Knowledge and Practice of Preconception Care and Related Factors Among Health Care Providers in Public Health Facilities of Assosa Zone, Western Ethiopia, 2022

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To cite this article:

Berhane Teklay Asfaha, Hunduma Dina, Yaregal Dessalew Tarik, Nigus Chekole Sharew. Knowledge and Practice of Preconception Care and Related Factors Among Health Care Providers in Public Health Facilities of Assosa Zone, Western Ethiopia, 2022. Cross-Sectional Study. *American Journal of Nursing and Health Sciences*. Vol. 3, No. 4, 2022, pp. 84-93. doi: 10.11648/j.ajnhs.20220304.11

Abstract: *Background:* Preconception care refers to activities that women and their couples should undertake before and between pregnancies to improve pregnancy outcomes, and preconception prevention is still low worldwide, including Ethiopia. *Objective:* To assess of pre-conception nursing knowledge, practices and related factors among health care providers in public health facilities of the Assosa Zone, Benishangul Gumuz Region 2022. *Methods:* An institution-based cross-sectional study design was conducted. Pre-tested structured self-administered questionnaires were distributed to a sample of 421 study participants selected by simple random selection. Data were cleaned, coded and entered into Epi-Data software version 4.6 and then exported to version 25 of the Social Science Statistics Package (SPSS) for statistical analysis. Variables with a p-value < 0.25 in the bivariate analysis were candidates for multivariate logistic regression, and variables with a p-value < 0.05 in the multivariate analysis were considered statistically significant. The test for quality and multicolinearity was checked. Finally, the result was presented using tables, figures and texts. *Result:* Overall, around 66.1% and 42% of respondents respectively had good knowledge and practical experience of preconception care. The main determinants identified for knowledge of preconception care were level of education (medical doctorate) [AOR (95% CI = 3.23 (1.23-6.1)]), occupation [AOR (95% CI = 3 (1.8-7.65)], professional experience [AOR (95% CI = 2 (1.64-6.76)] and prior reading of the PCC guideline [AOR (95% CI = 3.2 (1.22-6.72))] And for practice, Education (medical PhD and BSc degree) [AOR (95% CI = 3.1 (1.67-5.89)] and [AOR (95% CI = 2.12 (1.09-4.89))], Knowledge of preconception care [AOR (95% CI = 3.3 (1.32-5.6)], Monthly salary [AOR (95% CI = 6.7 (2.8-15.9)] and work experience (3>=years) [AOR (95% CI = 2.4 (1.03-5.23)] were associated. *Conclusion and recommendation:* In this study, the majority of healthcare providers in the study area had good knowledge of PCC but poor PCC practice. It is recommended to create a PCC approach and rules and additionally create HCPs and guidelines to strengthen the integration of the health system.

Keywords: Knowledge, Practice, Pre-Conception, Health Care Provider, Assosa Zone

1. Introduction

Preconception care refers to activities that women and their couples should undertake before and between pregnancies to improve pregnancy outcome, with the goal of improving their health status and reducing behavioral and environmental variables that contribute to poor maternal and child health could contribute. Preconception Care recognizes that many adolescent girls and young women are pushed into motherhood without the knowledge or skills [1]. Their ultimate goal is to promote the well-being of mother and child in both the short and long term. Their ultimate goal is to promote the well-being of mother and child in both the short and long term [2, 3]. PCC is designed to identify and respond to biomedical, behavioral, and social threats to a woman's well-being or pregnancy outcomes through prevention and management. The importance of preconception care is to

offer risk screening, well-being promotion, and successful mediation as part of routine well-being care [4]. Issues assessed during preconception care include: behavior, chronic illnesses, genetics, medication use, sexually transmitted infections, and immunizations [5]. In addition, PCC also addresses family planning, infertility/subfertility, female genital mutilation, unwanted and violated pregnancies, and mental health issues [6]. Preconception care has a positive impact by improving pregnancy outcomes and women's health in general, by preventing diseases and managing risk factors that affect pregnancy outcomes and the health of future generations. It can reduce maternal and infant mortality, prevent unwanted pregnancies, anticipate complications and side effects during pregnancy and childbirth, and increase the likelihood of conception [7].

Preconception care can also avoid obesity and stunting, and prevent the vertical transmission of human immunodeficiency and from the perspective of health consequences; in the short term, preconception care could reduce pregnancies, premature pregnancies, and unplanned pregnancies. Preconception care could help reduce the risk of genetic disorders and environmental exposure, reduces maternal and infant mortality, and improves maternal and infant health [6].

In both high- and low- and middle-income countries, such as Italy, the Netherlands, the Philippines and Sri Lanka [6, 8], there is growing involvement in the implementation of preconception care policies. Preconception nursing interventions could be creatively integrated into current health care mechanisms used to reach specific groups. For example, folic acid supplementation could be integrated with family planning services and provider-initiated HIV testing and counseling services; and discussions about sexual violence, female genital mutilation and smoking cessation could find their way into the school education system with young men and women. Preconception care could be provided in health, educational and community settings. It could also be provided through the use of innovative electronic and mobile technologies [3, 6]. However, there is no general international agreement on who should be offered PCC. PCC could be offered to the general population, all persons of childbearing potential, persons planning to conceive and persons not planning to conceive. Targeting individuals, couples, families and communities for PCC should make greater efforts to avoid them becoming socially and financially excluded and therefore more vulnerable to well-being and social problems. There is also a particular need to reach out to couples and individuals to achieve preconception interventions that include prior negative reproductive outcomes, pre-existing genetic risks, genetic diseases, and chronic diseases such as diabetes. Preconception care (PCC) might be a modern evidence-based practice that is not yet well presented and coordinated in the Ethiopian healthcare framework [5, 7, 9, 10]. The government of the Federal Democratic Republic of Ethiopia plans to reduce maternal mortality to 199 per 100,000 live births by 2020 and to 70 or less by 2030, in line with the World Health Organization (WHO) target. The target set by the WHO is achievable as most maternal deaths are preventable if prenatal, Intrapartum and postpartum care is used [11]. Preconception care (PCC) of women before conception by health care providers (HCPs) is a critical management for the outcome of a pregnancy. HCPs are primarily responsible for adjusting and identifying preconception risk factors that cause negative pregnancy outcomes. The absence of PCC and delayed entry into ANC has been reported to be factors in infant mortality. Preconception care is an evidence-based practice but has not been globally recognized in the health care system [7, 10, 12, 13]. Only a cross-sectional survey of 634 health care providers working in public health facilities in Hawassa, Ethiopia found that only 31% of HCPs had a good knowledge of PCC and 84.7% (537/634) of them had no PCC practiced the field of study [14]. Another cross-sectional survey carried out in one of the African countries, Egypt; found that HCPs have insufficient PCC knowledge and practices. This study reported that only 22% of HCPs had good knowledge [15]. Healthcare providers' knowledge of PCC will have an impact on improving PCC practice. Knowledge is required to perform a task correctly. Acting without knowledge, however, distances the providers from their goal and makes the result impossible. A review of previous studies shows that there are few studies of preconception care, mainly on the knowledge and practice of health care providers in Ethiopia. With the innovation of the pre-conception nursing program in mind, we wanted to conduct a study of the knowledge and practice of PCC and related health care factors providers working in Assosa Zone public health institutions Assosa Zone, Benishangul Gumuz region.

2. Methods and Materials

2.1. Study Area

The study was conducted from January 20, 2022 to February 12, 2022 in the Assosa Zone Benishangul Gumuz region of Ethiopia. Assosa is one of the three zones in the Benishangul-Gumuz region of Ethiopia. Assosa borders the Mao Komo Special Region of Woreda to the south, Sudan to the west and the Kamashi to the northeast. It has 8 Woredas Assosa, Bambasi, Homosha, Menge, Undulu, Sherkole, Kumruk and Buldiglu and 240 Kebeles. The largest city in this zone is Assosa. Based on the 2007 census conducted by the Central Statistical Agency of Ethiopia (CSA), this zone has a total population of 310,822 of which 158,932 are males and 151,890 are females. 39,957 or 12.86% of the population are urban dwellers. Assosa Zone has a total of 207 health facilities; 2 hospitals, 25 health centers and 186 health posts and a total of 1,475 health professionals. An institution-related cross-sectional study design was conducted from January 20 to February 12, 2022.

2.2. Participants

All health care providers in Assosa Zone public health facilities who meet the inclusion criteria were used as the study population. All healthcare providers selected from the baseline population who met the inclusion criteria were included, while healthcare providers on educational leave or furlough and those with less than 6 months of professional experience were excluded.

2.3. Sample Size Determination and Sampling Technique

Sample size was calculated using a single population proportion formula with the following assumption: prevalence of knowledge of obstetric fistula risk factor was 50%, 95% of confidence interval (1.96), 5% of tolerated sampling error, and 10% of non-response rate. The study environments were randomly selected from the two public hospitals and 23 health centers in the Assosa zone. The first sample was divided among selected hospitals and health centers based on the number of providers in each facility. Then samples were distributed proportionately for each profession (doctors, nurses, midwives, pharmacists and health officials). Finally, using a simple random sampling (SRS), healthcare providers was drawn from each occupation using the list of healthcare providers as the sampling frame. Then the calculated sample size (421) was allocated proportionately.
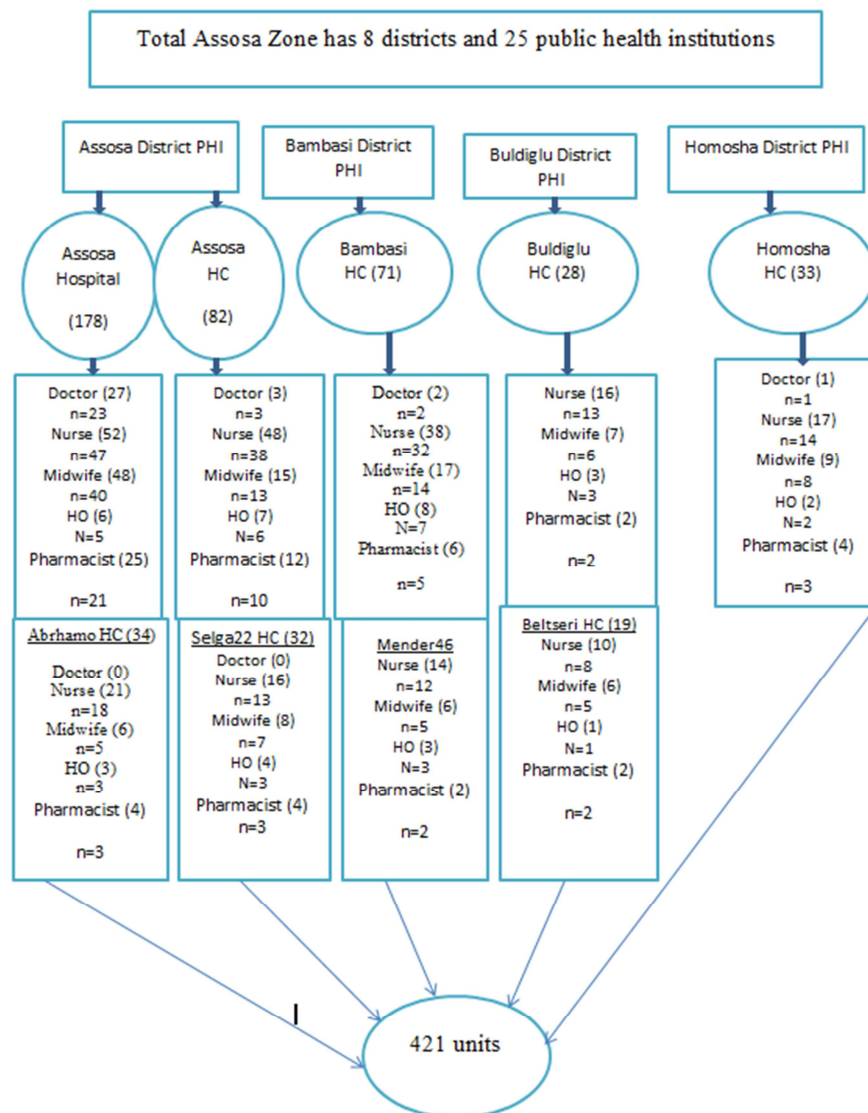

Figure1. Schematic Presentation of Sampling Procedure.

2.4. Data Collection Procedure

Instrument
Data collection was carried out using pre-tested, structured self-completion questionnaires in English and local language, based on the chosen language and the level of knowledge of the study, adapted to a literature review [10, 14]. It consists of five sections (socio-demographic information, knowledge, practice and related factors of preconception care issues.

2.5. Data Collection Technique

Self-completion questionnaires were distributed to providers by four trained midwives experienced in data collection, data were collected in the clinical setting, and the lead midwives and nurses facilitated their orientation and distribution of the questionnaires. Finally, the completed questionnaire was checked by the supervisors of the data collection for completeness and consistency of the data.

2.6. Variables

Dependent variables
Level of provider's preconception care Knowledge and practice
Independent variables
Socio-demographic variables
1) Age
2) sex
3) Professional category
4) Religion
5) Educational level
6) Marital status
7) Work experience
8) Knowledge related variables
9) Availability of preconception guideline
10) Internet access
11) Working unit
12) Practice related variables
13) The practice of reproductive life span screening

2.7. Definition of Terms

Healthcare providers (HCPs): is an individual health professional or a health facility organization licensed to provide health care diagnosis and treatment services (doctors, nurses, midwives, health officers and pharmacists).

Preconception care (PCC): is the provision of biomedical, behavioral, and social health interventions to women and couples prior to conception.

PCC Knowledge: Those who scored less than the mean were considered poor have poor knowledge, while those who scored greater than or equal to the mean were considered have good knowledge.

PCC Practice: Those who scored less than the mean were considered poorly practiced, while those with scores greater than or equal to the mean were considered well practiced.

2.8. Data Analysis

Data were cleaned, coded and entered into Epi-data version4.6 software and then exported to Social Science Statistics Package (SPSS) version 25 for statistical analysis. The first descriptive summaries of frequency, proportion, and mean measures were performed for both independent and dependent variables. Next, the bivariate analysis was performed to identify the association between the independent and dependent variables. The variables with a p-value < 0.25 in the bivariate analysis were candidates for multivariate logistic regression, and then the variables with a p-value < 0.05 in the multivariate analysis were considered to be statistically significantly associated with PCC. The test of goodness and multicolinearity were checked. Finally, the result was presented using tables, figures and texts.

2.9. Data Quality Management

The quality of the data was ensured at the maximum achievable level using a structured questionnaire, adapted after reviewing the relevant literature and following the necessary procedures to achieve the intended results. To ensure the quality of the data, a pre-test of the data collection tools were carried out outside the study setting before the main data collection period, in which 5% of the total sample was taken. Training was given to data collectors and supervisors the day before data collection. The questionnaire was checked daily for completeness and correctness.

3. Results

3.1. Socio-Demographic Characteristics of Respondents

In this study, 416 healthcare providers were surveyed and the response rate was 98.8%. The mean age and standard deviation of respondents were 30.5 and+ 5.798, respectively. Around 168 (40.4%) of the respondents were in the 30-34 age group, with regard to the gender of the respondents, 216 (51.9%) of them were women. The result showed that the majority of study participants were single (46.2%), followed by married (38%). Regarding religion, around 171 (41%) of the respondents were Muslim, followed by Orthodox 170 (40%). 220 (53%) of the respondents were nurses, followed by midwives 100 (24%). (Table 1).

Table 1. *Socio-demographic characteristics of respondents among health care providers in Assosa Zone Public health institutions, Benishangul Gumuz Region, Ethiopia 2022, (N=416).*

Variable	Category	Frequency	Percentage
Age	20-24 years	64	15.4%
	25-29 years	129	31%
	30-34 years	168	40.4%
	>=35 years	55	13.5%
	Total	416	100%
Gender	Male	200	48.1%
	Female	216	51.9%
	Total	416	100%
Marital status	Single	221	53%
	Married	195	47%
	Total	416	100%
Religion	Orthodox	170	40.9%
	Muslim	171	41.1%
	Protestant	59	14.2%
	Catholic	16	3.8%
	Total	416	100%
Profession	Doctor	18	4.3%
	Nurse	220	53%
	Midwifery	100	24%
	Health Officer	52	12.5%
	Pharmacy	26	6.2%
	Total	416	100%

Variable	Category	Frequency	Percentage
Educational level	Diploma	252	61%
	BSc degree	114	27%
	GP MD	50	12%
	Total	416	100%
Work Experience	<3 years	182	43.8%
	>= 3 years	234	56.3%
	Total	416	100%
Monthly Salary	<4000 Birr	34	8.2%
	4000-5000birr	72	17.3%
	>5000 birr	310	74.5%
	Total	416	100%

3.2. Other Factors for Knowledge and Practice of Preconception Care

In terms of patients/clients seen by a single healthcare provider per day, approximately 227 (54.6%) of the respondents saw more than thirty patients/clients per day. It turned out that the majority (62.5%) of the respondents had internet access in their area. About 60% of the study participants had a smartphone. It was found that; the majority (65.4%) of healthcare providers had ever read the preconception care guideline (Table 2).

Table 2. Other factors of respondents among health care providers in Assosa Zone Public health institutions, Benishangul Gumuz Region, Ethiopia 2022.

Variable	Category	Frequency	Percentage
No of patient treated/day	<30 patients	189	45.4%
	>=30patients	227	54.6%
	Total	416	100%
Internet Access in your setting?	Yes	260	62.5%
	NO	156	37.5%
	Total	416	100%
Do have Smart phone?	Yes	248	59.6%
	No	168	40.4%
	Total	416	100%
Ever read PCC guideline?	Yes	144	34.6%
	NO	272	65.4%
	Total	416	100%

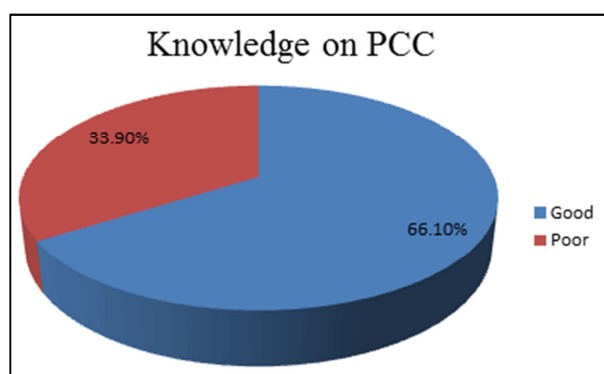## 3.3. Level Knowledge on Preconception Care

This report shows that among all participants, approximately 66.1% had a good knowledge of preconception care. Two hundred and seventy (64.9%) participants knew that all adolescents and persons of childbearing potential are entitled to preconception care. Two hundred sixty-six (63%) knew that PCC should start four weeks before conception. Around 280 (67.3%) of those surveyed had information that women with a BMI <= 18 are at risk of an adverse pregnancy outcome. Three hundred (72%) of the participants agreed that reproductive women should take 0.4 g of folic acid daily. Approximately 258 (62%) had information on recommended preconception laboratory tests such as HIV, HBV and VDRL. Around 290 (69.7%) of the participants agreed that women who had previous C/s should avoid the next pregnancy for at least 18 months. (Table 3).

Table 3. Health care providers Preconception Care (PCC) Knowledge in selected public health institutions In Assosa Zone, 2022.

Variable	Category	N	%
Eligible customers for Pre-Conception Care (PCC) include all adolescents and persons of childbearing potential	Yes	270	64.9
	No	100	24
	I don't know	46	11.1
To be effective, PCC should start four weeks before conception	Yes	266	63.9
	No	115	27.6
	I don't know	35	8.5
Periodontitis is a risk factor for adverse pregnancy outcomes (APO)	Yes	283	68
	No	60	14.4
	I don't know	73	17.6
Women with B I ≤ 18.4 planning pregnancy are at risk of developing APO	Yes	280	67.3
	No	112	27
	I don't know	24	5.7
All women of reproductive age should take 0.4 mg (400 mcg) of folic acid daily.	Yes	300	72
	No	50	12
	I don't know	66	16
The recommended routine pre-conceptual laboratory tests include Hgb, Hct, HIV, HBV, and RPR or VDRL tests	Yes	258	62
	No	52	12.5
	I don't know	106	25.5
Preconception genetic counselling and screening include recommending carrier screening tests for the client with sickle cell hemoglobinopathies	Yes	280	67.3
	No	60	14.4
	I don't know	76	18.3
A clinician providing PCC for clients with diabetes mellitus and chronic hypertension should recommend genetic screening testing	Yes	276	66.3
	No	54	12.3
	I don't know	86	21.4

Variable	Category	N	%
Isotretinions, Valproic acid, and Warfarin are medications poses teratogenicity effects requiring preconception modification	Yes	271	65.1
	No	45	10.8
	I don't know	100	24.1
Women with asthma planning pregnancy should avoid taking Salbutamol one month before and after conception	Yes	301	72.4
	No	53	12.7
	I don't know	62	14.9
The recommended test that guarantees good periconceptional blood sugar control for a woman with pre-gestational diabetes is random blood sugar (RBS) test	Yes	269	64.7
	No	60	14.4
	I don't know	87	20.9
Recommending regular exercise is an important PCC counselling point. Thus, women planning pregnancy should aim 30 minutes of moderate exercise 5 days a week.	Yes	266	63.9
	No	70	16.8
	I don't know	80	19.3
A clinician attending clients with previous caesarean section (C/S) should advise the client to delay the next pregnancy for at least 18 months before the next conception	Yes	290	69.7
	No	55	13.2
	I don't know	71	17.1
Women planning pregnancy should be advised to delay pregnancy until reducing drug, alcohol and tobacco use	Yes	240	57.7
	No	70	16.8
	I don't know	106	25.5

Figure 2. The Status of Public health care provider's Knowledge on Preconception care in Assosa Zone, Benishangul Gumuz Region, Ethiopia 2022.
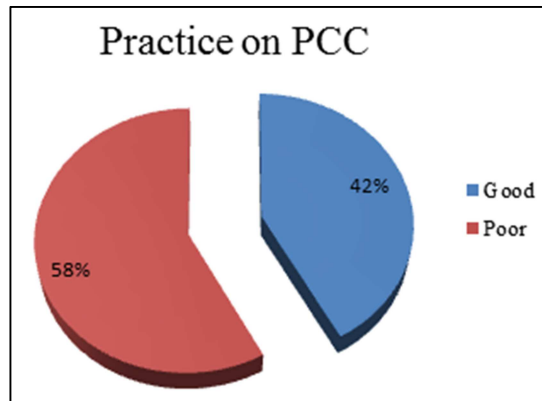
3.4. Level Practice on Preconception Care

Overall, 175 (42%) of respondents were found with Good practice regarding Preconception care in Assosa Zone Public health institutions. Only 176 (42.3%) of health care providers were practiced counseling about family planning. Of the total participants, one hundred seventy four (41.8%) of practiced counseling regarding the benefit of birth spacing, and around 42.5% of the respondents practiced counseling on nutrition. About 175 (42%) of participants were practiced counseling regarding the importance of multivitamin containing folic acid. Of the total respondents, about one hundred seventy nine (43%) of them were assessed past obstetrics and gynecological history. (Table 4).

Table 4. Health care providers practice preconception care counseling and Assessment in selected public Health institutions in Assosa Zone, 2022.

Variable	Category	N	%
Counselling about Family planning methods	Yes	176	42.3
	NO	240	57.7
Counselling about Pregnancy spacing	Yes	174	41.8
	NO	242	58.2
Counselling about Body weight	Yes	170	40.8
	NO	246	59.2
Counselling about Nutrition	Yes	178	42.8
	NO	238	57.2
Counselling about Alcohol tobacco, and psychoactive substance use	Yes	177	42.5
	NO	239	57.5
Counselling about Importance of Multivitamin containing Folic acid	Yes	175	42
	NO	241	58
Importance of maintaining good control of any pre-existing medical conditions before conception	Yes	180	43.2
	NO	236	56.8
Importance of screening for STIs/HIV	Yes	182	43.75
	NO	234	56.25
Dangers of prescribed and non-prescribed medication use	Yes	178	42.79
	NO	238	57.21
The importance of inviting partner for preconception counselling, risk screening, and management	Yes	184	44.2
	NO	232	55.8
Environmental hazard & toxins	Yes	168	40.4
	NO	248	59.6
Assessing Demographic information	Yes	172	41.3
	NO	244	58.7
Assessing Past Obstetric & Gynaecologic history	Yes	179	43

Variable	Category	N	%
	NO	237	57
Assessing Past medical and surgical history	Yes	179	43
	NO	237	57
Assessing Social history particularly lifestyle behaviours	Yes	168	40.4
	NO	248	59.6
Pharmacologic history	Yes	177	42.5
	NO	239	57.5
Assessing Nutritional assessment particularly BMI	NO	246	59.2
	Yes	178	42.8

Figure 3. The Status of Public health care provider's Practice on preconception care in Assosa Zone, Benishangul Gumuz Region, Ethiopia 2022.

3.5. Associated Factors of Knowledge on Preconception Care

Binary logistic regression was done to identify significant factors with the knowledge on pre conceptual care, then those factors with p-value of less than 0.25 during bivariate analysis had been taken to multivariable analysis. The variables significantly associated in bivariate analysis were, Educational level, work Experience, Profession, history of reading PCC guideline, internet access, monthly salary, marital status and having smart phone. The multivariable binary logistic regression analysis showed the following finding. Educational level, Profession, history of reading PCC guideline and work Experience were independently associated with Knowledge on Preconception care. Health care providers who had medical doctorate level of education were found 3.23 times more likely to have Adequate knowledge regarding preconception care as compare to those who had diploma level [AOR (95%CI=3.23 (1.23-6.1)]. besides to that, participants who had BSc degree level of education were found 2 times more likely to have good knowledge than those who had diploma level [AOR (95%CI=2 (1.09-6.3)]. Health care providers who were Midwife by profession were found 3 times more likely to have Adequate knowledge regarding preconception care as compare to those who were pharmacist [AOR (95%CI=3 (1.8-7.65)]. Health care providers who had greater than three years work experience were found 2 times more likely to have good knowledge on preconception care than their counterparts [AOR (95%CI=2 (1.64-6.76)]. Moreover, participants who had ever read PCC guideline were found 3.2 times more likely to have good knowledge on preconception care as compare to their counterparts [AOR (95%CI=3.2 (1.22-6.72)]. (Table 5).

Table 5. Associated factors of Knowledge on Pre conceptual care among Public health care providers in Assosa Zone, Benishangul Gumuz, Ethiopia 2022.

Variable	Category	Knowledge on PCC		COR (95%CI)	AOR (95%CI)
		Good	Poor		
Educational Level	Diploma	86 (34%)	166 (66%)	1	1
	BSc degree	60 (53%)	54 (47%)	2.14 (1.12-5.23)*	2 (1.09-6.3)**
	GP MD	35 (70%)	15 (30%)	4.5 (2.013-8.089)**	3.23 (1.23-6.1)*
	Doctor	12 (67%)	5 (33%)	2.06 (1.09-5.078)*	3.12 (0.89-6.09)
Profession	Nurse	160 (73%)	60 (27%)	2.3 (1.15-4.589)**	2.1 (1.078-4.3)*
	Midwifery	70 (70%)	30 (30%)	2 (1.2-5.17)**	3 (1.8-7.65)*
	Health officer	30 (58%)	22 (42%)	1.17 (0.89-6.78)	2.4 (0.65-8.4)
	Pharmacy	14 (54%)	12 (46%)	1	1
Marital status	Single	160 (72%)	61 (28%)	2.49 (1.34-5.67)*	1.8 (0.49-4.67)
	Married	100 (51.3%)	95 (48.7%)	1	1
Monthly Salary	<4000 birr	7 (20%)	27 (80%)	1	1
	4000-5000 birr	26 (36%)	46 (64%)	2.18 (1.8-9.2)*	2.85 (0.87-9.27)
	>5000 birr	202 (65%)	108 (35%)	7 (3.41-9.12)**	5 (0.68-12.76)
Work Experience	<3years	100 (55%)	82 (45%)	1	1
	>=3years	180 (77%)	54 (23%)	2.7 (1.79-6.89)**	2 (1.64-6.76)**
Internet Access	Yes	180 (69%)	80 (31%)	4 (1.89-8.45)*	3.3 (0.64-6.3)
	No	56 (36%)	100 (64%)	1	1
Ever read PCC guideline	Yes	100 (69%)	44 (31)	4 (1.85-8.76)**	3.2 (1.22-6.72)*
	No	102 (37.5%)	170 (66.5%)	1	1
Having Smart phone	Yes	170 (68.5%)	78 (31.5%)	3.21 (1.43-7.32)*	2.8 (0.45-5.76)
	No	68 (40.5%)	100 (59.5%)	1	1

Note:*=significant at p-value<0.05, **=significant at p<.001 &1=reference

3.6. Associated Factors of Practice on Preconception Care

Binary logistic regression was performed to identify significant factors with knowledge of preconception care, and then those factors with a p-value less than 0.25 during bivariate analysis were carried over into multivariable analysis. The variables significantly associated in the bivariate analysis were educational level, work experience, marital status, and history of reading the PCC guideline, gender, monthly salary, and knowledge. The multivariable binary logistic regression analysis showed the following result. Educational level, knowledge, and history of reading the PCC guideline were independently associated with preconception nursing practice.

Health care providers who had medical doctorate level of education were found 3.1 times more likely to have Adequate practice regarding preconception care as compare to those who had diploma level [AOR (95%CI=3.1 (1.67-

5.89)]. besides to that, participants who had BSc degree level of education were found 2.12 times more likely to have good practice than those who had diploma level [AOR (95%CI=2.12 (1.09-4.89)]. Health care providers who had good knowledge on preconception care were found 3.3 times more likely to have Adequate practice regarding preconception care as compare to those who had poor knowledge [AOR (95%CI=3.3 (1.32-5.6)]. Health care providers who had greater than 5000 birr monthly salary were found 6.7 times more likely to have good practice on preconception care than those who had <4000 birr monthly salary [AOR (95%CI=6.7 (2.8-15.9)]. Moreover, participants who had <=3years work experience were found 2.4 times more likely to have good practice on preconception care as compare to those participants who had <3 years work experience [AOR (95%CI=2.4 (1.03-5.23)]. (Table 6).

Table 6. *Associated factors of Practice on Pre conceptual care among Public health care providers in Assosa Zone, Benishangul Gumuz, Ethiopia 2022.*

Variable	Category	Practice on PCC		COR (95%CI)	AOR (95%CI)
		Good	Poor		
Educational Level	Diploma	72 (28.6%)	180 (71.4%)	1	1
	BSc degree	58 (50.9%)	56 (49.1%)	2.59 (1.8-5.34) **	2.12 (1.09-4.89)*
	GP MD	30 (60%)	20 (40%)	3.75 (2.08-6.78)*	3.1 (1.67-5.89) **
Ever read PCC guideline	Yes	90 (62.5%)	54 (37.5%)	2.87 (1.67-4.56)*	1.8 (0.678-3.07)
	No	100 (36.8%)	172 (63.2%)	1	1
Marital status	Single	161 (72%)	60 (28%)	2.3 (1.65-4.04)*	1.7 (0.6-4.12)
	Married	105 (51.3%)	90 (48.7%)	1	1
Gender	Male	135 (67.55)	65 (32.5%)	2 (1.054-4.13)*	1.4 (0.34-3.2)
	Female	110 (50.9%)	106 (49.1%)	1	1
Monthly Salary	<4000birr	5 (14.7%)	29 (85.3%)	1	1
	4000-5000birr	25 (34.7%)	47 (65.3%)	3.15 (1.23-5.78)*	2.1 (0.69-4.56)
	>5000 birr	100 (54.9%)	82 (45.1%)	7.1 (4.5-12.35) **	6.7 (2.8-15.9) **
Knowledge	Knowledgeable	200 (72.7%)	75 (27.3%)	4.7 (2.2-6.69) **	3.3 (1.32-5.6)*
	Not Knowledgeable	51 (36.2%)	90 (63.8%)	1	1
Work Experience	<3 years	106 (59.6%)	72 (40.4%)	1	1
	>=3years	192 (81.4%)	44 (18.6%)	2.96 (1.079-4.05)*	2.4 (1.03-5.23)*

Note:*=significant at p-value<0.05, **=significant at p<.001 &1=reference

4. Discussion

4.1. Knowledge on Preconception Care Among Public Health Care Providers

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 be approached step-by-step to achieve good pre-conception care. If the essential component of PCC is absent in the following results in inferior or poor PCC, PCC should be administered regularly to all persons of childbearing potential prior to conception.

The result of this study showed the knowledge of the public health providers and the influence of education, work experience, reading of the preconception guideline and the type of profession on the knowledge of preconception care.

According to this study, around 66.1% (95% CI = 60.9% to 70.3%) of the participants had a good knowledge of preconception care, which was higher than the result of the study conducted in Iran [16] that was 36.4%. The difference could be due to the difference in academic year, since knowledge of preconception care is expected to increase year by year as ideas and information are shared from time to time. And it is also higher than the study conducted in South Africa [17] that was 55%. The difference could be due to level of education and work experience, as the previous study was conducted among college students, but the current study was conducted among healthcare providers who had at least six months of work experience and expect to have a good understanding of preconception care, when the level of education and work experience increases. But this study was comparable to a study conducted in Ethiopia [18] that was 69.2%. This study shows that there is a significant association between healthcare providers' knowledge of preconception care and their level of education. Healthcare

providers with a medical PhD are 3.23 times more likely to have an adequate knowledge of preconception care than those who have the Diploma level [AOR (95% CI = 3.23 (1.23-6.1)]. The discrepancy found in this study may lead to educational preparations and institutions in which these professionals work. It was found that healthcare providers who were midwives by profession were three times more likely than pharmacists to have adequate knowledge of preconception care [AOR (95% CI = 3 (1.8-7.65)]. This difference could be due to differences in job description as midwives are more likely to be employed in the MCH clinic than in other professions. It was found that healthcare providers with more than three years of professional experience were twice as likely to have a good knowledge of preconception care as their peers [AOR (95% CI = 2 (1.64-6.76)]. This discrepancy may be due to the fact that as work experience increases, knowledge of healthcare providers will also increase, since as exposure increases, so can be knowledgeable by sharing experiences and attending training sessions to update self-knowledge. And it was supported by the study conducted in Bahir Dar Ethiopia [13]. In addition, it was found that participants who had ever read the PCC guideline were 3.2 times more likely than their peers to have a good knowledge of preconception care [AOR (95% CI = 3.2 (1, 22-6.72)). This is due to the fact that reading Preconception Nursing can increase the knowledge of healthcare providers about preconception nursing. This was consistent with a study conducted in Hawasa Ethiopia [14].

Practice on Preconception care among public health care providers

The results of this study revealed the practice of public health service providers and the impact of educational level, knowledge and history of reading the PCC Guideline on Preconception Nursing Practice.

According to this study, approximately 42% (95% CI = 38% to 48%) of the participants had established preconception care practices, which was supported by a study conducted in Nigeria [19], that was 47.7%. But it is higher than a study conducted in Bahir Dar Ethiopia [13] which was 31.4%. The discrepancy could be due to differences in academic year, as the practice of health care is expected to increase from time to time due to increased training and mentoring related to preconceived knowledge and practice. Healthcare providers with a medical doctorate were 3.1 times more likely to have appropriate practice related to preconception care than those with a graduate degree [AOR (95% CI = 3.1 (1.67-5.89)]. This is due to the fact that doctors take extensive courses over a long period of time and are competent and knowledgeable. Participants with a BSc degree were found to be 2.12 times more likely to have good practices in preconception care compared to those with a diploma. This discrepancy is due to the fact that a BSc degree provides deeper knowledge and more practice compared to a Diploma. This study also showed that healthcare providers who had high proficiency in preconception care were 3.3 times more likely to have appropriate preconception care practice than those who had low proficiency [AOR (95% CI = 3.3 (1.32-

5.6)] Poor PCC practice could be related to a lack of PCC training, including on-the-job and off-the-job training. Healthcare providers' knowledge of PCC will lead to improved PCC practice. Knowledge is required to perform a task correctly. However, ignorant action removes the providers from their goal and makes the result impossible. Respondents earning more than Birr 5,000 a month were 6.7 times more likely to have good practice in preconception care than those earning < Birr 4,000 a month [AOR (95% CI = 6.7 (2:8-15:9)). This is higher as compare to the study conducted in Hawasa Ethiopia [14]. The discrepancy may be due to the increasing disproportionate between income/salary and expenditure since it can reduce motivation to learn and perform good practice.

5. Conclusions and Recommendation

In this study majority health care providers in the study area had good knowledge regarding PCC but they had poor PCC practice. Creating of PCC approach and rules additionally preparing of HCPs and Guidelines are recommended to fortify the integration of the health care system.

Abbreviations

ANC - Ante Natal Care, CDC-Center for disease control and Prevention

EDHS-Ethiopia Demographic and Health Survey, ETB-Ethiopian Birr,

HCPs-Health Care Providers, LBW-Low birth weight

MNCH-Maternal Newborn and Child Health, NGOs-None Governmental Organizations, NTDs-Neural Tube Defects, PCC-Pre conceptual care

SPSS – Statistical Package for Social Science, SRS-Simple Random Sampling

STI-Sexual Transmitted Infections, WHO- World Health organization

PHI-public health institutions

Declarations Appreciate, Ethical Consideration

The study was conducted with full permission and ethical clearance from the Millennium College of Medicine. Written applications to conduct the study were submitted to the Assosa Zone Health Bureau and approval to conduct the study was granted by the participating hospital health center. Written informed consent was obtained from all participants after being informed of the purpose of the study. Information obtained from individuals of a participant was kept secure and confidential. Respondents' names and other identifying data were generated using codes throughout the study process to ensure confidentiality. Finally, data were collected according to the prepared standard questionnaire.

Consent for Publication

Not applicable.

Availability of Data and Materials

The datasets used during the current study available from the corresponding author on reasonable request.

Computing Interest

The authors declare that they have no competing interests.

Authors' Contributions

BT designed the study, performed statistical analysis, and drafted the paper. HD, YD, and NC participated in paper writing. All authors contribute to the data analysis and read and approved the final paper.

Acknowledgements

References

[1]   Dean S V., Lassi ZS, Imam AM, Bhutta ZA. Preconception care: Promoting reproductive planning. Reprod Health. 2014; 11 (Suppl 3): 1–17.

[2]   Okonofua F. African Journal of Reproductive Health. Afr J Reprod Health [Internet]. 2014; 18 (4): 79–85. Available from: https://books.google.co.zw/books?id=reqVBAAAQBAJ

[3]   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 (Suppl 3): 1–9.

[4]   Johnson K, Posner SF, Biermann J, Cordero JF, Atrash HK, Parker CS, 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 (RR-6): 1–23.

[5]   Bigman F. Preconceptions. TLS - Times Lit Suppl. 2013; (5756): 30.

[6]   WHO. Meeting to develop a global consensus on preconception care to reduce maternal and childhood mortality and morbidity. WHO Headquarters, Geneva Meet report Geneva. [Internet]. 2012; 78. Available from: http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Meeting+to+Develop+a+Global+Consensus+on+Preconception+Care+to+Reduce+Maternal+and+Childhood+Mortality+and+Morbidity#0%5Cnhttp://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Meeting+t

[7]   Tanja Tyden. Why is preconception health and care important? Ups J Med Sci. 2016; 121 (4): 3009734.

[8]   World Health Organization. Preconception care: Maximizing the gains for maternal and child health. 2013; 8.

[9]   Lassi ZS, Dean S V., Mallick D, Bhutta ZA. Preconception care: Delivery strategies and packages for care. Reprod Health. 2014; 11 (3): 1–17.

[10] 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 (10): 1–11.

[11] FMOH. Ethiopian Health Sector Transformation Plan. 2015/16 - 2019/20. Fed Democr Repub Ethiop Minist Heal. 2015; 20 (May): 50.

[12] Ojukwu O, Patel D, Stephenson J, Howden B, Shawe J. General practitioners' knowledge, attitudes and views of providing preconception care: a qualitative investigation. Ups J Med Sci [Internet]. 2016; 121 (4): 256–63. Available from: http://dx.doi.org/10.1080/03009734.2016.1215853

[13] Demilew YM, Nigussie AA. Knowledge of health professionals on folic acid use and their prescribing practice in Bahir Dar city administration, northwest Ethiopia: Cross-sectional study. PLoS One. 2017; 12 (1): 1–13.

[14] 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 (1): 903–12.

[15] Munthali M, Chiumia IK, Mandiwa C, Mwale S. Knowledge and perceptions of preconception care among health workers and women of reproductive age in Mzuzu City, Malawi: a cross-sectional study. Reprod Health [Internet]. 2021; 18 (1): 1–10. Available from: https://doi.org/10.1186/s12978-021-01282-w

[16] Sattarzadeh N, Farshbaf-Khalili A, Khari E. Socio-demographic predictors of midwives' knowledge and practice regarding preconception care. Int J Women's Heal Reprod Sci [Internet]. 2017; 5 (3): 212–7. Available from: http://dx.doi.org/10.15296/ijwhr.2017.38

[17] Ukoha WC, Dube M. Primary health care nursing students' knowledge of and attitude towards the provision of preconception care in KwaZulu-Natal. African J Prim Heal Care Fam Med. 2019; 11 (1): 1–8.

[18] Seman WA, Teklu S. Assessment of the Knowledge, Attitude and Practice of Residents At Tikur Anbesa Hospital About Preconceptional Care. Ethiop J Reprod Heal [Internet]. 2019; 11 (1): 19–28. Available from: https://ejrh.org/index.php/ejrh/article/view/232

[19] Tokunbo Oa, Abimbola Ok, Polite Io, Gbemiga Oa. Awareness and perception of preconception care among health workers in Ahmadu Bello University Teaching University, Zaria. Trop J Obstet Gynaecol [Internet]. 2016; 33 (2): 149. Available from: 10.4103/0189-5117.192215