Original Article

Knowledge and Practices of Women Health Developmental Army Leaders in Maternal and New-born Care in Jimma Zone, Ethiopia: A Community- Based Cross-Sectional Study

Lelisa Sena Dadi[1*], Melkamu Berhane[2], Esayas Kebede Gudina[3], Yusuf Ahmed[4], Tasew Berhanu[5], Kim Kyung Hwan[6], Masrie Getnet[1], Zerihun Kura[1], Muluemabet Abera[7]

Abstract

Background: Women Health Developmental Army Leaders (WHDALs) assume the responsibility of coordinating the activities of one to five networks comprising voluntary women. Their primary objective is to facilitate the promotion of disease prevention and control, with a particular focus on maternal and newborn healthcare, within the rural areas of Ethiopia. The purpose of this study was to assess the extent of knowledge and adherence to practices among the WHDALs operating within the Jimma Zone, located in the Southwest region of Ethiopia.

Methods: A community-based cross-sectional study was conducted on randomly selected WHDALs. Descriptive statistics and binary logistic regression were used, respectively, to summarize data and identify significantly associated factors with maternal and newborn health services knowledge and practices of the WHDALs at the P-value ≤ 0.05 cut-off point.

Results: A total of 784 (98.0% response rate) WHDALs participated in this study. Overall knowledge and adequate practices of newborn and maternal health care among the WHDALs were 50.1% and 54.0%, respectively. WHDALs who read/write (ARO = 1.64; 95% CI: 1.18, 2.25), who attended formal education (ARO = 3.25; 95% CI: 1.55, 7.99), and younger WHDALs (< 25 years) had better knowledge of maternal and newborn health care compared to their counterparts. Similarly, possession of radio (AOR = 1.36; 95% CI: 1.01, 1.82) and having adequate knowledge (AOR = 1.66; 95% CI: 1.25, 2.21) were significantly associated with the maternal and newborn healthcare practices of the WHDALs.

Conclusions: The knowledge and practices of the WHDALs were found to be low. Considering radio for health behavioral change communication, recruiting younger and more educated women in the WHDALs can improve their knowledge and practices and better involve them in maternal and newborn healthcare activities. [*Ethiop. J. Health Dev.* 2023; 37(4): 00-00]

Keywords: Jimma Zone, Knowledge, Maternal and new-born health, Practice, Women health developmental army

Introduction

Utilization of optimal maternal health services in Ethiopia is said to be very low due to several factors, including sociocultural, perceived benefits, and accessibility issues (1). Despite the expansion of health institutions, the overall utilization of maternal continuum care remains very low at 21.60%. Factors such as maternal education, distance to health institutions, road access, and satisfaction with service provision have been identified as major factors (2). A recent systematic review reported that the utilization of essential new-born care in Ethiopia was estimated to be 48.77%, with residence, antenatal care (ANC), postnatal care (PNC) attendance, and maternal education being associated factors (3).

There have been relative improvements in the utilization of maternal and new-born health services over the past two decades. From 2005 to 2011, there was notable progress in the utilization of selected services. However, wealth-related inequalities persisted among the poor and the better-off (4). ANC attendance also improved from 2005 to 2016, although the attainment of the minimum recommended four ANC visits remained low (5).

A study conducted based on the Ethiopian Demographic and Health Surveys (EDHS) revealed that the proportion of Ethiopian women receiving PNC increased from 5.6% to 18.5% between 2000 and 2016, with urban women experiencing a higher increase from 15.2% to 47.0% (6). Another study showed that maternal and infant mortality rates remained persistently high from 1990 to 2013, with significant improvements over the period (7). Furthermore, a study reported that only 50% of women attended the minimum recommended four ANC visits, with lack of perceived necessity, distance to health facilities, and lack of transportation cited as influential factors (8).

[1] Epidemiology department, Faculty of Public Health, Jimma University, Ethiopia
[2] Department of Pediatrics and Newborn Health, Jimma University Medical Center, Ethiopia
[3] Department of Internal Medicine, Jimma University Medical Center, Ethiopia
[4] Department of Obstetrics and Gynecology, Jimma University Medical Center, Ethiopia
[5] Jimma Zone Health Office, Jimma, Ethiopia
[6] Institute of Health and Environment, Graduate School of Public Health Seoul National University, Seoul, South Korea
[7] Department of Population and Family Health, Faculty of Public Health, Jimma University, Ethiopia
*** Corresponding author email -lelisajitu@gmail.com; ORCID: 0000-0002-5232-3771**

The relative improvements in maternal and new-born health services have mainly been attributed to the expansion of health services to rural areas where health extension workers (HEWs) and women's Health Developmental Army (WHDA) members have played key roles in providing and facilitating essential maternal and new-born healthcare in the grass-root communities (9). Being a member of the WHDA team has been reported to be associated with a reduction in maternal death, improvements in child immunization, and ANC and skilled delivery utilization (10). The presence of female community health workers is associated with higher utilization of maternal health services (11).

The WHDAs, introduced in Ethiopia in 2011 (9), are networks of voluntary neighbouring women where one women's health developmental army leader (WHDAL) coordinates the activities of her team. The WHDAL is accountable to an overall WHDAL who supervises five to six WHDA teams consisting of 25 to 30 members. The WHDAs are supposed to support the HEWs to increase their efficiency in reaching all households (12). Their main roles include reducing mortality and producing "model" women who adopt healthy behaviour and discipline themselves and their neighbours. The Army is also meant to empower these model women to be more autonomous and active in development-oriented work (13).

However, the intensive involvement of the WHDAs in multiple tasks as community health workers while already overburdened by their poor livelihoods has been criticized for such unpaid work, which exposed them to social, economic, and psychological problems (14). Furthermore, women in the WHDA generally do not exercise political power or attain authority within the health system despite being taken away from their work demands without payment. Nevertheless, some women were empowered and "self-actualized" through their voluntary work and made positive contributions to the health system (15).

WHDA leaders play a vital role in promoting health and providing information to the community. However, their knowledge and practices regarding maternal and new-born healthcare have not been thoroughly investigated in Ethiopia. Considering the Ethiopian context, where most WHDA members are uneducated and of low socio-economic status (16), it is important to clearly outline strategies for effectively utilizing this approach. WHDA leaders should be empowered through comprehensive orientation and training, as well as incentivization and designation within the healthcare system. Simply involving these women intensively in the healthcare system without ensuring they have a proper understanding of the system may be counterproductive. Therefore, it is crucial to assess the competency and overall capacity of these women to engage in maternal and neonatal health in Ethiopia. This study aimed to assess the knowledge and practices of WHDALs and associated factors in rural districts of Jimma Zone, Southwest Ethiopia.

Methods

Study area, Design, and Population: The study was conducted in selected districts of Jimma Zone, Southwest Ethiopia. According to the 2007 population census, the projected population of the zone was estimated to be 3,261,371 (50.1% males and 49.9% females) in 2017. In the zone, there were 1251 Women's Health Developmental Army (WHDA) teams and 6255 one-to-five networks. This community-based cross-sectional survey was conducted in 2017 as part of the maternal, neonatal, and new-born health (MNCH) intervention baseline assessment. WHDALs were interviewed in selected districts of the zone. A detailed description of the study setting has been published (17).

Sample Size Determination and Sampling Procedure:
Epi Info version 7 was used to estimate the sample size based on a population survey using random sampling and considering the total population of the WHDAs in the zone, 50% expected frequency, 95% confidence level, 5% confidence limit, and a design effect of 2. Thus, the final sample size was calculated to be 796, which was rounded to 800. The sample size was allocated to each selected kebele, considering it proportional to the size of WHDALs in the kebeles. Then, a random selection of the study participants was made from lists of the WHDALs within each kebele.

Data Collection Procedure and Tool: Trained data collectors (BSc holders in health) and supervisors (MPH holders) collected the data using an interviewer-administered questionnaire. The questionnaire was adapted from similar literature, mainly the Ethiopian EDHS Maternal Health Section (18), and pretested on 5% of the sample size outside the coverage area of the main study setting. The questionnaire consists of three sections, including socio-demographic characteristics, knowledge, and practice questions.

Data processing and analysis: Data were entered into EpiData version 3.1, checked, and cleaned. Afterward, the data were exported and analysed using SPSS version 25. Both descriptive statistics and bivariate and multivariable models were done. The models' goodness of fit was assessed using the Hosmer-Lemeshow test. All variables with a P value ≤ 0.25 at the bivariate analysis were entered into the multivariable regression model. The adjusted odds ratio (AOR) with its corresponding 95% CI was used to assess the strength of the associations between dependent and independent variables at the p-value ≤ 0.05 cut-off point for statistical significance.

Measurement of Knowledge and Practice
Knowledge was measured on six knowledge questions using cumulative scores of the questions, each with two ("yes or no") possible responses. The scoring system was done based on the respondent's correct or incorrect answers, where "1" or "0" points were assigned, respectively. Then, the knowledge scores were summed up to give a total knowledge score to each respondent. Participants who scored above the mean value for the cumulative score were labeled as having

"adequate knowledge" or otherwise "inadequate knowledge." Following the same procedure, the practice of the WHDALs was also analyzed based on eight practice questions where a score of 1 was assigned for each acceptable practice while 0 was assigned to unacceptable practice; hence, subjects who answered above the mean score were labeled as having good practice or otherwise poor practice.

Ethical Considerations: Ethical clearances were obtained from the Ethical Review Committee of the Institute of Health of Jimma University, Oromia Regional Health Bureau, and Jimma Zonal Health Office. Relevant offices of the study districts were communicated by formal letter for permission. In addition, verbal consent was obtained from every study participant before data collection, and individual information was kept confidential. As a baseline assessment for health intervention, the study would not negatively affect the study participants; rather, it is expected to improve the MNCH of the study community.

Results

A total of 784 (98.0% response rate) women developmental army leaders (WHDALs) participated in this study. Close to half (49.4%) of them were in the age range of 20-34 years, followed by those in the age group of 35-44 years (40.6%), where the average age was 34.0 (± 9.01) years. The majority (90.8%) of them were Muslims and Oromo ethnic (88.1%). Nearly two-thirds (66.3%) of them were unable to read or write. Only a few (4.2%) of them attended formal education. The majority (89.0%) of the respondents were married. Occupationally, more than half (56.5%) and more than one-third (38.4%) of the WHDALs were housewives and farmers, respectively. Only below half (42.9%) of them had a radio at their home, and most of them reported to have used radio regularly (Table 1).

Table 1: **Socio-demographic Characteristics of Women Developmental Army leaders, Jimma Zone, Sept 2017 (n=784)**

Characteristics	Categories	Number (%)
	< 20	9 (1.1)
Age in year	20-34	387 (49.4)
	35-49	318 (40.6)
	≥ 50	70 (8.9)
	Average (±SD)	34.0 (± 9.01)
	Christians	72 (9.2)
Religion	Muslim	712 (90.8)
	Oromo	691(88.1)
Ethnicity	Amhara	32 (4.1)
	Others	61(7.8)
Educational level	Unable to read/write	520 (66.3)
	Read/write	231(29.5)
	Formal education	33 (4.2)
Marital Status	Married	698 (89.0)
	Unmarried*	86 (11.0)
Occupational Status	Housewife	443 (56.5)
	Farmer	301 (38.4)
	Merchant	29 (3.7)
	Other	11 (1.4)
Had radio	Yes	336 (42.9)
	No	448 (57.1)
Listen to radio	Yes	311 (39.7)
	No	25 (3.2)

** Unmarried includes widowed (# 54), divorced (# 23) and separated (# 7).*

WHDALs' knowledge of pregnancy-related danger signs was very low. Only about one-third of them cited severe headaches (34.2%), persistent vomiting (32.2%), and vaginal bleeding (31.4%) as danger signs of pregnancy. The proportion of WHDALs who knew danger signs related to labor and delivery was also low. They cited vaginal bleeding (45.2%), prolonged labor for more than 12 hours (42.7%). They retained placenta (22.3%) as danger signs related to labor and delivery. About half (51.7%) of the WHDALs identified severe vaginal bleeding as a danger sign. In contrast, still smaller proportions of them mentioned high fever (23.0%) and fits (14.0%) as danger signs that can be seen within the first week after delivery. Slightly above half (52.0%) of the WHDALs knew that mothers could die if they showed those danger signs (Table 2).

The majority (97.2%) of the WHDALs knew the need for skilled birth attendants for safe pregnancy and new-borns. The advantages of skilled birth attendants were mentioned to be the prevention of complications (76.0%), better care for the new-born (41.5%), and getting health information (31.9%). About two-thirds (68.0%) of the WHDALs knew the use of family planning, and they included it in their annual plan. The uses of family planning were cited to be the prevention of unwanted pregnancy (13.4%), spacing births (89.8%), limiting the number of new-borns (24.9%), and health benefits (41.4%). Again, about two-thirds

(68.6%) of the WHDALs reported that they know and incorporate vaccination into their annual plan. The listed advantages of vaccination were the prevention of polio (47.9%), diarrhea (40.1%), measles (35.6%), tetanus (33.1%), pneumonia (25.3%), and whooping cough (21.4%). The overall knowledge of the WHDALs in maternal and new-born health care was 50.1% (95% C. I.: 47, 54) (Table 2).

Table 2: **Knowledge of Danger Signs related to Pregnancy and Family Planning among Women Developmental Army leaders, Jimma Zone, September 2017**

Variables	Categories	Number (%)
Danger signs related to pregnancy	Severe headache	268 (34.2)
	Persistent vomiting	254 (32.4)
	Vaginal bleeding	246 (31.4)
	Convulsion	115 (14.7)
	Hypertension	47 (6.0)
	Swollen hands/face	54 (6.9)
	Others	101 (12.9)
Danger signs related to labor and delivery	Vaginal bleeding	356 (45.4)
	Labor for >12hrs	335 (42.7)
	Retained placenta	175 (22.3)
	Hypertension	57 (7.3)
	Others	55 (7.0)
Danger signs that occur within the first week of delivery	Severe vaginal bleeding	405 (51.7)
	High fever	180 (23.0)
	Fit	110 (14.0)
	Hypertension	46 (5.9)
	Swollen hands/face	42 (5.4)
	Offensive vaginal bleeding	41 (5.2)
	Other	51 (6.5)
Pregnant mother can die of danger signs	Yes	408 (77.0)
	No	122 (23.0)
Need for skilled attendant	Yes	762 (97.2)
	No	22 (2.8)
Advantages of skilled attendants	Prevents complications	596 (76.0)
	Care for newborn	325 (41.5)
	Health information	250 (31.9)
Knows FP planning use and incorporate in an annual plan	Yes	533 (68.0)
	No	214 (27.3)
	Sometimes	37 (4.7)
Prevents unwanted pregnancy	Yes	76 (13.4)
	No	491(86.6)
Birth spacing	Yes	509 (89.8)
	No	58 (10.2)
Limiting number of newborns	Yes	141 (24.9)
	No	426 (75.1)
Health benefit	Yes	235 (41.4)
	No	332 (58.6)
Vaccination plan into annual plan & know it is uses	Yes	538 (68.6)
	No	215 (27.4)
	Sometimes	31 (4.0)
Prevent polio	Yes	265 (47.9)
	No	288 (52.1)
Prevent diarrhea	Yes	222 (40.1)
	No	331 (59.9)
Prevent measles	Yes	197 (35.6)
	No	356 (64.4)
Prevent tetanus	Yes	183 (33.1)
	No	370 (66.9)
Prevent pneumonia	Yes	140 (25.3)
	No	413 (74.7)
Prevent whooping cough	Yes	118 (21.4)
	No	43 5(78.6)
Overall knowledge	**Inadequate**	**391 (49.9)**
	Adequate	**393 (50.1)**

Regarding maternal and new-born health services, two-thirds (66.8%) of the WHDALs responded that they identify and report pregnant women to health facilities regularly. More than half (56.4%) of the WHDALs reported that they had monthly meetings. Two-thirds of the WHDALs reported that they had plans with all pregnant mothers (62.6%), had a support system during delivery (67.7%), organized coffee ceremonies at homes (68.5%), incorporated family planning (68.0%), and included vaccination (68.8%) in their annual plan. More than half (53.7%) of them reported having mechanisms for performance monitoring and setting ways forward. Overall, more than half, 54.0% (95% C. I.: 50, 57), of the WHDALs had adequate practices of maternal and new-born health care (Table 3).

Table 3: **Practices of Maternal Health Services among Women's Health Developmental Army leaders, Jimma Zone, September 2017(n=784)**

Variables	Categories	Number (%)
Report pregnant mother to HF	Yes	524 (66.8)
	No	183 (23.3)
	Sometimes	77 (9.8)
Have monthly meeting	Yes	442 (56.4)
	No	164 (20.9)
	Irregularly	178 (22.7)
Plan with all pregnant mothers	Yes	491(62.6)
	No	211(26.9)
	Sometimes	82 (10.5)
Have a support system during maternity	Yes	531 (67.7)
	No	173 (22.1)
	Sometimes	80 (10.2)
Organize a coffee ceremony at home	Yes	537 (68.5)
	No	177 (22.6)
	Sometimes	70 (8.9)
Incorporate family planning in the annual plan	Yes	533 (68.0)
	No	214 (27.3)
	Sometimes	37 (4.7)
Incorporate vaccination plan in the annual plan	Yes	539 (68.8)
	No	215 (27.4)
	Sometimes	30 (3.8)
Means for performance monitoring and setting ways forward	Yes	421(53.7)
	No	288 (36.7)
	Sometimes	75 (9.6)
Overall practice	**Inadequate**	**361 (46.0)**
	Adequate	**423 (54.0)**

Factors such as occupation and marital status of the WHDALs, husband level of education, possession of television, and decision-making patterns at home did not show a significant association with the WHDALs' knowledge of essential maternal and newborn health services. Factors like age and education level of the WHDALs, husband occupational status, and possession of radio within their household have shown significant associations with the maternal and newborn health services knowledge status of the WHDALs.

WHDALs who were in the age range of 25 to 34 (AOR = 0.35; 95% C.I.: 0.18, 0.68) and 35 to 44 (AOR =0.54; 95% C I; 0.33, 0.88) years had less knowledge compared to those below the age of 25 years. Nevertheless, a significant knowledge difference was not seen between WHDALs whose age was 45 years or older compared to those whose age was below 25 years. WHDALs who could read and write (AOR = 1.64; 95% CI: 1.20, 2.25) and those who had formal education (AOR = 3.52; 95% CI: 1.55, 7.99) had better knowledge of maternal and newborn health services compared to those who were illiterate. WHDALs whose husbands were merchants showed less (AOR = 0.26; 95% CI: 0.09, 0.73) knowledge of maternal and newborn health services. Those WHDALs who had a radio in their household had more knowledge (AOR = 1.44; 95% CI: 1.04, 1.99) of maternal and newborn health services compared to those who did not have it (Table 4).

Table 4: **Factors Affecting Knowledge of Maternal Health Care Services among Women Developmental Army Leaders, Jimma Zone, September 2017**

Variables	Categories	Freq. (%)	Knowledge		OR (95% CI)	AOR (95% CI)
			Yes	No		
Respondent Age in years	< 25	78(10.0)	30	48		1
	25-34	320(40.8)	154	166	45(0.25, 0.80)	0.0.5(0.18, 0.68) *
	35-44	266(33.9)	139	127	66(0.43, 1.013	0.0.4(0.33, 0.88) *
	≥ 45	120(15.3)	70	50	78(0.51, 1.21)	0.0.2(0.43,1.19)
Respondent Educational level	Illiterate	520(66.3)	234	286		1
	Read/write	231(29.5)	134	97	69(1.23, 2.31)	1.64(1.18, 2.25) *
	Formal education	33(4.2)	25	8	82(1.69, 8.62)	3.52(1.55, 7.99) *
	Housewife	443(56.5)	215	228		1
Respondent Occupation	Civil servant	304(38.8)	153	151	45(0.22, 0.92)	0.68(0.28,1.68)
	Merchant	37(4.7)	25	12	49(0.24,1.00)	0.85(0.34, 2.13)
Husband Educational status	illiterate	386(55.3)	165	221		1
	Read/write	263(37.7)	147	116	36(0.19, 0.68)	0.82(0.38, 1.77)
	Formal education	49(7.0)	33	16	61(0.32, 0.12)	1.15(0.54, 2.45)
Husband's occupation	Farmer	631(90.4)	293	338		1
	Merchant	37(5.3)	27	10	17(0.07, 0.46)	0.26(0.09, 0.73) *
	Others	30(4.3)	25	5	54(0.16, 1.80)	0.60 (0.17, 2.12)
Has radio	Yes	326(41.6)	183	143	51(1.14, 2.01)	1.44 (1.04,1.99) *
	No	458(58.4)	210	248		1
Has television	Yes	56(7.1)	40	16	66(1.46, 4.83)	1.12 (0.52, 2.41)
	No	728(92.9)	353	375		1

At bivariate analysis, the majority of the variables, such as age, educational status, marital status, possession of television, and occupational status, of both WHDALs and their husbands were not significantly associated with their practices of maternal and new-born health services provision.

Only possession of radio and knowledge of maternal and new-born health services were significantly associated with the practices of WHDALs. Those WHDALs who had radio were more (AOR = 1.36; 95% CI: 1.01, 1.82) likely to provide maternal and new-born health services. Similarly, those WHDALs who knew about maternal and new-born health services were more (AOR = 1.66; 95% CI: 01.25, 2.21) likely to provide the services (Table 5).

Table 5: **Factors Affecting Practices of Women Developmental Army Leaders on Maternal Health Care Services, Jimma Zone, September 2017**

Variables		Freq. (%)	Practice		COR (95%CI)	AOR (95%CI)
			Yes	NO		
Has radio	Yes	326 (41.6)	194	132	1.47 (1.10, 1.96)	1.36(1.01,1.82) *
	No	458 (58.4)	229	229		1
Knowledgeable	Yes	393 (50.1)	238	155	1.71(1.29, 2.27)	1.66(1.25, 2.21) *
	No	391(49.9)	185	206		1

Discussion

This study assessed the knowledge and practice of Women's Health Developmental Army Leaders (WHDALs) in a rural community in Jimma Zone, southwest Ethiopia. WHDALs were asked to mention danger signs during pregnancy and childbirth. Accordingly, the respondent mentioned danger signs like severe headaches and vaginal bleeding in the pregnant woman. A very few also mentioned rare but vital danger signs such as hypertension and convulsions in pregnant women.

About two-thirds of the respondents reported that they identify and report pregnant mothers to the health facility, as well as incorporate vaccination and family planning teaching into their annual plan. The overall knowledge and practices of the WHDALs were 50.1% (95%CI: 47, 54) and 54.0% % (95%CI: 50, 57), respectively. This implies that almost half of the WHDALs have inadequate knowledge and practice of maternal and newborn health care. This finding is similar to the finding of a study done in four regions of Ethiopia, where less than half of the participants mentioned danger signs during pregnancy and childbirth (16).

Similarly, a qualitative study done in rural Pakistan (19) showed that the knowledge level of CHWs was insufficient, and they needed further continuing updates. In contrast, a review study that covered articles published from 1995–2016 reported higher (80%) knowledge of CHWs (20). Another study also shows better knowledge of the CHWs (21). The difference might be due to differences in their definitions and roles, remunerations, training, and socio-economic differences, among others (22). On the other hand, studies (23) indicate that knowledge of community health workers have a positive and significant relationship with the antenatal care use of pregnant women in the community. Another study (24)

also highlighted that moderate knowledge was related to good practices of community health workers.

In this study, factors significantly and positively associated with the knowledge of the WHDALs include younger age, husbands' occupational status (farmers), and possession of radio. Different studies have documented that socio-demographic factors such as age and marital status have a significant influence on the performance of community health workers (24, 25). A study whose findings indicate poor knowledge of non-communicable disease risk factors showed a significant association between the knowledge and education level of CHWs (27). However, the present study has not shown a significant difference in educational status since most of the study participants were illiterate or had low-level education. The fact that young WHDALs exhibited significantly better knowledge might be due to acceptance and a better understanding of the training of essential health services by the young women in contrast to the old ones. This concept has been reported in another study (28): younger health workers showed significantly higher knowledge of COVID-19 than older ones.

The present study shows that the WHDALs had low practices of maternal and new-born care compared to the previous study findings (16). Nevertheless, it is higher than the study findings from Uganda (29). Their low level of knowledge might have resulted in low practices, as those who had adequate knowledge were more likely to practice maternal and new-born healthcare activities compared to those who did not. Such a correlation between the knowledge and practices of community health workers has been reported in other studies (23, 24, 30, 31) as well.

One of the limitations of our study was the potential for social desirability bias in response to practice questions, given the self-reporting nature of data collection. It is also worth noting that our study did not qualitatively assess various aspects of knowledge and performance. To the best of the authors' knowledge, the associations between knowledge/practice and some variables, such as possession of radio and occupational status of husbands, have not been quantitatively assessed on similar subjects. Thus, comparing/contrasting the present findings was not possible. However, since the study was carried out with a relatively adequate sample size and covered the rural part, the findings can be well-informative, and generalizability is ensured in similar settings.

Conclusions

The knowledge and practices of the WHDALs about maternal and newborn health in the study setting were very low. About half of them had adequate knowledge and practice in relation to maternal and newborn health. Slightly more than half of the respondents were able to mention key danger signs during pregnancy and childbirth. Only 35% of WHDALs were able to mention the advantages of vaccinations.

The WHDALs report pregnant mothers to health facilities regularly; about half of them have monthly meetings and have plans with pregnant mothers. Moreover, some of them reported having a support system for the family of a pregnant mother during her stay in the maternity ward, including a coffee ceremony for the delivering mother in the health institutions. Having radio and being young were found to be significant factors that positively affect the maternal and new-born health services of the WHDALs, hence their practices. Therefore, considering radio for behavioural change communication, recruiting younger and more educated women in the WHDALs can contribute to the successful provision of maternal and new-born health care in rural settings.

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