

**PREVALENCE AND FACTORS ASSOCIATED WITH PREGNANCY
TERMINATION AMONG REPRODUCTIVE AGED WOMEN IN
BANGLADESH: FINDINGS FROM BANGLADESH
DEMOGRAPHIC AND HEALTH SURVEY DATA 2017-2018**



This thesis is prepared for the partial fulfillment of the requirement of Master of Public Health (MPH) degree of Independent University of Bangladesh (IUB).

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DECLARATION

I do solemnly declare that the research work presented in this dissertation entitled **“Prevalence and factors associated with pregnancy termination among reproductive aged women in Bangladesh: findings from Bangladesh demographic and health survey data 2017-2018”** has been conducted by myself and not been submitted to any other university or academic institute for an academic qualification or certification degree previously. I certify that this is the true copy of my thesis with final revisions and approved by my thesis review committee.

I do hereby warrant that the work has been presented here does not breach any existing copyright and any material reproduced in this project has been properly acknowledged.

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Declaration by the Supervisor

This is to certify that Dr. Makfiratur Rahman worked on, “Prevalence and factors associated with pregnancy termination among reproductive aged women in Bangladesh: findings from Bangladesh demographic and health survey data 2017-2018”, under my supervision. I have gone through the paper. It is up to the mark and to my full satisfaction.

Signature of the Supervisor

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Acknowledgement

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Dr. Makfiratur Rahman

March 22, 2022

Bangladesh

Abbreviations

PT	:	Pregnancy Termination
WHO	:	World Health Organization
BDHS	:	Bangladesh Demographic and Health Survey
ICDDR, B	:	International Centre for Diarrheal Diseases Research, Bangladesh
COR	:	Crude Odds Ratio
AOR	:	Adjusted Odds Ratio
ANC	:	Antenatal Care
PNC	:	Post Natal Care
CI	:	Confidence Interval
SPSS	:	Statistical Package on Social Science
DV	:	Dependent Variable
IDV	:	Independent Variable
MR	:	Menstrual Regulation
FWC	:	Family Welfare Centers
MCH	:	Maternal and Child Health
FP	:	Family Planning
ERC	:	Ethical Review Committee
MCH-FP	:	Maternal and Child Health and family Planning
H&FWC	:	Health & Family Welfare Centre
TOP	:	Termination of Pregnancy
MOHFW	:	Ministry of Health and Family Welfare
USAID	:	United States Agency for International Development

Abstract

Introduction: Pregnancy termination is a major public health issue in low-and middle-income countries. It may be induced or spontaneous in different perspectives. This study aimed to determine the prevalence and factors associated with pregnancy termination among ever married women in Bangladesh.

Methods: Data for this study have been extracted from Bangladesh Demographic and Health Survey (BDHS) 2017. The survey followed a two-stage stratified sampling procedure and the study used a sub-sample of 8759 ever-married women aged 15 to 49 who pregnancy during their reproductive life. Bivariate and multivariate logistic regression analyses model were used to determine the risk factors for pregnancy termination.

Results: The mean age of the women was 25.79 years and standard deviation was ± 5.68 . It was found, around 65% women lived in rural area, more than 16% women lived in Chittagong division, nearly 50% women were secondary educated, and more than 90% respondents were from Muslim religion as well as above 20% were from wealth quintile. The prevalence of pregnancy termination was found 17.9%.

Women having higher age (COR=1.12, CI=1.09-1.14) and those were currently working (COR=1.17, CI=1.05-1.31) have higher chance of pregnancy termination. On the other hand, women living rural area (COR=0.78, CI= 0.69-0.87), higher educated (COR=0.69, CI=0.55-0.88), non-Muslim (COR=0.74, CI=0.59-0.92), studying after marriage(COR=0.82, CI=0.73-0.92), marriage in right time (COR=0.78, CI=0.67-0.89) and mobile phone owner (COR=0.84, CI=0.74-0.94) have lower chance of pregnancy termination.

It is showed that after increasing of age, the chance of pregnancy termination increased. On the other hand, residential area, marital time and self-mobile phone of the respondent had lower chance to terminate pregnancy compare to their reference value at 95% CI and $p \leq 0.05$ level.

Conclusions: Around 18% women terminative their pregnancy. Age, place of residence, education level, religion, employment status, early marriage and self-mobile phone use are factors associated with pregnancy termination among reproductive aged women in Bangladesh. Further study can be done to explore the causal association between these factors and termination of pregnancy among these age group respondents.

Keywords: Pregnancy termination, Reproductive aged women, Demographic and Health Survey, Bangladesh.

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CHAPTER-I: INTRODUCTION

1.1. Introduction:

Globally, pregnancy termination is a very sensitive issue and it may be either contentious or spontaneous with religious, moral, cultural, geographical and political perspective. In many parts of the world, terminated pregnancy is still one of the major public health concerns. The World Health Organization (WHO) estimates that worldwide each year nearly 210 million women become pregnant and that about two-thirds of them, or approximately 130 million, deliver live infants. The remaining one third ends in as terminated pregnancies which includes; miscarriage, stillbirth, or induced abortion or others forms of termination. Of the estimated 42 million induced abortions each year, nearly 20 million are performed in unsafe conditions or by unskilled providers and result in the deaths of an estimated 47,000 girls and women. This represents about 13% of all pregnancy-related deaths all over the world. At most all unsafe abortions take place in developing countries, and this is where 98% of abortion-related deaths occur [1].

In some cases, pregnancy termination causes maternal death. Maternal mortality is unnecessarily very high in developing countries which are 211 deaths per 100,000 live births compared to only 14 per 100,000 live births in developed countries and more than 99 % of the annual global maternal deaths occur in developing countries [2]. Each pregnancy puts a woman at risk of death, but compared with women who have live births, those who have induced abortions; miscarriages or stillbirths have been found to be at a higher risk of maternal mortality [3–5]. Induced abortions in developing countries may be performed in unhygienic and unskilled settings and carry very high risk of mortality among pregnant mother [6, 7]. Moreover, it is also found that induced abortions carry a higher risk of maternal mortality than miscarriages, while the risk of maternal death is higher among women who have stillbirths than those having live births

[5]. Bangladesh, a country with poor socio economic conditions, has a moderate level of maternal mortality that is 173 deaths per 100,000 live births, for the period 2014–2017 [8] especially considering its poorly managed and inadequate health infrastructure and high rate of non-institutional births [9]; only 15 % of births in Bangladesh take place in health facilities [10]. Some factors like socioeconomic, demographic, cultural, habitual or environmental conditions are caused for maternal death and pregnancy termination. Recently, results from some research have identified that an array of potential risk factors for repeat induced abortion including: age; socioeconomic status; parity; education; foreign origin; race; smoking; alcohol/drug abuse; physical abuse or violence; early sexual debut; previous contraceptive use; and type of contraceptives used [11]. Previous research mainly in high income countries has identified common risk factors for repeat abortions, including higher age, higher parity, and lower socioeconomic status. Evidence from the United States clearly showed that the women with repeat abortion were as highly as those with one-time abortion to use contraception [12-14]. A facility based cross sectional study in Sweden outlined that parity, lack of emotional support, being unemployed or on sick leave, daily tobacco use, and compulsory school or high school as the highest educational level were the associated factors for repeat abortion among women aged 20–49 years [15]. We observed different studies which show that various risk factors for repeat abortion, for instance, the risk of repeat abortion has been found to be related to several socioeconomic factors, such as immigrant status and weak social networks [15-16], low educational level and unemployment [17-18]. A correlation between repeat abortion and a history of violence and sexual abuse has been found [19] and parity and smoking are more common among women with repeat abortions [20-21]. In Bangladesh, as a country of lower income, poor health settings and unskilled or less skilled health providers, its pregnancy termination is really high. Among the women of reproductive age group, the induced abortion was found 29% in 2013 [22] and maternal

mortality was 173 per 100,000 live births (BDHS-2017). Country's maternal and child health status is improving gradually after its independence, but still it is not up to the mark. Still lots of women are not maintaining their reproductive and maternal health guidelines even though they are not receiving proper ANC. So, abortion, stillbirth and miscarriage are very common [8]

1.2. Justification of the study:

Pregnancy termination is a part of mother reproductive health. It may be induced or spontaneous and everything is considered for the sake of mother's wellbeing. Many studies have been examined about the risk factors associated with pregnancy terminations. But very few articles have been found using the BDHS 2017 data on terminated pregnancy and its risk factors. So, after conducting this study, there will have scope to explore the reasons for pregnancy termination and its prevalence. Besides, the study outcome may help the policy makers to implement different program to reduce pregnancy termination and maternal death as well as improve women reproductive health.

1.3. Study Objectives:

1.3.1. General Objective: The aim of the study is to find out the prevalence and factors associated with pregnancy termination among reproductive aged women in Bangladesh.

1.3.2. Specific Objectives:

- a. To find out the socio-demographics characteristics of reproductive aged women.
- b. To measure the prevalence of pregnancy termination.
- c. To determine the factors, associate with pregnancy termination among reproductive aged women in Bangladesh.

CHAPTER-II: REVIEW OF THE LITERATURE

2. Literature Review:

For population maintenance, human being is required reproduction. So, knowledge about factors that influence reproduction is important. The demographic transition to fewer children per woman has been explained by altered preferences for women, from childbearing and childrearing to education and paid employment [23]. Due to maternal and pregnancy related complications, a large number of women as well as infants die worldwide and nearly 99.0% of maternal death happens mainly in low- and middle-income countries [24]. Pregnancy termination is one of the leading causes of maternal death. A large study conducted in 2003 to 2009 based on 115 countries reported that around 8% of maternal deaths causes for terminated pregnancy [25]. Report from some studies explained that the number of maternal deaths due to abortion or others pregnancy termination may be larger that are reported [26].

Lots of factors are cause for maternal deaths but, one of the most important contributing factors to maternal mortality in low and middle-income countries is unsafe abortion or early pregnancy outcome [24]. Pregnancy termination may occur spontaneously or intentionally, the later also known as induced abortion, which may be either safe or unsafe. Abortion (especially unsafe) may have serious health consequences and cause complications such as hemorrhage, sepsis and uterine perforation [27, 28]. The global rate of abortion has been constant at 28–29/1000 women aged 15 to 44 years from 2003 to 2008, but the proportion of unsafe abortions has increased from 44.0% in 1995 to 49.0% in 2008 [29]. The rate of unsafe abortion is quite high in South-Asia (1/3 of the globe) due to strict antiabortion legislation in many South-Asian countries [30]. Sex-selective abortion is also high in this region due to the preference for a male child [31-34]. Besides, many women in this area are still not aware of the legal provision for abortion and its consequences. An earlier study reported that only

44.0% of the women were aware of the legal provision of abortion in Nepal [35]. Another study reported that most of the women are unaware of the availability of various abortion services in Nepal [36]. Mainly young, less educated, poor and those without a supportive male partner are at higher risk of early pregnancy termination [37]. An earlier study reported that rich and well-educated women are more likely to have an abortion than are poor and illiterate women. However, in case of low and middle-income countries, there is no clear and established evidence on this issue [38].

Bangladesh is a South Asian country with a population of 160 million, is one of the most densely populated countries of the world. The literacy rate is around 70 percent. The maternal mortality ratio is 1.73 per 1,000 live births. Among all married women of reproductive age, the contraceptive use prevalence rate is 62 percent, and the total fertility rate is 2.3. However, the Bangladesh Family Planning Program (FPP) still faces problems, like low method continuation rate, method failure due to reliance on temporary methods, and high unmet need for contraceptives, leading to the increased number of abortions. The existing laws in Bangladesh, derived from the Penal Code of India, 1860, prohibit abortion, except to save the life of a woman [39]. The existing health infrastructure of the Government of Bangladesh has been providing menstrual regulation (MR) services since 1978. These services are available in almost every village of the country. The Health and Family Welfare Centers (H&FWC) are the maternal and child health and family planning (MCH-FP) service units at the union level, and the rural hospitals or Thana Health Complexes (THC) at the sub-district level are the static facilities which provide these services [40]. Menstrual regulation (MR) is usually done within 6-10 weeks of amenorrhea, without pregnancy confirmation, and is widely provided in both the public and private sectors. In rural Bangladesh, the people still depend on traditional methods of pregnancy termination, which are often performed by the untrained personnel or Traditional Birth Attendant (TBA) under unhygienic conditions [41]. These clandestine

abortions lead not only to death, but also to appalling morbidity. These include perforation of the uterus and sterility; a woman may linger on the verge of death for several days as a result of septic abortion [42]. Women with abortion-related complications usually seek hospital care only as a last resort and after a considerable suffering [43].

CHAPTER-III: METHODOLOGY

3.1.Study variables:

3.1.1.Dependent variable (DV):

In this study, the dependent variable is pregnancy termination among mother of reproductive age. Our participants' age in this study was 15 to 49 years. In the questionnaire of the 2017 Bangladesh Demographic Health Survey, lifetime history of miscarriage, induced abortion, and stillbirth was assessed for all women through a single item asking if they ever had a pregnancy that ended in miscarriage, ended due to an induced abortion or 'menstrual regulation (MR)' (a term used in Bangladesh to describe administration of legal abortive procedures by a clinician or clinical procedures to induce abortion), or ended in the stillbirth of a child. Respondents who reported ever having experienced a miscarriage, induced abortion, or stillbirth were asked whether such an event had occurred within the past 5 years. The term menstrual regulation and/or induced abortion is considered as the termination of pregnancy (TOP) in this study and dichotomized as had a TOP and had no TOP.

3.1.2.Independent variables (IDV):

In this study, a group of risk factors is considered as independent variables or covariates. All socio demographic variables including age, education, divisions, residence (rural or urban), wealth index, religion of the respondent, currently residing with husband, currently working, studying after marriage, husband's and self-occupations and poses self-mobile phone considered as independent variables. Moreover, some covariates also considered as risk factors for pregnancy termination which are; earlier or late marriage, ANC received, contraceptive use, beating by husband to refuge sex etc. Finally, awareness and media like exposed also considered.

3.2. Study design:

In this study, we have used secondary data from Bangladesh demographic and health survey 2017. So, the study is a descriptive cross-sectional study.

3.3. Data source:

In this study, the data was taken from Bangladesh Demographic and Health Survey 2017-2018. The 2017-18 BDHS is the eighth national survey to report on the demographic and health status of Bangladeshi women and their families. The main objective of the 2017-18 BDHS is to provide up-to-date information on fertility and childhood mortality levels; fertility preferences; awareness, approval, and use of family planning methods; EPI coverage, maternal and child health, including breastfeeding practices, nutrition levels, and newborn care; and community-level data on availability and accessibility of health and family planning services. The 2017-18 BDHS was conducted under the authority of the National Institute of Population Research and Training (NIPORT) of the Ministry of Health and Family Welfare (MOHFW). Mitra and Associates, a Bangladeshi research firm located in Dhaka, implemented the survey. icddr,b provided technical assistance on verbal autopsy to determine causes of under-5 deaths. ICF of Rockville, Maryland, USA, provided technical assistance as part of its international Demographic and Health Surveys (DHS) Program. The survey received financial support from the United States Agency for International Development (USAID).

3.4. Sample population:

The study utilized data from the Bangladesh DHS (BDHS), which was carried out from September to December 2017 in collaboration with the Bangladesh National Institute for Population Research and Training (NIPORT). The data in this study was assessed from MEASURE DHS of the U.S. Agency for International Development (USAID). The BDHS sample was drawn from the total adult population of Bangladesh residing in private dwellings. A stratified, multistage cluster sample of 675 primary sampling units, 425 in rural areas and 250 in urban areas, was constructed. A total of 20250 ever married women aged 15–49 was deemed eligible to participate in the survey, and 20127 respondents were interviewed (response rate was 99%). The ORC Macro Institutional Review Board (Calverton, MD, USA) approved the data collection procedures of the BDHS. This study analyzed data from currently married women of age 15–49 years, living with their husbands and who had at least one pregnancy in the last 5 years. For this study, the data set was restricted to 8759 married women who had a pregnancy during the last 5 years immediately preceding the date of the survey.

3.5. Data management and analysis plan:

For this study, secondary data from BDHS 2017 has been used. Data has been analyzed using computer software SPSS. Firstly, we have used descriptive statistics like mean (SD), frequency and percentage. Secondly, chi-square (χ^2) test has been used to assess the association between pregnancy terminations and some different risk factors among the respondents. To estimate the effect of association between dependent and different independent variables were estimated using logistic regression procedures. Both crude and

adjusted odds ratio have been estimated. In all analyzes, the significance level was set at $P < 0.05$ (2-tailed) with 95% CI.

3.6.Ethical consideration:

The 2017 Bangladesh Demographic and Health Survey (BDHS) data collection procedures were approved by the ORC Macro Institutional Review Board (Calverton, MD, USA). The protocol of the survey was reviewed and approved by the National Ethics Review Committee of the Bangladesh Ministry of Health and Family Welfare. Because the existence of a signed consent form can provide risk in itself for the abused women, oral informed consent was obtained from respondents by interviewers [44]. Several specific protections based on World Health Organization (WHO) ethical and safety recommendations for research on terminated pregnancy were built into the 2017 BDHS. In this study, we used BDHS 2017-2018 data. As it is secondary source data there is no need to take ethical clearance.

CHAPTER-IV: RESULTS

4.1. Descriptive results:

Table 01 shows the frequency and percentage distributions for the socioeconomic and demographic variables of interest. The mean age of women is 25.79 years and standard deviation is ± 5.68 years. It is also found, two third of women (65.1%) are from rural area. Around 17 percent women from Chittagong division and the lowest proportion (10.3%) are from Khulna and Barisal divisions. Nearly half (47%) of the total women are secondary educated, and only 7.3% could not receive any institutional or formal education in their life. The study outcome also shows, more than ninety percent (91.5%) respondents are Muslims and rest of 9.5% is from other religions like Hindu, Christianity or Buddhist. Considering wealth quintile, 22% are the poorest; nearly eighteen percent (17.8%) from middle income group and one, out of five are from the richest category. Around forty percent (40.7%) pregnant mother who terminated their pregnancy before safe delivery were working. We also consider pregnant studying after marriage or not. It is seen that around 74% is not studying after marriage and rest of forty percent is working during their pregnancy period. The table 01 also describes more than fifty percent (50.5%) pregnant mother got married at right time, whereas around eighteen percent married earlier, and one out of three women married later than normal marital age. It is also found, two third of the total participants (67.8%) used any form of contraceptive methods. We also considered the variable antenatal care visits during their pregnancy period. More than sixty three percent (63.4%) respondents received three or more ANC visits before their pregnancy outcome. The results also found above sixty percent (62.2%) participants have own mobile phone and rest of has no phone at all.

Table-01: Socio-demographic characteristics of the participants (N=8759).

Characteristics	Frequency (n)	Percent (%)
Age (Mean SD) years	25.79 (5.68)	
Age group in years		
15-24	4128	47.1
25-34	3920	44.8
35-44	689	7.9
≥45	22	0.3
Place of residence		
Urban	3057	34.9
Rural	5702	65.1
Divisions		
Barisal	906	10.3
Chittagong	1446	16.5
Dhaka	1304	14.9
Khulna	904	10.3
Mymensingh	1025	11.7
Rajshahi	912	10.4
Rangpur	971	11.1
Sylhet	1291	14.7
Level of education		
No education	642	7.3
Primary	2548	29.1
Secondary	4115	47.0
Higher	1454	16.6
Religion		
Islam	8018	91.5
Hinduism	691	7.9
Buddhism	34	0.4
Christianity	16	0.2
Wealth quintile		
Poorest	1928	22.0
Poorer	1755	20.0
Middle	1563	17.8
Richer	1737	19.8
Richest	1776	20.3
Respondent currently working		
No	5195	59.3
Yes	3564	40.7

Continue studying after marriage		
No	2942	73.7
Yes	1049	26.3
Earlier or late marriage		
Earlier	1586	18.1
Right time	4426	50.5
Later	2747	31.4
Contraceptive use and intention		
No contraceptive use	2822	32.2
Contraceptive use	5937	67.8
Antenatal care (ANC) visits		
No ANC Visit	408	8.1
One ANC Visit	630	12.6
Two ANC Visits	794	15.8
Three or more ANC Visits	3180	63.4
Have own mobile phone		
No	3308	37.8
Yes	5451	62.2

Our study also strongly considered exposed to mass media like reading newspaper, listening radio and watching television. Respondents' ten years age group found in Table 01 which explains the highest number of women (47.1%) within 15-24 years of age group and only 0.3% women age over 45 years. We also considered the variable antenatal care visits (ANC) during their pregnancy period.

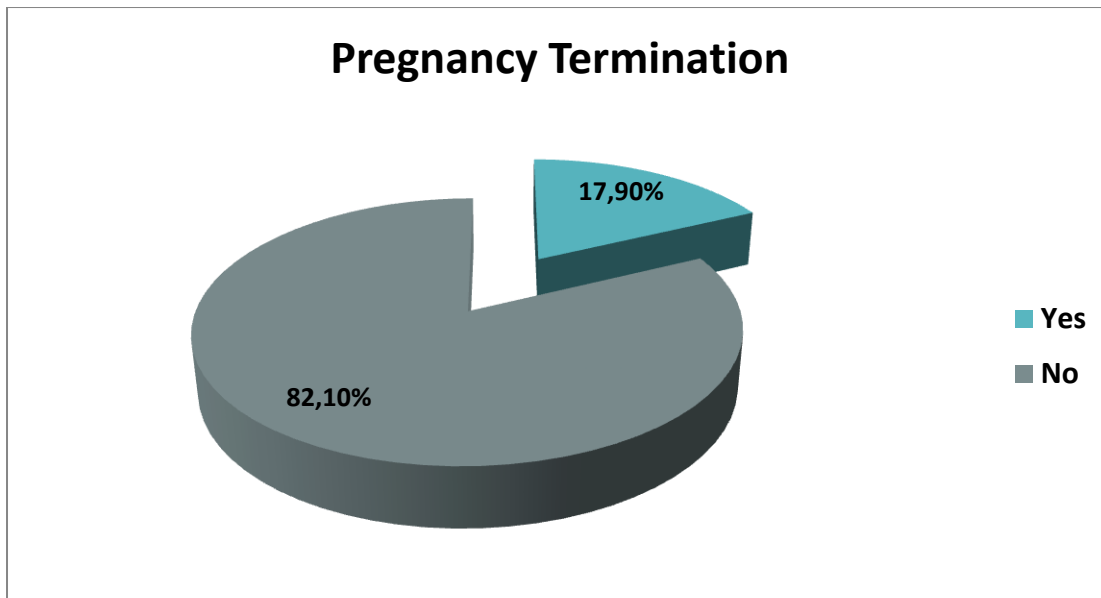


Figure-01: Distribution of pregnancy termination of among respondents.

Figure-01 presents, approximately 18% woman reports their pregnancy termination whereas rest of had no history of abortion, miscarriage or still births in their life.

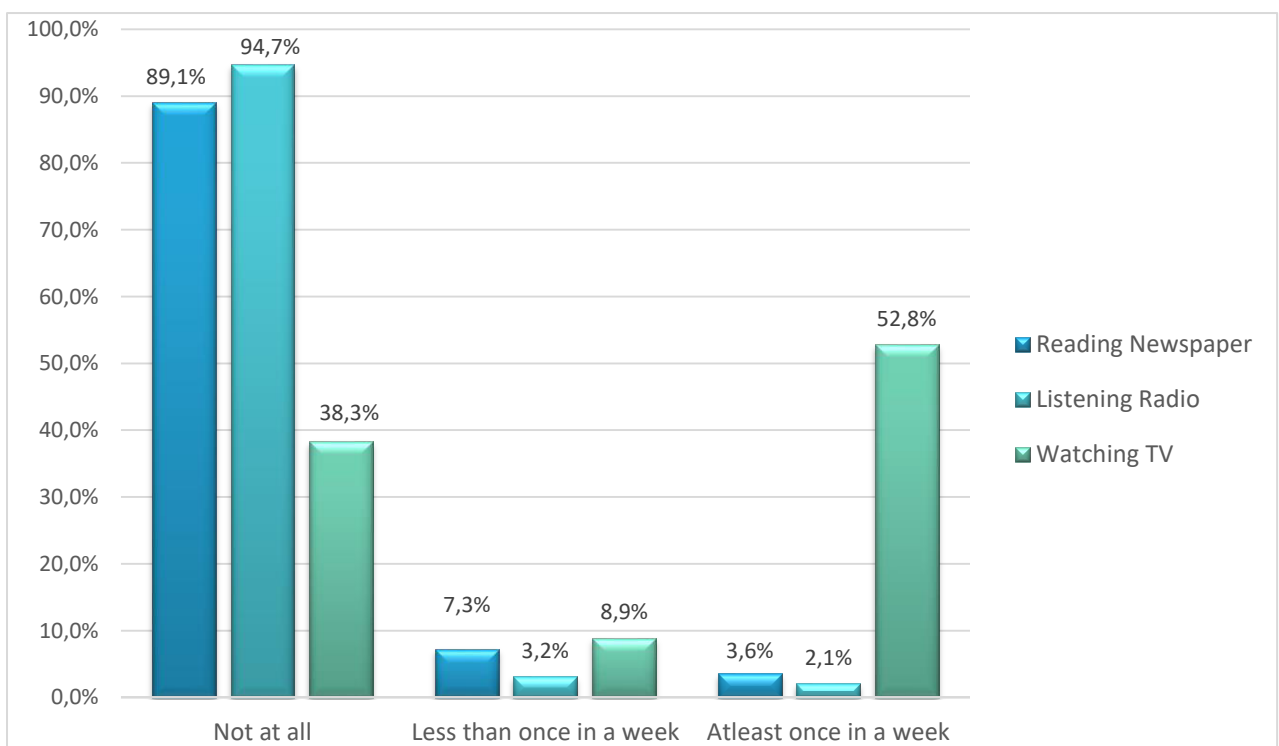


Figure-02: Mothers exposed to mass media.

Figure 02 presents, 89.1%, 94.7% and 38.3% pregnant mothers respectively never used any forms of media like newspaper, radio or TV. It is also found, more than fifty percent (52.8%) women watched TV at least once in a week or more than once. On the other hand, only 2.1% women was listening to radio at least once in a week.

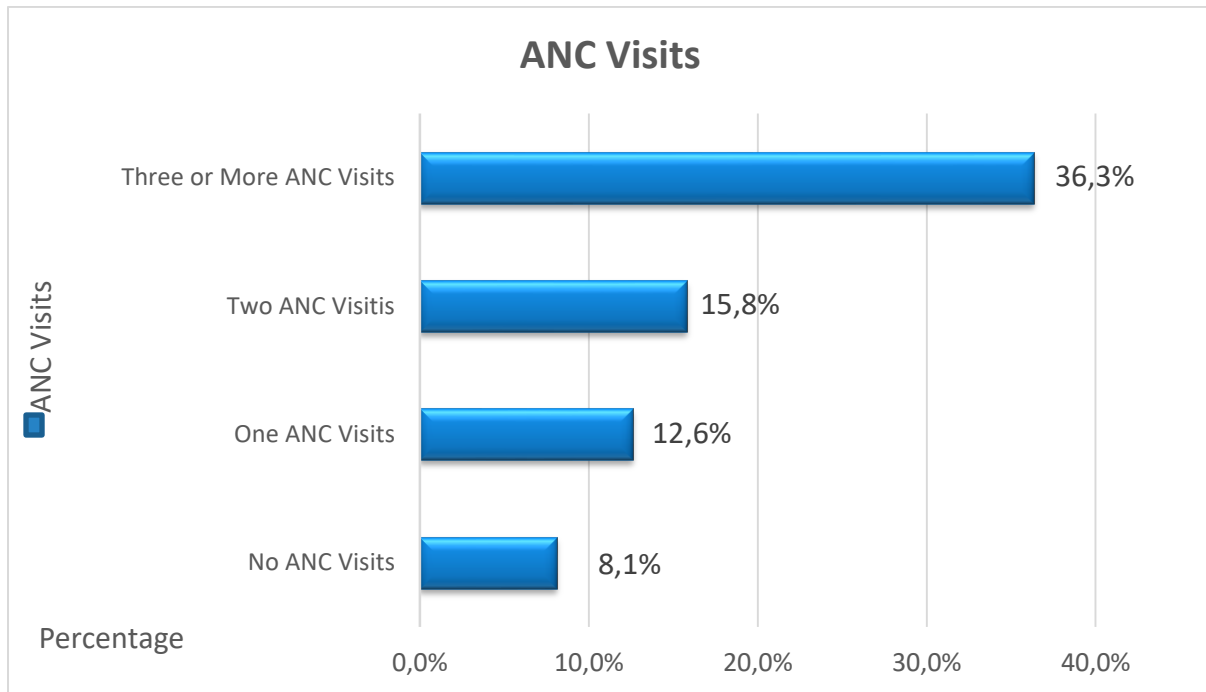


Figure-03: Number of ANC visits during pregnancy.

We also considered respondents' awareness related variable antenatal care visits during their pregnancy period. Figure-03 explains that more than sixty three percent (63.4%) pregnant women received three or more ANC visits in their different trimester during their pregnancy.

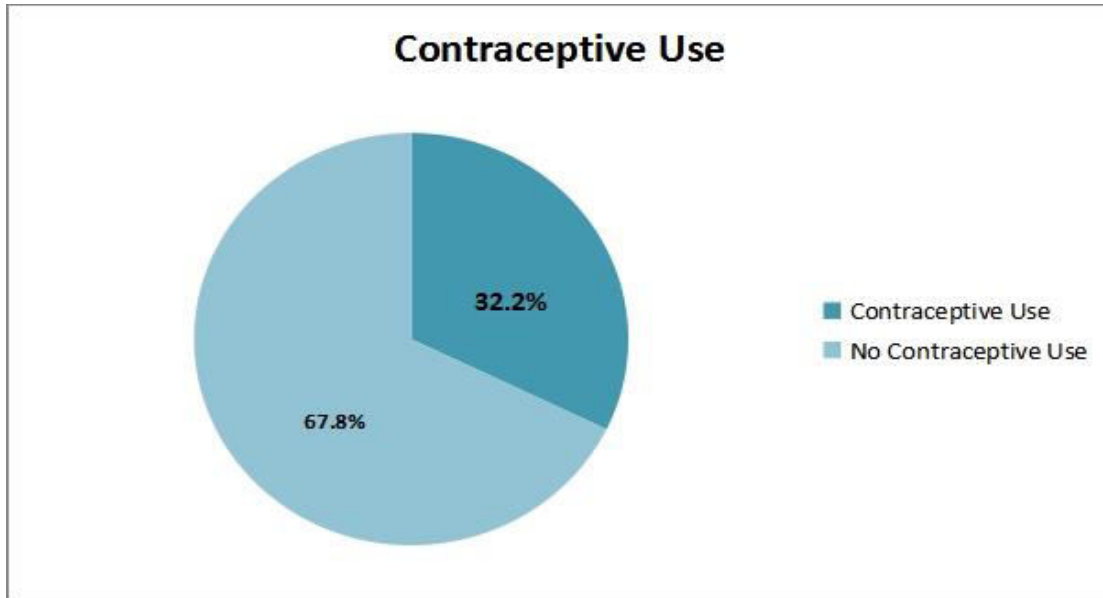


Figure-04: Participants' history of contraceptive use.

It is clearly observed from Figure-04 that more than thirty percent (32.2%) women regularly used any forms of contraceptive methods in their reproductive age.

4.2 Results from bivariate and multivariate analysis:

Table-02 presents the results on respondents who have ever had a pregnancy termination based on the background characteristics which consist of age group, residence, divisions, level of education, religion, currently working, continue studying after marriage, marital age and respondents have own mobile phone or not. The results revealed that about 36% of the respondents over 44 years of age had a pregnancy termination. More than 20% urban women and above 20% of women from Khulna and Sylhet division had terminated their pregnancy. Again, around 15% women who were higher educated, and over 18% women who belong to Muslim religion had pregnancy termination in the reproductive life. It is also found; around 20% women who were working during pregnancy period and just below 19% were studying after marriage had pregnancy termination. In addition, our findings show that more than 21% who got marriage earlier and around 19% who used mobile phone had pregnancy

termination. We could not find any association about contraceptive used, ANC visits or exposed to mass media on pregnancy termination among women.

Table-02: Distribution socio-demographic characteristics of by pregnancy termination

Socio-demographic characteristics	Pregnancy termination		P value
	Yes n(%)	No n(%)	
Age group in years			
15-24	541(13.1)	3587(86.9)	<0.01
25-34	821(20.9)	3099(79.1)	
35-44	201(29.2)	488(70.8)	
≥45	8(36.4)	14(63.6)	
Place of residence			<0.01
Urban	622(20.3)	2435(79.7)	
Rural	949(16.6)	4753(83.4)	
Divisions			<0.01
Barisal	152(16.8)	754(83.2)	
Chittagong	184(12.7)	1262(87.3)	
Dhaka	261(20.0)	1043(80.0)	
Khulna	189(20.9)	715(79.1)	
Mymensingh	173(16.9)	852(83.1)	
Rajshahi	159(17.4)	753(82.6)	
Rangpur	188(19.4)	783(80.6)	
Sylhet	265(20.5)	1026(79.5)	
Level of education			<0.01
No education	134(20.9)	508(79.1)	
Primary	518(20.3)	2030(79.7)	
Secondary	693(16.8)	3422(83.2)	
Higher	226(15.5)	1228(84.5)	
Religion			0.05
Islam	1466(18.3)	6552(81.7)	
Hinduism	98(14.2)	593(85.8)	
Buddhism	5(14.7)	29(85.3)	
Christianity	2(12.5)	14(87.5)	
Wealth quintile			0.14
Poorest	320(16.6)	1608(83.4)	
Poorer	304(17.3)	1451(82.7)	
Middle	277(17.7)	1286(82.3)	
Richer	320(18.4)	1417(81.6)	
Richest	350(19.7)	1426(80.3)	

Respondent currently working			
No	881(17.0)	4314(83.0)	<0.01
Yes	690(19.4)	2874(80.6)	
Continue studying after marriage			
No	472(16.0)	2470(84.0)	<0.01
Yes	1099(18.9)	4718(81.1)	
Earlier or late marriage			
Earlier	335(21.1)	1251(78.9)	<0.01
Right time	763(17.2)	3663(82.8)	
Later	473(17.2)	2274(82.8)	
Contraceptive use and intention			
No contraceptive use	506(17.9)	2316(82.1)	0.50
Contraceptive use	1065(17.9)	4872(82.1)	
ANC visits			
No ANC Visit	62(15.2)	346(84.8)	0.25
One ANC Visit	98(15.6)	532(84.4)	
Two ANC Visits	124(15.6)	670(84.4)	
Three or more ANC Visits	563(17.7)	2617(82.3)	
Mothers exposed mass media			
Reading newspaper/magazine			0.26
No	1408(18.0)	6399(82.0)	
Yes	163(17.1)	789(82.9)	0.39
Listening radio			
No	1490(18.0)	6802(82.0)	0.07
Yes	81(17.3)	386(82.7)	
Watching television			0.07
No	576(17.2)	2779(82.8)	
Yes	995(18.4)	4409(81.6)	
Own mobile phone			
No	541(16.4)	2767(83.6)	<0.01
Yes	1030(18.9)	4421(81.1)	

Statistically significant at $p \leq 0.05$

Table-3 presents the results of Binary Logistic Regression Analysis (COR) with some predictor's variables and pregnancy termination among young women in Bangladesh. In the unadjusted model (COR), age, working status, residence, divisions, and education, religion, studying after marriage, marital age and personal mobile phone were found as predictors and most of the explanatory variables have significant association with pregnancy termination. Specifically, we found that women of aged 25-34 (COR=1.75, CI=1.56-1.98), 35-44 years

(COR=2.73, CI=2.26-3.29) and 45 years and above (COR=3.79, CI= 1.58-9.07) were more likely to have a terminated pregnancy compared to those aged 15–24 years.

Table-03: Association of pregnancy termination with socio-demographic characteristics.

Factors	COR	CI (95%)		P value
		Lower limit	Upper Limit	
Age group (years)				
15-24(ref)	1.00	--	--	
25-34	1.75	1.56	1.98	0.00
35-44	2.73	2.26	3.29	0.00
≥45	3.79	1.58	9.07	0.00
Respondent currently working				
Not working (ref)	1.00	--	--	0.00
Working	1.17	1.05	1.31	
Place of residence				
Urban(ref)	1.00	--	--	
Rural	0.78	0.69	0.87	0.00
Divisions				
Sylhet (ref)	1.00	--	--	
Barisal	0.78	0.62	0.97	0.02
Chittagong	0.56	0.46	0.69	0.00
Dhaka	0.96	0.80	1.17	0.74
Khulna	1.02	0.83	1.26	0.82
Mymensingh	0.78	0.63	0.97	0.02
Rajshahi	0.81	0.65	1.01	0.07
Rangpur	0.93	0.75	1.14	0.49
Education level				
No education(ref)	1.00	--	--	
Primary	0.96	0.78	1.19	0.00
Secondary	0.76	0.62	0.94	0.00
Higher	0.69	0.55	0.88	0.25

Religion				
Muslim (ref)	1.00	--	--	
Hinduism	0.74	0.59	0.92	0.00
Buddhist	0.77	0.29	1.99	0.59
Christianity	0.64	0.14	2.81	0.55
Continue studying after marriage				
Yes(ref)	1.00	--	--	0.00
No	0.82	0.73	0.92	
Early or late marriage				
Earlier(ref)	1.00	--	--	
Right time	0.78	0.67	0.89	0.00
Later	0.77	0.66	0.90	0.00
Have own mobile phone				
Yes(ref)	1.00	--	--	0.00
No	0.84	0.74	0.94	

Statistically significant at $p \leq 0.05$

The likelihood of having a pregnancy termination was slightly high among young women who were working compared to those who were not (COR = 1.17, CI = 1.05–1.31). Pregnancy termination in rural area were less likely than urban participants (COR = 0.78, CI = 0.69–0.87). Some divisions have significant associations with pregnancy termination. Women in Barisal (COR= 0.78, CI= 0.62-0.97), Chittagong (COR= 0.56, CI= 0.46-0.69) and Mymensingh (COR= 0.78, CI= 0.63-0.97) divisions are less likely to have terminated pregnancy than Sylhet (ref) division. Pregnant women who are educated mainly primary level (COR=0.96, CI= 0.78-1.19) and secondary level (COR= 0.76, CI= 0.62-0.94) have less chance of pregnancy termination. Besides, women who belong to Hindu religion and those are not studying after marriage having less chance to terminate pregnancy than Muslim (ref) and mother who were studying after marriage (ref). We also have seen from the table, women who got marriage earlier (ref) than right time (COR= 0.78, CI= 0.67-0.89) or later (COR=

0.77, CI= 0.66-0.90) and has their own mobile phone (ref) have more chance to terminate pregnancy.

Table-04 shows the adjusted odds ratio (AOR) of pregnancy termination and some socio demographic characteristics of the respondents. Age is significantly associated with female's pregnancy termination and with the increase of ages, the likelihood of pregnancy termination increases. As is observed, age group of 25-34, 35-44 and 45 and above years are respectively 1.73, 2.64 and 3.44 times more risk to loss their pregnancy before safe delivery. Similarly, rural people have 21% less chance to terminate their pregnancy.

Women of Barisal, Chittagong and Dhaka division adjusted odds ratio are 0.77 (CI=0.61-0.97), 0.56 (CI=0.45-0.70) and 0.87 (CI=0.71-1.06) respectively. Participants who are from Hindu religion, their pregnancy termination risk are 29% less than those women are from Muslim (ref) community. Moreover, women's marital age also significantly associated. Marriage in right time has 23% less chance to loss their pregnancy before normal outcome. We also found, women who possess own mobile phone; their pregnancy termination risk is 0.79 times less compare to those have no mobile phone (ref).

Table 04: Factors determinants for pregnancy termination among reproductive aged women in Bangladesh.

Factors	AOR	CI (95%)		P value
		Lower limit	Upper Limit	
Age (years)	1.12	1.09	1.14	0.00
Age group (years)				
15-24(ref)	1.00	--	--	
25-34	1.73	1.53	1.95	0.00
35-44	2.64	2.17	3.21	0.00
≥45	3.44	1.40	8.42	0.00
Place of residence				
Urban(ref)	1.00	--	--	
Rural	0.79	0.70	0.89	0.00
Divisions				
Sylhet (ref)	1.00	--	--	
Barisal	0.77	0.61	0.97	0.03
Chittagong	0.56	0.45	0.70	0.00
Mymensingh	0.75	0.59	0.93	0.01
Religion				
Muslim (ref)	1.00	--	--	
Hinduism	0.71	0.56	0.89	0.00
Early or late marriage				
Earlier(ref)	1.00	--	--	0.00
Right time	0.77	0.66	0.90	
Have own mobile phone				
Yes(ref)	1.00	--	--	0.00
No	0.79	0.70	0.90	

Statistically significant at $p \leq 0.05$

CHAPTER 5: DISCUSSION

5.1. Discussions:

Based on the findings of our study, about one-fifth of ever married women in Bangladesh had terminated the pregnancy. The outcome of this study added to the limited literature on the reproductive health of women in Bangladesh. The study findings revealed some significant associations of women's age at survey time, working status, demographic characteristics, marital status, and poses own mobile phone with reporting having a history of terminated pregnancy among Bangladesh ever-married women. The results from our study suggested that women with increasing of age, the risk of pregnancy termination increased. The pregnancy was highly prevalent among the age group of 25-34 years. Women who were involved in any occupation were at an increased risk of reported pregnancy termination in Bangladesh. This is consistent with another study conducted by Bangladeshi women based in BDHS data [45] and one in Ghanaian women based on Ghana DHS data [46]. There might be several reasons for employed women to experience terminated pregnancies compared to non-working women: decision-making power of working women regarding their reproductive health, prioritizing career goals over pregnancy, being more aware of contraceptive options including, menstrual regulation [B], or access to induced abortion through financial means [47] even though abortion is still illegal in Bangladesh. These may explain the reasons why working women tended to be more likely to have had voluntary termination of pregnancies. In contrast, working women may experience involuntary pregnancy termination for several reasons. Previous study suggested that working women had a higher risk of stillbirth [48]. Working women carry a higher risk of adverse reproductive outcomes (e.g., spontaneous abortion) [49] and some occupations are associated with high risk during pregnancy [50]. The authors suggested that parental exposure to harmful chemicals during their work may

influence the function and structure of the gamete, which may lead to an adverse outcome of pregnancy [49].

The likelihood of pregnancy termination was lower among young women who lived in rural areas. The proportion of pregnancy termination was disproportionate with the regional concentration, which showed that women from other divisions in Bangladesh except Khulna were less likely to have pregnancy termination compare to Sylhet division. The termination is the highest in Khulna division. It may be the easy access and knowledge level about the reproductive health services, and they face higher restriction and social stigma, which are consistent with previous studies [51-54].

Inconsistent with other studies [55,56] education was not associated with pregnancy loss in our unadjusted model, which has been omitted from the adjusted odds ratio. In Bangladesh, education is merely associated with income generating activities or healthcare decision-making process. For instance, a large number of women with no education working in garments industries while many highly educated women are not in formal employment and involve only in household duties [57].

It was also observed that Islamic women were more likely to terminate a pregnancy as compared to Hindu, Christians, Buddhist or women who belonged to other religions. This is inconsistent to the findings of Klutsey [58] and Ahiadeke [59], where prevalence of abortion was found to be high among Christians. As Bangladesh is a country of Muslim majority (around 90%), and abortion is prohibited in Islamic rules, but pregnancy termination can be happened other different ways like miscarriage, stillbirth, MR etc. which may be the higher prevalence of pregnancy termination amongst Muslim women.

Young women who got marriage at the early time of their reproductive age, they have more chance to terminate pregnancy compare to those are right time or late marriage. their first sex at the age of 20–24 and those whose first sex the higher probability of an unintended pregnancy and termination among young women who have sex at earlier ages could be the

plausible reason for this finding [60-61]. These unintended pregnancies have been attributed to a lack of or inadequate access to sexual and reproductive health services, including family planning [62-63], as well as the socio-cultural norms surrounding access to contraceptive services among young women having their first sex at an age of less than 15 years [64-65]. One of the means of reducing the barriers to access to family planning services, which increases unintended pregnancies among young women who initiate sex early, is to enhance education through the use of mass media and eliminate all forms of socio-cultural barriers to access sexual and reproductive health services.

In this study we could not find any significant association with exposure to mass media and pregnancy termination which is inconsistent with some other study[66] However, mobile phone is now available in every family and we have found a strong and significant association with own mobile phone and pregnancy termination of young women in Bangladesh. It may be a reason that mobile phone is a communication technology and even it's like one of the media which has a direct impact on public awareness. To implement these findings in national level or implementation in different program, more research is needed.

CHAPTER 6: Conclusion and Recommendation

6.1. Conclusion:

Pregnancy termination is one of the critical public health issues. Sometimes, it is expected, and, in some cases, unintended pregnancy termination happens. The study findings reveal some socio demographic characteristics provided of pregnancy termination among women within reproductive age group in Bangladesh are age, residence, divisions, education, religion, currently working, marital age, studying and self-mobile owner. Although, similar findings and understanding are observed in some other countries like Ghana and Mozambique, showed variations in relation to how each demographic variable influenced pregnancy termination. The odds of pregnancy termination were high among women with older age group, working or not and some divisions as well. However, lower odds ratio also found in residence, education, religion, studying after marriage, mother's working status, early or late marriage and self-mobile holder. On the contrary, we could not find any significant association with pregnancy termination and some predictors like women wealth quintile, expose to mass media (newspaper, radio or television), ANC visits and contraceptive used. To reduce unintended pregnancies that could lead to pregnancy termination, there is a need for regular integrated community-based outreach programs targeted at generating community awareness of effective contraception and prevention of unintended pregnancy.

Pragmatic steps should be taken to make health systems easily accessible to women seeking safe abortion services. Furthermore, prevention of unexpected pregnancy terminations must always be given the highest priority and every attempt should be made to eliminate the practice for unsafe abortion. Women who have unwanted pregnancies should have ready access to reliable information and compassionate counseling.

6.2. Recommendations:

Our study has some recommendations for policy implications. It is showed that with the increase of age women pregnancy termination chance has increased. So, women who are higher age should be more aware to prevent Pregnancy termination. and maternal death. Besides, policy could be in place to encourage young women to start their marital life at a later age. Female currently working status also important to reduce pregnancy termination. So, providing financial support or providing them empowerment program to delay their marriage. women residential area also important to reduce pregnancy termination. So, identifying high risk geographical area for targeted interventions and evaluating the impact of intervention program. Education also very important for reduction of pregnancy termination and female's mortality. So, education and awareness program should be implemented to improve about this issue. Finally, mobile phone as a strong communication media has an impact to reduce pregnancy termination. So, we recommend for mass use of mobile phone to reduce pregnancy termination as well as maternal mortality.

6.3. Limitations of the study:

There are some limitations in our study have been identified, which should be considered during interpretation of the results. First of all, past events have been reported based on recall of the respondents, such as pregnancy termination, age of first cohabitation, date of ANC visits, and the total number of children ever born; therefore, the study may suffer from recall bias. Secondly, the Bangladesh Demographic and Health Survey 2017, data does not classify which of the terminated pregnancies were due to spontaneous or induced for therapeutic or elective reasons. Additional information on types of pregnancy termination should be collected to determine the extent to which the potential risk factors associated with different

types of pregnancy termination. The next weakness, residential locations at the individual level are not available in HDSS 2017 data. The government decides at the district level; so, the spatial analysis was conducted at the district level for drawing policy implications. Further, studies could be conducted using GPS location for fitting geo-statistical models at finer spatial scales for each sampling cluster. Finally, this study is a cross-sectional study and temporal relationship between the risk factors and the outcome variables is absent and it is one of the major limitations in this study. For example, the outcome variable i.e., ever experienced pregnancy termination, may occur before marriage. Besides, Bangladesh is a very conservative society (i.e. patriarchal and predominantly Muslim). The social norms never support premarital sexual relationships or extramarital sexual relationship, and these are considered as taboo. So, we suspect the likelihood of premarital pregnancies or pregnancy termination prior to marriage is very low. Additionally, a woman's educational attainment, place of residence, employment status may be different during her pregnancy termination than at the time of the survey. The unobserved shift in these characteristics relative to the time-variant may bias the results of the analysis. Analytical studies, such as prospective cohort studies, seeking to establish relationships between risk factors and pregnancy termination, are therefore warranted to address the limitations of the cross-sectional study.

6.4. Strength of the study:

Despite many limitations, this study has some strength. First, using BDHS 2017 data, to the best of our knowledge, no studies have investigated unobserved spatial variation in pregnancy terminations while studying the impact of a range of demographic and socio-economic and some maternal factors. From the findings of our study, it is indicated that properly accounting for the geographical clustering and flexibly modeling the nonlinear effects of the continuous covariates are crucial for drawing a valid statistical inference. In addition, the data is valid and sample size comparatively large. Besides, this is a national-wide study, which provides the ground for policymakers to employ policies to provide safer service for family planning or reproductive health to women living in high-risk regions of terminated pregnancies.

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Appendix-A

UPDATED CV

This should only be the part of a thesis proposal. A generic format is given here with.

Particulars of the Student:

Name	Dr. Makfiratur Rahman
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Academic Qualifications:

EXAM TITLE	INSTITUTE	RESULT	PASSING YEAR
M.B.B.S	Kumudini Women's Medical College	Passed	2017
H.S.C	Savar Model College	GPA 4.40	2010
S.S.C	S.K Govt Girl's High school, Manikganj	GPA 5.00	2008

Name: