

Post-War Assessment of the Prevalence and Determinants of Unplanned Pregnancy Among Pregnant Women Attending Public Hospitals in Conflict-Zones of South Wollo, Northeast Ethiopia, 2022, Multi-Center Study

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Background: Worldwide, although unplanned pregnancy seems decreasing, 38% of pregnancies are unintended. In sub-Saharan Africa, unintended pregnancy accounts for more than a quarter of the 40 million pregnancies that occur annually.

Objective: The study aimed to assess the prevalence and determinants of unplanned pregnancy among pregnant women attending public hospitals in conflict-zones of South Wollo zone, Northeast Ethiopia, 2022.

Methods: A multi-center facility-based cross-sectional study was conducted from December 20, 2021 to February 30, 2022 among the hospitals of South Wollo zone that were destroyed by the armed conflict.

Results: The prevalence of unplanned pregnancy in our study was 44.72% (CI=39.40–48.08%).

Conclusion: In this study nearly half of the pregnancies were unplanned, which is shocking to the health care system in the 21st century.

Keywords: unplanned pregnancy, armed conflict, post-war assessment, Ethiopia

Introduction

Unplanned pregnancy is defined as any form of conception that is mistimed (pregnancy that comes earlier than the time) or pregnancy that is unwanted at all.^{1,2} Unplanned pregnancy is one of the most common root causes of maternal morbidity like mental, physical, economical, and other health related crises, mainly through unsafe abortion and other related sexually transmitted diseases.^{3,4} Unplanned pregnancy is found to have an increased public health importance in determining the quality-of-life for the woman, the fetus in utero, children, and family as a whole, both in developed and developing countries.^{5,6} A complex set of social and psychological factors puts women at risk of unintended pregnancy. Abortion, infertility, child abandonment, and maternal deaths are negative consequences of unintended pregnancies.^{7,8} Worldwide, although unplanned pregnancy seems to be decreasing, 38% of pregnancies are unintended (that is, 80 million pregnancies annually). In sub-Saharan Africa, unintended pregnancy accounts for more than a quarter of the 40 million pregnancies that occur annually.^{4,9} The magnitude of unplanned pregnancy is a good indicator for evaluation of women's reproductive health, women's right to decide when to have children, level of unwanted sexual acts happening to women, and proportions of limitations to have better opportunities on social, economical, and other health care guarantees given to women.

Globally, from all pregnancies, 44% of them are unplanned, of which, more than half (56%) ended up in termination before viability by the year 2014.¹⁰ Worldwide, in 2015, 303,000 women died due to terminating a pregnancy; of these women, 99% of the deaths were from developing countries, with sub-Saharan Africa accounting for the majority of deaths, followed by South Asia (22%).¹¹

Available literature in Africa showed that the prevalence of unplanned pregnancy was 53.3%, 31.1%, and 24% in Malawi,¹² southern Nigeria,⁷ and Kenya,³ respectively. Other available studies done in Ethiopia showed that the figure was 37.8%, 36.9%, 33.3%, 36.5%, 32.9%, 22.3%, and 13.7% in Addis Ababa,¹³ Dilla,¹⁴ Harare,¹⁵ Wellega,¹⁶ and North Shoa,¹⁷ respectively.

Worldwide, according to available findings, the common determinant factors of unplanned pregnancy were age greater than 40 years,^{6,9} unemployment, higher education,^{6,18} being unmarried women,^{3,19} age less than 30,^{3,5} contraceptive failure,^{18,20} contraceptive inconsistent use,^{7,18} not using contraceptive,^{2,18} rural residence,^{18,19} absence of male involvement,^{9,18} lack of knowledge about contraceptives,^{7,18} short birth interval,⁵ high parity,^{2,6} and no formal education.^{6,18}

Despite the fact that the global health policy gives an emphasis on the reduction of maternal mortality and family planning coverage women are still dying from pregnancy related complications and unintended pregnancy is still on the national health public health agenda. Hence, this study was, as it was the first of its nature, aimed to assess the prevalence and determinants of unintended pregnancy among pregnant women attending antenatal clinics in the conflict zone of South Wollo hospitals. The study also aimed to signify the impact of the armed conflict on the women's desire when to conceive. The findings of this study will be used for policy makers in order to properly allocate resources and intervene in maternal and child health problems. In addition, the concerned stockholder will also intervene and compensate damages due to the conflict that had an impact on reproductive and family health.

Methods and Materials

Study Design and Setting

An institutional-based cross-sectional study was employed. The study was conducted in selected public hospitals of South Wollo zone, Ethiopia, immediately after the armed conflict (after the Tigray People Liberation Front (TPLF)'s withdrawal) from December 20, 2021 to February 30, 2022. Among the hospitals of South Wollo zone that were attacked by the armed conflict, especially by the TPLF's forces, four government hospitals (Borumeda Hospital, Delanta Hospital, Hayq Hospital, and Mekaneselem Hospital) were selected using a simple random sampling technique.

Source Population

All pregnant women who attended antenatal clinics of government hospitals of South Wollo zone.

Study Population

All pregnant women who attended antenatal clinics of selected public hospitals of South Wollo zone during the study period.

Sample Size and Sampling Procedure

The sample size was calculated by using the assumption of a single population proportion formula considering the prevalence of unplanned pregnancy in Debre Markos as 32.9%, with a 95% confidence interval, a margin of error of 5%, and a 10% non-response rate. Then the final sample size was calculated to be 369. To reach the study participants, systematic random sampling was employed after investigating the case flow of each study hospital before the armed conflict. This was because the case flow was considered to be affected due to the fact that the hospitals were in the conflict zone. Finally, the sampling interval was determined by dividing two months case report to sample size in each hospital, and the final kth value for Mekaneselem Hospital, Delanta Hospital, Borumeda Hospital, and Mekaneselem Hospital was 2.2, 2.5, 2.3, and 2.7, respectively. Hence the first case to come was taken as participant one and every two cases were selected.

Data Collection Procedure

The data was collected by four BSc degree holder midwives using structured questionnaires after training was given for a day. The questionnaire was prepared originally in English and was translated into local language (Amharic) for the purpose of data collection. It was translated back to English again for consistency and accuracy by language experts. Pretesting was also done in two primary hospitals outside the study areas. To avoid a chicken and egg dilemma on the possible reasons for the pregnancy to be unplanned, the data collectors were provided with a clear explanation.

Ethical Approval and Consent to Participate

Ethical clearance was obtained from the Institutional Review Board of Debre Tabor University, School of Midwifery College of Medicine and Health Sciences (CMHS) with a reference number DTU/RE/1104/2022. A letter of permission was obtained from the clinical coordinator of each study hospital. Clear explanations about the purpose of the study were given, along with the letter of support for all concerned bodies. Finally, written informed consent was obtained from all respondents after thoroughly explaining the aim of the study to them. In addition, all methods were performed in accordance with the relevant guidelines and regulations. The guidelines outlined in the Declaration of Helsinki were also followed.

Study Variables

Dependent Variable

- Unplanned pregnancy.

Independent Variables

- Sociodemographic variables.
- History of sexual and reproductive health.

Data Processing and Analysis

After manually checking its completeness and consistency, the data were entered using Epi-data version 4.6 software and analyzed using SPSS version 23 software. Then the crude association between unplanned pregnancy and determinant factors crude odds ratio (COR) was calculated with a 95% confidence interval (CI). Variables with an odds ratio of ≤ 0.2 were considered for multivariate analysis. Variables with an adjusted odds ratio of ≤ 0.05 were considered to determine a significant association. Hosmer–Lemeshow goodness-of-fit test was used to check the model fitness, and poor fit was considered by a value less than 0.05. It is considered to have multi-collinearity when the variance inflation factor (VIF) is greater than 10. There was no multi-collinearity poor fit as the calculated VIF was less than 10.

Operational Definitions

Family Planning Knowledge

The respondents' level of knowledge about family planning was reported as good knowledge if the study participant correctly responded to more than or equal to 80% of knowledge assessment tools, and poor for $< 80\%$.

Unmet Need of Family Planning

The percentage of women of reproductive age, either married or in any other relationship who wish to stop or delay childbirth but are not using contraceptives.

Unwelcomed Sex

Expressions of sexual interests that are unwelcome, unreciprocated, or offensive to those targeted to the sexual act.

Results

Socio Demographic Characteristics

A total of 369 respondents were included in this study, with a response rate of 100%. The majority of the respondents were in the age group 25–34 years (45.80%), rural residents (67.21%), ethnic Amhara (84.55%), married (75.34%), and had a monthly income of between 1,001–3,000 ETB (47.78%) in this post war study. The mean age of the study participants was 24.61 (± 5.85 SD) (Table 1).

Table 1 Socio-Demographic Characteristics of the Respondents at Public Hospitals of South Wollo Zone, Northwest Ethiopia, 2022 (N=369)

Variables	Frequency	Percentage
Age in years		
18–24	112	30.35
25–34	169	45.80
≥35	98	23.84
Residency		
Rural	248	67.21
Urban	121	32.79
Ethnicity		
Amhara	312	84.55
Oromo	57	15.45
Religion		
Orthodox Christian	133	36.04
Muslim	167	45.26
Protestant	69	18.70
Marital status		
Single	57	15.45
Married	278	75.34
Divorced	34	9.21
Educational status of women		
No formal education	112	30.35
Primary	145	39.29
Secondary	67	18.16
Higher	45	12.19
Husband's educational status		
No formal education	97	26.29
Primary	152	41.19
Secondary	74	20.05
Higher	46	12.47
Occupation		
Student	59	15.99
House wife	143	38.75
Merchant	89	21.12
Government employ	78	21.14
Monthly income in ETB		
≤1,000	96	26.02
1,001–3,000	180	47.78
3,001–5,000	69	18.70
>5,000	34	9.21
Distance from health facility		
≤30 minutes	175	47.42
1 hour	125	33.88
≥2 hours	69	18.70

Abbreviation: ETB, Ethiopian Birr.

Reproductive Characteristics

In this study, a high proportion (44.72%) of the pregnancies were unplanned, but wanted (74.25%) and supported (82.38%) after the pregnancy had occurred. The majority of the respondents also had parity between one and four (50.14%), a birth interval of less than 2 years (51.22%) and had alive children of less than 5 years old (78.59%). In

addition, most of the respondents faced an unmet need of FP (59.08%), and lack of a functioning health facility during the war (79.95%) in our post conflict assessment (Table 2).

Post War Reasons for Unplanned Pregnancy

According to this post war assessment, the most common reasons for the women to think of their pregnancy as unplanned were pregnancy due to contraceptive failure, pregnancy due to unmet need of FP, the need to postpone the pregnancy, not supported by their family, abandoned by their partner, and extramarital pregnancy (Table 3).

Table 2 Reproductive Characteristics of the Respondents at Public Hospitals of South Wollo Zone, Northwest Ethiopia, 2022 (N=369)

Variables	Frequency	Percentage
Pregnancy intention		
Planned	204	55.28
Unplanned	165	44.72
Pregnancy wanted		
Yes	274	74.25
No	95	25.75
Pregnancy supported		
Yes	304	82.38
No	65	17.62
Parity		
Zero	103	27.91
One–four	185	50.14
> four	81	21.95
History of abortion		
Yes	85	23.03
No	284	76.96
Birth interval in years		
Less than two	189	51.22
Two	145	39.30
Greater than two	35	9.48
Number of children alive		
Less than five	290	78.59
≥ five	79	21.41
Discussion with husband about FP		
Yes	296	80.22
No	73	19.88
FP knowledge		
Knowledgeable	318	86.18
Not knowledgeable	51	13.82
Unmet need of FP		
Yes	218	59.08
No	151	40.92
History of unwelcomed sex		
Yes	96	26.02
No	273	73.98
Functioning health facility during the war		
Yes	74	20.05
No	295	79.95

Abbreviation: FP, Family planning.

Table 3 Percentage Distribution of the Reasons for Unplanned Pregnancy Among Women with Unplanned Pregnancy in South Wollo Zone, Ethiopia, 2022 (N=165)

Reasons	Frequency	Number
Contraceptive failure	28	16.97
Economically unfit	91	55.15
Wanted to postpone	148	89.70
Not supported by family	68	41.21
Abandoned by partner	67	40.61
Extramarital pregnancy	18	10.91
Pregnancy from unknown person (rape)	29	17.58
Lack of family planning methods	152	92.12
Others	11	6.67

Note: More than one answer was possible and included.

Post War Determinants of Unplanned Pregnancy

Under possible adjustment for other confounding variables, rural residency (0.59; 0.06–0.89), being single (9.34; 6.65–12.11), having an occupation of student (7.91; 6.42–10.04) and house wife (2.01; 1.94–4.21), unmet need for family planning (3.12; 1.76–4.28); and lack of functioning health facility during the armed conflict (7.45; 5.25–9.04) were found to be the factors associated with unplanned pregnancy in this post war assessment of the conflict zones immediately after the armed conflict (Table 4).

Table 4 Bivariate and Multivariate Logistic Regression Analysis of Determinants Associated with Unplanned Pregnancy in Public Hospitals of South Wollo Zone, Northwest Ethiopia, 2022 (N=369)

Variables	Categories	Pregnancy		COR* (95% CI)	AOR* (95% CI)
		Unplanned	Planned		
Age in years	18–24	50	62	1.56 (0.04–4.42)	1.09 (0.01–4.43)
	25–34	80	89	1.74 (0.11–3.72)	1.33 (0.12–3.29)
	≥35	30	58	Ref	Ref
Residency	Rural	101	147	0.61 (0.02–0.96)	0.59 (0.06–0.89)**
	Urban	64	57	Ref	Ref
Marital status	Currently Single	80	11	16.5 (7.21–18.96)	9.3 (6.65–12.11)***
	Currently Married	85	193	Ref	Ref
Educational status	No formal education	54	58	1.22 (0.34–3.86)	1.09 (0.03–2.63)
	Had formal education	111	146	Ref	Ref
Occupation	Student	49	10	13.3 (5.06–14.23)	7.91 (6.42–10.04)**
	House wife	61	82	2.02 (1.21–3.26)	2.01 (1.94–4.21)*
	Government employee	21	57	Ref	Ref
	Merchant	34	55	1.68 (0.07–4.19)	1.03 (0.25–3.76)
Monthly income in ETB	≤1,000	57	39	6.46 (2.73–8.91)	5.21 (2.91–9.27)**
	1,000–3,000	89	91	4.32 (1.06–5.21)	2.20 (0.06–4.04)
	≥3,001	19	84	Ref	Ref

(Continued)

Table 4 (Continued).

Variables	Categories	Pregnancy		COR* (95% CI)	AOR* (95% CI)
		Unplanned	Planned		
Parity	Zero	58	45	Ref	Ref
	One–four	76	109	0.54 (0.04–1.56)	0.03 (0.02–2.26)
	> four	31	50	0.48 (0.03–0.92)	0.39 (0.01–1.87)
Number of children alive	Less than five	125	165	Ref	Ref
	≥ five	40	39	1.35 (1.21–3.78)	1.13 (0.03–3.21)
FP knowledge	Knowledgeable	144	174	Ref	Ref
	Not knowledgeable	21	30	0.84 (0.02–1.75)	0.27 (0.03–2.12)
Unmet need for FP	Yes	127	91	4.15 (2.07–5.86)	3.12 (1.76–4.28)***
	No	38	113	Ref	Ref
History of un-welcomed sex	Yes	43	53	1.01 (0.09–4.90)	1.00 (0.03–3.05)
	No	122	151	Ref	Ref
Presence of functioning health facility during the war	Yes	08	66	Ref	Ref
	No	157	138	9.39 (6.07–11.32)	7.45 (5.25–9.04)***

Notes: * $p \leq 0.05$. ** $p \leq 0.01$. *** $p \leq 0.001$.

Abbreviations: ETB, Ethiopian Birr; FP, Family Planning.

Discussion

The primary findings of our study are the prevalence and common determinants of unplanned pregnancy in the conflict zones of South Wollo zone. This post war assessment specifically aimed to report the negative burden of the armed conflict on unplanned pregnancy. The prevalence of unplanned pregnancy in our study was 44.72% (CI=39.40–48.08%). This finding is much higher than in studies done in Nigeria (31.1%), Kenya (24%), and other sub-Saharan countries.²⁰ Our study finding is also extensively higher than studies reported in Mizzan-tepi (13.3%),¹⁸ Dilla (36.9%),¹⁴ Wolega (32.9%),¹⁶ Harare (33.3%),¹⁵ and Addis Zemen (26.1%).² The most likely reason for this higher prevalence of unplanned pregnancy in our study was the great impact of the armed conflict on the health system, specifically of the reproduction and reproductive health areas. Since there was no functional reproductive health clinic during the armed conflict in our study area, women of reproductive age could not access any options of family planning methods. Other possible explanations for the increased prevalence of unplanned pregnancy could be the presence of illegal and un-welcomed sexual acts either by the conflict handlers or their close relatives and lack of awareness about post coital family planning methods. Surprisingly, the prevalence of unplanned pregnancy in our study was found to be lower than a study prevalence reported in Malawi (53.3%).^{12,19} The possible justification for the lower prevalence could be the difference in study nations and the study done in Malawi was done before eight years when people were not aware of family planning methods.

In our study, rural residency (0.59; 0.06–0.89) decreases the odds of unplanned pregnancy by 41%. This finding was the reverse of other studies done in Mchinji district of Malawi and Mizzan-tepi of Ethiopia.^{18,19}

Our study finding also opposes the logical notion that urban populations are more aware of family planning methods and can access it easier than the rural community. The possible justification for this different finding could be due to the control and use of urban rather than rural areas for the temporary living environment of the armed forces. This indirectly exposes the urban women to un-welcomed sex along with greater difficulty of getting family-planning methods. Our study also reported that being single (9.34; 6.65–12.11) increases the odds of unplanned pregnancy by a factor of 9.34-times. This finding is also supported by studies done in Malawi,¹⁹ Kenya,³ and Suhul of Northern Ethiopia.¹ The possible reasons for this association could be due to the tradition that pregnancies before marriage are not supported by the community, and most commonly occurred after un-welcomed sex, contraceptive failure, or unmet need of family planning.

Our study also showed that occupation of being a student (7.91; 6.42–10.04) and house wife (2.01; 1.94–4.21) increases the odds of unplanned pregnancy by 7.91-times and 2.01-times, respectively. This study finding is also supported by studies done in Nigeria,^{8,21} Egypt,⁵ Malawi,^{12,19} Kenya,³ and Ethiopia.^{9,18} The possible reason for the association could be students and housewives were the ones with lower economic status and can not afford to migrate to the conflict free areas and are affected by the armed conflict. Another possible explanation for this could be the attractive nature of students due to the difference in age (mostly younger) and dressing (mostly modernized).

In addition our study also reported that the unmet need for family planning (3.12; 1.76–4.28) and lack of a functioning health facility during the armed conflict (7.45; 5.25–9.04) increased the odds of unplanned pregnancy by a factor of 3.12-times and 7.45-times, respectively, in this post war assessment in the conflict zones immediately after the armed conflict. Unless we retrospectively look for outdated research reports, unmet need of contraceptive due to unavailability of functional health facilities for family planning and other reproductive health services is not a problem anywhere currently. But, in our post-war assessment, the root cause for the extremely higher prevalence of unplanned pregnancy in the conflict zones were women could not get any type of contraceptives because of the colonization and destruction of health facilities by the armed forces. They could not even get post coital pills after sexual acts, whether the sex was voluntry or un-welcomed.

Study Limitations

Despite the novelty of the study to assess the effect of the armed conflict on unplanned pregnancy in the conflict zones of Ethiopia, the cross-sectional nature of the study might have chicken and egg like dilemma on the possible reasons of unplanned pregnancy. In addition the effect of religiosity on unplanned pregnancy was not addressed.

Conclusion and Recommendations

In this study nearly half (44.72%; CI=39.40–48.08%) of the pregnancies were unplanned, which is shocking to the health care system in the 21st century. Rural residency, being single, having an occupation of student and house wife, unmet need of family planning, and lack of a functioning health facility during the armed conflict were found to be the factors associated with unplanned pregnancy in this post war assessment of the conflict zones immediately after the armed conflict.

There should be an extensive health care mobilization including psychological and other health related infrastructure and even access to family planning options to reverse the unmet need of family planning methods in all the conflict zones. The impact of armed conflicts to the health care system should be protected by international laws.

Abbreviations

AOR, Adjusted odds ratio; BSc, Bachelor of Sciences; CI, Confidence interval; COR, Crude odds ratio; ETB, Ethiopian Birr; FP, family planning; SGZ, South Gondar zone; SPSS, Statistical Package for Social Sciences; TPLF, Tigray People Liberation Front; VIF, variance inflation factor; WHO, World Health Organization.

Data Sharing Statement

All data included in this manuscript can be accessed from the corresponding author upon request through the email address after the negotiation is over. In addition, the authors don't have any access privileges that others don't have.

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Author Contributions

All authors made a significant contribution to the work reported and took part in drafting, revising, or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors declare that they have no competing interests.

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