Current Utilization of Long Acting and Permanent Contraceptive Methods among rural and urban residents of Kersa District and Harar Town, Eastern Ethiopia: Evidence from Kersa and Harar Health and Demographic Surveillance Sites.

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Abstract

Background: Ethiopia has one of the highest maternal mortality rates in the world. Evidence indicates that 44% of maternal mortality can be averted by the provision of contraceptives. Regardless of its convenience and effectiveness, Long Acting and Permanent Contraceptives Methods (LAPCM) are the least utilized methods in Ethiopia. Hence, this analysis is aimed at assessing the current utilization of LAPCM among urban and rural residents of Kersa district and Harar Town, Eastern Ethiopia.

Method: The analysis used data from all reproductive age group women residing in Kersa (841) and Harar (339) Health and Demographic Surveillance Sites (HDSS) that are operated by Kersa Demographic Surveillance and Health Research Center, under Haramaya University. Kersa HDSS is distinctly rural while Harar HDSS is distinctly urban. Data were collected by using Kersa Health and Demographic Surveillance System questionnaire. Both bivariate and multivariate analyses were used to identify associated factors.

Results: The prevalence of a long acting and permanent contraceptive methods was found to be 10.6% among rural and 20.1% among urban residents. During the study overall, 157(13.3%) women were using one of these contraceptive methods. The most commonly used method was implants (145 (12.3%)), followed by IUCD (11 (0.9%)). In this study the odds of using the method is 2.8 times higher in urban HDSS residents than their counter part in rural HDSS (AOR=2.77, 95% CI=1.54, 4.96). The women with a family income of 1600 birr and above were 4 times (AOR=4.02, 95% CI=2.34, 6.90) more likely to use LAPCM than those who had an income of less than 549.99 Ethiopian birr.

Conclusions: The study found the prevalence of LAPCM was low. Having a higher income and living in an urban area were significantly associated with its utilization. Ensuring LAPCM service accessibility and availability, focusing on rural settings and on women of low income, would improve its uptake.

Key words: *Long Acting and Permanent Contraceptive Method, Rural and Urban HDSS, East Ethiopia*

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Introduction

Ethiopia is the second most populous nation in Africa. Projections from the 2007 population and housing census estimated its population for 2015 to be 90 million (CSA, 2015) and it is one of the countries with highest total fertility rate (4.8 children per women) in the world (CSA & ICF, 2016). Globally, an estimated 303,000 maternal deaths occurred in 2015, making the approximate global lifetime risk of a maternal death of 1 in 180. Almost all the annual maternal deaths in the world occur in the developing regions (99%), of which sub-Saharan Africa alone accounts for roughly 66% (WHO *et al.*, 2015).

Even if there is progress in the reduction of maternal mortality, Ethiopia remains among the countries with high maternal mortality. According to the 2016 Ethiopian Demographic Health and Surveillance (EDHS) report, the maternal mortality rate in Ethiopia was 412 per 100,000 live births (CSA & ICF, 2016). Besides preventing rapid population growth (Saifuddin *et al.*, 2012), family planning is one of the most effective

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tools for reducing maternal and child mortality. It prevents unwanted pregnancies, which might end up as unsafe abortions that increase the maternal risk of death and ill health (Saifuddin *et al*., 2012; WHO, 2016). In fact, evidence indicates that 44% of maternal mortality can be averted by the provision of contraceptives (Saifuddin *et al*., 2012).

Using a Long Acting and Permanent Contraceptive Method (LAPCM) is relatively more convenient and effective: it is long term, requires fewer visits to health facilities and no daily motivation of the user, and thus saves time, effort and money (USAID, 2007). Cognizant of this importance, the Ethiopian government planned to increase long term utilization to 20% of all family planning in Ethiopia by 2015 (FMoH, 2010). The most recent evidence from Ethiopia shows that despite efforts being made to scale up long-term and permanent contraceptives only one in ten women in Ethiopia are using LAPCM (CSA & ICF, 2016).

Although previous studies were conducted in Ethiopia to assess determinants of LAPCM usage, almost all were conducted in an urban context (Alemayehu *et al*., 2012; Haile and Fantahun, 2012; Mekonnen *et al*., 2014). Hence, evidence regarding factors associated with LAPCM in both rural and urban context is lacking. Therefore, this analysis aimed at assessing the current use of LAPCM among urban and rural residents of Kersa district and Harar town, Eastern Ethiopia.

Materials and Methods

Setting

The analysis used secondary data obtained from Kersa and Harar Health and Demographic Surveillance System (Kersa HDSS and Harar HDSS). The two HDSS are run by Kersa Demographic Surveillance and Health Research Center (KDS-HRC) that is owned by Haramaya University. Kersa HDSS is distinctly rural whereas Harar HDSS is distinctly urban. Both are located in Eastern Ethiopia, and the distance between them is 44 km.

Study Design, and Study Population

A longitudinal community-based follow up of the population was conducted in both Kersa HDSS and Harar HDSS. Kersa HDSS is in the Kersa woreda, which is divided into 14 urban and 24 rural kebeles (the smallest administrative unit in Ethiopia). Harar HDSS is in Harar, the capital city of Harari Regional State, and consists 12 urban and 7 rural kebeles. The baseline census was undertaken in Kersa kebeles in 2007, and in Harar kebeles in 2010; and since then population updates have been completed in both areas twice a year. During each update, demographic and health related events are recorded. By 2015, Kersa HDSS and Harar HDSS had a population of 129,000 and 60,000 respectively.

Database and Data Extraction

The analysis used the data that were collected from the 1st September 2015 to the 28th February 2016 from reproductive age group women residing in both rural and urban surveillance areas. The data were entered into HRS-2 software, which is used to export selected data to other software for further analysis and which is being used by both HDSSs. The data were then extracted and transferred to SPSS Version 20 software package for further analysis.

Data Generation

Data were collected by trained personnel recruited for the surveillance purpose, using questionnaires that were adopted by reviewing EDHS reports (CSA & ORC Macro, 2006). For this analysis, all relevant data of women of reproductive age group residing both in rural HDSS (841) and urban HDSS (339) who were interviewed for family planning questions were extracted to determine whether they were using LAPCM. LAPCM was defined as using any of the following contraceptive: Implants, Intra Uterine Contraceptive Device (IUCD), and Voluntary Surgical Contraception (CSA & ICF, 2016).

Variables

Maternal age, ethnicity, religion, residence, marital status, maternal education, maternal occupation, access to media, number of alive children, monthly average family income, ever use of contraceptive and knowledge regarding contraceptives were used as independent variables. The dependent variable in this study is current use of LAPCM.

Analysis

The data were analyzed using SPSS Version 20 statistical software package. The results are presented via text and tables. Frequencies and summary statistics such as percentage, mean, and standard deviation are used to explain the study population. Chi-square test was used to establish the LAPCM usage difference between rural

and urban women. Moreover, to identify the factors associated with the utilization of LAPCM, both bivariate and multi-variate analyses were performed. The variables with p value ≤ 0.05 in the multivariate analysis were considered as determinants of LAPCM use. Both crude and adjusted odds ratios with 95% confidence intervals were calculated. The Hosmer and Lemeshow goodness-of-fit test was used to assess the assumption of multiple logistic regressions and p value > 0.05 was taken as a good fit.

Ethical Clearance

Ethical clearance was obtained from FDRE, National Ethical Clearance Board with the reference number of 3.10/313/03. Voluntary oral consent was obtained from the participants after informing them about the research objective, outcome, benefit and risk related with the study.

Results

Characteristics of Women

All the1180 respondents (rural DHSS= 841; urban DHSS= 339) were included in the analysis, making the response rate 100%. The mean age of the women was 32.90 years (SD=6.72) in the rural HDSS, and 29.87(SD=5.45) in the urban HDSS. Almost all the rural study subjects were Muslim (817 (97.1%)), married (811 (96.4%)), housewives (799 (95.0%)), and Oromo (819 (97.4%)). More than half of the respondents from urban HDSS were Christian (188 (55.5%)), almost all were married (330 (97.3%)), some were housewives (179 (52.8%)), and a few were Amhara (137 (40.4%)). Whereas most of the urban respondents were literate (288(85.0%)), and owned radio/TV (319 (94.1%)), only 162 (19.3%) and 220 (26.2%) of the rural HDSS study subjects were literate and owned radio/TV respectively. Among the urban HDSS respondents, all had heard about contraceptives, 336 (99.1%) knew where to get contraceptives and 305 (90%) had used contraceptives. Like the urban respondents, almost all the rural participants had heard about contraceptives (827(98.3%)) and knew where to get contraceptives (818 (97.3%)), but, unlike the urban respondents, only 439 (52.2%) of them had ever used contraceptives. Health professionals were the most common sources of information both for the rural 704 (85.1%) and the urban 246 (72.6%) HDSS respondents.

Regarding the current use of contraceptive, 239 (28.4%) of the respondents from rural HDSS and 248 (73.2%) of the respondents from urban HDSS were using contraceptives. The prevalence of LAPCM utilization was 89 (10.6%) among rural HDSS residents and 68 (20.1%) among urban HDSS residents. The overall prevalence of the current LAPCM use was 157 (13.3%) (Table 1).

Long Acting and Permanent Contraceptive Method use by Urban and Rural HDSS

Among the young respondents (<25 years old) in both sites, more urban HDSS young women (21 (30.4%)) than their rural counterparts (5 (4.8%)) used LAPCM. . The difference between the rural and the urban groups by their respective ages was significant (x2= 7.908, P value, 0.0192). Similarly, more Ethnic Oromos in the urban group (17(15.6%)) than Ethnic Oromos in the rural group (80(9.8%)) used LAPCM. The overall difference in utilizing LAPCM with respect to ethnicity among the rural and the urban groups was significant (X^2= 5.028, P=0.0249).

More housewives (147(82.1%)) and employed women (102 (77.9%)) in urban HDSS than the housewives (82(10.3%)) and the employed women (4(22.2%)) in rural HDSS said they had used LAPCM. The overall difference in utilizing LAPCM was significant among different occupations of the women (X^2=9.515 P=0.0086).

More urban women who earned less than 550 Birr a month (7(24.1%)) than the rural counterparts (14(5.3%)) used LAPCM. Similarly, among the women with an average income of 550-949.99 birr a month, the proportion of the urban (21(21.4%)) women who used LAPCM was higher than that of the rural (11(5.3%)) residents. The difference due to income and residence was significant (X^2=14.190, P=0.0027) (Table 2).

Table 1: Socio-demographic and family planning related factors of women included in the analysis with respect to their place of residence, Kersa and Harar HDSS, East Ethiopia, September 2015.

Variable		Kersa No (%) (n=841)	Harar No (%) (n=339)	Total No (%) (N=1180)
Age	<25 years	104(12.4)	69(20.4)	173(14.17)
	25-34.9	429(51.0)	223(65.8)	652(55.3)
	35 and above	308(36.6)	47(13.9)	355(30.1)
Ethnicity	Oromo	819(97.4)	109(32.2)	928(78.6)
	Amhara	22(2.6)	137(40.4)	159(13.5)
	Gurage	0	43(12.7)	43(3.6)
	Other/Harar, Tigrai, Somali	0	50(14.7)	50(4.2)
Religion	Muslim	817(97.1)	151(44.5)	968(82.0)
	Christian	24(2.9)	188(55.5)	212(18.0)
Maternal education	Literate	162(19.3)	288(85.0)	450(38.1)
	Illiterate	679(80.7)	51(15.0)	730(61.9)
Marital status	Married	811(96.4)	330(97.3)	1141(96.7)
	Other/single/Divorced	30(3.6)	9(2.7)	39(3.3)
Maternal occupation	House wife	799(95.0)	179(52.8)	987(82.9)
	Employed	18(2.1)	131(38.6)	149(12.6)
	Other/farmer/jobless, student	24(2.9)	29(8.6)	53(4.5)
Average family monthly income in Ethiopian Birr	<549.99	263(31.3)	29(8.6)	292(24.7)
	550-949.99	209(24.9)	98(28.9)	307(26.0)
	950-1599.99	80(9.5)	201(59.3)	281(23.8)
	1600 and above	289(34.4)	11(3.2)	300(25.4)
Access to media (TV/Radio)	Yes	220(26.2)	319(94.1)	539(45.7)
	No	621(73.81)	20(5.9)	641(54.3)
Numbers of child alive	No child	62(7.4)	31(9.1)	93(7.9)
	One to four children	408(48.5)	209(61.7)	617(52.3)
	Five and above children	371(44.1)	99(29.2)	470(39.2)
Heard about family planning (FP)	Yes	827(98.3)	339(100)	1166(98.8)
	No	14(1.7)	-	14(1.2)
Source of FP information	Health professional	704(85.1)	246(72.6)	950(81.5)
	Media/Family/friend	106(12.8)	47(13.9)	153(13.1)
Know place where to get Contraceptives	Yes	818(97.3)	336(99.1)	1154(97.8)
	No	23(2.7)	3(0.9)	26(2.2)
Contraceptive ever use	Yes	439(52.2)	305(90.0)	744(63.1)
	No	402(47.8)	34(10.0)	436(36.9)
Current use of contraceptives	Yes	239(28.4)	248(73.2)	487(41.3)
	No	602(71.6)	91(26.8)	693(58.7)
Current use of Contraceptive by type (n=487)	Injectable	137(16.3)	85(25.1)	222(18.8)
	OCP	59(7.0)	43(12.7)	102(8.7,)
	Implant	86(10.2)	58(17.1)	145(12.3)
	IUCD	3(0.36)	9(2.7)	11(0.9)
	VSC/Tubal ligation/	0	1(0.3)	1(0.1)
	Other/condom, calendar method	4(0.48)	2(0.6)	6(0.5)
Long acting Family planning utilization/LAPFP	Yes	89(10.6)	68(20.1)	157(13.3)
	No	752(89.4)	271(79.9)	1023(86.7)
Want to conceive in the coming two years	Yes	238(28.3)	164(48.4)	402(34.1)
	No	603(71.7)	175(51.6)	778(65.9)

Table 2: Associations of background characteristics of respondents with utilization of LAPCM by Kersa and Harar DHSS residency, East Ethiopia, September 2015

Variable	USED LAPCM		X^2	p-value
	Urban HDSS No. (%)	Rural HDSS No. (%)		
Age				
<25 years	21(30.4)	5(4.8)	*7.908*	*0.0192**
25-34.9	41(18.4)	54(12.6)		
35 and above	6(12.8)	30(9.7)		
Ethnicity				
Oromo	17(15.6)	80(9.8)	*5.028*	*0.0249**
Other/Amhara, Gurage, Harari, Tigre	51(22.2)	9(40.9)		
Religion				
Muslim	17(11.3)	80(9.8)	1.233	0.2669
Christian	51(27.1)	9(37.5)		
Maternal education				
Literate	63(21.9)	16(9.9)	2.372	0.1235
Illiterate	5(9.8)	73(10.8)		
Maternal occupation				
Housewife	147(82.1)	82(10.3)	*9.515*	*0.0086**
Employed	102(77.9)	4(22.2)		
Other/farmer/jobless, student	7(24.1)	3(12.5)		
Average family monthly income in Ethiopian Birr				
<550	7(24.1)	14(5.3)	*14.190*	*0.0027**
550-949.99	21(21.4)	11(5.3)		
950-1599.99	38(18.9)	4(5.0)		
1600 and above	2(18.2)	60(20.8)		
Access to media (TV/Radio)				
Yes	66(20.7)	23(10.5)	1.629	0.2019
No	2(10.0)	66(10.6)		
Number of child alive				
No child	8(25.8)	9(14.8)	0.128	0.9378
One to four children	39(18.7)	42(10.3)		
Five and above children	21(21.2)	38(10.2)		

*Significant at p-value of ≤ 0.05

Factors Associated with LAPCM Utilization

In the bivariate analysis, education, ownership of radio/TV, residence, and average monthly income in Ethiopian Birr had association with LAPCM use. In multiple logistic regression analysis, residence and average monthly family income were significantly and independently associated with the utilization of LAPCM. The respondents from urban HDSS were 2.8 times (AOR=2.77, 95% CI=1.54, 4.96) more likely to use LAPCM compared to those from rural HDSS. In addition, average family income was association with LAPCM use. Women with family income of 1600 and above are 4 times (AOR=4.02, 95% CI=2.34, 6.90) more likely to use LAPCM methods than those who have an income of less than 549.99 Ethiopian birr (Table 3).

Table 3: Factors associated with LAPCM among reproductive age group women residing in Kersa and Harar HDSS, East Ethiopia, September 2015

Variable	Use of LAPCM		COR(95% CI)	p-value	AOR(95% CI)
	Yes	No			
	Number (%)	Number (%)			
Maternal education					
Literate	79(17.6)	371(82.4)	1.78(1.27, 2.49)	0.001	1.44(0.91, 2.31)
Illiterate	78(10.7)	652(89.3)	1		
Ownership of Radio/TV					
Yes	89(16.5)	450(83.5)	1.67(1.19, 2.34)	0.003	1.29(0.80,2.10)
No	68(20.1)	573(89.4)	1		
Residence					
Kersa HDSS	89(10.6)	752(89.4)	1		
Harar HDSS	68(20.1)	271(79.9)	2.12(1.50, 2.99)	0.001	2.77(1.54,4.96)*
Average monthly Family Income in Eth Birr					
<549.99	21(7.2)	271(92.8)	1		
550-949.99	32(10.4)	275(89.6)	1.50(0.85, 2.67)	0.166	0.97(0.53,1.79)
950-1599.99	42(14.9)	239(85.1)	2.27(1.31, 3.94)	0.004	0.84 (0.44,1.61)
1600 and above	62(20.7)	238(79.3)	3.36(1.99, 5.68)	0.001	4.02(2.34, .90)*

*Significant at p-value of ≤ 0.05

Discussion

In this analysis, the prevalence of LAPCM use was 89 (10.6%) among rural and 68 (20.1%) among urban respondents. Similar findings from Malawi (Palamuleni and Adebowale, 2014) showed a higher rate of LAPCM utilization in urban (22.2%) settings than in rural (19.4%) settings. But this finding is inconsistent with a finding in Tigrai, Ethiopia (Alemayehu *et al.,* 2015), in which more rural women (37.8%) than urban ones (19.9%) used LAPCM. This difference might be due to the presence of extensive health education on LAPCM and its distribution through different non-governmental organizations working in rural part of Tigrai, as reported by the author. In this study more young women in urban DHSS (30.4%) used LAPCM than their counterpart in rural DHSS (4.8%). In addition, more employed women in the urban DHSS (77.9%) than those in rural HDSS (22.2%) used LAPCM. The difference might be due to the fact that the urban respondents were better educated and more receptive to health education, including LAPCM.

The overall prevalence of LAPCM use among the rural and the urban participants was 13.3%. This finding is similar to the one in Mekelle (12.3%) (Alemayehu *et al.*,2012) but higher than reported from southern Ethiopia 7.3% (Mekonnen *et al.*, 2014) and central Ethiopia 3% (Haile and Fantahun, 2012), and this might be due to the relative improvement in the availability and accessibility of LAPCM through health extension workers. However, the overall prevalence of LAPCM use in our study is lower than the ones reported from Nekemte town (20%), Debra Markos town (19.5%), and Shashemenne town (28.4%) (Bulto *et al.*, 2014; Melka *et al.*, 2015; Mota *et al.,* 2015). The urban nature of these towns might have contributed to the higher level of LAPCM uptake, as our study included participants not only from urban but also from rural settings. Moreover, the 13.3% rate in this study is lower than the rates found by similar studies conducted in Zambia (29%) (Mutombo and Bakibinga, 2014) and Iran (27.7%) (Hosseini *et al.*, 2014). The difference might be attributed to the cross-country differences in culture and health service provision.

As in the study done in Nekemte, western Ethiopia (Melka *et al.*, 2015), in this analysis the most commonly used LAPCM was implants (12.3%); hardly any respondents reported IUCD use (0.9%) or tubal ligation (0.1%). The preference of implants can be attributed to its accessibility through health extension workers, as they are only authorized to provide implants out of all LAPCM (FMoH, 2016).

The odds of using LAPCM is 2.8 times higher in urban HDSS respondents than in rural HDSS ones. This finding is consistent with the finding in Nigeria (Olalekan and Olufunmilayu, 2012). This might be due to the fact that women's contraceptive decision making power is lower in the rural area, and this in turn results from the low literacy and the high economic dependence of the women in the area (Bogale *et al.*, 2011).

In addition, the odds of using LAPCM is 4.0 times higher in the households earning 1600 Ethiopian Birr and above monthly compared to those households earning <549.9 Ethiopian Birr monthly. A similar finding is reported in a study conducted in Zambia (Mutombo and Bakibinga, 2014), and another multi-country analysis study (Ugaz *et al.*, 2016). This could be due to those women with higher incomes being more empowered and able to make decision about their health, including contraceptive services. In addition, LAPCM such as IUCD and voluntary surgical contraceptive methods are not available in health posts and clients might need to have transportation to reach health centers and hospitals offering LAPCM services. The limitation of this analysis is that variables that may affect the utilization of LAPCM, such as knowledge of LAPCM (Alemayehu *et al.*, 2012), joint fertility related decisions (Melka *et al.*, 2015), having spousal discussion in the last six months (Bulto *et al.*, 2014) which were included in other studies, were not part of the data available from the existing HDSS database, which were not primarily collected for family planning study purpose. Regardless of this limitation, the finding of this study can provide valid information regarding the determinants of LAPCM utilization in the study area.

Conclusion and Recommendations

In this study the prevalence of long acting and permanent contraceptive methods was low. Having a higher income and living in an urban area were significantly associated with its utilization. Ensuring LAPCM service accessibility and availability, focusing on rural settings and women of low income, would improve its uptake.

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Consent to publish: Not applicable

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Author's contribution

AM made substantial contribution in conception, design, acquisition, analysis and interpretation of data and drafting the manuscript. NA set the health and demographic surveillance system, supervised data quality, led the system and contributed to design, analysis, and interpretation and revised the manuscript critically. AS, HS contributed to the conception, design, acquisition, analysis and interpretation of data and drafting the manuscript. All authors read and approved the final content of the manuscript.

References

Alemayehu, M., Belachew, T., Tilahun, T. 2012. Factors associated with utilization of long acting and permanent contraceptive methods among married women of reproductive age in Mekelle town, Tigray region, north Ethiopia. *BMC pregnancy and childbirth*, 12:6.

Alemayehu, M., Kalayu, A., Desta, A., Gebremichael, H., Hagos, T., Yebyo, H. 2015. Rural women are more likely to use long acting contraceptive in Tigray region, Northern Ethiopia: a comparative community-based cross sectional study. *BMC Women's Health*, 15(71).

Bogale, B., Wondafrash, M., Tilahun, T., Girma, E. 2011. Married women's decision making power on modern contraceptive use in urban and rural southern Ethiopia. BMC Public Health; 11(342).

Bulto, G. A., Zewdie, A., Beyen, T. K. 2014. Demand for long acting and permanent contraceptive methods and associated factors among married women of reproductive age group in Debre Markos Town, North West Ethiopia. *BMC Womens Health*, 14(1):46.

CSA (Central Statistical Agency, Ethiopia). 2015. News release of CSA, 30th Januray 2015. (Available at http://www.csa.gov.et/images/banners/csa2) Accessed 28 April 2016.

CSA [Ethiopia], & ICF. (2016). *Ethiopia Demographic and Health Survey 2016: Key Indicators Report*. Retrieved from Addis Ababa, Ethiopia, and Rockville, Maryland, USA:

CSA (Central Statistical Agency, Ethiopia), and ORC Macro. 2006. Ethiopia Demographic and Health Survey (EDHS) 2005. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ORC Macro.

FMoH (Federal Ministry of Health). 2010. Health Sector Development Program IV, 2010-2014. Addis Ababa; p. 27.

FMoH (Federal Ministry of Health Ethiopia). 2016. Family Planning: Blended Learning Module for the Health Extension Program. Addis Ababa, Ethiopia:. (Available at http://www.moh.gov.et or http://www.open.ac.uk/africa/heat, Accessed on April 20, 2016).

Haile, A., Fantahun, M. 2012. Demand for long acting and permanent contraceptive methods and associated factors among family planning service users, Batu town, Central Ethiopia. *Ethiopian Medical Journal* 2012, 50(1):31-42.

Hosseini, H., Torabi, F., Bagi, B. (2014). emand for long-acting and permanent contraceptive methods among Kurdish women in Mahabad, Iran. *Journal of biosocial science* 2014, 46(6):772-785.

Mekonnen, G., Enquselassie, F., Tesfaye, G., Semahegn, A. 2014. Prevalence and factors affecting use of long acting and permanent contraceptive methods in Jinka town, Southern Ethiopia: a cross sectional study. *The Pan African Medical Journal; 18:98*.

Melka, A. S., Tekelab, T., Wirtu, D. 2015. Determinants of long acting and permanent contraceptive methods utilization among married women of reproductive age groups in western Ethiopia: a cross-sectional study. *The Pan African medical journal*; 21:246.

Mota, K., Reddy, S., Getachew, B. 2015. Unmet need of long-acting and permanent family planning methods among women in the reproductive age group in shashemene town, Oromia region, Ethiopia: a cross sectional study. *BMC Womens Health*; 15:51.

Mutombo, N., Bakibinga, P. 2014. The effect of joint contraceptive decisions on the use of Injectables, Long-Acting and Permanent Methods (ILAPMs) among married female (15-49) contraceptive users in Zambia: a cross-sectional study. *Reproductive health;* 11:51.

Olalekan, A. W., Olufunmilayu, A. A. 2012. Comparative Study of Contraceptive Use among Rural and Urban Women in Osun State, Nigeria. International Journal of Tropical Disease & Health; 2(3):214–24.

Palamuleni, M., Adebowale, A. 2014 Women empowerment and the current use of long acting and permanent contraceptive: Evidence from 2010 Malawi Demographic and Health Survey. *Malawi Medical Journal* September; 26(3): 63-70.

Saifuddin A., Li, Q., and Liu, L. 2012. Maternal deaths averted by contraceptive use: an analysis of 172 countries. *Lancet*; 380(9837):111-125.

WHO, UNICEF, UNFPA. World Bank Group (WBG) and the United Nations Population Division (UNPD). 2015. Trends in Maternal Mortality: 1990 to 2015 (Available at: http://www.who.int/reproductivehealth/publications/monitoring/maternal-mortality-2015/en/ Accessed on May 27,2016)

WHO. 2016. Media Center, Fact Sheets. (Available at: http://www.who.int/mediacentre/factsheets/fs351/en , accessed on May 25, 2016).

Ugaz, J.I, Chatterji, M., Gribble, J.N., Banke K. 2016. Is Household Wealth Associated With Use of Long-Acting Reversible and Permanent Methods of Contraception? A Multi-Country Analysis. *Global health, science and practice*, 4(1):43-54.

USAID (United States Agency for International Development). 2007. Long-Acting and Permanent Methods: Addressing Unmet Need for Family Planning in Africa. Issue Brief Washington, DC: USAID.Google Scholar .