Knowledge, attitude and factors associated with induced abortion among female students ‘of Private Colleges in Ambo town, Oromia regional state, Ethiopia: a cross-sectional study

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Abstract

Background: Around 73 million induced abortions take place worldwide each year. Six out of 10 (61%) of all unintended pregnancies, and 3 out of 10 (29%) of all pregnancies, end in induced abortion. In Africa, nearly half of all abortions occur under the least safe circumstances. In Ethiopia 35% of women obtaining induced abortions service. Therefore, this study aims to assess knowledge, attitude, and associated factors towards induced abortion service among female students of private Colleges in Ambo town, Ethiopia, 2022.

Methods: An Institution-based cross-sectional study was conducted from January 15, 2022, to February 15, 2022, among college students in Ambo, Ethiopia. Data were collected from 631 female students using semi-structured self-administered questionnaires by a systematic sampling method. We collected data on demographics, Institutional factors: facility policy and regulation, sexual experience, knowledge, and attitude. Bivariable and multivariable logistic regression analyses were done to identify the association of dependent and independent variables using SPSS, version 26, at 95% of confidence interval by adjusting for confounding factors. Finally, variables with $p$-value $\leq 0.05$ were taken as factors associated.

Results: All the participants gave their responses. Among the participants 279 (44.2) have good knowledge while the majority 352 (55.8%) of the students had poor knowledge about induced abortion. Age [AOR = 4.64, 95% CI (2.95, 7.30)], Marital status [AOR = 5.24, 95% CI (3.16, 8.69)], religion [AOR = 0.48, 95% CI (0.26, 0.81)], Year of study [AOR = 4.51, 95% CI (2.88, 7.08)], Monthly earn/income [AOR = 2.07, 95% CI (1.40, 3.07)], Ever had sex [AOR = 1.92, 95% CI (1.26, 2.92)] and urban residence [AOR = 1.87, 95% CI (1.26, 4.35)] were factors associated with knowledge of students towards induced abortion. Regarding attitude, 377 (59.7%) of students had good attitude towards induced abortion. Marital status [AOR = 2.30, 95% CI (1.30, 4.0)], and Religion [AOR = 0.47, 95% CI (0.10, 2.23)] were factors significantly associated with attitude towards induced abortion.

Conclusion: More than half of the participants have poor knowledge while majority of the students have a good attitude toward induced abortion. Since majority of the students (55.8%) have poor knowledge about induced abortion: health education, short course training, panel discussions and communication programs for youth on induction of abortion services is crucial.
Introduction

Abortion is the termination of pregnancy before fetal viability (before 20 weeks of gestation according to the World Health Organization or before 28 weeks of gestational age [Ethiopia]), that can occur either spontaneously or induced under certain circumstances [1]. Induced abortion is the termination of pregnancy by undergoing a deliberate steps to remove or expel an embryo or fetus [2]. Induced abortion is mainly performed whenever there are some compelling reasons to end a pregnancy [3]. Unsafe abortion is defined as the termination of pregnancy by unskilled persons and/or those conducted under unhygienic conditions [4]. Lack of delivery systems, restrictive abortion laws, negative cultural and religious attitudes, and poor health infrastructure for the treatment of abortion-related complications were the main burdens of women’s health problems [5]. Each year an estimated 36-53 million abortions are performed worldwide and from this, around 20 million abortions are considered unsafe [6]. World Health Organization estimates showed that the proportion of maternal mortality due to abortion complications ranges from 8% in Western Asia to 26% in South America, with a worldwide average of 13% [7, 8]. Even though developing countries have been applying public health approaches based on primary, secondary, and tertiary preventions in order to reduce morbidity and mortality associated with unsafe abortion, abortion still produces a deleterious effect on maternal health [9–11]. Complications of unsafe abortion cause between 50,000 and 100,000 women’s deaths annually [12]. Long-term consequences like chronic pelvic pain, incontinence, obstetric problems, and infertility have been associated with complications from induced abortion [13]. In addition to seriously negative health consequences, induced abortion also has a severe economic impact, especially in poor countries with already overloaded health systems. Direct costs include skilled personnel, medications, blood for transfusion, supplies, equipment, and hospitalization costs [14, 15]. Studies in Ethiopia showed that an estimated 620,300 induced abortions were performed in 2014 [16]. The annual abortion rate was 28 per 1,000 women aged 15–49, an increased from 22 per 1,000 in 2008, and was highest especially in the urban areas (Addis Ababa, Dire Dawa, and Harari) [16]. Ethiopia has ratified laws and conventions pertaining to abortion under certain circumstances [17]. This restrictive Law coupled with contraceptive shortages, low usage of available methods, and a high rate of sexual violence had led the country to be among the leading developing countries in abortion-related morbidity and mortality [18]. In most developing countries including Ethiopia, access to induced abortion and post-abortion care (PAC) was influenced by women’s knowledge to induced abortion services [5]. The decision as to whether to continue a pregnancy or terminate it, is fundamentally and primarily the woman’s decision, as it may shape her whole future personal life as well as family life and has a crucial impact on women’s enjoyment of other human rights [19]. A woman’s access to services is also determined in part by their positive attitude towards abortion services in order to reduce maternal mortality and morbidity [20]. Increasing access to comprehensive abortion care requires careful consideration and understanding of the multilayered physical, legal, political, economic, and cultural context of women’s daily lives. There is no assessment made on such situations in the study area. So, this study aims to assess knowledge, attitude, and factors associated to induced abortion service among female students of Colleges in Ambo town, Oromia regional state, Ethiopia.

Methods

A facility-based cross-sectional study was carried out among female college students in Ambo town from January 15, 2022, to February 15, 2022. Ambo town is the administrative city of West Shoa zone, and located at 114 kilometers to the west of Addis Ababa the capital city of Ethiopia. According to the 2019 population estimation, the total number of residents of Ambo town was estimated to be 80,712. There are seven private educational colleges in Ambo town. The total number of students from all colleges was 10,448, of whom 5,756 were female students.

All selected non-health science female college students among the selected colleges at the time of data collection were included in the study.

Sample size determination

The single population proportion formula was computed to get the sample size with the assumption of a 95% confidence interval, 5% margin of error, and \( p = 50\% \) (no previous study conducted on induced abortion), considering a 10% non-response rate and using a design effect of 1.5 yields the final sample size of 631.

Sampling technique

To get the required sample size, stratified random sampling method was used to select study participants.
First, students were stratified by their department. Then, the sample size was proportionally allocated to all the departments in the institutions based on the number of female students in each department. The sample was collected from all departments at every kth interval which is obtained by dividing the total female students in the department by selected study participants.

Variables

**Dependent variables**
- knowledge of induced abortion
- attitude of induced abortion

**Independent variables**
- Socio-demographic characteristics, Institutional factors: facility policy and regulation, sexual experience.

Operational definitions

Induced abortion: is the termination of pregnancy with a method recommended by world health organization, by skilled health care provider and performed under hygienic conditions.

Attitude: In this study, the attitude was used to describe the views of students toward Induced abortion.

Good attitude: respondents those answer greater than the mean attitude score is considered to have a good attitude.

Poor attitude: respondents who answered less than the mean attitude score were considered to have a poor attitude.

Knowledge: In this study knowledge was used for explaining the awareness of students about Induced abortion.

Good knowledge: The respondents who scored greater than or equal to 60% in the knowledge questions were considered as having “good knowledge”.

Poor knowledge: respondents who scored less than 60% were considered as having “poor knowledge”.

Data collection tool, procedure and data quality control

The data were collected using a structured and self-administered questionnaire that was designed by reviewing different studies [21–24]. The questionnaire was prepared in the English version, as it is teaching/learning medium at all colleges. The questionnaire consists of variables related to socio-demographic characteristics, Institutional factors: facility policy and regulation, sexual experience, knowledge, and attitude towards induced abortion. Ten degree holder data collectors who have experience and two supervisors were recruited for the data collection. Before the actual data collection, the questionnaires were pre-tested on 5% of the total sample size of students who are different from the selected institution and place. After data collection is completed, the questionnaires were checked for completeness by the investigators.

Data analysis

The questionnaire was cleaned, coded, and entered into EPI data version 3.1. Then the data was exported to SPSS version 26 for cleaning and analysis. Frequencies, percentages, and mean were computed to describe the key variables of the study. Bivariable and multivariable analyses were used to determine the association between different factors and the outcome variables and variables having a \( p \)-value < 0.05 in the multivariable analysis were considered statically significant. Odds ratios and the respective 95% confidence intervals were used to assess the strength of association.

Results

Socio-demographic characteristics of the respondents

All of the respondents participated in this study gave their response. The mean age of the participants was 22.1 years (SD ± 2.50). One hundred ninety-seven (31.2%) of students were single, never been in a relationship. The majority of students (67.4%) reported that they were living in an urban area. Nearly, two-thirds (60.4%) of the students get 501.00–1500.00 Ethiopian birr or 10.02–30 dollars sent from family. Concerning the Year of study, 226 (35.84%) of them were attending in 1st year (Table 1).

Sexual behavior

Sexual behavior: concerning Sexual experience 366 (58.0%) of the students never had sex during the time of the interview in which most of them make an episode of sexual intercourse during the last week of the interview. Among the participants who have ever had sex (265), the majority (53.97%) of the students does not use contraceptives, stating their reason as 55 (38.46%) due to fear of side effects followed by 30 (20.97%) don’t know where to get the contraceptive. (Table 2).

Knowledge of the Respondents on Induced abortion

Overall 279 (44.2%) students’ have good knowledge regarding induced abortion (Fig. 1).

About 297 (47.1%) of the respondents had ever heard about induced abortion; of those 147 (49.49%) got information from health institutions. The majority (391 (62.0%)) of the respondents mentioned that the place where induced abortion was performed was in the hospital. Nearly three-fourths of 424 (67.2%)
### Table 1  
Socio-demographic characteristics of private college students in Ambo town, Ethiopia, 2022 (n = 631)

| Variables                              | Response          | Frequency | (%)  |
|----------------------------------------|-------------------|-----------|------|
| Age                                    | < 20              | 139       | 22.0 |
|                                        | 20–23             | 375       | 59.3 |
|                                        | ≥ 24              | 117       | 18.5 |
| Marital status                         | Never in relationship | 197     | 31.2 |
|                                        | No current relationship | 119     | 18.9 |
|                                        | In relationship   | 195       | 30.9 |
|                                        | Married           | 120       | 19.0 |
| Religion                               | Orthodox          | 267       | 42.3 |
|                                        | Muslim            | 62        | 9.8  |
|                                        | Protestant        | 293       | 46.4 |
|                                        | Wakefata          | 9         | 1.4  |
| Ethnic group                           | Oromo             | 563       | 89.2 |
|                                        | Amhara            | 64        | 10.1 |
|                                        | Tigre             | 4         | 0.6  |
| Father’s educational status            | No formal education | 26      | 4.1  |
|                                        | can read and write | 41      | 6.5  |
|                                        | Primary education | 111       | 17.6 |
|                                        | Secondary education | 308    | 48.8 |
|                                        | Diploma and above | 145     | 23.0 |
| Mother’s educational status            | No formal education | 78      | 12.4 |
|                                        | Primary education | 227       | 36.0 |
|                                        | Secondary education | 189    | 30.0 |
|                                        | Diploma and above | 137     | 21.7 |
| What is your father’s occupation?      | Daily laborer     | 58        | 9.2  |
|                                        | Farmer            | 206       | 32.6 |
|                                        | Government employed | 161    | 25.5 |
|                                        | private Employed  | 150       | 23.8 |
|                                        | own business      | 56        | 8.9  |
| What is your mother’s occupation?      | House wife        | 249       | 39.5 |
|                                        | Daily laborer     | 74        | 11.7 |
|                                        | private Employed  | 63        | 10.0 |
|                                        | Has own business  | 169       | 26.8 |
|                                        | Government employed | 76     | 12.0 |
| Residence                              | Urban             | 425       | 67.4 |
|                                        | Rural             | 206       | 32.6 |
| Department                             | Accounting        | 175       | 27.7 |
|                                        | Economics         | 189       | 30.0 |
|                                        | Management        | 115       | 18.2 |
|                                        | Marketing management | 74     | 11.7 |
|                                        | Automotive        | 31        | 4.9  |
|                                        | cooperative business management | 47       | 7.4  |
| Year of study                          | 1st year          | 251       | 39.8 |
|                                        | 2nd year          | 226       | 35.8 |
|                                        | 3rd and above     | 154       | 24.4 |
| Monthly income sends from family       | < 500             | 77        | 12.2 |
|                                        | 501.00–1500.00    | 381       | 60.4 |
|                                        | > 1501.00         | 173       | 27.4 |
of the students believe that induced abortion services reduce the risk of women’s reproductive health problems. About 278 (44.1%) of the participants reported that induced abortion was a major health problem in Ethiopia today. More than half 403 (63.9%) of the respondents said that Ethiopia has an abortion law. Among respondents, 360 (57.1%) said below 3 months of pregnancy is the preferable time to perform induced abortion (Table 3).

### Table 2

| Variables                                      | Frequency | (%)   |
|------------------------------------------------|-----------|-------|
| Sexual experience                              |           |       |
| Ever had sex                                   | 265       | 42.0  |
| Never had sex                                  | 366       | 58.0  |
| Most recent episode of sexual intercourse      |           |       |
| Past week                                      | 108       | 40.7  |
| Past month                                     | 97        | 36.6  |
| More than two month back                       | 60        | 22.6  |
| Use of contraceptives during most recent coitus|           |       |
| Used                                           | 122       | 46.03 |
| Not used                                       | 143       | 53.97 |
| Type of contraceptive used                     |           |       |
| Oral contraceptive pills                       | 28        | 23.0  |
| Condoms                                        | 80        | 65.57 |
| Injectable                                     | 8         | 6.55  |
| Implant                                        | 6         | 4.91  |
| If not used why?                               |           |       |
| I do not like them (oppose)                    | 19        | 13.28 |
| Partner opposed                                | 18        | 12.58 |
| Don’t know where to get them                   | 30        | 20.97 |
| Fear of side effects                           | 55        | 38.46 |
| Fear of the society                            | 21        | 14.68 |
| If you have any unwanted pregnancy at any time, what would you do? | | |
| To continue with the pregnancy and gave birth | 161       | 25.5  |
| To terminate it                                | 247       | 39.1  |
| I am not sure what to do                       | 223       | 35.3  |
| Have you ever had abortion (pregnancy terminated before completed 28 weeks of gestation)? | | |
| Yes                                            | 31        | 4.9   |
| No                                             | 600       | 95.1  |
| where was that particular abortion induced? (for yes) | | |
| Patient's home                                 | 4         | 12.9  |
| Abortionist's home                             | 2         | 6.4   |
| Hospital                                       | 14        | 45.16 |
| Health center                                  | 5         | 16.12 |
| Clinic                                         | 4         | 12.9  |
| Private health institution                     | 2         | 6.4   |

**Fig. 1** knowledge on induced abortion among female students of private Colleges in Ambo town, Ethiopia, 2022

**Attitudes of respondents on induced abortion**

Among the study participants, 377 (59.7%) had a good attitude toward induced abortion (Fig. 2). The majority 584 (92.6%) of the respondents agreed that induced abortion should be fully legalized and accessible in Ethiopia. The majority (461 (72.8%)) of respondents have disagreed with the statement which says the outcome of abortion done in health institutions and by traditional practitioners is similar. More than two-thirds of 454 (71.9%) students agreed that induced abortion has no complications. The finding also showed that 570 (90.3%) of the respondents agreed that pregnant women should decide to abort or not, not their family or clinician (Table 4).
Factors Affecting Students’ Knowledge towards Induced abortion

In the bivariate and multivariate analysis, the factors that found to have an association with knowledge towards induced abortion among private college female students were age, marital status, religion, residence, year of study, monthly earn and Sexual experience. Students found in the age group of 21-23 and ≥ 24 were 4.64 times and 2.12 times more likely to have good knowledge of induced abortion than those who are in the age group of < 20 [AOR = 4.64, 95% CI (2.95, 7.30)], [AOR = 2.12, 95% CI (1.35, 3.32)] respectively.

| Variables | Response | Frequency | % |
|-----------|----------|-----------|---|
| Have you ever heard about the method of pregnancy termination or induced abortion? | Yes | 297 | 47.1 |
| | No | 334 | 52.9 |
| From where/whom have you ever heard about induced abortion? (n = 297) | Health institution | 147 | 49.49 |
| | Mass media | 54 | 18.18 |
| | Parents | 9 | 3.0 |
| | Peer/friend | 87 | 29.29 |
| Where do you think that induced abortion service conducted? | Hospital | 391 | 62.0 |
| | Health centre | 48 | 7.6 |
| | Private clinic | 11 | 1.7 |
| | Don’t know | 181 | 28.8 |
| Will induced abortion service reduce the risk of women’s reproductive health problem? | Yes | 424 | 67.2 |
| | No | 28 | 4.4 |
| | Don’t know | 175 | 27.7 |
| When is the preferable time to perform abortion? | Before 3 months of pregnancy | 360 | 57.1 |
| | At any time during pregnancy | 89 | 14.1 |
| | Don’t know | 182 | 28.8 |
| Is unsafe abortion a major problem, today in Ethiopia? | Yes | 278 | 44.1 |
| | No | 170 | 26.9 |
| | Don’t know | 183 | 29.00 |
| Ethiopia has abortion law? | Yes | 403 | 63.9 |
| | No | 45 | 7.1 |
| | Don’t know | 183 | 29.00 |
| For what reason is abortion legal in Ethiopia? (More than one possible) | If the pregnancy is extra-marital | 49 | 7.7 |
| | If pregnancy is due to rape or incest | 343 | 54.3 |
| | If pregnancy endangers life of the woman or fetus | 232 | 36.76 |
| | For woman with physical/mental disabilities | 230 | 36.45 |
| | For woman physically psychologically unprepared | 78 | 12.36 |
| | If she is financially unable to rise the child | 45 | 7.13 |
| | Not allowed for any reason in Ethiopia | 87 | 13.78 |
| What is/are some possible complication of abortion? | Heavy bleeding | 111 | 17.6 |
| | Uterine rupture | 73 | 11.6 |
| | Infertility | 93 | 14.7 |
| | Infections | 80 | 12.7 |
| | No complication | 93 | 14.7 |
| | Don’t know | 181 | 28.68 |
Table 4  Attitude towards induced abortion among private college students in Ambo town, 2022 (n = 631)

| Variables                                                                 | Disagree n (%) | Neutral n (%) | Agree n (%) |
|---------------------------------------------------------------------------|----------------|---------------|-------------|
| If your sister, relative or friend encounter unwanted pregnancy, it is good if advised on induced abortion | 4 (0.6)        | 27 (4.3)      | 602 (95.4)  |
| Induced abortion should be recommended to every woman with unwanted pregnancy | 41 (6.5)       | 27 (4.3)      | 563 (89.2)  |
| Induced abortion should be fully legalized and accessible in Ethiopia      | 28 (4.4)       | 19 (3.0)      | 584 (92.6)  |
| Induced abortion has no complication                                       | 102 (16.2)     | 75 (11.9)     | 454 (71.9)  |
| Induced abortion can kill because of its complications                     | 486 (77.0)     | 59 (9.4)      | 86 (13.6)   |
| Abortion should be done everywhere                                          | 560 (88.7)     | 44 (7.0)      | 27 (4.3)    |
| The outcome of abortion done in health institution and by traditional practitioners is almost similar | 596 (94.5)     | 23 (3.6)      | 12 (1.9)    |
| All women who undertake induced abortion will suffer negative mental health effects | 447 (70.8)     | 78 (12.3)     | 104 (16.48) |
| Contraceptive cannot prevent unwanted pregnancy                            | 544 (86.2)     | 79 (12.5)     | 8 (1.3)     |
| It is Pregnant women who should decide to abort or not but not her family or clinicians | 37 (5.9)       | 24 (3.8)      | 570 (90.3)  |

Students who are Single, with no current relationship, in a relationship, and Married were 5.24 times, 2.48 and 1.99 times more likely to have good knowledge of induced abortion than those who are Single, never in a relationship [AOR = 5.24, 95% CI (3.16, 8.69)], [AOR = 2.48, 95% CI (1.43, 4.31)] and [AOR = 1.99, 95% CI (1.23, 3.23)] respectively. Regarding religion Muslim respondents were 0.48 times less likely knowledgeable than Orthodox [AOR = 0.48, 95% CI (0.26, 0.81)]. The respondents who came from the urban area were 1.87 times more knowledgeable than those living in rural areas [AOR = 1.87, 95% CI (1.31, 2.80)]. Students who attend 2nd year and 3rd and above were 4.51 times and 2.05 times more likely to have good knowledge of induced abortion than 1st-year students [AOR = 4.51, 95% CI (2.88, 7.08)], [AOR = 2.05, 95% CI (1.31, 3.20)] respectively. Respondents with monthly income sent from family > 1500.00 dollars were 2.07 times more likely to have good knowledge than those whom monthly income sends from family < 500.00 dollars [AOR = 2.07, 95% CI (1.40, 3.07)]. Students who ever had sex were 1.92 times more likely to have good knowledge about induced abortion than those who never had sex [AOR = 1.92, 95% CI (1.26, 2.92)] (Table 5).

Factors Affecting Students’ Attitude towards Induced abortion: religion and marital status had an association with the attitude towards induced abortion in the bivariable and multivariable logistic regression analysis. Students who are in a relationship were 2.30 times more likely to have a good attitude towards induced abortion than those who are never in a relationship [AOR = 2.30, 95% CI (1.30, 4.0)]. Regarding religion Protestant respondents were 0.48 times less likely have good attitude than Orthodox [AOR = 0.48, 95% CI (0.10, 2.01)] (Table 6).

Discussion

This study revealed that 44.2% of the students have good knowledge about induced abortion. This finding is consistent with the study done at Mekelle University, Northern Ethiopia (44.1%), higher than studies conducted in India (36%), and WoalaSodo University, Ethiopia (38.8%). This might be due to the differences in the year of study participants, in our study, the study participants included were the first year and above and socioeconomic status. This result is lower than the study conducted in Kampala, Uganda (72.4%) and in Gondar City, Northwest Ethiopia (68.4%) respectively [21, 22, 25–27]. The reason for this discrepancy might be due to differences in study participants’ educational level, exposure to sources of information (mass media, radio, television, etc.), and geographical location (urban or rural). Regarding age, students found in the age group of 21–23 and ≥ 24 were five times and two times more likely to have good knowledge of induced abortion than those who are in the age group of < 20. The probable justification might be the fact that as age increases; students’ exposure to information and education regarding induced abortion could also increase. This finding is in line with a cross-sectional study conducted in Kampala Uganda and in Gondar, Northwest Ethiopia [21, 27]. Students who are currently not in a relationship, in a relationship, and Married were five times, two times, and nearly two times more likely knowledgeable about induced abortion than those who have been never in a relationship respectively. This may be because the chance of females who are in relation to be exposed to sexual intercourse and getting unwanted pregnancy is high, their knowledge of the solution also increase. This result is in line with the study done in Buenos Aires, Argentina, and South Africa [28, 29]. Regarding religion, Muslim respondents were found to be less knowledgeable about induced abortion than Orthodox
Christians. This is supported by the study done in South Africa [29]. This may be due to different religions having a different point of view related to abortion [30]. This study also showed that students who came from the urban area were nearly two times more knowledgeable than those living in rural areas. This is in line with the study done in Gondar, Ethiopia [21]. Students who attend 2nd and 3rd and above years of study were four times and two times more likely to have good knowledge of induced abortion than 1st-year students respectively. This finding was supported by studies done at the University of Buenos Aires, Argentina, and kebribayah town in the Somali region, Ethiopia [23, 28]. This is due to the fact that as the year of study increases, the level of knowledge of students also increases [31]. Respondents whom monthly income sent from family > 1500.00 EB/30 dollars were two times more likely to have good knowledge than those whom monthly income sent from family < 500.00 EB/10.02 dollars. The justification for this might be because participants who have good income get access to information through media, education, and peer education, which may lead to having provided knowledge. Participants who ever had sex were nearly two times more likely to have good knowledge about induced abortion than those who never

Table 5 Bivariable and Multivariable analysis of factors associated with knowledge of induced abortion service among female students in Ambo, Ethiopia, 2022 (n = 631)

| Variables                        | Knowledge level | COR (95%CI) | AOR (95%CI) | p-value |
|----------------------------------|-----------------|-------------|-------------|---------|
|                                 | Good n (%)      | Poor n (%)  |             |         |
|                                 | 279 (44.2)      | 352 (55.8)  |             |         |
| Age < 20                         | 43 (15.5)       | 96 (27.3)   | 1           |         |
| Age 21–23                        | 159 (57.2)      | 215 (61.1)  | 4.49 (2.85,7.08) | 4.64 (2.95,7.30)* | 0.002 |
| Age ≥ 24                         | 76 (27.3)       | 41 (11.6)   | 2.14 (1.36,3.36) | 2.12 (1.35,3.32)* | 0.011 |
| Marital status                   |                |             |             |         |
| Never in relationship            | 55 (19.7)       | 142 (40.3)  | 1           |         |
| Married                          | 78 (28.0)       | 42 (11.9)   | 1.38 (0.83,2.32) | 1.99 (1.23,3.23)* | 0.012 |
| Religious                        |                |             |             |         |
| Orthodox                         | 101 (36.2)      | 166 (47.2)  | 1           |         |
| Muslim                           | 37 (13.3)       | 25 (7.1)    | 0.41 (0.23,0.72) | 0.48 (0.26,0.8)* | 0.008 |
| Protestant                       | 136 (48.7)      | 157 (44.6)  | 0.69 (0.49,0.8) | 0.86 (0.60,1.24) |         |
| Wakefata                         | 5 (1.8)         | 4 (1.1)     | 0.48 (0.12,1.8) | 0.40 (0.10,1.6) |         |
| Father’s educational status      |                |             |             |         |
| No formal education              | 12 (4.3)        | 14 (4.0)    | 1           |         |
| can read and write               | 11 (3.9)        | 30 (8.5)    | 1.18 (0.51,2.73) | 0.82 (0.33,2.00) |         |
| Primary education                | 43 (15.4)       | 68 (19.3)   | 2.76 (1.28,5.93) | 1.99 (0.88,4.49) |         |
| Secondary education              | 140 (50.2)      | 168 (47.7)  | 1.60 (0.97,2.64) | 1.18 (0.67,2.07) |         |
| Diploma and above                | 73 (26.2)       | 72 (20.5)   | 1.21 (0.81,1.80) | 1.06 (0.70,1.61) |         |
| Mother’s occupation              |                |             |             |         |
| House wife                       | 92 (33.0)       | 157 (44.6)  | 1           |         |
| Daily laborer                    | 31 (11.1)       | 43 (12.2)   | 1.70 (1.01,2.86) | 1.54 (0.87,2.71) |         |
| private Employed                 | 29 (10.4)       | 34 (9.7)    | 1.38 (0.72,2.64) | 1.25 (0.64,2.45) |         |
| Has private business             | 89 (31.9)       | 80 (22.7)   | 1.17 (0.60,2.21) | 1.11 (0.56,2.20) |         |
| Government employed              | 38 (13.6)       | 38 (10.8)   | 0.89 (0.52,1.54) | 0.88 (0.51,1.5)  |         |
| Residence                        |                |             |             |         |
| Rural                            | 210 (75.3)      | 215 (61.1)  | 1           |         |
| Urban                            | 69 (24.7)       | 137 (38.9)  | 1.86 (1.29,2.69) | 1.87 (1.31,2.80)* | 0.002 |
| Year of study                    |                |             |             |         |
| 1st year                         | 74 (26.5)       | 177 (50.3)  | 1           |         |
| 2nd year                         | 105 (37.6)      | 121 (34.4)  | 4.49 (2.85,7.03) | 4.51 (2.88,7.08)* | 0.001 |
| 3rd and above                    | 100 (35.8)      | 54 (15.3)   | 2.14 (1.36,3.36) | 2.05 (1.31,3.20)* | 0.006 |
| Monthly income sends from family |                |             |             |         |
| < 500.00                         | 35 (12.5)       | 42 (11.9)   | 1           |         |
| 501.00–1500.00                   | 150 (53.8)      | 231 (65.6)  | 1.42 (0.83,2.44) | 1.64 (0.92,2.92) |         |
| > 1500.00                        | 94 (33.7)       | 79 (22.4)   | 1.83 (1.27,2.63) | 2.07 (1.40,3.07)* | 0.004 |
| Sexual experience                |                |             |             |         |
| Ever had sex                     | 158 (56.6)      | 107 (30.4)  | 1.95 (1.29,2.96) | 1.92 (1.26,2.92)* | 0.007 |
| Never had sex                    | 121 (43.4)      | 245 (69.6)  | 1           |         |

*Associated variables with p-value < 0.05
had sex. This finding is in agreement with a study done in South Africa [29]. Concerning the attitude, this study shows that 59.7% of the students have a good attitude toward induced abortion. This result is nearly in line with the studies done in Gondar City, Northwest Ethiopia (57.0%), and in Mekelle University, Ethiopia respectively (52.8%) [21, 22]. However, this result is lower than other cross-sectional studies conducted at Mizan-Tepi University (74.17%) and South Africa (70%), respectively [29, 32]. This difference might be due to the study participants, and socioeconomic status among the participants. This result is higher than a study conducted in the Somali Region, Ethiopia, which revealed 40.7% of students had a favorable attitude toward induced abortion [23]. The reason for this variation may be due to cultural beliefs, religious points of view, and socioeconomic status. Students who are in a relationship were nearly two times more likely to have a good attitude towards induced abortion than those who are never in a relationship. This result is supported by a cross-sectional study conducted in Gondar City [21]. Participants who ever had sex were nearly two times more likely to have a good attitude towards induced abortion than those who never had sex. The explanation would be due to abortion experience may be compounded by pregnancy due to sexual abuse or transactional sex.

**Conclusion**

Though significant progress has been achieved, knowledge and attitude towards induced abortion remain inadequate and substandard in the study area. This could be attributable to socioeconomic status, cultural beliefs, and the problem of information dissemination. School health programs have to be considered and redesigned and attention must be given to the students on reproductive health issues. Governments as well as non-government organizations along with the most respectable community elders and religious leaders should work on these issues to develop positive knowledge and a good attitude toward induced abortion. Forums and panel discussions on induced abortion need to be undertaken, especially among youths and students who come from rural areas. To prevent maternal mortality and morbidity which results from the complication of unsafe abortion, youth-friendly service has to be expanded to the rural part of Ethiopia.

| Variables                  | Attitude |                   |                   |                   | p-value |
|----------------------------|----------|-------------------|-------------------|-------------------|---------|
|                            | Good n (%)| Poor n (%)        | Good n (%)        | Poor n (%)        |         |
|                            | 377 (59.7)| 254 (40.3)        | 377 (59.7)        | 254 (40.3)        |         |
| Age                        | < 20     | 83 (22)           | 56 (22)           | 1.00              | 1.00    |
|                            | 21–23    | 215 (57.2)        | 159 (62.6)        | 1.37 (0.71, 2.67) | 1.27 (0.76, 2.12) |
|                            | ≥ 24     | 78 (20)           | 39 (15.4)         | 1.30 (0.77, 2.13) | 1.43 (0.92, 2.21) |
| Marital status             | Never in relationship | 120 (31.8) | 77 (30.3) | 1.00 | 1.00 |
|                            | No current relationship | 60 (15.9) | 59 (23.2) | 1.15 (0.72, 1.84) | 1.41 (0.78, 2.55) |
|                            | In relationship | 119 (31.6) | 76 (29.9) | 2.07 (1.23, 3.41) | 2.30 (1.30, 4.01) |
|                            | Married   | 78 (20.7)         | 42 (16.5)         | 1.18 (0.74, 1.88) | 1.32 (0.79, 2.22) |
| Religion                   | Orthodox | 164 (43.5)        | 103 (40.6)        | 1.00              | 1.00    |
|                            | Muslim    | 40 (10.6)         | 22 (8.7)          | 0.38 (0.53, 0.31) | 0.57 (0.14, 2.34) |
|                            | Protestant| 168 (44.6)        | 125 (49.2)        | 0.29 (0.45, 0.10) | 0.47 (0.10, 2.01) |
|                            | Wakefata  | 5 (1.3)           | 4 (1.6)           | 0.55 (0.65, 0.16) | 0.70 (0.17, 2.81) |
| Residence                  | Rural     | 260 (69.0)        | 165 (65.0)        | 1.00              | 1.00    |
|                            | Urban     | 117 (31.0)        | 89 (35.0)         | 0.82 (0.57, 1.16) | 0.80 (0.57, 1.14) |
| Year of study              | 1st year  | 135 (35.8)        | 116 (45.7)        | 1.00              | 1.00    |
|                            | 2nd year  | 148 (39.3)        | 78 (30.7)         | 1.29 (0.85, 1.96) | 1.28 (0.85, 1.94) |
|                            | 3rd and above | 94 (24.9) | 60 (23.6) | 0.82 (0.53, 1.28) | 0.82 (0.53, 1.26) |
| Monthly earn               | < 500.00 | 49 (13.0)         | 28 (11.0)         | 1.00              | 1.00    |
|                            | 501.00–1500.00 | 227 (60.2) | 154 (60.6) | 0.67 (0.38, 1.80) | 0.68 (0.38, 1.19) |
|                            | > 1500.00 | 101 (26.8)        | 72 (28.3)         | 0.93 (0.64, 1.34) | 0.95 (0.65, 1.37) |
| Sexual experience          | Ever had sex | 156 (41.4) | 109 (42.9) | 1.51 (0.96, 1.98) | 1.89 (1.64, 2.09) |
|                            | Never had sex | 221 (58.6) | 145 (57.1) | 1.00 (1.00)   | 1.00    |

* Associated variables with p-value < 0.05
Some limitations of this study: The social desirability bias due to the nature of the sensitivity issues of abortion and the past history of abortion might be affected by recall bias.

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Author contributions
RM, Formed and designed the study, control the data collection, analyze the data and develop the manuscript. GD supervised the data collection, analyzed, edited the data, and reviewed the manuscript. The authors read and agreed on the final manuscript.

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Availability of data and materials
The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
This study was approved by the Ethical Review Committee (IRC) of Addis Ababa University with the number of AAU/R/E/A/05/403/2022. Informed consent was taken from each respondent before data collection of the study. Interviews were conducted in privacy, and participants were assured of confidentiality. This study was carried out in accordance to the pertinent ethical guidelines and regulations.

Consent for publication
Not applicable.

Competing interests
The authors have no competing interests.

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