Utilization and contributing factors of sexual and reproductive health services in Ethiopia during COVID-19 pandemic: A systematic review and meta-analysis

Dessie Abebaw Angaw (dessieabebaw96@gmail.com)
University of Gondar, college of medicine and health science, institute of public health, Gondar, Ethiopia
https://orcid.org/0000-0001-9827-2255

Berhanu Fikadie Endehabtu
Institute of Public health, college of medicine and health sciences, University of Gondar

Tajebew Zayede Gonete
University of Gondar College of Medicine and Health Sciences

Kassahun Dessie
University of Gondar College of Medicine and Health Sciences

Meskerem Jisso
Hawassa University College of Medicine and Health Sciences

Alemu Tamiso
Hawassa University College of Medicine and Health Sciences

Elias Yesuf
Jimma University College of Public Health and Medical Sciences

Netsanet Abera
Hawassa University College of Medicine and Health Sciences

Biru Abdisa
Jimma University College of Public Health and Medical Sciences

Habtamu Sime
Jimma University College of Public Health and Medical Sciences

Jessika Yin
World health organization-Ethiopia, health system strengthening Unit, Addis Ababa

Kassu Ketema Gummu4
World Health Organization-Ethiopia, Health system strengthening Unit

Binyam Tilahun
University of Gondar College of Medicine and Health Sciences

Research Article
Abstract

**Background:** The COVID-19 pandemic has reduced access to and utilization of essential health services, including sexual and reproductive health services. The indirect supply-side and demand-side effects of the coronavirus pandemic has shown moderate service reduction scenarios can lead to a large number of additional maternal deaths.

**Objective:** Determine the pooled proportion and contributing factors of sexual and reproductive health care in Ethiopia during the COVID-19 pandemic was the primary goal of this systematic review and meta-analysis.

**Methods:** The Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA-2020) statement guided the conduct of this systematic review and meta-analysis. Electronic databases like SCOPUS, EMBASE, PubMed, and Science Direct were used to search for the papers. Studies were searched utilizing additional data sources such as Google scholar’s advanced search and Google. The COVID 19 period and the latest search dates of June 6, 2022 were used for the primary research.

Heterogeneity was evaluated using $I^2$ and Q-statistics. Wherever possible subgroup analysis was planned by study setting, and overall risk of bias (study quality). To test the small study effect; funnel plot and egger's test were applied in the Meta-analysis

**Result:** A total of six studies with 3848 participants included in this Meta-analysis. the pooled proportion of sexual and reproductive health service utilization reported by 6 studies was 32% (95%CI (18,46%)). In the sub group analysis, the pooled proportion of SRH service utilization for study done at the community level was 26% (95% Cl:6-46%) and 38% (95% Cl: 26-50%) among institutional based studies. Participants age 20-24 (OR=2.4 95% CI:1.07-5.3) Participate in youth club (OR=2.74; 95% CI:10.07-6.99), Ever had sexual partner (OR=1.65; 95% CI:1.11-2.45), Participated in peer-to-peer education (OR=1.71; 95% CI:1.12-2.62), and having pocket money (OR=2.5;3 95% CI:1.03-6.19) where variables had positively associated with sexual and reproductive health service utilization.

**Conclusion:** The pooled SRH service utilization in Ethiopia during COVID 19 was decreased compared to SRH service utilization before the pandemic. Participants age 20-24, Participate in youth, ever had sexual partner, participated in peer-to-peer education, and having pocket money where variables had positively associated with sexual and reproductive health service utilization.

**Background**

Ethiopia has made promising progress towards achieving universal health coverage, particularly in access to and utilization of maternal and child health services, over the past decades. There is an increase in the use of modern contraceptive methods (1, 2). The utilization of sexual and reproductive health services are key interventions to reduce maternal and child deaths through problem detection and treatment, promotion of health-seeking behaviour, and preparing pregnant women for birth (3). All women...
need access to quality care during pregnancy, childbirth and after childbirth. Besides treating complications of pregnancy and childbirth, all women, including adolescents, need access to contraception, safe abortion services, and post-abortion care (3).

The COVID-19 pandemic has reduced access to and utilization of essential health services, including sexual, reproductive and maternal health services. The indirect supply-side and demand-side effects of the coronavirus pandemic has shown moderate service reduction scenarios can lead to a large number of additional maternal deaths (4). The pandemic is already having adverse effects on the supply chain for contraceptive commodities by disrupting the manufacture of key pharmaceutical components of contraceptive methods or the manufacture of the methods themselves (e.g., condoms), and by delaying transportation of contraceptive commodities (5). In addition, equipment and staff involved in the provision of sexual and reproductive health services may be diverted to fulfil other needs, clinics may close and people may be reluctant to go to health facilities for sexual and reproductive health services (5).

Many governments are restricting people's movements to stem the spread of the virus, and providers are being forced to suspend some sexual and reproductive health services that are not classified as essential, such as abortion care, thus denying people this time-sensitive and potentially life-saving service (5, 6). An online survey done on the impact of the COVID-19 pandemic on partner relationships and sexual and reproductive health showed that 22% of participants reported a decrease in sexual desire; 41% experienced a decrease in the sexual intercourse frequency; 30% reported an increase in the frequency of masturbation; 20% reported a decrease in alcohol consumption before or during sexual activities, and 31% reported a deterioration in partner relationships during the pandemic (7).

The overall utilization of sexual, reproductive, services in Ethiopia remains low (need some additional points). This study was part of the WHO's project to strengthen essential health services during the COVID-19 pandemic. The findings of this study, would initiate evidence-informed policy dialogue among stakeholders and would support the development of evidence-informed policy briefs to address factors that influence sexual and reproductive health service utilization. Therefore, this study has addressed a research question, What was the status of sexual and reproductive health service utilization and what was the evidence base in Ethiopia on factors affecting sexual and reproductive health services utilization in Ethiopia?

**Methods**

This systematic review and meta-analysis was conducted within the Reporting Items for Systematic reviews and Meta-Analyses (PRISMA-2020) statement (1). We searched for studies of sexual and reproductive health service utilization and those factors affecting the interest of the outcome. We reviewed the literature systematically to appraise the epidemiological evidence and we estimated the status of SRH service utilization in Ethiopia. The systematic review is ongoing for registration on the PROSPERO. Epistemonikos, website (http://www.library.UCSF.edu), PubMed, and PROSPERO and
Cochrane library were explored to confirm whether previous systematic review or meta-analysis exists on maternal health service utilization.

**Eligibility criteria**

To declare the inclusion and exclusion criteria in this systematic review and meta-analysis, the researchers followed PICO ± study design filter approach mainly CoCoPop (Condition, Context, and Population) questions for prevalence studies, and PEO (population, Exposure, and outcome) for etiology and risk review.

**Inclusion Criteria’s**

**Setting**

Ethiopia, both rural and urban, community and institutional based studies.

**Study design and period**

all observational and experimental study designs was enrolled. The authors included the primary study in which the data was collected during COVID-19 started after march 13, 2020 to show the status of SRH service during the pandemic season.

**Participants**

Adolescents and youth

**Outcome**

One of sexual and reproductive health service utilization (information and education on SRH matters, consultation and provision of modern contraceptives; STIs diagnosis and management, getting VCT service, and abortion and/or postabortion care within the last 12 month)

**Exclusion criteria**

Review and qualitative studies, articles with no relevant information, articles other than English language, expert opinion studies were excluded.

**Search strategies**

The studies were searched using electronic data bases like SCOPUS: ( TITLE-ABS-KEY ( "reproductive health" OR "reproductive medicine " OR "family planning" OR contraceptive OR "sexual health" OR "sexual violence" OR "sexual abuse" OR "gender- based violence" ) ) AND TITLE-ABS-KEY ( "service utilization" OR "service use" OR "service uptake" OR "health care service" ) AND TITLE-ABS-KEY ( Ethiopia ) )
PubMed: ("Reproductive health"[Title/Abstract] OR "reproductive health medicine"[Title/Abstract] OR "reproductive health service"[Title/Abstract] OR "reproductive medicine"[Title/Abstract] OR "sexual health"[Title/Abstract] OR FGM[Title/Abstract] OR "female genital mutilation"[Title/Abstract] OR GBV[Title/Abstract] OR "Gender based violence"[Title/Abstract] OR "family planning"[Title/Abstract] OR contraceptive[Title/Abstract] OR STI[Title/Abstract] OR "sexual transmitted infection"[Title/Abstract] OR "Sexual Abuse"[Title/Abstract] OR "Sexual Assault"[Title/Abstract] OR "Sexual Violence's"[Title/Abstract] OR "Sex offense"[Title/Abstract] OR sexuality[Title/Abstract] AND ("Service utilization"[Title/Abstract] OR "service use"[Title/Abstract] OR "service uptake"[Title/Abstract] OR "sexual health service"[Title/Abstract])) AND (Ethiopia[Title/Abstract]), EMBASE: ('sexual health'/exp OR 'sexual health' OR 'gender based violence'/exp OR 'gender based violence' OR 'sexual abuse'/exp OR 'sexual abuse' OR 'sexual abuse women'/exp OR 'sexual abuse women' OR 'sexual violence'/exp OR 'sexual violence' OR 'sexual crime'/exp OR 'sexual crime' OR 'sexual crimes') AND (health care delivery'.ti,ab,kw OR service:ti,ab,kw OR 'service utilization':ti,ab,kw OR 'service use':ti,ab,kw OR 'service uptake':ti,ab,kw OR 'sexual health service':ti,ab,kw) AND ethiopia:ti,ab,kw; SCIENCE DIRECT: ("sexual health service use" OR "sexual health" OR "reproductive health" ) AND "service utilization" AND Ethiopia.

Additionally, other data sources like Google scholar using advanced search and Google were used to search studies. Additional relevant articles were identified by searching the reference lists of full-text articles and grey literatures from institutions and government websites. Primary studies which were conducted during COVID 19 and the last searched dates of June 06, 2022 were included (additional file 1).

**Study selection**

Screening of titles abstracts and full text which is a three-stage was conducted independently by two review authors (DA & BF) on the bases of these criteria. A disagreement between the two reviewers was resolved by consensus or the third reviewer (BT) made the decision regarding inclusion of the article for the final selection of studies to be included in the systematic review and meta-analysis.

**Data extraction and outcome of interest**

Two authors (DA & KD) extract data and they compared the results; discrepancies were resolved by discussion or the third reviewer (BT) made the decision. We have contacted the original authors of the eligible studies through email for further clarification of data. For each study, we extracted the following data.

i. author(s) and dates of data collection
ii. study design
iii. Ethiopian regions
iv. Study setting (community and institutional based)
v. total population participated in the study
vi. number of events from a study
vii. level of risk bias
viii. contributing (associated) factors of SRH service utilization (resident, educational level, pocket money, sex, participants age, Participate in youth club, ever had sexual partner, had a parental discussion on SRH issues, had parental discussion on SRH service, Participated in peer-to-peer education, attitude, Knowledge of SRH issues (good), and marital status)

Pooled proportion of SRH service utilization and factors affecting SRH service utilization were the outcome interest of the current systematic review and meta-analysis.

Quality assessment

All papers were selected for inclusion in the review were subjected to a rigorous, independent appraisal by the investigators before inclusion in the review. For cross-sectional studies we used BSA medical sociology group quality assessment tool which has seven quality indicators: (1) Appropriate Research Design 2) Appropriate Recruitment Strategy 3) Response Rate Reported 4) Sample Representative of Similar Population 5) Objective and Reliable Measures Used 6) Power Calculation/Justification of Numbers Reported and 7) Appropriate Statistical Analysis. Quality indicators met out of 7: 1–2 (low), 3–5 (moderate) and 6–7 (high). A second assessor (BK) was blinded to the primary assessor (DA) decision for checking the risk of bias assessment stages of the review. Any differences of opinion were discussed; otherwise, a third reviewer (BT) was available to arbitrate any issues that remained unresolved.

Statistical analysis

Data were entered in to excel 2013 and exported to Stata version 16 for meta-analysis. In the presence of between study heterogeneity, the pooled proportion of SRH service utilization, odds ratio, and corresponding 95% confidence intervals (CIs) were calculated using random-effects meta-analyses (5).

Heterogeneity was evaluated using $I^2$ and Q-statistics. Studies that have $I^2 = 0$ is considered no heterogeneity, $\leq 25$ indicates low heterogeneity, $26–50$ indicates moderate heterogeneity, $51–75$ indicates substantial heterogeneity and $>75$ indicates high heterogeneity (5–7). A leave-one-out sensitivity analysis was carried out to evaluate the influence of individual study on the overall proportion of SRH service utilization (8). Wherever possible, subgroup analysis was planned by study setting, and overall risk of bias (study quality). To test the small study effect funnel plot and egger's test were applied in the Meta-analysis (9–11).

Result

The review process and study characteristics

A total of two hundred ninety-nine potentially relevant articles from electronic data bases (84 from PubMed, 120 from SCOPUS, 51 EMBASE, and 44 from science direct. Additionally, 25 articles from website searching (9 from Google and 16 from Google scholar) were generated from the initial search. Sixty-four duplicated articles were identified and removed. Two hundred twenty-four studies were excluded based on title review (n = 197) and abstract review (n = 27) and two additional articles were not
retrieved due to inaccessibility of the full text. Then 34 records were considered for full-text review. When screening the 34 full texts; 28 were excluded due to the following reason: two studies due to duplication, three studies no relevant data, two studies due to not quantitative, twenty were due to Data collection date before covid 19, and one study were reviewed. The rest six studies met all of the inclusion criteria for methodological quality assessment, systematic review and Meta-analysis (Fig. 1).

A total of six studies with 3848 participants included in this Meta-analysis were summarized in Table 1. These six studies originated from SNNPR(8–11), Oromia(12), and Benishangul(13)(Table 1).

### Table 1

<table>
<thead>
<tr>
<th>Author (year)</th>
<th>Regions of Ethiopia</th>
<th>Types of facility</th>
<th>Total participant</th>
<th>Service utilized</th>
<th>Participants age interval</th>
<th>Level of quality after arbitrated by third reviewer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habte, 2000</td>
<td>SNNRP</td>
<td>Community based</td>
<td>1075</td>
<td>395</td>
<td>15–19</td>
<td>high</td>
</tr>
<tr>
<td>Tilahun, 2000</td>
<td>Oromia</td>
<td>Community based</td>
<td>771</td>
<td>66</td>
<td>15–24</td>
<td>high</td>
</tr>
<tr>
<td>Mesfin, 2000</td>
<td>SNNRP</td>
<td>Institutional based</td>
<td>422</td>
<td>136</td>
<td>15–19</td>
<td>high</td>
</tr>
<tr>
<td>Amaje, 2000</td>
<td>SNNRP</td>
<td>Community based</td>
<td>421</td>
<td>138</td>
<td>15–24</td>
<td>moderate</td>
</tr>
<tr>
<td>Gunta, 2020</td>
<td>SNNRP</td>
<td>Institutional based</td>
<td>759</td>
<td>378</td>
<td>20–24</td>
<td>high</td>
</tr>
<tr>
<td>Dina, 2021</td>
<td>Benishangul</td>
<td>Institutional based</td>
<td>400</td>
<td>128</td>
<td>15–24</td>
<td>moderate</td>
</tr>
</tbody>
</table>

#### Quality assessment

A summary of the risk of bias for all 6 included articles rate for each item is provided in the supplementary appendix (Additional file 2). Based on the BSA Medical Sociology Group for a cross-sectional study, the quality level of all the studies is high (four studies) and moderate (two studies). Additionally, the overall kappa statistics was 76.9% (additional file 3)

#### Sexual and reproductive health service utilization in Ethiopia

The proportion of the studies ranges between 8.5 (9) and 49.8%(12). The overall estimated proportion of sexual and reproductive health (SRH) service utilization reported by 6 studies using a fixed-effect model showed significant heterogeneity between the studies. As a result, the pooled proportion was fitted using a random effect model. Based on random effect model analysis, the pooled proportion of SRH service
utilization reported by 6 studies was 32% (95% CI (18.46%)) with significant heterogeneity between the studies ($I^2 = 99.01\%$, $p < 0.001$) (Fig. 2).

**Subgroup analysis and investigation of heterogeneity**

Subgroup analysis were performed by study facility (institutional based and community based) and quality level of the study (moderate and high) to identify the potential heterogeneity between studies. In our subgroup analysis by facility, potential concerned heterogeneity was detected across studies in the proportion of estimates of sexual and reproductive health service ($I^2 99\%$; all $p < 0.001$) According to facility based analysis the proportion of SRH service utilization was 26% (95% CI:6–46%) among studies conducted at the community level and 38% (95% CI: 26–50%) among studies conducted at the health facility level (Fig. 3). A subgroup analysis using the level of study quality did not have any difference in pooled SRH service utilization and heterogeneity level (additional file 4).

**Sensitivity analysis and Publication bias**

In our study, we employed a leave-one-out sensitivity analysis to identify the potential source of heterogeneity in the analysis of the pooled prevalence of SRH service utilization. The result showed that finding was robust in which there is no single study effect (see Fig. 6). After deletion of a single study the SRH service utilization varied between 28.4% (14.6–42.2%) and 36.8% (30.0-43.6%) (Table 3).

<table>
<thead>
<tr>
<th>Study omitted</th>
<th>Estimate (%)</th>
<th>(95% conf. interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habte A (2020)</td>
<td>31.0</td>
<td>13.8–48.3</td>
</tr>
<tr>
<td>Tilahun T. (2020)</td>
<td>36.8</td>
<td>30.0-43.6</td>
</tr>
<tr>
<td>Mesfien Y. (2020)</td>
<td>32</td>
<td>15.3–48.6</td>
</tr>
<tr>
<td>Amaje E. (2020)</td>
<td>31.8</td>
<td>15.2–48.5</td>
</tr>
<tr>
<td>Gunta M. (2020)</td>
<td>28.4</td>
<td>14.6–42.2</td>
</tr>
<tr>
<td>Dina H et al (2021)</td>
<td>32</td>
<td>15.4–48.6</td>
</tr>
<tr>
<td>Combined</td>
<td>32</td>
<td>17.7–46.3</td>
</tr>
</tbody>
</table>

A review of the funnel plots did not rule out the potential for publication bias for sexual and reproductive health service utilization (Fig. 4).

It was assessed using egger’s test. The estimated bias coefficient was 6.4 (Egger bias B = 21.4 (95% CI: -0.67-49.5)) with a standard error of 10.2, giving a $p$-value of 0.10. The test thus provides no evidence for the presence of small-study effects (Fig. 5).
Factors associated with sexual and reproductive health service utilization in Ethiopia

In this meta-analysis, all the six studies were incorporated. From these studies we found that ten factors which has an association with SRH service utilization, such as Participants age (15–19 vs 20–24) from three studies(8, 12, 13), sex(8–10), participating in youth club(8, 11), Ever had sexual partner(8–13), had a parental discussion on SRH issues(8–10, 12, 13), Participated in peer-to-peer education(9–11, 13), Knowledge of SRH issues (good vs poor)(10, 11, 13), Attitude (favorable vs not vibrable)(8, 9, 11), Marital status (married vs un married)(9, 11),and Pocket money(8, 9)
<table>
<thead>
<tr>
<th>Factor</th>
<th>Author (year)</th>
<th>Odd ratio</th>
<th>95%CI</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants age 20–24 Ref age = 15–19</td>
<td>Tilahun T,200</td>
<td>2.87</td>
<td>1.32–5.88</td>
<td>Oromia</td>
</tr>
<tr>
<td></td>
<td>Amaje E,2020</td>
<td>2.19</td>
<td>1.41–3.39</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Dina H,2021</td>
<td>2.74</td>
<td>1.52–4.95</td>
<td>Benishangul</td>
</tr>
<tr>
<td>Sex(female)</td>
<td>Habte A,2020</td>
<td>1.26</td>
<td>0.91–1.75</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Amaje E,2020</td>
<td>2.2</td>
<td>1.34–3.62</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Gunta M,2020</td>
<td>0.79</td>
<td>0.54–1.16</td>
<td>SNNPR</td>
</tr>
<tr>
<td>Participate in youth club(yes)</td>
<td>Amaje E,2020</td>
<td>5.13</td>
<td>3.94–6.69</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Mesfin Y,2020</td>
<td>1.9</td>
<td>1.21–3.09</td>
<td>SNNPR</td>
</tr>
<tr>
<td>Ever had sexual partner(yes)</td>
<td>Habte A,2000</td>
<td>1.44</td>
<td>0.98–2.13</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Tilahun T,2000</td>
<td>5.33</td>
<td>2.53–11.23</td>
<td>Oromia</td>
</tr>
<tr>
<td></td>
<td>Mesfin Y,2000</td>
<td>1.53</td>
<td>0.98–2.39</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Amaje E,2000</td>
<td>5.46</td>
<td>3.49–8.56</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Gunta M,2020</td>
<td>5.12</td>
<td>3.33–7.9</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Dina H,2021</td>
<td>1.82</td>
<td>1.25–3.26</td>
<td>Benishangul</td>
</tr>
<tr>
<td>had a parental discussion on SRH issues (yes)</td>
<td>Habte A,2000</td>
<td>3.29</td>
<td>2.36–5.59</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Tilahun T,2000</td>
<td>1.11</td>
<td>0.55–2.24</td>
<td>Oromia</td>
</tr>
<tr>
<td></td>
<td>Amaje E,2000</td>
<td>0.52</td>
<td>0.32–0.82</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Gunta M,2020</td>
<td>1.24</td>
<td>0.87–1.75</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Dina H,2021</td>
<td>3.05</td>
<td>1.94–4.7</td>
<td>Benishangul</td>
</tr>
<tr>
<td>Participated in peer-to-peer education (Yes)</td>
<td>Habte A,2020</td>
<td>2.06</td>
<td>1.47–3.89</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Mesfin Y,2020</td>
<td>2.5</td>
<td>1.6–3.94</td>
<td>SNNPR</td>
</tr>
<tr>
<td>Factor</td>
<td>Author (year)</td>
<td>Odd ratio</td>
<td>95%CI</td>
<td>Region</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>---------------</td>
<td>-----------</td>
<td>----------</td>
<td>---------</td>
</tr>
<tr>
<td>Knowledge of SRH issues (good)</td>
<td>Gunta M,2020</td>
<td>1.48</td>
<td>1.05–2.10</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Dina H,2021</td>
<td>2.27</td>
<td>1.24–4.16</td>
<td>Benishangul</td>
</tr>
<tr>
<td></td>
<td>Habte A,2020</td>
<td>2.01</td>
<td>1.45–3.03</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Mesfien Y,2020</td>
<td>1.9</td>
<td>1.19–3.19</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Dina H,2021</td>
<td>0.77</td>
<td>0.21–0.81</td>
<td>Benishangul</td>
</tr>
<tr>
<td>Attitude (positive)</td>
<td>Mesfien Y,2000</td>
<td>1.04</td>
<td>0.66–1.63</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Amaje E,2000</td>
<td>1.97</td>
<td>1.23–3.16</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Gunta M,2020</td>
<td>1.02</td>
<td>0.74–1.42</td>
<td>SNNPR</td>
</tr>
<tr>
<td>Marital status (married)</td>
<td>Mesfien Y,2000</td>
<td>4.1</td>
<td>0.87–19.57</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Gunta M,2020</td>
<td>1.76</td>
<td>0.69–4.51</td>
<td>SNNPR</td>
</tr>
<tr>
<td>Pocket money</td>
<td>Amaje E,2000</td>
<td>2.22</td>
<td>1.38–3.57</td>
<td>SNNPR</td>
</tr>
<tr>
<td></td>
<td>Gunta M,2020</td>
<td>3.29</td>
<td>2.08–5.2</td>
<td>SNNPR</td>
</tr>
</tbody>
</table>

In this study, participant age 20–24 (pooled OR = 2.38; 95% CI: 1.07–5.31), participate in youth club (pooled OR = 2.74; 95% CI: 1.07–6.99), ever had sexual partner, participated in peer-to-peer education, having positive attitude, marital status, and having pocket money (pooled OR = 2.53; 95% CI: 1.03–6.19) were significant factors affection sexual and reproductive health service utilization in Ethiopia.

The overall effect participating in youth clubs for SRH service utilization was about 2.74 times higher than those who were not participating in youth club. Similarly, the pooled effect of ever had sexual partner was about 1.7 times higher than to utilize SRH service compared to no its counterpart (Table 6 and additional file 5).
Table 6
factors associated with sexual and reproductive health service utilization based on random effect

<table>
<thead>
<tr>
<th>Factor</th>
<th>Number of studies</th>
<th>Effect size</th>
<th>95% Confidence interval</th>
<th>Heterogeneity (I² (%), p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants age 20–24</td>
<td>3</td>
<td>2.38</td>
<td>1.07–5.31</td>
<td>0.0, 0.96</td>
</tr>
<tr>
<td>Sex (female)</td>
<td>3</td>
<td>1.09</td>
<td>0.68–1.74</td>
<td>61.2, 0.08</td>
</tr>
<tr>
<td>Participate in youth club (yes)</td>
<td>2</td>
<td>2.74</td>
<td>1.07–6.99</td>
<td>26.8, 0.24</td>
</tr>
<tr>
<td>Ever had sexual partner (yes)</td>
<td>6</td>
<td>1.65</td>
<td>1.11–2.45</td>
<td>0.0, 0.80</td>
</tr>
<tr>
<td>had a parental discussion on SRH issues (yes)</td>
<td>5</td>
<td>1.18</td>
<td>0.6–2.31</td>
<td>80.9, &lt; 0.001</td>
</tr>
<tr>
<td>Participated in peer-to-peer education (Yes)</td>
<td>4</td>
<td>1.71</td>
<td>1.12–2.62</td>
<td>0.0, 0.82</td>
</tr>
<tr>
<td>Knowledge of SRH issues (good)</td>
<td>3</td>
<td>0.62</td>
<td>0.62–2.72</td>
<td>72.0, 0.03</td>
</tr>
<tr>
<td>Attitude (positive)</td>
<td>3</td>
<td>1.08</td>
<td>0.83–1.41</td>
<td>0.0, 0.44</td>
</tr>
<tr>
<td>Marital status (married)</td>
<td>2</td>
<td>1.82</td>
<td>0.28–11.83</td>
<td>0.0, 0.86</td>
</tr>
<tr>
<td>Have pocket money</td>
<td>2</td>
<td>2.53</td>
<td>1.03–6.19</td>
<td>0.0, 0.67</td>
</tr>
</tbody>
</table>

Discussion

In the current systematic review and meta-analysis, we described the proportion of sexual and reproductive health utilization in Ethiopia. This analysis comprised six trials with 3848 individuals across three Ethiopian regions. We discovered that the percentage of people using sexual and reproductive health services varied between Wolega (12) and Wolaita-Sodo (43.8%)(9).

During COVID 19 in Ethiopia, the pooled percentage of SRH service use was 32%. Before COVID 19, however, a review in Ethiopia found that the percentage was 42.7%. The impact of COVID 19 and the political unrest during that time period may be the cause of this discrepancy. Only SNNPR (8–11, 14), Oromia(12) and Benishangul studies were found in the current review (13). There was undoubtedly a war in Ethiopia's northern region, as is evident from this (Amhara, Tigray and Afar). Due to the violence in the northern part of Ethiopia, where SRH service was disrupted, several health facilities had to close during the years 2020 and 2021.

We also quantify the pooled proportion of SRH based on the community and institutional based services. In the current systematic review and meta-analysis (SRMA), we found that the pooled SRH service utilization at the community setting was 26% (95% CI:6–46%) which is in line with a SRMA conducted before Covid-19 (33%) (15). The possible reason can be COVID 19 did not affect extremely youth friendly SRH service at the community level, particularly to the rural area. But, the pooled proportion of SRH
service utilization on the institutional settings (38%) was less than a study conducted before COVID 19 (55%). The possible difference might be due to health professionals were focusing on COVID 19 service and infrastructures and budgets were shifted to control the pandemic diseases.(16).

In the current meta-analysis, participants age was a positive association for SRH service utilization. A person whose age was between 20 and 24 years old were 2.38 times more likely to utilized SRH service compared to age less than 20 years old. This is supported by a systematic review and meta-analysis conducted in Ethiopia before covid 19 pandemic(15, 17). This could be potentially explained by individuals above age 20 has a chance to hear about the SRH service utilization from different medias and electronic web sites. Additionally, as they get older, their maturity level rises, as do their sexual behaviors, and they engage in sex in which they demand SRH service utilization to avoid unwanted pregnancy and STI ((15, 18). Participating in the youth club has also a significant positive contribution on SRH service utilization. This study was supported by different systematic review findings (19, 20).The positive association might be due to participating in youth club increase awareness of the SRH, their freedom ,and confidence of the individuals to use SRH services (18, 21, 22).

In the current meta-analysis, we found that individuals who had sexual partner in their life time was 1.65 higher to utilize SRH service compared to its counterpart. This finding is supported by different primary studies conduct before covid 19 pandemic in Amhara and Oromia regions(23, 24). This could be due to those individuals having sexual partner may have difference in risk perception. Adolescents who had sexual contact might relatively have high level of risk perception like being vulnerable for sexual transmitted diseases and for unwanted pregnancy. Therefore, they are more intended to use sexual and reproductive service such as family planning, HIV test, and pregnancy service (25–27). In the current pooled meta-analysis, having pocket money had statistically significant association with SRH service utilization. This might be due to having pocket money may facilitate for enjoyment and sexual practice compared to individuals has no pocket money.

Limitations of the study

Though we applied comprehensive searching strategies for the current systematic review and meta-analysis, we found studies only in the SNNPR, Oromia, and Benishangul which cannot be generalized for northern Ethiopia that were affected by armed conflict on the utilization of SRH service. Additionally, we found that heterogeneity is highly concerned in which the interpretation could be with cautious

**Conclusion**

The pooled SRH service utilization in Ethiopia during COVID 19 was decreased compared to SRH service utilization before the pandemic. Participants age 20–24, Participate in youth, ever had sexual partner, participated in peer-to-peer education, and having pocket money where variables had positively associated with sexual and reproductive health service utilization.
Declarations

Acknowledgement

None

Funding

WHO Ethiopia was the funding source with Grant number 2021/1158442-0

Availability of data and materials

The datasets supporting the conclusions of this review are included within the article.

Authors contribution

All authors are participated in searching, screening, data extraction and writing up of the manuscript. All authors reviewed and approved the manuscript.

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

References


25. Uzobo E, Enoch RO. Social Media use and Sexual Behaviour of Undergraduate Students in a Nigerian University. 2020.


Figures
Figure 1

PRISMA flow chart
Figure 2

pooled proportion of sexual and reproductive health service utilization in Ethiopia
Figure 3

a forest plot using community and institutional based of the data source
Figure 4

Funnel plot to assess publication bias

Figure 5

Meta-analysis estimates, given named study is omitted

<table>
<thead>
<tr>
<th>Study</th>
<th>Estimate</th>
<th>Lower CI Limit</th>
<th>Upper CI Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habte A (2020)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tilahun T. (2020)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mesfien Y. (2020)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amaje E et al (2020)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gunta M et al (2020)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dina H et al (2021)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
sensitivity analysis to determine potential source of heterogeneity for SRH service utilization

**Supplementary Files**

This is a list of supplementary files associated with this preprint. Click to download.

- Additionalfile1searchingstrategiesforsexual.docx
- additionalfile2summaryqualityassesment.docx
- Additionalfile3Kappastatistics.docx
- Additionalfile4subgroupanalysisbystudyqualitylevel.docx
- Additionalfile5pooledforestplotforassociatedl.docx