

Research Article

Knowledge of Preconception Care and Associated Factors among Healthcare Providers Working in Public Health Institutions in Awi Zone, North West Ethiopia, 2019: Institutional-Based Cross-Sectional Study

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Background. Preconception care is a set of interventional care for the better maternal and childbirth outcome. Nevertheless, this area still faces implementation problems in most of the developing countries including Ethiopia. **Objective.** To assess the knowledge of preconception care and associated factors among healthcare providers working in public health institutions in Awi zone, North West Ethiopia. **Method.** An institutional-based cross-sectional study was conducted among 660 healthcare providers working in public health institutions in Awi zone, North West Ethiopia. A pretested structured self-administered questionnaire was used to collect the data from individual healthcare providers who were selected randomly using a multistage sampling technique. The data entry and analysis were conducted using SPSS version 25 software. Frequency, proportions, means, and standard deviations were used to describe the data. Candidate variables at bivariate logistic regression with a p value > 0.2 were moved to multivariable logistic regression models, and statistical significance was declared at p value < 0.05 with 95% confidence interval. **Result.** Among the total of 660 healthcare providers, 344 (52%) had good knowledge of preconception care. The odds ratio of having good knowledge of preconception care was high among healthcare providers working at hospitals [AOR = 2.316, 95% CI: 1.900-5.528], using smartphones [AOR = 3.177, 95% CI: 1.945-5.167], presence of preconception care guidelines at health institutions [AOR = 3.166, 95% CI: 1.872-5.299], taking training on preconception care education and counseling [AOR = 3.812, 95% CI: 2.241-6.581], taking training about human immune virus [AOR = 4.911, 95% CI: 3.008-8.123], and attending training on increasing public awareness of preconception health and care [AOR = 2.345, 95% CI: 3.922-5.488] which were independent predictors associated with knowledge of preconception care among healthcare providers. **Conclusion.** Healthcare providers' knowledge of preconception care was low. Study participants working at hospitals, using smartphones, presence of preconception guidelines at health institutions, taking training on preconception education and counseling, taking training about human immune virus testing and management, and increasing public awareness of preconception care affect knowledge of health providers positively. The provision of updated training on preconception and linkage of internet service with health service should be enhanced among healthcare providers.

1. Introduction

According to World Health Organization, preconception care is a way of provision of preventive, curative health

of biomedical, behavioral, and social health interventions to women and couples before conception occurs to improve maternal and child health outcomes, in both the short term and the long term [1]. As reported by WHO,

preconception care has positively affected maternal and child health outcomes and is addressed primarily by health professionals responsible for developing national and local health policies [2].

Improving the knowledge of health professionals is an important strategy to provide the appropriate preconception care for women before pregnancy with good health status and to minimize risks faced during childbirth by evidence-based risk assessment. This is mainly feasible by identifying factors for preconception care to achieve better pregnancy outcomes among women. For example, providing advice regarding exercise, obesity, nutrition, occupational hazards, family support, and financial issues related to pregnancy provides a healthy pregnancy outcome [3]. Maximizing access to psychological and psychiatric therapies, drug and alcohol services, stop smoking services, weight management services, reducing barriers to utilize preconception care, and migrant health-related services such as TB, hepatitis B, and HIV can be managed and mitigated with the support of health professionals [4–8].

Essential health interventions provided once a woman and her partner decide to have a child will be too late in 40% of pregnancies. Up to 35% of pregnancies among women with untreated gonococcal infections result in low-birth weight infants and premature deliveries, and up to 10% result in perinatal death. Maternal undernutrition and iron deficiency anemia increase the risk of maternal death, accounting for at least 20% of maternal mortality worldwide. Female genital mutilation increases the risk of neonatal death from 15% to 55%, mother to child transmission of HIV without intervention between 15% and 45%, and smoking cases 23%-24% of sudden infant death syndrome [6, 7, 9, 10].

Healthcare providers have an obligation and take the leading place to update evidence-based clinical scenarios related to preconception care; doctors, nurses, and midwives need to have an updated knowledge to give PCC [1]. A systematic review study conducted in Europe [11] and cross-sectional studies done in North Dakota (USA) [12], the United Kingdom [13], Egypt [14], and Ethiopia [15] showed that most of the healthcare providers wanted to give preconception care though they did not have enough knowledge for service provision.

Research conducted on the knowledge of preconception care in Ethiopia was limited and has not been done in the study area yet. Therefore, the aim of this study was to find out the knowledge of preconception care and associated factors among healthcare providers in Awi zone, Amhara region, Ethiopia.

2. Methods

2.1. Study Area, Design, and Period. An institutional-based cross-sectional study design was conducted from March 1 to April 30, 2019, in selected public health institutions in Awi zone, Amhara region, Ethiopia. Awi zone is one of the 11 zones in the Amhara region of Ethiopia. It is located about 447 km away from the capital city of Addis Ababa, Ethiopia. Awi zone is structured within nine woredas and three subcities for the administrative issue. There are also four hospitals

and forty-six health centers with a total of 1,339 active health provider staffs.

2.2. Sampling and Population. The source population was all health providers who were found from Awi zone public health institutions. All healthcare providers who were working in the selected public health institutions of Awi zone were considered the study population. All healthcare providers who were available in Awi zone public health institutions during the study period were included, whereas healthcare providers who were physically and mentally ill at the time of data collection were excluded in the study. The sample size was determined by using factors of the knowledge of preconception care considering the following assumptions: 51.7% the proportion of healthcare providers of the previous study in Hawassa City [15] Administration, 80% power of study, p value = 0.001, and adjusted ratio = 1.8. Since the sampling procedure is multistage, the design effect was taken as 1.5 and 10% nonresponse. Based on these, the final sample size of the study was 660. Among the total of nine woredas and three subcities found in Awi zone, only four woredas and one subcity were selected by lottery method of simple random sampling technique. By using population proportional to size, the allocated number of healthcare providers of the selected woredas and subcity was as follows: woreda 1 = 162, woreda 3 = 136, woreda 5 = 109, woreda 7 = 103, and subcity 1 = 150. Therefore, the number of total health providers that participated in the research was selected by systematic random sampling method. The sampling frame was obtained from the zonal health office, and then, the sampling interval (k) was calculated by dividing the number of total health providers in Awi zone to the sample size (n) so that $k = N/n = 2$. Therefore, having selected the first participants by lottery method, the rest were included to the sample by every other health provider until reaching 660.

2.3. Variables

2.3.1. Dependent Variable. Knowledge of healthcare providers on preconception care is the dependent variable.

2.3.2. Independent Variables

- (i) Sociodemographic characteristics
 - (a) Age
 - (b) Gender
 - (c) Religion
 - (d) Income
 - (e) Marital status
 - (f) Educational status
- (ii) Profession
- (iii) Types of PHIs where professionals work
 - (a) Hospital
 - (b) Health center

- (iv) Years of experience
- (v) Access to PCC information and training
- (vi) Availability of guidelines

2.4. Operational Definitions/Term Definitions. *Preconception care:* the provision of biomedical, behavioral, and social health interventions to women and couples before conception occurs

Healthcare provider: the healthcare providers in this study stand for certified obstetrician and gynecologist, general practitioners, internal emergency obstetrical surgeon, nurses, midwives, public health officers, pharmacists, medical laboratories, and anesthetists

Good knowledge of preconception care: the knowledge index was built from the answers to 18 questions on nutrition, family planning, PMTCT, pregnancy spacing, and folic acid supplementation. Based on the answers to these knowledge questions, the index was classified as knowledgeable (score 9–18)

Poor knowledge of preconception care: the knowledge index was built from the answers to 18 questions on nutrition, family planning, PMTCT, pregnancy spacing, and folic acid supplementation. Based on the answers to these knowledge questions, the index was classified as not knowledgeable (score < 9)

2.5. Data Collection Instrument and Procedure. Data was collected by using self-administered structured questionnaires adopted from different published articles and similar studies. The tools were categorized into four parts: sociodemographic factors with 10 items, knowledge-related questions with 18 items that was adapted from a previous study done in Hawassa [15], and actual and potential access to resources with 8 items. The questionnaire was translated into local language, Amharic, by experts and was translated back to English to ensure consistency and accuracy. Data were collected by three Bachelor of Science midwives and two Bachelor of Science nursing graduates. Data collectors and supervisors were trained for two days. A pretest was conducted using 33 of the sample among healthcare providers at Chagni Hospital that had similar characteristics with the study population to assess instrument simplicity, flow, and consistency. To improve the validity and reliability of the instrument, a questionnaire modification was made after the pretest accordingly. The tool was tested for content validity by a panel of experts and was scored with a content validity index (CVI) of 92.4%, and the reliability of the instrument was checked for its internal consistency with Cronbach's α test and demonstrated a score of 0.945 [20].

2.6. Data Analysis and Presentations. The collected data was cleaned, coded, and entered to the EpiData version 3.1, then exported to SPSS version 25. The frequency, proportion, mean, and standard deviation were used to describe the data. The goodness of fit of the models was tested by using the Hosmer-Lemeshow test which was found to be greater than the significance level (p value = 0.05) and was accepted, and the final model was checked by the multicollinearity test by

using the tolerance and variance inflation factor. Bivariate analysis was done for all explanatory variables in relation to knowledge of preconception care, and variables with p value < 0.2 in the bivariate analysis were selected for the multivariate logistic regression model for adjustment of confounding effect between explanatory variables. Adjusted odds ratio with 95% confidence interval was computed, and variables having p value < 0.05 in the multivariable logistic regression model were considered factors for knowledge of preconception care.

2.7. Ethical Issue. Ethical clearance and approval was obtained from the Institutional Review Board of College of Medicine and Health Science, Bahir Dar University. In addition, the official letter of cooperation was granted by the administrative offices of Awi zone. The purpose of the study was explained to the study participants, written informed consent was secured before data collection was started, and confidentiality of the information was ensured by coding. Participation was on a voluntary basis after written consent, and responses were kept confidential. The consent procedure was approved by the ethics committee for all.

3. Result

3.1. Sociodemographic Characteristics of Healthcare Providers. All of the study participants responded to the questionnaires fully. The majority of the respondents (348 (52.7%)) were between the age groups 26 and 30 years. Four hundred forty-one (66.8) of the study participants were male by sex. Regarding religion, the majority of the respondents (609 (92.3%)) were orthodox Christian followers. More than half of the study participants (345 (52.3%)) were single by marital status. Concerning the type of profession, most of the respondents (286 (43.3%)) were nurse healthcare providers, and nearly half of the study participants (317 (48%)) were degree holders by educational status. Three hundred fifty-three (53.3%) of the study participants had less than five years of experience, and 284 (43%) of them earned \geq 5000 ETB (see Table 1).

3.2. Level of Knowledge on Preconception. The respondents' knowledge was measured by using their score on 18 dichotomous questions: awareness of the benefits and the value of folic acid supplementation, adequate interpregnancy spacing, PMTCT, family planning, nutrition, and stabilization of chronic disease before becoming pregnant. The level of healthcare providers' knowledge score ranges from 1 to 17, and the mean score of the respondents was 1.81 with SD = 0.9. There was no healthcare provider who scored zero and 18. The majority of the study participants (344 (52%)) had good knowledge on preconception care whereas the remaining (316 (48%)) had poor knowledge on preconception care. Of the eighteen (18) items measuring knowledge, only 10 healthcare providers scored 17 out of 18 and others scored from 1 to 16 (see Figure 1).

3.3. Factors Associated with Knowledge of Preconception Care among Healthcare Providers. On bivariate analysis, monthly income, years of experience, taking training about HIV/AIDS

TABLE 1: Sociodemographic characteristics of healthcare providers working in public health institutions of Awi zone ($n = 660$), North West Ethiopia, 2019.

Variables	Frequency	Percent
Age		
20-25	211	32
26-30	348	52.7
31-35	52	7.9
>36	49	7.4
Sex		
Male	441	66.8
Female	219	33.2
Religion		
Orthodox	609	92.3
Muslim	23	3.5
Protestant	23	3.5
Catholic	5	0.8
Marital status		
Single	345	52.3
Married	301	45.6
Divorced	13	20
Widowed	1	0.2
Profession		
Obstetrician/gynecologist	2	0.3
General practitioner	34	5.2
IESO	7	1.1
Midwifery	125	8.9
Nurse	286	43.3
Health officer	79	12
Pharmacy	72	10.9
Laboratory	50	7.6
Anesthesia	5	0.8
Educational level		
Diploma	298	45.2
Degree	317	48
Master	9	1.4
Doctorate/MD	34	5.2
Experience		
≤5 years	353	53.5
≥5 years	307	46.5
Monthly salary		
<4000 birr	258	39.1
4000-5000 birr	118	17.9
>5000 birr	284	43

testing and management, using smartphones for downloading clinical procedures, taking training on cessation of alcohol and tobacco use, presence of procedural guidelines at health institutions, age of respondents, taking training on increasing public awareness of preconception health and PCC, taking training on preconception education and

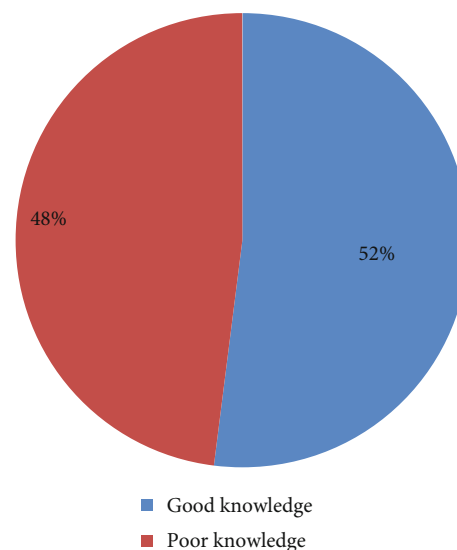


FIGURE 1: The level of healthcare providers' knowledge on preconception care in Awi zone, North West Ethiopia, 2019 ($n = 660$).

counseling, and type of health institution were associated at the cutoff point (p value < 0.20).

On multivariable logistic regression analysis, healthcare providers who were using their smartphones to access clinical resources, presence of procedural guidelines at health institutions, taking training about HIV/AIDS, taking training on preconception education and counseling, and providers' work experience were found to be statistically significant with knowledge of preconception care among health providers. Healthcare providers who were trained on increasing public awareness of preconception health and preconception care were 2 times knowledgeable about preconception care than their counterparts [AOR = 2.345, 95% CI: 3.922-5.489]. Study participants who had preconception guidelines at health institutions were 3 times knowledgeable on preconception care than those who did not have guidelines at their health institutions [AOR = 3.166, 95% CI: 1.872-5.299]. Participants who had taken training on preconception education and counseling and training on HIV/AIDS testing and management were nearly 4 and 5 times knowledgeable than their counterparts, respectively [AOR = 3.812, 95% CI: 2.241-6.581; AOR = 4.911, 95% CI: 3.00-8.123]. Healthcare providers who used smartphones for reading and downloading of clinical procedures were 3 times more knowledgeable than those who did not use their phones for this purpose [AOR = 3.177, 95% CI: 1.945-51.67]. Finally, healthcare providers who were working at public health hospitals were 2 times knowledgeable on preconception care than working at public health centers [AOR = 2.316, 95% CI: 1.900-5.528] (see Table 2).

4. Discussion

Since knowledge has a pivotal role in human reproduction, healthcare providers are seeking to acquire enough information about preconception. The study was aimed at assessing

TABLE 2: Multivariable logistic regression analysis depicting predictors of good PCC knowledge among healthcare providers, Awi zone, North West Ethiopia, 2019.

Variables	Knowledge on PCC		COR (95% CI)	AOR (95% CI)
	Good	Poor		
Age				
20-25	81 (38.4%)	130 (61.6%)	1	1
26-30	184 (52.9%)	164 (47.1%)	1.801 (1.334-2.623)*	1.621 (0.875-2.413)
31-35	39 (75%)	13 (25%)	4.815 (2.413-9.685)*	3.173 (0.563-1.923)
≥36	40 (81.6%)	9 (18.4%)	7.133 (3.306-15.517)*	5.347 (0.773-2.675)
Taking training on cessation of alcohol and tobacco use				
Yes	164 (72.6%)	62 (27.4%)	3.733 (2.614-5.398)*	0.331 (0.659-3.621)
No	180 (41.5%)	254 (58.5%)	1	1
Taking training on PCC education and counseling				
Yes	195 (75.9%)	62 (24.1%)	5.362 (3.801-7.623)*	3.812 (2.241-6.581)**
No	149 (37%)	254 (63%)	1	1
Taking training about HIV/AIDS testing and management				
Yes	219 (80.2%)	54 (19.8%)	8.500 (5.923-12.347)*	4.911 (3.00-8.123)**
No	125 (32.3%)	262 (67.7%)	1	1
Presence of PCC guidelines at health institutions				
Yes	157 (76.6%)	48 (23.4%)	4.688 (3.212-6.865)*	3.166 (1.872-5.299)**
No	187 (41.1%)	268 (58.9%)	1	1
Taking training on increasing public awareness of preconception health and PCC				
Yes	210 (76.1%)	66 (23.9%)	5.936 (4.267-8.419)*	2.345 (3.922-5.489)*
No	134 (34.9%)	250 (65.1%)	1	1
Using smartphones for clinical practice				
Yes	215 (62.3%)	130 (37.7%)	2.385 (1.765-3.371)*	3.177 (1.945-5.167)**
No	129 (41%)	186 (59%)	1	1
Types of public health institutions				
Public health hospital	206 (69.8%)	89 (30.2%)	3.807 (2.733-5.321)*	2.316 (1.900-5.528)**
Public health center	138 (37.8%)	227 (62.2%)	1	1
Years of experience				
<5	151 (42.8%)	202 (57.2%)	1	1
≥5	193 (62.9%)	114 (37.1%)	2.265 (1.721-3.198)*	1.188 (0.323-3.488)

the knowledge of preconception care and associated factors among healthcare providers so as to generate important information and create overall image for conception. The finding of this study revealed that 344 (52%) of healthcare providers have good knowledge on preconception care which was nearly consistent with the finding reported in Iran, a moderate level of preconception knowledge 30-67% [16].

The result of the current study was higher the study done in Ethiopia (Hawassa City (31%)) and Egypt (22%) [14, 15]. The discrepancy was due to the time gaps between the studies done and the difference in the study participants' academic profile which in turn affects knowledge of health providers on preconception care. On the contrary, the finding of this study was lower than that of studies conducted in Ethiopia (Addis Ababa (69.2%)) [17]. A possible explanation could be because the current study was done in remote areas of the country which had difficulty in accessing updated infor-

mation and training for health providers in turn affecting knowledge of preconception care.

In this study, healthcare providers working at public health hospitals were knowledgeable on preconception care [AOR = 2.316, 95% CI: 1.900-5.528] than health providers working at health center which was consistent with a study done in Ethiopia [15]. The reason behind this was the presence of a variety of professional skills; the availability of the number of specialists with different departments and the types of clinical cases attended at public hospitals are very different and by far better than public health centers, which affects positively the knowledge and skills of HCPs working in the hospitals.

The finding of the study revealed that healthcare providers using smartphones for accessing, downloading, and reading clinical resources had a better knowledge on preconception care than healthcare providers who did not use

smartphones [AOR = 3.177, 95% CI: 1.945-5.167]. This finding was in agreement with the studies done in Ethiopia [15, 17, 18]. The utilization of the traditional library available at the health institutions did not enable access to updated scientific evidence for clinical cases as quickly as possible. Therefore, using mobile phones and internet enhances the knowledge of health providers in limited-resource setting areas which in turn contributes knowledge of preconception.

The study demonstrated that healthcare providers that had policy and procedural guidelines available at their working place (health institution) were more knowledgeable on preconception care [AOR = 3.166, 95% CI: 1.872-5.299] than their counterparts which was consistent with a study in Ethiopia [15]. The guidelines provide the updated step-wise activities on clinical case diagnosis and management which might have contributed to the enhanced knowledge of healthcare providers.

Preconception care knowledge has been influenced positively by in-service and preservice training which was supported by this finding, and similarly, a study done in Swaziland showed that healthcare providers taking training on HIV/AIDS testing and management were more knowledgeable than their counterparts. This might be due to the impact of the attention given for the prevention of HIV/AIDS transmission as government agenda implementation enables to improve health providers' knowledge [19].

The result of this study revealed that healthcare providers who were trained about increasing public awareness on preconception care [AOR = 2.345, 95% CI: 3.922-5.489] and preconception education and counseling [AOR = 3.812, 95% CI: 2.241-6.581] were knowledgeable on preconception care than those healthcare providers who did not take training on preconception care. This was in line with the study conducted in North Dakota, USA (p value < 0.0001) [12]. This might be due to the updated information obtained from training which influences positively the knowledge of healthcare providers on preconception care.

5. Conclusion

In conclusion, the finding of this study demonstrated that knowledge of preconception care among healthcare providers was low. It is therefore highly recommended that preconception care among healthcare providers should become a standard of care to have good maternal and fetal outcomes. Having training on preconception counseling and education and on HIV/AIDS testing and management, increasing public awareness on preconception care, working on public health hospitals, using smartphones for downloading and reading resources, and presence of PCC guidelines at health institutions affect knowledge of preconception among health providers. Healthcare providers should emphasize on the importance of using smartphones, taking training on preconception care, and the benefit of HIV testing and management and preconception education and counseling during the provision of preconception care.

Abbreviations

AIDS: Acquired immune deficiency syndrome
 HCPs: Healthcare providers
 HIV: Human immunodeficiency virus
 SPSS: Statistical Package for the Social Sciences.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Additional Points

Limitation of the Study. Since the study was cross-sectional, recall and social desirability bias were anticipated. As far as the researcher searches, the related literature available for the study was not enough for comparison of findings. The generalization of the finding to the general population needs prudence.

Conflicts of Interest

The authors declared that they have no competing interests.

Authors' Contributions

MM was involved in the conception, design, analysis, result, and manuscript writing. NA was involved in analysis, interpretation, and report writing. MM and SA were involved in report writing and manuscript preparation. All authors read and approved the final manuscript.

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