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Desire for birth spacing or limiting and non-use of long acting and permanent contraceptive methods among married women of reproductive age in Aksum Town, North Ethiopia

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Abstract

Background: Long acting and permanent contraceptive methods are the most effective family planning (FP) methods to prevent pregnancy and thereby averting adverse consequences of too many and ill-timed pregnancies. However, long acting and permanent contraceptive methods (LAPMs) are underutilized in Ethiopia for little documented reasons. Therefore, this study is aimed to assess magnitude and factors associated with desire for birth spacing for at least 2 years or limiting child bearing and non-use of LAPMs among married women of reproductive age in Aksum town, Northern Ethiopia.

Methods: A community-based cross-sectional study was conducted in Aksum town, North Ethiopia from May to June, 2015 among 779 randomly selected married women of reproductive age. Data were collected using interviewer administered pre-tested questionnaire. Data were entered using Epi-Info version 6.04 and exported to SPSS version 16 for analysis. Multivariate logistic regression models were fitted to identify factors associated with desire for birth spacing or limiting and not using LAPMs.

Results: The total desire for birth spacing or limiting was 69 % and amongst those women 85.2 % were not using LAPM. Education, occupation, husband's attitude towards LAPMs, age, number of pregnancy, regular media exposure and decider on the number of children to bear were significantly associated with desire for birth spacing or limiting. Moreover; education, occupation, husband's attitude towards LAPMs, discussion on family planning with husband, knowledge, attitude and intention to use LAPMs were significantly associated with not using LAPMs.

Conclusion: Desire for birth spacing or limiting and not using LAPMs is very high in the study area. Therefore, increasing access to family planning information and services with special emphasis on LAPMs and male involvement in the program are very important.

Keywords: Desire for birth spacing or limiting, Non-use of LAPMs, Aksum, Ethiopia

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Background

Long-acting and permanent methods of contraception (LAPMs) are modern family planning (FP) methods that prevent pregnancy for three or more years per application. LAPMs include intrauterine contraceptive devices (IUCDs), implants, female sterilization, and male sterilization [1]. LAPMs are safe, cost effective, convenient for users and 3–60 times more effective in preventing pregnancy than short acting methods (pills, injectable hormones and condoms) during a year of typical use [2, 3]. Effective contraceptive could prevent as many as one in every three maternal deaths by allowing women to delay motherhood, space births, avoid unintended pregnancies and abortions, and stop childbearing when they have reached their desired family size [4].

In the developing region, 57 % of the 1.6 billion women of reproductive age desire to space births for at least 2 years or to limit childbearing at all [5]. Satisfying this total demand for contraception could prevent 52 million unintended pregnancies per year which would result in 500,000 fewer new born deaths and 70,000 fewer maternal deaths each year from the current status. However, about 26 % the total women who desire to space or limit births in developing region and 58 % in sub-Saharan Africa lack access to the modern methods of contraception [5, 6]. Even among the users of modern contraception methods, short acting methods of contraception, the less effective methods, are widely used (27 %) [2, 3, 5, 7, 8]. Furthermore, about 20–30 % of women who use short acting methods of contraception stop within 2 years of starting due to health concerns. Many of these women could benefit from switching to LAPMs [9].

In the case of Ethiopia, nearly 75 % of married women of reproductive age desire to space births for at least two years or to limit childbearing at all but not more than 5 % are using LAPMs [10]. Moreover, Ethiopia continues to be one of the most populous countries in the world with a total population of 87.1 million and total fertility rate of 4.8 children per reproductive age group women [11]. According to Ethiopian Demographic and Health Survey (EDHS) report, Ethiopia is one of the Sub-Saharan Africa countries with the highest maternal mortality (676 per 100,000 live births) and neonatal mortality (37 per 1,000 live births) rates [10].

Therefore, to solve the aforementioned health problems in particular and to achieve the development goals in general, it is crucial to promote desire to space or limit births and let all women who desire to space or limit births access to LAPMs. Different factors may contribute to low desire for birth spacing or limiting and high non-use of LAPMs. As indicated by some studies conducted elsewhere; socio-demographic characteristics, reproductive health characteristics, knowledge,

attitude, myths and misconceptions may affect desire for birth spacing or limiting and contribute to non-use of LAPMs [12–29].

Given the prevailing low utilization of LAPMs in Ethiopia, analysis of desire for birth spacing or limiting and non-use of LAPMs and a critical assessment of the underlying factors are very important. This information would have an important role in designing effective programs to heighten desire for birth spacing or limiting and reduce the prevailing high non-use of LAPMs. However, little has been documented so far in Ethiopia with regard to the aforementioned issues. Thus, this study is aimed to assess the magnitude and factors associated with desire for birth spacing for at least 2 years or limiting child bearing and non-use of LAPMs among married women of reproductive age in Aksum town, Northern Ethiopia.

Methods

Study design and setting

This community based cross sectional study was conducted from May to June, 2015 among married women of reproductive age (15–49 years) in Aksum town. Aksum town is located in the northern part of Ethiopia between 14, 1297 (147°46.920"N) latitude and 38, 7158 (3842'56.880"E) longitude at a distance of 1010 km away from Addis Ababa. According to the 2007 report of Central Statistical Agency of Ethiopia, the total population of Aksum town is 60,766, with 30,991 (51.0 %) females and 29,775 (49.0 %) males. Administratively the town is divided in to four Kebeles (small local administrative units) [30].

Sample size and sampling procedure

The sample size was determined using a single population proportion formula assuming; 95 % level of confidence, proportion of women who desire to space or limit births of 50 %, a design effect of 2 and non-response rate of 5 %. This gave a final sample size of 806 married women of reproductive age. A two-stage sampling approach was used; where first 2 kebeles were selected randomly from the total 4 kebeles of Aksum town. In the selected kebeles, census was done to identify households where married women of reproductive age live. Then, the total sample size was allocated to each of the randomly selected kebeles based on probability proportional to size allocation. Secondly, using the sampling frame from the census of each respective kebele, 806 women who fulfilled the inclusion criteria were selected by simple random sampling technique. In case of absence of the eligible woman in the selected household, repeated attempts were made to get the woman. If the respondent could not be interviewed after 3 attempts, the woman was considered as non-

respondent. When two or more married women were in a selected household, only one of them was considered by lottery method to participate in the study, to avoid intra-class correlation. Eventually, a total of 779 women were participated in this study.

Measurement

Data were collected using interviewer administered structured questionnaire adapted from different literatures [10, 12–14, 19, 31]. The questionnaire was translated and contextualized to the local situation. The contents of the questionnaire included: socio-demographic factors, sexual and reproductive characteristics, knowledge, attitude and practice of family planning methods. Prior to data collection, the questionnaire was pre-tested on 5 % of the sample on similar population in one of the non-study kebeles. Based on the results of pretest, the time required for interviewing each participant was estimated and the skip pattern of some of the questions was corrected. The reliability of the items on attitude scale of the questionnaire was also tested using Cronbach's alpha after pre-test and a value superior or equal to 0.7 was considered as reliable. The Cronbach's alpha coefficient of attitude items was 0.75.

The data were collected by eight female diploma nurses and the data collection was entirely supervised by two BSc Nurses. Furthermore, the data collection process was closely monitored by the principal investigators. Both data collectors and supervisors were trained for 2 days on the objectives of the study, sampling technique, data collection tool and techniques of collecting data to maintain precaution throughout the study. To reduce non-response or reporting biases, interviews were conducted either in private rooms or places where other people could not overhear. Daily meetings were also held between the principal investigators and enumerators to troubleshoot problems that arose in the data collection process. In addition, inspection for completeness and quality of data collection was carried out daily by the supervisors and feedback was provided to data collectors.

Married women's knowledge on LAPMs was assessed by asking 12 questions with 'yes/no' answers adapted from different literatures [10, 19, 31]. For each knowledge question a score of 1 was given to correct and 0 to incorrect responses. The final score was computed by summing all correct answers. Finally, to evaluate knowledge of the married women, it was categorized as "high" - for those who knew 70 % and above, "moderate" - for those who knew 40 - 69 % and "low"- for those who knew less than 40 % of the total knowledge questions [31].

Married women's attitude towards LAPMs was assessed using 10 items rated on a five-point Likert scale

adapted from different literatures [19, 31]. Attitude score was computed using the above 10 items whose theoretical value ranges from 10 to 50. This scoring was subsequently reversed for negatively stated statements. Finally, respondents who scored above the median attitude score of the sampled population, which is 31, were labeled as having a positive attitude whereas respondents with an attitude score of less than or equals to the median score were labeled as having a negative attitude [31].

Data processing and analysis

Data were entered and cleaned using Epi- Info version 6.04, and transferred to SPSS 16 statistical software package for analysis. Descriptive analysis was used to describe the data. The dependent variables were desire for birth spacing or limiting, and LAPMs use. Desire for birth spacing or limiting was coded as 0 for women who have no desire for birth spacing or limiting and 1 for those who have desire for birth spacing or limiting. LAPMs use was coded as 0 for women who have desire for birth spacing or limiting and using LAPMs and 1 for those who have desire for birth spacing or limiting but not using LAPMs. Bivariate analysis was used to see the unadjusted effect of each factor on each of the dependent variables of the study. The independent variables with a $p \leq 0.05$ in the bivariate analyses with each of the dependent variables were fitted in to a multivariate logistic regression model to identify their independent effect on desire for birth spacing or limiting, and not using LAPMs among women who desire to space or limiting birth. Odds ratio with 95 % confidence interval were calculated both to assess the association and measure the strength of the association between the explanatory and outcome variables.

Results

Socio-demographic characteristics of respondents

Out of the total 806 sampled married women, 779 women were included in the study with response rate of 96.7 %. The mean (\pm SD) age of the respondents was 30.01 (\pm 7.29) years. Majority of the respondents were Orthodox (91.2 %) in religion, house wives (63.2 %) in occupation and at least primary school (77.7 %) in education. The median monthly family income was 1000.0 ETB with a range of 250.0–5000.0 ETB (Table 1).

Reproductive characteristics of respondents

Out of the total respondents, 716 (91.9 %) had ever been pregnant. The median number of living children was 2 with 0 and 10 minimum and maximum alive children, respectively. More than two third, 539 (69.2 %) didn't desire to have a child within the next 2 years. Pertaining to the fertility related decision making, 592 (76.0 %) reported joint decision making by both husband and wife

Table 1 Socio-demographic characteristics of married women of reproductive age in Aksum town, North Ethiopia, 2015, (N = 779)

| Characteristics | Number | Percent |
|-------------------------------------|--------|---------|
| Age | | |
| 15-24 | 198 | 25.4 |
| 25-34 | 334 | 42.9 |
| 35-44 | 215 | 27.6 |
| ≥ 45 | 32 | 4.1 |
| Religion | | |
| Orthodox | 711 | 91.2 |
| Muslim | 66 | 8.5 |
| Others ^a | 2 | 0.3 |
| Educational status | | |
| No formal education | 174 | 22.3 |
| Primary | 280 | 36.0 |
| Secondary | 229 | 29.4 |
| Above secondary | 96 | 12.3 |
| Occupation | | |
| House wife | 492 | 63.2 |
| Merchant | 137 | 17.6 |
| Employed ^b | 97 | 12.4 |
| Daily laborer | 36 | 4.6 |
| Student | 17 | 2.2 |
| Husband's educational status | | |
| No formal education | 182 | 23.4 |
| Primary education | 261 | 33.5 |
| Secondary education | 176 | 22.6 |
| Above secondary education | 160 | 20.5 |
| Husband's occupational status | | |
| Employed ^b | 260 | 33.4 |
| Merchant | 202 | 25.9 |
| Daily laborer | 197 | 25.3 |
| Farmer | 41 | 5.3 |
| Private work | 37 | 4.7 |
| Student | 30 | 3.9 |
| Priest | 12 | 1.5 |
| Monthly family income | | |
| ≤ 500 ETB | 168 | 21.6 |
| > 500 ETB | 611 | 78.4 |
| Regular media exposure ^c | | |
| Yes | 674 | 86.5 |
| No | 105 | 13.5 |

Table 1 Socio-demographic characteristics of married women of reproductive age in Aksum town, North Ethiopia, 2015, (N = 779) (Continued)

| Visited and given health education on FP by HEWs | | |
|--|-----|------|
| Yes | 123 | 15.8 |
| No | 656 | 84.2 |

1 USD = 20.95 ETB, ^a = protestant, catholic, ^b = both governmental and nongovernmental, ^c = listen to radio and/or watch TV at least once per week

on the number of children to bear. About 581 (74.6 %) of the respondents reported that they had discussed FP methods with their husband at least once in the past 6 months. Nearly three fourth (72.5 %) of the respondents believed that their husband approves the use of LAPMs. Moreover, majority (70.4 %) reported that they jointly decide with their husband on which type of contraceptive to use (Table 2).

Knowledge and attitude of respondents

Seven hundred forty seven (95.9 %) of the total respondents reported that they had heard of LAPMs, and 578 (74.2 %) of them were familiar with at least one of the LAPMs. The most commonly known LAPMs was implant which account for 535 (71.6 %), followed by IUCD 433 (58.0 %). Major source of information about LAPMs was public health facilities 691 (92.5 %), followed by HEWs 553 (74 %). Generally, based on the composite scores of knowledge and attitude, 501 (64.3 %) of the respondents had moderate or high knowledge on LAPMs whereas half 390 (50.1 %) had positive attitude towards practicing LAPMs (Table 3).

Desire for birth spacing or limiting and not using long acting and permanent contraceptive methods

The total desire for birth spacing or limiting was 69.2 %; 35.8 % for limiting and 33.4 % for spacing. Of the total women who had desire for birth spacing or limiting, 80 (14.8 %) were using the method whereas the rest 459 (85.2 %) women were not using LAPMs; 48.8 % for spacing and 51.2 % for limiting. The three main reasons cited by the respondents for not using LAPMs were fear of side effect 257 (56.0 %), need for many children 83 (18.1 %) and religious reasons 45 (9.8 %) (Fig. 1).

Factors associated with desire for birth spacing or limiting and not using long acting and permanent contraceptive methods

Results of multivariate logistic regression analysis showed age, education, occupation; daily labor, regular media exposure, number of lifetime pregnancy, joint decision making on the number of children to bear and husband's attitude towards LAPMs use were positively associated with desire for birth spacing or

Table 2 Reproductive characteristics of married women of reproductive age in Aksum town, North Ethiopia, 2015, (N = 779)

| Characteristics | Number | Percent |
|--|--------|---------|
| Number of pregnancy | | |
| None | 63 | 8.1 |
| 1-2 | 345 | 44.3 |
| 3-4 | 233 | 29.9 |
| ≥ 5 | 138 | 17.7 |
| Number of abortion (n = 87) | | |
| 1 | 55 | 63.2 |
| ≥ 2 | 32 | 36.8 |
| Number of living children | | |
| None | 67 | 8.6 |
| 1-2 | 369 | 47.3 |
| 3-4 | 244 | 31.3 |
| ≥ 5 | 99 | 12.8 |
| Desire for more children | | |
| Yes | 500 | 64.2 |
| No | 279 | 35.8 |
| Desired time for having additional child (n = 500) | | |
| Within two years | 240 | 48.0 |
| After two years | 260 | 52.0 |
| Decider on when to have another child | | |
| Husband | 13 | 1.7 |
| Wife | 142 | 18.2 |
| Both wife and husband jointly | 624 | 80.1 |
| Decider on number of children to bear | | |
| Husband | 29 | 3.7 |
| Wife | 158 | 20.3 |
| Both wife and husband jointly | 592 | 76.0 |
| Discussed FP methods with husband | | |
| No, never | 198 | 25.4 |
| Yes, once/twice | 397 | 51.0 |
| Yes, more often | 184 | 23.6 |
| Husband's attitude towards LAPMs use | | |
| Approve | 565 | 72.5 |
| Disapprove | 59 | 7.6 |
| Don't know | 155 | 19.9 |
| Decider on type of contraceptive to be used | | |
| Husband | 40 | 5.1 |
| Wife | 191 | 24.5 |
| Both wife and husband jointly | 548 | 70.4 |

limiting. That is, being ≥35 years old (AOR = 2.10, 95 % CI: [1.21, 3.64]), attending primary level of education (AOR = 1.70, 95 % CI: [1.09, 3.56]), being daily laborer in occupation (AOR = 2.83, 95 % CI: [1.02,

7.87]), being regularly exposed to media (AOR = 2.03, 95 % CI: [1.26, 3.26]), having ≥3 lifetime pregnancy (AOR = 1.73, 95 % CI: [1.15, 2.60]), joint decision making on the number of children to bear (AOR = 2.43, 95 % CI: [1.58, 3.53]) and unfavorable/unknown husband's attitude towards LAPMs use (AOR = 9.57, 95 % CI: [4.91, 17.20]) were more likely to desire for birth spacing or limiting compared to their counterparts (Table 4).

However, the merchant category of the women's occupation variable was negatively associated with desire for birth spacing or limiting. That is, women who were merchants in occupation (AOR = 0.52, 95 % CI: [0.34, 0.79]) were less likely to desire for birth spacing or limiting compared to housewives (Table 4).

Of the several factors included in the multivariate logistic regression analysis to identify factors associated with having desire for birth spacing or limiting but not using LAPMs, women's education, husband's attitude towards LAPMs, discussion on FP with husband, knowledge, attitude and intention to use LAPMs were positively associated with not using LAPM among women with desire for birth spacing or limiting. That is, women's education; secondary education (AOR = 3.05, 95 % CI: [1.18, 7.85]), not discussing family planning methods with husband (AOR = 5.93, 95 % CI: [3.61, 8.77]), low knowledge (AOR = 2.51, 95 % CI: [1.08, 5.85]), negative attitude towards LAPMs (AOR = 2.00, 95 % CI: [1.02, 3.87]), unfavorable/unknown husband's attitude towards LAPMs use (AOR = 3.60, 95 % CI: [3.06, 5.84]) and not intending to use LAPMs (AOR = 7.70, 95 % CI: [4.18, 14.17]) were more likely not using LAPMs compared to their counterparts. However, women's occupation; daily labor (AOR = 0.31, 95 % CI: [0.12, 0.82]) was negatively associated with LAPMs use (Table 5).

Discussion

In this study total desire for birth spacing or limiting was 69.2 % (95 % CI: 65.9, 72.4) which is higher than the total desire in developing region (57 %) [5]. However, it is lower than the 2011 EDHS report (75 %) [10] and a study in Ethiopia (77.8 %) [21]. Of those who desire to space or limit births, 85.2 % were not using LAPMs which is higher than the overall non-use of LAPMs in developing region (53 %) [5] and study in Ethiopia (62.9 %) [13]. The inconsistency could be due to difference in time, socio-cultural and access to information and the services.

Age and number of lifetime pregnancy were positively associated with desire for birth spacing or limiting. Increasing age and number of lifetime pregnancy might let women have many children and met their fertility desire which results in desire for birth spacing or limiting and

Table 3 Knowledge and attitude towards long acting and permanent contraceptive methods among married women of reproductive age in Aksum town, North Ethiopia, 2015

| Variables | Responses | Number (Percent) |
|---|--------------------------|------------------|
| Ever heard of LAPMs (n = 779) | Yes | 747 (95.9) |
| | No | 32 (4.1) |
| ^a Source of information on LAPMs (n = 779) | Public health facilities | 691 (88.7) |
| | HEWs | 553 (71.0) |
| | Media | 489 (62.8) |
| | School | 122 (15.7) |
| Know at least one LAPM (n = 779) | Yes | 578 (74.2) |
| | No | 201 (25.8) |
| ^a Type of LAPM known (n = 779) | Implants | 535 (68.7) |
| | IUCD | 433 (55.6) |
| | Female sterilization | 162 (20.8) |
| Knowledge score (composite) | Low | 278 (35.7) |
| | Moderate | 212 (27.2) |
| | High | 289 (37.1) |
| Attitude score (composite) | Negative | 389 (49.9) |
| | Positive | 390 (50.1) |

^aEach of the percentages does not add up to 100.0 because respondents could choose several responses which could be spontaneous or prompted

use LAPMs [13, 16, 17, 19, 20, 26]. Women's education was positively associated with both desire for birth spacing or limiting and use of LAPMs as shown in studies elsewhere [17, 18, 21, 24, 28, 29, 32]. This could be due to difference in awareness and health seeking behavior. Moreover, desire for birth spacing or limiting and not using LAPMs also varied with occupation [17, 18]. This might be due to difference in socioeconomic status, access to information and women empowerment [17, 26, 33].

Women with regular media exposure had higher desire for birth spacing or limiting compared to their counterparts similar to studies in Ethiopia [22]. Moreover, non-use of LAPMs varied with women's knowledge and attitude. Women with low knowledge on LAPMs were more likely not using LAPMs than their counterparts as shown in studies done in Ethiopia and Rwanda [15, 27]. Likewise, women who had negative attitude towards LAPMs were more likely not using LAPMs which was similar to studies in Ethiopia and Rwanda [17, 27]. This could be due to difference in health seeking behavior and acceptance of LAPMs.

Women who decide jointly with their husband on the number of children to bear were more likely to desire for birth spacing or limiting than their counterparts. Moreover, women who had no discussions about FP methods with their husbands were more likely not using LAPMs which is similar to studies elsewhere [12, 17, 18, 21, 27, 28, 34]. This could be due contribution of men's involvement and exchange of ideas on FP which leads to desire for birth spacing or limiting and LAPMs use [12, 16]. Furthermore, women having husbands with unfavorable/unknown attitude towards use of LAPMs were more likely to desire for birth spacing or limiting compared to their counterparts. This is consistent with studies in Ethiopia and Rwanda [13, 27]. Similar pattern of relationship was found between husband's attitude towards LAPMs and not using LAPMs as shown in studies elsewhere [12, 16, 17, 21, 27]. Having husband with unfavorable attitude towards LAPMs let women lack their husband's support in family planning and have too many or too close births, which results in higher desire for birth spacing or limiting.

This study has its own drawbacks. The study suffers from the usual limitation of cross sectional study. Moreover, it missed qualitative data and did not assess the contribution of health service related factors. It is still not free from social desirability and recall biases.

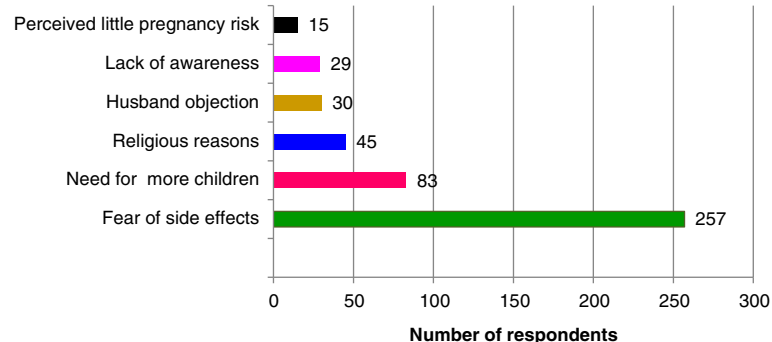


Fig. 1 Reasons for not using LAPMs among women of reproductive age who had desire for birth spacing or limiting in Aksum town, North Ethiopia, 2015 (N = 539)

Table 4 Factors associated with desire for birth spacing or limiting among married women of reproductive age in Aksum town, North Ethiopia, 2015 (N = 779)

| Variables | Desire for birth spacing or limiting | | COR (95 % CI) | AOR (95 % CI) ^a |
|--|--------------------------------------|--------|--------------------|----------------------------|
| | Yes (n) | No (n) | | |
| Age | | | | |
| < 25 | 110 | 88 | 1 | 1 |
| 25-34 | 234 | 100 | 1.87 (1.30, 2.70) | 1.46 (0.97,2.20) |
| ≥ 35 | 195 | 52 | 3.00 (1.98, 4.54) | 2.10 (1.21,3.64)** |
| Education | | | | |
| No formal education | 130 | 44 | 2.11 (1.24, 3.59) | 1.97 (0.85,3.43) |
| Primary education | 203 | 77 | 1.88 (1.16, 3.05) | 1.70 (1.09,3.56)* |
| Secondary education | 150 | 79 | 1.36 (0.83,2.21) | 1.48 (0.84,2.60) |
| Above secondary education | 56 | 40 | 1 | 1 |
| Occupation | | | | |
| Daily laborer | 31 | 5 | 2.47 (0.94,6.47) | 2.83 (1.02,7.87)* |
| Merchant | 80 | 57 | 0.56 (0.38,0.83) | 0.52 (0.34,0.79)** |
| Employed | 68 | 29 | 0.93 (0.58,1.50) | 1.06 (0.59,1.88) |
| Student | 8 | 9 | 0.35 (0.13,0.94) | 0.45 (0.16,1.22) |
| Housewife | 352 | 140 | 1 | 1 |
| Regular media exposure | | | | |
| Yes | 480 | 194 | 1.93 (1.27,2.94) | 2.03 (1.26,3.26)** |
| No | 59 | 46 | 1 | 1 |
| Number of pregnancy | | | | |
| < 3 | 243 | 165 | 1 | 1 |
| ≥ 3 | 296 | 75 | 2.68 (1.94,3.70) | 1.73 (1.15,2.60)** |
| Decider on number of children to bear | | | | |
| Self/husband | 96 | 91 | 1 | 1 |
| Both wife and husband jointly | 443 | 149 | 2.78 (1.98,3.91) | 2.43 (1.58,3.53)*** |
| Knowledge on LAPMs | | | | |
| High | 214 | 75 | 1.65 (1.10,2.47) | 1.36 (0.86,2.15) |
| Moderate | 150 | 62 | 1.46 (0.99,2.15) | 1.23 (0.79,1.93) |
| Low | 175 | 103 | 1 | 1 |
| Attitude towards LAPMs use | | | | |
| Positive | 284 | 106 | 1.41 (1.04,1.91) | 1.18 (0.80,1.72) |
| Negative | 255 | 134 | 1 | 1 |
| Ever use of modern contraception methods | | | | |
| Yes | 423 | 161 | 1.79 (1.28,2.51) | 1.42 (0.97,2.07) |
| No | 116 | 79 | 1 | 1 |
| Husband's attitude towards LAPMs use | | | | |
| Approve | 338 | 227 | 1 | 1 |
| Disapprove/don't know | 201 | 13 | 10.42 (5.80,18.72) | 9.57 (4.91,17.20)*** |
| Decider on type of contraceptive to be used | | | | |
| Self/husband | 182 | 49 | 2.00 (1.39,2.87) | 1.59 (0.95,2.39) |
| Both wife and husband jointly | 357 | 191 | 1 | 1 |

^a adjusted for age, education, occupation, regular media exposure, number of pregnancy, decider on number of children to have, knowledge on LAPMs, attitude towards LAPMs use, ever use of modern contraception methods, husband's attitude towards LAPMs use and decider on type of contraceptive to be used

*Significant at $P < 0.05$, **significant at $P < 0.01$, ***significant at $P < 0.001$

Conclusion

This study revealed that there was high desire for birth spacing or limiting and not using LAPMs among women who had desire for birth spacing or limiting. Education, occupation, husband's attitude towards LAPMs, age, number of pregnancy, regular

media exposure, and decider on the number of children to bear were significantly associated with desire for birth spacing or limiting. Moreover; education, occupation, husband's attitude towards LAPMs, discussion on FP with husband, knowledge, attitude and intention to use LAPMs were significantly associated

Table 5 Factors associated with not using long acting and permanent contraceptive methods among married women of reproductive age who desire birth spacing or limiting in Aksum town, North Ethiopia, 2015, (N = 539)

| Variables | LAPMs use | | COR (95 % CI) | AOR (95 % CI) ^a |
|--|-----------|---------|--------------------|----------------------------|
| | No (n) | Yes (n) | | |
| Age | | | | |
| < 25 | 86 | 24 | 1 | 1 |
| 25-34 | 201 | 33 | 1.70 (0.95, 3.05) | 0.75 (0.35, 1.60) |
| ≥ 35 | 172 | 23 | 2.08 (1.11, 3.89) | 1.24 (0.64, 2.40) |
| Educational status | | | | |
| No formal education | 116 | 14 | 2.74 (1.21, 6.22) | 2.30 (0.75, 7.04) |
| Primary education | 170 | 33 | 1.72 (0.84, 3.50) | 1.87 (0.73, 4.84) |
| Secondary education | 131 | 19 | 2.30 (1.06, 4.98) | 3.05 (1.18, 7.85)* |
| Above secondary education | 42 | 14 | 1 | 1 |
| Occupation | | | | |
| Daily laborer | 22 | 9 | 0.35 (0.15, 0.81) | 0.31 (0.12, 0.82)* |
| Merchant | 65 | 15 | 0.62 (0.33, 1.18) | 0.69 (0.33, 1.44) |
| Employed | 57 | 11 | 0.74 (0.36, 1.52) | 1.47 (0.59, 3.68) |
| Student | 7 | 1 | 1.00 (0.12, 8.32) | 1.38 (0.12, 15.55) |
| Housewife | 308 | 44 | 1 | 1 |
| Decider on number of children to bear | | | | |
| Self/husband | 89 | 7 | 1 | 1 |
| Both wife & husband jointly | 370 | 73 | 2.5 (1.12, 5.59) | 1.54 (0.93, 2.48) |
| Discussed FP methods with husband | | | | |
| Yes | 304 | 74 | 1 | 1 |
| No | 155 | 6 | 6.25 (2.66, 14.69) | 5.93 (3.61, 8.77)*** |
| Knowledge on LAPMs | | | | |
| High | 173 | 41 | 1 | 1 |
| Medium | 124 | 26 | 1.13 (0.66, 1.95) | 1.44 (0.76, 2.72) |
| Low | 162 | 13 | 2.95 (1.53, 5.71) | 2.51 (1.08, 5.85)* |
| Attitude towards LAPMs | | | | |
| Positive | 224 | 60 | 1 | 1 |
| Negative | 235 | 20 | 3.15 (1.84, 5.39) | 2.00 (1.02, 3.87)* |
| Husband's attitude to LAPMs use | | | | |
| Approve | 275 | 63 | 1 | 1 |
| Disapprove/don't know | 184 | 17 | 2.48 (1.41, 4.37) | 3.60 (3.06, 5.84)*** |
| Decider on type of contraceptive to be used | | | | |
| Self/husband | 172 | 10 | 4.20 (2.12, 8.42) | 2.58 (0.96, 4.20) |
| Both wife & husband jointly | 287 | 70 | 1 | 1 |
| Intention to use LAPMs | | | | |
| Yes | 156 | 63 | 1 | 1 |
| No | 303 | 17 | 7.20 (4.07, 12.72) | 7.70 (4.18, 14.17)*** |

^a adjusted for age, education, occupation, decider on number of children to have, discussed FP methods with husband, Knowledge on LAPMs, husband's attitude to LAPMs use, decider on type of contraceptive to be used and Intention to use LAPMs

*Significant at $P < 0.05$, **significant at $P < 0.01$, ***significant at $P < 0.001$

with not using LAPM. In conclusion, findings from this study suggested the need to educate mothers on LAPMs with emphasis on those with higher number of children and lower educational status. The findings of this study also underlined the need for male involvement in FP program. Thus, the federal ministry of health and regional health bureau in combination with NGOs working on FP has to work hard to increase accessibility and availability of LAPMs in the study area.

Abbreviations

AOR: Adjusted odds ratio; CI: Confidence interval; COR: Crude odds ratio; EDHS: Ethiopian Demographic and Health Survey; ETB: Ethiopian birr; FP: Family planning; IUCDs: Intrauterine contraceptive devices; LAPMs: Long acting and permanent contraceptive methods; NGOs: Nongovernmental Organizations; SD: Standard deviation

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Availability of data and materials

All the required data supporting the findings are contained within the manuscript.

Authors' contributions

KHM: conception, design, data analysis, drafting and writing final manuscripts. HBA, MGW: design, data analysis, drafting and writing final manuscripts. AAK, NBW & YGT: design, data analysis and reviewing both draft and final manuscripts. GGA, TGG & THG: design, and reviewing both draft and final manuscripts. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

Consent for publication

Not applicable.

Ethics approval and consent to participate

Ethical clearance was obtained from Research and Publication Center of Aksum University. Permission letter was also attained from Aksum town health office. Moreover, all study participants were informed about the purpose of the study and verbal consent was obtained from each study participant before data collection. Confidentiality was also ensured by using questionnaire identification number instead of using respondents' names.

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