Differentials of modern contraceptive methods use by food security status among married women of reproductive age in Wolaita Zone, South Ethiopia

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Abstract

Background: In spite of the massive spending and extensive family-planning promotion, many poor people in the third world remain reluctant to use modern contraceptive method. Mostly when they use modern contraceptives, their continuation rates are often low. Reproductive health can improve women’s nutrition; in return better nutrition can improve reproductive health. Thus addressing the connection between nutrition and reproductive health is critical to ensure population growth that does not overwhelm world resources.

Methods: A community based cross-sectional study was conducted from March 15 – 30, 2014 in Soddo Zuria Woreda, Southern Ethiopia. A total of 651 currently married women of reproductive age group were selected using multistage sampling. Probability proportional to the size allocation method was employed to determine the number of households. Multivariable logistic regression was used to assess the association between family planning use and food security status after adjusting for other covariates.

Results: Use of modern contraceptive method was significantly low among food insecure women (29.7 %) compared to those who were food secure (52.0 %), (P < 0.001). Women from food secure households were nearly twice likely to use modern contraceptive methods (AOR: 1.69 (CI: 1.03, 2.66)). Similarly, those who had antenatal care (ANC) visit (AOR: 4.56 (CI: 2.45, 7.05)); exposure to media (AOR: 4.92 (CI: 1.84, 13.79)) and those who discussed about contraceptive methods with their partner (AOR: 3.07 (CI: 1.86, 5.22)) were more likely to use modern contraceptive methods. Conversely, women who delivered their last child at home were less likely to use modern contraceptive methods (AOR: 0.08 (CI: 0.03, 0.13)).

Conclusion: Food insecurity is negatively associated with modern contraceptive method use. Thus food insecurity should be considered as one of the barriers in designing family planning services and needs special arrangement.

Keywords: Modern family planning, Currently married women, Food insecurity, Soddo Zuria woreda

Background

At the beginning of twenty-first century, world population was estimated to be almost 6.1 billion. According to the United Nation (UN) projection, the world’s population will reach 11 billion by 2020. This continued world population growth has become an urgent global problem. This growth rate is mostly occurring in developing countries where fertility rate is very high [1].

Despite impressive reductions in child mortality and improvements in life expectancy, women’s reproductive health in developing countries particularly Sub-Saharan Africa lags behind leaving birth rates to remain high. Women in the region have on average 5.1 children [2]. Each year, there are an estimated 80 million unintended pregnancies, and 42 million of these pregnancies end in abortion. The primary reason for abortion is to end an unplanned pregnancy. To reduce the number of unintended pregnancies...
pregnancies and the number of abortions, women must have access to contraceptive information and services. Studies around the world revealed that, in regions where women had given high-quality contraceptive services, the number of abortions would have been decreased [3].

Family planning is a viable solution to control such a fast growing population and its associated consequences. In addition to spacing and limiting the number of children, it improves the maternal and child health: it empowers women and enhances economic development [4]. Family planning is also one of the human rights. In this regard Article 16 of the Teheran Proclamation issued by the United Nations Conference on Human Rights in 1968 states that "...Parents have a basic human right to determine freely and responsibly the number and spacing of their children" [5].

In spite of the massive spending and extensive family planning promotion over three decades, many poor people in the third world remain reluctant to use modern contraception in the early twenty-first century. Attitudes and the need for children among the poor are often quite different from that of family-planning enthusiasts, who are mostly middle class individuals. Mostly when poor people use modern contraceptive methods, their continuation rate of modern contraceptive methods use is often low. Poverty and adverse social conditions including lack of information and access to other methods of birth control, threats of discontinued social benefits, and economic constraints also set the conditions for abuses in family-planning programs [6].

Ethiopia has been deemed a population-climate “hotspot” place where rapid growth and a changing climate pose grave threats to food security and human well-being. One in ten Ethiopians is chronically food insecure, and nearly one in five go hungry in drought years. With almost half of its people under the age of 15 and an average fertility rate of nearly five (4.8) children per woman, Ethiopia's population is the fifth fastest growing in the world [7]. In Ethiopia most of the modern contraceptive methods that are the results of current technologies are available, and around 97.1 % of the communities are aware of those methods. Modern contraceptive methods that are commonly used in the country are injectables (20.8 %), implants (3.4 %), pill (2.1 %), female sterilization (0.5 %), intrauterine device (IUD) (0.3 %), male condom (0.2 %) and other methods are rarely used [9].

A closer look at Ethiopia shows that neither the Malthusians nor the Boserupians quite get it right concerning the relation between population and food supply. The connections between population and food security are extraordinarily complex. The country is characterized by highly troubling Global Hunger Index (29.8 i.e. 80th out of 84 countries) [8] and poor family planning utilization (only 29 % of married women) [9] which leads to rapid population growth that does not match with available resource [10]. Numbers matter, but so do other dynamics, such as migration and age structure. Context is paramount: the right policies are essential to encouraging and reaping the benefits from positive demographic trends, but those policies must be tailored to local circumstances [7].

Women's health is crucial to food security and nutrition. Agriculture and food security programmes should be uniquely positioned to respond to women's productive and reproductive needs. Reproductive health services can improve women's and children's nutrition, and better nutrition can improve reproductive health. Population growth directly challenges food security, particularly in sub-Saharan Africa, and food security and agricultural programmes can be an effective means to deliver reproductive health services, and integrate family planning with sustainable agriculture [11].

Addressing the connection between food security and reproductive health is critical to ensure population growth that does not overwhelm the world’s resources. Program for Appropriate Technology in Health (PATH’s) Integrated Population and Costal Resource Management Project exemplifies a cost-effective intervention which integrated sustainable fishing practices with improved access to family planning, enabled coastal communities with a history of rapid population growth, extensive malnutrition, and overwhelmed municipal fisheries to take control of their reproductive health and natural resources for the sustainability of community life [12].

Nearly everywhere, wealthier women are more likely to use modern contraceptives than poorer women. The disparities in use between rich and poor are most pronounced in countries with low contraceptive use such as in Uganda. In countries such as Honduras, contraceptive use overall may rise, but the poor still lag behind [13].

The influence of food insecurity on the utilization of family planning services is not well-explained directly, with little studies demonstrating the effect of socioeconomic status [14], standard of living [15], asset index [16–18] and income [16, 19] on family planning outcome.

There are also incompatible findings from some studies. A study conducted in Butajira District, South Central Ethiopia identified variables like ecology/residence, household food shortage, and educational status and house hold livelihood as determinants of family planning utilization. The study found that married women who were members of food self deficient households were about 1.58 times more likely to use family planning compared to their counterparts in food self sufficient households though the association turned statistically insignificant when other variables are included [20]. Contrary to expectations, spousal
communication about family planning and geographic accessibility to service facilities were found to be less
critical in determining contraceptive use [16].

Although an overwhelming amount of researches have been
given to food security issues and to reproductive health, scanty attention has been given to the relation-
ship between the two. Indeed, there has been some at-
ttempt to illuminate how women’s reproductive health
status influences household food security, but no enough
work has been done in the reverse direction to explicate
the relationship between the various aspects of food se-
curity and childbearing and family planning utilization.
Similarly, there were no studies on the relationship be-
tween household food insecurity and family planning
utilization particularly in the study area. Thus, this study
is designed to comprehend the relationships between
food security and reproductive health needs.

Methods
Study Area and Setting
A comparative community based cross sectional study
was conducted from March 15–30, 2014 in Soddo Zuria
Woreda, Wolaita Zone Southern Ethiopia 380 km south
of Addis Ababa (The capital of Ethiopia). The study
comprised 15 randomly selected Kebeles from 34 rural
kebeles (smallest administrative unit in Ethiopia) as
there were no urban kebele in the study setting. This
Zone is characterized by small landholdings supporting
high populations’ and high fertility rates [21].

Sampling
A sample of 651 married women of reproductive age
was included in the study. The sample size was deter-
mained using a formula for estimation of two pop-
ulation proportion using Epinfo software with the
assumptions of 95 % confidence level, expected pro-
portion of current use of family planning among food
secure married women (50 %), power (80 %), the ratio
of food secure to food insecure(r = 1), Odds ratio
(OR) = 2, a design effect of 2 for cluster sampling and
a non-response rate of 10 %.

The study subjects were randomly selected from fif-
ten randomly selected kebeles out of the 34 kebeles.
The probability proportional to the size allocation
method was employed to determine the number of
households to be included from each of the kebeles. The
selection of each sampling unit was done by applying
systematic sampling method based on the list of house-
holds with currently married women available in the
database of kebele administration. The data base con-
tains list of households (locally called “Aba Wora”) in
the kebele administration that is regularly updated by
the administrative bodies through health extension
workers of the kebele. The initial household was
randomly selected by lottery method using number be-
tween one and the sampling interval for each kebeles.
Since it was only one woman that was needed per
household, in case where there was more than one
woman in a given household, a lottery method was
employed to identify the women to be interviewed.

Method of data collection
The questionnaire for determinants of modern contra-
ceptive method was adapted from Ethiopia Demographic
Health Survey (EDHS, 2011) English version and further
developed by using peer reviewed published literatures to
include other determinants of family planning method.
Questionnaires constituted information on respondent’s
socio demographic and economic variables, food security
status, reproductive health, and contraceptive information.

To assure the quality of data, the final English version
of the questionnaire was translated by two language experts
into the local language of the respondents (Wolaitegna lan-
guage) and back translated to English in order to keep its
consistency. Pre-test was conducted on 5 % of the sample
to determine the applicability of the question to be asked
on adjacent woreda i.e. Damot Gale Woreda Delbo Kebele
before the actual data collection. Correction and modifica-
tion were done on the instrument after pretest.

Two days training on the objective of the study, data
collection tools and interview techniques were given for
fifteen Clinical Nurses as data collectors and five BSc
nurses as supervisors recruited from health centers. The
interview was conducted in a place where the woman
felt free to express her feelings and ideas. Moreover, in
occasions where the sampled women were not accessed
for absence, up to three attempts were endeavored for
interviewing to lessen the non response rate. The ques-
tionnaires were checked by the supervisors on daily basis
for completeness.

Measurement
Knowledge of modern contraception was measured for
at least one modern contraceptive method i.e. if three of
the knowledge assessing questions were answered cor-
rectly (whether the mother had heard of any modern
contraceptive method, knows the importance of modern
contraceptive method and knows where to get it). Simi-
larly attitude toward modern contraceptive method was
measured using six attitude assessment questions on a
five point Likert scale with score values ranging from 1
(strongly disagree) to 5 (strongly agree) adapted from
EDHS and other peer reviewed literatures. Respondents
that have attitude score greater than the average score
for six attitude assessing score using Likert scale were
considered as having favorable attitude. Exposure to
mass media was measured based on the response of re-
spondents for exposure to at least one media in the last
six months. Discontinuation of modern contraceptive method was a unit variable measured by asking about interruption of any modern contraceptive method (MCM) for at least three months after initiation.

The tool for assessment of food security status was adapted from Food and Nutrition Technical Assistance (FANTA) household food insecurity access scale (HFIAS) developed for use in developing country settings, and it is a tool that asks respondents about three domains of food insecurity: (1) experiencing anxiety and uncertainty about the household food supply; (2) altering quality of the diet; (3) reducing quantity of food consumed [22]. The tool consists of nine questions that ask about changes households made in their diet or food consumption patterns due to limited resources to acquire food in the preceding 30 days.

Based on the responses given to the nine questions and frequency of occurrence over the past 30 days, households were given a score that ranges from 0 to 27. A higher HFIAS score is indicative of poorer access to food and greater household food insecurity. For this analysis, households were classified into two groups based on overall distribution of the HFIAS in the sample. The lower the score, the most food secured a household was. Based on the answer to nine occurrence questions and 27 frequency questions; women who responded no to all occurrence questions and those who responded ‘yes’ to the first occurrence question i.e. “In the past four weeks, did you worry that your household would not have enough food?” and responded only ‘rarely’ to frequency questions were classified as food secured.

Data analysis

The data template format was prepared in Epidata version 3.1 and the data was entered into the software with caution. The completeness of the data were checked. Errors related to inconsistency were verified using data cleansing method. The data were exported to statistical package for social sciences (SPSS) version 20(Illinois Chicago), categorized and sorted to facilitate its analysis.

Descriptive statistics were computed for household food insecurity, socio-demographic characteristics and family planning use. Food-secure and food-secure households were compared with the logistic regression and chi-square test for proportions through different characteristics of respondents. Some of reproductive health related characteristics of respondents; namely Antenatal care (ANC) follow up, place of delivery of the last child and previous history of child death, were also compared between the two groups. Logistic regression, specifically binary was used to identify factors that were associated with family planning utilization to select variables for multiple logistic regressions. Variables with p-value of < 0.25 on binary logistic regression were taken into multivariable logistic regression models to assess the association between independent variables and the outcome variable (modern family planning practice).

Crude and adjusted odds ratios with their corresponding 95 % confidence intervals were computed. A P-value ≤ 0.05 was considered statistically significant in this study. Efforts were made to assess whether the necessary assumptions for the application of multiple logistic regression are fulfilled. In this regard, the Hosmer and Lemeshow’s goodness-of-fit test was done to check the fitness of the model. Interaction between different predictor variables was checked.

Ethical considerations

Ethical clearance was obtained from the Ethical Review Committee of Jimma University College of Public Health and Medical Science and letter of permission was obtained from Wolaita Zone Health Office and Soddo Zuria Woreda health office. Informed oral consent was also obtained from each study subject prior to interview and the purpose of the study explained to the respondents.

Results

A total 651 women were involved in the study giving a response rate of 100 %. Concerning socio-demographic characteristics of the respondents a little over half of the respondents had no education 339(52.1 %).Occupationally more than half of the study subjects 386(59.3 %) were housewives and farmers’ women accounts for 161(24.7 %) of the study subjects. The prevalence of household food insecurity was 60.5 % (Table 1).

Regarding their reproductive health experiences, 15.6 % of food secure mothers and 18.7 % of food insecure mothers reported to have at least one experience of unintended pregnancy and this is relatively lower when compared with national level which is 25 %. Regarding ANC follow up 72.4 % of food secure mothers and 56.7 % of food insecure have ANC visit for their last pregnancy. Nearly three fourth, 73.9 % of mothers reported to have delivered their last child at home, which accounts 65.9 % of food secure mothers and 79.2 % of food insecure. The history of child death was also asked and the respondents reported that 12.4 % of food secure and 16.8 % of food insecure have at least one experience of child death (Table 2).

On behalf of contraceptive characteristics about 38.6 % of women from the study subjects were currently using modern contraceptive method in the study area and it is 52.0 % among women from food secure households and 29.7 % among women from food insecure households. The most common reason for mothers not using modern family planning is a need for more children 28.5 % followed by religious prohibition 20.3 %. About 96.9 % of women from
food secure households and 86.8% of food insecure had knowledge of modern contraceptive method. Information about exposure to mass media shows that 95.6% of women from food secure households and 82.5% of women from food insecure households had history of exposure to at least one media within the last six months (Table 3).

On bivariate analysis some of the respondent’s characteristics show variation between food secure and food insecure households. The proportion of women marrying before 18 years of age is higher for food insecure households, \( p = 0.002 \). On the other hand the proportion of women having unintended pregnancy was insignificantly different among the two groups: 15.6% among food secure and 18.7% among food insecure, \( P = 0.16 \). Majority of women from food secure households (72.4%) had at least one ANC visit compared to women from food insecure households which was 56.7% \( (P < 0.001) \). The proportion of women who have delivered their last child at a health institution was significantly smaller among food insecure households (20.5%) as compared to women from food secure households (34.4%) with \( P < 0.001 \). The proportion of women using modern contraceptive method was significantly different among women from food secure (52.0%) and food insecure (29.7%) households \( (p < 0.001) \) and among ever users of modern contraceptive method discontinuation rate is higher for women from food insecure households (50.5%) compared to food secure households (36.9%) with \( P = 0.003 \) (Table 4).

Concerning the association between modern contraceptive utilization and respondents characteristics, the results from binary logistic regression showed that household food security \( (P < 0.001) \), ANC visit \( (P < 0.001) \), place of delivery \( (P < 0.001) \), knowledge of modern contraceptive method \( (P < 0.001) \), attitude toward modern contraceptive

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**Table 1** Socio-demographic characteristics of respondents by Food Security Status category; Soddo Zuria Woreda, South Ethiopia, March 2014

| Characteristics         | Food secure n(%) | Food insecure n(%) | Total N (%) |
|-------------------------|------------------|-------------------|-------------|
| Age group               |                  |                   |             |
| ≤20                     | 257(41.3)        | 394(68.7)         | 651         |
| 21 – 25                 | 145(45.8)        | 81(23.7)          | 226         |
| 26 – 30                 | 81(32.7)         | 129(50.0)         | 210         |
| 31 – 35                 | 61(23.7)         | 70(27.1)          | 131         |
| 35 – 40                 | 63(25.4)         | 55(22.1)          | 118         |
| ≥40                     | 26(10.1)         | 30(12.5)          | 56          |
| Educational status      |                  |                   |             |
| no education            | 127(49.4)        | 212(54.0)         | 339         |
| Primary                 | 112(43.6)        | 158(40.1)         | 270         |
| Secondary and above     | 18(7.1)          | 24(6.1)           | 42          |
| Occupational status     |                  |                   |             |
| House wife              | 158(61.9)        | 228(57.9)         | 386         |
| Farmer                  | 68(26.5)         | 93(23.6)          | 161         |
| Merchant                | 10(3.9)          | 35(9.1)           | 45          |
| Employed                | 10(3.9)          | 16(4.0)           | 26          |
| Others\(^a\)            | 11(4.1)          | 22(5.6)           | 33          |
| Religion                |                  |                   |             |
| Protestant              | 168(65.4)        | 229(58.1)         | 397         |
| Orthodox                | 74(28.3)         | 116(29.4)         | 190         |
| Catholic                | 12(4.7)          | 40(10.2)          | 52          |
| Others\(^b\)            | 3(1.2)           | 9(2.3)            | 12          |

\(^a\)Daily laborers and others  \(^b\)Muslims and others

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**Table 2** Reproductive characteristics of respondents by Food Security Status category; Soddo Zuria Woreda, South Ethiopia, March 2014

| Characteristics         | Food secure n(%) | Food insecure n(%) | Total n (%) |
|-------------------------|------------------|-------------------|-------------|
| Age at marriage         |                  |                   |             |
| <18                     | 26(10.2)         | 74(19.0)          | 100         |
| ≥18                     | 230(89.8)        | 315(81.0)         | 545         |
| Mean                    | 20.88 ± 3.3      | 19.73 ± 2.9       | 20.19 ± 3.1 |
| Age at delivery         |                  |                   |             |
| <18                     | 7(2.9)           | 25(6.9)           | 32(5.3)     |
| ≥18                     | 237(97.1)        | 335(93.1)         | 257(94.7)   |
| Mean                    | 22.46 ± 3.3      | 21.23 ± 2.9       | 21.73 ± 3.1 |
| Unintended Pregnancy    |                  |                   |             |
| Yes                     | 39(15.6)         | 70(18.7)          | 109         |
| No                      | 211(84.4)        | 304(81.8)         | 515         |
| ANC follow up           |                  |                   |             |
| Yes                     | 181(72.4)        | 212(56.7)         | 393         |
| No                      | 69(27.6)         | 162(43.3)         | 231         |
| Place of delivery       |                  |                   |             |
| Home                    | 164(65.6)        | 294(79.5)         | 458         |
| Institutional           | 86(34.4)         | 76(20.5)          | 162         |
| Child death             |                  |                   |             |
| Yes                     | 31(12.4)         | 63(18.6)          | 94           |
| No                      | 219(87.6)        | 313(81.4)         | 532         |

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method ($P < 0.001$), exposure to media ($P < 0.001$), discussion with partner ($P < 0.001$) and total number of birth ($P < 0.001$) were significantly associated with modern contraceptive method (Table 5).

After adjusting all the other variables in the multivariable logistic regression model household food insecurity, delivery place of the last child, religion of the respondent, media exposure, antenatal care (ANC) follow up and discussion with husband about modern contraceptive methods (MCM) of the respondents were independently associated with modern contraceptive use. Women from food secure households were 1.7 times more likely to use MCM compared to women from food insecure households [adjusted odds ratio (AOR): 1.69, (confidence interval (CI): 1.03, 2.66)]. Mothers who had at least one ANC follow up were nearly five times more likely to use MCM when compared to women who have no any ANC visit [AOR: 4.56, (CI: 2.45, 7.05)]. Concerning place of delivery, the likelihood of using MCM decrease by 92 % for those women who delivered their last child at home compared to institutional delivery, [AOR: 0.08 (CI: 0.03, 0.13)]. Exposure to mass media has also significant effect on MCM utilization. Women who were exposed to at least one media in the last six months were about 5 times more likely to use MCM than those who have no any history of exposure [AOR: 4.92, (CI: 1.84, 13.79)]. Discussion between couples is also positively associated with modern contraceptive method utilization [AOR: 3.07, (CI: 1.86, 5.22)] (Table 6).

### Table 3 Modern contraceptive method related information of respondents by Food Security Status of the respondents; Soddo Zuria Woreda, South Ethiopia, March 2014

| Characteristics          | Food secure ($n$) | Food insecure ($n$) | Total ($n$) |
|--------------------------|-------------------|---------------------|-------------|
| Media Exposure ($n = 633$) | 250               | 383                 | 633         |
| Yes                      | 239 (95.6)        | 316 (82.5)          | 555 (87.7)  |
| No                       | 11 (4.4)          | 67 (17.5)           | 78 (12.3)   |
| Attitude toward MCM ($n = 633$) | 250       | 383                 | 633         |
| Favorable                | 242 (96.8)        | 362 (94.5)          | 604 (94.5)  |
| Unfavorable              | 8 (3.2)           | 21 (5.5)            | 29 (5.5)    |
| MCM use ($n = 632$)      | 252               | 380                 | 632         |
| Yes                      | 131 (52.0)        | 113 (29.7)          | 244 (38.6)  |
| No                       | 121 (48.0)        | 267 (70.3)          | 388 (61.4)  |
| Ever use of MCM ($n = 629$) | 250       | 379                 | 629         |
| Yes                      | 203 (81.2)        | 283 (74.7)          | 486 (77.3)  |
| No                       | 47 (18.8)         | 96 (25.3)           | 143 (22.7)  |
| Discontinuation of MCM ($n = 486$) | 203 | 283                 | 486         |
| Yes                      | 75 (36.9)         | 143 (50.5)          | 218 (44.9)  |
| No                       | 128 (63.1)        | 140 (49.5)          | 268 (55.1)  |
| Knowledge MCM ($n = 651$) | 257               | 394                 | 651         |
| Yes                      | 249 (96.9)        | 342 (86.8)          | 591 (90.8)  |
| No                       | 8 (3.1)           | 52 (13.2)           | 60 (9.2)    |

### Table 4 Respondents reproductive and contraceptive related characteristic by food security status Zuria Woreda, South Ethiopia, March 2014

| Variables                | Food secure ($n$) | Food insecure ($n$) | X²   | P     |
|--------------------------|-------------------|---------------------|------|-------|
| Age at marriage ($n = 645$) | 256               | 389                 |      |       |
| < 18                     | 26(10.2)          | 74(19.0)            | 9.2  | 0.002 |
| ≥ 18                     | 230(89.8)         | 315(81.0)           |      |       |
| Unintended Pregnancy ($n = 624$) | 250       | 374                 |      |       |
| Yes                      | 30(15.6)          | 70(18.7)            | 1.956| 0.162 |
| No                       | 221(84.4)         | 304(81.8)           |      |       |
| ANC* follow up ($n = 624$) | 250               | 374                 |      |       |
| Yes                      | 181(72.4)         | 212(56.7)           | 12.43| ≤0.00001 |
| No                       | 69(27.6)          | 162(43.3)           |      |       |
| Place of delivery ($n = 620$) | 250       | 370                 |      |       |
| Home                     | 164(65.6)         | 294(79.5)           | 14.85| ≤0.00001 |
| Institutional            | 86(34.4)          | 76(20.5)            |      |       |
| History of Child death ($n = 626$) | 250       | 376                 |      |       |
| Yes                      | 31(12.4)          | 63(16.8)            | 2.23 | 0.14  |
| No                       | 219(87.6)         | 313(83.2)           |      |       |
| MCM* use ($n = 632$)     | 252               | 380                 |      |       |
| Yes                      | 131(52.0)         | 113(29.7)           | 31.64| ≤0.00001 |
| No                       | 121(48.0)         | 267(70.3)           |      |       |
| Discontinuation of MCM ($n = 486$) | 203       | 283                 |      |       |
| Yes                      | 75(36.9)          | 143(50.5)           | 8.82 | 0.003 |
| No                       | 128(63.1)         | 140(49.5)           |      |       |
| Discussion MCM ($n = 643$) | 256               | 387                 |      |       |
| Yes                      | 167(65.2)         | 200(51.7)           | 11.555| 0.001 |
| No                       | 89(34.8)          | 187(48.3)           |      |       |
| Knowledge MCM ($n = 651$) | 257               | 394                 |      |       |
| Yes                      | 249(96.9)         | 342(86.8)           | 18.90| ≤0.0001 |
| No                       | 8(3.1)            | 52(13.2)            |      |       |

*ANC = Antenatal care *MCM = Modern contraceptive method
In Ethiopia only three in every ten (29%) of currently married women were using contraceptive method. About 93% of these methods were modern methods i.e. 27% out of 29%. About twenty-five percent of currently married women have an unmet need for family planning [9]. In this study the prevalence of modern contraceptive method use is relatively higher than the national and regional contraceptive prevalence level. It is also relatively higher than the prevalence in rural area of Butajira from previous study done on determinants of low family planning use and high unmet need [20]. Similarly, from our study other maternal health services like ANC and institutional delivery are also higher than the national level.

The result of this study showed that women from food secure households were about 1.7 times more likely to use modern contraception than women from food

| Characteristics | Current users | Non-users | COR (95 % CI) |
|-----------------|--------------|-----------|---------------|
| Household food security (n = 632) | 244 (38.8%) | 388 (61.2%) |          |
| Food secure | 131 (53.7%) | 121 (31.2%) | 2.56 (1.84, 3.56) |
| Food insecure | 113 (46.3%) | 267 (68.8%) | 1.00 |
|ANC follow up (n = 608) | 242 (36.6%) | 366 (63.4%) |          |
| Yes | 199 (82.2%) | 186 (50.8%) | 4.48 (3.04, 6.60) |
| No | 43 (17.8%) | 180 (49.2%) | 1.00 |
| Place of delivery (n = 604) | 241 (39.7%) | 363 (60.3%) |          |
| Home | 115 (47.7%) | 332 (91.5%) | 0.085 (0.05, 0.13) |
| Institutional | 126 (52.3%) | 31 (8.5%) | 1.00 |
| Knowledge of MCM (n = 632) | 244 (38.8%) |          |          |
| Yes | 231 (94.7%) | 349 (89.9%) | 2.10 (1.01, 4.36) |
| No | 13 (5.3%) | 39 (10.1%) | 1.00 |
| Exposure to mass media (n = 628) | 250 (40.0%) | 386 (60.0%) |          |
| Yes | 229 (95.4%) | 326 (84.0%) | 3.959 (2.04, 7.68) |
| No | 11 (4.6%) | 62 (16.0%) | 1.00 |
| Attitude of MCM (n = 628) | 240 (38.8%) |          |          |
| Favorable | 238 (99.2%) | 361 (93.0%) | 8.9 (2.10, 37.78) |
| Unfavorable | 2 (0.8%) | 27 (7.0%) | 1.00 |
| History of Child death (n = 610) | 241 (39.6%) | 369 (60.4%) |          |
| Yes | 29 (12.0%) | 59 (16.0%) | 0.72 (0.45, 1.16) |
| No | 212 (88.0%) | 310 (84.0%) | 1.00 |
| Discussion with their husband on MCM (n = 631) | 243 (38.8%) |          |          |
| Yes | 181 (74.5%) | 174 (44.8%) | 3.59 (2.53, 5.10) |
| No | 62 (25.5%) | 214 (55.2%) | 1.00 |
| Total Number of birth (n = 606) | 241 (36.5%) |          |          |
| 3 and below | 114 (47.3%) | 227 (62.2%) | 1.00 |
| 3 to five | 87 (36.1%) | 90 (24.7%) | 1.659 (1.031, 2.671) |
| above five | 40 (16.6%) | 48 (13.2%) | 0.862 (0.516, 1.44) |

| Variables | Current use of modern contraceptive | Current use of modern contraceptive | Adjusted OR(CI) |
|-----------|-------------------------------------|-------------------------------------|-----------------|
| Yes | 244 (38.8%) | 388 (61.2%) |          |
| Food security status (n = 632) | 131 (53.7%) | 121 (31.2%) | 1.69 (1.03, 2.66) |
| Food secured | 113 (46.3%) | 267 (68.8%) | 1.00 |
| Discussion on MCM (n = 631) | 243 (38.8%) |          |          |
| Yes | 181 (74.5%) | 174 (44.8%) | 3.07 (1.80, 5.20) |
| No | 62 (25.5%) | 214 (55.2%) | 1.00 |
| ANC follow up (n = 608) | 242 (36.6%) | 366 (63.4%) |          |
| Yes | 199 (82.2%) | 186 (50.8%) | 4.56 (2.64, 7.05) |
| No | 43 (17.8%) | 180 (49.2%) | 1.00 |
| Exposure to mass media (n = 628) | 240 (38.8%) |          |          |
| Yes | 229 (95.4%) | 326 (84.0%) | 4.92 (1.84, 13.79) |
| No | 11 (4.6%) | 62 (16.0%) | 1.00 |
| Place of delivery (n = 604) | 241 (39.7%) | 363 (60.3%) |          |
| Home | 115 (47.7%) | 332 (91.5%) | 0.08 (0.03, 0.13) |
| Institutional | 126 (52.3%) | 31 (8.5%) | 1.00 |

*Controlled for age, educational status, occupation, religion, age at marriage, age at delivery, number of currently alive children, knowledge, and source of income

**Discussion**

In Ethiopia only three in every ten (29%) of currently married women were using contraceptive method. About 93% of these methods were modern methods i.e. 27% out of 29%. About twenty-five percent of currently married women have an unmet need for family planning services [9]. In this study the prevalence of modern contraceptive method use is relatively higher than the national and regional contraceptive prevalence level. It is also relatively higher than the prevalence in rural area of Butajira from previous study done on determinants of low family planning use and high unmet need [20]. Similarly, from our study other maternal health services like ANC and institutional delivery are also higher than the national level.

The result of this study showed that women from food secure households were about 1.7 times more likely to use modern contraception than women from food
insecure households. Although there were no studies that show the relation between food insecurity and modern contraceptive use some previous studies show that poorer women were less likely to use modern contraceptive method and women with higher income are more likely to use contraception compared to the poor women [16]. In study done on utilization of family planning services by married Sudanese women of reproductive age; women with a higher socioeconomic status were found to be more likely to use modern methods of family planning than their counterparts [14]. In addition to this when poor people use modern contraceptives, their continuation rates are also often low [6]. Among ever users of modern contraceptive in this study larger number of women from food insecure households, about 50.5 %, had discontinued using modern contraceptive method as compared to women from food secure households which is only 36.9 % had discontinued using modern contraceptive method.

This finding has important implication especially in Ethiopia, which is one of the world’s most food insecure countries with problems along all key dimensions of food security[22] where one in ten Ethiopians is chronically food insecure. With almost half its people under the age of 15 and an average fertility rate of nearly five (4.8) children per woman, Ethiopia’s population is the fifth fastest growing in the world [7]. The combined effect of high prevalence of food insecurity and a youthful population with potential for population momentum poses arguments on the need for devising appropriate intervention strategies to promote use of modern family planning methods especially in food insecure areas to curb the synergistic negative consequences of both problems.

The study also found that women who have discussion with their husband were about 3 times more likely to use modern contraceptive method. Spousal discussion about family planning and contraceptive practice was documented to be crucial for the wider acceptance of contraceptive practice and lessening partners’ fertility intention in developing countries [23, 24]. A study done on awareness and determinants of family planning practice in Jimma, Ethiopia indicated that the percentage of women who used modern contraceptives was higher among those who had discussed family planning with their husbands than among those who had not [25]; in agreement with the study done in Butajira that showed a positive association between couple’s discussion on family planning and contraception [20].

Utilization of other health services like previous attendance of ANC, post natal care (PNC), and delivery at health institution and attendance of immunization services were found to have statistically significant association to the current use of modern contraception.

In this study ANC follow up and institutional delivery were found to be statistically significant. Regarding ANC follow up and modern contraceptive method use the women who have at least one ANC follow up are more likely to use modern contraceptive method compared to those who have no any ANC follow and women who delivered at home were also less likely to use modern contraceptive compared to those that delivered at health institution. It may be that women who deliver at health institutions receive more exposure to family planning information compared to those who deliver at home. Information about public exposure to media were about five times more likely to use modern contraceptive method. In study done in Wolaita Soddo Town south west Ethiopia women who have radio and television were about three times more likely to use contraceptive method as compared to those who have not [26].

The study on family planning knowledge and current use of contraception among the Mru indigenous women in Bangladesh also shows that women who have exposure to mass media were six times more likely to use contraceptive methods [27]. Study done on factors influencing contraceptive use among young women in urban squatter settlements of Karachi, Pakistan stated that women were more likely to use contraceptives when messages of family planning were delivered through media [28].

In Ethiopia national health policy gives a high priority to the democratization and decentralization of the health service systems and one of targets of the Ministry of Health, with respect to improving maternal and child health, is to increase the contraceptive prevalence rate (CPR) to 66 percent by 2015 [29]. This study showed that households’ food insecurity significantly affects modern contraceptive method use and its continuation. Hence any program whether governmental or non-governmental that wants to improve modern contraceptive method use and its continuation should consider food security status of the area while planning for family planning service and should cooperatively work with agricultural offices.

Strong emphasis should be given to active involvement of women in productive activities like Productive Safety Net Program that is being practiced in the country with the aim of enabling the rural poor facing chronic food insecurity to resist shocks, create assets and become food self sufficient. Woreda Health Office should also give emphasis to modern contraceptive use related reproductive health services like ANC and place
of delivery. ANC follow up and institutional deliveries show significant improvement in modern contraceptive method use. Therefore improving the rate of ANC follow up and institutional delivery may highly improve utilization of modern contraceptive method. Awareness creation on the importance of discussing on reproductive health issue for both mothers and their husbands and encouraging women in discussions about modern contraceptive methods with health professional should be encouraged.

Strength and limitation

There were no non respondent from the sample and all of the probably selected individuals were interviewed. The study was comparative in nature and efforts were made to show the difference in different characteristics of the respondents in the two groups. By controlling for confounders as much as possible the difference in MCM utilization among the two groups was assessed. We admit a number of limitations in our study. Although we used standardized tool to assess food security status there may be possibility of some misclassification. Household Food Insecurity Access Scale measures acute food insecurity as it asks food access within the last one month. In addition, our analysis was based on cross-sectional data whereas data capturing seasonal trends are needed to fully understand the relationship between modern contraceptive use and household food insecurity. The cross-sectional nature of the data also limits our ability to draw any causal conclusions i.e. failure to use modern contraceptive that leads to large family size resulting in food insecurity may be the case.

Conclusion

Overall, the study showed that food insecurity is a significant barrier to use of modern contraceptive methods. Not only family planning method use, but also women from food insecure households were less likely to practice other reproductive services like antenatal care and institutional delivery. Food security interventions should integrate appropriate strategies for enhancing use of modern contraceptive methods in food insecure areas.

Abbreviations

EC: Ethiopian calendar; FAO: Food and Agricultural Organization; FP: Family planning; HIV/AIDS: Human immunodeficiency virus/ Acquired immunodeficiency syndrome; IUDs: Intrauterine devices; NGO: Non-Governmental Organization; MFP: Modern family planning; PNC: Post-natal care; SNNP: Southern Nations Nationalities and Peoples Representative; UN: United Nations; WHO: World Health Organization; PATH: Program for appropriate technology in health.

Competing interests

The authors declare that they have no competing interests.

Authors’ contributions

MF conceived and designed the study, performed analysis and interpretation of data and critically reviewed the manuscript. TB and AT assisted with the design conception, analysis, interpretation of data and draft the manuscript and critically reviewed the article. YA assisted in analysis, interpretation and in drafting and reviewing of the manuscript. All authors read and approved the final manuscript.

Acknowledgements

We would like to thank Jimma University, College of Public Health & Medical Sciences for funding this research. We extend our deepest gratitude to supervisors, data collectors and respondents who participated on this study. We would also like to thank Soddo Zuria Woreda administration office. Finally our gratitude also goes to Mr. Halleslasie Beyene, from Jimma University, an English language expert who reviewed the article for language edition.

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Received: 8 December 2014 Accepted: 10 August 2015

Published online: 28 September 2015

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