

**Repeat abortion and use of contraception among post-abortion women in Nepal –  
A prospective cohort study**

Aradhana Thapa

A thesis  
submitted in partial fulfillment of the  
requirements for the degree of

Master of Public Health

University of Washington  
2015

Committee:  
Annette L. Fitzpatrick, PhD  
Emily M. Godfrey, MD, MPH

Program Authorized to Offer Degree:  
School of Public Health, Department of Global Health

©Copyright 2015  
Aradhana Thapa

University of Washington

**Abstract**

Repeat abortion and use of contraceptive among post-abortion women in Nepal –  
A prospective cohort study

Aradhana Thapa

Chair of the Supervisory Committee:  
Research Professor, Annette L. Fitzpatrick  
Department of Family Medicine and Epidemiology  
Adjunct, Department of Global Health

*Aim:* The study aims to identify the associated risk factors of repeat abortions and post-abortion contraceptive use among women in Pokhara city of Nepal. *Background:* Nepal legalized abortion in 2002 to promote safer motherhood (1). Safe abortion was attributed to be one of the contributing factors to a sharp decline of maternal mortality and morbidity in the country (2), however, abortion should not be considered an alternative to contraceptive use. Choosing abortions, repeatedly, can be detrimental to women and child health (3, 4). Post-abortion acceptance of contraception is low (41%) in the country and repeat abortion, high (33%) (3, 5). *Method:* This is a prospective cohort study conducted among women who had just received an abortion procedure between January 2015 to April 2015 at three abortion clinics of Pokhara city in Nepal. We recruited 220 women immediately after their abortions to conduct a baseline interview and followed these in-person interviews with a telephone interview two months later to collect information on each woman's current contraceptive method. *Findings:* The present study revealed that only half of the post-abortion women use effective contraception after abortion and there is a high prevalence of repeat abortion. The main factors positively influencing use of post-abortion contraception were presence of the woman's husband in another country and choice of Tier II contraceptive methods. The main risk factors identified for repeat abortion were age and age at first pregnancy. Better educated women were less likely to adopt effective contraceptive measure after abortion. *Conclusion:* Considering low contraception use after

abortion, increasing numbers of abortion, and high incidence of repeat abortion, a well targeted intervention may have substantial effect to reduce risk of unintended pregnancies.

## Table of Contents

<u>LIST OF ACRONYMS &amp; ABBREVIATIONS</u> .....	vi
<u>LIST OF FIGURES</u> .....	vii
<u>LIST OF TABLES</u> .....	viii
ACKNOWLEDGMENT .....	ix
INTRODUCTION .....	1
1.1 Background .....	1
1.2 Rationale of the Study .....	3
1.3 Conceptual Model .....	5
OBJECTIVES AND RESEARCH QUESTIONS .....	5
2.1 Overall Aim .....	6
2.2 Specific Objectives .....	6
METHODS .....	1
3.1 Study Design .....	1
3.2 Study Population and Sample .....	2
3.3 Ethical Consideration .....	2
3.4 Data Collection .....	3
3.5 Study Instruments .....	3
3.6 Study Variables .....	4
3.7 Other Independent Variables .....	5
3.8 Quality Control and Statistical Analysis .....	6
RESULTS .....	7
4.1 Characteristics of Sample .....	7
4.2 Risk factors associated with repeat abortion among women .....	13
4.3 Factors associated with post-abortion use of effective contraceptive methods .....	15
DISCUSSION .....	18
Conclusion .....	21
REFERENCES .....	23
APPENDIX – 1: COPY OF RECRUITMENT SCRIPT .....	26
APPENDIX – 2: WRITTEN CONSENT FORM .....	27
APPENDIX – 3: BASELINE AND FOLLOW UP QUESTIONNAIRE .....	30

## **LIST OF ACRONYMS & ABBREVIATIONS**

CAC	Comprehensive Abortion Care
FPAN	Family Planning Association of Nepal
IUD	Intrauterine Device
NGO	Non-Governmental Organization
WHO	World Health Organization
WRH	Western Regional Hospital

**LIST OF FIGURES**

Figure 1 Map of Pokhara city, Nepal..... 4

Figure 2 Conceptual Framework ..... 5

Figure 3 Study Plan..... 1

## **LIST OF TABLES**

Table 1 Power Calculations calculated using STATA software.....	2
Table 2. Demographic characteristics of post-abortion women participating in the study .....	9
Table 3 Awareness, knowledge and counseling on contraception among post-abortion women .....	10
Table 4 Self-reported reasons for: recent abortion and not using any contraceptive methods post-abortion .....	11
Table 5 Contraception: Use pre-abortion, Choice immediately after abortion and Use 2 months post-abortion among post-abortion women .....	12
Table 6 Risk factors associated with repeat abortion <sup>a</sup> among post-abortion women .....	14
Table 7 Factors associated with effective contraceptive methods¥ use after abortion <sup>a</sup> .....	16

## **ACKNOWLEDGMENT**

I would like to acknowledge the guidance, encouragement and support from Annette Fitzpatrick, my thesis chair, which brought this thesis together and Emily Godfrey, my thesis committee member, for her support and instruction throughout the study. I extend my heartfelt gratitude to Western Regional Hospital and its team in CAC unit, Family Planning Association of Nepal and its team in Pokhara and private health institution for their trust in my ability to conduct this study. I am deeply grateful to respondents who made this study possible; I respect their volunteerism and selflessness.

I am immensely grateful to the Global Health Fellowship award for supporting this research; Jennifer Tee, my staff adviser for her patience and immense support; and the UW Department of Global Health. Elizabeth Meacham ‘Liz’, Thank you for your love, unconditional support, motivation, inputs and edits to complete this thesis report.

Archana Shrestha, my mentor, sister and best friend, thank you! This graduate school has become possible because of you; I appreciate your support at each steps of my life not to forget this thesis project. My love and appreciation for my friends in Nepal; Gyanu for helping me with study logistics, Ram for answering statistical questions in my convenient Pacific time ☺, Smita for being there and Amrita for arranging human resources. Binaya, I get to thank you for laying a foundation of statistics in my life. To my family and extended family: I remain grateful for your presence in my life; I am because of your immense love, kindness, and faith. A special mention of Khuchu, dai and Z-ju for an easier, livelier and a lovely journey in the U.S.

## INTRODUCTION

*“If the woman we treat for post-abortion complications is there because she could not get contraception, we have failed her. If she leaves without family planning, we have failed her twice.”*  
– Verme, 1994

### 1.1 Background

The International Conference on Population and Development Programme of Action defines reproductive health as, “a state of complete physical, mental and social well-being, and not merely the absence of reproductive disease or infirmity and includes information and access to safe, effective, affordable and acceptable methods of family planning of the individual’s choice (6). Provision of access to and use of voluntary family planning, especially effective contraceptive methods, for women and men is crucial to improve reproductive health outcomes, and is positively associated with improvements in health, schooling, and economic outcomes (7). Family planning lowers the risk of maternal mortality and morbidity by reducing parity, high risk pregnancy, unwanted pregnancies and the associated unsafe abortions (8, 9). The breadth of potential benefits includes women’s empowerment, diminished poverty, and enabling of educational, social and economic participation (10). Addressing the global unmet need for family planning has the potential to lower maternal deaths by up to 29 percent (11).

In recent history, the reproductive right to abortion has been extended to women in many countries, including Nepal. Abortion was legalized in Nepal in 2002 and the government began to provide comprehensive abortion care services in 2004 following the World Health Organization (WHO) guidelines (1). The ‘Abortion Law’ allows any women to terminate their pregnancy during the first 12 weeks of gestation, and up to 18 weeks of gestation if the pregnancy is a result of rape or incest (5). Further, women can legally terminate pregnancies of any duration with the recommendation of an authorized medical practitioner if the life of the mother is at risk, if her physical or mental health

is at risk, or if the fetus is deformed (5). The legalized safer abortion services are attributed to decline in maternal mortality and morbidity in the country (2). The number of women receiving abortion care increased in thousands from 2013 to 2014, the abortion related complications reduced by half from 1998 to 2009, and the maternal mortality has decreased by more than half from 360 to 170 per 100,000 live births in the past decade in the country (1, 12). The government of Nepal is progressively expanding comprehensive abortion services provided by trained health workers at service delivery points with surgical facilities and medicines located at district hospitals, some primary health care centers, health posts, non-governmental clinics and private hospitals. About one in five women who had an abortion in the last five years went to government health facilities, while one in three went to non-government health facilities. The remaining third sought care in private-sector facilities (5).

Access to safer abortion services decreases maternal morbidity and mortality; however, abortion should not be considered an alternative to contraceptive use. Choosing abortion over contraceptive use can be detrimental to women and child health; repeat abortion not only adds financial burden to the clients and health system, but is also associated with low birth weight and preterm delivery, distress, fetal loss, and ectopic pregnancy (3, 4). Yet, previous studies have observed an increase in incidence of abortion with relaxation of abortion laws (3). A study done by Thapa, S et al (2012) reported a high incidence of repeat abortion (32%) and concluded that the volume was likely to continue to rise in foreseeable future (3). The study reported a rising incidence of repeat abortion with increase in age and parity, and was higher among those attaining primary or secondary level education (3).

The government of Nepal has included contraceptive counseling as a mandatory component of post-abortion care to increase post-abortion contraceptive use (12). Despite the Nepalese government's effort to promote contraceptive use among post-abortion women, low acceptance of family planning

in post-abortion care remains a major challenge in the country (1, 3, 5). Though abortion services have opened a new window of opportunity to administer effective contraception to women, the opportunities have been under-utilized; the abortion data from public abortion facilities show that only half of clients in 2009-2011 received a contraception after abortion and still, there are no data from private facilities which account for a large proportion of total abortion services (13). The National Demographic and Health Survey (DHS) showed low contraception prevalence (41%) among post-abortion women who had had an abortion within last 5 years (5), (14).

Additionally, a new population dynamic is added to the existing challenges of promoting contraceptive uptake in Nepal. About one third of Nepalese couples are separated due to migration (5). A majority of wives of migrant males discontinue reversible contraceptive methods and do not make any prior arrangements for the use of contraception before their husbands return home, which exposes them to unintended pregnancy (15). This information is reinforced by the National Demographic Health Survey 2011 reporting 'husband away' as the most common reason for contraceptive discontinuation (5). Wives of male migrants face cultural barriers such as fear of being accused of infidelity, denial of family planning services by service providers, and reservations with regards to asking for family planning services when their husbands are away from home which disproportionately affects their access to contraception (15). Rocca, H.C et al (2013) assessed contraceptive information received and method choice and use among post-abortion women. The study identified spousal employment location in addition to parity and educational status to be associated with contraceptive use of after abortion (16).

## **1.2 Rationale of the Study**

Nepal made a historic decision to promote safer motherhood by legalizing abortion a decade ago. This has led to a decrease in unsafe abortion, and also attributed to a significant decrease in maternal

mortality and morbidity in the country (7, 10). As mentioned above, it is, however, necessary to promote contraception uptake in the country because abortion should not be considered as an alternative to contraception use. Yet, despite wide accessibility and availability of contraceptive methods, abortion and repeat abortions continue to rise (1, 12). While, it is understood that contraceptive use reduces their risk of unplanned pregnancy, subsequently reducing abortion rates (17), very little research has examined the factors associated with use of contraception after abortion in Nepal and in the broader South Asian context (13, 18). Understanding the associations of different factors with repeat abortion and post-abortion contraceptive use is important for developing targeted strategies to prevent repeat abortions and promote safer motherhood.

In this context, we collected data from three different types of clinics in Pokhara City of Nepal to investigate the factors associated with repeat abortion and use of contraception among post-abortion women. The city is located in western region of the country in Kaski district. Kaski district has served the second highest number of abortion care services in the country after Kathmandu (12). The district has a population of 492,098 people with more than half living in Pokhara sub-metropolitan city (19). This study can contribute to the development of larger studies, and to help design guidelines for the promotion of contraceptives use among post-abortion women in Nepal.



Figure 1 Map of Pokhara city, Nepal

### 1.3 Conceptual Model

Our conceptual model (Figure 1) represents the data collected during the study. Independent variables include demographic variables, pregnancy history, knowledge of contraception and post-abortion contraception counseling and information about different types of contraceptive methods. Intermediate variable includes choice of contraception immediately after abortion at the baseline interview. These variables are shown in terms of their relationship with the study outcome of 2-month post abortion contraceptive use.

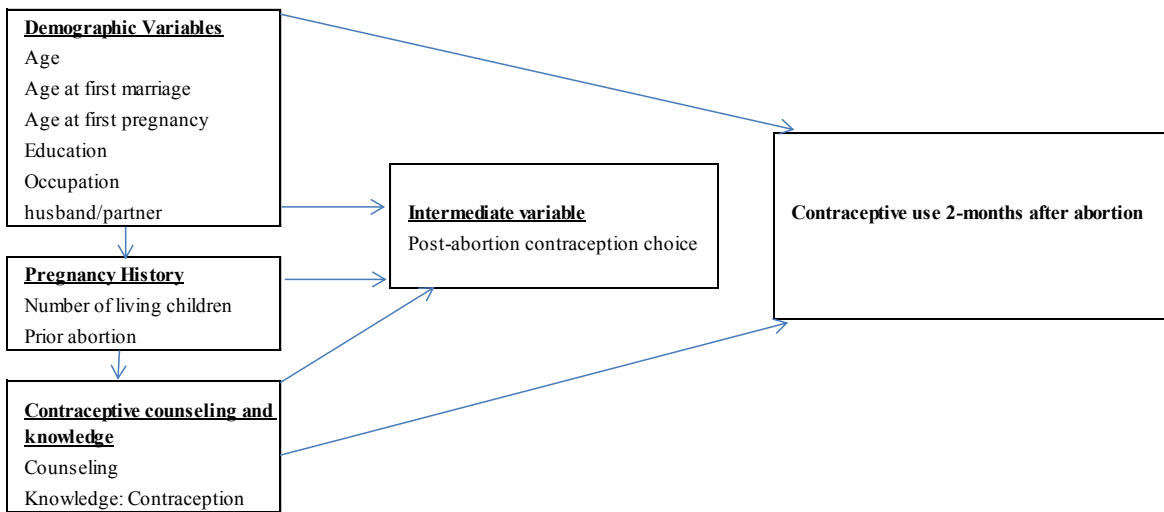


Figure 2 Conceptual Framework: Outcome (Contraceptive use 2-months post abortion), Independent variables: Demographic variables, Pregnancy, and Contraceptive counseling and knowledge, and Intermediate variable.

‘

### OBJECTIVES AND RESEARCH QUESTIONS

This study examined factors associated with repeat abortion and post-abortion contraceptive use in Nepal. The findings will help us to develop targeted strategies to increase post-abortion contraceptive use in Nepal and define further research questions.

## **2.1 Overall Aim**

The study aims to identify the associated risk factors of repeat abortions and post-abortion contraceptive use among women in Pokhara city of Nepal.

## **2.2 Specific Objectives**

The main study objectives are:

- To describe socio-demographic characteristics of women who had an abortion at public, private and non-governmental health clinics in Nepal;
- To describe women's contraceptive use before and after their abortions;
- To examine risk factors associated with repeat abortion; and
- To ascertain factors associated with contraceptive use 2-month post abortion.

## METHODS

### 3.1 Study Design

This is a prospective cohort study conducted among women who had just received an abortion procedure between January 2015 to April 2015 at three abortion clinics of Pokhara city in Nepal. We recruited two hundred and twenty women immediately after their abortions. Trained native interviewers conducted the baseline survey, just after women completed their abortion procedure and prior to exiting the clinic, to collect data on contraceptive counseling, information, use, and choice of contraception after abortion. Interviewers followed these in-person interviews with a telephone interview two months later to collect information on each woman's current contraceptive method.

(Figure 2)

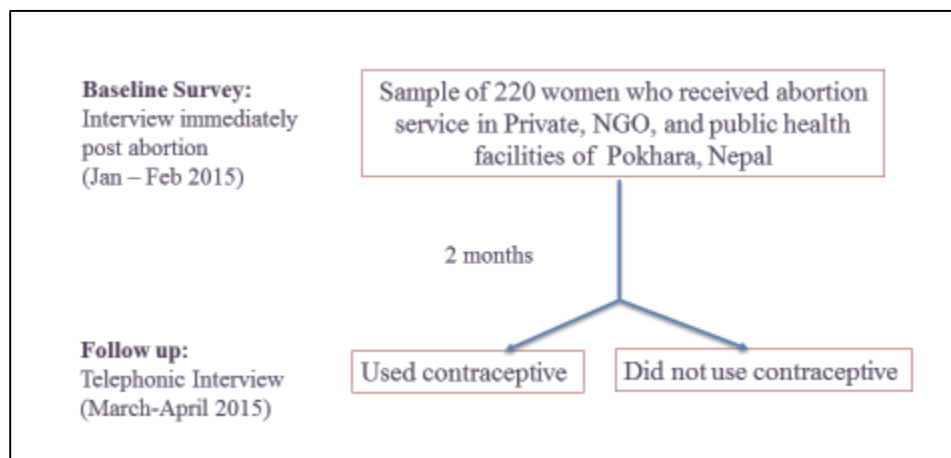


Figure 3 Study Plan

### 3.2 Study Population and Sample

The target study population consisted of women who had an abortion in the approved Comprehensive Abortion Care (CAC) facilities. We purposely selected the largest public hospital (Western Regional Hospital, WRH), a non-governmental facility (Family Planning Association of Nepal, FPAN) and a private (anonymous upon request) service provider among CAC facilities in Pokhara. The Western Regional Hospital is a regional level state hospital, which serves patients from the western region of Nepal, and FPAN is a prominent NGO addressing family planning in Nepal. We invited all eligible women, who attended the Comprehensive Abortion Care (CAC) clinics in the above mentioned health facilities from January 4th, 2015, to participate in the study, immediately following their abortion procedure, until the predefined sample size (n=220) was recruited. The eligibility criteria included women who were 18 years or older, and could communicate in the Nepali language. The sample size for the study was calculated using STATA 11 assuming a 95% level of significance, 80% power, 20% contraceptive use among those who did not receive counseling, and minimum detectable odds ratio of 1.44. (Table 1) Women who provided written consent were recruited into the study. We recruited a total of 220 women: 29 women from the private hospital, 39 from the Western Regional Hospital and 152 from the FPAN - over a period of 6 weeks from January 4th, 2015 through February 15<sup>th</sup>, 2015. A copy of the script used for recruitment can be found in Appendix -1.

Table 1 Power Calculations calculated using STATA software

Confidence level	95%	95%	95%
Power	80%	80%	80%
Exposed vs unexposed	1:1	1:1	1:1
Proportion of outcome in non-exposed population (Use of contraception in women without counseling)	0.20	0.20	0.20
Relative risk	1.5	1.8	2.2
Recommended sample size per group	151	110	67
Total sample size	302	<b>220</b>	134

### 3.3 Ethical Consideration

The Institutional Review Board-Human Subjects at the University of Washington and the Nepal Health Research Council in Nepal approved the study. All study activities conformed to the ethical standards set forth by both committees to ensure the protection of study participants. The research assistants informed all the respondents about the voluntary nature of participation, study purpose, risks and benefits of their contribution and that they can decline to participate in the study at any time. The research assistants read the consent form to potential female participants, answered questions potential participants had about the form, and documented a written approval (Appendix- 2). All participants received a copy of the consent form. All participants had access to the Principal Investigator's contact information.

### 3.4 Data Collection

We hired three female research assistants who were Nepali public health graduate students, and were trained intensively on confidentiality, recruitment and interviewing. The trained assistants performed face to face interviews to collect baseline information at each study site in a private room. The interview lasted between 30-40 minutes. The research assistants followed the participants via telephonic interview after two months. The follow up interviews lasted between 10-15 minutes. Interviewers conducted each interview in Nepali and recorded responses within a structured questionnaire.

The research assistants collected data over a 6-week period following recruitment from January 4th, 2015 through February 15<sup>th</sup>, 2015. They completed follow-up calls in March and April 2015.

### 3.5 Study Instruments

We conducted a comprehensive literature review regarding abortion, repeat abortion, counseling, contraception, and contraceptive use and interview techniques prior to development of the study

protocol. From the literature review, we designed a questionnaire focusing on the main study variables of interest here. We consulted other public health researchers in Nepal to review the content of the questionnaire and made modifications based on their advice. We translated the questionnaire into Nepalese after it was finalized. The Nepal Health Research Council approved the questionnaire for piloting among women in a similar approved CAC health facility for validity of its content, accuracy and preciseness. We made final revisions to the instruments after administering 10 pre-test interviews at CAC facilities. See Appendix 3 for the baseline and follow-up questionnaires.

### 3.6 Study Variables

A description of the variables collected and analyzed in this study is described below.

#### 3.6.1 Study Outcome (Dependent Variables)

- Proportion of women who had prior abortions (Repeat abortion)

Repeat abortion is defined as one or more prior abortion procedures any time in the study participant's life to the current procedure.

- Proportion of women using contraception 2-months post abortion

Contraceptive use has been defined as use of any modern effective contraceptive method at the time of follow up interview. Modern effective methods are defined as contraception that has great than 88% effectiveness with typical use(implant, IUD, sterilization, injectable, pill, patch, ring and diaphragm) (20). Effectiveness is how well the contraceptive works in typical settings, taking human errors and other non-ideal factors into consideration.

#### 3.6.2 Main effects for contraception use after abortion

- Knowledge of different effective methods of contraception (Number)

The research assistants, during the baseline interview, asked the name of different contraception methods known to the participants. The assistants documented the name and total number of known effective contraceptive methods in the questionnaire.

- Immediate post-abortion contraceptive choice (Effectiveness level of the chosen contraceptive)

The World Health Organization (WHO) has categorized contraceptive methods based on their effectiveness within four different tiers (Figure 1). Tier I consists of the most effective contraceptive methods and Tier IV with the least effective methods with mid-level effective methods in Tier II and III.

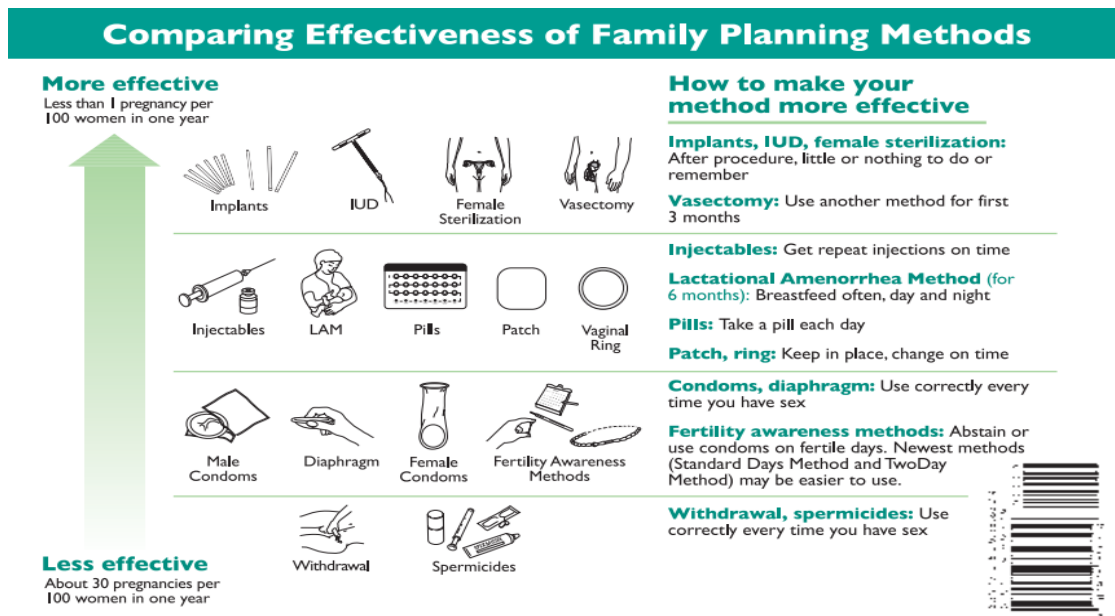


Figure 1: Effectiveness Chart of Family Planning Methods [Source: Family Planning: A Global Handbook for Providers(21)]

### 3.7 Other Independent Variables

- Demographic Variables: **age** (in years), **age at first marriage** (in years), **age at first pregnancy** (in years), **education** (no formal education/ primary/ secondary/ high school or higher), **occupation** (agriculture/ service or business/ homemaker/ labor/ student), and **husband/ partner living in country** (yes/ no)

- Pregnancy History: *number of living children* (in number) and, *prior abortion* (in number) were ascertained in the baseline interview.
- Post-abortion Contraception Counseling by Health Service Providers in Abortion facility (yes/no)

### 3.8 Quality Control and Statistical Analysis

Over the six-week period of baseline data collection, the primary investigator reviewed the completed questionnaires with the research assistants at the end of each week, inspecting them for any missing information. Researchers followed-up on missing information in follow-up telephone interviews with study participants. A research assistant entered all data in an Excel spreadsheet and imported into STATA for data analysis. The primary investigator randomly selected half of the data entries (n=100) and manually compared to the hard copy of the completed questionnaire to assure accuracy. No significant inconsistencies were found. We analyzed data in STATA-11 (22).

We calculated descriptive statistics to describe the characteristics of the sample, including socio-demographic and contraceptive use before and after abortion. We computed frequencies and percentages for categorical variables and averages and standard deviations for continuous variables stratified by type of health facility. A total of 8 respondents (<5%) lost to follow up; no important bias was introduced in the study (23).

We conducted bivariate and multivariate logistic regression to examine risk factors associated with repeat abortions among respondents. We extracted variables from the interview questionnaire and included demographic characteristics (age, age at first marriage, age at first pregnancy, occupation, and education), number of living children, husband working in/out country, and site of abortion. We

calculated odds ratios, 95% confidence intervals and p-values adjusting for the set of confounding variables to measure the strength of associations between risk factors and repeat abortion.

We utilized multivariate logistic regression model to ascertain factors associated with contraceptive use among the women at two months after abortion, with post-abortion contraceptive use and repeat abortion as the outcome. We have reported the odds ratios and 95% confidence intervals with the p-values the following three models for each variable: (1) crude odds ratio; (2) odds ratio adjusted for demographic variables (age, age at first marriage, age at first pregnancy, occupation, and education); (3) odds ratio adjusted for demographic and other variables (number of living children, husband working in/out country, and site of abortion). We calculated the strength of associations between the main effects- knowledge on number of different effective modern methods of contraception and immediate post-abortion contraceptive choice- and outcome – post-abortion contraceptive use - adjusting for the set of confounding variables.

Reference groups for the independent variables in the logistic regression models followed a logical definition (i.e. smallest or largest category). In cases where cell size was small, we chose another category as the reference to allow resolution of the model.

## **RESULTS**

### ***4.1 Characteristics of Sample***

Selected demographic characteristics of the 220 study participants participating in this study according to type of abortion clinic are presented in Table 2. The mean age of the participants was 29.7 (SD=5.7) years. The majority (89%) of the women were Hindus. Almost all women (98%) were married and one-fourth of the married women had their husbands working abroad. There were significant differences in educational levels and occupation of women presenting at different clinics.

More illiterate women and homemakers had the abortion at NGO clinic. The mean age at first marriage was 19 years (SD=2.7) while mean age for the first pregnancy was 20 years (SD=2.7). A quarter of participants had one child while few (8%) were nulliparous. The prevalence of having at least one prior abortion was 43%.

Table 2. Demographic characteristics of post-abortion women participating in the study

<b>Variable/Clinic</b>	<b>NGO (n=152)</b>	<b>Public (n=39)</b>	<b>Private (n=29)</b>	<b>Total (n=220)</b>	<b>P value<sup>a</sup></b>
<b>Age (In years), Mean (SD)</b>	29.5 (5.7)	29.2 (5.5)	27.5 (5.9)	29.2 (5.7)	0.1
<b>Religion, n (%)</b>					0.72
Hindu	136 (89.5)	35 (89.7)	24 (82.8)	195 (88.6)	
Buddhist	14 (9.2)	4 (10.3)	4 (13.8)	22 (10.0)	
Christian	2 (1.3)	0 (0)	1 (3.4)	3 (1.4)	
<b>Marital Status, n (%)</b>					0.18
Currently Married	150 (98.7)	38 (97.4)	27 (93.1)	215 (97.7)	
Husband working abroad	28 (18.7)	10 (26.3)	10 (37.0)	48 (22.3)	0.09
Husband working in country	122 (81.3)	28 (73.7)	17 (63.0)	167 (77.7)	
Never married, separated or widow	2 (1.3)	1 (2.6)	2 (6.9)	5 (2.3)	
<b>Age at first marriage* (In years), Mean (SD)</b>	19.0 (3.0)	19.3 (2.0)	18.7 (2.2)	19.0 (2.7)	0.91
<b>Age at first pregnancy (In years), Mean (SD)</b>	20.5 (3.0)	20.1 (2.0)	20.2 (2.1)	20.4 (2.7)	0.28
<b>Education, n (%)</b>					<b>0.05</b>
Illiterate/ No formal education	52 (34.2)	7 (18.0)	2 (7.0)	61 (27.8)	
Primary (grades 1-5)	20 (13.2)	5 (12.9)	4 (13.8)	29 (13.2)	
Secondary (grades 6-10)	50 (32.9)	16 (41.0)	16 (55.2)	82 (37.3)	
High School and higher	30 (19.7)	11 (28.3)	7 (24.1)	48 (21.7)	
<b>Occupation, n (%)</b>					<b>0.03</b>
Homemaker	83 (54.6)	27 (69.2)	15 (51.7)	125 (56.8)	
Agriculture	20 (13.2)	6 (15.4)	3 (10.3)	29 (13.2)	
Service/ Business	37 (24.4)	4 (10.2)	6 (20.6)	47 (21.4)	
Labor	6 (3.9)	2 (5.1)	1 (0)	8 (3.6)	
Student	6 (3.9)	0 (0)	5 (17.2)	11 (5.0)	
<b>No of living children, n (%)</b>					0.41
0	10 (6.6)	2 (5.1)	6 (20.7)	18 (8.2)	
1	39 (25.7)	8 (20.5)	8 (27.6)	55 (25.0)	
2	72 (47.4)	18 (46.2)	10 (34.5)	100 (45.5)	
3/+	31 (20.4)	11 (28.2)	5 (17.2)	47 (21.3)	
<b>Abortion, prior, n (%)</b>					0.18
None	80 (52.6)	27 (69.2)	19 (65.5)	126 (57.3)	
1	44 (28.9)	8 (20.5)	8 (27.6)	60 (27.3)	
2 or more	28 (18.4)	4 (10.3)	2 (7.0)	34 (15.4)	

\* n = 215

<sup>a</sup>P Value is based on Chi-Square test for the categorical variables, and is based on ANOVA test for the continuous variables.

Knowledge of contraceptive methods among participants and counseling by health professionals after abortion are presented in Table 3. Almost 83% of post-abortion women knew about 3 or more contraceptive methods. Ninety-two percent women had received counseling following abortion on effective methods of contraception. A significantly higher proportion of women received the post-abortion contraceptive counseling in NGO clinic and public clinics compared to private clinics.

Table 3 Knowledge and counseling of contraception among post-abortion women

<b>Variable/Clinic</b>	<b>NGO (n=152)</b>	<b>Public (n=39)</b>	<b>Private (n=29)</b>	<b>Total (n=220)</b>	<b>P value<sup>a</sup></b>
<b>Number of contraceptive methods, Knowledge, n (%)</b>					0.3
2 or less	21 (13.8)	10 (25.6)	7 (24.1)	38 (17.3)	
3 to 4	67 (44.1)	14 (35.9)	9 (31.0)	90 (40.9)	
5 or more	64 (42.1)	15 (38.5)	13 (44.8)	92 (41.8)	
<b>Received post-abortion counseling on contraceptive methods, n (%)</b>					<0.001
Yes	151 (99.3)	39 (100.0)	12 (41.4)	202 (91.8)	
No	1 (0.7)	0 (0.0)	17 (58.6)	18 (8.2)	

<sup>a</sup>P Value is based on Chi-Square test for the categorical variables, and is based on ANOVA test for the continuous variables.

The most common reason women reported for their recent abortion was ‘not wanting any more children’ followed by ‘birth spacing’. The women’s husband living abroad was reported by the majority as a reason for not choosing to use any contraception after abortion. (Table 4)

Table 4 Self-reported reasons for recent abortion and for not using any contraceptive methods after abortion

Variable/ Clinic	NGO (n=152)	Public (n=39)	Private (n=29)	Total (n=220)	P value <sup>a</sup>
<b>Reason for abortion, n (%)</b>					0.12
Not ready for a child	17 (11.2)	3 (7.7)	7 (24.1)	27 (12.3)	
Health Effect	3 (1.9)	1 (2.6)	1 (3.5)	5 (2.3)	
Do not want any more children	108 (71.1)	29 (74.3)	13 (44.8)	150 (68.2)	
Birth spacing	21 (13.8)	4 (10.3)	5 (17.2)	30 (13.6)	
Others	3 (1.9)	2 (5.1)	3 (10.3)	8 (3.6)	
<b>Reason for not choosing to use any contraception, two months after abortion, n (%) n=73</b>					<b>0.05</b>
Fear of Health Effect	3 (7.5)	1 (9.1)	1 (4.5)	5 (6.8)	
Husband abroad	25 (62.5)	5 (45.5)	11 (50.0)	41 (56.2)	
No physical contact	4 (10.0)	1 (9.1)	4 (18.2)	9 (12.3)	
Health Effects	7 (17.5)	0 (0.0)	0 (0.0)	7 (9.6)	
Yet to get contraceptives	1 (2.5)	1 (9.1)	1 (4.5)	3 (4.1)	
Others	0 (0.0)	3 (27.3)	5 (22.7)	8 (11.0)	

<sup>a</sup>P Value is based on Chi-Square test for the categorical variables, and is based on ANOVA test for the continuous variables.

As shown in Table 5, more than a quarter of participants (29%) reported as never having used any contraceptive method. Thirteen percent women had contraceptive failure leading to the recent abortion. Tier III contraceptive methods had highest proportion of failure (50%). More than half of the respondents (58%) reported discontinuing the contraceptives, most of them discontinued the Tier II methods. Unwanted side effects' was the main reason cited for discontinuation of contraceptives. Immediately after abortion, 44% of the women chose Tier II contraceptive methods while 15% decided not to use any contraception. Two-months post-abortion, the majority of the women (36%) reported to be using Tier II contraceptive methods, while 33% of them were not using any contraception.

Table 5 Contraception: Use pre-abortion, Choice immediately after abortion and Use 2 months among post-abortion among women

Variable/Clinic	NGO (n=152)	Public (n=39)	Private (n=29)	Total (n=220)	P value <sup>a</sup>
<b>Contraception used, pre abortion, n (%)</b>					
Never used any	35 (23.0)	15 (38.5)	13 (44.8)	63 (28.6)	
Failure (On Contraception)	17 (11.2)	8 (20.5)	4 (1.4)	29 (13.2)	<b>0.005</b>
Tier I	1 (0.7)	0 (0)	1(3.5)	2 (0.9)	
Tier II	5 (3.3)	2 (5.1)	1 (3.5)	8 (3.6)	
Tier III	8 (5.3)	5 (12.8)	1 (3.5)	14 (6.4)	
Tier IV	3 (1.9)	1 (2.6)	1 (3.5)	5 (2.3)	
Discontinued	100 (65.7)	16 (41.1)	12 (41.4)	128 (58.1)	0.26
Tier I	7 (4.6)	3 (7.7)	3 (10.3)	13 (5.9)	
Tier II	67 (44.0)	11 (28.2)	6 (20.6)	84 (38.1)	
Tier III	20 (13.1)	2 (5.1)	3 (1.0)	25 (11.3)	
Tier IV	6 (3.9)	0 (0.0)	0 (0.0)	6 (2.7)	
<b>Reasons for discontinuation of contraception pre abortion, n (%) n= 128</b>					
					0.14
Unwanted Side Effects	48 (48.0)	7 (43.8)	4 (33.3)	59 (46.1)	
Missed a contraception cycle/ dose	32 (32.0)	3 (18.8)	4 (33.3)	39 (30.5)	
Others	6 (6.0)	1 (6.3)	1 (8.3)	8 (6.3)	
Inconvenient to use	6 (6.0)	1 (6.3)	0 (0.0)	7 (5.5)	
Husband went abroad	4 (4.0)	1 (6.3)	2 (16.7)	7 (5.5)	
No reasons	4 (4.0)	1 (6.3)	0 (0)	5 (3.9)	
Spacing between contraception	0 (0)	2 (12.5)	1 (8.3)	3 (2.3)	
<b>Contraception choice, Immediate Post-abortion, n (%)</b>					
					<b>&lt;0.001</b>
<b>Contraception choice</b>					
Tier I	30 (22.2)	17 (50.0)	7 (36.8)	54 (28.7)	
Tier II	71 (52.6)	11 (32.4)	1 (5.3)	83 (44.2)	
Tier III	32 (23.7)	5 (14.7)	8 (42.1)	45 (23.9)	
Tier IV	1 (0.7)	1 (2.9)	1 (5.3)	3 (1.6)	
Undecided on method	1 (0.7)	0 (0)	2 (10.5)	3 (1.6)	
Decided not to use any contraception	17 (11.2)	5 (12.8)	10 (34.5)	32 (14.6)	
<b>Contraceptive use, two months post-abortion, n (%)</b>					
					<b>&lt;0.001</b>
Tier I	16 (10.5)	13 (33.3)	1 (3.5)	30 (13.6)	
Tier II	65 (42.8)	14 (35.9)	1 (3.5)	80 (36.4)	
Tier III	25 (16.5)	1 (2.6)	3 (10.3)	29 (13.2)	
Loss to f/u	6 (4.0)	0 (0.0)	2 (6.9)	8 (3.6)	
None	40 (26.3)	11 (28.2)	22 (75.9)	73 (33.2)	

#### ***4.2 Risk factors associated with repeat abortion among women***

The odds of having a repeat abortion was higher for older women ( $p < 0.001$ ) whereas older age at the first pregnancy was significantly associated with lower odds of repeat abortion. The odds of repeat abortion was 33% lower for each increment of age at first pregnancy adjusting for demographics (age, age at first marriage, age at first pregnancy, occupation and education), number of living children, husband in country and site of abortion (OR: 0.70, 95% CI: 0.57 – 0.96; p value: 0.02). Age at first marriage, number of living children, education, occupation, and husband in country were not significantly associated with repeat abortion. (Table 6)

Table 6 Risk factors associated with repeat abortion<sup>a</sup> among 220 post-abortion women

Variable	n	Crude			Adjusted*			Adjusted#		
		OR	(95% CI)	p value	OR	95% CI	p-value	OR	95% CI	p-value
<b>Age of respondents</b>	220	1.11	1.05 - 1.17	<0.001	1.16	1.09 - 1.24	<0.001	1.16	1.07 - 1.27	<0.001***
<b>Age at first marriage</b>	215	0.92	0.83 - 1.02	0.12	1.04	0.83 - 1.29	0.75	1.1	0.84 - 1.33	0.62
<b>Age at first pregnancy</b>	220	0.91	0.82 - 1.01	0.07	0.77	0.61 - 0.98	0.04	0.7	0.57 - 0.96	0.02**
<b>No of living children</b>	220									
1	55	Ref			Ref			Ref		
0	18	0.28	0.06 - 1.35	0.11	0.32	0.03 - 3.01	0.32	0.34	0.03 - 3.31	0.35
2	100	2.33	1.16 - 4.65	0.02	1.05	0.45 - 2.45	0.91	1.08	0.46 - 2.57	0.85
3/+	47	2.33	1.04 - 2.24	0.04	0.74	0.25 - 2.18	0.58	0.84	0.27 - 2.56	0.76
<b>Education</b>	220									
Illiterate/ No Formal Education	61	Ref			Ref			Ref		
Primary (grades 1-5)	29	1.9	0.77 - 4.64	0.16	1.49	0.56 - 3.95	0.43	1.56	0.57 - 4.27	0.39
Secondary (grades 6-10)	82	1.21	0.62 - 2.37	0.59	1.47	0.68 - 3.15	0.33	1.68	0.75 - 3.74	0.21
High School and higher	48	0.93	0.42 - 2.01	0.84	1.56	0.62 - 3.92	0.34	1.90	0.71 - 5.05	0.20
<b>Occupation</b>	220									
Homemaker	125	Ref			Ref			Ref		
Agriculture	29	0.84	0.37 - 1.91	0.68	0.69	0.28 - 1.72	0.42	0.74	0.30 - 1.86	0.53
Service/ Business	47	0.81	0.41 - 1.60	0.54	0.87	0.41 - 1.85	0.73	0.80	0.37 - 1.75	0.58
Labor	8	1.19	0.29 - 4.98	0.81	1.45	0.30 - 7.10	0.64	1.49	0.28 - 7.76	0.64
Student	11	0.27	0.06 - 1.28	0.10	0.51	0.06 - 4.69	0.55	0.71	0.06 - 7.92	0.78
<b>Husband working abroad</b>	207									
Husband working in country	160	Ref			Ref			Ref		
Husband working abroad	47	0.82	0.43 - 1.58	0.56	0.64	0.31 - 1.34	0.24	0.69	0.32 - 1.47	0.33

<sup>a</sup> Repeat Abortion, n=94

\*Adjusted for demographics: age, age at first marriage, age at first pregnancy, occupation, and education.

# Adjusted for demographics, number of living children, husband in country, and site of abortion

### ***4.3 Factors associated with post-abortion use of effective contraceptive methods***

Table 7 presents the factors associated with use of effective contraceptive methods after abortion along with the variables used for adjustment in the model. Husbands living abroad was inversely associated with use of post-abortion contraception (adjusted OR= 0.03; 95% CI: 0.01 – 0.11; p value <0.001). Use of post-abortion contraception was positively associated with women who chose Tier II contraception (OR= 0.03; 95% CI: 0.01 – 0.11; p value <0.001) immediately after abortion, compared with women who chose Tier I contraception. The odds of using contraception for women with higher education was 76% less likely compared to the odds of women with no education (OR: 0.24, 95% CI:0.16 – 0.74). This association is statistically significant (p value = 0.01).

Age, age at first marriage, age at first pregnancy, occupation, knowledge of contraceptive methods, and prior abortion were not statistically different between the women who used contraception 2 months after abortion and the women not using any contraception.

Table 7 Factors associated with effective contraceptive methods use after abortion\*

	n	Crude			Adjusted*			Adjusted†		
		OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value
<b>Age of respondents</b>	207	1.01	0.96 - 1.06	0.79	0.97	0.91 - 1.03	0.31	0.94	0.84 - 1.04	0.21
<b>Age at first marriage</b>	207	1.02	0.92 - 1.13	0.68	1.04	0.86 - 1.28	0.67	0.93	0.72 - 1.21	0.59
<b>Age at first pregnancy</b>	212	1.01	0.92 - 1.12	0.78	0.98	0.80 - 1.21	0.87	1.01	0.75 - 1.35	0.95
<b>No of living children</b>	212									
1	53	Ref			Ref			Ref		
0	17	0.1	0.2 - 0.50	0.004*	0.09	0.01 - 0.54	0.009*	0.05	0.004 - 0.55	0.02*
2	97	0.9	0.43 - 1.67	0.636	1.39	0.60 - 3.20	0.044	1.44	0.52 - 3.97	0.48
3/+	45	1.1	0.51 - 2.58	0.734	1.78	0.59 - 5.41	0.31	1.68	0.43 - 6.61	0.46
<b>Education</b>	212									
Illiterate/ No Formal Education	57	Ref			Ref			Ref		
Primary (grades 1-5)	28	0.053	0.16 - 1.01	0.05*	0.42	0.16 - 1.10	0.08*	0.44	0.12 - 1.54	0.20
Secondary (grades 6-10)	80	0.033	0.23 - 0.94	0.03*	0.49	0.23 - 1.02	0.06	0.84	0.32 - 2.24	0.73
High School and higher	47	0.003	0.13 - 0.64	0.003*	0.34	0.14 - 0.81	0.02*	0.24	0.16 - 0.74	0.01*
<b>Occupation</b>	212									
Homemaker	120	Ref			Ref			Ref		
Agriculture	28	2.18	0.91 - 5.21	0.08	1.87	0.75 - 4.67	0.18	1.70	0.51 - 5.61	0.39
Service/ Business	45	1.18	0.59 - 2.35	0.63	1.17	0.57 - 2.40	0.67	1.38	0.52 - 3.63	0.52
Labor	8	1.72	0.39 - 7.54	0.47	1.67	0.37 - 7.52	0.51	2.41	0.26 - 22.28	0.44
Student	11	0.39	0.09 - 1.53	0.17	0.63	0.13 - 3.07	0.57	5.30	0.36 - 78.03	0.22
<b>Husband working abroad</b>	207									
Husband working in country	160	Ref			Ref			Ref		
Husband working abroad	47	0.08	0.03 - 0.20	< 0.001**	0.06	0.02 - 0.17	<0.001**	0.03	0.01 - 0.11	<0.001**
<b>Knowledge on number of contraceptive methods</b>	212									
2 or less	36	Ref			Ref			Ref		
3 to 4	88	0.87	0.40 - 1.90	0.73	0.89	0.38 - 2.07	0.79	0.43	0.13 - 1.40	0.16
5 or more	88	1.38	0.63 - 3.00	0.42	1.53	0.65 - 3.62	0.33	0.81	0.25 - 2.68	0.74

Table 7 Continue

	n	Crude			Adjusted*			Adjusted†		
		OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value
<b>Prior Abortion</b>	207									
Prior Abortion, No	118				Ref			Ref		
Prior Abortion, Yes	89	0.75	0.43 - 1.29	0.304	0.76	0.41 - 1.40	0.38	0.50	0.22 - 1.14	0.10
<b>Immediate Post-abortion contraception choice</b>	209									
Tier I	54	Ref			Ref			Ref		
Tier II	83	2.65	1.10 - 6.37	0.03*	3.1	1.18 - 8.14	0.02*	5.34	1.34 - 21.19	0.02*
Tier III and IV	48	0.03	0.01 - 0.11	<0.001**	0.02	0.01 - 0.10	<0.001**	0.01	0.002 - 0.11	<0.001**
Decided not to use any contraception	32	0.01	0.001 - 0.11	<0.001**	0.01	0.001 - 0.11	<0.001**	0.04	0.002 - 0.49	0.01*

<sup>a</sup> Contraceptive use, n=110

¥ Effective contraceptive use is defined as use of any modern effective contraception method (Tier I and Tier II) after 2 months of abortion

\*Adjusted for demographics (age, age at first marriage, age at first pregnancy, occupation, and education)

† Adjusted for demographics, number of living children, husband in country, prior abortion, knowledge of contraception, counseling and site of abortion

## **DISCUSSION**

Despite Nepal's commitment to post-abortion contraception, data are lacking regarding repeat abortion and post-abortion contraceptive use. The absence of data constrains evaluation and improvement of services in the country. This study contributed to addressing this research gap, reporting findings from women who recently obtained an abortion procedure at three different types of facilities to evaluate women's experiences with contraceptive services and use post-abortion.

On average, the women in this study interviewed were 30 years old. A difference was found in education and occupation status of women who chose to receive abortion care from an NGO facility compared to public and private facilities; more illiterate women and homemakers had an abortion at NGO clinic. Half of the women who had used Tier II contraceptive methods before abortion in the past chose to discontinue. Most women reported to have sought abortion care because they did not want any more children. The odds of having a repeat abortion was significantly higher for older women compared to younger women. Post-abortion care utilization was negatively associated with one's husband living abroad. Husbands were living abroad for about two-thirds of the women who were not using any contraception after abortion. The women who chose Tier II contraceptives were more likely to use post-abortion contraception compared to those who chose Tier I. Contrary to our usual expectation, women with the highest level education were less likely to use contraception after abortion compared to women with no formal education.

In our study, the most common reason reported (68%) for the recent abortion was 'not wanting any more children'. The finding is consistent with other studies and surveys in Nepal. The Demographic Health Survey reported 'not wanting any more children' as the main reason for the most recent

abortion for one in five women(5). Similarly, Rocca, CH et al (2014) reported a majority post-abortion women did not want another child (5, 16).

Our study revealed that more than half of the respondents who were using contraception before their abortion had discontinued contraceptive use because of ‘side effects’. The discontinuation proportion was highest for the Tier II methods. Other studies have reported that side effects are the most frequently cited reason for discontinuation particularly with the more effective methods (9, 18, 24). It has been reported that, in general, 30–50% of women discontinue use of oral and injectable contraception (Tier II) within 12 months because of side effects or health concerns (25).

In this study, the odds of repeat abortion was higher for older women, and lower for respondents who had their first pregnancy at an older age. Similar to our findings, Thapa et al (2013) found that age was significantly positively associated with the first abortion (3). While another study (16) reported that although receipt of effective contraceptive information or use of contraception after abortion did not differ by age, older women were more likely to initiate and to continue using the method (18).

The practice of men migrating to another country for employment was found to have a large influence on our study results. In our sample, the majority of women who did not initiate post-abortion contraception had their husband living abroad. Although there might be some social desirability bias, many other studies have reported similar results. (16, 18, 26). In Nepal, the proportion of married women whose husbands migrate was more than twice that reported in other South Asian Countries in 2011 (5). Women whose husbands are abroad may face sociocultural barriers to contraceptive use that put them at higher risk of unintended pregnancy with sporadic return of their husbands.

The negative association between education and post-abortion contraceptive use remained statistically significant after adjusting for demographics, abortion site and spousal employment

location. There are inconsistent results in the literature regarding the association of education and post-abortion contraceptive use. Some studies from Nepal have reported the initiation of post-abortion contraception to be earlier and prevalence of repeat abortion lower among higher educated women (3, 18). However, a prospective study found that better educated women were less likely to choose a contraception after abortion (16), whereas another study reported null result (27). It has been documented that educated women in Nepal commonly choose condom (Tier III – lesser effective method) for contraception. Higher education of both partners has been related to greater use of condoms and traditional methods (28). Studies from India and Mongolia have reported that the most highly educated and urban women used traditional birth control measures and the illiterate and rural women tended to opt for modern methods (29, 30). Educated women are also more likely to persuade their partners in withdrawing or abstaining (31). Hence, educated women may not have used modern contraceptive methods because of better knowledge of menstrual cycle, and cooperation from their partners.

Our study found that use of post-abortion contraception was positively associated with women who chose Tier II contraception, compared with women who chose Tier I contraception. Higher proportion of women who intended to use Tier II contraception immediately after abortion also used the method compared to those who intended to use Tier I contraceptive method (16). The Tier II method can be used on the same day of the abortion, whereas follow up visit is required for Tier I method excluding implants, which might have facilitated the better uptake of Tier II. This study is one of a very few prospective studies, to my knowledge, to understand contraceptive use after abortion in Nepal. This suggests a causal relationship of our study findings because the associations were strong (OR=0.24) and statistically significant for education and use of post-abortion contraception, as well as for use of Tier II methods (OR = 5), although causality cannot be determined with these data. We were able

control for many demographics (age, age at first marriage, age at first pregnancy, occupation, and education), contraceptive knowledge, pregnancy history, site of abortion and spousal employment location in our multivariate model. This eliminated alternative explanations of our findings. We also looked at repeat abortion as our main outcome of interest. We measured prior abortion at the time of repeat abortion. Although temporality cannot be established, we can argue that retrospective recall of prior abortion is less likely to be biased. However, there might also be social desirability bias in reporting of prior abortion.

A number of limitations were also inherent in the study. Although we have adjusted for many confounding, residual confounding cannot be completely ruled out in observational studies. We approached all women leaving the abortion room in selected study clinics within the six weeks study period. The sample may not be representative of women receiving abortions in approved CAC facilities in Nepal and the conclusions may not be extrapolated to other rural and remote parts of the country. Our study relied on self-reported information from our participants, which is subject to individual respondent's perceptions and honesty. The self-reported data in the sensitive issues like abortion may be prone to misclassification and measurement errors, despite assuring study participants of the importance of the study and confidentiality of their responses.

## **Conclusion**

In conclusion, the present study revealed that only half of the post-abortion women use effective contraception after abortion and there is a high prevalence of repeat abortion. The main factors positively influencing use of post-abortion contraception were presence of the woman's husband in another country and choice of Tier II contraceptive methods. The main risk factors identified for

repeat abortion were age and age at first pregnancy. Better educated women were less likely to adopt effective contraceptive measure after abortion.

These findings provide useful information regarding the potential gap in family planning needs among post-abortion women and wives whose husband are living away, especially in the context of Nepal where many couples are separated because of migration. Considering low contraception use after abortion, increasing numbers of abortion, and high incidence of repeat abortion, a well targeted intervention may have substantial effect to reduce risk of unintended pregnancies.

This study reinforces the need of further research with nationally representative samples to explore acceptability of effective contraceptive methods and to better assess contraception use after abortion among Nepalese women. This study emphasizes the magnitude of repeat abortion in Nepal and will hopefully encourage and lead to future work in this important aspect of global health.

## REFERENCES

1. Department of Health Services MoHaP. Annual Report. 2012/13.
2. Suvedi BK, Pradhan A, Barnett S, Puri M, Chitrakar SR, Poudel P, et al. Nepal Maternal Mortality and Morbidity Study 2008/2009: Summary of Preliminary Findings. Kathmandu, Nepal: Family Health division, Department of Health Services, Ministry of Health, Government of Nepal, 2009.
3. Thapa S, Neupane S. Risk factors for repeat abortion in Nepal. *Int J Gynaecol Obstet.* 2013;120(1):32-6.
4. Casey PR. Abortion among young women and subsequent life outcomes. *Best Pract Res Clin Obstet Gynaecol.* 2010;24(4):491-502.
5. Ministry of Health and Population (MOHP) [Nepal] NE, and ICF International (Maryland). Nepal Demographic Health Survey. 2011.
6. Department of Reproductive Health and Research WHO. Sexual and Reproductive Health 2008 [cited 2014 February 15]. Available from: [http://www.who.int/reproductivehealth/publications/unsafe\\_abortion/9789241501118/en/](http://www.who.int/reproductivehealth/publications/unsafe_abortion/9789241501118/en/).
7. Alkema L, Kantorova V, Menozzi C, Biddlecom A. National, regional, and global rates and trends in contraceptive prevalence and unmet need for family planning between 1990 and 2015: a systematic and comprehensive analysis. *The Lancet.* 2013;381(9878):1642-52.
8. Cleland J, Bernstein S, Ezeh A, Faundes A, Glasier A, Innis J. Family planning: the unfinished agenda. *Lancet.* 2006;368(9549):1810-27.
9. Cleland J, Conde-Agudelo A, Peterson H, Ross J, Tsui A. Contraception and health. *Lancet.* 2012;380(9837):149-56.
10. Cleland J, Bernstein S, Ezeh A, Faundes A, Glasier A, Innis J. Family planning: the unfinished agenda. *The Lancet.* 2006;368(9549):1810-27.
11. Ahmed S, Li Q, Liu L, Tsui AO. Maternal deaths averted by contraceptive use: an analysis of 172 countries. *The Lancet.* 2012;380(9837):111-25.
12. Department of Health Services MoHaP, Nepal. Annual Report. In: Services DoH, editor. 2013/14.

13. Puri M, Lamichhane P, Harken T, Blum M, Harper CC, Darney PD, et al. "Sometimes they used to whisper in our ears": health care workers' perceptions of the effects of abortion legalization in Nepal. *BMC Public Health*. 2012;12:297.
14. Department of Health Services MoHaP. Annual Report. 2011/12.
15. Shrestha DR, Shrestha A, Ghimire J. Emerging challenges in family planning programme in Nepal. *Journal of Nepal Health Research Council*. 2012.
16. Rocca CH, Puri M, Harper CC, Blum M, Dulal B, Henderson JT. Postabortion contraception a decade after legalization of abortion in Nepal. *Int J Gynaecol Obstet*. 2014;126(2):170-4.
17. Singh S, Wulf D, Hussain R, Bankole A, Sedgh G. *Abortion Worldwide: A Decade of Uneven Progress*. New York: Guttmacher Institute; 2009.
18. Padmadas SS, Lyons-Amos M, Thapa S. Contraceptive behavior among women after abortion in Nepal. *Int J Gynaecol Obstet*. 2014.
19. Mishra SR, Joshi MP, Khanal V. Family planning knowledge and practice among people living with HIV in Nepal. *PLoS One*. 2014;9(2):e88663.
20. Prevention CfDca. Effectiveness of Contraceptive Methods. In: Services USDoHaH, editor. 2013.
21. (WHO/RHR) WHODORHaR, Project JHBSOPHCfCPCI. *Family Planning: A Global Handbook for Providers*. Baltimore and Geneva 2007.
22. StataCorp L. *Stata 11 base reference manual*. College Station, TX: Stata Corporation. 2009.
23. Kristman V, Manno M, Côté P. Loss to follow-up in cohort studies: how much is too much? *European journal of epidemiology*. 2004;19(8):751-60.
24. Glasier AF, Smith KB, van der Spuy ZM, Ho PC, Cheng L, Dada K, et al. Amenorrhea associated with contraception-an international study on acceptability. *Contraception*. 2003;67(1):1-8.
25. Ali MM, Cleland J. Contraceptive switching after method-related discontinuation: levels and differentials. *Stud Fam Plann*. 2010;41(2):129-33.

26. Ban B, Karki S, Shrestha A, Hodgins S. Spousal separation and interpretation of contraceptive use and unmet need in rural Nepal. *Int Perspect Sex Reprod Health*. 2012;38(1):43-7.
27. Raj A, Vilms RJ, McDougal L, Silverman JG. Association between having no sons and using no contraception among a nationally representative sample of young wives in Nepal. *Int J Gynaecol Obstet*. 2013;121(2):162-5.
28. Gubhaju B. *The Differential Impact of Wives' and Husbands' Education on Contraceptive Method Choice in Nepal, 1996-2006*. 2008.
29. Basu AM. Ultramodern contraception: social class and family planning in India. *Asian Population Studies*. 2005;1(3):303-23.
30. Gereltuya A, Falkingham J, Brown J. Determinants of current contraceptive use and method choice in Mongolia. *Journal of biosocial science*. 2007;39(06):801-17.
31. Bulatao RA. *Toward a framework for understanding contraceptive method choice*. 1989.

## APPENDIX – 1: COPY OF RECRUITMENT SCRIPT

Greetings. I am Aradhana Thapa (Interviewer's name), a second year Master's student, studying public health. I understand this may not be the best time to approach you. We are conducting a study on post- abortion contraception to determine the factors associated with acceptance of contraception after abortion by women in Nepal and your thoughts and insights are deeply valuable to us. We are requesting you to participate in the study. All information that you provide including your identification will be kept confidential.

We are interviewing women more than 18 years of old, mentally capable, giving consent to participate in the study, willing to share their information without the presence of any other individual and can speak Nepali. If you are eligible, we will explain you the study. If you decide to participate in this study, we will go to a private room to move further with the research procedure. We will first ask you to provide consent by reviewing the consent form and signing it. Then, we will ask you questions about post-abortion counseling, intent to use contraception after abortion, choice of contraception method, knowledge about modern methods of contraception and preferred choice of contraceptive after abortion. We will record your answers in a questionnaire. There will be a follow up interview. For the follow up, we will contact you, through your preferred medium, after 2 months to collect information on use of contraception, method of contraception used and reasons behind not using contraception.

Please note that the study is not related with the clinical care you receive; this is purely for research study. Your participation or non-participation in the study will in no way influence the treatment you are/ will be receiving from the health center. Your participation in this study is voluntary and you have the right to refuse to answer any questions at any time or stop interview at any point.

If you are interested to join the study, please follow me to the private room where we will discuss more about the study and start the interview, if you provide your consent to participate. If you want to participate in the study but cannot give your interview now, we request you to contact the researcher Aradhana Thapa at 9841357326 and come back to the same health center within a week to provide consent and participate in the study.

APPENDIX – 2: WRITTEN CONSENT FORM  
UNIVERSITY OF WASHINGTON

**Consent Form**

**Factors associated with acceptance of contraception after abortion in Nepal**

Principal Investigator and Contact: Aradhana Thapa, MPH Candidate, Department of Global Health, School of Public Health/ School of Medicine, University of Washington. Contact at University of Washington: +1 2054932236 or [aradhana@uw.edu](mailto:aradhana@uw.edu)

Researcher: Annette L. Fitzpatrick PhD, Research Professor, Department of Epidemiology, Adjunct Department of Global Health, School of Public Health/ School of Medicine, University of Washington

Researcher: Emily M. Godfrey MD, MPH, FAAFP, Associate Professor, Family Medicine, Adjunct Associate Professor, Obstetrics & Gynecology, School of Medicine, University of Washington

**Researchers' statement**

We are asking you to participate in the above named research study. The purpose of this consent form is to give you the information you will need to help you decide whether or not to participate in the research study. Please read the form carefully. You may ask questions at any time about the purpose of the research, what we would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research that is not clear. When we have answered all your questions, you can decide if you want to be in the study or not. This process is called “informed consent.” If you agree to participate, you can then consent in the study by signing below. We will give you a copy of this form for your records. Please ask for an explanation on anything you may not understand.

**PURPOSE OF THE STUDY**

We are planning to conduct a research study to determine the factors associated with acceptance of contraception after abortion by women in Nepal. The findings of the study will contribute towards guiding the policy makers to plan approaches to help increase the use of contraception after abortion by women.

**STUDY PROCEDURES**

We would like to conduct individual interviews with you as well as follow up after 2 months. We will ask you about counseling on contraceptives after abortion, your intention of using contraception after abortion, choice of contraception method, your knowledge about modern methods of contraceptives, and preferred choice of contraceptive after abortion. You will be followed after 2 months to collect information on use of contraception, method of contraception used and reasons behind not using contraception.

After we explain about the study verbally, we will give you this consent form to review. We will ask you to provide consent by signing the consent form if you decide to participate in the study. You can also come to the health center within a week to provide consent and participate in the study, if you cannot do so now. The researcher will ask you a series of questions about contraceptives.

We will record your answers in a questionnaire so we are certain not to miss any of the valuable information you share. All information you provide will be kept confidential. The questionnaire and your responses will be typed into computer along with the information you will provide on the follow up interview. Your name and other identifying information will not appear on the computer. We will destroy the page with your identifiable information by June 2015.

### **LENGTH OF YOUR PARTICIPATION IN THE STUDY**

Your participation in the study will take between 30-40 minutes of your time (about 20 minutes for the initial interview and 10 minutes for a follow-up phone call).

### **RISKS, STRESS, OR DISCOMFORT**

You may feel uncomfortable answering some personal questions, as these are sensitive and personal issues. An example of a sensitive question might if we ask you about your intention to use contraceptive after abortion. You may stop interview at any time and review your answers to delete any portions you are not comfortable with.

### **BENEFITS OF THE STUDY**

You may not benefit directly from this study; the goal is to study the factors associated with acceptance of contraception after abortion in Nepal.

### **COMPENSATION**

There is no compensation for this study.

### **CONFIDENTIALITY**

Every effort will be made to keep your personal information private. Although we will make every effort to keep your information confidential, the following groups may need to review the study records about you. These organizations review studies to ensure that everything is carried out safely and legally. These organizations include The Human Subjects Ethical Review Board of the University of Washington, The National Health and Research Council, and other research regulatory institutions. The information you give us will be kept private to the extent allowed by law. All records related to your involvement in this study will be stored in a locked secure cabinet. All digital records indicating your participation will be kept on a password protected computer in an encrypted file.

### **RIGHTS TO PARTICIPANTS**

Your participation is entirely voluntary. The research is not related with the clinical care you receive; this is purely a research study. If you decide not to participate in the study, your decision will not affect the care you receive at the clinic in the future in any way. You can choose to discontinue with interview in the study at any time without any penalty. You can also choose which questions you want or don't want to answer, and we can stop the interview at any time. If you experience any kind of psychological distress as a result of participating in the study, the research team can refer you to appropriate care in the clinic we are interviewing. If you have any questions or concerns, please contact the researcher, Aradhana Thapa at 9841357326 or [aradhana@uw.edu](mailto:aradhana@uw.edu). If you contact the Research team by email, please note that we cannot guarantee the confidentiality of the correspondence sent by email.

**Subject's Statement**

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions about the research, I can contact one of the researchers listed above. If I have questions about my rights as a research subject, I can call the Human Subjects Division at the University of Washington at +1 206 5430098 or the Nepal Health Research Council, Research Officer-Namita Ghimire at 4254220 or [namitag@nhrc.org.np](mailto:namitag@nhrc.org.np). I will receive a copy of this written consent form.

---

Printed name of subject	Signature of subject or thumb print	Date
Phone number of the subject:		

---

Printed name of Researcher	Signature of Researcher	Date
----------------------------	-------------------------	------

In case of subjects who cannot read or write,

---

Printed name of Witness	Signature of Witness
	Date

## APPENDIX – 3: BASELINE AND FOLLOW UP QUESTIONNAIRE

Code No:

Date:

Name of the CAC service facility:

Name of enumerator:

### Part 1: SOCIO-DEMOGRAPHIC INFORMATION

Age of the respondent:

Address (Zone, district):

Religion:

1. Hindu
2. Buddhist
3. Christian
4. Muslim
5. Others (Please specify) .....

Caste/ Ethnic groups:

1. Brahman/ Chhetri (Brahman, Chhetri, Thakuri, Sanyasi, Nurang, Rajput, Kayastha)
2. Tarai/ Madhesi/ Other caste  
(Kewat, Mallah, Lohar, Nuniya, Kahar, Lodha, Rajbhar, Bing, Mali Kamar, Dhuniya, Yadav, Teli, Koiri, Kurmi, Sonar, Baniya, Kalwar, Thakur/Hazam, Kanu, Sudhi, Kumhar, Haluwai, Badhai, Barai, Bhediyar/ Gaderi)
3. Dalits  
(Chamar/ Harijan, Musahar, Dushad/ Paswan, Kami, Damai/Dholi, Sarki, Badi, Gaine, Tatma, Khatwe, Dhobi, Baantar, Chidimar, Dom, Halkhor, Unidentified Dalits)
4. Adivasi/ Janajatis  
(Newar, Tamang, Kumal, Sunuwar, Majhi, Danuwar, Thami/Thangmi, Darai, Bhote, Baramu/Bramhu, Pahari, Kusunda, Raji, Raute, Chepang/Praja, Hayu, Magar, Chyantal, Rai, Sherpa, Bhujel/Gharti, Yakha, Thakali, Limbu, Lepcha, Bhote, Byansi, Jirel, Hyalmo, Walung, Gurung, Dura, Tharu, Jhangad, Dhanuk, Rajbanshi, Gangai, Santhal/ Satar, Dhimal, Taipuriya, Meche, Koche, Kisan, Munda, Kusbadiya/ Patharkata)
5. Muslim
6. Others (Marawari, Bangali, Jain, Punjabi/ Sikh, Unidentified Others) -Please specify

.....

Educational level

1. Illiterate
2. Literate
3. Completed Primary School
4. Completed Secondary School
5. Completed High School
6. Beyond High School
5. Refused

Marital Status

1. Married
2. Divorced
3. Separated
4. Not previously married
5. Do not want to disclose
6. Others. Please specify .....

If married, how old were you when you first got married? .....

Living with Husband/ Partner:

1. Yes
2. No

Occupation:

1. Agriculture
2. Service
3. Business
4. Housework
5. Labour
6. Others:\_\_\_\_\_

**Part 2: INFORMATION ON OBSTETRIC AND GYNECOLOGICAL FACTORS**

2.1 Have you ever been pregnant before?

0-No [go to part 3]

1-Yes

2.2 How old were you when you were first pregnant? ..... years

2.3 Excluding the current pregnancy, how many times have you been pregnant before? ..... times

2.4 How many living sons and daughters do you have?

Sons:

Daughters:

### **PART 3: FAMILY PLANNING CONTRACEPTIVES: INFORMATION AND USE**

3.1 Have you heard about family planning contraceptive methods?

0- No (Proceed to Part 4)

1-Yes

If Yes,

3.1.i Which methods have you heard about?

1. Pills
2. Male condoms
3. Injectables
4. Implants
5. IUD
6. Female sterilization
7. Male sterilization
8. Emergency contraception
9. Rhythm/ Calendar method
10. Withdrawal method
11. Lactational amenorrhea method
12. Others (specify) .....

3.1.ii Have you ever used contraceptives?



- |                                  |                                   |
|----------------------------------|-----------------------------------|
| 1. Not ready to be a mother      | 2. Health effect                  |
| 3. Unmarried                     | 4. Education will be affected     |
| 5. Do not want any more children | 6. Financial difficulty           |
| 7. Rape                          | 8. Contraception failure          |
| 9. Fetal birth defect            | 10. Others (Please specify) ..... |

4.4 Have anyone spoken to you about contraceptive method in this abortion visit?

- Yes                      No (Go to Part 5)

4.5 What method of contraceptive did the counselor discuss with you?

1. Pills
2. Male condoms
3. Injectables
4. Implants
5. IUD
6. Female sterilization
7. Male sterilization
8. Emergency contraception
9. Rhythm/ Calendar method
10. Withdrawal method
11. Others (specify).....

4.6 Was there a pre-condition, to use post-abortion contraception, imposed on you before getting abortion service this

- No    Yes

4.7 Were you told about when you could become pregnant again?

- No    Yes

**PART 5 INTENTION TO USE CONTRACEPTION AND PREFERRED CHOICE**

5.1 Do you intend to use any family planning contraceptive method after you are discharged from here?

No

Yes (Go to 5.2)

If no,

5.1.i. Is there any reason for not using contraceptive?

1. I want more children
2. Husband wants more children
3. Mother in law wants more children
4. Not living with husband or partner/ Husband is away
5. Health issues with desired contraceptive
6. Husband/Partner opposed the use of contraceptive
7. Desired choice was not available in the facility
8. Fear of side effects
9. Medical Illness
10. Fatalism/ Up to god
11. Others (Specify) \_\_\_\_\_

If Yes,

5.2 What contraception method do you intend to use?

1. Pills
2. Male condoms
3. Injectables
4. Implants
5. IUD
6. Female sterilization
7. Male sterilization
8. Emergency contraception
9. Rhythm/ Calendar method
10. Withdrawal method
11. Others (specify) \_\_\_\_\_

Setting up a follow-up interview:

For the 2 months post-abortion follow up interview, do you want me to call you or meet you somewhere?

Phone call

Meet at a place

Instruction:

- If phone call, ensure if the phone number provided in the consent form to be used or other number
- If meeting at a place, choose a private place to meet. Write the address in the consent form.

**\*\*End of Interview\*\***

**Follow Up Questionnaire**

Date

Place of Interview (If applies): Place / Phone

Name of Enumerator:

Name of the respondent:

Phone number of the respondent:

1. Have you used any contraception after abortion?

Yes

Used, discontinued (Proceed to ques 3)

Not used (Proceed to ques 4)

If yes,

2. What kind of contraceptives are you using?

- 1. Male Condom
- 2. Pills
- 3. Female Sterilization
- 4. Male Sterilization
- 5. Injectables
- 6. Norplant
- 7. IUCD
- 8. Others (Specify) .....

2.b Where did you get the contraceptives?

- 1. Abortion clinic
- 2. Hospital
- 3. Medical pharmacy
- 4. General Stores
- 5. Others (Specify) .....

If discontinued,

3. Is there any reason for discontinuing contraceptives?

- 1-Side effects
- 2- Inconvenient to use
- 3- Contraceptive is expensive to buy
- 4- Inconvenient to buy
- 5- Husband/ partner opposed
- 6- Contraceptive failure

7-Others (specify).....

If not used contraceptives,

4. Why are not you using any contraceptives?
  1. Forgot to use
  2. I want more children
  3. Husband wants more children
  4. Mother in law wants more children
  5. Not living with husband or partner/ Husband is away
  6. Health issues with desired contraceptive
  7. Husband/Partner opposed the use of contraceptive
  8. Desired choice was not available in the facility
  9. Fear of side effects
  10. Medical illness
  11. Fatalistic/ Up to god
  12. Others (Specify) \_\_\_\_\_

**\*\*END OF INTERVIEW\*\***