Integration of Long Acting Duration on Liver Enzymes Knowledge, Attitude & Practice

Highlights
Duration on Liver Enzymes
Influence of Clinic-Based Health

Discovering Thoughts, Inventing Future

VOLUME 14 ISSUE 1 VERSION 1.0
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Knowledge, Attitude and Practice on Emergency Contraception and Associated Factors among Female Students of Debre-Markos University, Debre-Markos Town, East Gojam Zone, North West Ethiopia, 2013

By Marta Tessema & Hinsermu Bayu

Mekelle University College Of Health Sciences, Ethiopia

Abstract- In Ethiopia more than 60% of the pregnancies in adolescents are unwanted and most of these pregnancies end up with unsafe abortion which is the most common cause of maternal morbidity and mortality. Unwanted pregnancy can occur due to missed pills, forced sex, method failures, and condom breakage. To prevent such problem, emergency Contraceptives (EC) is the only method that can be used after unprotected sex.

Objective: The aim of the study is to assess the knowledge, attitude and practice of emergency contraception and associated factors among female regular undergraduate students of Debre-markos University.

GJMR-E Classification : NLMC Code: WJ 140

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Knowledge, Attitude and Practice on Emergency Contraception and Associated Factors among Female Students of Debre-Markos University, Debre-Markos Town, East Gojam Zone, North West Ethiopia, 2013

Marta Tessema & Hinsermu Bayu

Abstract- In Ethiopia more than 60% of the pregnancies in adolescents are unwanted and most of these pregnancies end up with unsafe abortion which is the most common cause of maternal morbidity and mortality. Unwanted pregnancy can occur due to missed pills, forced sex, method failures, and condom breakage. To prevent such problem, emergency Contraceptives (EC) is the only method that can be used after unprotected sex.

Objective: The aim of the study is to assess the knowledge, attitude and practice of emergency contraception and associated factors among female regular undergraduate students of Debre-markos University.

Method: A cross-sectional study design was employed from March 26 to 30/2013, on 624 regular undergraduate female students of Debre-markos University. Self administered questionnaires were used for data collection and analyzed using logistic regression. OR with 95% CI was taken as statistically significant association.

Results: A total of 599 voluntary students were participated in the study with overall response rate of 96%. 374(62.5%) of respondents had good knowledge and 322(53.8%) had favorable attitude towards EC. Only 68(11.4%) used the method.158 (26.4%) of students were sexually active, 32(78%) had history of unwanted pregnancy of this 30 (93.7%) had history of induced abortions. Residence (AOR: 2.3, 95% CI: 1.3, 4.3), Year of study (AOR: 2.1, 95% CI: 1.1, 4.1), Mother’s educational status of the student (AOR: 4.4, 95% CI: 1.1, 17.8) and ever use of regular contraceptive (AOR: 3.2, 95% CI: 1.0, 9.6), showed significant association with knowledge of EC. Age (AOR: 9.0, 95% CI: 1.4, 20.0), Marital status (AOR: 6.5, 95% CI: 2.5, 17.3), father’s educational status of the students (AOR: 4.5, 95% CI: 1.1, 17.6) and knowledgeable on EC (AOR: 23.97, 95%CI: 3.19, 35.83) showed significant association with practice of Ec.

Conclusion: Knowledge and attitude of EC among female regular undergraduate students in this University was good, but utilization of EC was very low. There was misinformation among these students such as correct indication of EC.

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I. Introduction

One fourth of world population is between age 10 and 24. One third of the total population of sub Saharan Africa is aged between 10-24 years (1). Ethiopia has a predominantly young population that makes up to 30% of the total population (2). Young people today marry later, and more start sex before marriage. Thus they face more risk of unwanted or unintended pregnancy results in unsafe abortion (3).

Behavioral factors that frequently put adolescents at greater risk of unintended pregnancy include experimentation and risk taking, as well as limited ability to plan ahead. The nature of relationships and frequency of intercourse are often different during adolescent years than later in life. Shorter relationships, sometimes with long intervals in between, are not uncommon, and sex may be infrequent and sporadic. This may lead to reluctance to adopt a regular family planning method or make it harder to plan to use one (4). For many youth, sex is largely unplanned and sporadic yet few young people know about the option of emergency contraception, contraceptives after unprotected intercourse (5).

World health organization (WHO) estimates that every year, nearly 5.5 million African women have an unsafe abortion, as many as 36,000 of these women die from the procedure, while millions more experience short- or long term illness and disability. Moreover, 59% of all unsafe abortions in Africa are among young women aged 15-24 years (6).

Despite the technological advancements in modern contraception methods, unintended pregnancy is still a big problem in Ethiopia. More than 60% of the pregnancies in adolescents are unintended; ones which result from contraception non-use, contraception method failure and rape. The incidence of unintended pregnancy and unsafe abortion, particularly among adolescents, remains high. In Ethiopia, abortion emanating from unintended pregnancy is one of the
most significant causes of maternal morbidity and mortality; it is also a major medical and public health problem (7).

EC uses the same hormones that regular oral hormonal contraceptives contain, but EC is administered in higher doses and within a defined period of time.

EC is a method that is safe for women’s health there are no known medical conditions under which ECPs should not be used. From a medical perspective, EC does not interrupt pregnancy; therefore it does not induce abortion (8).

In 2001, the Family Guidance Association of Ethiopia (FGAE) in collaboration with the Population Council initiated for the time a pilot project to introduce EC in selected youth center clinics in the country. In this project EC was provided in a repackaged attractive brand for adolescents and youth by cutting the regular contraceptive pills though the services were limited in scope and coverage. Emergency contraception was officially introduced in Ethiopia by the Ministry of Health in 2005 with the aim of improving sexual and reproductive health (SRH). The method, however, remained poorly known and unavailable (9).

Studies showed that there was a gap on knowledge, attitude and practice of emergency Contraception in the studies conducted in different countries. Different studies conducted in Ethiopia indicated that awareness of EC is less than 50% and utilization is less than 10% (10, 11, 12, and 13). Thus, this thesis was tried to assess knowledge, attitude and practice of emergency contraception and its associated factors among female students of Debre-Markos University. The information attained from this study could help to improve reproductive health services for young people and to apply appropriate interventions based on the findings.

II. Methods

Institution based cross-sectional study was employed at Debre-Markos University from March 26 to 30/2013. Debre-Markos University is found in Debre-Markos town, East Gojam zone of Amhara regional state and is located 300 km North West of Addis Ababa. Debre-Markos University began its operation in 1993. It has 33 departments under seven colleges these are College of Agriculture, College of Business and Economics (CBE), College of Engineering (CE), College of Law and Governance (CLG), College of Language and Social Science (CLSS), College of Natural and Computational science (CNCS) and College of Health Sciences (CHS). According to the statistics obtained from student service center, in Debre-Markos University in the seven colleges, the total number of regular undergraduate students enrolled at the time of survey were about 8094 and 2176 (26.9%) of them were females. The university has one clinic in campus which provides health services to the university students and there is one referral hospital in the town owned by the town which provides service to the population of Debre-Markos and the university students.

The study population was comprised of all female regular undergraduate students of, Debre-Markos University attending their education during time of data collection. A two-stage sampling technique was used; where first 18 departments were selected from the total of 33 departments using lottery method,. The number of study participants from the selected departments was determined using probability proportionate-to-population size allocation methods depending on their educational year. The sample size was determined by using a single population proportion formula considering the following assumptions: proportion of students with positive attitude towards Emergency contraception to be 53 % (p = 0.53), 5% level of significance (α = 0.05) () and 2 design effect. The final sample size was adjusted for none response rate of 10% and the total samples arrived at was 624.

Two diploma nurses and Eight 12 th grade completed female student were assigned and trained for supervisor and data collection respectively. Data analysis was performed using SPSS version 16.0 software package. Variables found significant (p –value ≤ 0.2) on bivariate analysis was included in multiple logistic regression analysis. The results were presented in the form of tables, figures and text using frequency and summary statistics such as mean, standard deviation and percentage. The degree of association between the independent and dependent variables was analyzed using odds ratio with 95% confidence interval.

Ethical clearance was obtained from Midwifery department, College of medicine and Health sciences, University of Gondar review board. Both written and verbal permissions were secured to undertake the study from Educational Office of Debre-Markos University

III. Result

a) Socio-demographic characteristics of respondents

A total of six hundred twenty four (624) female students were included in which 599 female students were willing to participate in the study with overall response rate of 96%. Majority of the respondents 438(73.1%) belongs to age group of 20-24 years. The mean age was 20.29 years (±1.4SD).Majority 540(90.1%) were not currently married, 527(87.9%) were Orthodox Christian followers, 477(79.6%) of students were Amhara in ethnicity, 408(68.1%) were originally from urban area and 583(97.3%) students were studying undergraduate 3rd year and below .Regarding Parent Educational Status 495(82.6%) of the respondents’ fathers were alive and of them 29.9% were do not read and write. Similarly, 546 (91.1%) of the respondents’
mother were alive and of those 238 (43.6%) were do not read and write. (Table1).

Table 1: Socio-demographic characteristics and academic distribution of female regular undergraduate Debre-Markos University students, March 2013

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number(n=599)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>151</td>
<td>25.2</td>
</tr>
<tr>
<td>20-24</td>
<td>438</td>
<td>73.1</td>
</tr>
<tr>
<td>25+</td>
<td>10</td>
<td>1.7</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>540</td>
<td>90.1</td>
</tr>
<tr>
<td>Married</td>
<td>50</td>
<td>8.4</td>
</tr>
<tr>
<td>Divorced</td>
<td>9</td>
<td>1.5</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orthodox</td>
<td>527</td>
<td>87.9</td>
</tr>
<tr>
<td>Protestant</td>
<td>38</td>
<td>6.4</td>
</tr>
<tr>
<td>Muslim</td>
<td>30</td>
<td>5.0</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>0.7</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>408</td>
<td>68.1</td>
</tr>
<tr>
<td>Rural</td>
<td>191</td>
<td>31.9</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amhara</td>
<td>477</td>
<td>79.6</td>
</tr>
<tr>
<td>Oromo</td>
<td>50</td>
<td>8.4</td>
</tr>
<tr>
<td>Tigre</td>
<td>40</td>
<td>6.7</td>
</tr>
<tr>
<td>Others</td>
<td>32</td>
<td>5.3</td>
</tr>
<tr>
<td>Year of study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First year</td>
<td>285</td>
<td>47.6</td>
</tr>
<tr>
<td>Second year</td>
<td>169</td>
<td>28.2</td>
</tr>
<tr>
<td>Third year</td>
<td>129</td>
<td>21.5</td>
</tr>
<tr>
<td>Fourth year</td>
<td>16</td>
<td>2.7</td>
</tr>
<tr>
<td>Father educational status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t read and write</td>
<td>148</td>
<td>29.9</td>
</tr>
<tr>
<td>Elementary</td>
<td>197</td>
<td>39.8</td>
</tr>
<tr>
<td>Secondary</td>
<td>72</td>
<td>14.5</td>
</tr>
<tr>
<td>College and above</td>
<td>78</td>
<td>15.8</td>
</tr>
<tr>
<td>Mother educational status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t read and write</td>
<td>238</td>
<td>43.6</td>
</tr>
<tr>
<td>Elementary</td>
<td>191</td>
<td>35</td>
</tr>
<tr>
<td>Secondary</td>
<td>73</td>
<td>13.4</td>
</tr>
<tr>
<td>College and above</td>
<td>44</td>
<td>8</td>
</tr>
</tbody>
</table>

Ethnicity (Others;- Agew ,Guragea) Religion (others;- Catholic,Joba)

b) Sexual and Reproductive Characteristics of Respondents

One hundred fifty eight (26.4%) of the respondents were sexually active, from those 74%, started sex between the age 15 and 19 years and the mean age at first sex was 18.7 years. From those of sexually active students (41) 26% students had an experience of pregnancy. Majority, 32(78.0%) of the pregnancies were unwanted. Among students who faced unwanted pregnancy 30 (93.7%) of pregnancies were ended with induced abortions. From those who have induced abortion about 13.3% were induced by self infliction.

Table 2: Sexual and Reproductive History of female regular undergraduate Debre-Markos University students, March 2013

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexually active(n=599)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>158</td>
<td>26.4</td>
</tr>
<tr>
<td>No</td>
<td>441</td>
<td>73.6</td>
</tr>
<tr>
<td>Age at first sex (n=158)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>117</td>
<td>74</td>
</tr>
<tr>
<td>20+</td>
<td>41</td>
<td>26</td>
</tr>
<tr>
<td>Ever been pregnant (n=158)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>41</td>
<td>26</td>
</tr>
<tr>
<td>No</td>
<td>117</td>
<td>74</td>
</tr>
<tr>
<td>Age at first pregnancy(n=41)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>22</td>
<td>53.6</td>
</tr>
<tr>
<td>20+</td>
<td>19</td>
<td>46.4</td>
</tr>
<tr>
<td>Unwanted pregnancy (n=41)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>32</td>
<td>78.0</td>
</tr>
<tr>
<td>No</td>
<td>9</td>
<td>22.0</td>
</tr>
<tr>
<td>Induced abortion(32)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>30</td>
<td>93.7</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>6.3</td>
</tr>
<tr>
<td>Place of abortion (n=30)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health institution</td>
<td>17</td>
<td>56.7</td>
</tr>
<tr>
<td>Private clinic</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Self infliction</td>
<td>4</td>
<td>13.3</td>
</tr>
</tbody>
</table>

c) Contraceptive history of respondents

Five hundred fifty (91.8%) of respondents have heard about regular modern contraceptive methods. Oral contraceptive pills were the most commonly known method 86.3% followed by injectables (81.4%). From those who heard about regular modern contraceptive methods 132 (24%) of the respondents used regular contraceptive methods and of these the most commonly used methods was pills 74 (56%) followed by Injectables (42.4%) (Table 3).

Table 3: Contraceptive history of Female regular Undergraduate Debre-Markos University students, March 2013

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever heard about regular modern contraceptive (n=599)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>550</td>
<td>91.9</td>
</tr>
<tr>
<td>No</td>
<td>49</td>
<td>8.2</td>
</tr>
<tr>
<td>Types of regular modern contraceptive ever heard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pills</td>
<td>475</td>
<td>86.3</td>
</tr>
<tr>
<td>Injectable</td>
<td>448</td>
<td>81.4</td>
</tr>
</tbody>
</table>
d) Knowledge of EC among female regular undergraduate Debre-Markos University Students.

An overall 374 (62.5%) had good knowledge while 225(37.5%) had poor knowledge about the method. When asked about specific types of emergency contraceptives, among those who have ever heard about EC, 419(98.3%) and 101 (23.7%) mentioned pills and IUCDs respectively. Of those who have heard about pills as an EC method, 262 (61.5%) could tell the correct timing of administration of pills, while, of the respondents who have heard about IUCDs, only 38 (8.9%) could tell the correct timing of administration of the IUCD. When asked about the indication of EC, majority of them mentioned the correct indication, 321 (75.4%) after unprotected sexual intercourse and 229(53.8%) when slippage of condom. And others gave different incorrect responses like after unwanted pregnancy 83(19.5%). Two hundred sixty eight (62.9%) respondents stated that they could get EC from government hospitals/health centers, 203 (47.6%) from pharmacy.

Table 4 : Knowledge of emergency contraceptives among female regular undergraduate Debre-Markos University students; March, 2013

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever heard about EC(599)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>426</td>
<td>71.1</td>
</tr>
<tr>
<td>No</td>
<td>173</td>
<td>28.9</td>
</tr>
<tr>
<td>Method reported as EC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pills</td>
<td>419</td>
<td>98.3</td>
</tr>
<tr>
<td>IUCD</td>
<td>101</td>
<td>23.7</td>
</tr>
<tr>
<td>Injectable</td>
<td>90</td>
<td>21.1</td>
</tr>
<tr>
<td>Implant</td>
<td>44</td>
<td>10.3</td>
</tr>
<tr>
<td>Source of EC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov’t health institution</td>
<td>268</td>
<td>62.9</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>203</td>
<td>47.6</td>
</tr>
<tr>
<td>Private clinic</td>
<td>75</td>
<td>17.6</td>
</tr>
<tr>
<td>Shop</td>
<td>33</td>
<td>7.7</td>
</tr>
<tr>
<td>Indication EC can be used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-After unprotected sexual intercourse</td>
<td>321</td>
<td>75.4</td>
</tr>
<tr>
<td>-When slippage/breakage of condom happens</td>
<td>229</td>
<td>53.8</td>
</tr>
</tbody>
</table>

e) Attitude and Practice of EC among female Debre-Markos University Students.

Three hundred twenty two (53.8%) of the students have positive attitude towards emergency contraceptives. some of the positive attitudes reported by the respondents were: 502 (83.7%) respondent support availing EC for all females, 494(82.5%) support the idea of EC safe for its users, 532(88.9%) said I would use EC if I have unsafe sex and 543(90.6%) support use of EC after unsafe sex by all female.

The prevalence of ever use of emergency contraception among female students was only 68(11.4%). Emergency contraceptive pills were the commonest EC method used which accounted for 65(95.6%) and IUCD only 3(4.4%) (Table 5).

f) Factors associated with Knowledge of EC

Among variable showed association on bivariate logistic regression analysis, only Residence, Year of study, Mather’s educational status of the student and ever use of regular contraceptive showed significant association with knowledge of EC in multivariate logistic regression analysis.

Female students who came from urban area were 2.34 times more likely to have knowledge of EC when compared to those who came’s from rural area (AOR: 2.34, 95% CI: 1.27, 4.29). Female students who are third year and above were 2.13 times more likely to have knowledge of EC when compared to first year female students (AOR: 2.13, 95% CI: 1.08, 4.19).

Female student’s whose mother’s educational status college and above were 4.37 times more likely to have knowledge of EC when compared to who their mother’s do not read and write (AOR: 4.37, 95%CI: 1.07, 17.84).

Female students who ever used modern contraceptive were 3.17 times more likely to have adequate knowledge of EC when compared to those who were not ever used (AOR:3.17, 95% CI: 1.04, 9.55)(Table 6).
Table 6: Factors associated with knowledge of EC among female undergraduate Debre-Markos University students, March 2013

<table>
<thead>
<tr>
<th>characteristics</th>
<th>Knowledge of EC (Yes)</th>
<th>COR (95%CI)</th>
<th>AOR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>293</td>
<td>115</td>
<td>1.00</td>
</tr>
<tr>
<td>Rural</td>
<td>81</td>
<td>110</td>
<td>3.41(2.208,5.28)</td>
</tr>
<tr>
<td>Year of study</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First year</td>
<td>155</td>
<td>130</td>
<td>1.00</td>
</tr>
<tr>
<td>Second year</td>
<td>111</td>
<td>58</td>
<td>1.61(1.958,2.603)</td>
</tr>
<tr>
<td>Third year</td>
<td>108</td>
<td>37</td>
<td>2.33(1.34,4.060)</td>
</tr>
<tr>
<td>Mother's educational status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not read and write</td>
<td>124</td>
<td>114</td>
<td>1.00</td>
</tr>
<tr>
<td>Elementary school</td>
<td>93</td>
<td>97</td>
<td>1.87(1.874,4.037)</td>
</tr>
<tr>
<td>Secondary school</td>
<td>55</td>
<td>19</td>
<td>2.39(1.958,5.998)</td>
</tr>
<tr>
<td>College and above</td>
<td>35</td>
<td>9</td>
<td>3.36(1.105,10.2)</td>
</tr>
<tr>
<td>Father's educational status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not read and write</td>
<td>77</td>
<td>71</td>
<td>1.00</td>
</tr>
<tr>
<td>Elementary school</td>
<td>124</td>
<td>73</td>
<td>1.14(1.631,2.070)</td>
</tr>
<tr>
<td>Secondary school</td>
<td>37</td>
<td>35</td>
<td>1.51(1.697,3.274)</td>
</tr>
<tr>
<td>College and above</td>
<td>43</td>
<td>35</td>
<td>2.27(1.022,5.0)</td>
</tr>
<tr>
<td>Ever had sexual inter.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>117</td>
<td>41</td>
<td>2.01(1.233,3.27)</td>
</tr>
<tr>
<td>No</td>
<td>257</td>
<td>184</td>
<td>1.00</td>
</tr>
<tr>
<td>Ever had p_x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>30</td>
<td>11</td>
<td>1.00</td>
</tr>
<tr>
<td>No</td>
<td>87</td>
<td>30</td>
<td>2.10(1.204,3.66)</td>
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<tr>
<td>Ever used regular contraceptive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>108</td>
<td>24</td>
<td>3.44(1.926,1.188)</td>
</tr>
<tr>
<td>No</td>
<td>238</td>
<td>180</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**Table 7**: Factors associated with practice of EC among female regular undergraduate Debre-Markos University students, March 2013

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Practice of EC</th>
<th>COR (95%CI)</th>
<th>AOR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n(Yes)</td>
<td>n(no)</td>
<td></td>
</tr>
<tr>
<td>Age in groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>10</td>
<td>141</td>
<td>1.00</td>
</tr>
<tr>
<td>20-24</td>
<td>53</td>
<td>385</td>
<td>1.87(80.436)</td>
</tr>
<tr>
<td>25+</td>
<td>5</td>
<td>5</td>
<td>10.17(1.89,17.73)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>47</td>
<td>493</td>
<td>1.00</td>
</tr>
<tr>
<td>Married</td>
<td>21</td>
<td>38</td>
<td>5.67(2.57,12.52)</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>59</td>
<td>349</td>
<td>3.47(1.43,8.42)</td>
</tr>
<tr>
<td>Rural</td>
<td>9</td>
<td>182</td>
<td>1.00</td>
</tr>
<tr>
<td>Year of study</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First year</td>
<td>25</td>
<td>260</td>
<td>1.00</td>
</tr>
<tr>
<td>Third year and above</td>
<td>24</td>
<td>121</td>
<td>2.33(1.11,4.87)</td>
</tr>
</tbody>
</table>

Among Factors associated with practice of EC during Bi-variate analysis, only Age, Marital status, father’s educational status of the respondents and having adequate Knowledge of EC showed significant association with student’s practice of EC in Multivariate analysis.

Students age 25 and above were 9 times more likely practice EC than who are age between 15-19 years old (AOR: 9.00, 95% CI: 1.448, 20.040). Students who are married were 7 times more likely practice EC than not married (AOR: 6.51, 95% CI: 2.455, 17.279).

Respondents whose father’s educational status secondary school and above were 4 times more likely practice EC when compared to who their father’s do not read and write (AOR: 4.93, 95% CI: 1.146, 17.619). Students who has adequate knowledge of EC were 24 times more likely practice EC than who has inadequate knowledge of EC (AOR: 23.97, 95% CI: 3.19, 35.83) (Table 7).
IV. Discussion

a) Knowledge, attitude and Practice among female Debre-Markos University Students.

Although emergency contraception is not recommended as a regular family planning method it is a useful method after unprotected sexual intercourse to reduce the chance of unwanted pregnancies. Emergency contraception is most useful when there is a failure of barrier methods such as slippage and breakage of condoms, or when sexual intercourse was unplanned (8).

The overall prevalence of awareness among the study participant was 426(71.1%). It's greater than studies conducted in Adama University (46.8%), Jimma University (41.9%) and Kampala University, Uganda (45.1%) (11, 12 and 24). This difference might be due to difference in study setting, time variation related with currently accelerated RH promotion activities and youth friendly programs in some health institutions of the study area.

In this study the most common sources of information for EC were health institution/personnel's which is in agreement with studies from Bahirdar University and Nigeria, in tertiary schools (25, and 22). But different from Jimma University which is the most common source of information were peers/friends and for Addis Ababa and UUC students, mass media (12, 10).This difference may be due to the method they use for education of EC.

The efficacy of EC is dependent on how soon after the unprotected intercourse treatment is administered. If women are to benefit from EC, they need to have prior knowledge and easy access to the method since it has a time limit. Two hundred sixty two (61.5%) of them had identified the correct timing of administration of the pills after unexpected sexual contact with in 72 hrs, which is higher than reports from Jimma University(30%) and Addis Ababa and Unity University college (26.2%)(12, 10). The possible reason may be linked to the source of information; health personnel/institutions that have good information on the subject than peers/friends and time difference may also be one reason.

In this study, 62.5% of the study participants had adequate knowledge about EC when overall summary index for knowledge is computed which is nearly similar to the studies conducted in Cameroon and USA (62.7% and 64.7% respectively) (23 and 16). But higher than that of Adama University (27.2%), Jimma University (50%) and Addis Ababa and UUC (43.5%) (11, 12 and 10). The possible reason may be due to time variation related with the currently accelerated RH promotion activities in the country and youth friendly programs in some health institutions of the study area. Most of the respondents 53.8% had positive attitude towards EC. It is comparable to studies from Addis Ababa and Unity University College (53%)(10).But lower than the studies on Haramaya University (76.5%)(13). This difference might be due to difference in study setting and socio-demographic variation of study participants. Majority of participants (88.9%) had agreed that I would use EC if I have unsafe sex and (90.6%) support use of EC after unsafe sex by all female which is higher than the results of Jimma University (71.2%)(12). Eighty-three point seven percent of students believed that emergency contraceptives are important and they should be available for all females.

The ever use of EC in this study was 11.4% which is comparable to a study conducted among university students in Cameroon(12.7%) and Kampala, Uganda (14.5%)(23,24). Its higher than reports from Jimma University (6.8%), Addis Ababa and Unity University college (4.7%) and Adama University (4.7%)(12,10 and 11).The possible reason for such higher prevalence of EC use in this study could be also time variation, related with the currently accelerated RHs promotion activities in the country and increasing availability of EC in many Gev’t and non Gevn’t health institutions.

Findings from this study showed that the prevalence of regular contraceptive use was
The most common methods used were Pills (56.2%) followed by (19%) injectables. As compared to regular contraceptive methods emergency contraceptive use was low. One important reason could be the lack of awareness of the place where it is available, and also indicates the fact that there is low promotion and availability of methods in most health institutions and providers.

b) Factors associated with knowledge and practice of EC

In this study students who come from urban area were 2 times more likely to have knowledge of EC than who comes from rural area (AOR : 2.33, 95% CI: 1.27, 4.29). In a situation where use of any modern family planning is low (23%) in most areas of the rural Ethiopia, it is likely that female students with rural background know little about such rarely available contraception. A study conducted on Finnish adolescents also documented that girls from rural villages or sparsely populated areas were less often aware of EC than those from city areas. Similarly, the result is consistent with the study conducted at Haramaya University (28, 29 & 13).

Moreover, as the year of study in campus increases, there appears to be an increase on emergency contraceptive knowledge. Respondents who are third year and above were 2 times more likely to have knowledge of EC than first year students (AOR: 2.13, 95% CI: 1.08, 4.19). The reason of this result may be as the year of study in campus increases students are more exposed to RH education in Campus and difference in educational level. The result is consistent with similar studies conducted in Haramaya and Adama University (13 and 11).

Student’s whose mother’s educational status college and above were 4 times more likely to have knowledge of EC than who had mother’s do not read and Wright (AOR: 4.37, 95%CI: 1.07, 17.84). The reason may be most of the time educated mother may discuss sexual issues with their daughter more openly about matters related to health including EC. Result is consistent with similar studies conducted in Kampala University, Uganda and Haramaya University (24, 13).

Knowledge of EC was 3 times higher among the respondents who had ever used regular contraceptives than those who had no experience of it (AOR: 3.16, 95% CI: 1.04, 9.55). Those respondents who already use some method of regular contraceptive are more likely to know the importance of EC. Because when giving service of family planning, health personnel gives information to clients about different type of contraception, where EC is a part, it is likely that using some method of contraception may help access knowledge on others. Result is consistent with similar studies conducted in Haramaya University (13).

In this study, students age 25 and above were 9 times more likely practice EC than who are age between 15-19 years old (AOR: 9.00, 95%CI: 1.44, 20.04) its consistent study done in Adama University and Addis Ababa and Unity University College (11, 10). The possible reason may be that the service sites may not be convenient to non married clients.

Married respondents were 7 times more likely utilize EC than those never married respondents (AOR: 6.51, 95% CI: 2.45, 17.27). It’s similar to the study conducted in Adama University and Addis Ababa and Unity University College (11, 10). The possible reason may be Younger girls may have less information about the availability and indication of EC due to the fact that difference in educational level and life experience.

Respondents whose father’s educational status secondary school and above were 4 times more likely practice EC than who has illiterate fathers (AOR: 4.49, 95% CI: 1.14, 17.61). Discussion of RH issue in the household and economic difference could be the possible explanation for this difference.

In this study, female students who had adequate knowledge about EC were found 23 times more likely practice EC than their counterparts (AOR: 23.97, 95%CI: 3.19, 35.83). The possible explanation may be as students become exposed to information regarding emergency contraceptive, their knowledge become improved. As a result, they practice EC if they face risk of unprotected sexual intercourse.

V. Conclusion

Knowledge and Attitude towards EC among the regular under graduate female students in this University was good. But there was misinformation among these students such as correct indication of EC.

Residence, Year of study, Mother’s educational status of the student and ever use of regular contraceptive are determinant factors for knowledge of EC.

Utilization of emergency contraceptive was very low and determinant factors for practice of EC are Age, Marital status, father’s educational status of the respondents and having adequate knowledge of EC.

Reference Références Referencias


Effect Normal Pregnancy and Duration on Liver Enzymes Tests

By Dunia M. R. M.Sc

University of Kufa, Iraq

Abstract- The current study was designed to investigate the changes of liver enzymes during normal pregnancy. To achieve the intended aim, 185 pregnant women of aged 20 – 37 years (60 women in first trimester, 65 women in second trimester and 60 women in third trimester of pregnancy), also the study contain 70 women (control individuals) in age near to age of pregnant women. The levels of Alanine amino transferase(ALT), Aspartate amino transferase(AST) and Alkaline Phosphatase(ALP) were determined by enzymatic methods. The results indicated a significant (P<0.05) increase of ALT and significant (P<0.01) increase of AST activities in pregnant women in third trimester when compared with those of the control group, while ALP indicated higher significantly (P<0.0005) in third and second trimester when compared with control group.

Keywords: alanine amino transferase(ALT), aspartate transferase(AST) and alkaline phosphatase (ALP).

GJMR-E Classification : NLMC Code: WU 190

Strictly as per the compliance and regulations of:

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Effect Normal Pregnancy and Duration on Liver Enzymes Tests

Dunia M. R. M.Sc

Abstract- The current study was designed to investigate the changes of liver enzymes during normal pregnancy. To achieve the intended aim, 185 pregnant women of aged 20 – 37 years (60 women in first trimester, 65 women in second trimester and 60 women in third trimester of pregnancy), also the study contain 70 women (control individuals) in age near to age of pregnant women. The levels of Alanine amino transferase(ALT), Aspartate amino transferase(AST) and Alkaline Phosphatase(ALP) were determined by enzymatic methods. The results indicated a significant (P<0.05) increase of ALT and significant (P<0.01) increase of AST activities in pregnant women in third trimester when compared with those of the control group, while ALP indicated higher significantly (P<0.0005) in third and second trimester when compared with control group. The liner regression analysis demonstrated significant (r=0.85, P<0.0005) positive correlation for ALT levels when compared with AST and significant positive correlation for ALT with ALP(r=0.89, P<0.0005) and AST levels with ALP levels(r=0.9, P<0.0005). Iam found from my study, the elevated liver enzymes during pregnancy as part of physiological changes.

Keywords : alanine amino transferase(ALT), aspartate transferase(AST) and alkaline phosphatase (ALP).

I. Introduction

The liver in the body is the most important organ after the heart. Performing many important functions including metabolism, detoxification and formation of important compounds including blood clotting factors and albumin (16). The pregnant women experiences physiological changes to support fetal growth and development (1,2,3). The levels of estrogens (estradiol) and progesterone increase progressively during pregnancy (4,5). These sex hormones have effects on hepatic metabolic, synthesis, and excretory functions (6,7,8). The biliary excretion of bromosulophthalein decreases during late pregnancy and the clearance of some compounds that are secreted into bile may therefore be impaired (9,10). The phenomenon of hemodilution secondary to the increase in plasma volume decreases the serum protein concentrations. Consequently, certain changes in values of liver function tests occur during normal pregnancy (11,12,13). Pregnancy does not change liver size but in the third trimester the enlarging uterus displaces the liver superiorly and posteriorly, therefore a palpable liver disease (14,15). Liver cell injury or necrosis is measured by determent Glutamate Oxaloacetate Transaminase (AST) and Glutamate Pyruvate Transaminase(ALT) levels(17). While liver synthetic function is quantified by determining albumin level and prothrombin time. Biliary obstruction are elevated by measuring alkaline phosphatase(18). The most commonly used indicators of liver damage (hepatocellular) are the alanine aminotransferase (ALT) and aspartate aminotransferase (AST), formerly referred to as SGPT and SGOT (19). These are enzymes normally found in liver cells that leak out of these cells and make their way to the blood when liver cells are injured. The ALT is felt to be a more specific indicator of liver inflammation as AST is also found in other organs such as the heart and skeletal muscle, the level of the ALT and AST may be used as a general measure of the degree of liver inflammation or damage(19,20). Measurement of serum alanine aminotransferase (ALT) and aspartate aminotransferase (AST) activities levels is the most useful tests for the routine diagnosis of liver diseases (18,19). While serum Alkaline phosphatase (ALP) activity level increase in late pregnancy, mainly during the third trimester.

II. Materials and Methods

Four groups of individuals were included in this study. Group 1 contained 60 pregnant women in first trimester of pregnancy (1 – 3 months). Group 2 consisted of 65 pregnant women in second trimester of pregnancy (4 – 6 months). Group 3 comprised 60 pregnant women of pregnancy (7 – 9 months) and Group 4 contained 70 non pregnant women as control in this study.

Disposable syringes and needles were used for blood collection. Venous blood samples, about 5ml were collected from pregnant and non pregnant women (control group). The blood collected in a polyethylene tubes without anticoagulant, allowed to clot at room temperature for 15 min, blood samples were centrifuged at 3000Xg for 15 min, sera were removed and stored at -17 C until analysis. Labrotary data were obtained by using available kits; serum ALT, serum AST (Randox Kit) and serum ALP (Kind and King). The results were expressed as mean ± SD students t test was used for comparison of different groups with controls.
III. Results

a) Serum ALT, AST and ALP in normal pregnancy during the three times of pregnancy and control group: The characteristics of the study groups are presented in Table 1 which consists of data of both pregnant women and control group not receiving oral contraception. The results were analyzed using students- test. There was significant (P<0.05) increase in ALT activity level during the third trimester (9.5±3.3) when compared with those of the control group (7.0±2.5), while there was no significant difference in ALT during the first(7.1±2.8) and second(7.8±2.8) trimester, also the serum AST activity level found to increase significantly (P<0.01) during the third trimester (38.9±4.5) when compared with those of control group (14.5±2.5) and no significant difference in AST in second (23.7±6.1) and first (18.9±3.3) trimester. On the other hand, serum ALP activity level show higher significant (P<0.0005) during the third (379.0±70.2) and second (173.1±46.8) trimester when compared with those of the control group (75.2±11.1) and no significant difference in ALP activity level in first (79.2±25.2) trimester.

Table 1: Serum ALT, AST, and ALP in normal pregnancy during the three times of pregnancy and control group.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Subjects</th>
<th>NO</th>
<th>Mean±SD</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALT (U/L)</td>
<td>Control 1st. trimester</td>
<td>70</td>
<td>7.0±2.5</td>
<td>N.S</td>
</tr>
<tr>
<td></td>
<td>2nd. trimester</td>
<td>60</td>
<td>7.1±2.8</td>
<td>N.S</td>
</tr>
<tr>
<td></td>
<td>3rd. trimester</td>
<td>65</td>
<td>7.8±2.8</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>Control 1st. trimester</td>
<td>70</td>
<td>14.5±2.5</td>
<td>N.S</td>
</tr>
<tr>
<td></td>
<td>2nd. trimester</td>
<td>60</td>
<td>18.9±3.3</td>
<td>N.S</td>
</tr>
<tr>
<td></td>
<td>3rd. trimester</td>
<td>65</td>
<td>23.7±6.1</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td></td>
<td>Control 1st. trimester</td>
<td>70</td>
<td>75.2±11.1</td>
<td>N.S</td>
</tr>
<tr>
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<td>60</td>
<td>79.2±25.2</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>3rd. trimester</td>
<td>65</td>
<td>173.1±46.8</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>Control 1st. trimester</td>
<td>70</td>
<td>79.2±25.2</td>
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<tr>
<td></td>
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<td>60</td>
<td>173.1±46.8</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>3rd. trimester</td>
<td>65</td>
<td>379.0±70.2</td>
<td>N.S</td>
</tr>
</tbody>
</table>

b) Correlation factors of ALT, AST and ALP levels in normal pregnant women: The linear regression analysis stated significant (r=0.85,P<0.0005) positive correlation for ALT with AST activities and significant positive correlation for ALT activity with ALP activity (r=0.89,P<0.0005) and AST activity with ALP activity (r=0.9,P<0.0005) in pregnant women (Table 2).

Table 2: Correlation Factors of serum ALT,AST and ALP activities in normal pregnant women

<table>
<thead>
<tr>
<th>Parameter</th>
<th>ALT</th>
<th>P</th>
<th>AST</th>
<th>P</th>
<th>ALP</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALT</td>
<td>0.85</td>
<td>&lt;0.0005</td>
<td>0.89</td>
<td>&lt;0.0005</td>
<td>0.9</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>AST</td>
<td>0.85</td>
<td>&lt;0.0005</td>
<td>0.9</td>
<td>&lt;0.0005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALP</td>
<td>0.89</td>
<td>&lt;0.0005</td>
<td>0.9</td>
<td>&lt;0.0005</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

c) Influence the duration of pregnancy time on liver enzymes activities. To demonstrate the influence of duration of pregnancy time on ALT, AST and ALP values in pregnant women. As shown in Table 3 no significant in ALT and AST activities in second trimester when compared with those of the first trimester, while a significant (P<0.01) less elevation of ALP activity in the same comparison. On the other hand there were significant (P<0.0001) increases in ALT,AST and Alp activities levels in third trimester when compared with those of first trimester, the table show also a significant(P<0.001) increase in activities levels of AST and ALP during the third trimester when compared with those of second trimester and less elevation in significant(P<0.01) for ALT activity.

Table 3: Influence the duration of pregnancy on liver enzymes activities

<table>
<thead>
<tr>
<th>Parameter</th>
<th>1st Vs 2nd Trimester</th>
<th>1st Vs 3rd Trimester</th>
<th>2nd Vs 3rd Trimester</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALT</td>
<td>N.S</td>
<td>0.001</td>
<td>0.01</td>
</tr>
<tr>
<td>AST</td>
<td>N.S</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>ALP</td>
<td>0.01</td>
<td>0.001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

IV. Discussion

In the present study ALT, AST and ALP activities were measured in 185 healthy pregnant women and 70 control group not receiving oral contraception. None of the women included had evidence of liver disease. When liver cells are damaged or destroyed, the enzymes in the cell leak out into the blood, where they
check the blood for two main liver enzymes ALT and AST (22, 23).

In the present investigation that serum ALT activity was significantly higher during the third trimester than in controls (P<0.05). The present results were in agreement with previous works (24, 25), while Bacq et al (12) found that serum ALT activity was significantly higher during the second trimester than in controls but was no different during the third trimester. The current results illustrated that serum AST activity was significantly higher during the third trimester than in controls (p<0.01), two other studies found the same results (14, 26), while Bacq et al (12) have stated that serum AST activity was during all three trimesters not significantly higher than in control group. Other study (27) found a significant increase in AST levels between first and third trimester of pregnancy. An increase in ALT and AST levels was found during labor, which might be caused by contractions of uterine muscle (28, 29).

The results indicate that serum ALP activity was significantly higher during the third and second trimesters as compared to control group (P<0.0005). This is primarily due to placental isoenzyme production (30, 31). During the third trimester, there was also increase in the production of the bone isoenzyme. The results of this study, showed serum ALT, AST and ALP increased in normal pregnancy as compared to non pregnant women.

V. Conclusions

1. The results indicated a significant increase of ALT in pregnant women in third trimester when compared with those of the control group.
2. The levels of AST activity in cease significantly in third trimester when compared with those of control group.
3. The ALP activity indicated higher significantly in third and second trimester when compared with control group.
4. Liver enzymes activities elevated during normal pregnancy.

VI. Acknowledgments

First of all, thanks to good for giving me the power and the insistence to complete this work. I want to thank the staff of the AL- Sadder Teaching Hospital in Najaf Governorate for their help during the work. Special thanks are due to Mr. Layth AL faham for this help. I would also like to express my gratitude to my family.

Reference Références Referencias


Influence of Clinic-Based Health Education on Pregnant Women's Knowledge and Attitudes in Relation to Pregnancy Management: Evidence from Ogun State, Nigeria

By C.O. Agbede, P.E. Omeonu & J.O. Kio
Babcock University Nigeria

Abstract- The study assessed the influence of clinic-based health education on women’s knowledge and attitudes in relation to pregnancy management in Ogun State. Stratified sampling method was used to allocate 48 pregnant women each to experimental and control groups, making a total of 96 respondents. Structured questionnaire was used to gather data from the respondents. The women in the experimental group were exposed to two hours of health education discussion addressing pertinent maternal health issues weekly for five weeks. Data were analyzed using descriptive statistics and independent t-test. All tests were measured at p≤0.05 level of significance.

Keywords: clinic-based, health education, pregnant women, knowledge and attitudes, pregnancy management.

GJMR-E Classification : NLMC Code: WQ 150

Strictly as per the compliance and regulations of:

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Keywords: clinic-based, health education, pregnant women, knowledge and attitudes, pregnancy management.

1. Introduction

Several studies have shown the nexus between pregnant women’s decision to use the primary health care facility especially for delivery and their knowledge of normal signs and symptoms of pregnancy, labour and puerperium, danger signs and symptoms of pregnancy, labour and puerperium, birth preparedness and complication readiness plans during pregnancy, labour and puerperium (JHPIEGO, 2004; Ujah et al., 2005; Abass, 2008). Further studies have shown that about 75% of all maternal deaths, globally, are those associated directly and indirectly with some sort of health care facility particularly during delivery and the week immediately after (Choudhry, 2005; FMOH, 2009). The situation is particularly bad in developing countries like Nigeria (Bale, Stoll and Lucas, 2003; Ekele, Bello, Adamu, 2003).

Nigeria is still one of the forty countries that had high Maternal Mortality Ratio (MMR) (defined as MMR ≥ 300 maternal death per 100,000 live births) giving a life time risk of maternal death 1 in 18 (WHO, UNICEF, UNFPA and the World Bank, 2010). When these rates are viewed globally, approximately 1 in 9 maternal deaths occur in Nigeria alone (USAID, 2009). Beyond mortality cases, many other women suffer from injuries, infections or diseases related to pregnancy basically from lack of adequate knowledge (WHO, UNICEF, UNFPA, 2012). It is estimated that for every maternal death, at least thirty women suffer short to long term disabilities such as Vesico- Vaginal Fistula (VF). For example, Nigeria accounts for 40% of the global burden of VF (FMOH, 2007). This condition arises from prolonged unmanaged labour and complicated deliveries. For example, when the pregnant woman is still contemplating on going to the health facilities for delivery, she encounters three other delays according to Thaddeus and Mane (1994):

1. Delay at home in recognizing complications and deciding to seek for care. A woman may delay in deciding to seek care because of ignorance, inability to recognize danger signs or because of cultural inhibitions.
2. Delay in accessing the appropriate health facilities. A further delay occurs when a woman is unable to reach a health facility due to distance, poor communication, inability to mobilize transport or to pay for transportation.
3. The delay in receiving care. The third delay occurs at the health facility when trained personnel and supplies are not immediately available to provide critical, life-saving care.

All these have a lot of bearing on the health and well-being of families, communities and in the social and economic situations of the societies. Each year an...
estimated US $15.5 billion is lost in potential productivity due pregnancy complications or when women and newborns die (WHO 2007). Every year an additional two million children worldwide are maternal orphans (WHO, 2007). Children without a mother are less likely to be immunized and are more likely to suffer from malnutrition (WHO, 2007).

Many intervention projects, programmes and policy strategies have been initiated globally and nationally in many countries including Nigeria to reduce complications surrounding pregnancy and parturition such as the Safe Motherhood Initiative (Berer, 1988), International Planned Parenthood Federation (IPPF) and the Population Council (WHO, 2006). Some of these efforts are profiled in Table 1. Despite all these efforts, maternal death tolls increase is still a phenomenon (Moore, Hart & George 2011; Ishola, 2011). Research into collaborative intervention efforts is therefore pertinent and imperative for the achievement of the Millennium Development Goal (MGD) of reducing MMR by 75% between 1990 and 2015 (WHO, UNICEF, UNFPA and World Bank, 2012). It is against this backdrop that this study examined the effects of motivational health education in improving pregnant women’s knowledge of signs, symptoms, birth preparedness and complication readiness in Ikenne Local Government Area of Ogun State.

II. THEORETICAL FRAMEWORK

The study focused on health information dissemination necessary to equip selected pregnant women with the necessary knowledge and skills that will bring about changes in their attitudes and decrease in maternal death. A theoretical model that suggested effective approach to ensure participants in the intervention complied with the information delivered and thus increased their knowledge level leading to decisions for better patronage of the healthcare facility was employed. The Comprehensive Health Education model (CHEM) was employed.

Following Farotimi (2011) the CHEM model was applied following six steps thus:

- **Step I:** The participants (pregnant women) were involved in an active learning process.
- **Step II:** At the end of the program, these pregnant women were able to have in-depth understanding on Normal Symptoms of Pregnancy, Labour, Delivery and Puerperim; have better understanding as regards birth Preparedness and Complication Readiness (BP/CR) and to demonstrate positive attitudes towards Birth Preparedness and Complication Readiness (BP/CR).
- **Step III:** The a priori expectation was that significant increase in knowledge of the participant will improve their attitudes and responses to health care services and consequently reduce complications associated with pregnancy and maternal mortality.
- **Step IV:** The sampled women for the study were categorized into experimental and control groups. The experimental group were exposed to the motivational health education and compared with the control group for knowledge increase.
- **Step V:** Necessary resources were acquired and utilized to implement the program
- **Step VI:** Evaluation was done with the use of questionnaire.

**Table 1:** Policies to Reduce Maternal Morbidity and Mortality in Nigeria

<table>
<thead>
<tr>
<th>Policies</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>The International Safe Motherhood Initiative launched in Nairobi, Kenya, 1987</td>
<td>To reduce maternal mortality in the country by 50% by the year 2000</td>
</tr>
<tr>
<td>The National health policy and strategy. Developed in 1988, revised in 1998 and 2004.</td>
<td>To achieve health for all Nigerians, emphasizing Primary Health Care as key to developing the health care</td>
</tr>
<tr>
<td>The National Policy on Population for Development, Unity, Progress and Self Reliance, 1998</td>
<td>To promote maternal health especially vulnerable groups such as adolescents.</td>
</tr>
<tr>
<td>The National Economic Empowerment Development Strategy (NEEDS) 1999.</td>
<td>To reduced the level of poverty in Nigeria</td>
</tr>
<tr>
<td>The National Reproductive Health Policy (NRHP) developed by FMOH in 2001.</td>
<td>a) To “achieve quality reproductive and sexual health for all Nigerians b) To &quot;reduce maternal morbidity and mortality due to pregnancy and childbirth by 50% by 2006</td>
</tr>
<tr>
<td>The National Reproductive Health Strategic Framework, developed by FMOH 2002</td>
<td>To reduce maternal mortality. (FMOH, 2002)</td>
</tr>
<tr>
<td>The National Guidelines for Women’s Health, developed by (FGN) 2002</td>
<td>To establish women-friendly services at all levels of the health care system. (FMOH and UNICEF, 2002)</td>
</tr>
<tr>
<td>The Health Sector Reform policy, developed (FMOH) 2003</td>
<td>To improve the functioning of Nigeria’s health system as a way of reducing maternal mortality in the country.</td>
</tr>
<tr>
<td>National Strategic Plan for Reproductive Health Commodity Security developed (FMOH) 2003</td>
<td>To develop a strategy to secure the supply of reproductive health commodities.</td>
</tr>
</tbody>
</table>
III. Research Methodology

a) Study area and Description of Population

This study was carried out in Ikenne Local Government Area (LGA) in Ogun state, Nigeria. Ikenne community houses culturally diversified people of different background. This LGA is semi-urban comprising of five towns- namely, Ikenne-Remo (the LGA headquarter), Ilishan-Remo, Iperu-Remo, Ogere-Remo and Irolu-Remo. Estimated population of women of reproductive age is 27, 713 (Nigeria Demographic and Health Survey [NDHS], 2008). However, the target population included women who were pregnant and in the third trimester of pregnancy (28-40 weeks of pregnancy). The health facilities available in the LGA include Babcock University Teaching Hospital at Ilishan, State General Hospital at Ikenne, State Hospital at Iperu, Community Hospital at Ilishan and ten (10) Primary Health Care (PHC) Centres in Wards situated in the five towns.

There are also eight registered Private Hospitals/Clinics, some Traditional Birth Attendants and religious Health Care Centres within the Local Government Area.

IV. Sampling Technique and Data Collection

The multi-stage sampling technique was used to select a total of 96 participants from the five healthcare centres in the study area offering maternity care. The healthcare facilities were stratified into two for the control and experimental groups. Ikenne PHC ward II, Ilishan town PHC ward VII and Irolu PHC ward X were in the control groups while Iperu PHC, ward V and Ogere PHC ward VII were in the experimental group. Forty eight pregnant women were purposively selected from each group to represent the sample frame. Structured questionnaires designed in line with the developed Motivational Health Education Information (MHE) and with study objectives were used to gather data from the respondents. Reliability analysis was applied to test the internal consistency of the questionnaire. Result of the analysis showed that the average Cronbach’s alpha value for the instrument was 0.82. Items of an instrument were considered to represent a measure of high internal consistency if the total Cronbach’s alpha value was more than 0.7 (Graham, 2008 and Muhamad, 2010). The intervention group was exposed to 5 weeks of intervention education following the focus group discussions.

V. Method of Data Analysis

Both descriptive and inferential statistics were employed in analyzing data collected in the study. Frequency tables were used to present results for the descriptive analysis. Each construct of the questionnaire was coded along the appropriate ranking scale. Maximum point-scales were generated for each construct to measure the stated research variables, mean scores were also computed. The t-test was used to determine significant difference in the mean of the analyzed variables in the experimental and control groups. All statistical analysis were done using the statistical package for social science (SPSS version 17) and set at \( P \leq 0.05 \) levels of significances. Ethical clearance was obtained from the Ethical Review Committee, Babcock University and consent forms were filled by all participants.

VI. Results and Discussion

a) Socio-demographic information of respondents

Results in Table 1 show that the respondents generally were below 35 years old (79% for control and 92% for experimental groups), mostly married (96% for control and 100% for experimental groups), from Yoruba ethnic group (75% for control and 76% for experimental groups) and largely Christians (50% for control and 57% for experimental groups). The result for educational level showed that the respondents had relatively good level of education with majority having secondary education and...
above (92% for control and 72% for experimental groups). The nexus between education and adoption of innovations for behavioral change has been detailed in previous studies (Babalola et al., 2013; Omeonu et al., 2014; Babalola, 2014). Thus the intervention is expected to have a significant impact on knowledge and attitude of the respondents. However, most of them were artisans (41% for control and 38% for experimental groups) and their monthly income was below ₦16,000 (<$81) (42% for control and 66% for experimental groups) which is clearly below the national minimum wage of ₦18,000. This implies that although, most of these women may depend on their husbands for household financial sustenance, poverty level is likely high among the women. This may pose a challenge to the women’s capacity to afford certain financial requirements for necessary healthcare.

Further results in Table 1 showed that within the control group the majority of the respondents (67%) had 1-2 children and also in the experimental group (45.2%) had 1-2 children. Thus the women are expected to have certain knowledge about pregnancy management since they have had children before. Results of antenatal care (ANC) showed that most of the women (67% for control and 74% for experimental groups) had their first visit to the healthcare center between 20th and 24th weeks of pregnancy. However, the majority of the respondents (63% for control and 62% for experimental groups) visited the healthcare facility up to 4 times during ANC.

VII. Result of the Intervention Effort

The women in the experiment group were exposed to 5 weeks of intervention education as earlier stated. The knowledge levels and attitude, with respect to the earlier stated pregnancy management factors and practices, for both the control and experimental groups were assessed both at the beginning (baseline) and at the end of the intervention exercise. Results are in Tables 3 and 4.

Generally, at baseline, the knowledge levels for all variables were relatively low compared to the respective maximum point on scale of measure (MPS). The knowledge variable about signs and symptoms about normal pregnancy for the experimental group measured at baseline (MPS = 20) had a mean score of 14.26 ± 1.64 while the control group had a mean of 13.98 ± 1.67.

Comparing the two mean scores, there was no significant difference between these mean scores (P=0.348). However, at immediate post-intervention, the experimental group had a mean score of 16.9405 ± 1.07 which was significantly higher than that of the control group (14.08 ± 1.72)(P=0.04).

Table 2: Demographic information of respondents

<table>
<thead>
<tr>
<th>Variables</th>
<th>Control (n= 48)</th>
<th>Experimental (n= 48)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq</td>
<td>%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19-24yrs</td>
<td>16</td>
<td>33.3</td>
</tr>
<tr>
<td>25-29yrs</td>
<td>10</td>
<td>20.8</td>
</tr>
<tr>
<td>30-34yrs</td>
<td>12</td>
<td>25.0</td>
</tr>
<tr>
<td>35-39yrs</td>
<td>4</td>
<td>8.3</td>
</tr>
<tr>
<td>≥40</td>
<td>6</td>
<td>12.5</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
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<tr>
<td>Married</td>
<td>46</td>
<td>95.8</td>
</tr>
<tr>
<td>Tribe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yoruba</td>
<td>36</td>
<td>75</td>
</tr>
<tr>
<td>Non-Yoruba</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christianity</td>
<td>24</td>
<td>50</td>
</tr>
<tr>
<td>Islam</td>
<td>22</td>
<td>45.8</td>
</tr>
<tr>
<td>Traditional</td>
<td>2</td>
<td>4.2</td>
</tr>
<tr>
<td>Education</td>
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<td></td>
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<tr>
<td>Below Secondary</td>
<td>4</td>
<td>8.3</td>
</tr>
<tr>
<td>Secondary and above</td>
<td>44</td>
<td>91.8</td>
</tr>
<tr>
<td>Husbands’ Education</td>
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<td></td>
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<tr>
<td>Below Secondary</td>
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<td>12.5</td>
</tr>
<tr>
<td>Secondary and above</td>
<td>44</td>
<td>87.5</td>
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<tr>
<td>Occupation</td>
<td></td>
<td></td>
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<tr>
<td>Farming</td>
<td>14</td>
<td>28.8</td>
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<tr>
<td>Civil Servant</td>
<td>8</td>
<td>16.8</td>
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<tr>
<td>Artisans</td>
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</tr>
<tr>
<td>Housewives</td>
<td>7</td>
<td>13.6</td>
</tr>
<tr>
<td>Income level (₦)</td>
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<td></td>
</tr>
<tr>
<td>Threshold Range</td>
<td>No. of Pregnancies</td>
<td>Proportion</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------</td>
<td>------------</td>
</tr>
<tr>
<td>≤15,000</td>
<td>20</td>
<td>41.6</td>
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<tr>
<td>16,000-30,000</td>
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<td>20.8</td>
</tr>
<tr>
<td>31,000-45,000</td>
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<td>12.5</td>
</tr>
<tr>
<td>&gt;45,000</td>
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<td>25.1</td>
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</table>

Parity

<table>
<thead>
<tr>
<th>Parity</th>
<th>No. of Pregnancies</th>
<th>Proportion</th>
<th>No. of ANC visits</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>2</td>
<td>4.2</td>
<td>7</td>
<td>14.3</td>
</tr>
<tr>
<td>1-2</td>
<td>32</td>
<td>66.7</td>
<td>22</td>
<td>45.2</td>
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<tr>
<td>3 and above</td>
<td>14</td>
<td>29.1</td>
<td>19</td>
<td>40.5</td>
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</table>

Timing of ANC first visit

<table>
<thead>
<tr>
<th>Timing</th>
<th>No. of Pregnancies</th>
<th>Proportion</th>
<th>No. of ANC visits</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-16 weeks</td>
<td>6</td>
<td>13</td>
<td>6</td>
<td>12.0</td>
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<tr>
<td>20-24 weeks</td>
<td>32</td>
<td>66.7</td>
<td>35</td>
<td>74.0</td>
</tr>
<tr>
<td>28 weeks +</td>
<td>10</td>
<td>20.8</td>
<td>7</td>
<td>14.0</td>
</tr>
</tbody>
</table>

No. of ANC visits

<table>
<thead>
<tr>
<th>No. of ANC visits</th>
<th>No. of Pregnancies</th>
<th>Proportion</th>
<th>No. of ANC visits</th>
<th>Proportion</th>
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</thead>
<tbody>
<tr>
<td>1 ANC visit</td>
<td>4</td>
<td>8.3</td>
<td>5</td>
<td>9.5</td>
</tr>
<tr>
<td>2 ANC visit</td>
<td>12</td>
<td>25.0</td>
<td>10</td>
<td>21.4</td>
</tr>
<tr>
<td>3 ANC visit</td>
<td>2</td>
<td>4.2</td>
<td>3</td>
<td>7.1</td>
</tr>
<tr>
<td>4 and above</td>
<td>30</td>
<td>62.5</td>
<td>30</td>
<td>61.9</td>
</tr>
</tbody>
</table>

Source: Computed from field Survey (2013)

The knowledge variable about signs and symptoms of normal child birth measured at baseline (MPS = 20) showed no significant difference in respondents’ knowledge level for experimental group (mean score of 16.45 ± 2.69) and the control group (mean of 16.2 ± 2.16) (P=0.281). At immediate post-intervention, there was a significant difference between the mean score of the knowledge level of the experimental group (18.88 ± 1.03) and the control group (16.47 ± 2.10) (P=0.001). The knowledge variable about signs and symptoms of normal puerperium measured at baseline (MPS = 20) also showed no significant difference in the respondents’ level of knowledge for experimental (mean score of 16.20 ± 2.24) and the control groups (mean of 16.50 ± 1.82) (P=0.409). The knowledge variable for the experimental group measured at immediate post-intervention increased to 17.92 ± 1.66 which was significantly higher than that of the control group (16.45 ± 1.80) (P=0.048).

The knowledge variable about danger signs during pregnancy, measured at baseline (MPS = 24), had mean scores of 17.17 ± 2.84 and 16.83 ± 2.25 for the experimental and control groups respectively. There was no significant difference in the knowledge level for both groups at baseline (P=0.459). However, after the intervention, the mean scores knowledge level measured were 18.85 ± 0.96 and 16.83 ± 2.14 for the experimental and control groups respectively. Comparing the two mean scores, there was a significant difference between the mean scores (P=0.041). The knowledge variable about danger signs during labour, measured at baseline (MPS = 12) on scale, had mean scores of 7.12 ± 1.81 and 6.67 ± 1.23 for the experimental and control groups respectively. The test statistics for significant difference showed no statistical significant difference between these two mean scores (P=0.09). After intervention, mean scores changed to 6.02 ± 0.15 and 6.79 ± 1.30 for the experimental and control groups respectively. The test statistics for significant difference showed statistically significant difference between the two mean scores (P=0.001). The knowledge variable about danger signs 7 days after delivery, measured at baseline (MPS = 12), had mean scores of 7.69 ± 2.09 and 7.33 ± 1.81 for the experimental and control groups respectively. There was no significant difference between the mean scores for the two groups (P=0.306). After the intervention, the knowledge mean scores for experimental group became significantly higher (9.00 ± 0.01 and 7.25 ± 1.83 for the experimental and control groups respectively) (P=0.001). The knowledge variable about birth preparedness and complication readiness measured at baseline (MPS = 30), had mean scores of 19.81 ± 1.90 and 21.25 ± 2.21 for the experimental and control groups respectively. The test statistics for significant difference showed statistically significant difference between the two mean scores (P=0.001). When measured at immediate post-intervention, the mean scores were 26.18 ± 1.13 and 21.79 ± 1.87 for the experimental and control groups respectively indicating significantly higher knowledge level for experimental group (P=0.001).
Table 3: Pre-intervention (clinic-based education) or baseline result for control and experimental group

<table>
<thead>
<tr>
<th>Variables</th>
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<th>Mean ±SD</th>
<th>Std. Error Mean</th>
<th>Level of Sig</th>
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<tbody>
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<tr>
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<td>22.7381</td>
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</table>

Source: Computed from field survey (2013)

Table 4: Post-intervention (clinic-based education) results for control and experimental groups.

<table>
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<tr>
<th>Variables</th>
<th>Groups</th>
<th>Max points on scale of measure</th>
<th>Mean ±SD</th>
<th>Std. Error Mean</th>
<th>Level of Sig</th>
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<tr>
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<tr>
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<td>16.8333</td>
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<td>control</td>
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</tr>
<tr>
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<td>7.2500</td>
<td>1.827</td>
<td>.26380</td>
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<tr>
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<td></td>
<td>9.0000</td>
<td>0.010</td>
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<tr>
<td>Knowledge about birth preparedness and complication readiness</td>
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<td>30</td>
<td>21.7917</td>
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<td>Attitudes towards birth preparedness &amp; complication readiness plans</td>
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<td>41.3690</td>
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</tbody>
</table>

Source: Computed from field survey (2013)

The attitude variable towards birth preparedness and complication readiness for the experimental group measured at baseline (MPS = 52) had a mean score of 22.73±4.85 while the control group had a mean of 24.83±4.41. There was no significant difference between these mean scores (P=0.324). At immediate post-intervention, the mean score for the experimental group (41.37±4.85) was
significantly higher than that for the control group (24.83±4.12) (P=0.001). This result confirmed that the intervention influenced the participants by improving their knowledge and attitudes towards pregnancy management, birth preparedness and complication readiness.

VIII. CONCLUSION AND RECOMMENDATION

This study assessed the influence of clinic-based education on pregnant women’s knowledge on normal pregnancy, danger signs and symptoms of pregnancy, labour and puerperium and their attitudes towards Birth Preparedness and Complication Readiness. The participants were selected from Ikenne LGA of Ogun state Nigeria. The investigation concluded by affirming significant impact of the motivational education on the stated knowledge variables and the attitudes of the respondents. Based on the findings of the study, the following recommendations have been suggested for policy action:

- Corroborative intervention programme initiatives, directed at creating more awareness and necessary education for pregnant women should be encouraged.
- There is the need for improvement in the education given to pregnant women for general pregnancy management and care during delivery especially following recommended benchmark by WHO.
- Pregnant women should be encouraged to start ANC appointments earlier and any cost implication subsidized to motivate use of healthcare facilities.

REFERENCES


Integration of Long Acting and Permanent Contraceptive Methods with an ART Program Was Poor in Tigray Region, Ethiopia

By Mussie Alemayehu, Belachew Etana, Girmatsion Fisseha, Kiday Haileslassie, Yibrah Berhe & Henock Yebyo

Abstract: Background: Use of contraceptive methods is one of the efficacious interventions that help to prevent HIV transmission and unintended pregnancies among HIV positive women. However, contraceptive utilization, in general, and Long Acting and Permanent Contraceptive (LAPM) methods, in particular, and its integration with HIV treatment services is not well understood in poor-resource settings. The study aimed to assess the level of integration of LAPM with ART, LAPM utilization and associated factors among HIV positive women in public hospitals of Tigray, northern Ethiopia.

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Keywords: integration, utilization of Lapm, tigray, public hospitals, ethiopia.

GJMR-E Classification : NLMC Code: QV 177
Integration of Long Acting and Permanent Contraceptive Methods with an ART Program Was Poor in Tigray Region, Ethiopia

Mussie Alemayehuα, Belachew Etanaα, Girmatsion Fissehaα, Kiday Haileslassieα, Yibrah Berheyβ & Henock Yebyoα

Abstract - Background: Use of contraceptive methods is one of the efficacious interventions that help to prevent HIV transmission and unintended pregnancies among HIV positive women. However, contraceptive utilization, in general, and Long Acting and Permanent Contraceptive (LAPM) methods, in particular, and its integration with HIV treatment services is not well understood in poor-resource settings. The study aimed to assess the level of integration of LAPM with ART, LAPM utilization and associated factors among HIV positive women in public hospitals of Tigray, northern Ethiopia.

Methods: A cross-sectional study was conducted in 2013 among 343 HIV positive married women selected using two-stage cluster sampling. Data were analyzed using SPSS version 20. Multiple logistic regression analysis was used to identify independent predictors of LAPM utilization.

Results: Long Acting and Permanent Contraceptive utilization was 29.7%; among which, only 37.3% got LAPM from ART clinics. Higher knowledge on LAPM (OR=3.2, 95% CI:1.35,7.8), positive attitudes towards LAPM (OR=4.2, 95% CI:2.19,8.2), delivery at age older than 18 years (OR=2.5, 95% CI:1.19,5.4), having less CD4 cells (OR=2.8, 95% CI:1.2,6.3) and desire to limit number of children (OR=2.1, 95% CI:1.2,4.1) were positively associated with LAPM utilization.

Conclusion: Overall LAPM utilization and integration of family planning services with ART service were lower. Integration of LAPM service with ART is crucial to optimize ART and address the special needs of HIV positive women to prevent unwanted pregnancy.

Keywords: integration, utilization of Lapm, tigray, public hospitals, ethiopia.

I. INTRODUCTION

The World Health Organization (WHO) promotes a strategy of preventing HIV infection among women, and preventing unintended pregnancies [1]. Prevention of unintended pregnancies among HIV positive women, although highly cost-effective, is a neglected strategy in combating HIV/AIDS [2-4].

Studies done in different countries of Sub-Saharan Africa (SSA) show that the use of ART was associated with almost 80% increased risk of pregnancy [5]. Prevention of unwanted pregnancy using contraceptive methods would benefit HIV positive mothers as compared to HIV free women to decrease HIV transmission and prevent unwanted pregnancy [6].

In Ethiopia, a large proportion of people living with HIV/AIDS are under ART including the Prevention of Mother to Child Transmission of HIV (PMTCT) service [7]. However, family planning utilization is low and the integration of family planning service with ART is observed to be poor. Especially, the Long Acting and Permanent contraceptive Methods (LAPM) are least used by HIV positive mothers, though these methods are more advantageous to reduce problems of non-adherence to family planning methods than the short acting methods [8, 9]. Not only LAPM utilization would be important for preventing unintended pregnancies among HIV positive mothers, but also it would be a cost effective strategy to prevent mother to child transmission rate of HIV [10, 11]. In Tigray, not limited to HIV positive women, the unmet need for family planning among unmarried women is 15% for child spacing and 7% for child limiting. In the same study, only 5.6% and 0.3% were using implants and female sterilization, respectively, and none of them were Intra Uterine Contraceptive Device (IUCD) users. However, evidence on LAPM utilization among HIV positive mothers in the region is scarce. One of the reasons for the hypothesized lower LAPM utilization among HIV positive women would be poor integration of family planning services with ART clinics.

In light of these, the current study aimed to point out the level of LAPM utilization among HIV positive mothers, reasons associated with non-use of LAPM and the integration level of family planning services with ART clinics among HIV positive women in public hospitals of Tigray, region northern Ethiopia.

II. METHODS

An institutional based cross-sectional study was conducted in four hospitals of Tigray region in 2013. The
region has an estimated total population of over four million with a sex ratio of one [12]. The region owns 16 public hospitals including one teaching hospital and a number of private hospitals. Unlike the private hospitals, family planning and ART services are provided for free in the public hospitals in Ethiopia. Thus, our study focused merely on public hospitals in which majority of women receive family planning and ART services.

The study focused on HIV positive married women of reproductive age who were on ART during the study period. Using predetermined parameters of 95% Confidence Interval (CI), 4% Marginal Error, 7.1% estimated proportion of LAPM utilization in South Africa [13], 10% non-response rate, Design Effect of two to compensate the higher variability that may be introduced due to the sample design, we included a total of 348 HIV positive women in our study.

The study women were selected using a two-stage cluster sampling. In the first stage, all the public hospitals were considered as clusters. There may be no or little difference in the provision of family planning and ART services among the hospitals since the treatment protocols are similar. Thus, we selected four public hospitals at random out of 16. We allocated the sample size needed from each hospital using probability proportional to size sampling. In the second stage, women were selected using systematic random sampling at every equal interval. The women were consented for service-exit interview using a face-to-face approach. The questionnaire focused on LAPM utilization and associated factors. It was first prepared in English and then translated back into the local language-Tigrigna. To check consistency of the contents of each question, the questionnaire was back translated into English by a different person. The questionnaire was adapted from different studies [13-16] but customized to the contextual population and health settings. It contained socio-demographic and economic characteristics of study participants, reproductive history, clinical characteristic, knowledge on LAPM, attitude towards and utilization of LAPM. We pretested the questionnaire on 15 HIV positive women in a different area to check the plausibility of the tool, estimate time for the interview, ensure understandability of the questions.

To assess the level of LAPM integration with ART services, we used checklist enquiring availability of contraceptive methods and teaching materials, number and type of trained health professionals and availability of registration book and referral document. Integration of family planning with ART services was defined as receiving any types of family planning methods from ART clinics together with the ARV drugs. The data collection was carried out by twelve trained clinical nurses who used to work in different hospitals and the overall data collection process was supervised by other four health professionals.

a) Data analysis

The raw data were entered into EPI data version 3.1 and analyzed using SPSS version 20 for windows (SPSS Inc. version 20, Chicago, Illinois). Descriptive analyses were run to estimate the level of LAPM utilization, integration of LAPM with ART services and descriptions of women characteristics. Knowledge of and attitude towards LAPM utilization among the study participants were measured based on respondents’ answers to certain knowledge and attitude questions. Accordingly, knowledge was defined as “higher knowledge”, “moderate knowledge” and “lower knowledge” if a woman answered 80%, 60-79% and less than 60% of the knowledge questions, respectively. Similarly, attitude was defined as “positive” and “negative” if a woman answered above the average of the attitude questions, and below the average of the attitude questions, respectively average and below.

The predictors of LAPM utilization were assessed using multiple logistic regression analysis. The effect sizes of predictors was estimated using adjusted Odds Ratio (OR) for the sample and 95% CI of OR for the population effect sizes. A p-value of less than 0.05 was considered as statistically significant for all tests.

b) Ethics statement

The Ethical Review Committee of Mekelle University, College of Health Sciences approved the study protocol as well as the verbal consent of the participants. Informed verbal consent was obtained from study participants after the purposes of the study were explained to them. The information and informed consent sheet contained information on selection criteria, confidentiality, voluntary participation, benefit and risks and contact information of the investigators. The right of the respondents to withdraw from the interview was assured. Any personal identifier was not encoded; identifiers of the women were replaced with identification numbers. The study neither had employed any intervention nor had taken any biomedical body sample.

III. Results

a) Sociodemographic and economic characteristics of women

A total of 343 HIV positive reproductive aged women who were on ART participated in the study which gave a response rate of 98.5%. Fifty percent of the women were younger than 31 years. The vast majority of the women, (92.7%), were followers of Orthodox Christianity. With regard to place of residence, 65.3% of the women used to live in urban during the study period. Overall, women were with less educational level than their partners. Only 51.9% and 64.4% of the women and their partners attended a formal education. Nearly one-third (65.9%) of the women were limited to indoor
activities. As such, half of the study participants had an average household monthly income of $55.6-111.1 [Table 1].

Table 1: Sociodemographic and clinical characteristics of respondents and their partner in Tigray Public hospitals, 2013

<table>
<thead>
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<th>Variables</th>
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<tr>
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<td>20-24</td>
<td>29(8.5)</td>
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<td>25-29</td>
<td>89(25.9)</td>
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<tr>
<td>30-34</td>
<td>113(32.9)</td>
</tr>
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<td>35-39</td>
<td>112(32.7)</td>
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<tr>
<td>1-8 grade</td>
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<td>College and above</td>
<td>8(2.3)</td>
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<td>9-12 grade</td>
<td>78(22.7)</td>
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<td>College and above</td>
<td>20(5.6)</td>
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<td>171(49.9)</td>
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<td>&gt;$111.1</td>
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<td>ART regimen (n=343)</td>
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<td>D4T-3TC-NVP</td>
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<td>59(17.2)</td>
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<td>72(21.0)</td>
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<td>Stage 3</td>
<td>167(48.7)</td>
</tr>
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<td>Stage 4</td>
<td>45(13.1)</td>
</tr>
</tbody>
</table>

b) Antiretroviral Therapy profile

Regarding to WHO clinical staging, 48.7% of the women were at stage 3 and 327 (95.3%) of the participants were in stage T1 during admission to ART. However, the WHO clinical stage decreased to 16 (4.7%) during the study period. The proportion of women with CD4 cells less than 200 cells/mm$^3$ before ART initiation was 75.5%; but, this declined to only 16.3% during the study period after ART initiation. The women were under a different ART regimen, but one-third of them were taking AZT-3TC-NVP.

c) Reproductive history of respondents

The mean age at marriage was 18.16 (SD±3.5) and age at first birth was 21 (SD±4.1) years. More than two-third (67.9%) of the participants got married before the age of 18 years. Nine in ten of the respondents had history of childbirth in their lifetime. Each woman had average children of 2.4 (SD±1.2) and 46.1% of them had three or more children. Regardless of the number of children that the women had, however, 183 (53.4%) of mothers had desired to have more children in the future [Table 2]. Experience of unintended pregnancy was reported among 66 (19.2%) of the respondents. Similarly, 55(16%) of the women had a history of...
abortion among which 11(20.4%) had more than one episodes. Two in ten women had a history of child death; but, half of them encountered more than one child deaths [Table 2].

Table 2: Reproductive history of HIV positive women, in Tigray Public hospitals, 2013

<table>
<thead>
<tr>
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</thead>
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</tr>
<tr>
<td>&lt;18 year</td>
<td>233(67.9)</td>
</tr>
<tr>
<td>≥18 year</td>
<td>110(32.1)</td>
</tr>
<tr>
<td><strong>History of birth (n=343)</strong></td>
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</tr>
<tr>
<td>Yes</td>
<td>310(90.4)</td>
</tr>
<tr>
<td>No</td>
<td>33(9.6)</td>
</tr>
<tr>
<td><strong>Number of children (n=310)</strong></td>
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</tr>
<tr>
<td>Two and less than two</td>
<td>185(53.9)</td>
</tr>
<tr>
<td>Three and above</td>
<td>158(46.1)</td>
</tr>
<tr>
<td><strong>Age at delivery (n=310)</strong></td>
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</tr>
<tr>
<td>&lt;18 year</td>
<td>95(27.7)</td>
</tr>
<tr>
<td>≥18 year</td>
<td>248(72.3)</td>
</tr>
<tr>
<td><strong>Time gap between previous and last birth (n=310)</strong></td>
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</tr>
<tr>
<td>Less than 3 years</td>
<td>125(40.3)</td>
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<tr>
<td>3 and above</td>
<td>185(59.7)</td>
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<tr>
<td><strong>History of child death (n=343)</strong></td>
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</tr>
<tr>
<td>Yes</td>
<td>65(21.0)</td>
</tr>
<tr>
<td>No</td>
<td>245(79.0)</td>
</tr>
<tr>
<td><strong>Number of child deaths (n=65)</strong></td>
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<tr>
<td>One</td>
<td>34(52.3)</td>
</tr>
<tr>
<td>Two and above</td>
<td>31(47.7)</td>
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<tr>
<td><strong>Was the last birth intended? (n=343)</strong></td>
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<tr>
<td>Yes</td>
<td>277(80.8)</td>
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<tr>
<td>No</td>
<td>66(19.2)</td>
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<td><strong>History of abortion (n=343)</strong></td>
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</tr>
<tr>
<td>No</td>
<td>288(84.0)</td>
</tr>
<tr>
<td><strong>Need to have more children in the future (n=343)</strong></td>
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<tr>
<td>Yes</td>
<td>183(53.4)</td>
</tr>
<tr>
<td>No</td>
<td>160(46.6)</td>
</tr>
</tbody>
</table>

Table 3: Knowledge of HIV positive married women on LAPM in Tigray Public hospitals, 2013

<table>
<thead>
<tr>
<th>Knowledge statements (n=219)</th>
<th>Yes</th>
<th>No</th>
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</thead>
<tbody>
<tr>
<td>Implant prevent pregnancy effectively for 3-5 years</td>
<td>212(96.8)</td>
<td>7(3.2)</td>
</tr>
<tr>
<td>Implants require a surgical procedure during insertion &amp; removal</td>
<td>173(79)</td>
<td>46(21)</td>
</tr>
<tr>
<td>Implants results in immediate reversal pregnancy</td>
<td>176(80.4)</td>
<td>43(19.6)</td>
</tr>
<tr>
<td>HIV positive women can use IUCD</td>
<td>132(60.3)</td>
<td>87(39.7)</td>
</tr>
<tr>
<td>Women on ARV can use IUCD</td>
<td>145(66.2)</td>
<td>74(33.8)</td>
</tr>
<tr>
<td>IUCD is not a problem in quick return of pregnancy after removal</td>
<td>133(60.3)</td>
<td>86(39.4)</td>
</tr>
<tr>
<td>IUCD is effective in preventing pregnancy for 12 years</td>
<td>155(70.8)</td>
<td>64(29.2)</td>
</tr>
<tr>
<td>IUCD has no interference with sexual intercourse</td>
<td>118(53.9)</td>
<td>101(46.1)</td>
</tr>
<tr>
<td>Women should only be sterilized when they don’t want more children</td>
<td>129(58.9)</td>
<td>90(41.1)</td>
</tr>
<tr>
<td>Women on ARV can use sterilization method</td>
<td>126(57.3)</td>
<td>93(42.5)</td>
</tr>
<tr>
<td>Sterilization needs mild surgical procedure</td>
<td>74(33.8)</td>
<td>145(66.2)</td>
</tr>
</tbody>
</table>

d) Knowledge of respondents on LAPM

The proportion of women with higher knowledge on LAPM was 53 (69.9%); while 53 (24.2%) and 13 (5.9%) had moderate and lower knowledge, respectively. Nearly 219 (64%) had ever heard of LAPM. A small number of women had ever heard of permanent methods- female sterilization (37%) and vasectomy (17.8%). However, only six in ten of the women knew the right time to have female sterilization. With regard to sources of information, most of the women (95%) had heard of LAPM from a health institution followed by media (44.3%). The reasons for LAPM utilization were for child limiting (70.5%) and child spacing (84.7%). Most of the women, 96.8% and 70.8%, had positive knowledge
on the effectiveness of implants and IUCD for prevention of pregnancy, respectively.

e) Attitude of the respondents towards LAPM utilization

The overall attitude showed that only 3 in 10 of the respondents had positive attitude towards LAPM utilization. Eighty six percent of the women believed that HIV positive women can use LAPM; while in contrast, 30% believed that short term contraceptives are more comfortable than LAPM for HIV positive women. In addition, 53% considered that LAPM can delay fertility when a need arises. Only half of the respondents believed that their partners have to have vasectomy given that they need no more children [Table 4].

<table>
<thead>
<tr>
<th>Table 4 : Attitude of HIV positive women towards LAPM utilization in Tigray Public hospitals, 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attitude statements (n=343)</strong></td>
</tr>
<tr>
<td>HIV positive women can use LAPM</td>
</tr>
<tr>
<td>HIV positive women on ART can use LAPM</td>
</tr>
<tr>
<td>LAPM use can cause infertility</td>
</tr>
<tr>
<td>Higher child deaths should not be compensated by many births</td>
</tr>
<tr>
<td>Men should share the responsibility of taking vasectomy</td>
</tr>
<tr>
<td>Short acting methods is more comfortable than LAPM for HIV positive women</td>
</tr>
<tr>
<td>HIV positive women who use LAPM get abandoned by their husbands</td>
</tr>
<tr>
<td>LAPM use among couple results disagreement</td>
</tr>
<tr>
<td>Couple should have discussion before LAPM use</td>
</tr>
<tr>
<td>Partners should approve family planning use</td>
</tr>
</tbody>
</table>

f) LAPM utilization and integration

Ever users of any contraceptives were 76%; but, only 30% had utilized LAPM. Among the LAPM users, 80% of them were using implants followed by IUCD (13%). With regard to intention of using LAPM, 50% reported that they were using it since it is effective, but 11% of them were using it with the influence of health professionals. The most frequent reasons for non-use of LAPM among the eligible women were preference of short-acting methods (88%), husband’s objection (4%) and fear of side effects (5.8%) [Table 5].

<table>
<thead>
<tr>
<th>Table 5 : LAPM Utilization among HIV positive women in Tigray Public hospitals, 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Characteristics</strong></td>
</tr>
<tr>
<td><strong>Ever use of contraceptive methods (n=343)</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td><strong>Use of LAPM (n=102)</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td><strong>Type of LAPM (n=102)</strong></td>
</tr>
<tr>
<td>IUCD</td>
</tr>
<tr>
<td>Implant</td>
</tr>
<tr>
<td>Female sterilization</td>
</tr>
<tr>
<td><strong>Integration of FP with ART services (n=102)</strong></td>
</tr>
<tr>
<td>Integrated</td>
</tr>
<tr>
<td>Not integrated</td>
</tr>
<tr>
<td><strong>Intention to use LAPM in the future (n=241)</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td><strong>Counselled by health professionals on LAPM (n=241)</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td><strong>Time of counseling (n=241)</strong></td>
</tr>
<tr>
<td>Before starting ART</td>
</tr>
<tr>
<td>After starting ART</td>
</tr>
</tbody>
</table>

Pertaining to service integration, only 37% of the women got family planning services from ART clinic. The rest received it from other clinics was separate from ART clinic. That’s, HIV positive women had visited more
clinics at different time to get family planning methods and ART.

g) Predictors of LAPM utilization

Multiple logistic regression was run over the data to identify the factors that had significant association with LAPM utilization. Knowledge, attitude, age at delivery, current CD4 count and family size were significant predictors of LAPM utilization.

Higher knowledge on- and positive attitude towards LAPM were associated with the odds of using LAPM (OR=3.2, 95% CI:1.35,7.8) and (OR=4.2, 95% CI:2.19,8.2), respectively. After controlling the effect of others, women with less CD4 cells (<200cells/mm³) (OR=2. 8, 95% CI: 1.2,6.3) and those with a desire to limit the number of children (OR=2. 1, 95% CI: 1.2,4.1) were more likely to utilize LAPM. Similarly, the odds of utilizing LAPM was higher among older women (OR=2.5, 95%: 1.9,5.4) and women with more children (OR=2.4, 95% CI: 1.2,5.08) than their counterparts [Table 6].

Table 6: Predictors of LAPM utilization among HIV positive women in Tigray Public hospitals, 2013

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>LAPM Utilization</th>
<th>OR(95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Use n(%)</td>
<td>Non use n(%)</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>58(53.2)</td>
<td>51(46.8)</td>
</tr>
<tr>
<td>Negative</td>
<td>44(18.8)</td>
<td>190(81.2)</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>3(23.1)</td>
<td>10(76.9)</td>
</tr>
<tr>
<td>Moderate</td>
<td>11(20.8)</td>
<td>42(79.2)</td>
</tr>
<tr>
<td>High</td>
<td>79(51.6)</td>
<td>74(48.4)</td>
</tr>
<tr>
<td>Age at delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;18y</td>
<td>21(22.1)</td>
<td>74(77.9)</td>
</tr>
<tr>
<td>≥18y</td>
<td>81(32.7)</td>
<td>167(67.3)</td>
</tr>
<tr>
<td>Family size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than four</td>
<td>58(25.3)</td>
<td>171(74.7)</td>
</tr>
<tr>
<td>Four and above</td>
<td>44(38.6)</td>
<td>70(61.4)</td>
</tr>
<tr>
<td>Current CD4 count (cells/mm³)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;200</td>
<td>31(55.4)</td>
<td>25(44.6)</td>
</tr>
<tr>
<td>≥200</td>
<td>71(24.7)</td>
<td>216(75.3)</td>
</tr>
<tr>
<td>Need of more children in the future</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>44(24)</td>
<td>139(76)</td>
</tr>
<tr>
<td>No</td>
<td>58(36.2)</td>
<td>102(63.8)</td>
</tr>
</tbody>
</table>

*p<0.05

IV. DISCUSSION

Long Acting and Permanent Contraceptive utilization was 29.7%. Positive attitudes towards LAPM, knowledge on LAPM, age at delivery, the desire to limit the number of children and less CD4 count were predictors of LAPM utilization among HIV positive women. The integration of family planning service with ART was poor.

The current study indicates that a considerable number of HIV positive women heard of IUCD (63.5%), female sterilization (63.5%) and male sterilization (17.8%). In addition, the Ethiopian women have more knowledge on short acting contraceptives [9,19]. However, this finding was inconsistent with a study done in South Africa, in which the utilization for IUCD ranges from 26-41% [16-18]. A study in South Africa showed that 93% of the participants heard about female sterilization and 28% about male sterilization [18]. The discrepancy could be due to the differences in the characteristics of study participants and nature of study settings and health system.

The current study found that LAPM utilization increases as the age of the participant increases. Similar finding was reported by a study done in South Africa, which shows that IUCD awareness was significantly associated with age [18]. It’s obvious that women in Ethiopia start to give birth since the early age. Thus, They are more likely to use the LAPM since they would have enough number of children as their age goes on.

Attitude is the proximate predictor of LAPM utilization. If women have a positive attitude towards LAPM, they are more likely to utilize it. Working on avoiding misconception related to LAPM is crucial to
enhance the utilization of LAPM. For instance, the current study reported that more women had misconception that LAPM may cause infertility. Our study indicated a promising thing in which only 38% of the respondents had negative attitude towards LAPM utilization. The same is true in case of Pretoria where 79% and 76% had a favorable attitude towards IUCD utilization and female sterilization, respectively [13].

In the current study, a majority of the respondents (90.7%) agreed that women on ART can use LAPMs. This finding was higher as compared to a study done in Cape Town which showed that more than half of participants were either unaware of or unsure that women ART can use an IUCD [13]. Apart from this, 30.3% of the participants in this study believed that short acting contraceptive methods are more comfortable than LAPMs for HIV positive women. This is consistent with the finding in Cape Town where 44.1% of HIV positive participants were either unaware or unsure that sterilization is a more effective method of contraception than the injection [13].

The use of ART was associated with almost 80% increased risk of pregnancy since the health of the women gets improved [5]. Moreover, Ethiopia is a third country in which many HIV positive individuals reside-[7] - and has also set a plan in the HSDP IV to increase CPR from 32% in 2010 to 66% by the year 2015 [20]. However, LAPM utilization in this study is only 29.7%. This implies that the government of Ethiopia should work more on increasing the contraceptive utilization so as to reduce the unplanned pregnancies and maternal mortality. In addition, LAPM utilization among HIV positive women should be more than the general population to avert vertical transmission of the disease [20,21].

There is a good initiative from the Ethiopian government in which currently it allows the health extension workers to insert Implanon and this would increase accessibility of the methods to reach the remote areas. The same is true in this study that only 12.7% were using IUCD, while (80.4%) had used Implanon. In our study, however, the utilization of IUCD is higher than studies done in Pretoria (1%) -[22] - and there was no user of IUCD in a study done in Cape Town [15, 25]. In the current study, only 7% of the study participants used female sterilization. But, this is consistent with three studies done in Cape Town and Pretoria in which 7.1%, 10%, and 13% of the HIV positive women used female sterilization [13,18,22].

In Ethiopia, most of the maternal health services are provided by the government at not cost. Obtaining the participation of the private health care sector in the provision of maternal health service, including LAPM could create a chance for women for easily accessibility of the services and it would be reachable to the population. On the contrast, in Nairobi only 10% of the HIV positive mothers got the contraceptives from government health institution [15].

Providing appropriate counseling for HIV positive women about LAPM could increase the number of family planning users. But, there were different reasons why women were using or not using LAPM. The most frequently mentioned reasons for using LAPM were awareness of the effectiveness of the methods and thorough counseling from health professionals. Similar findings were reported in Tigray region, though the study was not limited to HIV positive women [23]. Among the reasons for not using LAPM, fear of insertion and removal, uncertainty of the safety for health and their effectiveness and influence of partners were some of the frequent ones. These findings are comparable with other studies in which 30.3% of the participants believed that short acting contraceptives are more comfortable than LAPM for HIV positive women and 3.7% of the respondents also mentioned fear of side effect is one of the barriers for utilization [13].

Fifty four percent of the HIV positive mothers in this study wanted to have more children in the future which is also consistent with a study done in Tigray region [23]. But, this was inconsistent with studies done in Nairobi and Swaziland in which 86% of the HIV positive women don’t want to get pregnant for the next two years and 39.9% don’t intend for future fertility [15,24]. This dissimilarity may be attributable to the differences in the study and population settings, including the access to health, level of awareness, sociodemographic characteristics of the women and etc.

This finding indicates that HIV positive women who had CD4 cells less than 200cells/mm² were more likely to use LAPM as compared with those who had higher CD4 cells. Moreover, the majority of LAPM users had a BMI less than 18.5 kg/m² (56.9%). As CD4 count is the indicator of viral suppression, having more CD4 count indicates that the health of the mothers is improved. Thus, they may feel to have more children. Moreover, a significant number of HIV positive women (53.2%) want to have a child for the future and one-third of household had a family size of five and more.

In our study, HIV positive women who had a higher knowledge were more likely to use LAPM and this is consistent with a study done in Rwanda which showed a greater rate of LAPM utilization as knowledge of mothers on the contraceptive methods increases [8].

While the Ethiopian family planning national guidelines advocate for dual family planning methods to prevent HIV/STI transmission and unintended pregnancies for HIV positive mothers [18], only 26% of the women were using condom together with other types of family planning methods. In addition, 2 in 5 women had an unintended pregnancy in their latest one. Increasing access to family planning and reducing
unintended pregnancies among HIV clients have a number of economic benefits [25].

A systematic review of 16 studies found that integration of family planning with HIV services had a positive contribution to the increase of HIV testing, quality of services, reduction of costs, condom and contraceptive use. It also has a potential role in reducing unwanted pregnancy, vertical transmission and health care costs [25,26]. In a study done in Tigray region, nearly half of the HIV positive women got their FP from ART clinic [23]. But, integration of family planning with the ART clinic was lower in our study which is only 37.3%. Moreover, findings from checklist also indicate that most of the hospitals don’t have enough number of trained health professionals on LAPM, LAPM contraceptive methods and adequate IEC material in all ART clinics.

The study may have a limitation in that the partners’ influence on the use of family planning was not addressed in this study. In addition, some of the data for the sensitive issues such as abortion might not be valid. However, we are confident that this limitation wouldn’t have a negative influence on the findings given that the study attempted to cover all other attributes that may be associated with LAPM.

V. Conclusion

LAPM utilization was low in the northern region of Ethiopia. Negative attitude towards LAPM, fear of developing side effects, partners objection, improvement in health and preference of short acting contraceptive influenced women not to use LAPM. Integration of family planning services with ART program was poor.

VI. Acknowledgement

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Competing interests

The authors declare that they have no any competing interests.

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3. Submission of Manuscripts,
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- As a outline of job done, it is always written in past tense
- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
- Center on shortening results - bound background information to a verdict or two, if completely necessary
- What you account in an conceptual must be regular with what you reported in the manuscript
- Exact spelling, clearness of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else

Introduction:

The Introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
- Sort out your thoughts; manufacture one key point with every section. If you make the four points listed above, you will need a least of four paragraphs.
● Present surroundings information only as desirable in order hold up a situation. The reviewer does not desire to read the whole thing you know about a topic.
● Shape the theory/purpose specifically - do not take a broad view.
● As always, give awareness to spelling, simplicity and correctness of sentences and phrases.

**Procedures (Methods and Materials):**

This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt for the least amount of information that would permit another capable scientist to spare your outcome but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section. When a technique is used that has been well described in another object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text all particular resources and broad procedures, so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step by step report of the whole thing you did, nor is a methods section a set of orders.

**Materials:**

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

**Methods:**

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that’s all.

**Approach:**

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer’s interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

**What to keep away from**

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

**Results:**

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently. You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.
Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report.
- If you desire, you may place your figures and tables properly within the text of your results part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts.
- Despite of position, each figure must be numbered one after the other and complete with subtitle.
- In spite of position, each table must be titled, numbered one after the other and complete with heading.
- All figure and table must be adequately complete that it could situate on its own, divide from text.

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The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a argument should be. Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly described. Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved with prospect, and let it drop at that.

- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

- When you refer to information, differentiate data generated by your own studies from available information.
- Submit to work done by specific persons (including you) in past tense.
  - Submit to generally acknowledged facts and main beliefs in present tense.
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