



## Research article

## Unintended pregnancy and associated factors among unmarried female students: A case of Bahir Dar University

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## ABSTRACT

**Background:** Unintended pregnancy is a mistimed, unplanned or unwanted pregnancy at the time of conception. Unintended pregnancy has a number of adverse physical, mental, and social impacts. It brings illegal and unsafe abortions which are causes of maternal morbidity and mortality in the developing countries like Ethiopia. Even if such problem has significant impact on the community, there is scarcity of evidence on this issue in Ethiopian higher institutions. Therefore, this study was aimed to assess unintended pregnancy and associated factors among unmarried female students in Bahir Dar University, North West Ethiopia.

**Methods:** A descriptive, cross-sectional study was conducted among unmarried female students at Bahir Dar University from March 1<sup>st</sup> - 30<sup>th</sup>, 2018. Data were collected by self-administered questionnaire. Data were entered, cleaned, coded and analyzed using SPSS version 23.0. The statistical association between dependent and independent variables was assessed using logistic regressions. P-value <0.05 in the multivariable analysis was set to statistically significant.

**Result:** Three hundred eighty-nine students had participated in the study making the response rate 92.00%. The prevalence of unintended pregnancy was 10.00%. Getting money from family (AOR: 0.16, 95% CI: [0.06, 0.42], p < 0.001) and being Health Science student (AOR: 0.40, 95% CI [0.16, 0.98], p < 0.001) were the preventive factors of unintended pregnancy. Being age of less than or equals to 18 years in the first sexual intercourse time (AOR: 6.31, 95% CI: [2.56, 15.53], p < 0.001) was positively associated with unintended pregnancy.

**Conclusion:** In the current study the prevalence of unintended pregnancy was high among unmarried female University students. Unintended pregnancy was determined by the source of money, field of study and age at first sexual intercourse. Hence, students should use family as a source of money, abstain from early sexual intercourse and share experiences from Health Science students about the prevention of unintended pregnancies. In line with the alleviation of modifiable factors, health professionals should provide comprehensive reproductive health and contraceptive services to University students.

## 1. Introduction

Unintended pregnancy is a mistimed, unplanned or unwanted at the time of conception. It is an important public health issue in both developing and developed countries [1]. Unintended pregnancy has several adverse outcomes [2]. From these adverse outcomes, unsafe abortion is a major and critical one which leads to infection, hemorrhage, reproductive organ perforation, infertility and even death [3].

The prevalence of unintended pregnancies was estimated to be 44.00% globally from the years 2010–2014. It declined by 30.00%, from

64 per 1000 women aged 15–44 years in 1990–1994 to 45 in 2010–2014 and 16.00% from 77 per 1000 women aged 15–44 years to 65 in developed and developing regions respectively. Between 2010–2014, 59.00% of unintended pregnancies in developed regions, and 55.00% of unintended pregnancies in developing regions ended up with abortion [4]. According to the Ethiopian Demographic and Health Survey report (EDHS, 2016) the prevalence of mistimed and unwanted pregnancies in Ethiopia was found to be 17.00% and 8.00% pregnancies were mistimed and unwanted, respectively [5].

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Previous studies done on unintended pregnancy revealed that different factors contributed for unintended pregnancy. For instance, the study conducted by Cherie et al. [1] indicated that not using contraceptive methods such as condoms, oral contraceptives, injections, implants and Intrauterine Devices (IUD) was associated with unintended pregnancy. Similarly, the study conducted by MaQ et al. revealed that having multiple sexual partner, non-use of condom and non-consensual sex and sexual intercourse before high school were the potentiating factors of unintended pregnancy [6].

Almost all of University students in Ethiopia are living far away from their families. This means that they are out of their parental surveillance. Such context leads to poor parental or guardian connectedness and early sexual debut [7]. This poor guardian connectedness brings more relaxed and active students who are prone to practice premarital sexual intercourse. Hence, this unsafe practice produces unintended pregnancy [8, 9, 10]. Therefore, this study was aimed to assess the prevalence of unintended pregnancy and associated factors among unmarried female University students in Bahir Dar University.

## 2. Materials and methods

### 2.1. Study design, setting and period

An institution based cross-sectional study was conducted in Bahir Dar University from March 1<sup>st</sup> -30<sup>th</sup>, 2018. Bahir Dar University is one of the public higher education institutions in Ethiopia. It is located in Bahir Dar City; 563 km away from Addis Ababa. This University consists of eight campuses namely Poly, Zenzelma, Yibabe, Selam, Peda, Tibebe Ghion and Tana. In 2018, the numbers of student in Bahir Dar University were 28, 989 males and 15,754 females with a total of 44,543 students [6].

### 2.2. Inclusion and exclusion criteria

All unmarried generic (means that University students that enrolled to the University from grade twelve in the Ethiopian context) female students in Bahir Dar University were included in the study. Unmarried generic female students who were seriously ill and weekend students were excluded from the study.

### 2.3. Sample size determination and sampling technique

The sample size was determined using a single population proportion formula. The assumptions used were 95% confidence interval (CI) with Z  $\alpha/2$  value of 1.96, proportion of unintended pregnancy of 50% (since no study before), margin of error (d) of 5% and non-response rate of 10%.

$$n = (z \alpha/2)^2 p (1-p) / d^2$$

Finally, by using 10% non-response rate, the sample size was 423.

In the current study, multi-stage sampling method was applied to select the participants. First, three campuses namely Tibebe Ghion, Peda and Selam were selected by the lottery method. Secondly, from each campus namely Tibebe Ghion: Nursing, Midwifery and Medicine departments; Peda campus: Biology, Chemistry and Geography departments and Selam campus: Textile, Leather and Garment departments were selected by the lottery methods. Thirdly, the list of female students was obtained from students' rooster in each department. Fourthly, proportional sample size allocation was implemented to each department based on student numbers. Within the department the sample size was distributed based on years of study. Then, identification of pregnancy was performed in each year of study within the department. Finally, simple random sampling method was used to select the actual study participants from March 1<sup>st</sup> -30<sup>th</sup>, 2018.

### 2.4. Measurements

Five trained BSc Nurses were recruited to collect data by using self-administered questionnaire. The questionnaire was developed after

extensive literature review [11, 12, 13, 14]. The questionnaire contained two parts; namely socio-demographic variables (age, home town area, year of study, field of study, source of money, religion) and pregnancy and sexual behavior variables (ever had sexual intercourse, age at first sexual intercourse, from whom had sexual intercourse, pressure to have sex without a condom, history of unintended pregnancy, ever heard about emergency contraception, ever had used any family planning, type of contraceptive methods used).

The study participants were asked whether or not ever faced unintended pregnancy, used modern family planning and heard about emergency contraceptive. Their responses for these variables were categorized as 0 = no and 1 = yes [15].

Source of money: It was assessed through a question asking the study participants on their sources of money. The response was categorized as 1 = family, 2 = boyfriend/cohabit and 3 = others.

### 2.5. Data quality assurance

A pre-test of tool outside the study area was performed. Data collectors were trained for two days by doing standardization exercise in order to minimize errors. The tool was validated and its Cronbach's Alpha value was found to be 0.88. The principal investigator made day to day on-site supervision during the whole period of data collection. The collected data were reviewed and checked for completeness, accuracy and consistency by the investigators.

### 2.6. Data analysis

The collected data were entered, cleaned, coded and analyzed using SPSS version 23.0. Frequency distribution was performed. Both bivariable and multivariable logistic regression model were used to assess the association between independent and dependent variables. In this model, the odds ratio with a 95% confidence interval (CI) was used to determine the strength of the association between dependent and independent variables. Those variables, with  $P < 0.2$  in the bivariable analysis model were transferred to multivariable model. Finally, the statistical significance was set at P- value of  $< 0.05$ .

**Table 1.** Socio-Demographic profiles among unmarried female students of Bahir Dar University, June, 2018.

Variables	Category	Frequency	Percent(%)
Age at interview	≤18 years	140	36.00
	>18 years	249	64.00
Hometown area	Urban	217	55.80
	Rural	172	42.20
Religion	Orthodox	285	73.30
	Muslim	56	14.40
	Protestant	32	8.20
	Catholic	16	4.10
Source of money	Family	345	88.70
	Friend/cohabit	44	11.30
	Others	15	3.90
Monthly income	≤500ETB	110	28.30
	>500ETB	279	71.70
Campus	Tibebe Ghion	146	37.50
	Peda	120	30.80
	Selam	123	31.60
Field of study	Health science	286	73.50
	Non health science	103	26.50
Year of study	1 <sup>st</sup> year	350	90.00
	2 <sup>nd</sup> year	23	5.90
	3 <sup>rd</sup> year	16	4.10

**Table 2.** Pregnancy and Sexual behavior characteristics among unmarried female students of Bahir Dar University, June, 2018.

Variables	Category	Frequency	percent(%)
Ever had unplanned sexual intercourse.	Yes	141	36.00
	No	248	63.80
Age at first intercourse	≤18Years	109	77.30
	>18years	32	22.70
From whom the sexual intercourse had been happened?	Forced sex	16	11.35
	Boyfriend	112	79.43
	Not disclosed	13	9.22
Pressure to have Sex without a condom	Yes	0	0.00
	No	141	100.00
History of unintended pregnancy	Yes	40	10.30
	No	349	89.70
Ever heard emergency contraception	Yes	196	50.40
	No	193	49.60
Ever had used any contraceptive methods	Yes	102	26.20
	No	287	73.80
Type of artificial contraceptive method used	Post pills	79	77.50
	Injections	23	22.50

### 2.7. Ethical approval and consent to participate

Ethical approval of the study was obtained from Bahir Dar University, Nursing Department, Ethical Review Committee. Each study participant was adequately informed about the purpose, benefits and risks of the study and their right to discontinue or refuse to participate in the study. Finally, written informed consent was secured from each study participants and their confidentiality, privacy and anonymity were maintained.

## 3. Results

### 3.1. Socio-demographic profiles of the respondents

From the total sample size (n = 423), 389 respondents had participated in the study making the response rate 92.00%. The mean age of the

study participants was 20.61 (±2.23) years. The majority of the respondents were from urban areas. From all study participants, 73.30% were Orthodox Christian. Regarding to source of money, 88.70% of them obtained money from their families. About three fourth (72.00%) of participants earned >500 Ethiopian Birr per month. From the total participants, 37.50% and 73.50 % were from Tibebe Ghion campus and health related field of study respectively. Regarding years of study, 90.00% of the participants were first year students (Table1).

### 3.2. Pregnancy and sexual behavior

From all study participants, 36.00% of them had history of unplanned sexual intercourse. About 77.30% of participants started sexual intercourse at age less than or equal to 18 years. From all participants who practice sexual intercourse, 79.43% of them performed sex with their

**Table 3.** Factors associated with unintended pregnancy in Bahir Dar, Ethiopia, 2018 (n = 389).

Variable	Response	History of unintended pregnancy		COR (95 % CI)	AOR (95 % CI)
		No (%)	Yes (%)		
Age at interview	≤18 years	108 (77.10)	32 (22.90)	8.93 (3.98, 20.01)*	1.27 (2.46,20.55)
	>18 years	241 (96.80)	8 (3.20)	1	
Hometown area	Urban	209 (59.90)	140 (40.10)	5.97 (2.67, 13.34)*	2.31 (0.49, 11.23)
	Rural	8 (20.00)	32 (80.00)	1	1
Source of money	Family	326 (93.40)	23 (6.60)	0.11 (0.05, 0.23) **	0.16 (0.06, 0.42) **
	Boyfriend/cohabit	24 (60.00)	16 (40.00)	1	1
Monthly income	≤500ETB	102 (29.20)	247 (70.80)	1.19 (0.53, 2.68)	
	>500ETB	8 (20.00)	32 (80.00)	1	
Campus	Tibebe Ghion	139 (39.80)	7 (17.50)	0.43 (0.16, 1.10)	
	Peda	100 (28.70)	20 (50.00)	1.69 (0.80, 3.58)	
	Selam	110 (31.50)	13 (32.50)	1	
Field of study	Health sciences	262 (75.10)	87 (24.90)	0.50 (0.25, 0.98)**	0.40 (0.160, 0.978) <sup>3*</sup>
	Non health sciences	24 (60.00)	16 (40.00)	1	
Year of study	1 <sup>st</sup> year	308 (88.30)	41 (11.70)	0.39 (0.09, 1.70)	
	2 <sup>nd</sup> and above year	38 (95.00)	2 (5.00)	1	
Age at 1 <sup>st</sup> sexual intercourse	≤18 years	108 (30.95)	241 (69.05)	8.93 (3.98, 20.01)**	6.31 (2.56, 15.53)**
	>18 years	32 (80.00)	8 (20.00)	1	1
Ever heard emergency contraceptive	No	185 (95.90)	8 (4.10)	4.51 (1.92, 9.59)*	0.541 (0.206, 1.420)
	Yes	164 (83.70)	32 (16.30)	1	1
Ever used artificial Contraceptive methods	No	70 (68.60)	32 (31.40)	15.94 (7.04, 36.12)*	1.539 (0.206, 5.420)
	Yes	279 (97.20)	8 (2.80)	1	1

\*Statistically significant at p < 0.05, \*\*Statistically significant at p < 0.001.

boyfriends. Among those students, 11.35% of them started sexual intercourse by force or rape, and 9.22% of them did not disclose initial sexual intercourse partners. None of the study participants were pressured to have sex without a condom. The prevalence of unintended pregnancy was 10.30%.

About half (50.40%) of the study participants heard about emergency contraception. Nearly one-fourth (26.20 %) of the respondents utilized contraceptive methods. Among 102 contraceptive utilizers, 77.50% and 22.50% of them used pills and injections respectively. From all contraceptive utilizers, 77.50% of them used emergency contraceptive (post pills) (Table 2).

### 3.3. Factors associated with unintended pregnancy

To identify factors associated with unintended pregnancy, multivariable logistic regression was performed. In this model, source of money, field of study and age at first sexual intercourse were significantly associated with unintended pregnancy. Respondents who were getting money from their family had 84.00% of less risk to experience unintended pregnancy (AOR: 0.16, 95% CI: [0.06, 0.42],  $p < 0.001$ ). Similarly, respondents from fields of Health Sciences had 60.00% less chance to experience unintended pregnancy (AOR: 0.40, 95% CI [0.16, 0.98],  $p < 0.001$ ). On the other hand, participants who had started sexual intercourse at age less than or equal to 18 years were six times (AOR: 6.31, 95% CI: [2.56, 15.53],  $p < 0.001$ ) more likely to experience unintended pregnancy than their counter parts. Variables like ever heard about emergency contraceptive and ever used any contraceptive methods were not significantly associated with unintended pregnancy (Table 3).

## 4. Discussion

The prevalence of unintended pregnancy in this study was 10.30%. The current finding was similar to previous study done in Eastern China (11.67%) [6]. On the other hand, this finding was lower than the studies conducted in Tanzania (27.00%) [16] and Nigeria (67.80%) [17]. Lower level of unintended pregnancy in the present study as compared with the above previous studies is due to the implementation of youth friendly services in Ethiopian higher education [18].

On the other hand, the current study finding was higher than the study conducted in China (4.80%) [19]. The higher level of unintended pregnancy in the current findings as compared with study in China is due to the presence of the substantial unmet need for contraception in the developing countries such as Ethiopia [4]. The additional reason that exacerbate the level of unintended pregnancy among young adolescent in less developed countries including Ethiopia is presence of sexual intercourse for economic reasons and exchange sex for money or gifts [20].

Multivariable logistic regression model indicated that the factors of unintended pregnancy were multifactorial. Respondents who were getting money from their boyfriends are more likely to experience unintended pregnancy as compared with source from their family. The reason for high level of unintended pregnancy in case of respondents with money source from boyfriends is that young adolescents are having sexual intercourse for economic reasons and exchange sex for money or gifts in developing countries like Ethiopia [20].

Similarly, respondents from field of Health Sciences were less likely to experience unintended pregnancy as compared with non-health sciences students. The reason for this difference is respondents from field of Health Sciences had some knowledge of reproductive health rights from their classes and trainings. Having knowledge on reproductive health prevents premarital sexual intercourse and unintended pregnancy [10, 21, 22, 23, 24, 25, 26].

Participants who had started their sexual intercourse at age less than or equal to 18 years old were more likely to experience unintended pregnancy than respondents who started their sexual intercourse at age greater than 18 years. This finding is in line with the other previous study in China [19] and Pakistan [27]. As already mentioned the strategies to

solve this problem in the university student communities should be more concrete and there are many authors who approach them, even if in different contexts.

As a result of high burden of unintended pregnancy in the current study area, the researchers should perform in-depth investigations to dig out the major barriers of such problems in Ethiopian context. It is also an indication for health care professionals to provide comprehensive reproductive health, and contraceptive services to fulfill the unmet needs of university students.

## 5. Conclusion

In the current study the prevalence of unintended pregnancy was high in University students. Unintended pregnancy was determined by the source of money, field of study and age at first sexual intercourse. Hence, students should use family as a source of money, abstain from early sexual intercourse and share experiences from Health Science students about the prevention of unintended pregnancies. In line with the alleviation of modifiable factors, health professionals should provide comprehensive reproductive health and family planning services to University students. Ministry of Health, Ministry of Science and Higher Education (MOSHE), and Bahir Dar University should work in collaboration to reduce unintended pregnancy by establishing youth counseling centers, and providing youth friendly services. In collaboration with health professionals, the university should provide life skill trainings on assertiveness, effective communication, interpersonal relationship, self-esteem, problem solving, peer resistance, critical thinking, decision making and self-awareness.

### 5.1. Limitation

This study has certain limitations. The cross-sectional nature of study design used that suffers from recall bias. It might not also clearly identify cause-effect relationship of independent and dependent variables.

## Declarations

### Author contribution statement

Dagnachew Belay, Abebaw Alem, Salle Zerihun, Gashaw Antehun, Zewuditu Nega, Balew Zeleke: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Yinager Workineh, Addisu Melese, Getenet Dessie, Emiru Ayalew: Analyzed and interpreted the data; Wrote the paper.

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### Competing interest statement

The authors declare no conflict of interest.

### Additional information

No additional information is available for this paper.

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