

RESEARCH ARTICLE

Factors associated with contraception and induced abortion among young women in Nepal

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Abstract

This study analyzed data from the 2016 Nepal Demographic and Health Survey (NDHS) supplemented by key indicators from several previous waves of NDHS to identify the sociodemographic profiles of women aged 15 – 24 who were using contraceptive methods and sought an abortion within 5 years before surveys. To augment the abortion analysis, field monitoring data of the Gorkha Safe Abortion (GSA) project were also used. Results from multivariable analyses show that women who ever gave a birth, who were from Province 1, who were economically well-off, and who knew the legal status of abortion, were more likely to practice contraception than their respective counterparts. Results, further, reveal that women practicing traditional methods of family planning were more likely to have an abortion than their counterparts not using any contraception. Women with two or more children ever born were more likely to have an abortion. Women from Karnali Province were most likely to have an abortion. Rich women were most likely to have an abortion than poor women. Regarding safe abortion, it is found that women living in the *Tarai* area were most likely to have a safe abortion than other geographic areas, due perhaps to family health services being more accessible in the *Tarai* area. Although the analyses found no relationship between age and abortions, perhaps due to small sample, the GSA project data clearly indicate that women under age 20, and those from Dalit community in particular, were more likely to seek an abortion than women aged 20 – 24. One lesson learned from the GSA project is that the pay-off for increasing access to safe abortion for hard-to-reach populations is high. To understand the complexity of sexual behaviors, contraceptive uses, and abortions among young women, more research using both qualitative and quantitative approaches are needed.

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1. Introduction

Youth aged 15 – 24 make up 20% of Nepal's population (United Nations, 2022a). Youth have a high unmet need for contraception, and this has declined very little in the past 20 years in Nepal from 40% in 1996 (Pradhan *et al.*, 1997) to 33% in 2016 (MOH *et al.*, 2017). Globally, young women are more likely to access unsafe abortion due to stigma (Yokoe *et al.*, 2019). In developing countries, about 40% unsafe abortions occur among women under age 25 and about one in seven women who have unsafe abortions is under

20 (PRB, 2005; Shah & Ahman, 2012). Nepal is among the top countries with highest abortion rate (Singh *et al.*, 2018).

High and persistent unmet need for contraception among youth has important implications for reproductive health programming and planning. Youth who have unmet needs for modern contraception are likely to take recourse to traditional methods of contraception such as period or withdrawal methods and their effectiveness is very low. At the same time, as unsafe abortion is common among the youth, it is likely that if unmet need for contraception is not addressed, increasing number of youths will end up in taking recourse to unsafe abortion. Unsafe abortion is a pressing public health concern and is a major contributing factor to high maternal mortality in Nepal (Thapa & Padhye, 2001). The government's aim of reducing maternal mortality ratio (MMR) to <70/100,000 live births by 2030 (NPC, 2017) will not be achieved when unsafe abortion persists among the youth population. As per the past 2016 survey, women aged 15 – 24 contribute 55% to age specific fertility (MOH *et al.*, 2017), and therefore, it is important to pay special attention to unmet need for contraception among the youth so that the maximum number of youths are prevented from practicing unsafe abortion. This motivates the present research.

Below in the remaining of this introduction section, some background information about contraceptive use and abortion in Nepal is briefed, followed by reviews on factors associated with contraceptive use and abortion, an introduction of the Gorkha Safe Abortion (GSA) project aiming to help young Nepali women to get safe abortion services, and the objectives of the present research. Subsequently, data sources and methods used for fulfilling the research goals in the data and method section are described, followed by the results, discussion, and conclusion sections.

1.1. Brief background on contraceptive use and abortion in Nepal

In Nepal, contraceptive use has increased markedly since 1996. The prevalence rate of using any contraceptive method among currently married women was 32% in 1996 (Pradhan *et al.*, 1997) and increased to 39% in 2001 (MOHP *et al.*, 2002), 50% in 2006 (MOHP *et al.*, 2007), and 53% in 2016 (MOH *et al.*, 2017). Along with the increase in the use of modern contraceptive methods, increase in the use of traditional methods is also seen in Nepal. In 2006, the proportion of currently married women using traditional methods comprising mainly withdrawal and rhythm methods was 4% (MOHP *et al.*, 2007), which increased to 7% in 2011 (MOHP *et al.*, 2012) and further to 10% by 2016 (MOH *et al.*, 2017).

However, any method can fail, and some are more dependable than others. Research has shown that the chance of an unexpected pregnancy is almost non-existent for couples who rely on sterilization and very low for users of IUD, injectables, or implants. It is moderate for pill and condom users and very high if couples rely on periodic abstinence, withdrawal, or spermicides (The Alan Guttmacher Institute, 1999). This means that increasingly more couples might end up with unwanted pregnancies and thus demand more abortion services. However, despite a steady increase in contraceptive use, the unmet need for family planning is still high in Nepal. For all women aged 15 – 49, the total unmet need for family planning was estimated at 18% for 2016, higher for limiting methods (12%) than for spacing methods (6%) (MOH *et al.*, 2017).

Abortion was legalized in Nepal in 2002 (MOH, 2004), and Safe Abortion Policy 2002 and Procedural Process developed and implemented since 2004 (MOH, 2005). The policy called for an expansion of quality comprehensive abortion care services in the country with appropriate numbers of trained and skilled service providers, adequate equipment, and essential drugs. Under this policy, safe abortion services were charged at Nepalese Rupees 1,000/- or US\$10, which was out of reach for many women, especially in rural areas, but these services were made free of charge nationwide in 2016 (MOH, 2016).

Before 2002, abortions were totally illegal in Nepal. The Legal Code 1963 (*Muluki Ain*) of Nepal did not permit the termination of pregnancies even if they were the result of rape or incest or threatened the woman's life. In effect, it equated abortion with infanticide (Ministry of Law and Justice, 1963). Physicians and other medical practitioners were prohibited from recommending abortion or performing abortion without exceptions (Thapa, 2004). In this context, both women sought abortions and providers provided necessary abortion services clandestinely. Most of the abortions that took place were unsafe; only a very small proportion of women, mostly those living in urban or semi-urban areas and able to afford the cost, had access to trained medical practitioners and safe procedures (Thapa & Padhye, 2001).

As a result of the illegal and criminal status of abortion in Nepal before 2002, the conditions under which poor women obtained abortion services were often extremely unsafe. High unintended pregnancy makes women look for means to terminate it and in the absence of readily available safe abortion facility women who are likely to seek unsafe methods of abortion. This situation is likely to contribute to high maternal morbidity and mortality. Many are still dying during or shortly after pregnancy due to unsafe abortion (The Kathmandu Post, March 31, 2022).

MMR in Nepal was estimated at 790 deaths/100,000 live births in 1990 (WHO, 2014). In a hospital-based study of abortion in Nepal pre-legalization, deaths from abortion-related complications accounted for over half of all maternal deaths (Thapa *et al.*, 1992). The recognition that illegal abortions were unsafe and contributed to Nepal's high maternal mortality was instrumental in the advocacy efforts to legalize abortion (Shakya *et al.*, 2004). Indeed, MMR had improved and gone down to 239 deaths/100,000 live births for several years before the 2016 survey (MOH *et al.*, 2017). However, MMR of 186/10000 live births still remains among the highest worldwide (WHO, 2022), and unintended pregnancy was around 19% in 2016 (MOH *et al.*, 2017).

Under the current law, pregnancy can be terminated up to 12 weeks for any reason and up to 18 weeks for pregnancy resulting from rape or incest with the pregnant woman's consent. Recently, a provision has also been made to allow pregnancy termination as late as 28 weeks (The Kathmandu Post, 03 July, 2019), but this has not been operationalized (The Kathmandu Post, 27 August, 2019). However, the legalization of abortion does not seem to have much impact; the proportion of women aged 15 – 49 who are aware that abortion is legal in Nepal increased by only 3% points from 38% in 2011 (MOHP, 2012) to 41% in 2016 (MOH, *et al.*, 2017). According to the Nepal Demographic and Health Survey (NDHS) 2016, this knowledge is lower among older women aged 40 – 49 (34%), women living in rural areas (36%), women with primary (33%) or no education (28%), and poor (38%) and very poor (30%) women (MOH, *et al.*, 2017). By caste/ethnic groups, this knowledge is highest among the highest ranked group, namely, *Chhetri/Bahun* (48%), followed by the second highest ranked group, that is, *Janajati* ethnic group (40%) and the lowest ranked group – the *Dalit* (34%). After Nepal became a federal state in 2015, health care has been devolved to each province. Although safe abortion is free and legal, 50% of abortions accessed by young women in 2016 were “unsafe,” that is, performed at unauthorized facilities (MOH *et al.*, 2017). The worrisome situation is that unsafe abortion is reported to be on the rise in the country due to lockdowns during the COVID-19 pandemic (Gorkhapatra, October 07, 2020).

Gender-biased sex selection (GBSS) in favor of boys is a symptom of pervasive social, cultural, political, and economic injustices against girls and women. GBSS can be measured using sex ratio at birth (SRB), a comparison of the number of boys born versus the number of girls born in a given period. According to the WHO, 2011, when many more boys are born than girls, it is a sign that sex selection is taking place (WHO, 2011). In Nepal, high son

preference (Brunson, 2010) and prevailing discrimination against girls are factors contributable to sex selection (Nanda *et al.*, 2012). Although sex selective abortion is strictly prohibited by law and punishable, it is also possible that people may take advantage of liberal abortion to fulfill their wishes. In addition, the situation of stagnant contraceptive prevalence but declining fertility in the past 10 years may indicate that women are using abortion as a family planning method (Gorkhapatra, August 3, 2019).

Despite the legalization of abortion and the expansion of maternal health services, such as increased access to safe motherhood services including abortion services, it appears that the sexual and reproductive health needs of women are not being met. Furthermore, the existing accredited health facilities are not functioning well due to the lack of sufficient quantity of drugs and equipment, the frequent transfer of trained abortion service providers, and weak abortion related infrastructure development stand as a serious barrier to women seeking abortion services (Wan-Ju *et al.*, 2017). Nevertheless, Nepal is committed to Sustainable Development Goal 3 of achieving an MMR of 70 by 2030 (NPC, 2017), which calls for more focus on reproductive health and rights including safe abortion.

1.2. Factors associated with contraception and abortion

Numerous studies have examined factors associated with the prevalence of contraceptive use and the prevalence of abortion among young women (Bayer *et al.*, 2011; Munakampe *et al.*, 2018). Studies have revealed that lack of or limited knowledge, lack of sexuality education and limited access to services, high risk of misperceptions, and harmful social norms surrounding premarital sexual activity and pregnancy could be major barriers to use contraception and abortion services (Campbell *et al.* 2006; Siziya *et al.* 2008). These obstacles apply equally to adolescents and young people of Nepal (Thapa *et al.*, 2001). While several efforts have been made to understand young people's knowledge, attitudes and practices regarding contraception and safe abortion, systematic research on this matter, and related contexts remain limited. Increase in couple's knowledge that they can plan their family size leads them to search for contraceptive methods.

The relationship between contraceptive use and induced abortion is complex due to interactions of several interrelated factors that range from social, cultural, and economic, from how ideal family size is determined, and from the demand for contraception and abortion, to another set of variables related to the quality of reproductive health services (Phiri *et al.*, 2022; Senlet *et al.*, 2001). Modern contraceptives are considered the safest

methods to help couples realize better family planning. Despite the availability of various contraceptive methods, communities in both the developed and developing countries continue to register high rates of unintended and unwanted pregnancies which contribute to a higher prevalence of abortions (Haub & Kaneda, 2014).

An analysis of data of women aged 15 – 49 from 2011 Nepal Demographic and Health Survey found that women of older ages (35 years and above) were less likely to undergo both abortion and unsafe abortion. Educated women were more likely to undergo an abortion along with those who had no knowledge of legal abortion. Being rich was protective against unsafe abortion. Child spacing was the most common reason for abortion (Yogi *et al.*, 2018).

The above brief review of contraceptive use and abortion among women aged 15 – 49 shows that, although increases in contraceptive use ultimately led to decreases in induced abortion rates, trends have been following different paths in individual country settings. Abortion rates and contraceptive practice often rise simultaneously because they are affected by the same underlying social and demographic factors (Noble & Potts, 1996). Similarly, women who practice contraception are often those who are more likely than others to undergo abortions, again due to bidirectional causality. In these situations, increases in contraceptive use may reduce reliance on abortion by keeping abortion rates stable or by preventing an even more rapid increase in abortion rates.

1.3. Objectives of the present study

Research studies on abortion in Nepal are very limited. NDHS is carried out every 5 years and the survey started including abortion section since 2011 which provide basic quantitative indicators. Data on abortion incidence in Nepal are hardly available except for one study by Puri *et al.* (2016) that show 42/1000 women of reproductive ages 15 – 49 in 2014 based on Nepal's National Health Facilities Survey and Health Professionals Survey. Another important limitation in the existing literature is the paucity of research on how women accessed family planning services during the crisis. This is extremely important and closely relevant given the current situation of the ongoing COVID-19 pandemic. A recent estimate shows the contraceptive prevalence rate in Nepal among currently married women declined from 53% in 2016 (MOH *et al.*, 2017) to 33% in 2020 due to disturbance in supply of contraceptives (Global Financing Facility-GFF: <https://www.globalfinancingfacility.org/CoVid19/>).

Although no studies on the theme were available by far, it is fortunate that Nepal implemented the GSA project during mid-2018 to June 2020 (including the first period of

the COVID-19 pandemic, April-June 2020) in three *palika* (subdistrict) in Gorkha district that aims to empower women to access safe abortion services (see Map of Gorkha in Figure A1). The data collected in this GSA project enable researchers to investigate how family planning services were delivered to the most vulnerable populations in the area. Research using such data would have added value to the existing literature and have important policy implications on how to improve family planning services on the general as well as in crises, such as in this ongoing pandemic.

Based on the above reviews and consideration, this paper is written with three objectives in mind to fill the research gap. First, using national data from NDHS of different years, it attempts to show different family planning practices by sociodemographic characteristics of adolescents and youth. Second, it examines factors associated with abortion and safe abortion, and third, using the *Gorkha* project monitoring data on abortion, it investigates how increasing access to functioning safe abortion services could pay off even in difficult times such as in the COVID-19 pandemic lockdown periods.

2. Data and methods

2.1. Data sources

For national level data analysis on family planning and abortion, nationally representative sample survey data from the Nepal Demographic and Health Survey (NDHS) 2016 (MOH *et al.*, 2017) were the main source, but for comparison purposes, NDHS data from 1996 (Pradhan *et al.*, 1997), 2001 (MOHP *et al.*, 2002), 2006 (MOHP *et al.*, 2007), and 2011 (MOHP *et al.*, 2012) were also used. In all, 12,862 women of reproductive age 15 – 49 were interviewed in 2016 and the corresponding figures were 12,674 in 2011 and 10,793 in 2006. Interviews were conducted with only ever-married women in 2001 and 1996 and the numbers of women interviewed were 8,429 in 2001 and 8,726 in 1996, respectively. However, only the NDHS 2016 collected information about the residence of province because when the earlier surveys were conducted that the country was not divided into federal provinces. There are seven provinces in Nepal (Province No.1, *Madhesh* Province, *Bagmati* Province, *Gandaki* Province, *Lumbini* Province, *Karnali* Province, and *Sudurpashchim* Province; see Appendix). Therefore, for analyses of relationships between contraception, abortion, and sociodemographic variables, only the NDHS 2016 data were used with 4,568 women aged 15 – 24.

NDHSs deal with a number of topics, including but not limited to fertility, family planning, infant and child health and mortality, maternal health, and HIV/AIDS-related

knowledge and behaviors and mass media exposure. Only NDHS reports of 2011 and 2016 contain separate section on abortion although induced abortion rate as a component of pregnancy outcomes is reported in all NDHS reports. Some details about sampling designs, field work, and data quality of NDHSs can be found at <https://dhsprogram.com>

In addition to five national NDHS datasets, regularly collected abortion monitoring data from the project *Empowering women to access safe abortion services in Gorkha* implemented in three *palika* (subdistrict) in Gorkha district of Nepal (see Map in Figure A1) during mid-2018 to June 2020 (including the first few months of the COVID-19 pandemic, April-June 2020) are also used to augment the analysis.

The Gorkha project was funded by the Safe Abortion Action Fund (SAAF) and the International Planned Parenthood Federation (IPPF) (London) and was implemented by the Population, Health, and Development Group (PHD Group – a local NGO). The objectives of the project were to empower women and girls to realize their rights to sexual and reproductive health and for them to be informed and able to access contraception and safe abortion when needed.

Gorkha District was the epicenter of the 2015 devastating earthquake (NPC, 2015); nearly every house was hit by the tremor. People suffered and women and girls were impacted the most as a large number of women and girls who engaged in income-generating activities from their homes, incurred additional losses of home-based economic resources, and assets essential for their livelihood and well-being (NPC, 2015). The 21,000 women of reproductive age (WRA) in the three *palika* of Gorkha District were the project's main target group. In addition, about 2,000 boys of average age 16.2 years and 2,100 girls of average age 16 years in grades 9 to 12 in the project areas also benefited from basic sexuality education. This paper examines the association between sociodemographic characteristics (including caste/ethnicity) and access to safe abortion in young women aged 15 – 24, both nationwide and in the project area.

2.2. Measurements

2.2.1. Dependent variables

This study has three dependent variables that are all dichotomous variables. One dependent variable is whether a participant was using any of contraception at the time of survey; the second is whether a participant had an abortion within 5 years preceding the survey, and the third whether such an abortion is a safe abortion. Any respondent using any of the birth control methods, such as Pill, Intra Uterine Device (IUD), injections

(popularly known as Depo Provera), male condom, female sterilization, male sterilization, periodic abstinence or rhythm method, withdrawal, and implants/Norplant, is categorized as currently using a contraceptive method. A respondent was classified as having had an abortion if she obtained such abortion at a government accredited medical facility or at any other health facility, although as a rule, only government accredited health facilities can provide abortion services. In principle, a government facility that has not been accredited for safe abortion service by the Ministry of Health and Population cannot perform any abortion service. Any health facility that is private or non-governmental that has been accredited by the government can provide safe abortion services. In practice, however, NGO or private health facilities not accredited by the government also provide abortion services, but such abortions are regarded as “unsafe.” Women performing abortion at home using modern drugs such as Mifepristone and Misoprostol bought from a pharmacy and abortions performed using crude methods are all regarded as “unsafe.”

2.2.2. Explanatory variables

Having reviewed the literature earlier on reproductive health including contraception and abortion in the context of Nepal and elsewhere, a number of factors have been identified that are associated with women's access to contraception and abortion. These variables are grouped within three categories: demographic characteristics (age, marital status, caste/ethnic groups, and number of children ever born), socioeconomic characteristics (residence, ecological region, province, wealth index, and education), and knowledge (knowledge of legal status of abortion). For abortion models, the type of contraception (modern methods or traditional methods) currently used is also included as an independent variable. The traditional methods used by young women in 2016 included rhythm and withdrawal methods (MOH *et al.*, 2017). Therefore, ten independent variables were used for contraception models and 11 independent variables for abortion models.

Education is referred to as responsible for turning knowledge into practice (Martin & Juarez, 1995). The household wealth index is a composite measure of the cumulative living standard of a household (including assets such as the type of material used for flooring, water, and sanitation facilities and the possession of televisions). The methodology for construction of the index, based on the principal component analysis, is described in detail elsewhere (Rutstein & Johnson, 2004). The variable was classified into five categories using quintile (poorest, poor, middle, rich, and richest).

Demographic variables included respondent's age (15 – 19 years and 20 – 24 years), marital status, and caste/ethnic groups categorized as *Chhetri/Bahun*, *Janajati*, *Tarai*, and *Dalit*. In the 2011 census about 81% of the Nepalese reported their religion as Hindu and thus locating themselves within the caste system (CBS, 2012). In caste hierarchy, *Chhetri/Bahun* are ranked the highest followed by *Tarai* (those aboriginally living in the *Tarai* area excluding *Dalit*), *Janajati*, and *Dalit* – the lowest ranked group (Bennet *et al.*, 2008). Socioeconomic variables included urban-rural residence (urban vs. rural), ecological region (Mountain, Hill, and *Tarai* area), residence of province (seven provinces), wealth index (poorest, poorer, middle, richer, and richest), and educational attainment (no education, primary school, secondary school, and school leaving certificate or higher).

2.3. Analytical strategies

To obtain the profile of young women who were practicing contraception and those who obtained an abortion service in the past 5 years preceding the survey of 2016, basic statistical techniques such as frequencies, cross tabulations, and Chi-square tests were conducted. In this paper, multivariable logistic regression analyses were employed using SPSS v.21 to cross-check the results regarding who practiced contraception who obtained abortion and examined who opted for safe abortion. In addition, bivariate analyses and Chi-square tests were also conducted using project monitoring data on women 15 – 24 only. These young women obtained safe abortion services during the stringent lockdown of COVID-19 pandemic period January – June 2020 and during the 1-year period just before the lockdown.

3. Results

3.1. Sample description and odds ratios of use of contraception

Nationwide, contraceptive prevalence rate among married young women steadily increased from a mere 10% in 1996 to 17% in 2001 and further to 23% in 2011 (Figure 1). However, the proportion of young women using contraception stagnated at 21% between 2011 and 2016. Among the adolescents aged 15 – 19, the contraceptive use was much lower than their youth counterparts, exhibiting an increasing gap of about 10% points since 2001 between the two groups.

Table 1 presents the descriptive analysis of the young women aged 15 – 24 who were currently using contraceptive methods at the time of the survey in 2016 and also presents chi-square tests of the significance of the association between the various background characteristics and the use of contraception. In 2016, the sample of young women aged 15 – 24 was 568 (Muslim women not included in the analysis). Of these 4,568 women, 15.1% were currently using any

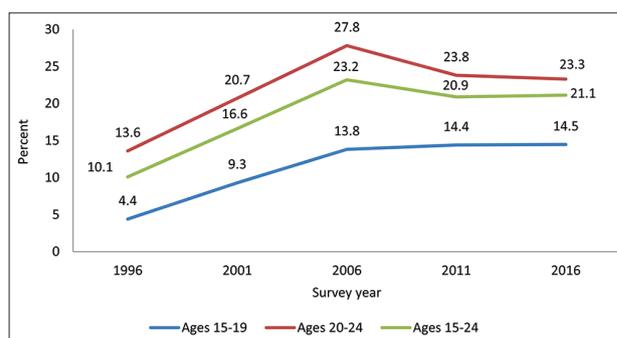


Figure 1. Prevalence of modern contraceptive use among currently married adolescents and young women by age, Nepal DHS 1996-2016. Source: MOH *et al.* (2017), MOHP *et al.* (2002); MOHP *et al.* (2007); MOHP *et al.* (2012), and Pradhan *et al.* (1997)

method of contraception, while the corresponding figure for all women aged 15 – 49 was 40.8% (MOH *et al.*, 2017).

Among the demographic variables, as shown in Table 1, age was significantly associated with the use of contraception, with more older women (24.9%) practicing contraception compared to their younger counterparts (6.4%). The prevalence of contraceptive use among married young women was 30% and it was virtually non-existent among currently not married. Among the four broad caste/ethnic groups of women, the highest proportion of women practicing contraception was seen among *Janajati* women (17.7%) in comparison with the lowest proportion among *Dalit* women (12.8%). Equal proportions (13.6% each) of women of the *Tarai* caste and the *Chhetri/Bahun* caste practiced contraception. Contraceptive use significantly increased with increasing number of children ever born: only 3.9% women practiced contraception without having any children ever born in comparison with the corresponding figures 34.8% for women with one child and 40.8% for women with two or more children.

The association between contraceptive use and socioeconomic variables was found significant for provinces and education. Among the seven provinces, the highest proportion (19.3%) of young women in Province 1 practiced contraception followed by *Gandaki* (15.9%), *Karnali* (15.7%) provinces, and so on while the contraceptive use was the lowest in *Madhesh* province (11.9%). Urban-rural residence, ecological region, and the wealth index were not significantly associated with contraceptive use (Table 1). Knowledge of the legal status of abortion was not significantly associated with contraceptive use either. Table 1 shows that higher contraceptive use among less educated women compared to their educated counterparts, although it was not statistically significant.

Table 2 presents the odds ratios of practicing contraception among young women from multivariable

Table 1. Percentage distribution of women aged 15 – 24 by contraceptive method currently used by study variable, Nepal, 2016

Characteristics	N	Not using contraception	Using contraception	Chi square test “P”
Total	4,568	84.9	15.1	
Demographic characteristics				
Age				***
15 – 19	2,429	93.6	6.4	
20 – 24	2,139	75.1	24.9	
Marital status				***
Currently married	2,237	69.4	30.6	
Currently not married ^a	2,331	99.9	0.1	
Caste/ethnic group				***
<i>Chhetri/Bahun</i>	1,350	86.4	13.6	
<i>Janajati</i>	1,755	82.3	17.7	
<i>Tarai</i>	823	86.4	13.6	
<i>Dalit</i>	641	87.2	12.8	
Number of children ever born				***
None	3,012	96.1	3.9	
One child	1,027	65.2	34.8	
Two or more	530	59.2	40.8	
Socioeconomic characteristics				
Residence				
Rural	1,722	84.4	15.6	
Urban	2,846	85.2	14.8	
Ecological region				
Mountain	306	83.7	16.3	
Hill	2,041	84.3	15.7	
<i>Tarai area</i>	2,221	85.7	14.3	
Province				**
Province 1	748	80.7	19.3	
<i>Madhesh</i>	855	88.1	11.9	
<i>Bagmati</i>	953	86.1	13.9	
<i>Gandaki</i>	458	84.1	15.9	
<i>Lumbini</i>	823	84.7	15.3	
<i>Karnali</i>	293	84.3	15.7	
<i>Sudurpaschim</i>	438	85.2	14.8	
Wealth index				
Poorest	843	85.8	14.2	
Poor	969	83.9	16.1	
Middle	907	85.0	15.0	
Rich	1,015	85.0	15.0	
Richest	835	85.1	14.9	
Education				***
No education	378	79.4	20.6	
Primary	595	80.0	20.0	
Some secondary	1,907	84.9	15.1	
SLC or Higher	1,688	88.0	12.0	
Knowledge				
Knowledge of legal status of abortion				
Yes	2,574	85.0	15.0	
No	1,994	84.9	15.1	

All estimates were weighted. Per cents may not sum to 100 due to rounding. * $P \leq 0.05$; ** $P \leq 0.01$; *** $P \leq 0.001$. ^aCurrently not married also includes 6 women aged 15 – 19 and 14 women aged 20 – 24 formerly in union. SLC: School leaving certificate.

Table 2. Odds ratios of a woman practicing contraception by study variables, Nepal, 2016

Characteristics	All women	Currently married women
	Odds ratio	Odds ratio
Demographic characteristics		
Age		
15 – 19 (r)	1.00	1.00
20 – 24	1.30*	0.80
Caste/ethnic group		
<i>Chhetri/Bahun (r)</i>	1.00	1.00
<i>Janajati</i>	1.58***	1.69***
<i>Tarai</i>	1.23	1.20
<i>Dalit</i>	1.05	0.98
Children ever born		
None	1.00	1.00
One	15.17***	3.17***
Two or more	24.75***	6.04***
Socioeconomic characteristics		
Residence		
Rural	1.00	1.00
Urban	1.12	1.18
Ecological region		
Mountain (r)	1.00	1.00
Hill	0.99	1.02
<i>Tarai area</i>	0.82	0.87
Province		
Province 1 (r)	1.00	1.00
<i>Madhesh</i>	0.35***	0.31***
<i>Bagmati</i>	0.75	0.79
<i>Gandaki</i>	0.68*	0.66*
<i>Lumbini</i>	0.72*	0.71*
<i>Karnali</i>	0.79	0.70
<i>Sudurpaschim</i>	0.90	0.86
Wealth index		
Poorest (r)	1.00	1.00
Poor	1.33	1.30
Middle	1.36	1.32
Rich	1.71**	1.65**
Richest	2.69***	3.43***
Education		
No education (r)	1.00	1.00
Primary	1.07	0.98
Some secondary	1.16	1.08
SLC or Higher	1.10	1.24

(Cont'd...)

Table 2. (Continued)

Characteristics	All women	Currently married women
	Odds ratio	Odds ratio
Knowledge		
Knowledge of legal status of abortion		
Yes (r)	1.00	1.00
No	1.17	1.24*
Model summary		
–2 log likelihood	2,885.2	2,467.2
Cox and Snell R2	0.194	0.121
Nagelkerke R Square	0.340	0.171
(Weighted N)	4,568	2,237

Odds ratios were weighted. SLC: School leaving certificate. * $P \leq 0.05$; ** $P \leq 0.01$; *** $P \leq 0.001$.

logistic regression models. The results regarding the demographic characteristics of women who practiced contraception were supported in the multivariable analyses. Among all the samples, women aged 15 – 19 was less likely to use contraception, which is mostly because they were not married and were involved in sexual activity less frequently. NDHS 2016 shows that 72% of women aged 15 – 19 never had sex in the last 1 year and among those who were sexually active only 15% had sexual intercourse in the past 1 month compared to 40% among their counterparts aged 20 – 24 (MOH *et al.*, 2017). The results among married women verified the no differences for use of contraception between these two age groups.

The number of children ever born stood out prominently: young women with two or more children ever born were about as much as 25 times of and women with one child were about 15 times of the odds of practicing contraception among the entire sample, compared with women who had no children (the higher odds ratios were reduced to 6 times and 3 times among the married sample). Women of the *Janajati* ethnic group were more likely to use family planning methods than adolescents and women from other caste/ethnic groups. Young women from *Madhesh* province were significantly less likely (65%) (OR = 0.35) (it was 69% in the married sample) than those from Province 1 to practice contraception. Young women from *Gandaki* and *Lumbini* provinces were also less likely than those young women from Province 1 to practice contraception. The odds of using contraception were the highest in Province 1 compared to all other provinces. This is also supported by simple contraceptive use prevalence among adolescents and youth by provinces, as shown in [Table 1](#) above.

The multivariable analysis shows that the economic status of respondents was positively related to the practice of contraception. Compared to women from the poorest wealth quintile, women belonging to the rich quintile were significantly 1.7 times more likely to use contraception (it was the same in the married sample) and it is even higher (2.7 times) for women from the richest wealth quintile (it was 3.4 times among the married sample). The multivariable logistic analyses largely confirm the results for the socioeconomic characteristics except for the association between educations. Knowing about the legal status of abortion was associated with higher odds of contraceptive use among married women, although such higher odds were not significant among the entire sample.

3.2. Descriptive profile of women having an abortion

Table 3 presents descriptive profiles of young women aged 15 – 24 who obtained an abortion in the past 5 years preceding the survey of 2016. It also presents the results of Chi-square tests of the significance of the association between the various background characteristics and having obtained an abortion. Overall, among all young women aged 15 – 24, about 1.8% had an abortion during the 5 years preceding the survey. There was a significant distributional difference in the prevalence of abortion over age, marital status, children ever born, contraceptive use, and wealth index.

The results in Table 4 show that women who ever gave one birth were nearly 6 times (OR=5.72) more than to have an abortion than women without any birth. The odds ratio was even higher among women who ever gave two or more births (OR= 7.14). The higher ratios for these two subgroups were reduced to 2 times and about 3 times in the married sample. Women who were using modern traditional contraceptive methods were 6 times (OR = 6.17) (4.4 times in the married sample) more likely to have an abortion than their counterparts using no contraception, implicating either a low effectiveness of traditional methods of family planning or lower sexual activities among those who were not using any methods. No difference in prevalence of abortion was found between women who were not using any contraceptive method and women who were using modern contraceptive method. The richer a woman, the greater the odds they had an abortion. Women from Karnali Province had nearly 6 times higher odds of having an abortion compared to women from Province 1, but there was no provincial difference for other provinces compared to Province 1. The results are very similar among the married sample with some reduced odds ratios for few factors as we also noted above.

3.3. Descriptive profile of women obtaining safe abortion services

In NDHS 2016, a total of 492 women aged 15 – 49 reported having had an abortion 5 years preceding the survey (MOH *et al.*, 2017), and 51% of them were performed at government authorized health facilities. Among the youth aged 15 – 24, the total number of recent abortions in the past 5 years was 83 with 42 abortions that were “safe” or performed at government authorized health facilities and the remaining 41 abortions were “unsafe” (see Table 5). Caste/ethnic group and the number of children ever born were the only demographic variables associated with abortion safety. It was only ecological region that was significantly associated with abortion safety among the five socioeconomic variables. Knowledge of the legal status of abortion was also associated with abortion safety.

Of the total recent 17 abortions reported by young women in the Tarai area in the past 5 years, 88% were performed at “safe” facilities, while the corresponding figures for other caste/ethnic groups were 38% for Chhetri/Bahun high castes, 41% for Janajati or indigenous ethnic groups, and 44% for Dalit castes (Table 5). The number of children ever born was also significantly associated with abortion safety. A large proportion (73%) of young women without having live birth were putting them at risk of going to “unsafe” health facilities for an abortion. More young women (51%) with one child ever born also took recourse to “unsafe” health facilities for abortion, while nearly one-third (65%) young women with two or more children ever born visited “safe” abortion health facilities for abortion (Table 5).

Proportionately, more women not currently using contraception were accessing safe abortion service than those who were using any contraception, although the relationship is not statistically significant. Women not using contraception were accessing “unsafe” abortion service; perhaps, the pregnancy was unplanned or was due to forced sex. For wealth quintiles and education, it appears that accessing safe abortion services decrease with rising economic status and education, although the association is not statistically significant. Higher proportion (60%) of women having no knowledge of the legal status of abortion were reporting accessing safe abortion service compared to their counterparts (42%) aware of the legal status of abortion (Table 5).

3.4. Safe abortion in Gorkha project area

The implementation of the PHD Group women empowerment and the safe abortion project in Gorkha has some good experience to share. The project was supplementing the government’s efforts of expanding safe

Table 3. Percentage distribution of young women aged 15 – 24 by abortion status in the 5 years preceding the survey, according to selected characteristics, Nepal, 2016

Characteristics	N	No abortion	Had abortion (s)	Chi square test “P”
Total	4,568	98.2	1.8	
Demographic characteristics				
Age				***
15 – 19	2,429	99.3	0.7	
20 – 24	2,139	96.9	3.1	
Marital status				***
Currently married	2,237	96.3	3.7	
Currently not married ^a	2,331	100.0	0.0	
Caste/ethnic group				
<i>Chhetri/Bahun</i>	1,350	97.9	2.1	
<i>Janajati</i>	1,755	98.3	1.7	
<i>Tarai castes</i>	823	97.9	2.1	
<i>Dalit</i>	641	98.6	1.4	
Children ever born				***
None	3,012	99.5	0.5	
One	1,027	95.7	4.3	
Two or more	530	95.3	4.7	
Use of family planning method				***
None	3,880	99.0	1.0	
Modern method	495	95.4	4.6	
Traditional method	193	88.1	11.9	
Socioeconomic characteristics				
Residence				
Rural	1,722	98.4	1.6	
Urban	2,846	98.0	2.0	
Ecological region				
Mountain	306	98.7	1.3	
Hill	2,041	98.0	2.0	
<i>Tarai</i>	2,221	98.2	1.8	
Province				
Province 1	748	98.8	1.2	
<i>Madhesh</i>	855	98.5	1.5	
<i>Bagmati</i>	953	98.4	1.6	
<i>Gandaki</i>	458	97.8	2.2	
<i>Lumbini</i>	823	97.9	2.1	
<i>Karnali</i>	293	96.2	3.8	
<i>Sudurpaschim</i>	438	97.9	2.1	
Wealth index				
Poorest	843	99.2	0.8	**
Poor	969	98.2	1.8	
Middle	907	98.3	1.7	
Rich	1,015	98.1	1.9	

(Cont'd...)

Table 3. (Continued)

Characteristics	N	No abortion	Had abortion (s)	Chi square test “P”
Richest	835	96.9	3.1	
Education				
No education	378	97.4	2.6	
Primary	595	97.3	2.7	
Some secondary	1,907	98.5	1.5	
SLC or Higher	1,688	98.3	1.7	
Knowledge				
Knowledge of legal status of abortion abortion				
Yes	2,574	98.3	1.7	
No	1,994	97.9	2.1	
(Weighted n)	4,568	4,485	83	

All estimates are weighted. Per cents may not sum to 100 due to rounding. * $P \leq 0.05$; ** $P \leq 0.01$; *** $P \leq 0.001$. ^aAmong women currently not in union there was one woman reporting abortion but due to rounding it is reported as “zero;” SLC: School leaving certificate.

abortion services in the country. The PHD Group does not have its own service infrastructure rather it uses the government infrastructure, health sector in this case, for project implementation. It is a Public-Private Partnership model in that NGOs or private sectors collaborate with the government entity to implement development activities. Provision of safe abortion services calls for, among other things, training of health personnel, supply of drugs, and equipment, record keeping of clients receiving service and follow-up of abortion clients for 2 weeks and taking care of post abortion complications (PAC). From January 2019 to end of June 2021, 348 women received safe abortion service in the project areas. Of them only four women had PAC and they were well taken care of following the procedure.

Monitoring data from PHD Group’s project in the Gorkha district indicate that despite difficult times due to COVID-19 lockdown which caused cancellation/postponement of several proposed project activities a large number of women and girls utilized safe abortion service. During the first 3 months of this period, the number of women and girls accessing safe abortion service was 67 (23 among women aged 15 – 24 and 44 among women aged 25+), while the corresponding figure increased to 106 (28 among women aged 15 – 24 and 78 among women aged 25+) in the following 3 months, representing a growth of 58.2% during the lockdown (Figure 2).

A number of reasons have been put forward for the increase in client flow during the pandemic. First, due to mothers’ group meetings which are organized by Female Community Health Volunteers (FCHVs) attended by women of reproductive age (WRA), more girls and women in villages are now aware that abortion is legal. Second, project employed Female Field Facilitators (FFFs) and

FCHVs do compassionate counseling to local women and girls about abortion and sometimes help them visit safe abortion facility. Third, free and quality safe abortion service is available. Fourth, local safe abortion facilities are never stock out with necessary drugs and the service is available 24 hours and 7 days a week. Fifth, service facility is readily accessible and nearby. Sixth, due to lockdown, women and girls are unable to visit health facility for contraception, and in several cases, the facilities are facing shortage of contraceptives resulting in more girls and women getting pregnant. Seventh, due to lockdown, frequency of meetings of family members increased giving rise to more unplanned pregnancies compared to other normal times making girls and women to opt for abortion. Eighth, due to introduction of sexuality education in schools by the project, adolescent girls and boys are aware of consequences of unwanted pregnancies and what to do about them. Finally, due to project and other development activities, women and girls are more empowered, have learned about reproductive health and rights, and make their own decision about sex and sexuality.

The monitoring data of the GSA project indicate that adolescents and youth aged 15 – 24 from Dalit community were significantly more likely to utilize safe abortion service before the COVID-19 pandemic. For instance, during January 2019 – June 2020, among the 15 – 19 and 20 – 24-year olds combined, the proportion of Dalit youth utilizing safe abortion service in the project areas was 38.5%, while among their high caste or non-Dalit counterparts, the corresponding proportion was 26.8% (Table 6A). During lockdown period from March 24, 2020, to July 21, 2020 too, the proportion of Dalit youth utilizing safe abortion service stood at 41.8% which was

Table 4. Odds ratios of women of having an abortion within 5 years preceding the survey by study variables, Nepal, 2016

Characteristics	All women	Currently married women
	Odds ratio	Odds ratio
Demographic characteristics		
Age		
15 – 19 (r)	1.00	1.00
20 – 24	1.44	1.00
Caste/ethnic group		
<i>Chhetri/Bahun</i> (r)	1.00	1.00
<i>Janajati</i>	0.91	0.90
<i>Tarai castes</i>	1.23	1.28
<i>Dalit</i>	0.75	0.71
Children ever born		
None	1.00	1.00
One	5.72***	2.01*
Two or more	7.14***	2.77**
Use of family planning method		
Not using	1.00	1.00
Using modern methods	1.77	1.44
Using traditional methods	6.17***	4.36***
Socioeconomic characteristics		
Residence		
Rural	1.00	1.00
Urban	1.17	1.21
Ecological region		
Mountain (r)	1.00	1.00
Hill	1.26	1.26
<i>Tarai</i>	1.00	0.99
Province		
Province 1 (r)	1.00	1.00
<i>Madhesh</i>	0.78	0.68
<i>Bagmati</i>	1.12	1.19
<i>Gandaki</i>	1.56	1.55
<i>Lumbini</i>	1.70	1.52
<i>Karnali</i>	5.96***	5.15***
<i>Sudurpaschim</i>	2.50	2.42
Wealth index		
Poorest (r)	1.00	1.00
Poorer	3.01*	2.9*
Middle	3.48*	3.35
Richer	4.35**	4.31**
Richest	9.83***	10.28***

(Cont'd...)

Table 4. (Continued)

Characteristics	All women	Currently married women
	Odds ratio	Odds ratio
Education		
No education (r)	1.00	1.00
Primary	1.25	1.23
Some secondary	0.68	0.66
SLC or Higher	0.59	0.66
Knowledge		
Knowledge of legal status of abortion obo		
Yes (r)	1.00	1.00
No	1.44	1.45
Model summary		
–2 log likelihood	663.631	621.849
Cox and Snell R^2	0.036	0.037
Nagelkerke R^2	0.218	0.136
(Weighted N)	4,568	2237

(r): Reference category. SLC: School leaving certificate. Significant at * $P \leq 0.05$; ** $P \leq 0.01$; *** $P \leq 0.001$.

significantly higher than the proportion of 23.7% utilizing safe abortion service among the non-Dalit or *Chhetri/Bahun* and *Janajati* youth (Table 6B). Although as the national data show proportionately that fewer Dalit women were aware that abortion is legal in Nepal than their *non-Dalit* counterparts, they utilized safe abortion service more in PHD Group project catchment areas. Field enquiry revealed that over two-thirds of the under 20 women and girls were unmarried, although marital codes were not included in the data set due to sensitivity.

4. Discussion

Using both the Nepal national DHS and some project specific monitoring data, this paper reviewed the trend of proportion of contraceptive use over time from 1996 to 2016 from several DHSs, and the prevalence of abortion among young women aged 15 – 24 from the 2016 DHS. The study also investigated the factors associated with the prevalence of contraceptive use and the prevalence of abortion based on multivariable regression models and examined the distributional difference in abortion safety for some major sociodemographic characteristics.

This study revealed several findings worthy of reporting. Contraceptive use data of various years reveal that since 2006 among the currently married adolescents use of modern contraceptive methods has remained nearly constant at 14% and among all adolescents, it declined from 4.5% in

Table 5. Percentage distribution of young women who terminated a pregnancy in the 5 years preceding the survey by selected characteristics, according to abortion safety, Nepal, 2016

Characteristics	N	Unsafe abortion	Safe abortion	Chi square test p
Total	83	49.4	50.6	
Demographic characteristics				
Age				
15 – 19	16	56.3	43.8	
20 – 24	67	47.8	52.2	
Marital status				
Currently married	82	49.4	50.6	**
Currently not married	1	100.0	0.0	
Caste/ethnic group				
<i>Chhetri/Bahun</i>	29	62.1	37.9	**
<i>Janajati</i>	28	57.1	42.9	
<i>Tarai castes</i>	17	11.8	88.2	
<i>Dalit</i>	9	55.6	44.4	
Children ever born				
None	15	73.3	26.7	*
One	43	51.2	48.8	
Two or more	25	32.0	68.0	
Use of family planning method				
None	37	43.2	56.8	
Modern method	23	56.5	43.5	
Traditional method	23	52.2	47.8	
Socioeconomic characteristics				
Residence				
Rural	28	46.4	53.6	
Urban	55	50.9	49.1	
Ecological region				
Mountain	5	80.0	20.0	**
Hill	40	65.0	35.0	
<i>Tarai</i>	38	28.9	71.1	
Province				
Province 1	10	60.0	40.0	
<i>Madhesh</i>	13	15.4	84.6	
<i>Bagmati</i>	14	71.4	28.6	
<i>Gandaki</i>	10	50.0	50.0	
<i>Lumbini</i>	16	50.0	50.0	
<i>Karnali</i>	11	54.5	45.5	
<i>Sudurpaschim</i>	9	44.4	55.6	

(Cont'd...)

Table 5. (Continued)

Characteristics	N	Unsafe abortion	Safe abortion	Chi square test p
Wealth index				
Poorest	7	42.9	57.1	
Poor	16	31.3	68.8	
Middle	15	53.3	46.7	
Rich	20	60.0	40.0	
Richest	25	52.0	48.0	
Education				
No education	10	20.0	80.0	
Primary	16	37.5	62.5	
Some secondary	29	58.6	41.4	
SLC or Higher	28	57.1	42.9	
Knowledge				
Knowledge of legal status of abortion				
No	42	40.5	59.5	*
Yes	41	58.5	41.5	

Percentages were weighted. Percent may not sum to 100 due to rounding. SLC: School leaving certificate. The statistical tests were based on the Chi-square tests. * $P \leq 0.05$; ** $P \leq 0.01$

2006 to 4.2% in 2011 and further to 4.0% in 2016. The use of traditional methods among all adolescents has increased from 0.7% in 2006 to 0.9% in 2011 and shot up to 2.3% in 2016. Among the women aged 20 – 24, the use of contraceptive methods declined from 22.4% in 2006 to 17.9% in 2016 and the corresponding figures for the use of traditional methods increased from 2.3% to 6.1%. These findings indicate that either the modern methods of contraception were increasingly becoming unpopular among both the adolescent and young women, or there was increased inaccessibility over the period. These imply that family planning programs in Nepal need to be strengthened and the young women need education and information on the usefulness of modern contraceptive methods instead of relying on traditional methods. Perhaps, there are misconceptions about modern contraceptives methods which need to be removed.

Regression analyses show that women who were aged 20 – 24, from *Janajati* ethnic group, and in rich/richest wealth index groups, and ever gave a birth, were more like to practice contraception than their counterparts who are adolescents, have fewer children ever born, poorer wealth index groups, and from *Chhetri/Bahun* or *Dalit* castes. The finding that women in their 20s are more likely to obtain an abortion than adolescents could be because the women in the former group are sexually more active (40% sexually active within the past 4 weeks) than adolescents

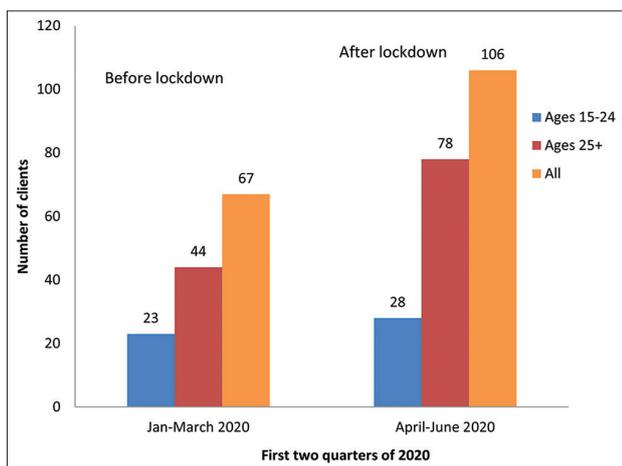


Figure 2. Safe abortion client flow before and during COVID-19 lockdown, Jan-June 2020

Table 6. Distribution of abortion cases before and during COVID-19 lockdown period

Caste/ethnic group	Age group			Total	
	15 – 19 ¹	20 – 24	25+	%	N
(A) Abortion cases from in 2019- June 2020 including COVID-19 lockdown period*					
Dalit	11.0	27.5	61.5	100.0	109
Non-Dalit	8.4	18.4	73.2	100.0	239
Total	9.2	21.3	69.5	100.0	348
(B) Abortion cases during COVID-19 lockdown period in January – June 2020**					
Dalit	10.9	30.9	58.2	100.0	55
Non-Dalit	9.3	14.4	76.3	100.0	118
Total	9.8	19.7	70.5	100.0	173

¹One girl aged 14 is added. Pearson Chi-square test significant at *P < 0.10; **P < 0.05.

(15% sexually active within the past 4 weeks) (MOH *et al.*, 2017) and have higher chance of becoming pregnant and, therefore, have a higher rate of unplanned pregnancies. Among the seven provinces contraceptive use was the lowest among young women from *Madhesh* Province and the highest in Province 1, which calls for special focus of family planning programs in *Madhesh*.

Despite limitation of sample size, our regression analyses of abortion among young women aged 15 – 24 also provide a glimpse of young women who are likely to take recourse to abortion in case that the pregnancy was unwanted. The results showed that while women who ever gave a birth were more likely to seek an abortion compared to women who did not give a birth, they were more likely to seek unsafe abortions. Results, further, show that women who were well-off were more likely to seek an abortion, and that

if they sought abortions, they were more likely to seek safe abortions. Women who were using the family planning services, especially those who were using traditional methods, were likely to seek an abortion service and obtain the abortion services at “unsafe” facilities. By contrast, those who were not using any contraceptive methods were less likely to seek abortion services and if they obtained services, they were more likely to obtain it from authorized facilities. Women in *Madhesh* Province were least likely to seek an abortion, while women in *Karnali* were likely to seek abortion services. Among young women seeking an abortion, it was found that women from the *Tarai* caste or the *Tarai* region were likely to have a safe abortion.

The likelihood of seeking an abortion among women who had been practicing traditional methods of family planning may reflect their mistrust for modern contraceptive methods or because they are unable to obtain modern methods that they wished. Increasing use of traditional methods indicates not just unavailability of contraceptives but it also implies the entrenched belief that contraceptives have side effects and may even make woman infertile. As fecundity is highly valued, it is challenging for family planning program to persuade young women to practice modern contraceptive methods. Women with greater wealth were more likely to obtain abortions services simply, because they have better access to financial resource and to better health care. Women who gave one or more births were more likely to seek abortion may be because they did not wish to have more children and wish to have space for more personal development (Kirkman *et al.*, 2009; World Bank, 1993). Total fertility rate in Nepal was substantially decreased down to 2.0 in 2021 from 3.9 in 2000 and 2.5 in 2010 (United Nations, 2022a). Apparently, factors other than contraceptive use and abortion, such as socioeconomic developmental, are attributable to such fertility decline (Anderson & Kohler 2015; Caldwell *et al.*, 1992; and Jain & Ross, 2012). Women in *Madhesh* province were least likely to seek an abortion reflecting lowest human development in the province (NPC & UNDP, 2020).

In the context of Nepal, these results may imply improvement and empowerment of women which enables them to decide when to seek an abortion. The finding that women with one or more children ever born are likely to obtain an abortion could be because the women who have been giving births to increasing number of children ever born are more likely ever to have been pregnant than women who have had no birth. In the abortion model, women who had one or more children ever born were more likely to have an abortion than those who did not give any birth. Furthermore, it could be because women’s desired family size has become 2 or less, many women opt

for permanent method of family planning and if accessing such service is difficult, they choose to go for medical abortion which is free and relatively easy to access. Indeed, according to the Ministry of Health of Nepal, of the total abortions in the 5 years preceding the 2016 survey, 72% were medical abortions (MOH *et al.*, 2017).

Nevertheless, the NDHS 2016 data show nearly half of all abortions among women aged 15 – 24 were taken place in unauthorized facilities such as at home, which is likely higher than the world average (Shah & Ahman, 2012). This is because Nepalese women buy medical abortion drugs from private pharmacies and use them at home and some women get abortion service at private pharmacies not authorized by government to perform abortion (Gorkhapatra, September 5, 2019; The Himalayan Times, March 7, 2022). This proportion is alarmingly high. With the prime objective of reducing maternal mortality, the government of Nepal legalized abortion in 2002. In 2004, the government announced a policy of providing safe abortion services through the extensive health infrastructure existing in the country. In principle, such private facilities are not legally allowed to sell abortion drugs, but still this takes place. Journalists report about illegal sale of abortion drugs and as per the government law illegal sellers can be subject to 3 years imprisonment and/or charged with fines but the situation has not improved (Gorkhapatra, October 9, 2020). However, until mid-2020, only about 1,500 health facilities in the country had provided safe abortion service out of about 4,400 facilities (Gorkhapatra, October 7, 2020). It is also argued that distance to a health facility is a major problem of accessing health care including abortion service in Nepal (MOH *et al.*, 2017). Besides, the facilities that are authorized to perform safe abortion service are not functional all the time, because they frequently face the absence of service providers and/or the shortage of supply of necessary drugs, and it is common that post-abortion contraceptives and equipment are interrupted. In addition, there are a number of social, normative, economic, and distance barriers for women to access safe abortion services. Nepalese is a patriarchal society and the NDHS 2016 data show that only 23% currently married women make decisions on their own about their own health care (MOH *et al.*, 2017). Last, but not least, due to cultural values and norms of son preference prevailing in Nepal (Karki, 1988), there is also evidence that sex selective abortion is on the rise after it was legalized (Frost *et al.*, 2013), although there are strict laws that prohibit such a practice (MoH, 2016). All these factors could make women to go to private unauthorized health-care facilities which are usually close by. The situation was likely worsened due to the COVID-19 lockdown. Relatively more Nepalese women ended up with unwanted pregnancies during the lockdown, because

contraceptives were in short supply, and many service centers were closed during the lockdown period, because abortion service providers were overwhelmed by COVID-19 pandemic, compelling women to seek abortion service from unauthorized private facilities (The Himalayan Times, 15 July 2021).

Fortunately, the analysis of the project data shows that access to safe abortion services has been improved even during the COVID-19 pandemic and lockdown. This is because no woman in the project was prevented from accessing safe abortion service, while, in other parts of the country, more women were utilizing unsafe abortion and putting their life at high risk. In the Gorkha project catchment area, there are 18 health facilities that provide safe medical abortion service. This indicates one facility per about 1,000 women of reproductive age, which is advantageous compared to the national rate of about 5,000 women per facility (MOH, 2021). The beauty of the project is that women in highly disadvantaged *Dalit*, in relative terms, were utilizing the safe abortion service made available in close-by facilities more than their advantaged counterparts. Furthermore, post-abortion family planning is much higher (87%) in the Gorkha project area than the national rate of 25% (MOH *et al.*, 2017). Admittedly, the findings in the Gorkha field monitoring data, and those from *Dalit* community in particular, were not sufficiently captured in the NDHS of 2016. To understand the complexity of sexual behavior and abortion among the young age population, more research aiming to capture large sample using both qualitative and quantitative approaches are needed. Furthermore, more investment is needed in that as evidenced from the data that even during difficult times of COVID-19 pandemic many women could access the safe abortion service available nearby.

In sum, findings of this study indicate that the sexual and reproductive health and rights (SRHR) programs including family planning and safe abortion programs in Nepal have not been satisfactory. For this, not only the family planning and safe abortion programs need to be strengthened but also the local Female Community Health Volunteers (FCHVs) have to be encouraged to do their jobs in communities better. The FCHVs should also be asked to hold community meetings with local women and young girls to spread the knowledge about effective use of modern contraceptive methods, unreliability of traditional contraceptive methods, legal status of abortion, and availability of free abortion service. The health infrastructure such as Health Posts, Primary Health Care Centers, local, district, and other hospitals must ensure that the contraceptives and medical abortion drugs are never in short supply. Family planning program was

introduced in the country more than 50 years ago, and yet, it appears that the program needs an overhaul to increase its efficacy. Furthermore, abortion was legalized and safe abortion service was introduced for over 12 years, and yet, it is still far from providing extensive safe and quality abortion service for common women and girls to access it.

4.1. Limitations

This study has several limitations. The NDHS data that have been used here are cross-sectional in nature which does not permit to establish causal relationships between contraceptive use and abortions. The NDHS data that are regularly collected in Nepal since 1996 are meant for monitoring progress made in health and demographic dynamics in every 5 years. The issues explored in the surveys do not probe for in-depth understanding of such a causal relationship, although they are good for program managers and policy makers. For instance, we have learned from the data that a certain proportion of women had abortion in the recent past, but we do not have information with respect to what made her to go for abortion nor we know how she felt about the service or how she felt herself after the service.

The monitoring data used in this analysis have limitations too. Because the government categorizes abortion facility data as highly sensitive and only a few characteristics of abortion clients are collected, it is not possible to understand deeply about the way a woman decides to opt for abortion service at a facility. Nevertheless, project monitoring data contain a few basic background characteristics in numerical forms which are helpful to make quantitative analysis.

In addition, the number of young women who had an abortion in the 5 years preceding the survey in this study was only 83 and when they were further divided into two groups the analyzed sample number became even smaller. It is thus important that the interpretations presented here must therefore be taken cautiously. Abortion is highly stigmatized in Nepalese society and people still believe that abortion is a sin (Karki & Magar, 2018). In such a society, collecting information on abortion from a face-to-face interview in a questionnaire survey is subject to underreporting. There is evidence that many women just do not report that they have had an abortion. On the basis of the total sample of 12,862 women aged 15 – 49 in 2016 (MOH *et al.*, 2017) and annual abortion rate of 42/1000 women of reproductive age 15 – 49 in 2014 (Puri *et al.*, 2016) of other data sources, approximately 2,700 abortion cases should be captured for the 5-year period preceding the 2016 NDHS survey. This suggests that only about 20% of abortions were reported in NDHS. As adolescents face severe social sanctions against premarital pregnancy (Thapa

et al., 2001), it is likely that many premarital pregnancies that ended in abortions were not captured in the survey. The analysis is based on cross-sectional data – abortions that took place in the past 5 years preceding the survey, which is subject to several limitations. In the absence of some important variables such as education, residence, and socioeconomic status at the time of abortion, the analysis was based on data collected at the time of the survey. As education and economic status change over time, they can impact the results that are presented here.

5. Conclusions

The 2016 Nepal Demographic and Health Survey (NDHS) supplemented by key indicators from several previous waves of NDHS shows that the prevalence of contraceptive use among women aged 15 – 24 has been stagnant, and their prevalence of unsafe abortion is high in the last two decades in Nepal. The study also investigated the factors associated with the prevalence of contraceptive use and the prevalence of abortion based on multivariable regression models for some major sociodemographic characteristics. It, further, analyzes the distributional difference in unsafe abortion by major factors, which shows that different sociodemographic factors played varied roles in affecting Nepalese young women's choice of contraceptive use and abortion behaviors. Overall, the sexual and reproductive health and rights (SRHR) programs including family planning and safe abortion programs in Nepal have not been very effective in the past two decades. Family planning and safe abortion programs need to be strengthened to achieve sustainable development goals. The Gorkha project demonstrated provided a good example that access to contraceptive and abortion services among disadvantaged populations could be largely improved when available services are provided to them. Post-abortion family planning services could also increase safe abortion. To understand the complexity of sexual behavior and abortion among the young age women and to achieve the sustainable development goals for reduction in maternal mortality risk in Nepal, more research aiming to capture large sample using both qualitative and quantitative approaches are needed.

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Conflict of interest

The author has no conflicts of interest to declare.

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Author contributions

This is a single-authored paper.

Ethics approval and consent to participate

Not applicable as this study involves the analysis of secondary data collected by the DHS program, ICF, Rockville, Maryland, USA, and monitoring data from the project which was approved by the Ministry of Health and Population.

Consent for publication

Not applicable.

Availability of data

Data utilized in this paper are from secondary sources and available to the public. The secondary data can be freely accessed from the DHS website. The project monitoring data used in the analysis are with the author in SPSS system file and if needed it can be made available to the publisher.

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Appendix

A1: Background information about Nepal.

Nepal has a diverse geography and a landmass of 147,181 km². The country is situated between two huge nations. All along the Himalayan northern border there is the Tibetan region of China, while the remaining three sides of the country are surrounded by India. Nepal is characterized by three distinct ecological regions running east to west, referred to as the Mountains, the Hills, and the *Tarai*. The Mountain area in the North ranges in altitude from 16,000 ft (4,880 m) to 29,028 ft (8,848 m) above sea level and the area accounts for about 35% of the total land of the country. The Hill area in the middle runs from east to west, ranging in altitude from above 1000 ft (305 m) to about 16,000 ft and accounts for 42% of the total land of the country. The *Tarai* area along the South ranges from about 200 ft (60 m) to 1000 ft above sea level, including some of the most fertile land in the country and accounting for 23% of the total land area. The *Tarai* area is a subtropical region adjoining India. According to the 2021 preliminary population census results, about 53.7% of the total population of 29.2 million resided in the *Tarai*, while, in the hills and the high mountain regions, the corresponding figures are 40.2% and 6.1%, respectively (CBS, 2022).

In September 2015, Nepal promulgated a new Constitution, adopted a three-tier federal state (local, provincial, and center) and became a federal democratic republic. The country is now divided into seven provinces (Province No.1, *Madhesh* Province, *Bagmati* Province, *Gandaki* Province, *Lumbini* Province, *Karnali* Province, and *Sudurpashchim* Province), 77 districts (see Map), and 753 *palika* or local politico-administrative units and each *palika* is divided into wards of varying numbers which are the lowest level politico-administrative units (Ministry of Law, Justice and Federal Affairs, 2015).

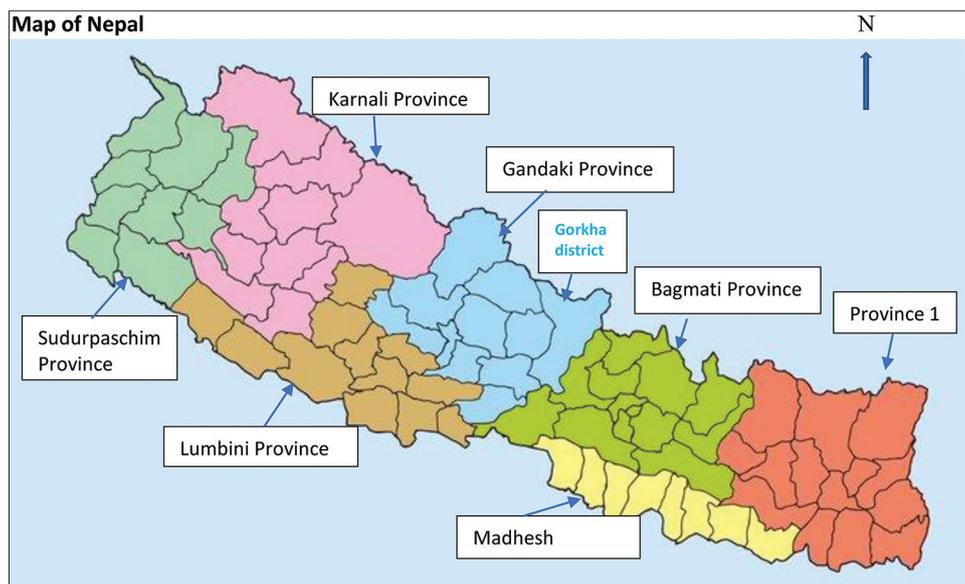


Figure A1. Each province is composed of a number of districts; there are 14 districts in Province 1, eight districts in *Madhesh* Province, 13 districts in *Bagmati* Province, 11 districts in *Gandaki* Province, 12 districts in *Lumbini* Province, ten districts in *Karnali* Province, and nine districts in *Sudurpaschim* Province. There are, in all, 6,743 wards in the country. Before 2015, the number of districts was 75. A *palika* is classified as a rural or an urban municipality. The urban municipalities are further classified as Metropolitan cities, Sub-metropolitan cities, and urban municipalities. In all, there are six metropolitan cities, 11 sub-metropolitan cities, and 276 Urban Municipalities in the country. Of the total population, 66% lives in 293 urban municipalities (CBS, 2022). Except for metropolitan and sub-metropolitan cities, the populations of 276 urban municipalities exhibit rural characteristics. The 2011 census reported 125 caste/ethnic groups with about 123 different languages spoken in Nepal (Dahal, 2014). Caste/ethnic groups can be broadly divided into four hierarchical categories such as “high” castes (*Chhetri/Bahun*), indigenous (*Janajati*) group, the *Tarai* castes, and the *Dalit* castes