception care. Of the eighteen items, the level of the HCPs PCC knowledge score range from 0-17(M = 10.73, SD \pm 3.19). Only 2 and 5 HCPs scored 0 and 17 respectively. There were no health care providers who scored 18 out of 18. More than half (55.7%) of the HCP had good knowledge about PCC and only (44.3%) of HCP had scored poor on knowledge of PCC.

3.3. The level of providers practice on preconception care

In this study, the level of the healthcare provider's practice on preconception care was measured by 36 items. Of the 36 items measuring practice, the level of the health care provider's PCC practice score range from 36-180 (M = 119.27, SD \pm 33.54). Only nine study participants had practiced all PCC practice

questions. Six study participants have never practiced all PCC practice questions. More than half (50.7%) of the HCP had poor practice about PCC and nearly half (49.3%) of HCP had scored good on the practice of PCC. To further classify the level of PCC practice (N = 775), lower practice <50% (153, 19.7%), medium practice between 50%-75% (333, 43%) and high level practice >75% (289, 37.3%).

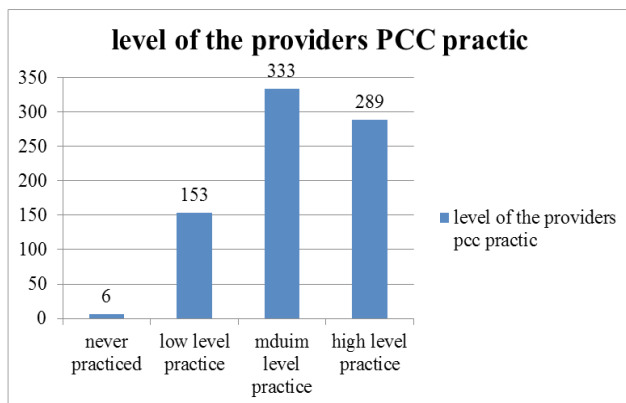


Figure 1: Health care provider's level of Practicing PCC in the selected public hospital of Addis Ababa (n = 781) 2020, Ethiopia.

In this study preconception, counseling questionnaires were used to assess the level of the health care provider's PCC practice. More than half of the health care provider's counseled the importance of screening for STI/HIV and nutrition for a client. But physical exercise and environmental hazards & toxins were low practicings by health care providers (see **Table 2**)

Table 2: Health care providers practice preconception care counseling in selected public hospitals in Addis Ababa, 2020, Ethiopia.

Variables	n	%
Family planning methods	Never	97 (12.4%)
	Rarely	137 (17.5%)
	Sometimes	243 (31.1%)
	Often	112 (14.3%)
	Always	192 (24.6%)
Pregnancy spacing	Never	75 (9.6%)
	rarely	201 (25.7%)
	sometimes	213 (27.3%)
	often	117 (15.0%)
	always	175 (22.4%)
Physical exercise:	Never	84 (10.8%)
	rarely	171 (21.9%)
	sometimes	269 (34.4%)
	often	123 (15.7%)
	always	134 (17.2%)
Bodyweight	Never	64 (8.2%)
	rarely	134 (17.2%)
	sometimes	290 (37.1%)
	often	152 (19.5%)
	always	141 (18.1%)
Nutrition:	Never	43 (5.5%)
	rarely	97 (12.4%)
	sometimes	247 (31.6%)
	often	141 (18.1%)
	always	253 (32.4%)

Alcohol tobacco, and psychoactive substance use :	Never	138	17.7%
	rarely	115	14.7%
	sometimes	211	27.0%
	often	128	16.4%
	always	189	24.2%
Multivitamin containing Folic acid :	Never	65	8.3%
	rarely	149	19.1%
	sometimes	225	28.8%
	often	142	18.2%
	always	200	25.6%
Maintaining good control of any preexisting medical conditions before conception	Never	73	9.3%
	rarely	132	16.9%
	sometimes	246	31.5%
	often	141	18.1%
	always	189	24.2%
Importance of screening for STIs/HIV	Never	63	8.1%
	rarely	132	16.9%
	sometimes	185	23.7%
	often	113	14.5%
	always	288	36.9%
Dangers of prescribed and non-prescribed medication use	Never	63	8.1%
	rarely	137	17.5%
	sometimes	200	25.6%
	often	130	16.6%
	always	251	32.1%
Environmental hazard & toxins	Never	139	17.8%
	rarely	151	19.3%
	sometimes	225	28.8%
	often	98	12.5%
	always	168	21.5%
Preventive of vaccines	Never	115	14.7%
	rarely	144	18.4%
	sometimes	201	25.7%
	often	128	16.4%
	always	193	24.7%
Inviting partner for preconception counseling, risk screening, and management	Never	116	14.9%
	rarely	136	17.4%
	sometimes	212	27.1%
	often	133	17.0%
	always	184	23.6%

Preconception assessment and risk screening questionnaires were used to assess the level of providers PCC practice. More than half of health care providers were assessed past obstetric and gynecologic history, past medical and surgical history, and physical examination for clients. But less than 30% of health care providers have assessed the history of dental care, social history particular lifestyle behaviors, and exposure to environmental toxins and contaminants for clients (see table 3).

Table 3: Health care providers preconception health assessment in selected public hospital Addis Ababa, 2020, Ethiopia.

Variables	N	%
Demographic information	Never	103 (13.2%)
	rarely	122 (15.6%)
	sometimes	174 (22.3%)
	often	131 (16.8%)
	always	251 (32.1%)

Past Obstetric & Gynecologic history	Never	73	9.3%
	rarely	157	20.1%
	sometimes	136	17.4%
	often	121	15.5%
	always	294	37.6%
Past medical and surgical history	Never	82	10.5%
	rarely	100	12.8%
	sometimes	176	22.5%
	often	133	17.0%
	always	290	37.1%
Genetic history or family pedigree	Never	112	14.3%
	rarely	131	16.8%
	sometimes	218	27.9%
	often	114	14.6%
	always	206	26.4%
History of dental care/ checkup	Never	167	21.4%
	rarely	142	18.2%
	sometimes	244	31.2%
	often	94	12.0%
	always	134	17.2%
Social history particularly lifestyle behaviors	Never	101	12.9%
	rarely	142	18.2%
	sometimes	246	31.5%
	often	135	17.3%
	always	157	20.1%
Exposure to environmental toxins and contaminants	Never	138	17.7%
	rarely	143	18.3%
	sometimes	196	25.1%
	often	129	16.5%
	always	175	22.4%
Pharmacologic history	Never	62	7.9%
	rarely	163	20.9%
	sometimes	235	30.1%
	often	137	17.5%
	always	184	23.6%
Nutritional assessment particularly BMI	Never	63	8.1%
	rarely	133	17.0%
	sometimes	244	31.2%
	often	148	19.0%
	always	193	24.7%
Psychosocial assessment	Never	88	11.3%
	rarely	177	22.7%
	sometimes	234	30.0%
	often	133	17.0%
	always	149	19.1%
Physical examination	Never	49	6.3%
	rarely	121	15.5%
	sometimes	208	26.6%
	often	141	18.1%
	always	262	33.5%
Employment history	Never	86	11.0%
	rarely	168	21.5%
	sometimes	227	29.1%
	often	141	18.1%
	always	159	20.4%

Vaccination status	Never	96	12.3%
	rarely	130	16.6%
	sometimes	212	27.1%
	often	113	14.5%
	always	230	29.4%

In this study prevention and management of identified risk factor questionnaires were used to assess the health care provider’s level of the PCC practice. More than half of the study participants were provided provider-initiated HIV testing and counseling, linking clients to other relevant departments and pregnancy confirmation for clients (see **Table 4**).

Table 4: Health care providers practicing PCC intervention either yourself or by referring selected public hospitals, Addis Ababa, 2020, Ethiopia.

Variables	N	%	
Folic acid supplementation/ prescription	Never	92	11.8%
	Rarely	98	12.5%
	sometimes	230	29.4%
	Often	133	17.0%
	Always	228	29.2%
Substance use cessation	Never	124	15.9%
	Rarely	156	20.0%
	sometimes	193	24.7%
	Often	115	14.7%
	Always	193	24.7%
Select safe medication or substitute the existing with a safe one	Never	90	11.5%
	Rarely	111	14.2%
	sometimes	226	28.9%
	Often	154	19.7%
	Always	200	25.6%
Ordering/ checking routine preconception lab investigations	Never	93	11.9%
	Rarely	121	15.5%
	sometimes	205	26.2%
	Often	154	19.7%
	Always	208	26.6%
Diagnosing & managing acute or chronic preconception Conditions	Never	79	10.1%
	Rarely	128	16.4%
	sometimes	186	23.8%
	Often	178	22.8%
	Always	210	26.9%
Controlling existing pre-gestational chronic diseases	Never	67	8.6%
	Rarely	136	17.4%
	sometimes	195	25.0%
	Often	176	22.5%
	Always	207	26.5%
Vaccination of client as per the national protocol	Never	130	16.6%
	Rarely	105	13.4%
	sometimes	196	25.1%
	Often	134	17.2%
	Always	216	27.7%
Pregnancy confirmation	Never	52	6.7%
	Rarely	104	13.3%
	sometimes	215	27.5%
	Often	134	17.2%
	Always	276	35.3%

Linking client to other relevant department or organizations	Never	61	7.8%
	Rarely	86	11.0%
	sometimes	193	24.7%
	Often	202	25.9%
	Always	239	30.6%
Provider initiated HIV testing and counseling	Never	52	6.7%
	Rarely	75	9.6%
	sometimes	155	19.8%
	Often	165	21.1%
	Always	334	42.8%

When asked to propose who should provide PCC, less than half (40.3%), gave their opinion that all health care providers, i.e. medical doctors, nurses, midwives, public health officers, and health extension workers should provide PCC. The remaining participants indicated specific healthcare providers (**Figure 2**).

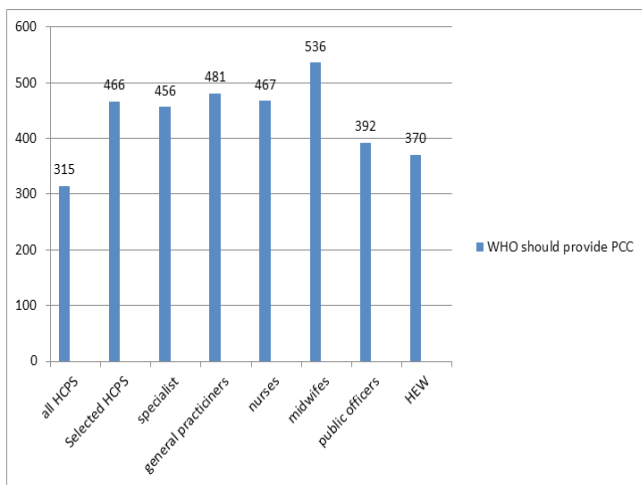


Figure 2: Health Care Providers’ idea of who should give PCC in the selected public hospital, Addis Ababa, 2020, Ethiopia.

When asked to propose do you ask for the reproductive life plan (RPL) of clients attending to your day to day practice, most of 86 % of HCPs had RPL screening practice. The remaining

study participated in never RPL screening practice. When asked to propose which health institutions should give PCC practice, more than half (55.7%) of health care providers gave their opinion that all health institutions. The remaining respondents indicated selected health institutions. Most health institutions had not a policy and procedural document guiding PCC. Around 62% of this study participant said no clear policy and procedural document in the institutions. And also 65% of study participants not ever seen national guidelines or protocols prepared by the federal minister of health. Most 82% of study participants wanted training on PCC and 65 % of study participants were willing to incorporate elements of PCC in daily practice.

3.4. Factors associated with PCC practice

Based on bivariate analysis professional category, monthly salary, level of knowledge, reproductive lifespan screening, who should give PCC care and which institution should give PCC service were all associated with the level of preconception care practice and those variables with p-value <0.25 in the bivariable analysis were included in multivariable logistic regression analysis. In multivariable analysis professional category, level of knowledge, monthly salary, and reproductive life span screening were all significantly associated with preconception practice (p <0.05).

The likelihood of not practicing PCC was fivefold higher among those HCPs who had a poor level of knowledge on PCC than those who had a good level of knowledge (AOR = 5.49, 95% C.I 3.84-7.84). Compared to medical doctors, nurses, midwives and health officers, pharmacy had the probability of less likely practicing PCC (AOR = 0.15 95% CI 0.62-0.34, AOR = 0.10 95% CI, 0.04-0.23, AOR = 0.03, 95% CI, 0.01-0.08) AOR = 0.15, 95% CI, 0.05-0.47) respectively. The odds of practicing of PCC was more than three-fold higher among those HCPs who did not screen women’s intention to pregnancy or their reproductive life plan (RPL) than those screening(AOR = 3.84, 95% CI, 2.20-6.71). The odds of having good PCC practice among those who earn a salary of >4791 birrs five times fold than those who earn a salary of <4000 birrs (AOR = 5.15, 95% CI, 1.39-19.03).

Table 5: Results bivariate & multivariate logistic regression analysis of good PCC practice among healthcare providers in selected public hospitals, Addis Ababa, 2020 Ethiopia.

Variable		HCP practice status			
		Good practice	Poor practice	COR (95.0%, C.I.)	AOR (95.0%, C.I.)
Knowledge level	Poor knowledge	95	251	5.29(3.88-7.20)	5.49(3.84-7.84)
	Good knowledge	290	145	1	1
Profession	Medical doctor	103	84	7.51(3.37-16.73)	0.15(0.62-0.34)
	Nurse	200	235	5.21(2.41-11.27)	0.10(0.04-0.23)
	Midives	61	13	28.74(11.03-74.88)	0.03(0.01-0.08)
	Health officer	13	15	5.31(1.85-15.23)	0.15(0.05-0.47)
	Pharmacy	8	49	1	1
Salary per month	<4000	4	14	3.55(1.16-10.90)	5.15(1.39-19.03)
	4000-4791	33	39	2.96(0.89-9.87)	1.45(0.83-2.55)
	>4791	348	343	1	
Who should give PCC?	Selected HCPS	190	276	2.36(1.76-3.16)	1.09(0.70-1.70)
	All HCPS	195	120	1	
Which health institutions give PCC?	Selected health institutions	126	220	2.57(1.92-3.44)	1.54(0.99-2.38)
	All health institutions	259	176	1	
Reproductive life screening	Not screening	21	86	4.81(2.92-7.93)	3.84(2.20-6.71)
	Screnning	364	310	1	

1 = Reference category, COR = cruds odd ratio, AOR = adjusted odd ratio, CI = confidence interval

4. Discussion

Preconception assessment and risk screening, preconception counseling, and prevention and management of identified risk factors are essential elements of preconception care. These elements of care should address step by step to achieve good preconception care. Missing the essential component of PCC throughout the following results in substandard or poor PCC. PCC should be given regularly to all reproductive-age individuals before conception(1). In this study, only 37 percent of HCPs were provided an essential element of preconception care.

In this study, 37.3% of HCPs gave full packaged PCC care, 43% substandard, and 19.7% poor package of preconception care. These findings, compared to reports from other studies in Hawassa, are evidence showing the presence of the service in the study area. This is because this study was done in Addis Ababa which is the capital city of Ethiopia. A cross-sectional study in Iran reported the nearly 70% of physicians and 75% of Bachelors of Science in family health in all preconception care fields was poor practice, but the majority of family physician project midwives (64.7%) and healthcare social workers (52.4%) had a moderate practice (25). Interpretation and comparison of this result might not be possible due to different study populations. In one cross-sectional study in Hawassa, almost all HCPs were not implementing PCC (85%).The remaining HCPs claiming to practice (15%)(21). Another study in Tikuranbesa hospital conducted on residents reported that 19.2% of study participants had good practice scores, whereas 42.3% had moderate and 38.5% had poor preconception care practice scores(23). The discrepancy might be different study participants. Still, the existence of the practice in its lower form might lead to prepare policy, guidelines, and continuous training for further improvement of the services. Efforts may be made by the concerned bodies to improve the practice of preconception care through the preparation of guidelines, providing continuous training, and creating awareness in the health care systems.

This study asked to propose who should provide PCC, less than half (40.3%), gave their opinion that all health care providers, i.e. medical doctors, nurses, midwives, public health officers, and health extension workers should provide PCC. This might be the absence of a clear job description, absence of facility-based policy, and procedural guidelines.

This study pinpoints four major factors to practice preconception care. HCP's poor PCC knowledge is the first factor associated with the non-implementation of PCC. The odd of not practicing PCC were more than five times greater than among HCPs with poor PCC knowledge than HCPs with good PCC knowledge. A similar study conducted on this topic in Hawassa identified that HCP's knowledge of PCC is a key determinant factor to providers' PCC practice(21). Poor PCC practice might be related to lack of training on PCC including in-service and pre-service training. Health care provider's knowledge of PCC will lead to improved PCC practice. Knowledge is required for correctly performing a duty. However, acting without knowledge distances the providers from their goal, rendering the outcome impossible.

This study identified other factors associated with poor PCC. Compared to medical doctors, nurses, midwives, and public officers to the pharmacy had a higher likelihood of not-practicing PCC. Similar studies found, but couldn't make

a comparison with this result(21). The discrepancy noted in this study may providers' educational preparation and setups in which these professionals are working. The WHO also revealed the benefit of building the capacity of health care providers and health care managers to enhance the planning, implementation, and monitoring of PCC(4). The CDC also vigorously advocated that all HCPs caring for a woman need to accomplish the suggested PCC components. This document concentrated on the need to improve the capacity building on the preconception care of pre-service training(2)before conception of a first or subsequent pregnancy. Since the early 1990s, guidelines have recommended preconception care, and reviews of previous studies have assessed the evidence for interventions and documented the evidence for specific interventions. CDC has developed these recommendations based on a review of published research and the opinions of specialists from the CDC/ATSDR Preconception Care Work Group and the Select Panel on Preconception Care. The 10 recommendations in this report are based on preconception health care for the U.S. population and are aimed at achieving four goals to 1. Provision of pre-service education along with the provision of in-service education for all HCPs may help provide the service to all HCPs caring for the reproductive-aged individuals.

This study also recognized another factor associated with poor practice PCC. HCPs that are not screening the RPL of their clients had odds of not practicing PCC by three-fold higher than those who screening RPL. A cross-sectional study from Hawassa reported that HCPs who are not regularly screening the RPL of the client had a likelihood of not practicing or not implementing PCC by seven-fold higher than those who regularly screen RPL(21). The reason for the similarity for these studies might be due to nearly a similar sample size and similar study design. Improvement of RPL with sufficient PCC training and institutional encouragement may help to address all the eligible to get PCC. The insertion of a single RPL question in clinical assessment formats may use as an alarm to all HCPs(21). The HCP's monthly salary was also among the factors affecting the HCP's PCC practice in this study. The analysis indicated that the odds of having poor PCC practice was higher among HCPs who earn a low salary. Similar studies could not be found to make a comparison with this result. This maybe who earns more salary may have more responsibility and a higher level of education.

This study also identified there is no significant association between the level of PCC practice and who should provide preconception care service given. Similar studies found those who perceived that all HCP should provide PCC were more likely to practice PCC as compared to HCPs with the perception that selected HCPs are responsible. This may be this study participant working similar working places that are hospital health care providers. But a similar study in Hawassa includes health centers and health extension workers.

5. Conclusion and Recommendations

Based on this study, the following conclusions are made:

- The study results demonstrated that more than half of the participants had good knowledge of preconception care
- The study revealed the absence of a standard and complete PCC practices by the HCPs
- The study identified that the majority of Providers' level of practice of preconception care was found to medium.

- The study showed that poor knowledge about PCC and Providers not screening Clients' RLP were predators of non-practicing PCC
- PCC is not well incorporated and plaint within the study space which indicates that also PCC is not well integrated into the area. Making ready of PCC policy and protocols and continuous pre-service and in-service education of HCPs are recommended to strengthen the integration of the health care system.

Based on the study findings, the following recommendations are made:

5.1. The federal ministry of health (FMOH)

- There is no recognized policy document guiding the implementation of PCC in Ethiopia. Hence, the FMOH is recommended for making ready clear PCC policy and integrate it into the Health care system
- Health care training programs don't include PCC in the curriculum. The FMOH is thus recommended to include PCC elements into the nationally harmonized curriculums for the training of medical doctors, nurses, midwives, pharmacists, health officers, and health extension workers.
- There is no PCC guideline or Protocol to guide HCP's practice. The FMOH is recommended to avail resources such as guidelines, procedural documents and other published resources on PCC to increase the knowledge and practice of HCPs

5.2. Addis ababa health bureau

- Provide continuous training (pre-service and in-service training.) to HCPs on PCC
- Organize mentorship to the HCPs in the implementation of PCC at the facility level
- Create public awareness using media outlets about preconception care

5.3. Researchers

Further study is recommended on how to tackle the barriers that hinder the provision of PCC and how to integrate PCC services into the health care system.

5.4. Acknowledgment

We would like to thank Addis Ababa University College of health science school of nursing and midwifery department of midwifery for giving me the chance to prepare this thesis. We acknowledge the administrators and staff of the Addis Ababa City Administration Health Bureau, for their cooperation to give me permission and information on data collection in the selected hospitals. We would like to thank Yekatit 12 hospital Medical College (Y12HMC), St Peters specialized hospital (SPSH), Gandhi memorial hospital (GMH), and Zewditu memorial hospital (ZMH) staffs for their cooperation to collect the data. I would also like to express my thanks to St. Peter Hospital for sponsoring me. Last but not least thank goes to data collectors and the supervisor for helping me in the data gathering process.

5.5. Author information

^{YA}: BSc, MSc fellow in Addis Ababa University, clinical staff in St Peter specialized hospital, Addis Ababa, Ethiopia

^{EG}: Ph.D., Assistant Professor, lecture, department of midwifery, school of nursing and midwifery, college of health sciences, Addis Ababa University, Addis Ababa, Ethiopia

^{AF}: BSc, MSc, lecture, department of midwifery, school of nursing and midwifery, college of health sciences, Addis Ababa University, Addis Ababa, Ethiopia.

5.6. Author contributions

YA proposed the study and wrote the proposal, facilitated data collection, analyzed and interpreted the data, drafted the final report write up, and prepared manuscript. All authors (EG, AF, YA) participated in developing the tools, data analysis, and involved in report write up. All authors revised the subsequent drafts of the paper and read and approved the final manuscript.

5.7. Availability of data

All relevant data are within the paper. If anyone wants to have further data on reasonable requests may contact the corresponding author for data access using the following, yihalemabeje2008@gmail.com.

6. Reference

1. World Health Organization. Preconception care: Maximizing the gains for maternal and child health. WHO, 2013;8.
2. Johnson K, Posner SF, Biermann J, et al. Recommendations to improve preconception health and health care--United States. A report of the CDC/ATSDR preconception care work group and the select panel on preconception care. *MMWR Recomm Rep*, 2006;55: 1-23.
3. Care P. Good health before pregnancy: Preconception care. *ACOG*, 2017.
4. World Health Organization. Meeting to develop a global consensus on preconception care to reduce maternal and childhood mortality and morbidity. WHO Geneva Meet report Geneva, 2012;78.
5. Wilkes J. AAFP releases position paper on preconception care. *Am Fam Physician*. 2016;94: 508-510.
6. Mason E, Chandra-Mouli V, Baltag V, Christiansen C, Lassi ZS, Bhutta ZA. Preconception care: Advancing from 'important to do and can be done' to 'is being done and is making a difference'. *Reprod Health*, 2014;11: S8.
7. Temel S, van Voorst SF, de Jong-Potjer LC, et al. The Dutch national summit on preconception care: a summary of definitions, evidence and recommendations. *J Community Genet*, 2015;6: 107-115.
8. World Health Organization. Trends in maternal mortality 2000 to 2017: Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. World Health Organization, 2019.
9. You D, Hug L, Ejdemyr S, et al. Level & trend in child mortality. UN Inter-agency group for child mortality estimation report, 2015.
10. World Health Organization. Trends in maternal mortality : 2000 to 2017. WHO, 2017.
11. Blencowe H, Krusevec J, de Onis M, et al. National, regional, and worldwide estimates of low birthweight in 2015, with trends from 2000: a systematic analysis. *Lancet Glob Heal*, 2019;7: 849-860.
12. Blencowe H, Cousens S, Jassir FB, Say L, Chou D, Mathers C, et al. National, regional, and worldwide estimates of stillbirth rates in 2015, with trends from 2000: A systematic analysis. *Lancet Glob Heal*, 2016;4: 98-108.
13. Gund P, Bhide P. Prevalence of periconception risk factors for adverse pregnancy outcomes in a cohort of urban indian women: Implications for preconception health education. *J Womens Heal Care*, 2016;5.

14. Joelsson LS. Lifestyle and reproductive health among women prior to conception. *Acta Universitatis Upsaliensis*, 2018.
15. WHO. Global action plan for the prevention and control of noncommunicable diseases 2013-2020. WHO, 2013;102.
16. Goossens J, De Roose M, Van Hecke A, Goemaes R, Verhaeghe S, Beeckman D. Barriers and facilitators to the provision of preconception care by healthcare providers: A systematic review. *Int J Nurs Stud*, 2018;87: 113-130.
17. Valley L, Network H, Valley L, Network H, Valley L. *Diabetes and Preconception Counseling*. 2019.
18. EDHS. Federal democratic republic of ethiopia demographic and health survey. EDHS, 2016;1-59.
19. FMOH. Ethiopian health sector transformation plan 2015/16 - 2019/20. *Fed Democr Repub Ethiop Minist Heal*, 2015;20: 25.
20. Kassa A, Human SP, Gemeda H. Knowledge of preconception care among healthcare providers working in public health institutions in Hawassa, Ethiopia. *PLoS One*, 2018;13: 1-11.
21. Kassa A, Human S, Gemeda H. Level of healthcare providers' preconception care (PCC) practice and factors associated with non-implementation of PCC in Hawassa, Ethiopia. *Ethiop J Health Sci*, 2019;29: 903-912.
22. M Fadia, Azza T, Refaat EE. Awareness of primary health care providers in elminia governorate about preconception care, Egypt. *El-Minia Med Bull*, 2012;23: 14.
23. Alemu WS, Teklu S, Tesfaye K. Assessment of the knowledge, attitude and practice of residents At Tikur anbesa hospital about preconceptional care 2018. *Medicine*, 2018;11: 19-28.