KNOWLEDGE, ATTITUDE AND PRACTICE OF EMERGENCY CONTRACEPTIVES AMONG FEMALE UNIVERSITY STUDENTS IN ETHIOPIA: A SYSTEMATIC REVIEW AND META-ANALYSIS

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ABSTRACT

BACKGROUND: Unwanted pregnancy followed by unsafe abortion is one of the major worldwide health problems, which has many negative consequences on the health and well-being of women. Emergency contraception is a type of modern contraception that is indicated after unprotected sexual intercourse when regular contraception is not in use. This study summarized the knowledge, attitude and practice of ECs among female university students in Ethiopia.

METHODS: A systematic review and meta-analysis of observational studies were conducted. Original studies were identified using databases of PubMed, Medline, Embase, Cinahl and Web of science. Heterogeneity across studies was checked using Cochrane Q test statistic and I² test. The pooled prevalence of the knowledge, attitude and practice of ECs methods were computed using a random effect model.

RESULTS: A total of 321 articles were retrieved through the initial search strategy, producing 15 observational studies from universities of Ethiopia for analysis. Based on the studies included in the meta-analysis, the pooled prevalence of level of knowledge, attitude and magnitude of utilization of ECs were 57.7% (95% CI: 49.8 to 65.3), 42.6% (95% CI: 41.4 to 43.8) and 9.2% (95% CI: 6.6 to 12.6), respectively. On the other hand, significant heterogeneity was observed between studies (Q = 664.9, p = 0.000, I² = 97.9%).

CONCLUSION: This meta-analysis revealed that the pooled prevalence of level of knowledge, attitude and the magnitude of utilization of ECs were relatively low among female university students in Ethiopia. Hence, behavioral change strategies should be considered by responsible bodies to improve knowledge and bring attitudinal change on use of emergency contraception.

KEYWORDS: Emergency contraceptives, Knowledge, Attitude, Practice, Meta-analysis, Systematic review, Ethiopia.

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INTRODUCTION
Unwanted pregnancy is an important public health issue in both developed and developing countries because of its negative association with social and health outcomes for both mothers and children as well as the society as a whole. Unintended pregnancies in higher education students pose a major public health problem in the developed and developing countries including Ethiopia, and are associated with far-reaching effects such as jeopardizing students’ educational progress and future careers. In about half of all unwanted pregnancies, conception occurs due to inadequate guidance to use contraception effectively, including the users’ inability to address their feelings, poor attitudes towards contraceptives, and lack of motivation. In spite of the availability of contraceptives with affordable costs and Ethiopian government’s effort to prevent unwanted pregnancies and abortion among youths, there is a large number youths’ with unwanted pregnancies and unsafe abortion.

Emergency contraceptive (EC) is any method of contraception which is used after intercourse and before the potential time of implantation. It plays a vital role in preventing unintended pregnancy, which in turn helps to reduce unintended child birth and unsafe abortion, which are major problems of maternal health. It is found to be effective and can prevent at least 75% of expected pregnancies if used as soon as possible after unprotected sexual intercourse, especially within 72 hours of unprotected sexual intercourse. Various studies have reported the level of knowledge, attitude and practice of EC among university students in Ethiopia. It is important to have summarized evidence on these studies to extract valuable information, which helps concerned bodies to identify existing gaps and propose supplementary strategies to increase the availability, accessibility and utilization of EC in Ethiopia. Therefore, the purpose of this study is to summarize the level of knowledge, attitude and practice of ECs among female university students in Ethiopia.

METHODS
The present research is a systematic review and meta-analysis on the knowledge, attitude and practice of EC among university students of Ethiopia. The researcher systematically searched studies published and unpublished observational studies on the level of knowledge, attitude and practice of EC among female university students in Ethiopia. English language publications in the PubMed, MEDLINE, EMBASE, CI-NAH, and Web of science databases were identified and cross-checked with reference lists containing combinations of the key words “knowledge”, “attitude”, “practice”, “emergency contraceptive”, “university students”, and “Ethiopia”. In addition, a search was also made for cross-reference lists of identified original articles and reviews of articles. The data search was performed from July 25 to August 30, 2016. Reference list of published studies was evaluated to increase sensitivity and to select more studies. An independent researcher did search evaluation randomly and it was confirmed that no studies were excluded. This meta-analysis is reported in accordance with the MOOSE guidelines. Endnote X7 was used to maintain and manage our library.

A systematic review and meta-analysis were made on
cross-sectional studies that were focused on the knowledge, attitude and practice of EC among female university students of Ethiopia. Every accessible article that reported knowledge, attitude and practice of EC among university students of Ethiopia was included in the meta-analysis without restriction based on publication date. Researchers carefully assessed entire text or summary of all searched articles, documents, and reports and the related articles were selected. Studies were excluded from the analysis for any of the following reasons: articles focused on other than ECs, meta-analysis or systematic reviews; articles consisted of comments, editorials, or duplicate publication of the same study; articles in which response rate was less than 80% and articles available only in abstract form. The selection of articles for review was done in three stages: titles alone, abstracts, and then full-text articles.

Concerning quality evaluation, the related studies in terms of titles and contents, a checklist, which is adapted from a previous study, was applied. To evaluate the quality of documents; objective of every research, study method, sample size, sampling method, data collection tool, variables evaluation status, studied target group, and analysis status were examined using 10 questions (one score for each question). According to this checklist, maximum score is 10 and minimum acceptable score is 8 (24). Finally, articles obtaining minimum score and above were selected and their respective information was extracted and analyzed. Data was extracted in terms of article title, first author, study year, total sample size, research method and place, level of knowledge, attitude and practice of EC. Data was entered in Excel spreadsheet.

Data synthesis for meta-analyses was performed using the random effect model with available data presented in a Forest plot. Prevalence rate of level of knowledge, attitude and practice of ECs in every study was calculated. Finally, heterogeneity index was determined using Q test and I² index, which describes the percentage of variation not because of sampling error across studies. An I² value above 75% indicates high heterogeneity. Meta-analysis was conducted by using a random-effects model (to account for heterogeneity) conducted using Comprehensive Meta-Analysis V2.exe.Ink (Biostat, Englewood, NJ 07631 USA).

Finally, point estimation of level of knowledge, attitude and practice of ECs with confidence interval of 95% was calculated by using forest plots. In this plot, square size represents weight of every study, which had positive association with the sample size and lines to both sides of it represent confidence interval of 95% of the reported prevalence, and the diamond below the graph shows the pooled average. Sensitivity analysis was also conducted to estimate the effect of each individual study in the pooled prevalence estimation.

RESULTS

A total of 321 citations were retrieved through electronic database screening and ten additional articles were also manually obtained. Of these 331 articles, 255 were excluded after screening by titles and abstracts. These were duplicated studies, case reports and reviews. Finally, 15 articles that met all of the eligibility criteria were used for the meta-analysis. All of the 15
studies selected for the analysis were cross sectional. Table 1 and a PRISMA flow chart outlining the details studies with a total population of 8,157 subjects. The related to the selection process are presented in Figure characteristics of each included study are reported in 1.

Table 1 and a PRISMA flow chart outlining the details related to the selection process are presented in Figure 1.

<table>
<thead>
<tr>
<th>ID</th>
<th>First author</th>
<th>Publication year</th>
<th>Study Setting</th>
<th>Sample size</th>
<th>Score quality</th>
<th>Parameter studied and their prevalence on EC</th>
<th>Attitude towards EC</th>
<th>Utilization of EC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dejene (13)</td>
<td>2010</td>
<td>Adama</td>
<td>660</td>
<td>8</td>
<td>Ever heard about EC, 46.8%</td>
<td>Positive attitude, 62.9%</td>
<td>Ever Used EC, 4.7%</td>
</tr>
<tr>
<td>2</td>
<td>Fatuma (11)</td>
<td>2012</td>
<td>Addis Ababa</td>
<td>368</td>
<td>9</td>
<td>Ever heard of EC, 84.2%</td>
<td>Positive attitude towards EC, 32.3%</td>
<td>Used EC, 7.33%</td>
</tr>
<tr>
<td>3</td>
<td>Ejara (18)</td>
<td>2013</td>
<td>Hawasa</td>
<td>776</td>
<td>8</td>
<td>Had knowledge about EC, 72.2%</td>
<td>-</td>
<td>Ever used EC, 5.3%</td>
</tr>
<tr>
<td>4</td>
<td>Nasir (9)</td>
<td>2014</td>
<td>Jimma</td>
<td>389</td>
<td>8</td>
<td>Ever heard or knew EC, 41.9%</td>
<td>Willing to use EC at times of need, 29.8%</td>
<td>Used the EC method, 6.8%</td>
</tr>
<tr>
<td>5</td>
<td>Jimma (12)</td>
<td>2013</td>
<td>Ambo</td>
<td>350</td>
<td>9</td>
<td>Had ever heard about EC, 62.5%</td>
<td>Plan to use if needed, 21.2%</td>
<td>Utilized EC, 36.5%</td>
</tr>
<tr>
<td>6</td>
<td>Belaynew (19)</td>
<td>2012</td>
<td>Gondar</td>
<td>623</td>
<td>9</td>
<td>Had heard about EC, 67%</td>
<td>Believe that EC can prevent pregnancy, 30.7%</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Marta (16)</td>
<td>2015</td>
<td>D/Markos</td>
<td>599</td>
<td>8</td>
<td>Had good knowledge, 62.5%</td>
<td>Positive attitude towards EC, 53.8%</td>
<td>Ever used EC, 11.4%</td>
</tr>
<tr>
<td>8</td>
<td>Wegene (8)</td>
<td>2007</td>
<td>AAU/Unity U</td>
<td>774</td>
<td>8</td>
<td>Have heard about EC, 43.5%</td>
<td>Positive attitude towards, 53%</td>
<td>Ever used EC, 4.9%</td>
</tr>
<tr>
<td>9</td>
<td>Bisrat (24)</td>
<td>2016</td>
<td>Mizan-Tepi</td>
<td>540</td>
<td>8</td>
<td>Ever heard about EC, 67.8%</td>
<td>Positive attitude towards EC, 46.8%</td>
<td>Utilized EC, 12.6%</td>
</tr>
<tr>
<td>10</td>
<td>Berhanu (21)</td>
<td>2011</td>
<td>Haramaya</td>
<td>572</td>
<td>8</td>
<td>Ever heard about EC, 46.6%</td>
<td>Positive attitude towards EC, 36.4%</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Tewodros (23)</td>
<td>2015</td>
<td>Wachamo</td>
<td>424</td>
<td>8</td>
<td>High levels of knowledge about EC, 49.8%</td>
<td>Positive attitudes towards EC, 47.6%</td>
<td>Used EC, 13.9%</td>
</tr>
<tr>
<td>12</td>
<td>Zeleke (20)</td>
<td>2009</td>
<td>Bahir dar</td>
<td>400</td>
<td>9</td>
<td>Heard about EC, 83.5%</td>
<td>Positive attitude towards EC, 62.3%</td>
<td>Utilized EC, 22.75%</td>
</tr>
<tr>
<td>13</td>
<td>Gelaye (15)</td>
<td>2014</td>
<td>Wolaita</td>
<td>493</td>
<td>8</td>
<td>Ever heard of EC, 44%</td>
<td>-</td>
<td>Used EC, 9.5%</td>
</tr>
<tr>
<td>14</td>
<td>Giziyenesh (22)**</td>
<td>2014</td>
<td>Aksum</td>
<td>628</td>
<td>8</td>
<td>Good knowledge about EC, 27.2%</td>
<td>Had positive attitude EC, 12.4%</td>
<td>Ever used EC, 14.7%</td>
</tr>
<tr>
<td>15</td>
<td>Etenesh (14)**</td>
<td>2009</td>
<td>Mekelle</td>
<td>561</td>
<td>8</td>
<td>Aware of EC, 44.7%</td>
<td>Had positive attitude towards EC, 33.9%</td>
<td>Had ever used EC before, 5.7%</td>
</tr>
</tbody>
</table>

*EC - Emergency contraceptive, ** - unpublished thesis studies
Records identified through database searching (n = 321)

Additional records identified through other sources

Records after duplicates removed

Records screened

Records excluded (n = 255)

Full-text articles assessed for eligibility (n = 20)

Full-text articles excluded for not meeting the inclusion criteria

Studies included in qualitative synthesis (n = 15)

Studies included in quantitative synthesis (meta-analysis)

Figure 1: A flowchart describing selection of studies for the systematic review and meta-analysis identification, screening, eligibility and inclusion).

*Articles may have been excluded for more than one reason
Figure 2: Forest plot of studies related to knowledge regarding emergency contraceptives among university students in Ethiopia. Rectangles indicate point prevalence and size of the rectangles represent the weight given to each study in the analysis; the diamond indicates the combined point prevalence and horizontal lines indicate 95% confidence interval.

Figure 3: Forest plot of studies related to attitude towards emergency contraceptives among female university students in Ethiopia. Rectangles indicate point prevalence and size of the rectangles represent the weight given to each study in the analysis; the diamond indicates the combined point prevalence and the horizontal lines indicate 95% confidence interval.
Knowledge regarding emergency contraceptive shown and hence were included in the assessment. In the assessment all of the 15 studies included some form of assessment regarding knowledge about ECs. Overall, the prevalence of level of knowledge about EC was 57.7% (95% CI: 49.8 to 65.3) see Figure 2. The highest level of knowledge (awareness) regarding ECs was reported from Addis Ababa University in 2012 with 84.2% (95% CI: 80.2 to 87.6) and the lowest level reported from Aksum University in 2014 with 23.4% (95% CI: 20.3 to 26.9). Significant heterogeneity was observed between studies (Q = 526.4, p = 0.000, I^2 = 97.7%) and consequently the random effect model was employed for the meta-analysis.

DISCUSSION

In many low income countries lack of knowledge about Attitude towards emergency contraceptive indicates, and inadequate access to EC has resulted in women among the 15 studies included in the meta-analysis, 13 resorting to unsafe or illegal abortions\textsuperscript{25}. In this systematic review and meta-analysis 15 studies aimed at as-

<table>
<thead>
<tr>
<th>First author</th>
<th>Event rate</th>
<th>Lower limit</th>
<th>Upper limit</th>
<th>p-Value</th>
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<tbody>
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<td>Dejene, 2010</td>
<td>0.047</td>
<td>0.033</td>
<td>0.066</td>
<td>0.000</td>
</tr>
<tr>
<td>Fatuma, 2012</td>
<td>0.073</td>
<td>0.051</td>
<td>0.109</td>
<td>0.000</td>
</tr>
<tr>
<td>Ejor, 2013</td>
<td>0.053</td>
<td>0.039</td>
<td>0.071</td>
<td>0.000</td>
</tr>
<tr>
<td>Nair, 2014</td>
<td>0.028</td>
<td>0.016</td>
<td>0.050</td>
<td>0.000</td>
</tr>
<tr>
<td>Jimma, 2013</td>
<td>0.211</td>
<td>0.122</td>
<td>0.257</td>
<td>0.000</td>
</tr>
<tr>
<td>Marta, 2015</td>
<td>0.114</td>
<td>0.060</td>
<td>0.142</td>
<td>0.000</td>
</tr>
<tr>
<td>Wogen, 2007</td>
<td>0.049</td>
<td>0.038</td>
<td>0.067</td>
<td>0.000</td>
</tr>
<tr>
<td>Besrat, 2016</td>
<td>0.136</td>
<td>0.100</td>
<td>0.157</td>
<td>0.000</td>
</tr>
<tr>
<td>Tevdos, 2015</td>
<td>0.139</td>
<td>0.109</td>
<td>0.175</td>
<td>0.000</td>
</tr>
<tr>
<td>Zeke, 2009</td>
<td>0.227</td>
<td>0.199</td>
<td>0.271</td>
<td>0.000</td>
</tr>
<tr>
<td>Gelaye, 2014</td>
<td>0.056</td>
<td>0.012</td>
<td>0.125</td>
<td>0.000</td>
</tr>
<tr>
<td>Gayenesh, 2012</td>
<td>0.116</td>
<td>0.101</td>
<td>0.132</td>
<td>0.000</td>
</tr>
<tr>
<td>Etenesh, 2012</td>
<td>0.012</td>
<td>0.001</td>
<td>0.022</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Figure 4: Forest plot of studies related to utilization of emergency contraceptives by female university students in Ethiopia. Rectangles indicate point prevalence and size of the rectangles represent the weight given to each study in the analysis; the diamond indicates the combined point prevalence and the horizontal lines indicate 95% confidence interval.
Assessing the level of knowledge, attitude and practice of ECs were selected and included. The evidence from the selected articles of meta-analysis, the pooled level of knowledge, attitude and magnitude of utilization of ECs were 57.7, 42.6 and 9.2%, respectively.

Level of awareness regarding ECs has tremendous impact on the utilization of EC. In this meta-analysis the overall pooled prevalence of knowledge about ECs was 57.7% (95% CI: 49.8 to 65.3). This finding reveals that more than two fifth of the respondents do not have awareness regarding EC methods. There was variation in the level of awareness among universities in Ethiopia, the highest level of knowledge was observed in Addis Ababa University (84.2%) but the lowest level in Aksum University (23.4%). This variation may be due to a difference in proximity of the respondents to sources of information that can influence awareness on ECs. The pooled prevalence of awareness regarding ECs was relatively higher as compared to the results of studies conducted in universities of Ghana (43.2%)\textsuperscript{26}, Uganda (45.1%)\textsuperscript{27} and South Africa (56.5%)\textsuperscript{28} but relatively lower than those of many other studies conducted among university students found in Nigeria (67.8%)\textsuperscript{29}, Cameroon (63%)\textsuperscript{30}, Nepal (66%)\textsuperscript{31} and Mexico (95%)\textsuperscript{32}.

Although EC is not recommended as a routine family planning method, it is a very useful method after unprotected sexual intercourse to reduce the chance of unplanned or unwanted pregnancies\textsuperscript{29}. Emergency contraceptive is an effective means of preventing unwanted pregnancies, but unfortunately, the large numbers of university students are unaware of it. In this meta-analysis, the pooled prevalence of practice of EC among participants of the studies is very low 9.2% (95% CI: 6.6 to 12.6). The possible reason for low EC utilization rate could be due to the fact that, less proportion sexually active participants, lack of awareness of its use and side effects, lack of correct information, low health promotion and availability of the methods in most health institutions. The pooled utilization of EC among university students was relatively higher in studies conducted in South African (28%)\textsuperscript{34} but lower than in studies conducted in Cameroon (7.4%)\textsuperscript{30}, Nigeria (5.7%)\textsuperscript{35}.

This study does have several limitations with all pooled analyses containing significant heterogeneity and subsequently should be interpreted with caution. The results should considered generalizable as they include a broad geographical cross-section from Ethiopia. Potential factors contributing to the variability include location (setting), time of the study and characteristics of the population. Such heterogeneity is to be expected though considering the diverse cultures and ethnic
groups found in Ethiopia. Although many would argue that in the presence of such significant heterogeneity a meta-analysis should not be presented, the researchers believe that providing the reader with the pooled prevalence estimates and a caution relating to the presence of heterogeneity will allow them to obtain a broad perspective examining the level of knowledge, attitude and utilization of EC among university students. However, the researchers believe that this review still provides the reader with an overview of the current available evidence and highlights. There is also a potential gap due to reporting biases that need to be considered in future investigations and research.

CONCLUSION
The results of this meta-analysis indicate that the overall level of knowledge, attitude and especially the practice on EC among university students was very low. Based on the findings, it is crucial to develop a strategy to increase awareness, positive attitude, need based practice of ECs and decrease barriers among respondents.

CONFLICT OF INTEREST
The authors declare that there is no conflict of interests in this study.

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