"PREVALENCE OF ABORTION AMONG MARRIED WOMEN AGED 20 – 40 YEARS IN A RURAL AREA"

Submitted by

(REG NO. BD0119006)

Dissertation

Submitted to
KAHER, Belagavi, Karnataka,
In partial fulfilment of the requirements for the degree of

M. D. (Doctor of Medicine)

in

COMMUNITY MEDICINE

DEPARTMENT OF COMMUNITY MEDICINE,

JAWAHARLAL NEHRU MEDICAL COLLEGE, KAHER,

BELAGAVI – 590010 KARNATAKA, INDIA.

APRIL – 2022

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH, BELAGAVI

Endorsement by the HOD & Principal / Head of the Institution

This is to certify that the dissertation entitled **"PREVALENCE OF ABORTION AMONG MARRIED WOMEN AGED 20 – 40 YEARS IN A RURAL AREA"** is a bonafide research work done by the candidate **(REG NO. BD0119006).**

Dr. SHIVASWAMY M. S. MD
Professor and Head,
Department of Community Medicine,
J. N. Medical College, KAHER,
Belagavi – 590010,
Karnataka.

Place: Belagavi
Date:

Dr. (Mrs.) N. S. MAHANTSHETTI MD
Principal,
J. N. Medical College, KAHER,
Belagavi – 590010,
Karnataka.

Place: Belagavi
Date:

UNDERTAKING

I, (Reg. No. BD0119006), hereby declare that the information and the data mentioned in my dissertation entitled "Prevalence of abortion among married women aged 20 – 40 years in a rural area" belongs to me and is original. I am aware of the definition of plagiarism as detailed below:

- An act or instance of using or closely imitating the language and thoughts of another author without authorization and the representation of that author's work as one's own, as by not crediting the original author.
- A piece of writing or other work reflecting such unauthorized use or imitation.
- The deliberate or reckless representation of another's words, thoughts or ideas as one's own without attribution in connection with submission of academic work, whether graded or otherwise.

I hereby declare that the dissertation prepared by me is original-one and does not involve plagiarism anywhere. In case at a later stage, it is found that I have indulged in plagiarism, then I am solely responsible for the same and the institution is at liberty to take any disciplinary action against me including cancellation of dissertation or any other penalties imposed by the University.

Date:

Place: Belagavi **(Reg No: BD0119006)**

PLAGIARISM ACCEPTANCE LETTER

KLE
JAWAHARLAL NEHRU MEDICAL COLLEGE
(Recognized by Medical Council of India, New Delhi)
Accredited 'A' Grade by NAAC (2nd Cycle) Placed in Category 'A' by MHRD (GoI)
Nehru Nagar, Belagavi- 590 010, Karnataka, INDIA
0831 - 2471350 0831 - 2470759 www.jnmc.edu principal@jnmc.edu

Ref No: MDC/PG/ Date: 13-11-2021.

ACCEPTANCE LETTER

The softcopy of thesis entitled: **"PREVALENCE OF ABORTION AMONG MARRIED WOMEN AGED 20-40 YEARS IN A RURAL AREA"** has been submitted for Anti-Plagiarism check through Turnitin software. The scan has been carried out and the scanned output reveals a match percentage of **07%** which is within the acceptable limits of **10%** as per the guidelines given by UGC.

Dr. (Mrs.) N.S. Mahantashetti.
Chairperson-Antiplagiarism Committee &
Principal,
J. N. Medical College, Belagavi.

To,
Reg. No. **BD0119006.**
Postgraduate Student,
2019-20 Batch,
Department of Community Medicine,
J. N. Medical College, Belagavi.

LIST OF ABBREVIATION USED

S. No	ABBREVIATION	EXPANSION OF THE ABBREVIATION
1	%	Percentage
2	>	Greater than
3	<	Lesser than
4	≤	Lesser than or Equal to
5	≥	Greater than or Equal to
6	$\chi 2$	Chi Square
7	AHS	Annual Health Survey
8	AMS	Abortion, Miscarriage, Stillbirth
9	ANC	Antenatal care
10	AOR	Adjusted Odd's Ratio
11	BMI	Body Mass Index
12	CDC	Centre for Disease Control and Prevention
13	CI	Confidence Interval
14	CPI	Consumer Price Index
15	Df	Degree of freedom
16	GA	Gestational Age
17	HR	Hazard Ratio
18	IPV	Intimate Partner Violence

19	MTP	Medical Termination of Pregnancy
20	NDHS	Nepal Demographic Health Survey
21	NFHS	National Family Health Survey
22	NGO	Non-Governmental Organization
23	No.	Number
24	OR	Odd's Ratio
25	PHC	Primary Health Centre
26	PUC	Pre-University Course
27	RPL	Recurrent Pregnancy Loss
28	RSM	Recurrent Spontaneous Miscarriage
29	SAb	Spontaneous Abortion
30	SD	Standard Deviation
31	SES	Socio Economic Status
32	S.No	Serial Number
33	SPSS	Statistical Package for Social Science
34	UHC	Urban Health Centre
35	UPT	Urine Pregnancy Test
36	USG	Ultrasonography
37	WHO	World Health Organization

ABSTRACT

Background & Objectives:

Abortion - a silent pandemic is a preventable cause of maternal morbidity and mortality. Access to safe abortion services protects a woman's health and human rights. Causes of miscarriage are often complex ranging from genetic, anatomical and environmental factors. Still 40 – 60 % of miscarriage remain unexplained with no identifiable cause, but many factors are suspected to be leading to it.

Statistics on miscarriage in India have shown wide disparity across the literature, mainly due to difficulty in obtaining reliable data on early gestational age among vulnerable rural population. As a result, there is inaccurate understanding of pregnancy outcomes in India's rural setting. Additionally, while studies on specific clinical contributors, such as nutrition and previous miscarriage exists, few population-based research studies are available determining the rate of miscarriage and their association with maternal characteristics. Better understanding of the impact of medical services on the pregnancy outcome of rural woman as well as the interplay of societal structure and personal health in context of developing region can help to target the complexities of miscarriage in such setting. Therefore, this study was planned with the aim to identify the prevalence of abortion, characteristics of women who experience abortion and factors leading to it in a rural setting of Belagavi.

Methodology:

The present study was a community based cross-sectional study conducted among 850 married women aged 20 to 40 years residing in the field practice area of Primary Health Centre Vantamuri. Data was collected from 1st January to 31st

December 2020. Ethical clearance was obtained from Institutional Ethical Committee on Human Subject Research of the Jawaharlal Nehru Medical College. Data collection was done by means of personal interview by the researcher in the community setting on a house-to-house basis. Written informed consent was obtained from all the study participant. A pre - designed and pretested questionnaire was used to obtain information on socio-demographic factors, maternal characteristics & habits, obstetric history and detailed history regarding abortion, if any.

Results:

Out of 850 study participant, majority (89.8%) women belonged to the age group of 20 to 29 years and the mean ± SD age of the study subject was 24.48 ± 3.83 years. Age distribution of their husband's showed that more than half (53.6%) were aged between 20 and 29 years and the mean ± SD age was 29.43 ± 4.66 years. More than 4/5th (87.1%) followed Hinduism and 84.9% belonged to socioeconomic classes III, IV and V according to Modified B G Prasad's Classification. Most (83.4%) of the women were literate, majority (82.2%) were homemaker and almost 3/4th (74.1%) lived in a joint family setup. Among the study participant husband 83.2% were literate and almost 1/3rd (29.7%) of them were in a private job. With respect to maternal characteristics of study participant, it was noted that almost half (48.9%) had their BMI in normal range, less than 1/10th consumed coffee (8.7%) or tobacco (7.1%) and 7.3% experienced atleast one episode of domestic violence in their lifetime. With respect to the obstetric profile of study subject, it was noted that 20.5% were married before the legal age of 18 years, 40.0% had their 1st pregnancy at an age <20 years and 1/5th (19.1%) had a consanguineous marriage. More than half (56.3%) were primiparous and 36.4% were multiparous. In our study participant, 55.8% had 1st

pregnancy order, 29.4% had 2nd pregnancy order and 14.8% had 3 or more pregnancy order.

The prevalence rate of abortion in our study was 22.5%. There was only 1 episode of abortion in 16.7% participant and >1 abortion in 5.8% participant. The recurrent pregnancy loss rate was 2.0%. The 191 ever-aborted women, in our study had a total of 262 abortion episodes. The mean abortion events per woman in our study was 1.4. Majority (77.5%) of the abortion episodes occurred during the first trimester of pregnancy and 22.5% occurred in the second trimester. Pregnancy status was confirmed in almost all (98.1%) of the pregnancy that ended in abortion. Four-fifth (80.1%) of the abortion were spontaneous and remaining 19.9% were induced abortion. For majority (79.8%) of the abortion events, the place of abortion was home. Most study subject (79.8%) were aided by family member at the time of abortion.

Out of the sociodemographic factors, the following variables showed a statistically significant association with prevalence rate of abortion i.e., age of the participant >30 years, age of study participant's husband ≥40 years, Muslim religion, higher literacy status and upper socioeconomic status of the study participant. Among the maternal characteristics, underweight or obesity in the study participant, tobacco consumption, domestic violence showed statistically significant association. With respect to obstetric profile, study participant's age at marriage either early or late, elderly primigravida, consanguineous marriage and higher order of pregnancy in the study participant showed a statistically significant association. Further univariate and multivariate logistic regression analysis confirmed these risk factors which were associated with prevalence of abortion in our study.

Conclusion:

The present revealed that the prevalence rate of abortion was 22.5%. The risk factors significantly associated with abortion in our study were paternal age ≥ 30 years, higher level of education among women, upper socioeconomic status, underweight mothers, early marriage and higher order of pregnancy.

Keywords:

Prevalence, Abortion, Rural area, Married women, Risk factors, Logistic regression analysis

TABLE OF CONTENTS

LIST OF TABLE

LIST OF GRAPH

LIST OF PHOTOGRAPH

INTRODUCTION

Abortion - a silent pandemic is a preventable cause of maternal morbidity and mortality.[1] Access to safe abortion services protects a woman's health and human rights.

The National Centre for Health Statistics, the Centre for Disease Control and Prevention (CDC), and the World Health Organization (WHO) define abortion as pregnancy termination prior to 20 weeks gestation or a foetus born weighing less than 500 g.[2] An abortion that occurs without intervention is known as a miscarriage or spontaneous abortion. An estimated 5% of pregnancies ends as spontaneous abortion in India.[3] Complications of spontaneous abortion contributes to maternal morbidity. Recurrent spontaneous miscarriage (RSM) refers to three or more clinically recognized pregnancy losses prior to 20 weeks of gestation from the last menstrual period affecting 1-2% of women.[4] Deliberate steps taken to end a pregnancy is termed as an induced abortion, or less frequently "induced miscarriage".[5]

Unsafe abortion as defined by the WHO is a procedure for terminating an unintended pregnancy either by individuals without the necessary skills or in an environment that does not conform to minimum medical standards, or both.[6] Globally, induced abortion is restricted by law and is criminalized in several countries. However, in Indian scenario, though legalized for the past four decades, the burden of unsafe abortion is significantly high and adversely affects a woman's health.[7] This could be due to the lack of accessibility and availability of quality health care services at every level.

The estimated annual global burden of miscarriage is 33 million out of 210 million pregnancies.[8] An estimated 56 million induced abortion occurred each year worldwide during 2010–2014. This number represents an increase from 50 million annually during 1990–1994, mainly because of population growth. As of 2010–2014, the global annual rate of abortion for all women of reproductive age (15 – 44 years) is estimated to be 35 per 1,000, which is a reduction from the 1990–1994 rate of 40 per 1,000.[9] In India alone 15.6 million estimated abortion occurred in the year 2015.[10] The abortion rate of Karnataka was 28 in the year 2012.[11] Many abortions occur outside the facility setting. Surveys regarding the abortion experience often result in under reporting due to stigma attached to it.[10] This is a major public health problem posing a serious threat to a woman's well-being.

Causes of miscarriage are often complex ranging from genetic, anatomical and environmental factors. Genetic factors are responsible for around 50% of early miscarriages, out of which autosomal trisomy is the most common cytogenic abnormality (50%). Polyploidy is observed in 22% of abortuses. Endocrine and Metabolic factors like luteal phase defect, deficient progesterone, hypo and hyperthyroidism, diabetes mellitus etc. account for 10 -15 % of miscarriages. Anatomical abnormalities such as cervical incompetence, congenital malformations of uterus, uterine fibroids, intrauterine adhesions etc. are responsible for 3 – 38% of miscarriages.

Infections account for about 5% of miscarriages which includes viral infections like Rubella, Cytomegalovirus, Variola, Varicella, Vaccinia, Human Immuno-deficiency Virus, Parasitic infections like Toxoplasma, Malaria and Bacterial infections like Ureaplasma, Chlamydia, Brucella, Spirochetes. Immunological

disorders like antiphospholipid antibody syndrome, autoimmunity and other immune factors are responsible for 5-10% of miscarriages. Other factors include Maternal medical illness, Premature rupture of membranes, Thrombophilia, Factor V Leiden mutation and Environmental factors like Cigarette smoking, drugs, chemicals and noxious agents.

Still 40 – 60 % of miscarriages remain unexplained with no identifiable cause.[12] The maternal risk factors suspected to be associated with abortion are age > 35 years, pregnancy order, Bad obstetric history, habits like alcohol and caffeine consumption and illicit drug usage.[13] Maternal characteristics like abnormal weight either underweight or overweight, poverty, literacy levels, religion and residence are also suspected.[14] Invasive prenatal genetic tests, such as chorionic villus sampling, amniocentesis are some of the known risk factors of pregnancy loss.[12]

The Sustainable Development Goals (2030) have renewed governments' commitment to reduce maternal mortality, achieve universal access to reproductive health information, education and services, ensuring reproductive rights and achieve gender equality as a matter of women's human rights.

Statistics on miscarriage in India have shown wide disparity across the literature, mainly due to difficulty in obtaining reliable data on early gestational age among vulnerable rural population. As a result, there is inaccurate understanding of pregnancy outcomes in India's rural settings. Additionally, while studies on specific clinical contributors, such as nutrition and previous miscarriage exists, few population-based research studies are available determining the rate of miscarriage and their association with maternal characteristics. Better understanding of the impact of medical services on the pregnancy outcome of rural woman as well as the interplay

of societal structure and personal health in context of developing regions can help to target the complexities of miscarriage in such settings.[14]

Given such differences, knowledge regarding causes and risk factors of abortion are insufficiently understood. Therefore, this study was planned with the aim to know the prevalence of abortion, characteristics of women who experience abortion and factors leading to it in a rural setting of Belagavi, Karnataka.

OBJECTIVES OF THE STUDY

1. To know the prevalence of Abortion among married women aged 20 – 40 years in a rural area.
2. To know the various risk factors associated with abortion.

REVIEW OF LITERATURE

India is the 2nd most populous country in the world, with 16.9% of the world population residing in it as per census 2011.[15] With the birth of 25 million children each year India accounts for nearly one fifth of the world's annual childbirths.[16]

Secondary data analysis of Indian Annual Health Survey (2010 – 2013) revealed the prevalence rate of abortion in India was 4.8%.[7] The recorded statistics number of abortions in hospitals published by the Government of India are known to undervalue the incidence of abortion. This is because of the incomplete coverage of services by hospitals and also, many abortions are known to occur outside hospitals.[10] The reason for the underestimation of abortion rates in India might be attributed to the lack of registration of pregnancies especially during the early gestational period.[14] Hence, comprehending the exact etiological factors responsible for miscarriages is also difficult.

Safe and legal abortion is considered to be a mainstay in improving health and quality of life of women. Medical Termination of Pregnancy (MTP) Act was passed by the Parliament of India in the year 1971 enabling women to have a safe and legal abortion.[10] Despite this, 56 percent of induced abortion are conducted, under unsafe condition out of 6.7 million induced abortions in India.[3] Majority of the abortion, especially those in the rural areas, are conducted by untrained personal illegally under unsafe and unhygienic condition.[17] Complications of spontaneous abortion also contribute to maternal morbidity. In all, there are approximately 10,000 to 12,000 deaths in India each year due to abortion–related complications.[3] Hence it's very vital

to find out the prevalence of abortion and understand the various factors associated with it, in order to improve the maternal health status.

A prospective observational study was conducted in Belagavi, Karnataka, among women of child bearing age. All the women were enrolled as soon as their pregnancy was confirmed. Totally 30,166 women were enrolled in this study. Rate of miscarriage was 115.3 between 6 and 8 weeks, 101.9 between 8 and 12 weeks and 60.3 between 12 and 20 weeks of Gestational Age (GA). For those periods Medical Termination of Pregnancy (MTP) rate were 45.4, 48.3, 40.2 per 1000 pregnancies respectively. Majority 96.6% miscarriage occurred unattended at home and 84.8% of MTPs were carried out by the physician. Whereas 69.6% of MTPs occurred in a health facility and 96.3% of miscarriage occurred at home. Women who experienced miscarriage were older (>30 years) and had a secondary level of education. Women with haemoglobin less than 9g/dl and Body mass index (BMI) more than 25kg/m^2 had a lower risk of miscarriage in all gestational age groups. Women with MTP were also older (>26 years), had a higher level of education (university), higher parity and higher BMI compared to those with an ongoing pregnancy, but the results were not consistent with GA.[14]

In a study on three separate components: abortions in facilities; medication abortions outside facilities; and abortions outside of facilities and with methods other than medication abortion were used to estimate National abortion incidence. It was estimated that in India, in the year 2015, 15·6 million abortion (14·1 million – 17·3 million) occurred. The abortion rate was 47·0 (42·2 – 52·1) abortion per 1000 women aged between 15 – 49 years. Out of which about 3·4 million (2.8 – 3.9) abortions were conducted in health facilities. Almost 64% of facility–based abortions were

surgical, and the remaining were medication abortions. Private sector facilities accounted for 73% of all facility–based procedures, while Public sector facilities accounted for 24% of these abortions and Non–Governmental Organization (NGO) facilities accounted for the remainder. Nearly 11·5 (10.8 – 12.2) million induced abortion that took place outside of health facilities were medication abortions. It was estimated that about 0·8 million abortions (0·4 – 1·2; 5%) were done outside of health facilities and with methods other than medication abortion. Almost 12·7 million abortion (81%) were medication abortion performed either in or outside facilities. About 2·2 million (14%) abortion were done by surgical methods and 0·8 million (5%) abortion were done outside of health facilities by methods other than medication or surgical abortion. Out of 48·1 million pregnancies 54% (25·8 million) resulted in livebirth, 33% ended in induced abortions, and 14% ended in a miscarriage.[10]

A secondary data analysis of India's Annual Health Survey (AHS) was conducted in nine states among 18,76,462 pregnant women aged 15 – 58 years, with the aim of assessing the rate of and risk factors for unsafe abortion and abortion–related maternal deaths. Among the total pregnant women in the study, 89,194 women (4.8%, 95% Confidence Interval [CI]: 4.8 – 4.9) had an abortion. Assam had the highest prevalence of abortion (6.5%). About 58,266 women (67.1%, 95% CI: 66.7 – 67.5) had an unsafe abortion. The factors associated with unsafe abortion were maternal age 20–24 years (Adjusted Odds Ratio [AOR]: 1.13; 95%, CI: 1.09 – 1.18), rural residence (AOR: 1.26; 95% CI: 1.21 – 1.32), illiteracy (AOR: 1.48; 95% CI: 1.39 – 1.59), Muslim religion (AOR: 1.16; 95% CI:1.12 – 1.22), poorest asset quintile (AOR: 1.45; 95% CI: 1.38 – 1.53), schedule caste social group (AOR: 1.08; 95% CI: 1.04 – 1.12), antenatal care (AOR: 0.69; 95% CI: 0.67 – 0.72), all surviving children being female (AOR: 1.12; 95% CI: 1.07 – 1.17), no surviving children

(AOR: 1.30; 95% CI: 1.16 – 1.46) and use of family planning method (AOR: 0.69; 95% CI 0.66 – 0.71). All these factors were statistically significantly associated with abortion ($p < 0.01$). [7]

According to a study conducted in outpatient clinics of 5 major cities of India, a total of 2398 female aged between 18 to 45 years were screened, out of which 762 (32%) had a history of at least one spontaneous miscarriage. Prevalence of Recurrent Spontaneous Miscarriage (RSM) was 7.46% out of 753 participant. Among the enrolled patients, less than 3 spontaneous miscarriage was mostly observed in the age group of 23–27 years (95.65%, n = 220) and RSM was mostly recorded in the age group of ≥ 33 years (14.68%, n = 32). The mean age of participant experiencing 1st, 2nd and 3rd miscarriage was 25.52 (±4.31), 26.39 (±4.48), and 27.92 (±5.09) years respectively. The percentage of patients having a subsequent miscarriage after the first, second, and third miscarriage was 24.97%, 34.04%, and 21.88 % respectively. Among all the age groups, patients aged 33 years or more had the highest probability of subsequent miscarriage after the first (0.0850), second (0.1702), and third (0.1406) miscarriage. The occurrence of RSM was found to be associated with clotting disorders, immunological factors, infections and genetic disorders.[4]

In a study conducted in Odisha, India to determine the prevalence of pregnancy termination by Abortion, Miscarriage, and Stillbirth (AMS) and its determinants, National Family Health Survey (NFHS) – IV data was used for analysis. The target population is 'pregnancy registered married women' aged between 15–49 years. Total number of pregnancy cases registered were 8,484 in the state of Odisha. Out of this, a total of 969 (11.4%) cases have met pregnancy termination. It was seen that miscarriages contributed the maximum (58.1%),

seconded by abortion (32.8%), and at last stillbirth (9.1%) in the total pregnancy termination cases. The maternal and socio–demographic variables like age, education, anaemia and place of delivery were associated significantly with pregnancy termination ($p < 0.05$). The women aged between 30–34 years have 1.254 times more chance of pregnancy termination than woman in the age group of 15–19 years. If we see mothers' education, women who had completed primary and secondary education had 1.304 and 1.568 higher odds, respectively, than those who were illiterates in having pregnancy termination. Concerning place of delivery, significantly higher odds of ratio of pregnancy termination is seen in the private sector health facilities (Odds Ratio [OR] = 1.412). Women who had pregnancy complications showed significantly higher odds of pregnancy termination (OR = 1.091).[18]

In a tertiary care hospital of Mumbai, a cross sectional study done was conducted among patients admitted in the Gynaecology Department. Out of 95 patients admitted most of them they were in the age group of 21–25 years and it was seen that rate of abortion increased after 35 years of age, 44% had spontaneous abortion among which 63.15% complained of per vaginal spotting and 35.78% with per vaginal bleeding. It was seen that 65% of patients who had Immunoglobulin M positive for Toxoplasma had abortion and patients who had shown positive for rubella had worst prognosis.[19]

A study done in Rajasthan among couples aged between 19–50 years showed that mean age of women was 29.3 years among study participant and 29.5 years among control. It was seen that about 83.5% couples had 3 abortions, 10.5% had 4 abortions respectively. Male were 40 years and female were 35 years among 145 couples who had 3 abortions. Among the cases 30% of couples had male in the age

group of 30–34 years and female in 20–29 years age group. In control 32% of male as well as female were in the age group of 30–34 years. They also found that 2% of male and 3% of female had major chromosomal abnormality among cases where as in controls they had none. About 7% male and 5.5% female had polymorphism amongst cases and 5% of male and female among controls where the difference was statistically significant. They have concluded that couples where female were aged 35 years and male 40 years and above need to be counselled for miscarriage. And genetic cause needs to be evaluated in case of recurrent miscarriage.[20]

The study was conducted in Gynaecology department, Civil hospital, Ahmedabad, among 406 women (203 Spontaneous Abortion [SAb] cases and 203– control subjects) and it revealed that SAb subjects had a statistically significantly higher mean BMI as compared to the control group. Overweight/ obese female subjects were significantly higher in SAb group. SAb group had a greater number of employed women when compared to control group which was statistically significant. The SAb group had statistically significant higher number of women who were chewers (tobacco or areca nut). Education and area of residence had no significant role with respect to SAb.[21]

A community–based cross–sectional study was conducted in Naxalbari block, Darjeeling district, West Bengal. The study was carried out among women aged 15–49 years, 420 in number selected by cluster sampling technique from 30 villages. A predesigned and pretested interview questionnaire validated in the local vernacular language was used for data collection. Among participant of the study, 80.7% of the women became ever pregnant. In that 41.6% of the women had any abortion in their lifetime. Hence lifetime occurrence of abortion was 33.6% in the study participant, in

which 51.7% were spontaneous abortion and 48.3% were induced abortion. Most of the spontaneous abortions were followed with a doctor (73.9%), in a private health facility (45.7%), and surgical methods were used for evacuating the products of conception (56.5%). But most of the induced abortions were conducted at quacks' place, home, etc., and not in a health facility (58.2%). Major reason for induced abortion were unwanted pregnancy (62.4%), nuclear family, no male child, number of children <2, lower education, domestic violence during pregnancy. Over the counter medicines and private facilities were preferred. Untrained providers were conducting about 14% of abortion. Medical methods were used mostly (68.6%). Out of which over–the–counter medicines contributed to 44.9% cases. So, 59.3% of induced abortions were illegal. Out of 86 induced abortion, unwanted pregnancies (54, 62.4%), medical causes (6, 7.1%), fetal abnormality (6, 7.1%), socioeconomic (5, 5.9%), and other reasons (15, 17.6%) like pregnancy before marriage, alcoholic husband, being unaware of pregnancy, having grown–up kids were the reasons for induced abortion. Women more than 30 years age, Hindu by religion, currently married staying with husband, lesser years of schooling, working women, not having a female child had higher odds of having abortion. But in the adjusted analysis these associations were not significant. Belonging to nuclear family (AOR 0.48; 95% CI, 0.29–0.80), not having male child (AOR 1.79; 95% CI, 1.01–3.17) and number of children <2 had significantly higher odds (AOR 0.39; 95% CI, 0.20–0.78) of having abortion. Majority did not have any sort of addiction (260, 76.7%); others had addiction to supari, betel–leaf, tobacco, and alcohol. About 32.2% (109) of women were engaged in some sort of heavy work like construction, carrying weight for agricultural work, drawing water from well, carrying water from distance and tea gardening. About 7.4% (25) women experienced domestic violence during pregnancy

and 16.5% (56) were accidentally injured during pregnancy. Domestic violence was significantly associated with abortion (AOR 4.73; 95% CI, 1.79–12.51).[1]

In Ballabgarh, a study was performed using secondary data analysis report of pregnancy outcomes from Health and Demographic Surveillance System. Women who had an abortion self–reported the cause of abortion. Out of 11,102 pregnancies, 11 % (1,226) were abortion, out of which 7.2% were spontaneous abortion and 3.8% were induced abortion. Both spontaneous and induced abortion rates showed an increasing trend during the study period. Bleeding per vaginum (23 %), unwanted pregnancy (16 %), and unviable foetus diagnosed by ultrasonography (11 %) were the self–reported reasons for opting for an induced abortion. Female sex of the foetus was the reason behind 8% of the induced abortion. Twenty weeks of gestation which was the upper legal permissible gestational age for performing induced abortion in India, but about 11% of abortion were performed beyond 20 weeks. Private doctors performed about 80% of induced abortion, 10% by nurse/dai and the remaining 10% by unqualified home practitioner. Factors that were significantly associated with induced abortion were wealth index, caste, birth order and size of the village population. Though the observed abortion rate was low, induced abortion contribution was more than the expected. Sex selective abortion and unsafe abortion, inspite of being illegal were prevalent. Higher socio–economic status, upper caste, birth order of 4 or more, paternal and maternal age >30 years were factors that more likely lead to opting for induced abortion.[22]

In the North East District of Delhi, a cross–sectional study was conducted in an urban resettlement colony. Two hundred married women aged 15–49 years were enrolled using systematic random sampling from each of the four blocks of the

colony. Participant were interviewed using a pretested and semi–structured questionnaire. Among 802 participant, 35.4% (284) reported having at least one abortion – spontaneous or induced and 24.4% (196) reported induced abortion. Out of the 284, 27.5% (78) women reported having unsupervised medical termination. The frequency of abortion (spontaneous or induced) was lowest among women aged 20 years or younger, and increased with age. Overall, 67 (8.4%) women reported two episodes of abortion, and only 6 (0.7%) reported three episodes of abortion. The proportion of participant who had experienced two or three abortions was highest among women aged 21–30 years, followed by those aged 41–49 years.The abortion rates did not differ significantly among various age groups, socio–economic status, or education level. Among the 284 women who reported at least one abortion, more than 40% had consulted a skilled healthcare provider for their most recent abortion. More than one–quarter of these participant had undergone an abortion after taking pills for a medical termination of pregnancy without skilled guidance and supervision. The complications noted following abortion were excessive bleeding (2/3rd), high fever, low backache, abdominal pain and foul– smelling discharge.[23]

A community based descriptive study was planned in an urbanized area of New Delhi to study the history of teenage marriage and the determinants of induced abortion among women of reproductive age group. It was observed that majority (82.2%) of the women belonged to the age group of 25 – 49 years whereas 17.8% of the study subject were 15 – 24 years old. About half (49.7%) of the women accepted that they had solemnized their marriage in their teenage. Nearly 40% of the women in their lifetime were having a history of abortion and 25% of the women had undergone induced abortion. It was reflected that 17.6% women had undergone induced abortion in their teens (15–19 years). More than half (52.7%) women had abortion during 20 –

29 years of age. Medical termination pill was used among 43.8% cases and surgery was done in 45% of the participant. For induced abortion, husband were the chief decision maker in most cases (47.3%) which was followed by joint decision of husband and wife (35.2%). Self–induced abortion was done in 33% of cases and untrained personnel were involved in 11% cases. About half (47.3%) induced abortion took place at home followed by government hospital (46%). The common reasons for induced abortion were completed family size noted in 34% of the study participant followed by birth spacing (25.3%) and then contraceptive failure in 17.6% of the cases. The unsafe abortion showed a statistically significant association with teen pregnancies ($p< 0.01$).[24]

A study was done in Nepal with the aim of examining the association between intimate partner violence (IPV) and abortion. Data was obtained from the 2011 and 2016 Nepal Demographic Health Surveys (NDHS). Among 8641 women in the reproductive age group (15–49 years) that were in the violence module in NDHS 2011 and 2016, analysis was done for 2978 women who had reported having atleast one pregnancy 5 years preceding each NDHS survey. In that, 839 women who had experienced different forms of intimate partner violence were included in the study. A total of 28.2% women had experienced some form of IPV. About 22.2% women had experienced physical violence and 19.5% women were slapped. More than half (52.8%) of the illiterate women experienced IPV. A significant association was seen between IPV and abortion by logistic regression analyses. Strong association with abortion was seen among women who experienced any form of severe violence (AOR 1.68; 95% CI: 1.06 – 2.64). Abortion was also more common in women who had experienced physical violence (AOR 1.54; 95% CI: 1.09 – 2.19). For women who experienced emotional violence lower odds value were observed (AOR 1.17; 95% CI:

0.79, 1.74). Compared to those who did not experience any such violence, it was observed that women who had reported IPV were more likely to have an abortion (AOR = 1.38; 95% CI: 1.01, 1.90).[25]

The community based prospective cohort study was carried out in China which revealed that 6.34% women had previous history of miscarriage and 21.18% had induced abortion. It was seen that women who were above 35 years, obese, with hypertension, irregular menses, who were stressed and those with Immunoglobulin G positive for cytomegalovirus had positive association with miscarriage. The study also showed that women with hypertension, with family history of abortion in mother has higher age adjusted risk ratio for miscarriage. They have concluded that women should be counselled for modifiable risk factors and screened for high–risk population in order to reduce the rate of abortion.[26]

The study carried among 18834 workers of Jinchuan *Group* Co Ltd belonging to Jincheng cohort showed that the incidence of spontaneous abortion was 6.89% and 84.76% of them were above 35 years. Nearly 71.46% were frontline workers and about 1.82% smoked and 2.6% consumed alcohol. Results also showed that 41.06% of the spontaneous abortion were due to fatigue, 33.28% due to unknown cause, 10.03% due to abnormal embryonic development, 8.96% due to trauma and 5.99% due to maternal disease. Positive correlation was observed between number of pregnancies, age at primary birth and age at the last pregnancy with an increased risk of spontaneous abortion. Negative correlation was observed between the number of artificial abortion and spontaneous abortion.[27]

A cross–sectional study was conducted in Iran, which included population from RaNCD cohort study. Out of 4831 female participant recruited 58% were from

urban area and others were from rural area. About 72.2% attained menarche between 13 and 16 years. Nearly 74.8% had non consanguineous marriage and 25.7% had spontaneous abortion at least once during her lifetime. The risk of abortion was 8.3 times more in women who had 6 or more pregnancies when compared to those who had 1–3 pregnancies. And risk was 1.6 times significantly more among those who were married after 26 years. It was seen that oral pills is a protective factor for spontaneous abortion and women who had pills were 22% at less risk of abortion than others which was statistically significant. Results also showed increased risk of abortion among those who were married and had first pregnancy after 26 years and also those who had higher socioeconomic status and secondary education.[28]

A case–control study was carried out in Riyadh, Saudi Arabia on pregnant women attending the outpatient department of Obstetrics' and Gynaecology Clinics at King Khalid University Hospital. Matching for BMI was done among the cases and controls. Recurrent pregnancy loss (RPL) cases were slightly older than the controls, but it was not statistically significant. Total consanguinity (combined 1^{st} + 2^{nd} cousins) for RPL patients, were 55% compared to the 36% in controls. Also the frequency of total consanguinity was significantly higher in the RPL ($P = 0.003$) group when compared to the control group. When the frequency of the 1^{st} and 2^{nd} cousin marriages were separately compared in the RPL, only the 1^{st} cousin marriage almost reached significance in the RPL group ($P = 0.05$). Second cousin marriage were not significantly different.[29]

According to a cross sectional study done in Western Nigeria using a self–administered questionnaire among women seeking abortion in private hospital/clinic in four geopolitical areas, it was found that out of 2934 women seeking abortion,

about 23% reported having ≥1 previous abortion. The median age of the study participant was 25 years. Of those who had more than one abortion, the level of awareness of contraceptive was 91.7%, while 21.5% used a contraceptive at their first intercourse after the procedure. Nearly 78.5% of the pregnancies were associated with non–contraceptive use while 17.5% of the pregnancies were associated with contraceptive failure. About 70% did not use any method of contraception because of fear of side effects and due to the lack of adequate information or misinformation about contraception. Objection from partner and family members was noted among 10% of the study participant. A woman presenting for second or higher–order repeat induced abortion was found to be statistically significantly with single compared to married (43% versus 22%, OR = 2.67, p = 0.0015).[30]

The Korea Centres for Disease Control and Prevention conducted a cross–sectional study which included a total of 25,534 participant. Working women aged above 19 years were included where 7.3% were educated up to middle school and 6.9% upto secondary schooling. This study showed that women who worked for more than 70 hours per week reported 9.8%, 61 to 70 hours reported 9.1%, and those working for less than or equal to 50 hours had reported the lowest spontaneous abortion. The OR (95% CI) for spontaneous abortion were higher in pink–collared, green–collared and blue–collared workers than in white–collared worker and this difference was statistically significantly.[31]

A study was done in Norway based on National Health Registries showed that among 299178 live births 443803 resulted in miscarriage and overall risk was 12.8%. It was higher among women who had stillbirth or miscarriage in her previous pregnancy. It was also seen that risk of miscarriage was 1.54 times higher after one

miscarriage and 2.21 times higher after two miscarriages and 3.97 times higher after 3 miscarriages respectively. The risk was also found higher with previous preterm livebirth where as women who had post term pregnancy had reduced risk.[32]

Internet–based prospective cohort study was conducted among eligible women aged 18–40 years and were residents of Denmark who were part of The Snart–Gravid cohort. Out of the 5132 participant 14.3% had spontaneous abortion. They have found that caffeine consumption in early pregnancy was associated with higher education, cigarette smoking, parity and alcohol consumption. Drinking coffee ≥3 servings per day had a slightly increased risk of spontaneous abortion (Hazard Ratio [HR]: 1.23; 95% CI: 0.89 – 1.72). In early pregnancy, the HRs for 100–199, 200–299 and ≥300 mg/day of caffeine consumption were 1.62 (95% CI: 1.19 – 2.22), 1.48 (95% CI: 1.03 – 2.13) and 1.23 (95% CI: 0.61 – 2.46) respectively, compared with that for 100 mg/day. After adjusting for period of gestation, it was observed that both in women who had decreased their caffeine consumption by 107 mg/day as they had nausea during early pregnancy and women who didn't report nausea but decreased their caffeine consumption by 95 mg/day, hazard ratios were similar.[33]

The prospective cohort study was conducted among women who were pregnant or planning a pregnancy from eight areas in North Carolina, Tennessee, and Texas showed that 514 had history of miscarriage. The mean age of participant was 30 years. Around 9% had 3 or more consecutive miscarriages. The interpregnancy interval was less than 6 months in 58.9% and less than 3 months in 24.3% participant. The prevalence of repeated miscarriage was 15.7% with median gestational age: 9 weeks, inter–quartile range: 7 to 11 weeks. Risk of repeat miscarriage was the lowest in women with interpregnancy intervals <3 months (adjusted–HR 0.33, 95% CI: 0.16

to 0.71). Attempting to conceive immediately after a miscarriage was not associated with any increased risk of miscarriage in next pregnancy.[34]

The prospective cohort study conducted among 5353 women enrolled from 8 areas in North Carolina, Tennessee, and Texas reported that 14.1% never use alcohol, 36.2% quit before Last Menstrual Period [LMP], 44.3% after LMP and 5.4% continued use. Almost in 41.0% after a positive pregnancy test, usage of alcohol was altered within 3 days and with a median gestational age of 29 days. Factors associated with alcohol usage were, level of education, income and higher maternal age. Those who consumed had median of 2 drinks per week with median number of 2 binge episodes. Overall, 12% pregnancies resulted in spontaneous abortion. Each week of alcohol use increased 8% the chance of having a spontaneous abortion compared to those who did not drink (Adjusted HR, 1.08; 95% CI, 1.04 – 1.12). The number of binge episodes were not associated with risk of spontaneous abortion.[35]

A study was conducted by the University of Manitoba based on Manitoba health insurance plan registry showed that every year there were 10.1% to 12.5% miscarriage between 2003 and 2014. They found that nulliparous women were more likely to experience miscarriage and their first loss will either be at an young or older age. And those who experienced 1st miscarriage had higher degree of morbidity in the previous year compared to those who had normal live child. Women who have taken treatment for infertility have 4 times higher chance of miscarriage and multiparous are 3 times less likely to have miscarriage compared to nulliparous. And those with mood disorder, anxiety disorder or past suicide attempt have 4 times and 3 times higher chances of miscarriage respectively. It was found that changing health care use pattern doesn't change association between social risk factors and miscarriage.[36]

A systematic review and meta–analysis was conducted to find out the relationship between smoking and miscarriage. PubMed database was searched (1956 – 2011) using keywords. In this study, full text of 1,706 articles were reviewed. Also 98 articles that looked into the relationship between miscarriage and active or passive smoking were reviewed in this meta–analysis. Two reviewers abstracted the data. Increased risk of miscarriage was seen in any active smoking (summary relative risk ratio = 1.23, 95% CI: 1.16 – 1.30; n = 50 studies). This risk was more when the smoking exposure was specifically defined as during the pregnancy in which miscarriage risk was measured (summary relative risk ratio = 1.32, 95% CI: 1.21 – 1.44; n = 25 studies). Amount smoked increased the risk (1% increase in relative risk per cigarette smoked per day). The risk of miscarriage increased by 11% (95% CI: 0.95 – 1.31; n = 17 studies) during pregnancy for second–hand smoke exposure. Biases seen in the study publication, design and analysis did not affect the results significantly. The findings of this systematic review and metanalysis strengthens the evidence that smoking increases the risk of having a miscarriage.[37]

MATERIAL & METHOD

SOURCE OF DATA: The present study was conducted in 20 Villages (Vantamuri, Halbhavi, Bomnatti, Irabhavi, H. Hosur, Bhutramanatti, Gugranatti, G. Hosur, Ukkad, Ramadurga, Bennali, Dasarwadi, Godihal, Honaga, Jumanal, Kenchanatti, Heggeri, Kakati-A, Kakati-B, Sonatti) covered under 5 Sub-centres (Vantamuri, Bhutramanatti, Honaga, Kakati-A, Kakati-B) of Rural Primary Health Centre (PHC) Vantamuri, which is under the administrative control of Jawaharlal Nehru Medical College, Belagavi. It is located around 30 kms from the Belagavi city, in the North western part of Karnataka. The PHC caters to a population of 39476, majority of them are farmer by occupation and Hindu by religion. In the field practice area of this PHC, there are a total of 52 schools – 30 Government, 5 aided and 17 private schools. There are a total of 52 Anganwadi workers, 35 Accredited Social Health Activist and 12 other health personnel working under the PHC. There are 3 Allopathy doctors, 10 Ayurveda doctors, 17 Homeopathy doctors, 7 Registered Medical Practitioner in the field practice area of PHC Vantamuri. There are 2 dispensaries and 35 private clinics functioning in the field practice area of PHC, but there are no Hospitals or Nursing homes.

STUDY POPULATION: The study population consisted of married women aged 20 to 40 years residing in the field practice area of PHC Vantamuri.

STUDY DESIGN: A Community based Cross-Sectional Study

SAMPLE SIZE: According to a previous study conducted in India[4], the prevalence rate of abortion was 32%. So,

p = 32 (prevalence of miscarriage)

q = (100 - p) = (100 - 32) = 68

d = relative error = (10% of P) = 3.2

Sample Size (n) = $4pq/d^2$

= 4 x 32 x 68 / 3.2 x 3.2 = 850

Therefore, the sample size was calculated to be 850.

INCLUSION CRITERIA:

- Married women aged 20-40 years.
- Permanent resident of the study area (residing at least for 1 year).

EXCLUSION CRITERIA:

- Nulligravida
- Primigravida

ETHICAL CLEARANCE: was obtained from the Institutional Ethics Committee on Human Subject Research of the Jawaharlal Nehru Medical College dated 24/12/2019 vide under letter (MDC / DOME / 221).

SAMPLING METHOD: Vantamuri PHC had 5341 eligible couples aged between 20-40 years as per eligible couple register. A sampling frame was prepared with help of eligible couple register, using computer generated random number sampling method, out of 5341 eligible couples 850 + 150 participants were selected. These additional 150 participants were selected to compensate for exclusion criteria.

STUDY PERIOD: The present study was conducted for a period of one year from 1st January to 31st December 2020 among married women aged 20 to 40 years, who were permanent resident of the field practice area of rural PHC Vantamuri in Belagavi district.

DATA COLLECTION: was done by means of personal interview by the researcher in the community setting on a house-to-house basis. Written informed consent was obtained from all the study participant before the onset of data collection and confidentiality was maintained. A pre - designed and pretested questionnaire was used to obtain information on the following:

- Socio - demographic factors
- Maternal characteristics and habits
- Obstetric history
- Detailed history regarding abortion, if any.

DATA ANALYSIS: The data collected was coded and entered in Microsoft Excel sheet. Data was analyzed using SPSS software Windows (Trial version 25). The study population were characterized using descriptive statistics and expressed as mean, standard deviation (SD) and percentage for quantitative variables. Frequency and proportion were used for categorical variables. Chi square test was used to know the association between two categorical variables and P value < 0.05 was considered as statistically significant. Univariate and multivariate logistic regression analysis was carried out to identify the risk factors.

DEFINITION OF STUDY VARIABLES:

AGE - Recorded to the nearest completed years.

EDUCATION (as per the Census of India criteria, 2011):38

Illiterate – A person who cannot read / write with understanding in any language and who has completed seven years of age.

Primary - Person who has studied from 1st to 5th standard.

Secondary – Person who has studied from 6th to 10th standard.

Pre-University Course (PUC) - A person who had completed education up to PUC or any

Degree / Graduate - A person who had completed any graduation degree course or any under-graduation course.

OCCUPATION - The activity to which one regularly devotes oneself, especially one's regular work or means of getting a living.

Classified in our study as:

Homemaker - A woman who takes care of the household day to day duties and not gainfully employed.

Agriculture - A person who works in a farm or a field.

Labourer - A person doing unskilled manual work for wages.

Government employee - one who works in the public sector.

Private employee - one who works in private sector.

Business - one who is self-employed like owning a shop or a small firm.

Unemployed – A person who is presently not working to earn a living.

SOCIOECONOMIC STATUS - Information regarding the family size (total number of family members residing in a house) and the per capita monthly income of the family were recorded and socioeconomic status was calculated using the Modified B.G. Prasad's classification for the study period. This was calculated by the usage of Multiplication factor with 1961 original Prasad's classification values. The Consumer Price Index (CPI) by old base for the original scale (1960) was 100. The scale was

modified in 1982 and 2001 by introduction of linking factors to convert CPI (1982 and 2001) from the new base of 100 to the old base CPI (1960). The linking factor between 1960 and 1982 series was 4.63. The linking factor between 1982 and 2001 series was 4.93. All India average Consumer Price index (for Industrial workers) for the year 2020 = 330. Multiplication factor = Current index value (330) / Base index value in 2001 (100) = 3.3.

Therefore,

New income value = multiplication factor × old income value × 4.63 × 4.93

= 3.3 x 100 x 4.63 x 4.93 = 7532.55

The updated value for the per capita monthly income (in Rs. /month) for 2020 are as below

Prasad's Social Classification (1961)		**Modified B.G. Prasad's Classification (2020)[39]**
Social Class	**Per capita monthly income limit**	**Revised for 2020 (in Rs / month)**
I	100 and above	7533 and above
II	50-99	3766-7532
III	30-49	2260-3765
IV	15-29	1130-2259
V	Below 15	1129 and below

TYPE OF FAMILY[40]

Nuclear: The family consisting of married couple along with their dependent children.

Joint: Consists of number of married couples and their children who live in the same household.

Body Mass Index (BMI)[41]

Calculation of BMI = weight in kg/ (Height in m)^2

BMI was calculated and categorised as per World Health Organization's (WHO) criteria for Asian population.

Category	Body Mass Index
Underweight	< 18.5 Kg/m^2
Normal	18.5 - 22.9 Kg/m^2
Overweight	23.0 - 27.5 Kg/m^2
Obese	>27.5 Kg/m^2

DEFINITION OF OBSTETRIC STUDY VARIABLES:

CONSANGUINITY - Mating between close biological relatives.[42]

GRAVIDA - A pregnant state both present and past, irrespective of the period of gestation.[43]

NULLIGRAVIDA – Defined as a woman who has never been pregnant.[43]

PRIMIGRAVIDA - Defined as a woman who is pregnant for the first time.[43]

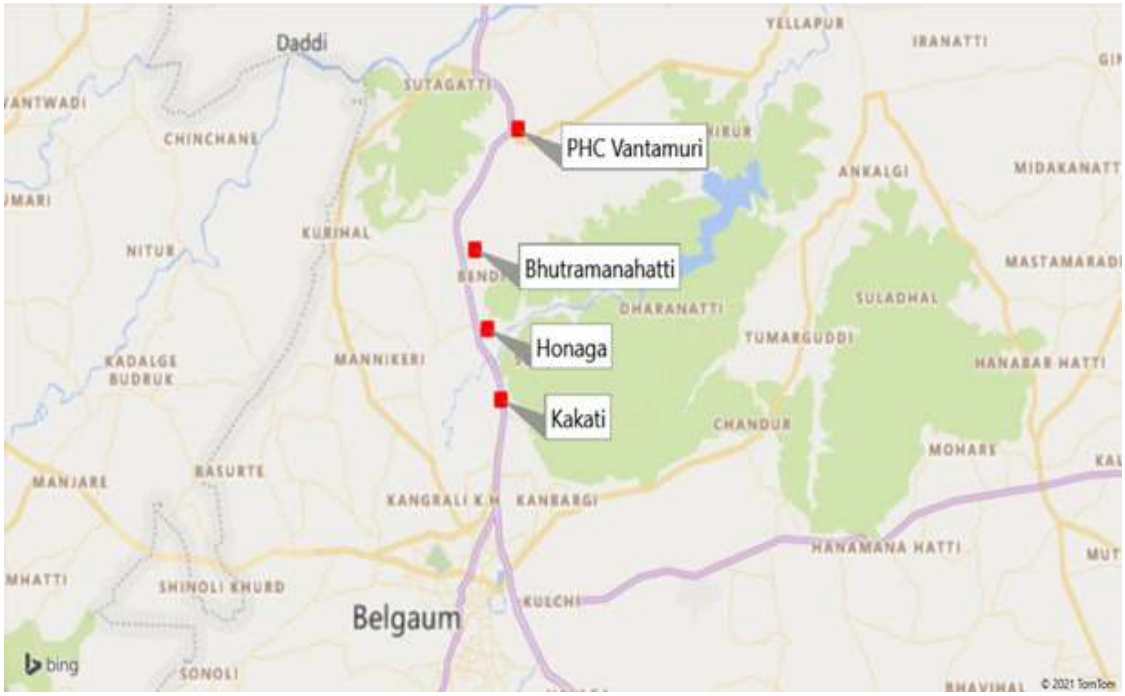
MULTIGRAVIDA - Defined as a woman who has been pregnant more than once. She may have aborted or delivered a viable baby.[43]

PARITY - The number of times a woman has given birth to a fetus with a gestational age of 24 weeks or more, regardless of whether the child was born alive or was stillborn.[43]

ABORTION - Defined as expulsion or extraction from its mother of foetus prior to 20 weeks gestation or weighing less than 500 g, when it is not capable of independent survival.[2]

PHOTOGRAPH OF PRIMARY HEALTH CENTRE (PHC), VANTAMURI

MAP OF PHC WITH SUB-CENTRES



RESULTS

The results of the study have been analyzed under the following headings:

I. Sociodemographic profile of the study participant

II. Maternal characteristics of the study participant

III. Obstetric profile of the study participant

IV. Profile of abortion of the study participant

V. Association between variables and prevalence of abortion

I. SOCIODEMOGRAPHIC PROFILE OF THE STUDY PARTICIPANT

Table 1: Age distribution of the study participant and their husband's

Age (in years)	Study Participant		Participant's Husband	
	Number	**Percentage**	**Number**	**Percentage**
20 – 24	498	58.6	91	10.7
25 – 29	265	31.2	365	42.9
30 – 34	55	6.5	281	33.1
35 – 39	30	3.5	72	8.5
≥40	2	0.2	41	4.8
Total	**850**	**100**	**850**	**100**

In the present study, out of 850 study participant, 498 (58.6%) women belonged to the age group of 20 to 24 years, 265 (31.2%) belonged to 25 to 29 years, 55 (6.5%) were aged between 30 to 34 years, 30 (3.5%) belonged to 35 to 39 years and 2 (0.2%) were aged 40 years. The mean ± SD age of the study subject was 24.48 ± 3.83 years with a range of 20 – 40 years and median age was 24.00 years. Age distribution of their husband's showed that, 365 (42.9%) belonged to the age group of 25 to 29 years, 281 (33.1%) belonged to 30 to 34 years, 91 (10.7%) belonged to 20 to 24 years, 72 (8.5%) belonged to 35 to 39 years and 41 (4.8%) were 40 years or more. The mean ± SD age was 29.43 ± 4.66 years with a range of 21 – 51 and median age was found to be 29.00 years.

Graph 1 (Table 1): Age distribution of the study participant and their husband's

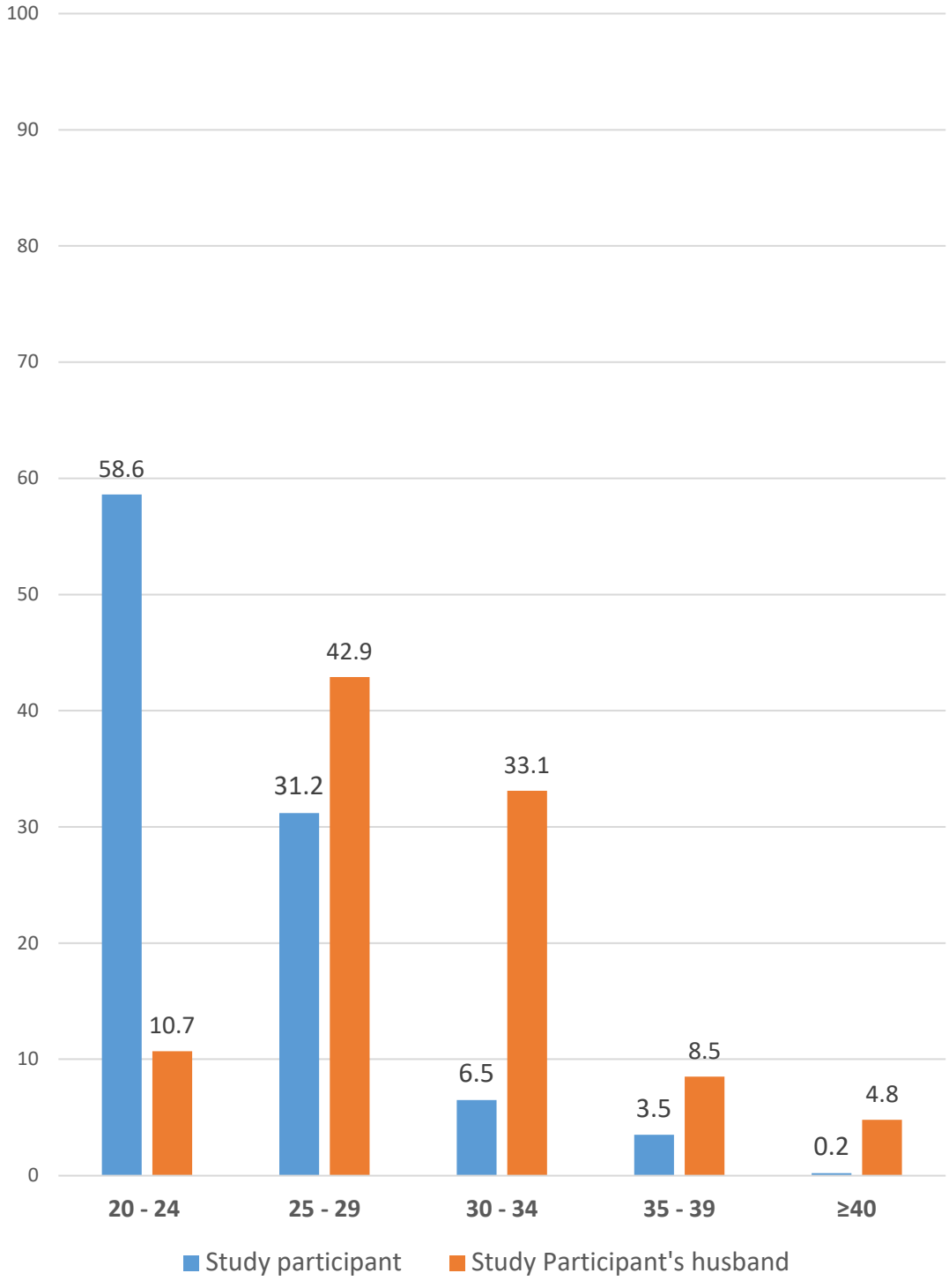


Table 2: Distribution of the study participant according to religion

Religion	Number	Percentage
Hindu	740	87.1
Muslim	108	12.7
Christian	2	0.2
Total	**850**	**100**

Out of the total subject studied, majority 740 (87.1%) followed Hinduism followed by Islam 108 (12.7%) and only 2 (0.2%) participant followed Christianity.

Table 3: Literacy status of the study participant and their husband's

Literacy status	Study Participant		Participant's Husband	
	Number	**Percentage**	**Number**	**Percentage**
Illiterate	141	16.6	143	16.8
Primary	200	23.5	169	19.9
High school	297	34.9	272	32.0
Pre-university course (PUC)	128	15.1	160	18.8
Degree	84	9.9	106	12.5
Total	**850**	**100.0**	**850**	**100**

Literacy status of the study participant and their husband's revealed that 709 (83.4%) and 707 (83.2%) respectively were literates. Among the study participant, 200 (23.5%) had completed primary level of education and 297 (34.9%) had high level school education. PUC was completed by 128 participant (15.1%) and 84 (9.9%) had completed degree. Literacy status of the husband's of the study participant showed that 169 (19.9%) had competed primary level of education and 272 (32.0%) had high level school education. Though the school education status was slightly lower in them, a higher proportion of the participant husband's had completed higher education with 160 (18.8%) who had completed PUC and 106 (12.5%) who had completed degree.

Graph 2 (Table 3): Literacy status of the study participant and their husband's

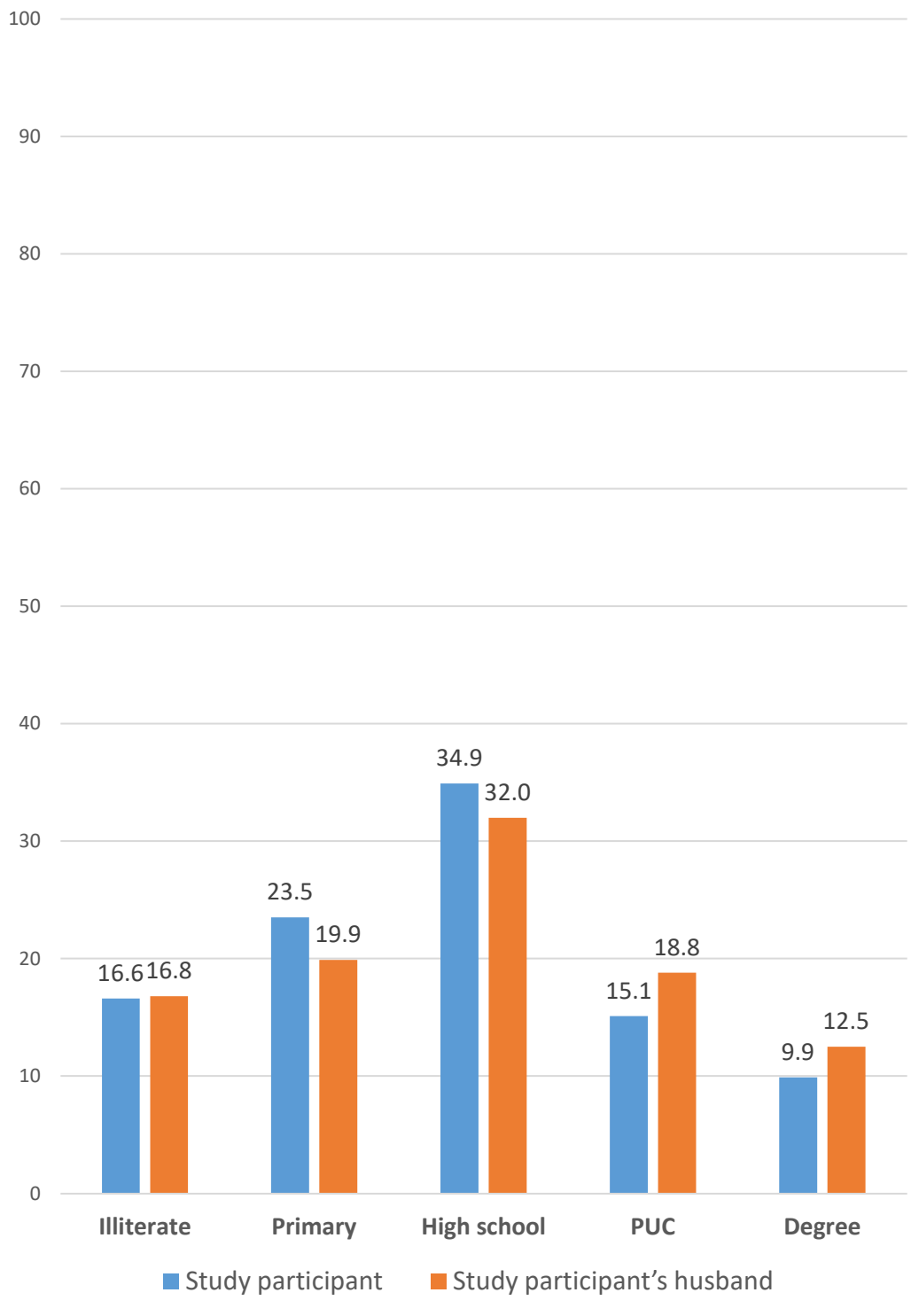


Table 4: Distribution of the study participant according to occupation

Occupation	Number	Percentage
Housewife	698	82.2
Agriculture labourer	97	11.4
Government job	24	2.8
Daily wager	14	1.6
Business	6	0.7
Teacher	6	0.7
Private job	5	0.6
Total	**850**	**100**

Among the study participant, it was observed that majority 698 (82.2%) were homemaker. Among the subject who were employed, 97 (11.4%) were agricultural labourer, 24 (2.8%) were working in a government sector, 14 (1.6%) of them were daily wager, 6 (0.7%) participant each were engaged in business and employed as teacher and the remaining 5 (0.6%) were employed in private sector.

Table 5: Distribution of the study participant's husband according to occupation

Occupation	Number	Percentage
Private job	252	29.7
Agriculture labourer	198	23.3
Daily wager	146	17.2
Driver	81	9.5
Self-employed	62	7.3
Business	49	5.8
Government job	42	4.9
Teacher	13	1.5
Unemployed	7	0.8
Total	**850**	**100**

Occupational status of the study participant husband's showed that, 252 (29.7%) were employed in private sector, followed by 198 (23.3%) who worked as agricultural labourer, 146 (17.2%) who were daily wager, 81 (9.5%) who worked as driver, 62 (7.3%) participants' husbands were self-employed and 42 (4.9%) were government employee. Also 49 (5.8%) were involved in business, 13 of them were teacher (1.5%) and the rest 7 (0.8%) were unemployed.

Table 6: Distribution of the study participant according to the socioeconomic status

Socioeconomic status	Number	Percentage
Class I	19	2.2
Class II	110	12.9
Class III	239	28.1
Class IV	342	40.3
Class V	140	16.5
Total	**850**	**100**

The 850 study subject when classified based on the socioeconomic status, 19 (2.2%) belonged to Class I, 110 (12.9%) to Class II, 239 (28.1%) to Class III, 342 (40.3%) to Class IV and 140 (16.5%) belonged to Class V according to Modified B.G. Prasad's Classification.

Type of family: Among the 850 study participant, majority 630 (74.1%) were living in a joint family and the remaining 220 (25.9%) belonged to nuclear family.

II. MATERNAL CHARACTERISTICS OF THE STUDY PARTICIPANT

Table 7: Distribution of the study participant according to Body Mass Index (BMI)

BMI Category	Number	Percentage
Underweight	191	22.5
Normal	416	48.9
Overweight	205	24.1
Obese	38	4.5
Total	**850**	**100**

Among the study subject, 416 (48.9%) had normal BMI, while 205 (24.1%) were overweight and 191 (22.5%) were underweight. Rest 38 (4.5%) had BMI in the obese range.

Graph 3 (Table 7): Distribution of the study participant according to Body Mass Index

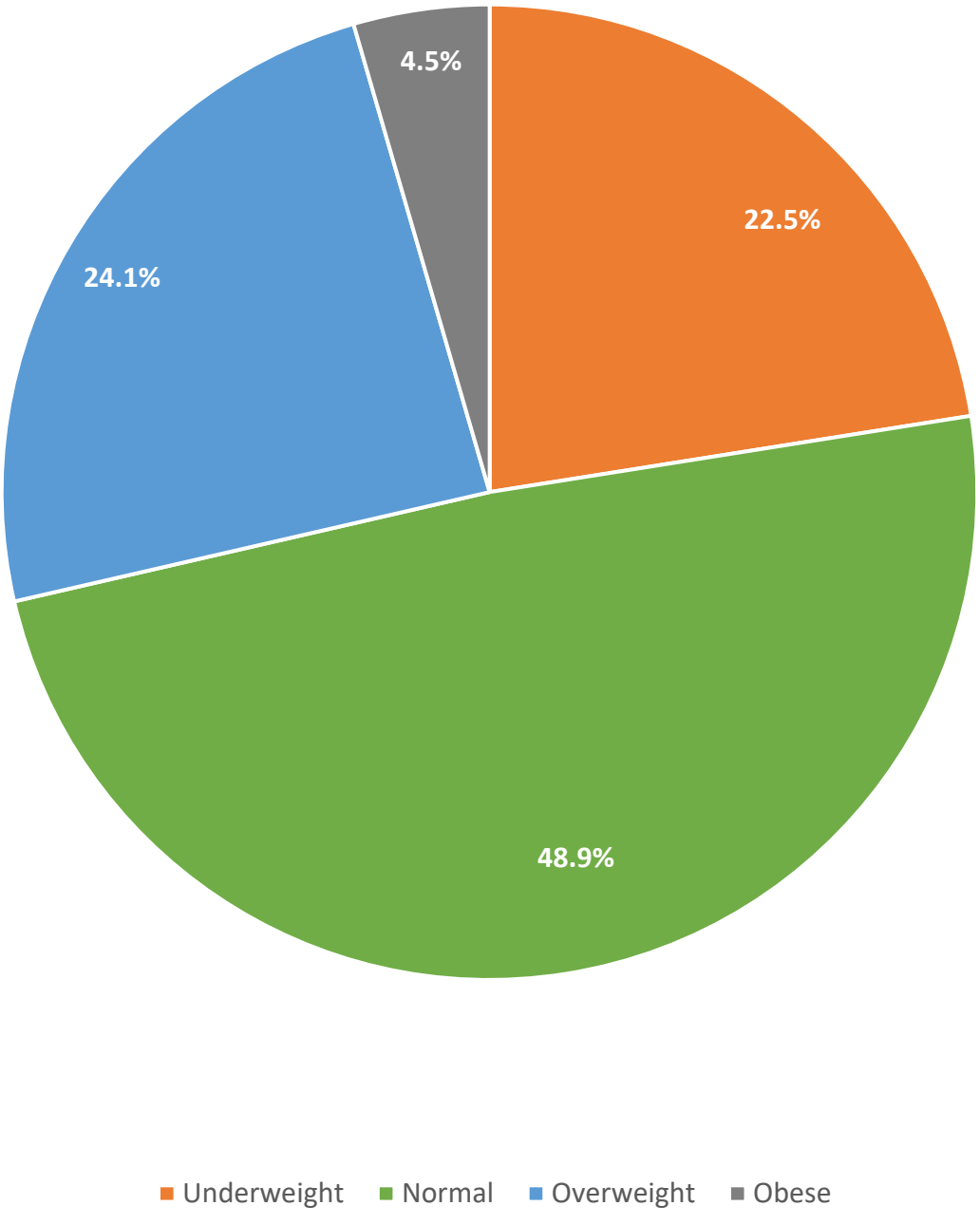


Table 8: Distribution of the study participant according to habit of coffee drinking

Coffee drinking	**Number**	**Percentage**
Yes	74	8.7
No	776	91.3
Total	**850**	**100**
If yes, number of cups consumed per day (n = 74)		
Cups / day	**Number**	**Percentage**
1	33	44.6
2	32	43.2
≥3	9	12.2
Total	**74**	**100**

Among 850 study participant, majority of them 776 (91.3%) had no habit of coffee consumption while the remaining 74 (8.7%) were consuming coffee. Among the 74 coffee consumer, 33 (44.6%) consumed 1 cup of coffee per day, while 32 (43.2%) subject had 2 cups of coffee per day and 9 (12.2%) had 3 or more cups per day.

Tobacco consumption: Among the total study population of 850 subject, 789 (92.9%) were not using tobacco in any form while the remaining 61 (7.1%) had the habit of consuming tobacco. Among the tobacco consumer, majority were consuming betel quid with tobacco 49 (80.3%), 7 (11.5%) consumed gutka and the rest 5 (8.2%) were consuming pan masala with tobacco.

Table 9: Distribution of the study participant according to domestic violence

Domestic violence	**Number**	**Percentage**
Present	62	7.3
Absent	788	92.7
Total	**850**	**100**
If yes, the assailant is (n = 62)		
Assailant	**Number**	**Percentage**
Husband	25	40.4
Mother-in-law	14	22.6
Sister-in-law	3	4.8
Brother-in-law	2	3.2
Husband & Mother-in-law	10	16.1
Mother-in-law & Sister-in-law	5	8.1
Mother-in-law & Brother-in-law	3	4.8
Total	**62**	**100**

Among the 850 subject, 788 (92.7%) were never subjected to domestic violence, while the remaining 62 (7.3%) experienced atleast one episode of domestic violence during their lifetime. Out of those 62 women who experienced domestic violence, 44 (71.0%) had single assailant while the remaining 18 (29.0%) had >1 assailant. Husband of the study participant was the major assailant of domestic violence in 25 (40.4%) study participant, followed by mother-in-law of the study participant in 14 (22.6%). In 10 (16.1%) subject it was both the husband and the mother-in-law, while in 5 (8.1%) study subject the assailant were both mother-in-law and sister-in-law and in 3 (4.8%) subject it was by both mother-in-law and brother-in-law. The sister-in-law and brother-in-law were the assailant in the remaining 3 (4.8%) and 2 (3.2%) study subject respectively. In none of the 62 victim, the assailant was the father-in-law.

III. OBSTETRIC PROFILE OF THE STUDY PARTICIPANT

Table 10: Distribution of the study participant according to age at marriage

Age at marriage (in years)	Number	Percentage
≤17	174	20.5
18 – 29	669	78.7
≥30	7	0.8
Total	**850**	**100**

In India, the legal age for marriage in woman is 18 years, inspite of this, 174 (20.5%) of our study population were married before the legal age. Nearly three-fourth 669 (78.7%) women were married between 18 – 29 years of age and remaining 7 (0.8%) were married after 30 years of age.

Table 11: Distribution of the study participant according to age at first pregnancy

Age at first pregnancy (in years)	Number	Percentage
<20	340	40.0
20 – 29	497	58.5
≥30	13	1.5
Total	**850**	**100**

Out of the 850 study participant, 497 (58.5%) had their first pregnancy between 20 to 29 years, whereas (340) 40.0% had a teenage pregnancy (<20years) and 13 (1.5%) were pregnant for the first time on or after 30 years of age.

Table 12: Distribution of the study participant according to duration of married life

Duration of married life (in years)	Number	Percentage
≤ 5	541	63.6
6 – 10	243	28.6
11 – 15	43	5.1
>15	23	2.7
Total	**850**	**100**

Among the population under study, 541 (63.6%) were married for ≤ 5 years of duration, 243 (28.6%) had a duration of 6 – 10 years of married life while 43 (5.1%) were married for 11 – 15 years and the remaining 23 (2.7%) had a duration of ≥ 15 years of marital life.

Table 13: Distribution of the study participant according to consanguinity

Consanguinity	**Number**	**Percentage**
Present	162	19.1
Absent	688	80.9
Total	**850**	**100**
If present, (n = 162)		
Pre-marital relation of the husband	**Number**	**Percentage**
Maternal Uncle	30	18.5
First cousin	107	66.1
Distant relative	25	15.4
Total	**162**	**100**

Out of the study population, 688 (80.9%) had a non-consanguineous marriage, while the rest 162 (19.1%) had a consanguineous marriage. Among the 162 consanguineous couple, 107 (66.1%) were related on first cousin basis, while 30 (18.5%) women married their maternal uncle and 25 (15.4%) couple were distantly related before marriage.

Table 14: Distribution of the study participant according to parity

Parity	Number	Percentage
0	62	7.3
1	478	56.3
2	223	26.2
3	64	7.5
4	14	1.6
≥ 5	9	1.1
Total	**850**	**100**

Among the study participant, 478 (56.3%) were para 1, 223 (26.2%) were para 2 and 64 (7.5%) were para 3. While 62 (7.3%) were non-parous, 14 (1.6%) were para 4 and the remaining 9 (1.1%) were para 5 or more. Thus, more than half (56.3%) were primiparous & 36.4% were multiparous.

Table 15: Distribution of the study participant according to the number of living children

Number of living children	Number	Percentage
Nil	69	8.1
1	489	57.5
2	215	25.3
≥ 3	77	9.1
Total	**850**	**100.0**

Out of the 850 subject studied, 489 (57.5%) had 1 living child, 215 (25.3%) had 2 living children and 77 (9.1%) had 3 or more living children. The rest 69 (8.1%) had no living children.

Table 16: Distribution of participant according to pregnancy order

Pregnancy order	Number	Percentage
1	474	55.8
2	250	29.4
3	90	10.6
≥4	36	4.2
Total	**850**	**100**

Out of 850 study participant, 474 (55.8%) had first pregnancy order, 250 (29.4%) had second pregnancy order, 90 (10.6%) had third pregnancy order and 36 (4.2%) had four or more pregnancy order.

IV. PROFILE OF ABORTION OF THE STUDY PARTICIPANT

Table 17: Prevalence of abortion

Abortion	**Number**	**Percentage**
Yes	191	22.5
No	659	77.5
Total	**850**	**100**
If yes, number of abortion (n = 191)		
Number of abortion	**Number**	**Percentage**
1	142	16.7
2	32	3.8
≥ 3	17	2.0
Total	**191**	**22.5**

The prevalence rate of abortion in our study was 22.5%. Among those who had abortion, 142 (16.7%) had 1 abortion and 32 (3.8%) had 2 abortion and 17 (2.0%) had 3 or more abortion. Among women (n = 17) who had recurrent pregnancy loss, 12 (1.4%) had 3 abortion and the remaining 5 (0.6%) had 4 abortion. Thus, the recurrent pregnancy loss rate was 2.0%. Out of 191 ever-aborted women, in our study we had 262 abortion events. The mean abortion events per woman in our study was 1.4.

Graph 4 (Table 17): Abortion profile of the study participant

Table 18: Distribution of the study participant according to period of gestation during abortion

Period of Gestation (in weeks)	Number	Percentage
≤4	7	2.7
5 – 8	98	37.4
9 – 12	98	37.4
13 – 16	51	19.5
17 – 20	8	3.0
Total	**262**	**100**

Out of 191 ever-aborted women, in our study we had 262 abortion events. Among them 203 (77.5%) of the abortion occurred during the first trimester of pregnancy and 59 (22.5%) occurred in the second trimester of pregnancy. Majority 196 (74.8%) of abortion which occurred in the first trimester of pregnancy were between 5 – 12 weeks, whereas most 51 (19.5%) of the abortion which occurred in the 2nd trimester of pregnancy were between 13 – 16 weeks. On further analysis, it was noted that 24 (9.2%) abortion were pre-embryonic loss (Gestational Age (GA) ≤ 5 weeks), 96 (36.6%) were embryonic loss (GA 6 – 9 weeks) and 142 (54.2%) were foetal loss (GA 10 – 20 weeks).

Table 19: Distribution of the study participant according to pregnancy confirmation status

Pregnancy confirmation Status	**Number**	**Percentage**
Confirmed	257	98.1
Not confirmed	5	1.9
Total	**262**	**100**
If confirmed, method (n = 257)		
Pregnancy confirmation method	**Number**	**Percentage**
Both UPT & USG	230	87.8
Ultrasonography (USG)	18	6.9
Urine Pregnancy Test (UPT)	9	3.4
Total	**257**	**98.1**

Pregnancy status was confirmed in 257 (98.1%) of the pregnancy that ended in abortion (n = 262). Majority 230 (87.8%) of the pregnancy were confirmed by both UPT and USG, while in 18 (6.9%) it was by USG alone and in the remaining 9 (3.4%) it was by UPT alone. All the non-confirmed (n = 5) pregnancy that ended in abortion were pre-embryonic loss (GA ≤ 5 weeks).

Table 20: Distribution of the study participant according to type of abortion

Type of Abortion	**Number**	**Percentage**
Spontaneous	210	80.1
Induced	52	19.9
Total	**262**	**100**
If induced, (n = 52)		
Type of induced abortion	**Number**	**Percentage**
Medical	29	11.1
Surgical	23	8.8
Total	52	**19.9**

Among the 262 abortion events in our study population, 210 (80.1%) were spontaneous, whereas the remaining 52 (19.9%) were induced abortion. Out the 52 induced abortion, 29 (11.1%) were medically induced, while the rest 23 (8.8%) were induced by surgical method.

Table 21: Distribution of the study participant according to place of abortion

Place of abortion	Number	Percentage
Home	209	79.8
Private Hospital	37	14.1
Government Hospital	16	6.1
Total	**262**	**100**

Out of 262 abortion events, for majority 209 (79.8%) of them the place of abortion was home, followed by 37 (14.1%) in a private hospital and the rest 16 (6.1%) in a government hospital. On further analysis, it was noted that out of 210 spontaneous abortion events, for 202 (96.2%) home was the place of abortion, 6 (2.9%) it was private hospital and for 2 (0.9%) it was government hospital, whereas for 14 (48.3%) of induced medical abortion private hospital was the place of abortion, followed by government hospital 8 (27.6%) and for the remaining 7 (24.1%) home was the place of abortion. For all the induced surgical abortion, the place of abortion was hospital either private (17, 73.9%) or government (6, 26.1%).

Table 22: Distribution of study participant according to person conducting / aiding during abortion

Person conducting / aiding during abortion	Number	Percentage
Family member	209	79.8
Physician	47	17.9
Nurse / Health worker female	6	2.3
Total	**262**	**100**

In the study population, out of the 262 abortion events, majority 209 (79.8%) of women were aided by family member at the time of abortion. Physician conducted 47 (17.9%) of the abortion events, while in 6 (2.3%) it was by nurse or health worker female placed at the primary health centre or sub-centre.

Table 23: Distribution of study participant according to complication following abortion

Complication	**Number**	**Percentage**
Yes	38	14.5
No	224	85.5
Total	**262**	**100**
If yes, (n = 38)		
Complication	**Number**	**Percentage**
Incomplete abortion	18	47.3
Excessive Bleeding	16	42.1
Infection	2	5.3
Life threatening complication	2	5.3
Total	**38**	**100**

Out of 262 abortion event in our study population, 38 (14.5%) abortion ended up in a complication, while the remaining 224 (85.5%) abortion events were not followed by any complication. Out of the abortion events that ended up in a complication (n = 38), in almost half 18 (47.3%) of them incomplete abortion was the complication, closely followed by excessive bleeding in 16 (42.1%). In 2 (5.3%) events, complication was infection, while in remaining 2 (5.3%) it was life threatening complication i.e., hypovolemic shock in one and uterine laceration in another.

V. ASSOCIATION BETWEEN VARIABLES AND PREVALENCE OF ABORTION

TABLE 24: Association between age of the study participant and prevalence of abortion

Age (in years)	Ever-aborted					
	Yes		No		Total	
	No	%	No	%	No	%
20 – 24	104	20.9	394	79.1	**498**	**100**
25 – 29	48	18.1	217	81.9	**265**	**100**
30 – 34	21	38.2	34	61.8	**55**	**100**
35 – 40	18	56.3	14	43.7	**32**	**100**
Total	**191**	**22.5**	**659**	**77.5**	**850**	**100**
$\chi 2 = 32.36$		**df = 3**		**p < 0.00001**		

Among the study participant, prevalence of abortion was highest (56.3%) in the age group of 35 – 40 years, followed by 38.2% in the age group of 30 – 34 years. The least (18.1%) prevalence rate of abortion was noted in the age group of 25 – 29 years and in 20 – 24 years the prevalence rate of abortion was 20.9%. This difference was statistically significant ($p<0.00001$). The rate of abortion doubled at the age of 30 to 34 years and again nearly doubled in the age group of 35 to 40 years. As the age of the study subject increased, the prevalence rate of abortion also increased.

Graph 5 (TABLE 24): Association between age of the study participant and prevalence of abortion

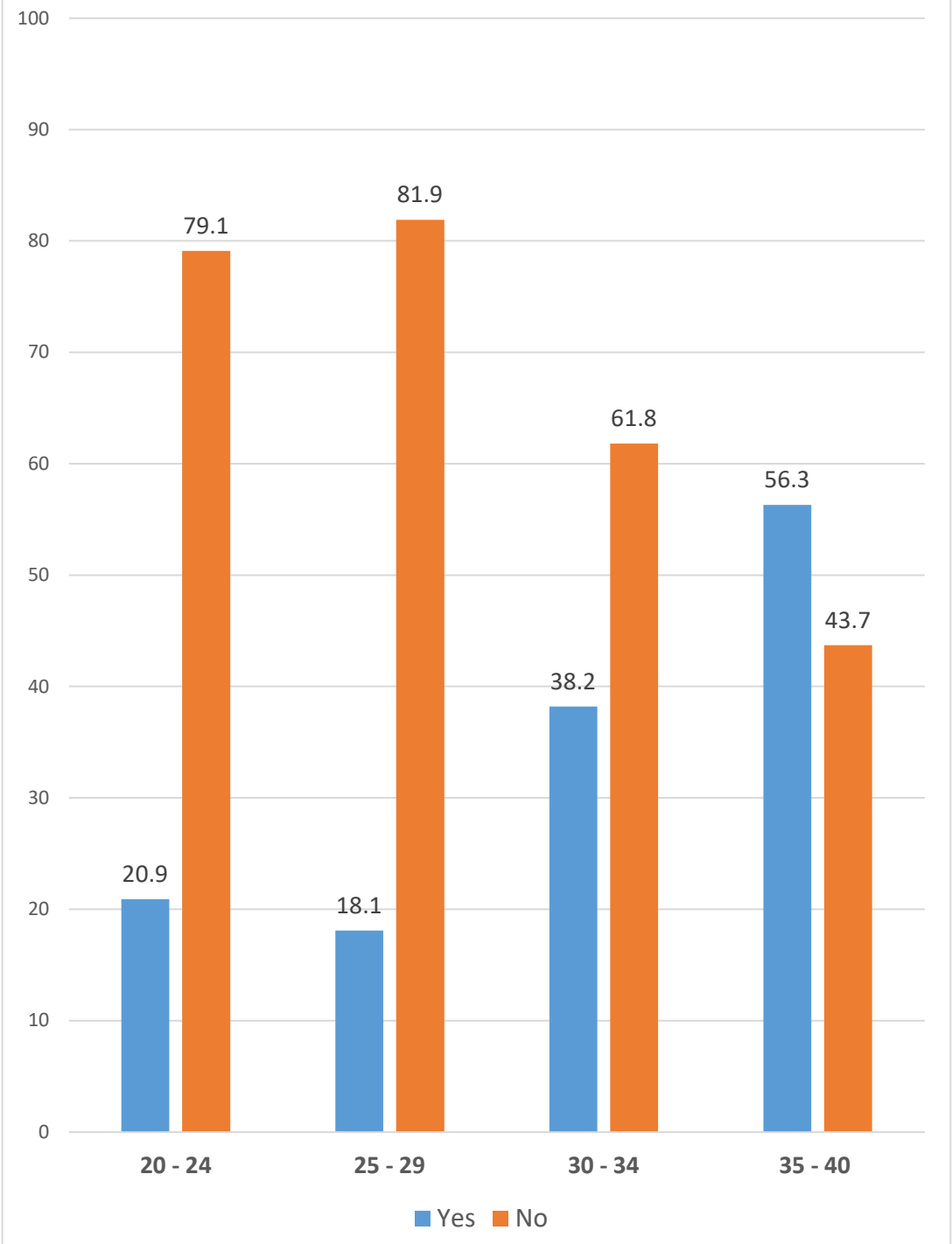


TABLE 25: Association between age of study participant's husband and prevalence of abortion

Age (in years)	Abortion					
	Yes		No		Total	
	No	%	No	%	No	%
20 – 24	18	19.8	73	80.2	**91**	**100**
25 – 29	60	16.4	305	83.6	**365**	**100**
30 – 34	72	25.6	209	74.4	**281**	**100**
35 – 39	19	26.4	53	73.6	**72**	**100**
≥40	22	53.7	19	46.3	**41**	**100**
Total	**191**	**22.5**	**659**	**77.5**	**850**	**100**
$\chi 2 = 33.13$		**df = 4**		**p < 0.00001**		

In this study, the prevalence rate of abortion was least (16.4%) for the study participant whose husband were in the age group of 25 to 29 years, followed by 19.8% in the age group of 20 – 24 years. The prevalence rate of abortion started gradually increasing from 25.6% in the age group of 30 to 34 years and reached rate of 53.7% in women whose husband were aged 40 years or more. This difference was statistically significant ($p<0.00001$). Compared to the study participant's age distribution, the prevalence rate of abortion doubled when the husband's age was 40 years or more.

Graph 6 (TABLE 25): Association between age of study participant's husband and prevalence of abortion

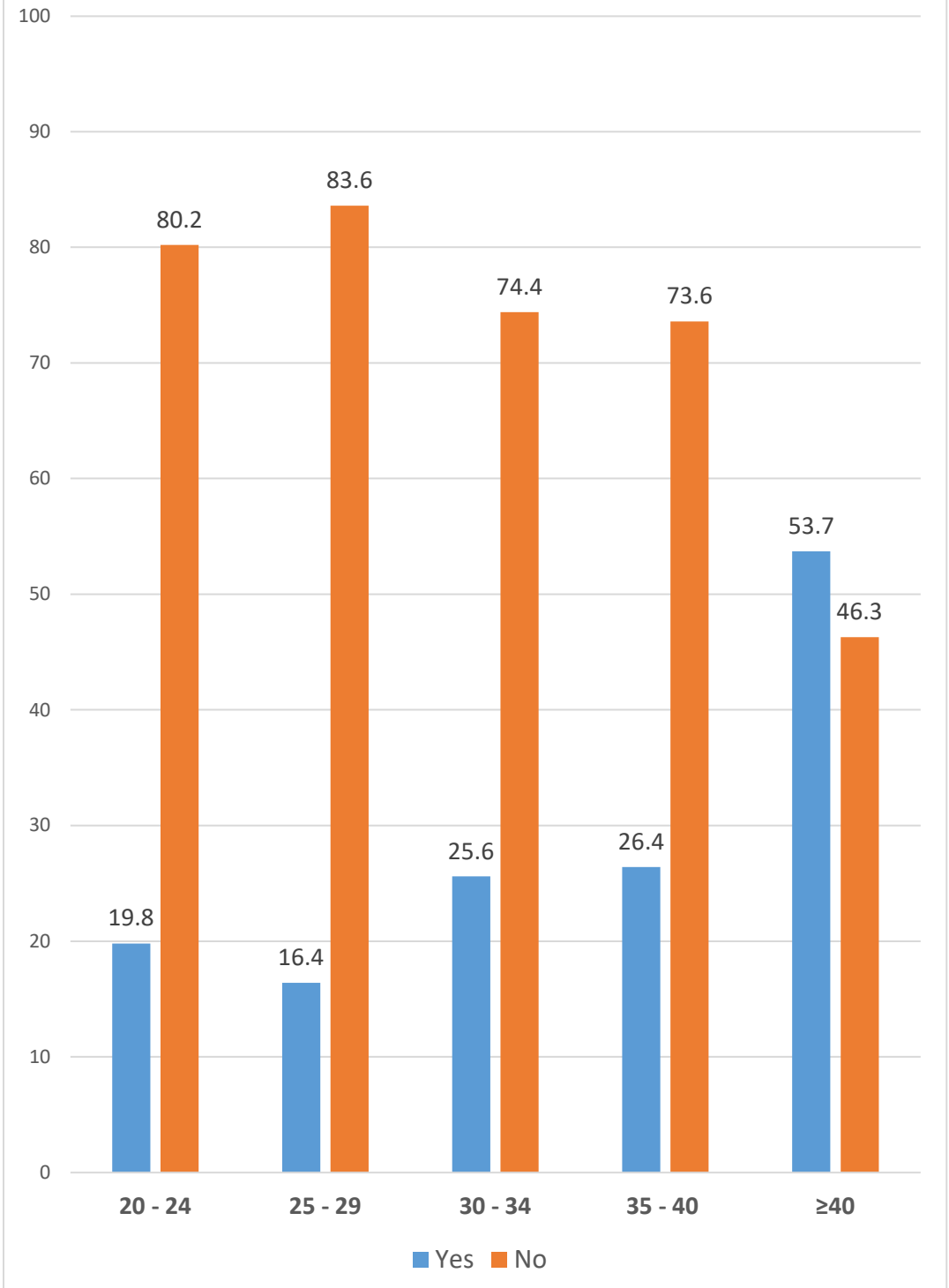


Table 26: Association between religion of the study participant and prevalence of abortion

Religion	Ever-aborted					
	Yes		No		Total	
	No	%	No	%	No	%
Hindus	151	20.4	589	79.6	**740**	**100**
Non-Hindus	40	36.4	70	63.6	**110**	**100**
Total	**191**	**22.5**	**659**	**77.5**	**850**	**100**
$\chi 2 = 14.0$		**df = 2**		**p = 0.0001**		

In this study, out of 740 study participant who followed Hindu religion the prevalence rate of abortion was 20.4%, whereas in women who followed Islam and Christianity religion the prevalence was 36.4%. And this difference was statistically significant (p = 0.0001).

Graph 7 (TABLE 26): Association between religion of the study participant and prevalence of abortion

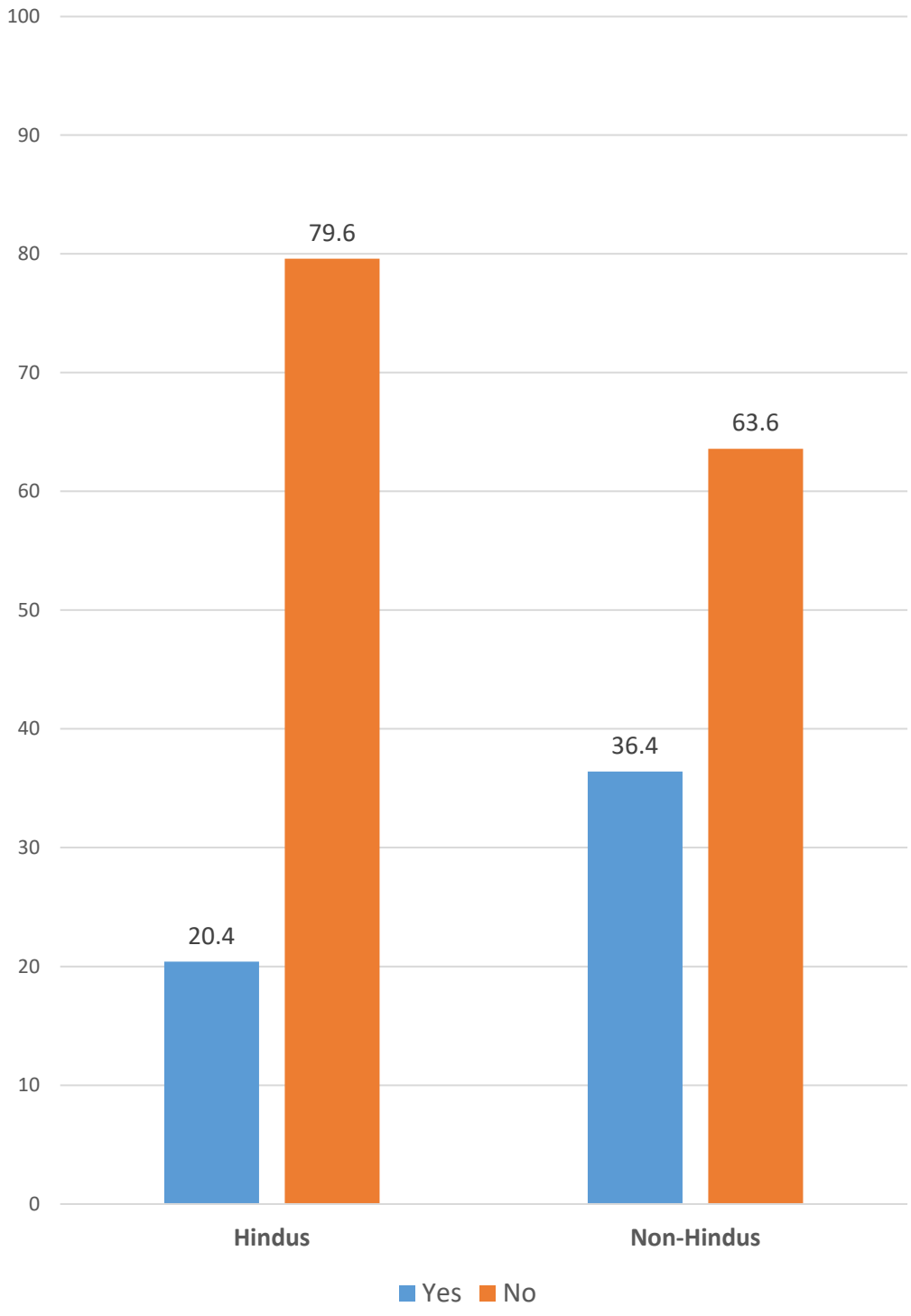


Table 27: Association between literacy status of the study participant and prevalence of abortion

Literacy status	Ever-aborted					
	Yes		No		Total	
	No	%	No	%	No	%
Illiterate	37	26.2	104	73.8	**141**	**100**
Primary school	47	23.5	153	76.5	**200**	**100**
High school	52	17.5	245	82.5	**297**	**100**
Pre-university course (PUC)	27	21.1	101	78.9	**128**	**100**
Degree	28	33.3	56	66.7	**84**	**100**
Total	**191**	**22.5**	**659**	**77.5**	**850**	**100**
$\chi 2 = 11.30$		**df = 4**		**p = 0.02**		

Among the study participant in this study, highest prevalence 28 (33.3%) of abortion was seen in degree holder, followed by 26.2% in illiterate women. Prevalence of abortion among study participant who completed primary school and pre-university course are 23.5% and 21.1% respectively. Prevalence of abortion was least 17.5% in study participant who completed high school education. This difference was statistically significant (p = 0.02). Prevalence of abortion was high in both illiterates and degree holders.

Graph 8 (Table 27): Association between literacy status of the study participant and prevalence of abortion

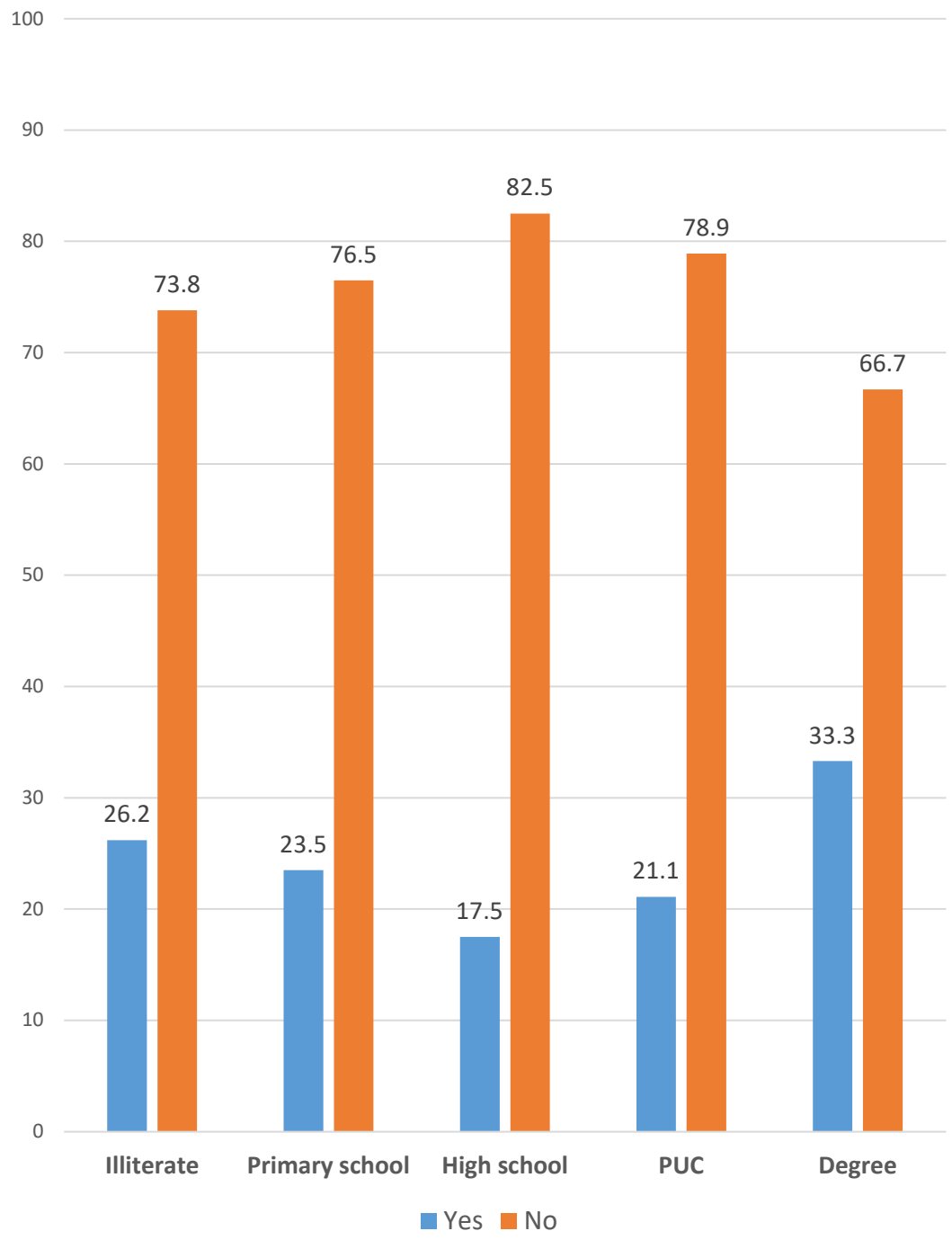


Table 28: Association between literacy status of the study participant husband's and prevalence of abortion

Literacy status of the study participant husband's	Abortion					
	Yes		No		Total	
	No	%	No	%	No	%
Illiterate	28	19.6	115	80.4	**143**	**100**
Primary	28	16.6	141	83.4	**169**	**100**
High school	71	26.1	201	73.9	**272**	**100**
Pre-university course (PUC)	37	23.1	123	76.9	**160**	**100**
Degree	27	25.5	79	74.5	**106**	**100**
Total	**191**	**22.5**	**659**	**77.5**	**850**	**100**
$\chi 2 = 6.71$			**df = 4**		**p = 0.15**	

Regarding association between literacy status of the study participant husband's and prevalence rate of abortion, it was noted that those who had education equal to or more than high school level of education had higher chance of pregnancy loss, when compared to those who were illiterate or had primary level of education. Though there was a difference in the prevalence rate of abortion, it was not statistically significant.

Table 29: Association between occupation of the study participant and prevalence of abortion

Occupation	Ever-aborted					
	Yes		No		Total	
	No	%	No	%	No	%
Housewife	158	22.6	540	77.4	**698**	**100**
Employed	33	21.7	119	78.3	**152**	**100**
Total	**191**	**22.5**	**659**	**77.5**	**850**	**100**
$\chi 2 = 0.06$		**df = 1**		**p = 0.80**		

In this study, the prevalence rate of abortion was almost similar in women irrespective of their employment status. There was no association found between occupation of the study participant and prevalence rate of abortion.

Table 30: Association between socioeconomic status of the study participant and prevalence of abortion

Socioeconomic status	Ever-aborted					
	Yes		No		Total	
	No	%	No	%	No	%
Class I	8	42.1	11	57.9	**19**	**100**
Class II	41	37.3	69	62.7	**110**	**100**
Class III	68	28.5	171	71.5	**239**	**100**
Class IV	48	14.0	294	86.0	**342**	**100**
Class V	26	18.6	114	81.4	**140**	**100**
Total	**191**	**22.5**	**659**	**77.5**	**850**	**100**
$\chi 2 = 38.14$		**df = 4**		**p<0.00001**		

In this study, prevalence rate of abortion was highest (42.1%) for the study participant belonging in socioeconomic status (SES) class I and gradually decreased with decrease in SES. Prevalence rate of abortion was 37.3% in SES class II, 28.5% in class III and 14.0% in class IV. Prevalence rate of abortion slightly increased in study participant belonging to socio-economic class V (18.6%). This difference was statistically significant ($p<0.00001$). The prevalence rate of abortion was directly related to socio-economic status of the study participant, as the SES class increased the prevalence rate of abortion also increased.

Graph 9 (Table 30): Association between socioeconomic status of the study participant and prevalence of abortion

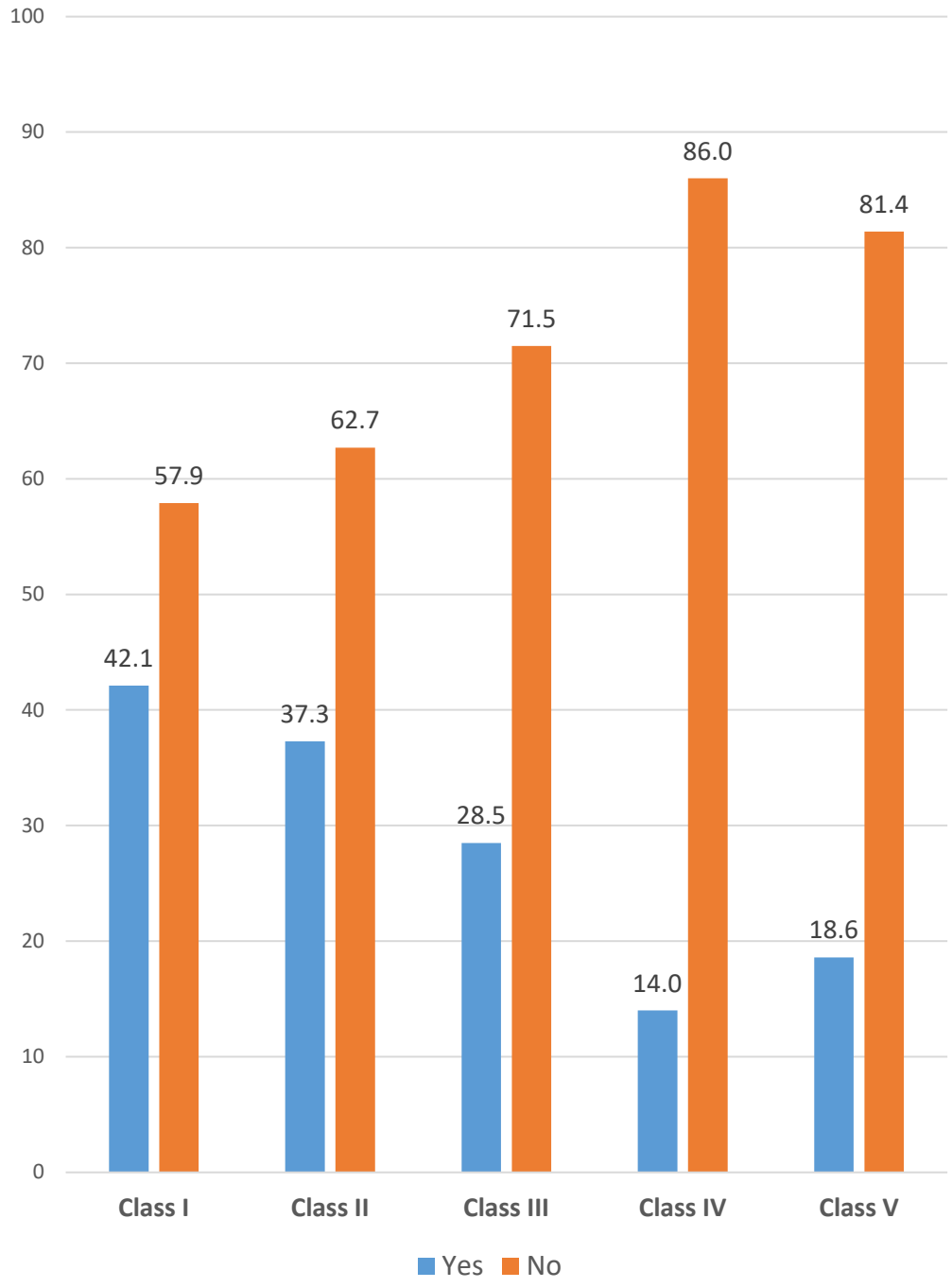


Table 31: Association between type of family of the study participant and prevalence of abortion

Type of family	Ever-aborted					
	Yes		No		Total	
	No	%	No	%	No	%
Joint	144	22.9	486	77.1	**630**	**100**
Nuclear	47	21.4	173	78.6	**220**	**100**
Total	**191**	**22.5**	**659**	**77.5**	**850**	**100**
$\chi 2 = 0.21$			**df = 1**		**p = 0.65**	

In this study, the prevalence rate of abortion was almost similar (22.9% v/s 21.4%) in study participant irrespective of the type of family. No association was found between the type of family of the study participant and prevalence of abortion.

Table 32: Association between body mass index of the study participant and prevalence of abortion

BMI Category of study participant's	Ever-aborted					
	Yes		No		Total	
	No	%	No	%	No	%
Underweight	67	35.1	124	64.9	**191**	**100**
Normal	64	15.4	352	84.6	**416**	**100**
Overweight	48	23.4	157	76.6	**205**	**100**
Obese	12	31.6	26	68.4	**38**	**100**
Total	**191**	**22.5**	**659**	**77.5**	**850**	**100**
$\chi 2 = 31.33$		**df = 3**		**p<0.00001**		

In this study, 35.1% of abortion were seen in the study participant who were underweight, followed by 31.6% in women who were obese and the least (15.4%) was seen in study participant who had their BMI in the normal range. Prevalence rate of abortion was 23.4% in study participant who were overweight. This difference was statistically significant ($p<0.00001$). The prevalence rate of abortion was higher in women who were underweight or obese.

Graph 10 (Table 32): Association between body mass index of the study participant and prevalence of abortion

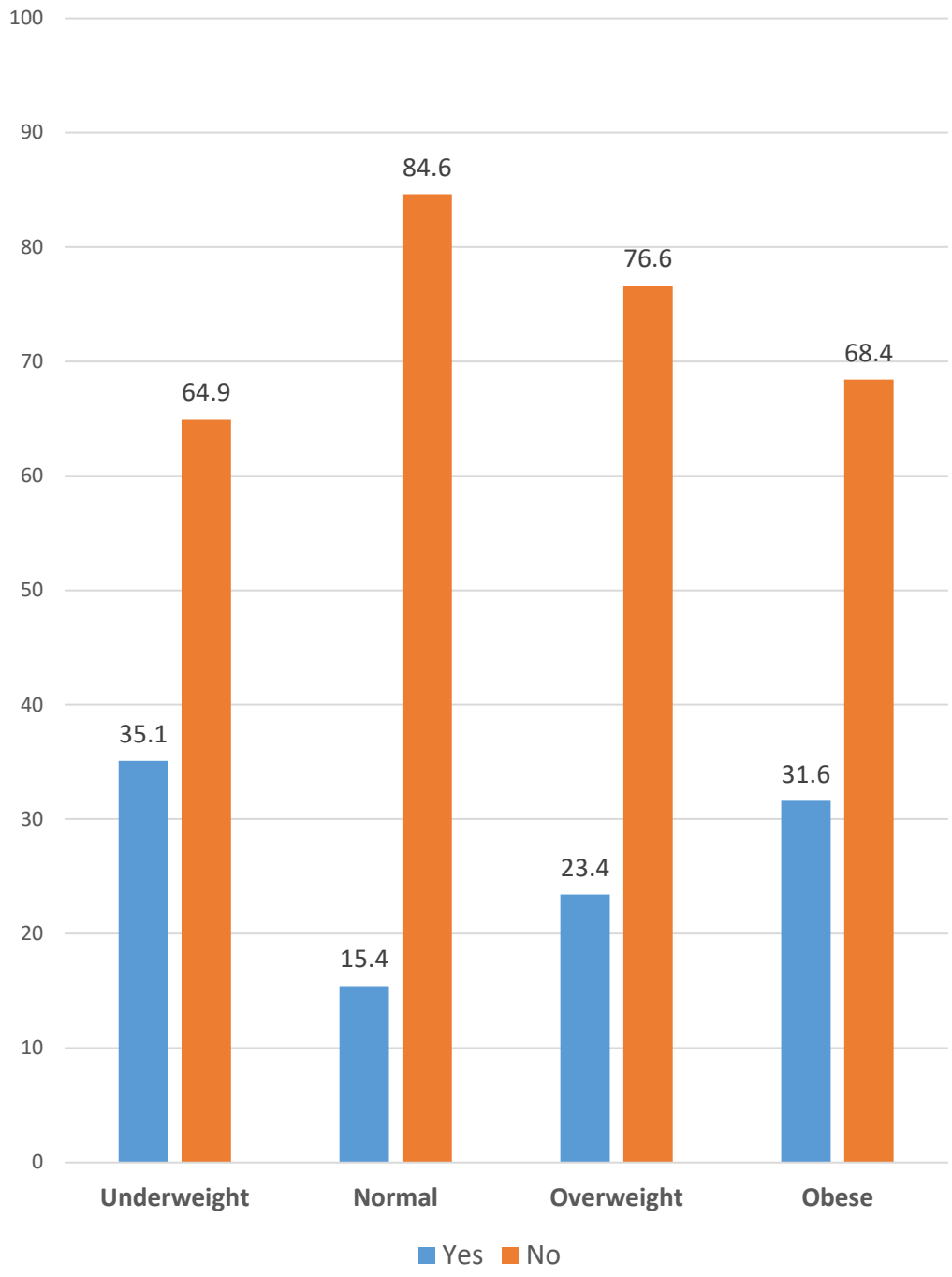


Table 33: Association between coffee consumption in study participant and prevalence of abortion

Coffee consumption	Ever-aborted					
	Yes		No		Total	
	No	%	No	%	No	%
Yes	16	21.6	58	78.4	**74**	**100**
No	175	22.6	601	77.4	**776**	**100**
Total	**191**	**22.5**	**659**	**77.5**	**850**	**100**
$\chi 2 = 0.03$		**df = 1**		**p = 0.85**		

In this study, prevalence rate of abortion rate was almost similar (21.6% v/s 22.6%) in coffee consumer and non-consumer. No association was found between coffee consumption and prevalence rate of abortion among the study participant.

Table 34: Association between habit of tobacco consumption in study participant and prevalence of abortion

Tobacco consumption	Ever-aborted					
	Yes		No		Total	
	No	%	No	%	No	%
Yes	20	32.8	41	67.2	**61**	**100**
No	171	21.7	618	78.3	**789**	**100**
Total	**191**	**22.5**	**659**	**77.5**	**850**	**100**
$\chi 2 = 4.01$ df = 1 p = 0.04						

In this study, prevalence rate of abortion was higher (32.8%) in study participant who consumed tobacco compared to 21.7% in study participant who didn't consume tobacco and this difference was statistically significant (p = 0.04).

Graph 11 (Table 34): Association between habit of tobacco consumption in study participant and prevalence of abortion

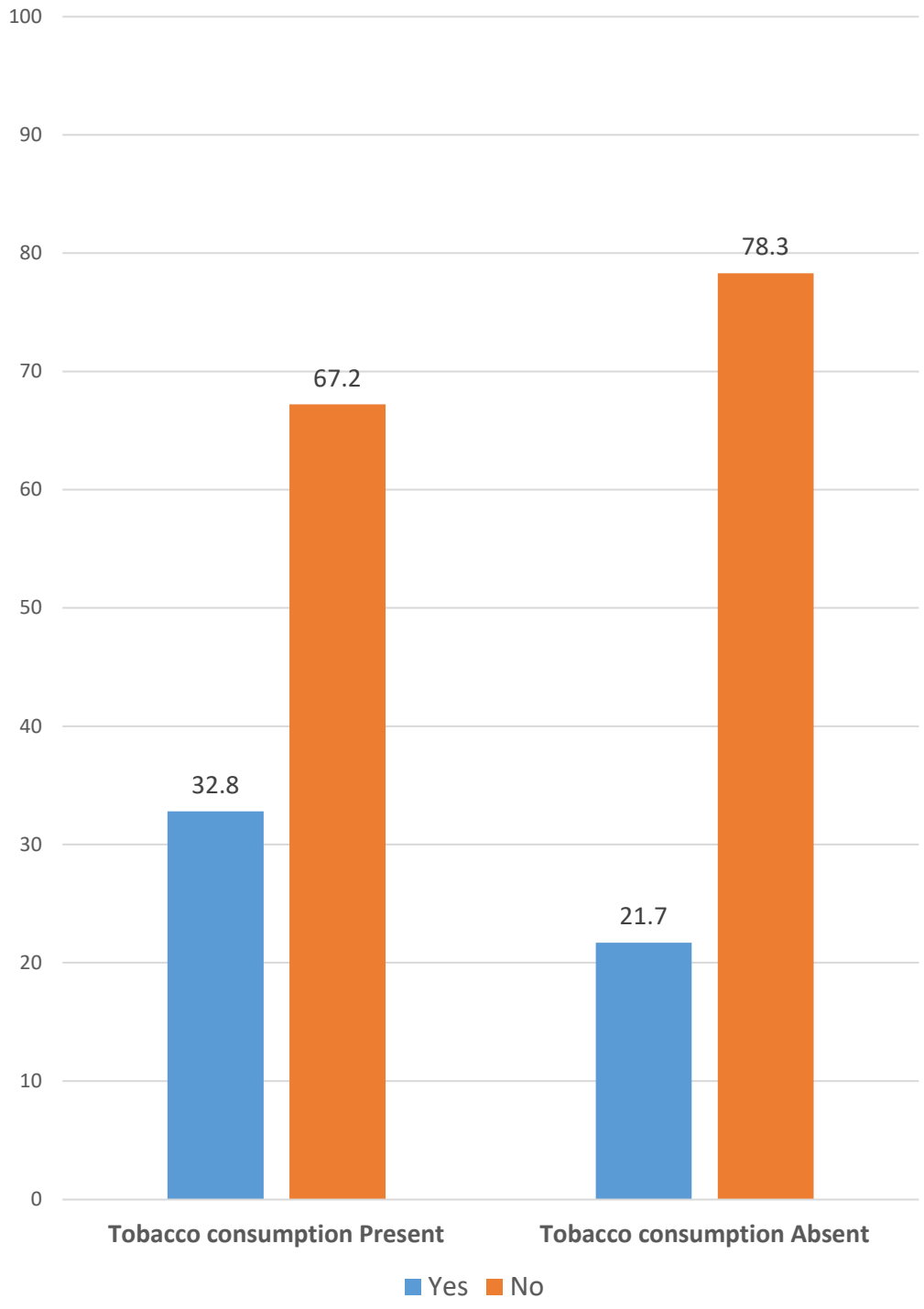


Table 35: Association between history of domestic violence in study participant and prevalence of abortion

Domestic violence	Ever-aborted					
	Yes		No		Total	
	No	%	No	%	No	%
Yes	25	40.3	37	59.7	**62**	**100**
No	166	21.1	622	78.9	**788**	**100**
Total	**191**	**22.5**	**659**	**77.5**	**850**	**100**
Total	**$\chi 2 = 12.23$**		**df = 1**		**p = 0.0005**	

In this study, prevalence of abortion was higher (40.3%) in study participant who experienced domestic violence compared to 21.1% in study participant who didn't experience domestic violence in their lifetime and this difference was statistically significant (p = 0.0005).

Graph 12 (Table 35): Association between history of domestic violence in study participant and prevalence of abortion

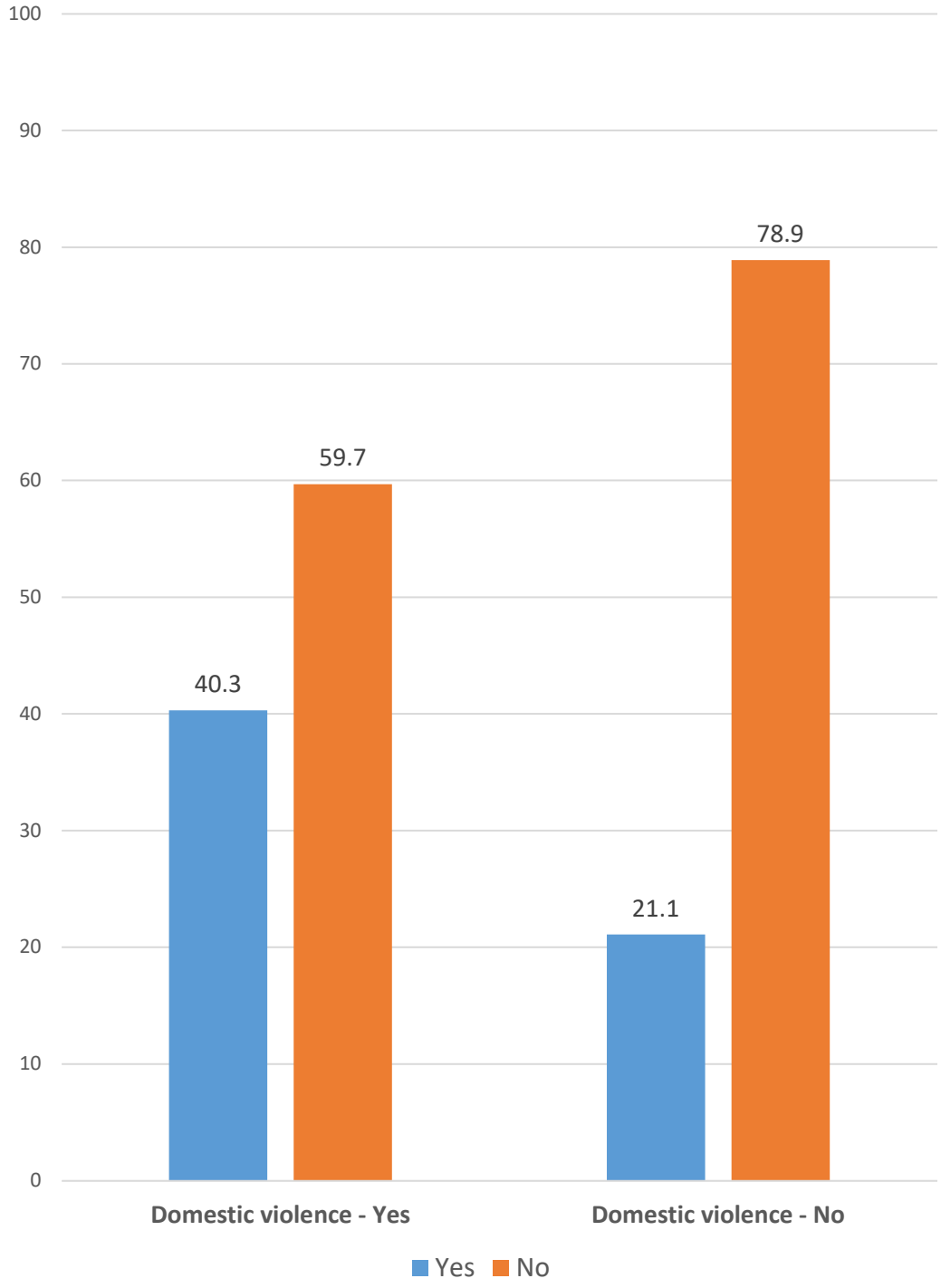


Table 36: Association between study participant's age at marriage and prevalence of abortion

Age at marriage (in years)	Ever-aborted					
	Yes		No		Total	
	No	%	No	%	No	%
≤17	74	42.5	100	57.5	**174**	**100**
18 – 29	113	16.9	556	83.1	**669**	**100**
≥30	4	57.1	3	42.9	**7**	**100**
Total	**191**	**22.5**	**659**	**77..5**	**850**	**100**
$\chi 2 = 56.97$ df = 2 p<0.00001						

In this study, prevalence of abortion was highest (57.1%) in study participant who married at the age of ≥ 30 years, followed by 42.5% in study participant who married at ≤ 17 years and the least 16.9% was seen in study participant who married at age 18 – 29 years. These differences were statistically significant ($p<0.00001$). Prevalence rate of abortion was higher in women who married before the legal age of marriage or who had a late marriage i.e., 30 years or more.

Graph 13 (Table 36): Table 10: Association between study participant's age at marriage and prevalence of abortion

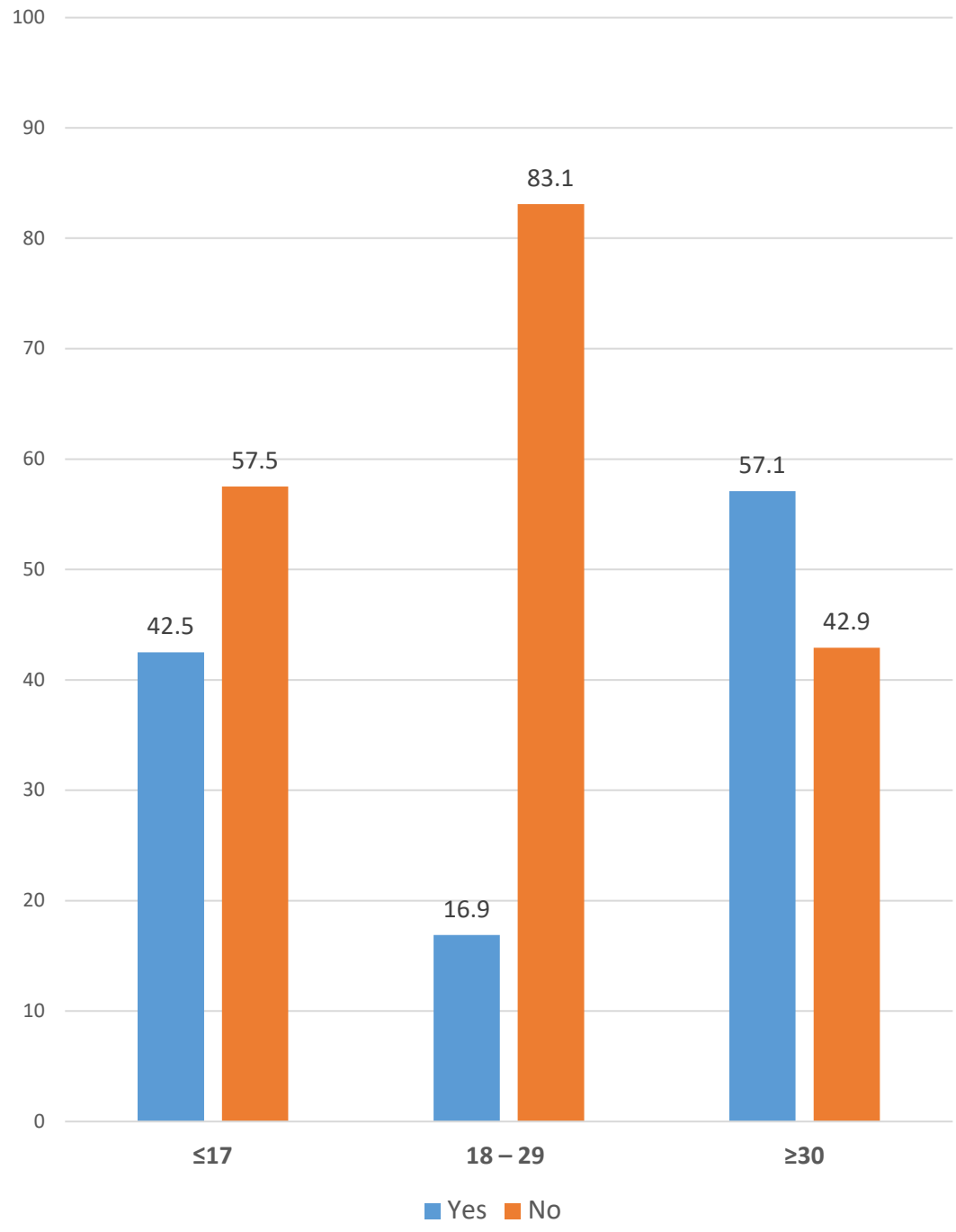


Table 37: Association between study participant's age at first pregnancy and prevalence of abortion

Age at first pregnancy (in years)	Ever-aborted					
	Yes		No		Total	
	No	%	No	%	No	%
≤20	140	27.2	375	72.8	**515**	**100**
21 – 29	45	14.0	277	86.0	**322**	**100**
≥30	6	46.2	7	53.8	**13**	**100**
Total	**191**	**22.5**	**659**	**77..5**	**850**	**100**
$\chi 2 = 23.65$ df = 2 p<0.00001						

In this study, prevalence of abortion was highest (46.2%) in study participant who had their first pregnancy at age ≥30 years, followed by 27.2% in study participant who first conceived at the age of ≤20 years and the least (14.0%) in study participant who were pregnant for the first time in the age group of 21 – 29 years. This difference was statistically significant (p<0.00001). The prevalence rate of abortion almost doubled when the women had their first pregnancy at the age of 30 years or more when compared to women who were aged 20 years or less.

Graph 14 (Table 37): Association between study participant's age at first pregnancy and prevalence of abortion

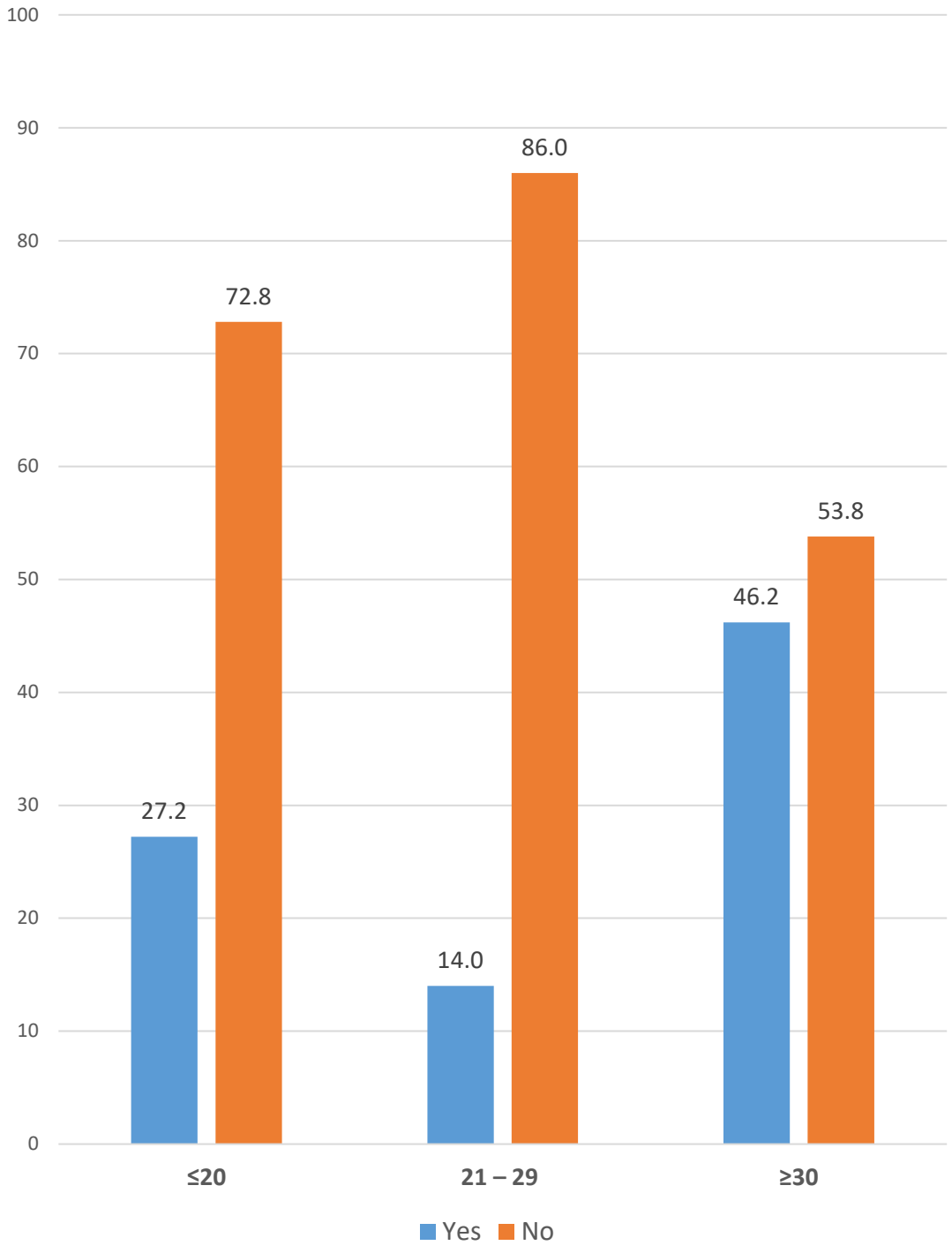


Table 38: Association between consanguinity of marriage of study participant and prevalence of abortion

Consanguinity	Ever-aborted					
	Yes		No		Total	
	No	%	No	%	No	%
Present	51	31.5	111	68.5	**162**	**100**
Absent	140	20.3	548	79.7	**688**	**100**
Total	**191**	**22.5**	**659**	**77.5**	**850**	**100**
$\chi 2 = 9.33$		**df = 1**		**p = 0.002**		

In this study, prevalence of abortion was higher (31.5%) in study participant who had a consanguineous marriage when compared to 20.3% in study participant who didn't have a consanguineous marriage and this difference was statistically significant (p=0.002).

Graph 15 (Table 38): Association between consanguinity of marriage of study participant and prevalence of abortion

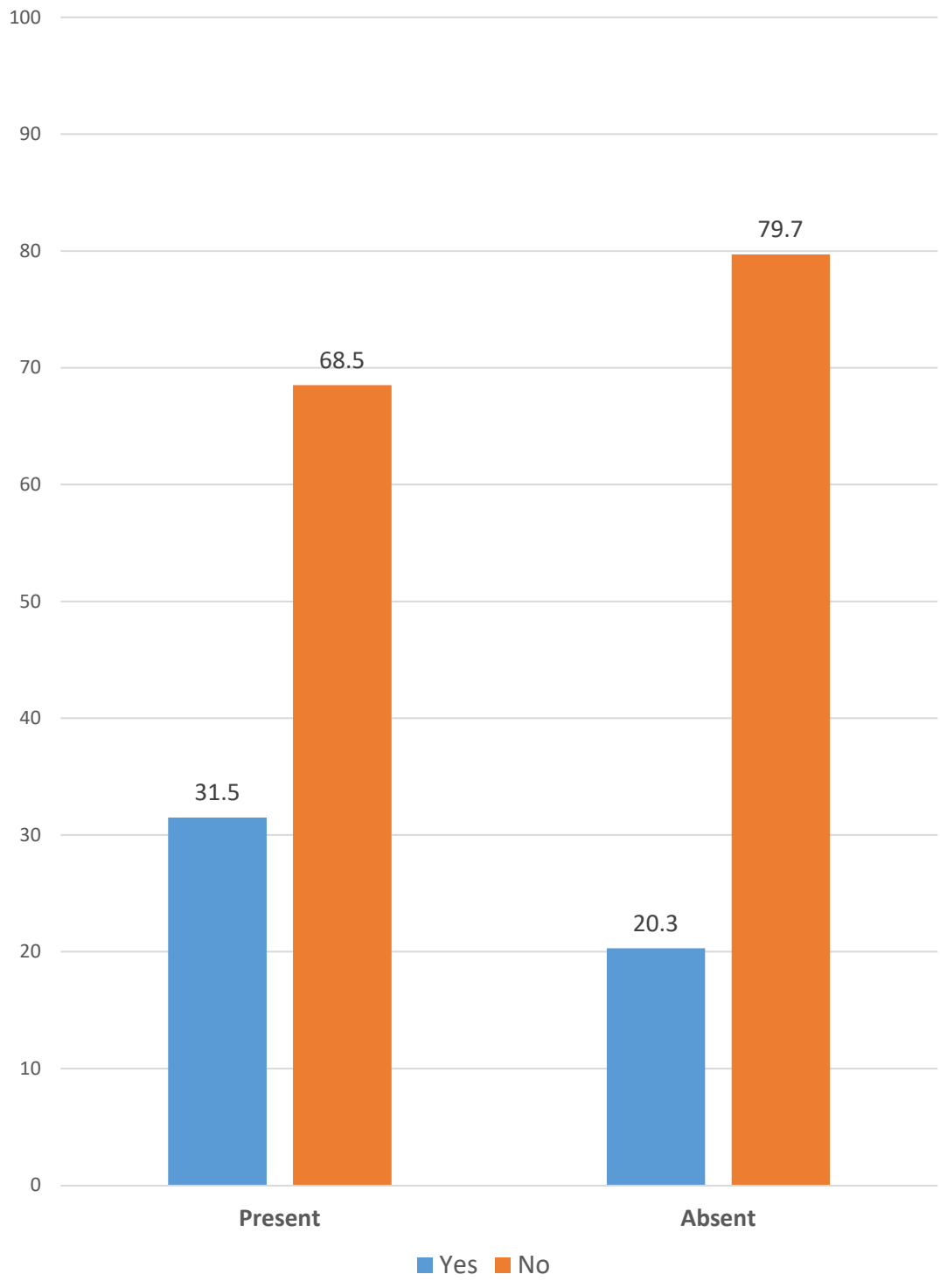


Table 39: Association between pregnancy order of study participant and prevalence of abortion

Pregnancy order	Ever-aborted					
	Yes		No		Total	
	No	%	No	%	No	%
1	62	13.1	412	86.9	474	**100**
2	68	27.2	182	72.8	250	**100**
3	35	38.9	55	61.1	90	**100**
≥4	26	72.2	10	27.8	36	**100**
Total	**191**	**22.5**	**659**	**77.5**	**850**	**100**
$\chi 2 = 92.3$			**df = 3**		**p < 0.00001**	

In our study participant prevalence rate of abortion more than doubled from first pregnancy order to second (13.1% to 27.2%) and it nearly doubled from third pregnancy order to fourth pregnancy order (38.9% to 72.2%) and this difference was statistically significant ($p<0.00001$). It was noted that with increase in pregnancy order the prevalence rate of abortion also increased.

Graph 16 (Table 39): Association between pregnancy order of study participant and prevalence of abortion

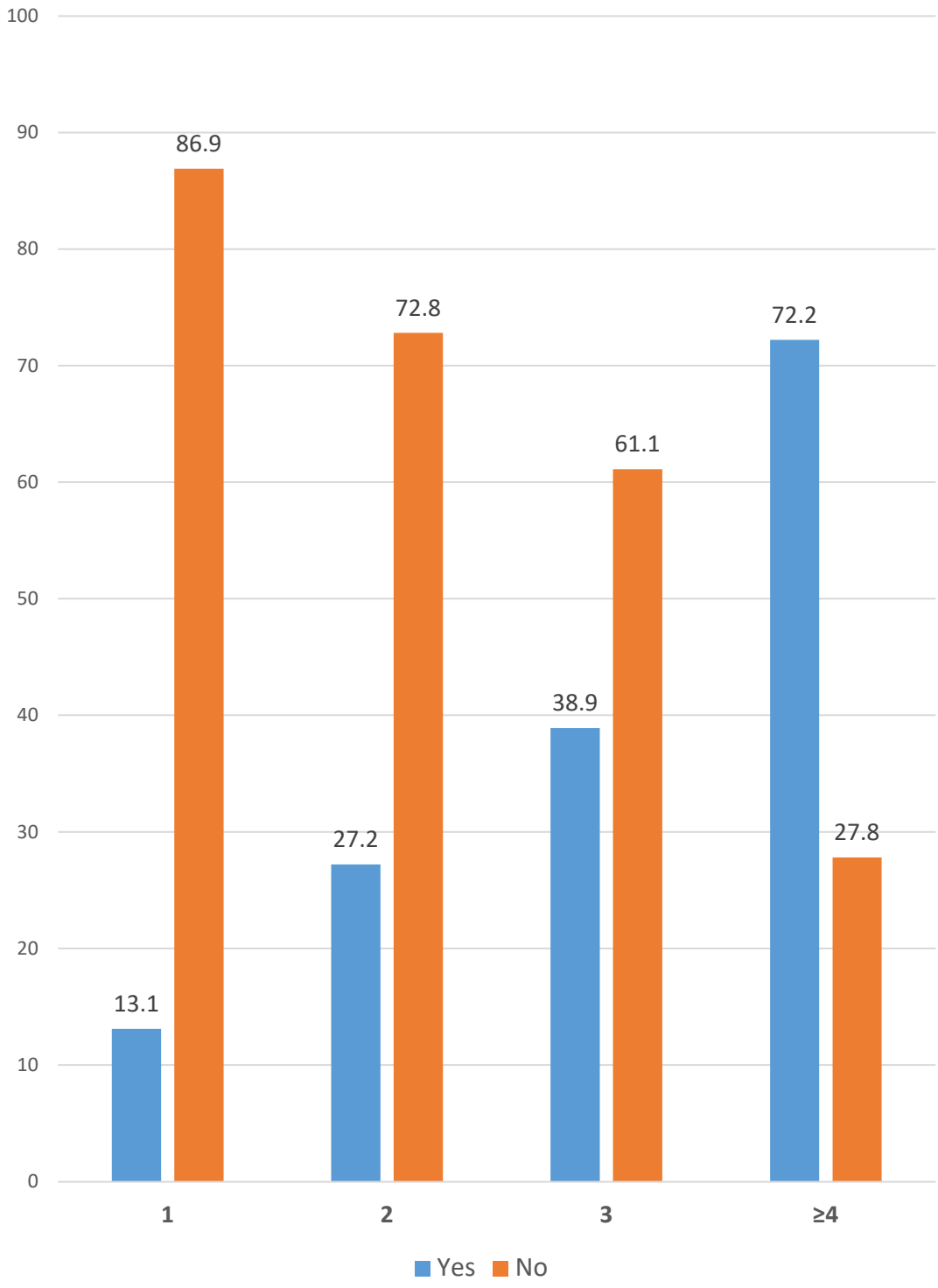


Table 40: Univariate Logistic Regression Analysis

Variables	UNIVARIATE ANALYSIS		
	Unadjusted Odd's Ratio	**95% Confidence Interval**	**P value**
Age of the study participant (in years)			
20 – 24	1.19	0.82 – 1.75	0.36
25 – 29	REF	–	–
30 – 34	2.79	1.49 – 5.23	**0.001**
35 – 40	5.81	2.70 – 12.49	**<0.001**
Age of study participant's husband (in years)			
20 – 24	1.25	0.70 – 2.25	0.45
25 – 29	REF	–	–
30 – 34	1.75	1.19 – 2.57	**0.004**
35 – 39	1.82	1.01 – 3.30	**0.047**
≥40	5.89	3.00 – 11.54	**<0.001**
Religion			
Hindus	REF	–	–
Non-Hindus	2.23	1.45 – 3.42	**<0.001**
Literacy status of the study participant			
Illiterate	1.68	1.03 – 2.70	**0.035**
Primary	1.45	0.93 – 2.25	0.10
High school	REF	–	–
Pre-university course	1.26	0.75 – 2.12	0.38
Degree	2.36	1.37 – 4.06	**0.002**
Socioeconomic status			
Class I	4.46	1.71 – 11.64	**0.002**
Class II	3.64	2.22 – 5.96	**<0.001**
Class III	2.44	1.61 – 3.69	**<0.001**
Class IV	REF	–	–
Class V	1.40	0.83 – 2.40	0.21
BMI			
Underweight	2.97	1.99 – 4.43	**<0.001**
Normal	REF	–	–
Overweight	1.68	1.11 – 2.56	**0.015**
Obese	2.54	1.22 – 5.29	**0.013**
Tobacco consumption			
Yes	1.76	1.01 – 3.09	**0.048**
No	REF		

Domestic violence			
Yes	2.53	1.48 – 4.33	**0.001**
No	REF	–	–
Age at marriage (in years)			
≤17	3.64	2.54 – 5.23	**<0.001**
18 – 29	REF	–	–
≥30	6.56	1.45 – 29.71	**0.015**
Age at first pregnancy (in years)			
≤20	2.30	1.59 – 3.33	**<0.001**
21 – 29	REF	–	–
≥30	5.28	1.70 – 16.42	**0.004**
Consanguinity			
Present	1.80	1.23 – 2.63	**0.002**
Absent	REF	–	–
Pregnancy order			
1	REF	–	–
2	2.48	1.69 – 3.65	**<0.001**
3	4.23	2.56 – 6.98	**<0.001**
≥4	17.27	7.94 – 37.56	**<0.001**

On further analysis by univariate logistic regression, the following risk factors for prevalence of abortion were noted in our study. Age of the study participant 30 – 34 years [unadjusted odds ratio (OR) = 2.79, 95% Confidence Interval (CI): 1.49 – 5.23, p = 0.001] and 35 – 40 years [unadjusted OR = 5.81, 95% CI: 2.70 – 12.49, p < 0.001]. This suggests that women above 30 years of age had 2.8 times higher odds of having an abortion and the odds increased to 5.8 times, when age increased to 35 years or more. The next risk factor identified was age of the study participant's husband 30 – 34 years [unadjusted OR = 1.75, 95% CI: 1.19 – 2.57, p = 0.004], 35 – 39 years [unadjusted OR = 1.82, 95% CI: 1.01 – 3.30, p = 0.047] and ≥40 years [unadjusted OR = 5.89, 95% CI: 3.00 – 11.54, p < 0.001]. This explains that if the age of the husband of the study subject was more than 30 years, the odds of the women having an abortion is 2 times and the odds increased to 6 times if his age increased to

40 years or more. Women who followed Muslim religion were 2 times more likely to have an abortion, when compared to Hindu women [unadjusted OR = 2.23, 95% CI:1.45 – 3.42, p < 0.001]. Illiterate women were about 1.7 times more likely to have an abortion [unadjusted OR = 1.68, 95% CI: 1.03 – 2.70, p = 0.035], whereas women who were degree holders were 2.4 times at the risk of having an abortion [unadjusted OR = 2.36, 95% CI: 1.37 – 4.06, p = 0.002], when compared to women with high school education. The odds of having an abortion was higher among women who belonged to higher socioeconomic classes i.e. study subjects who belonged to socioeconomic class I had 4.5 times higher odds [unadjusted OR = 4.46, 95% CI: 1.71 – 11.64, p = 0.002], while those who belonged to class II had 3.6 times higher odds [unadjusted OR = 3.64, 95% CI: 2.22 – 5.96, p < 0.001] and women who belonged to class III had 2.4 times higher odds [unadjusted OR = 2.44, 95% CI: 1.61 – 3.69, p < 0.001] of having an abortion, when compared with women who belonged to class IV. Study participants who were underweight had 3 times higher odds [unadjusted OR = 2.97, 95% CI: 1.99 – 4.43, p < 0.001], whereas women who were overweight had 1.7 times higher odds [unadjusted OR = 1.68, 95% CI: 1.11 – 2.56, p = 0.015] and women who were obese had 2.5 times higher odds [unadjusted OR = 2.54, 95% CI: 1.22 – 5.29, p = 0.013] of having an abortion, when compared to women who had their body mass index in normal range. Study subjects who consumed tobacco had 1.8 times higher odds of having an abortion [unadjusted OR = 1.76, 95% CI: 1.01 – 3.09, p = 0.048] and women who experienced domestic violence had 2.5 times higher odds of having an abortion [unadjusted OR = 2.53, 95% CI: 1.48 – 4.33, p = 0.001]. Women who married before the legal age (≤17 years) had 3.6 times higher odds [unadjusted OR = 3.64, 95% CI: 2.54 – 5.23, p < 0.001], whereas women who had a late marriage (≥30 years) had 6.6 times higher odds [unadjusted OR = 6.56, 95% CI:

1.45 – 29.71, p = 0.015] of having an abortion. This explains that both early and late marriage increase the odds of having an abortion. Similarly, women who had early first pregnancy were 2.3 [unadjusted OR = 2.30, 95% CI: 1.59 – 3.33, p < 0.001] times more likely to have abortion and elderly primigravida had 5.3 times more odds [unadjusted OR = 5.28, 95% CI: 1.70 – 16.42, p = 0.004] pregnancy ending in abortion. Odds of a consanguineous couple having an abortion was 1.8 times [unadjusted OR = 1.80, 95% CI: 1.23 – 2.63, p = 0.002] than that of a non-consanguineous couple. In regard to pregnancy order, study subjects with 2nd pregnancy order had 2.5 times higher odds [unadjusted OR = 2.48, 95% CI: 1.69 – 3.65, p < 0.001], whereas those with 3rd pregnancy order had 4 times higher odds [unadjusted OR = 4.23, 95% CI: 2.56 – 6.98, p < 0.001] and the odds of having an abortion increased steeply to 17 times [unadjusted OR = 17.27, 95% CI: 7.94 – 37.56, p < 0.001] for those who had 4th pregnancy order or more. This explains that with increase in order of pregnancy, the odds of having an abortion also increased.

Table 41: Multivariate Logistic Regression Analysis

Variables	MULTIVARIATE ANALYSIS		
	AOR	**95% Confidence Interval**	**P value**
Age of study participant's husband (in years)			
20 – 24	1.46	0.72 – 2.95	0.29
25 – 29	REF	–	–
30 – 34	2.41	1.39 – 4.19	**0.002**
35 – 39	1.31	0.48 – 3.57	0.59
≥40	3.72	`1.03 – 13.42	**<0.045**
Literacy status of the study participant			
Illiterate	0.87	0.42 – 1.79	0.71
Primary	1.25	1.25 – 2.24	0.46
High school	REF	–	–
Pre-university course	1.53	0.79 – 2.79	0.21
Degree	3.19	1.44 – 7.08	**0.004**
Socioeconomic status			
Class I	7.36	1.80 – 30.15	**0.005**
Class II	8.94	4.29 – 18.62	**<0.001**
Class III	4.64	2.67 – 8.07	**<0.001**
Class IV	REF	–	–
Class V	0.82	0.42 – 1.61	0.57
BMI			
Underweight	4.50	2.64 – 7.67	**<0.001**
Normal	REF	–	–
Overweight	1.27	0.74 – 2.16	0.39
Obese	2.21	0.88 – 5.57	0.09
Age at marriage (in years)			
≤17	2.80	1.67 – 4.69	**<0.001**
18 – 29	REF	–	–
≥30	4.26	0.22 – 81.52	0.34
Pregnancy order of study participant			
1	REF	–	–
2	4.33	2.57 – 7.32	**<0.001**
3	14.32	6.44 – 31.83	**<0.001**
≥4	47.38	13.92 – 161.30	**<0.001**

The following risk factors were identified to be significantly associated with prevalence of abortion on multivariate logistic regression: Age of the study participant's husband 30 – 34 years [Adjusted Odds Ratio (AOR) = 2.41, 95% CI: 1.39 – 4.19, p = 0.002], ≥40 years [AOR = 3.72, 95% CI: 1.03 – 13.42, p < 0.045]. This explains that when the age of the husband of the study subject was more than 30 years, the odds of the women having an abortion was 2.4 times and the odds increased to 3.7 times when his age increased to 40 years or more. Women who had degree level education had 3 times higher odds [AOR = 3.19, 95% CI: 1.44 – 7.08, p < 0.004] of having an abortion, when compared to women who had high school education. Higher the socioeconomic status of the study participant, higher were the odds of having an abortion i.e., study subjects who belonged to socioeconomic class I had 7.4 times higher odds [AOR = 7.36, 95% CI: 1.80 – 30.15, p = 0.005], while those who belonged to class II had 9 times higher odds [AOR = 8.94, 95% CI: 4.29 – 18.62, p < 0.001] and those women of socioeconomic class III had 4.5 times higher odds [AOR = 4.64, 95% CI: 2.67 – 8.07, p < 0.001] of having an abortion when compared to women in socioeconomic class IV. Women who were underweight had 4.5 times higher odds [AOR = 4.50, 95% CI: 2.64 – 7.67, p < 0.001] of having an abortion. Study subjects who married before the legal age of 18 years had 3 times higher odds [AOR = 2.80, 95% CI: 1.67 – 4.69, p < 0.001] of having an abortion. In regard to pregnancy order, study participants who had 2nd pregnancy order had 4 times higher odds [AOR = 4.33, 95% CI: 2.57 – 7.32, p < 0.001], whereas those who had 3rd pregnancy order had 14 times higher odds [AOR = 14.32, 95% CI: 6.44 – 31.83, p < 0.001] and women who had 4th pregnancy order or more had 47 times higher odds [AOR = 47.38, 95% CI: 13.92 – 161.30, p < 0.001] of having an abortion. This shows that the chance of having a abortion triples with each increase in order of pregnancy.

DISCUSSION

In Karnataka, almost three-fifth (59%) of the households are in rural area as per National Family Health Survey - 5 (NFHS-5).[44] The present study is an attempt to know the prevalence of abortion in a rural area and deepen the understanding of various risk factors that lead to it. This study was undertaken in field practice area of rural primary health centre Vantamuri in Belagavi, Karnataka among 850 married women aged between 20 to 40 years, chosen from the eligible couple register according to computer generated random number table.

I. SOCIODEMOGRAPHIC PROFILE OF THE STUDY PARTICIPANT

Table 1 to 6: Distribution of the study participant according to sociodemographic profile

The mean ± SD age of the study participant in our study was 24.48 ± 3.83 years with a range of 20 – 40 years. When compared to a study done in Darjeeling, West Bengal this was slightly lower as in the mean age of the participant in that study was 26.4 ± 7.1 years (range, 15 – 49 years).[1] This may be due to the reason that in that study all the women in reproductive age (15 – 49 years) group were included, while our study was done among women aged between 20 – 40 years. But the mean age of our study participant was comparable to the mean age of study subject in another study done in Ahmedabad (25.94 ± 0.28 years).[21] In our study, the age distribution noted was 89.8% were aged less than 30 years and 10.2% were 30 years or more. It was nearly similar to a study done in West Bengal, where 72.9% were aged 30 years or less and 27.1% were aged more than 30 years.[1] The mean ± SD age of the study participant's husband in our study was 29.43 ± 4.66 years with a range of 21 – 51

years. This was in agreement to the study done in Ahmedabad where the mean age of the study participant's husband was 29.50 ± 0.30 years.[21]

More than four-fifth (87.1%) of our study participant were Hindus. Muslim constituted 12.7% and a mere 0.2% of our study participant were Christian. This was comparable to a study done in Darjeeling, West Bengal, in which 87.4% of the study participant followed Hinduism. According NFHS-5, 88% of the household in Karnataka follow Hinduism, 10% follow Islam and the remaining 2% follow Christianity.[44]

Literacy rate was almost similar among our study participant and their husband i.e., 83.4% and 83.2% respectively. Though illiteracy was slightly higher in male than female (16.8% v/s 16.6%), more male continued education to attain a degree in our study population when compared to female (12.5% v/s 9.9%). Illiteracy rate among our study participant (16.6%) is significantly less when compared to the rate of illiteracy (27.2%) in a study done in urban slum of Delhi. Similarly, attainment of graduate level of education was higher among our study participant 9.9% v/s 6.7% in the study done in urban slum of Delhi.[23] This may be because of the higher value for education in general and also enhanced female education in southern states when compared to Northern states. However, NFHS-5 data revealed that 20% of women and 11% of men aged 15 – 49 years never went to school in Karnataka.[44]

Majority of our study participant (82.2%) were housewife despite having fair education and among those employed majority were involved in agriculture. This is high when compared to a study done in Darjeeling district, West Bengal, where 60% of the study participant were housewives.[1] It was also noted that in our study almost one-third (29.7%) of their husbands were working in a private job and almost one-

fourth (23.3%) were involved in agriculture and almost one-fifth (17.2%) were daily wager. According to NFHS-5, 59% women and 19% men belonging to the age group of 15 – 49 years were not employed, while 4% women and 34% men were employed in agricultural occupation.[44]

In our study, 84.9% of the study participant belonged to socioeconomic classes III, IV and V according to Modified B.G. Prasad's Classification. While in a study done in Delhi, 25.6% belonged to classes III, IV and V.[24] This difference may be due to the reason that our study was carried out in a rural area, whereas the Delhi study was conducted in urbanized village.

In our study, almost three-fourth (74.1%) were living in a joint family, while the remaining 25.9% belonged to a nuclear family. In the study done in West Bengal, 52.6 % lived in a joint family setup and 47.4% lived in a nuclear family.[1] Joint family setup is more prevalent in rural area when compared to urban area. And living in a joint family setup influences the reproductive choices of a women by social norms, customs and family pressure.

II. MATERNAL CHARACTERISTICS OF STUDY PARTICIPANT

Table 7 and 8: Distribution of study participant according to Body mass index (BMI), coffee and tobacco consumption

In our study, 48.9% had normal BMI, while 22.5% were underweight and 28.6% had BMI in overweight (24.1%) or obese (4.5%) range. In a study done in Mumbai, 88.4% of the participant had normal BMI, 6.3% were overweight and 5.6% were obese and none of them had BMI in the underweight range.[19] This maybe because of the reason that the study was done in a tertiary care hospital and also the

sample size was small. This was in agreement to NFHS-5 data of Karnataka where more than half of women (53%) were having their BMI in normal range and less than one-third of women (30%) were having their BMI in overweight or obese range, whereas 17% of women were underweight.[44] But in a study done in China, 70.1% had their BMI in normal range, 14.6% were underweight and 10.6% were overweight and 4.7% were obese.[26] This may be due to the better nutritional status of the study participant in China when compared to India.

Majority (91.3%) of our study participant didn't have the habit of drinking coffee, while the remaining 8.7% consumed coffee on regular basis. Out of them, almost half consumed either 1 (44.6%) or 2 (43.2%) cups of coffee and 12.2% had 3 or more cups on a daily basis. In a cohort study done in United States of America, 16.1% never consumed coffee while 24.1% had 1 serving per day, 18% had 2 – 3 servings per day and 21.6% had four or more servings per day.[45] In the western world, coffee is consumed in a widespread manner while in the eastern world tea is consumed more than coffee. Especially in rural India tea is consumed by majority than coffee as tea is more affordable.

In our study, majority (92.9%) of the study participant didn't consume tobacco in any form, whereas 7.1% consumed betel quid with tobacco or gutka or tobacco pan masala. In the study done in Darjeeling district, West Bengal, 23.3% had some sort of addiction including tobacco consumption.[1] In another study carried out in Ahmedabad, 5.4% of study subject consumed tobacco/areca nut.[21] In southern India, the culture system is more rigid especially in a rural setup where the women are mostly dependent on the family and hence the chance of a female having any sort of

addiction is comparatively less. According to NFHS-5 data, 3.8% of women in rural Karnataka consume tobacco in one or the other form.[44]

Table 9: Distribution of study participant according to domestic violence

Among our study participant, 7.3% had suffered from domestic violence. Out of them, in most the assailant was the husband (40.4%) followed by mother-in-law (22.6%) and in 16.1% the assailant was both the husband and the mother-in-law. In 8% the assailant was either sister-in-law (4.8%) or brother-in-law (3.2%). Whereas in 8.1% it was by both mother-in-law and siter-in-law and the remaining 4.8% it was by both mother-in-law and brother-in-law. In a study done in West Bengal, 7.4% women had experienced domestic violence.[1] However, NFHS-5 reports that nearly half (47%) of ever-married women aged 18 – 49 years have experienced domestic violence in Karnataka. It also revealed that 43% of them experience physical violence and 10% have ever experienced sexual violence, while among them 9% experienced both and the most common assailant was the husband.[44]

III. OBSTETRIC PROFILE OF THE STUDY PARTICIPANT

Table 10,11 and 12: Distribution of study participant according to age at marriage, age at first pregnancy and duration of married life

In our study 78.7% of the study participant were married at the age of 18 – 29 years, while 20.5% were married before the legal age of 18 years and 0.8% had a late marriage i.e., on or after 30 years. However, in a study done in Rajasthan and Uttar Pradesh, 45.8% of women were married before the legal age of 18 years.[46] Early marriage and marriage before the legal age is more common in rural parts of India especially in the Northern states. NFHS-5 reveals that 21% of women of age 20-24

years married before attaining the minimum legal age of 18 years in Karnataka, which is similar to our study.[44]

More than half (58.5%) of our study participant had their first pregnancy in the age group of 20 – 29 years, while 40% had teenage pregnancy (<20 years) and 1.5% were elderly primi. Teenage pregnancy is more common in rural areas of India. However as per NFHS-5 data, in Karnataka among women aged 15 – 19 years, 5% had a teenage pregnancy. Teenage pregnancy rate was higher two decades back in rural India and as our study population included women aged 20 – 40 years, this may be the reason for the high rate of teenage pregnancy.

In our study, more than three-fifth (63.6%) of the study participant were married for 5 years or less, whereas 28.6% were married for a period of 6 – 10 years and 5.1% and 2.7% were married for 11 – 15 years and more than 15 years respectively.

Table 13: Distribution of study participant according to consanguinity

Among the 850 study participant, 80.9% had a non-consanguineous marriage, whereas 19.1% had a consanguineous marriage. Among the consanguineous couple, 66.1% were related on first cousin basis and 18.5% women married their maternal uncle while 15.4% couple were distantly related before marriage. Consanguineous marriages are common in rural population. A study carried out by International Classification of Functioning, Disability and Health and the International Institute for Population Sciences, Mumbai, by analysis of NFHS-4 data showed that prevalence of consanguineous marriage in Karnataka was 23.8% which was comparable to our study result.[42]

Table 14,15 and 16: Distribution of study participant according to parity, number of living children and pregnancy order

Among our study participant 7.3% were nulliparous, 56.3% were primiparous and 36.4% were multiparous. In a study done in Chandigarh, 14.2% were nulliparous, 15.5% were primiparous and 70.3% were para 2.[47] This shows that the participant of our study understood the importance of a small family size and undertook measures to avoid unwanted pregnancy.

In another study done in China 64.9% were nulliparous while 35.1% were multiparous.[26] Developing countries have a lesser fertility rate.In our study, 57.5% of the participant had 1 living child, 25.3% had 2 living children and 9.1% had 3 or more living children, whereas 8.1% had no living children. In a study done in 9 states of India, 1.3% women had no living child, 75.8% had 1 – 3 living children and 21.1% had 4 or more living children.[7] This reflects that our study participant understood the importance of small family size norm – "we two, ours one".

Among the 850 study participant, 55.8% had first pregnancy order, 29.4% had second pregnancy order, 10.6% had third pregnancy order and 4.2% had four or more pregnancy order. As per NFHS-5, in Karnataka 43.3% had first pregnancy order, 37.1% had second pregnancy order, 14.3% had third pregnancy order and 5.4% had 4 or more pregnancy order.[44]

IV. PROFILE OF ABORTION OF STUDY PARTICIPANT

Table 17: Prevalence of abortion

Prevalence rate of abortion in our study was 22.5%. Occurrence of abortion for a woman in her lifetime was 33.6% in a study done in West Bengal.[1] In a study

done in Delhi, the prevalence rate of abortion was 35.4%.[23] This shows that the prevalence rate of abortion was lower in our study participant compared to studies done in Northern India. This may be because of better health care for pregnant women in the state of Karnataka. The 5-year prevalence rate of abortion was 21.1% in a study done in Nepal.[48] In our study 16.7% had 1 abortion, 3.8% had 2 abortion and 2% had 3 or more abortion, whereas in a study done in urban slum of Delhi, 26.3% had 1 abortion, 8.4% 2 abortion and 0.7% had 3 abortion.[23] In our study 1.8% of the study participant had recurrent spontaneous miscarriage (RSM), while in another study performed in five major cities in India the prevalence of RSM was 7.5%.[4] Out of 191 ever aborted women in our study, we had 262 abortion events. Thus, the mean abortion event per woman was 1.4 in our study. This was comparable to a study done in West Bengal where 141 ever aborted women had 178 abortion events, with mean abortion per woman being 1.3.[1]

Table 18 and 19: Distribution of study participant according to period of gestation during abortion, pregnancy confirmation status and method.

In our study, 77.5% of abortion occurred in the first trimester, whereas 22.5% of them occurred in the second trimester. In a study done in Rajasthan and Uttar Pradesh, 96.4% were first trimester abortion and 3.6% were second trimester abortion.[46] In another study carried out in West Bengal, 83.7% and 16.3% abortion occurred in first and second trimester respectively.[1] It was also noted in our study that 9.2% abortion were pre-embryonic loss (Gestational Age (GA) ≤ 5 weeks), 36.6% were embryonic loss (GA 6 – 9 weeks) and 54.2% were foetal loss (GA 10 – 20 weeks). This was almost similar to the results of a study done in China, in which

12.7% were pre-embryonic loss, 38% were embryonic loss and 49.3% were fetal loss.[26]

Among those pregnancy that ended in an abortion for our study participant, in 98.1% of them the pregnancy status was confirmed. In 87.8% it was confirmed by both UPT&USG, in 6.9% it was confirmed by USG alone and in 3.4% it was confirmed by UPT alone.

Table 20: Distribution of study participant according to type of abortion

In our study, out of 262 abortion events, 80.1% were spontaneous and the remaining 19.9% were induced. It was nearly comparable to a study done in Haryana, wherein 65.5% were spontaneous abortion and 34.5% were induced abortion.[22] Whereas in a study done in West Bengal the percentage of spontaneous abortion (51.7%) and induced abortion (48.3%) were almost equal.[1] The reason for lesser induced abortion in our study may be due to the higher contraceptive prevalence rate in southern states as compared to northern states of India. Another reason may be, family restrictions and cultural norms are stricter in a rural setup and hence for most women induced abortion is not a choice in rural India. In our study among the abortions that were induced, 55.8% were medically induced and 44.2% were surgically induced abortion. This result was comparable to a study done in Rajasthan and Uttar Pradesh, in which 74% were medically induced and 25% were surgically induced abortion and 1% were abortions by unapproved unsafe methods.[46] In another study done in West Bengal, 68.6% were medically induced and 31.4% were surgically induced abortions.[1] In a rural setup, there is less availability of specialist and equipped healthcare facility to perform a surgically induced abortion and also National Health Mission has made the drugs for Medical termination of pregnancy

available at Primary Health Centre and even Sub-centre. Hence most of the abortions are medically induced.

Table 21: Distribution of study participant according to place of abortion.

For almost four-fifth (79.8%) of our study participant the place of abortion was home, whereas 20.2% aborted in a hospital setup i.e., 14.1% in a government hospital and 6.1% in a private hospital. In a study done in West Bengal, 37.1% of abortion occurred at home, 39.9% occurred at private hospital and 23.0% occurred in a government setup.[1] Out of the spontaneous abortion that occurred in our study, 96.2% were at home, 2.9% at private hospital and 0.9% at government hospital. Whereas for induced abortion in our study, the place of abortion was private hospital for 48.3%, government hospital for 27.6% and home for 24.1%. In the study done in West Bengal, out of the spontaneous abortion that occurred, 17.3% were at home, 45.7% at private hospital and 37.0% at government hospital. Whereas for induced abortion, the place of abortion was private hospital for 33.7%, government hospital for 8.1% and home for 58.2%.[1] This difference in place of abortion, may be due to the higher rate of spontaneous abortion in our study.

Table 22: Distribution of study participant according to person aiding/conducting abortion.

In this study, out of the 262 abortion events, in 79.8% women were aided by family member at the time of abortion. Physician conducted 17.9% of the abortion events, while in 2.3% it was by nurse or health worker female placed at the primary health centre or sub-centre. In the study done in west Bengal 58.4 % of abortion were conducted by doctor and remaining it was done by self/quacks/others.[1] In another

study done in Delhi, 41.5% of the abortion were conducted by a skilled healthcare provider, whereas 58.5% happened unsupervised.[23] Yet another study done in Rajasthan and Uttar Pradesh, 48% of abortion were conducted by doctor, 47% were aided by family member and 5% were conducted by Auxiliary Nurse Midwives.[46]

Table 23: Distribution of study participant according to complications following abortion

Out of 262 abortion event in our study, 14.5% had one or the other complication following abortion. However, in a study done in Rajasthan and Uttar Pradesh, 51.8% women suffered from complication after abortion.[46] Out of the abortion events that ended up in a complication, in almost half (47.3%) of them incomplete abortion was the complication, followed by excessive bleeding (42.1%). In 5.3% events, complication was infection and in remaining 5.3% it was life threatening complication i.e., hypovolemic shock in one and uterine laceration in another. In the study done in Rajasthan and Uttar Pradesh, the common complications noted were fatigue and abdominal pain/cramps/backache (30.7% each), followed by 11.4% had excessive bleeding, 7.2% had infection, 0.6 % had uterine perforation and 0.6% had loss of consciousness.[46]

V. ASSOCIATION BETWEEN VARIABLES AND PREVALENCE OF ABORTION

Table 24 – 39: Association between variables and prevalence of abortion:

Out of the sociodemographic factors, the following variables showed a statistically significant ($p < 0.05$) association with prevalence rate of abortion i.e., age of the participant >30 years ($\chi 2 = 32.36$, $p < 0.00001$), age of study participant's

husband ≥40 years ($\chi2$ = 33.13, p < 0.00001), Muslim religion ($\chi2$ = 14.0, p = 0.0001), higher literacy status of the study participant ($\chi2$ = 11.30, p = 0.02) and upper socioeconomic status of the study participant ($\chi2$ = 38.14, p<0.00001). Whereas literacy status of the study participant husband's ($\chi2$ = 6.71, p = 0.15), occupation of the study participant ($\chi2$ = 0.06, p = 0.80) and type of family of the study participant ($\chi2$ = 0.21, p = 0.65) didn't know show any statistically significant association. Among the maternal characteristics, underweight or obesity in the study participant ($\chi2$ = 31.33, p<0.00001), tobacco consumption in study participant ($\chi2$ = 4.01, p = 0.04), history of domestic violence in study participant ($\chi2$ = 12.23, p = 0.0005) showed statistically significant association, whereas coffee consumption in study participant didn't show any statistically significant association. ($\chi2$ = 0.03, p = 0.85). With respect to obstetric profile, study participant's age at marriage either early or late ($\chi2$ = 56.97, p<0.00001), elderly primigravida ($\chi2$ = 23.65, p<0.00001), consanguineous marriage ($\chi2$ = 9.33, p = 0.002) and higher order of pregnancy in the study participant ($\chi2$ = 92.3, p < 0.00001) showed a statistically significant association.

A study conducted by secondary analysis of data from of about 18 lakh pregnant women between the age of 15 to 58 years from 9 states using the Indian Annual Health Survey showed that there were no clinically meaningful differences in age, education, residence, religion or social class background between the two groups. While 85.1% of women who had a livebirth reported having some Antenatal Care (ANC), only 23.1% of women who had an abortion had ANC. Also, a marginally higher proportion of women who had an abortion belonged to the highest quintiles of the asset index.[7]

In another study conducted based on data obtained from the NFHS-IV in the state of Odisha, showed that the occurrence of pregnancy termination and maternal age groups are statistically significant (p = 0.000). The pregnancy termination rate is higher (13%) among women with a secondary educational level than other educational qualifications (p = 0.000). In the case of the wealth index, those belonging to the middle and rich category had more (13%) pregnancy terminations than those who were poor (p = 0.020). This study also reveals that women who have anaemia (11%) showed significant results in pregnancy termination (p = 0.047). But the place of residence, religion, and knowledge about pregnancy complications were not statistically significant with the termination of pregnancy.[18]

Table 41 and 42: Univariate and Multivariate Logistic Regression Analysis

The present study assessed the various sociodemographic factors, maternal characteristics, maternal habits and obstetric factors that increased the chance of having an abortion. According to univariate logistic regression women aged ≥30 years were 3 to 6 times more likely to have an abortion. Similarly, if study participant's husband were aged 30 years or more, the odds of women having an abortion was 2 to 6 times. Study subjects who were Muslims were more than 2 times likely to have an abortion, when compared to study subjects who were Hindus. Study participant who had no education and who had degree were 1.7 times and 2.4 times more likely to have an abortion respectively. Study participant who belonged to Socioeconomic class I, class II and class III were 4.5 times, 3.6 times and 2.4 times more likely to have an abortion respectively. Study subjects who were underweight, overweight and obese had 3 times, 1.7 times and 2.5 times higher chance of having an abortion. Women who consumed tobacco had 1.8 times higher odds of having an abortion and

study subject who experienced domestic violence had 2.5 times higher odds of having an abortion. Study subject who married before 18 years and those who married after 30 years were 3.6 times and 6.6 times more likely to have an abortion respectively. Similarly, women who had early first pregnancy were 2.3 [unadjusted OR = 2.30, 95% CI: 1.59 – 3.33, $p < 0.001$] times more likely to have abortion and elderly primigravida had 5.3 times more odds [unadjusted OR = 5.28, 95% CI: 1.70 – 16.42, $p = 0.004$] of pregnancy ending in abortion. Study subject who had a consanguineous marriage had 1.8 times higher odds of having an abortion. Women who had 2nd pregnancy order, 3rd pregnancy order and 4th pregnancy order or more were 2.5 times, 4 times and 17 times more likely to have an abortion respectively. On further analysis by multivariate logistic regression, the following risk factors were found to be significantly associated with prevalence of abortion. It was noted that when the age of the husband of the study subject was more than 30 years, the odds of the women having an abortion was 2.4 to 3.7 times higher. Women that had degree level education had more than 3 times higher odds of having an abortion when compared to those who had high school education. Study subjects belonging to socioeconomic class I had 7.4 times higher odds, while those who belonged to class II had 9 times higher odds and women of socioeconomic class III had 4.5 times higher odds of having an abortion when compared to women in socioeconomic class IV. Women who were underweight had 4.5 times higher chance of having an abortion and women who had married before the legal age of 18 years had 3 times higher odds of having an abortion. Regarding pregnancy order, women who had 2nd pregnancy order had 4 times higher odds, women who had 3rd pregnancy order had 14 times higher odds and women who had 4th pregnancy order or more had 47 times higher odds of having an abortion.

In a study done in West Bengal, women aged more than 30 years had lesser odds of having an abortion [OR = 0.98], which was in contrary to our study result. Muslim/Christian were less likely to have an abortion when compared to Hindus [OR = 0.91], which didn't match with our study result. Study subject who lived in a joint family had lesser odds of having an abortion [OR = 0.72]. Also, it was noted when compared to women married and staying with husband, others (unmarried, separated, widowed) were more likely to have an abortion [OR = 1.09]. Women who had more education (≥ 5 years of schooling) were less likely to have an abortion [OR = 0.86]. Women who were homemaker were less likely to have an abortion, when compared to working women [OR = 0.74]. Women who did not have a male child were 2 times more likely to have an abortion [OR = 1.81], whereas women who did not have a female child were 1.5 times likely to have an abortion [OR = 1.35]. Women who had 2 or more children were less likely to have an abortion [OR = 0.52]. Women who used a contraceptive were less likely to have an abortion [OR = 0.81]. Women who had any addiction during pregnancy were more likely to have an abortion [OR = 1.12], women who performed heavy work during pregnancy were more likely to have an abortion [OR = 1.37]. Women who had accidental injury during pregnancy were more likely to have an abortion [OR = 1.16] and women who suffered from domestic violence during pregnancy were 5 times more likely to have an abortion [OR = 4.98]. On multivariate analysis domestic violence was significantly (AOR, 4.73; 95% CI, 1.79–12.51) associated with abortion.[1] The disparities in results between our study and this study may be due to the reason that the proportion of induced abortions were almost equal to spontaneous in this study, whereas majority of abortions were spontaneous in our study and the risk factors for induced and spontaneous abortion are most of the times different from each other. Another reason could be, many a times each region and it's community has it's own set of risk factors for any condition which may differ from other regions.

CONCLUSION

The present study aims to know the prevalence of abortion, characteristics of women who experience abortion and factors leading to it in a rural area.

The study revealed that the prevalence rate of abortion in our study participant was 22.5%. Less than 1/5th of the participant had a single episode of abortion, while nearly 6% had multiple episodes. The recurrent pregnancy loss rate was 2.0%. The 191 ever-aborted women, in our study had a total of 262 abortion episodes, with mean abortion events per woman as 1.4. More than 3/4th of the abortion episodes occurred during the first trimester of pregnancy and the rest occurred in the second trimester. More than half were foetal loss, nearly 1/3rd were embryonic loss and the rest were pre-embryonic loss. In almost all the pregnancy that ended in abortion, pregnancy status was confirmed. For more than 4/5th it was confirmed by both Urine pregnancy test & Ultrasonography. About 4/5th of the abortion were spontaneous and remaining 1/5th were induced abortion. It was noted that, 11.1% were medically induced abortion and 8.8% were surgically induced abortion. For almost 4/5th of the abortion events, the place of abortion was home, while for the rest 1/5th it was hospital. Almost 4/5th of the study participant were aided by family member at the time of abortion, while in 1/5th physician was present and the rest were by nurse or health worker female placed at the primary health centre or sub-centre. About 14.5% of the abortion events ended up in a complication. In almost half of them incomplete abortion was the complication, in more than 2/5th it was excessive bleeding and in the rest the complication was infection, hypovolemic shock and uterine laceration.

Out of all the risk factors studied, the following variables showed a statistically significant ($p < 0.05$) association with prevalence rate of abortion i.e., age of the participant >30 years, age of study participant's husband ≥40 years, Muslim religion, higher literacy status of the study participant, upper socioeconomic status of the study participant, lesser or more body mass index of the study participant, tobacco consumption in study participant, history of domestic violence in study participant, early or late at marriage, elderly primigravida or 1st pregnancy in teens, consanguineous marriage and two or more pregnancy order.

RECOMMENDATION

Based on the findings of the present study, the following recommendations are being suggested for the overall improvement of health of women:

1. Strengthening of Information Education and Communication / Behavioral Change Communication activities in the rural area by the health worker female to curb the stigma associated with abortion.

2. Grassroot level workers can emphasize on various risk factors leading to abortion especially among eligible couples during their regular house to house visit.

3. Educating the couples regarding importance of follow-up visit following an abortion event to avoid complication and recurrence.

4. Social change programmes in the country should provide better educational and job opportunities to young women to provide their families economically feasible options other than early marriage. Strict enforcement of law to prevent childhood marriage.

5. Re-emphasis on Integrated Child Development Service Scheme to ensure proper and appropriate food supply to prevent undernutrition among mothers.

6. Establishment of tobacco cessation clinic at Primary health centre. And also, strict enforcement of Cigarettes and Other Products of Tobacco Act as tobacco consumption is a direct risk factor for abortion

7. Increase awareness in the community regarding domestic violence utilizing ASHA workers. Interpersonal counselling of the family members regarding dangers of domestic violence on the woman and child.

8. Health education of the community regarding harmful health effects of consanguineous marriage and also provide pre-conceptional genetic counselling to consanguineous couple at tertiary care centre.

9. The existing family health programme is more women-centric, while in the rural area men are the decision makers. Therefore, there is a need to reorient this programme so that it can focus more on couples as a single to achieve the goal and objectives of Family planning.

STRENGTHS OF THE STUDY

1. It is a community based cross sectional study. Hence this gives a broader picture of the parameters studied in the region, thus the results can be generalized.

2. Abortion is sensitive issue which woman hesitate to reveal. Data collection was done by personal interview of the participant on a house-to-house basis and most of the time the investigator was accompanied by ASHA worker and thus this may have helped us in getting a more accurate prevalence rate of abortion.

3. In this study, we have tried to cover multiple sociodemographic, maternal and obstetric characteristics that were suspected to be associated with abortion.

LIMITATIONS OF THE STUDY

1. Mild complications following abortion may have been missed out due to recall bias.

2. Body mass index was calculated based on the weight of the study participant at the time of study. So, this may not reflect the actual body mass index at the time of pregnancy.

3. As in this study data collection was done on house-to-house basis, presence of family members in the vicinity during the time of interview may have led to inaccurate data on domestic violence.

SUMMARY

The present cross-sectional study was conducted in 20 villages covered under 5 Sub-centres of Rural Primary Health Centre (PHC) Vantamuri, which is under the administrative control of Jawaharlal Nehru Medical College, Belagavi with the aim to know the prevalence of abortion, characteristics of women who experience abortion and factors leading to it in a rural setting of Belagavi, Karnataka. This study was conducted for a period of one year from 1st January to 31st December 2020 among 850 married women aged 20 to 40 years, who were permanent resident of the field practice area of rural PHC Vantamuri in Belagavi district.

Data collection was done by means of personal interview by the researcher in the community setting on a house-to-house basis. Written informed consent was obtained from all the study participant before the onset of data collection and confidentiality was maintained. A predesigned and pretested questionnaire was used to obtain information on socio - demographic factors, maternal characteristics and habits, obstetric history and detailed history regarding abortion, if any.

Out of 850 study participant, majority (89.8%) women belonged to the age group of 20 to 29 years and the rest 10.2% were aged between 30 and 40 years. The mean ± SD age of the study subject was 24.48 ± 3.83 years with a range of 20 – 40 years and median age was 24.00 years. Age distribution of their husband's showed that more than half (53.6%) were aged between 20 and 29 years, whereas 46.4% were aged 30 years or more. The mean ± SD age was 29.43 ± 4.66 years with a range of 21 – 51 and median age was found to be 29.00 years. More than 4/5th (87.1%) followed Hinduism and more than 4/5th of them (84.9%) belonged to socioeconomic classes III,

IV and V according to Modified B G Prasad's Classification. Most (83.4%) of the women were literate and majority (82.2%) were homemaker. Almost 3/4th (74.1%) lived in a joint family setup. Among the study participant husband 83.2% were literate and almost 1/3rd (29.7%) of them were in a private job.

With respect to maternal characteristics of study participant, it was noted that almost half (48.9%) had their BMI in normal range, more than 1/4th (28.6%) was overweight or obese and nearly 1/4th were underweight. Less than 1/10th consumed coffee (8.7%) or tobacco (7.1%). About 7.3% experienced atleast one episode of domestic violence in their lifetime and in more than half (56.5%) husband was the assailant. With respect to the obstetric profile of study subject, it was noted that 20.5% were married before the legal age of 18 years and 78.7% married between 18 – 29 years. About 40.0% had their 1st pregnancy at an age <20 years and 1.5% were pregnant for the 1st time on or after 30 years. Almost 1/5th (19.1%) had a consanguineous marriage and out of them majority (66.1%) were first cousin marriage. More than half (56.3%) were primiparous and 36.4% were multiparous. More than half (57.5%) had 1 living child and 34.4% had ≥1 living children. In our study participant, 55.8% had 1st pregnancy order, 29.4% had 2nd pregnancy order and 14.8% had 3 or more pregnancy order.

Profile of abortion of the study participant reveals that, the prevalence rate of abortion in our study was 22.5%. There was only 1 episode of abortion in 16.7% participant and >1 abortion in 5.8% participant. The recurrent pregnancy loss rate was 2.0%. It was also noted that 1.6% had recurrent spontaneous miscarriage (≥ 3 spontaneous miscarriage). The 191 ever-aborted women, in our study had a total of 262 abortion episodes with 1.4 mean abortion events per woman. Majority (77.5%) of

the abortion episodes occurred during the first trimester of pregnancy and 22.5% occurred in the second trimester. It was also noted that majority (54.2%) were foetal loss (Gestational Age (GA) 10 – 20 weeks), 36.6% were embryonic loss (GA 6 – 9 weeks) and 9.2% abortion were pre-embryonic loss (GA ≤ 5 weeks). Pregnancy status was confirmed in almost all (98.1%) of the pregnancy that ended in abortion. In majority (87.8%) the pregnancy status was confirmed by both Urine Pregnancy Test & Ultrasonography. Four-fifth (80.1%) of the abortions were spontaneous and remaining 19.9% were induced abortion. It was noted that, 11.1% were medically induced abortion and 8.8% were surgically induced abortion. For majority (79.8%) of the abortion events, the place of abortion was home. For 14.1% it was private hospital and the rest 6.1% it was government hospital. Majority (79.8%) were aided by family member at the time of abortion. About 17.9% abortion were conducted by physician and 2.3% by nurse or health worker female placed at the primary health centre or sub-centre. About 14.5% of the abortion events ended up in a complication. In almost half (47.3%) of them incomplete abortion was the complication, followed by excessive bleeding in 42.1%. In 5.3% events, complication was infection. For the remaining 5.3%, it was life threatening complication i.e., hypovolemic shock in one and uterine laceration in another.

Out of the sociodemographic factors, the following variables showed a statistically significant ($p < 0.05$) association with prevalence rate of abortion i.e., age of the participant >30 years ($\chi2 = 32.36$, $p < 0.00001$), age of study participant's husband ≥40 years ($\chi2 = 33.13$, $p < 0.00001$), Muslim religion ($\chi2 = 14.0$, $p = 0.0001$), higher literacy status of the study participant ($\chi2 = 11.30$, $p = 0.02$) and upper socioeconomic status of the study participant ($\chi2 = 38.14$, $p<0.00001$). Whereas literacy status of the study participant husband's ($\chi2 = 6.71$, $p = 0.15$), occupation of

the study participant ($\chi2 = 0.06$, $p = 0.80$) and type of family of the study participant ($\chi2 = 0.2$, $p = 0.65$) didn't know show any statistically significant association. Among the maternal characteristics, underweight or obesity in the study participant ($\chi2 = 31.33$, $p<0.00001$), tobacco consumption in study participant ($\chi2 = 4.01$, $p = 0.04$), history of domestic violence in study participant ($\chi2 = 12.23$, $p = 0.0005$) showed statistically significant association, whereas coffee consumption in study participant didn't show any statistically significant association. ($\chi2 = 0.03$, $p = 0.85$). With respect to obstetric profile, study participant's age at marriage either early or late ($\chi2 = 56.97$, $p<0.00001$), elderly primigravida ($\chi2 = 23.65$, $p<0.00001$), consanguineous marriage ($\chi2 = 9.33$, $p = 0.002$) and higher order of pregnancy in the study participant ($\chi2 = 92.3$, $p<0.00001$) showed a statistically significant association.

According to univariate logistic regression women aged ≥30 years were 3 to 6 times more likely to have an abortion. Similarly, if study participant's husband were aged 30 years or more, the odds of women having an abortion was 2 to 6 times. Study subjects who were Muslims were more than 2 times likely to have an abortion, when compared to study subjects who were Hindus. Study participant who had no education and who had degree were 1.7 times and 2.4 times more likely to have an abortion respectively. Study participant who belonged to Socioeconomic class I, class II and class III were 4.5 times, 3.6 times and 2.4 times more likely to have an abortion respectively. Study subjects who were underweight, overweight and obese had 3 times, 1.7 times and 2.5 times higher chance of having an abortion. Women who consumed tobacco had 1.8 times higher odds of having an abortion and study subject who experienced domestic violence had 2.5 times higher odds of having an abortion. Study subject who married before 18 years and those who married after 30 years were 3.6 times and 6.6 times more likely to have an abortion respectively. Similarly,

women who had early first pregnancy were 2.3 times more likely to have abortion and elderly primigravida had 5.3 times more odds of pregnancy ending in abortion. Study subject who had a consanguineous marriage had 1.8 times higher odds of having an abortion. Women who had 2nd pregnancy order, 3rd pregnancy order and 4th pregnancy order or more were 2.5 times, 4 times and 17 times more likely to have an abortion respectively.

On further analysis by multivariate logistic regression, the following risk factors were found to be significantly associated with prevalence of abortion. It was noted that when the age of the husband of the study subject was more than 30 years, the odds of the women having an abortion was 2.4 to 3.7 times higher. Women that had degree level education had more than 3 times higher odds of having an abortion when compared to those who had high school education. Study subjects belonging to socioeconomic class I had 7.4 times higher odds, while those who belonged to class II had 9 times higher odds and women of socioeconomic class III had 4.5 times higher odds of having an abortion when compared to women in socioeconomic class IV. Women who were underweight had 4.5 times higher chance of having an abortion and women who had married before the legal age of 18 years had 3 times higher odds of having an abortion. Regarding pregnancy order, women who had 2nd pregnancy order had 4 times higher odds, women who had 3rd pregnancy order had 14 times higher odds and women who had 4th pregnancy order or more had 47 times higher odds of having an abortion.

LIST OF REFERENCE

1. Dasgupta P, Biswas R, Das DK, Roy JK. Occurrence and predictors of abortion among women of the reproductive age group in a block of Darjeeling District, West Bengal, India. Indian J Public Health. 2019;63(4):298 – 304
2. https://en.wikipedia.org/w/index.php?title=Definitions_of_abortion&oldid=914992839 Accessed on: 12/08/2019
3. Banerjee SK, Andersen KL, Warvadekar J. Pathways and consequences of unsafe abortion: A comparison among women with complications after induced and spontaneous abortions in Madhya Pradesh, India. International Journal of Gynecology and Obstetrics. 2012; 118(2): S113 – S120
4. Patki A, Chauhan N. An epidemiology study to determine the prevalence and risk factors associated with recurrent spontaneous miscarriage in India. J Obstet Gyanecol India. 2016; 66(5): 310 – 5.
5. https://en.wikipedia.org/w/index.php?title=Abortion&oldid=915037766 Accessed on: 12/08/2019
6. Grimes DA, Benson J, Singh S, Romero M, Ganatra B, Okonofua FE, et al. Unsafe abortion: the preventable pandemic. Lancet. 2006; 368(9550): 1908 – 19
7. Yokoe R, Rowe R, Choudhury SS, Rani A, Zahir F, Nair M. Unsafe abortion and abortion-related death among 1.8 million women in India. BMJ Glob Health. 2019; 4(3): 1 – 13
8. Lissauer D, Wilson A, Daniels J, Middleton L, Bishop J, Hewitt C, et al. Prophylactic antibiotics to reduce pelvic infection in women having miscarriage surgery – The AIMS (Antibiotics in Miscarriage Surgery) trial: study protocol for a randomized controlled trial.BMC Trial.2018;19(245):1-8.

9. https://www.who.int/reproductivehealth/news/440KeyAbortionFactsFinal.pdf. Accessed on: 14/08/2019
10. Singh S, Shekhar C, Acharya R, Moore AM, Stillman M, Pradhan MR, et al. The incidence of abortion and unintended pregnancy in India, 2015. Lancet Global Health. 2018; 6(1): e111 – 20
11. http://www.johnstonsarchive.net/policy/abortion/india/ab-indias2.html. Accessed on: 14/08/2019.
12. Dutta DC. DC Dutta's Text book of Obstetrics. 9th Edition. New Delhi: Jaypee Brothers Medical Publisher (P) Ltd; 2018. 151 – 53
13. Pinar MH, Gibbins K, He M, Kostadinov S, Silver R. Early Pregnancy Losses: Review of Nomenclature, Histopathology and Possible Etiologies. Fetal and Pediatric Pathology. 2018; 37(3): 191 – 209
14. Dhaded SM, Somannavar MS, Jacob JP, McClure EM, Vernekar SS, Yogeshkumar S, et al. Early pregnancy loss in Belagavi, Karnataka, India 2014 -2017: a prospective population-based observational study in a low resource setting. Reproductive Health. 2018; 15(95): 15 – 22.
15. https://censusindia.gov.in/census_and_you/area_and_population.aspx Accessed on: 14/10/2021
16. https://www.unicef.org/india/what-we-do/newborn-and-child-health#:~:text=With%20the%20birth%20of%2025,first%2024%20hours%20after%20birth. Accessed on: 14/10/2021
17. Dhillon BS, Chandhiok N, Kambo I, Saxena NC. Induced abortion and concurrent adoption of contraception in the rural areas of India (an ICMR task force study). Indian Journal of Medical Sciences. 2004; 58(11): 478 – 484

18. Swain PK, Jena A, Priyadarshini S. An Analysis of Trend, Pattern, and Determinants of Abortion, Miscarriage, and Stillbirths in Odisha, India. Journal of population and social studies. 2021; 29:223 – 234
19. Sivasane DS, Daver RG. Study of pregnancy outcome of threatened abortion and its correlation with risk factors in a tertiary care hospital of Mumbai, India. Int J Reprod Contracept Obstet Gynecol 2018 ;7(11):4598 – 4603
20. Pokale, YS, Khadke, P. Risk of Recurrent Miscarriage in India and the Effect of Paternal Age and Maternal Age. IRA-International Journal of Applied Sciences 2016; 3(3):459 – 468
21. Thaker R, Oza H, Verma V, Kumar S. Parental Factors Associated with Pregnancy Outcome With Reference to Spontaneous Abortion. Int J of Health Sci Res. 2018; 8(12):1 – 8
22. Kant S, Srivastava R, Rai SK, Misra P, Charlette L, Pandav CS. Induced abortion in villages of Ballabgarh HDSS: rates, trends, causes and determinants. Reproductive Health 2015; 12(51):1 – 7
23. Bhilwar M, Lal P, Sharma N, Bhalla P, Kumar A. Prevalence of induced abortions and contraceptive use among married women in an urban slum of Delhi, India. Int J Gynaecol Obstet 2017; 136: 29 – 32
24. Kumari S, Kishore J, Pandit V, Aparnavi P, Kumar M, Smanla S. Teenage Marriages and Induced Abortion among Women of Reproductive Age Group (15-49 Years) Residing in an Urbanized Village of Delhi. Ind J Youth Adozazaal Health 2019; 6(1): 15 – 20
25. Thakuri DS, Ghimire PR, Poudel S, Khatri RB. Association between Intimate Partner Violence and Abortion in Nepal: A Pooled Analysis of Nepal

Demographic and Health Surveys (2011 and 2016). BioMed Research International. 2020;2020:1-11

26. Huan Z, Yongping L, Lu L, Min Z, Xingzhi C, Yulong Q. Maternal pre-pregnancy risk factors for miscarriage from a prevention perspective: a cohort study in China. European Journal of Obstetrics & Gynecology and Reproductive Biology 2016; 206: 57 – 63
27. Hu X, Miao M, Bai Y, Cheng N, Ren X. Reproductive Factors and Risk of Spontaneous Abortion in the Jinchang Cohort. Int. J. Environ. Res. Public Health 2018; 15(11): 1 – 9
28. Moradinazar M , Najafi F, Nazar ZM, Hamzeh,B, Pasdar Y, Shakiba E. Lifetime Prevalence of Abortion and Risk Factors in Women: Evidence from a Cohort Study Journal of Pregnancy. 2020;27:1–8.
29. Warsy AS, Alkhuriji A, Al‐Marry BAA, Alraqibah AA, Alharbi AA, Babay Z, et al. Consanguinity in unexplained recurrent pregnancy loss and preterm delivery among Saudi females. J Nat Sci Med 2020; 3:33-8.
30. Lamina MA. Prevalence of Abortion and Contraceptive Practice among women Seeking Repeat Induced Abortion in Western Nigeria. Journal of Pregnancy 2015;10:1–7
31. Park C, Kang M-Y, Kim D, Park J, Eom H, Kim E-A. Prevalence of abortion and adverse pregnancy outcomes among working women in Korea: A cross-sectional study. PLoS ONE. 2017; 12(8): 1 – 13
32. Magnus MC, Wilcox AJ, Morken N-H, Weinberg CR, Haberg SE. Role of maternal age and pregnancy history in risk of miscarriage: prospective register based study. BMJ. 2019; 364: l869

33. Hahn KA, Wise1 LA, Rothman KJ, Mikkelsen EM, Brogly SB, Sorensen HT, et al. Caffeine and caffeinated beverage consumption and risk of spontaneous abortion. Human Reproduction. 2015; 30(5): 1246–1255.
34. Sundermann AC, Hartmann KE, Jones SH, Torstenson ES, Velez Edwards DR. Interpregnancy Interval After Pregnancy Loss and Risk of Repeat Miscarriage. Obstet Gynecol. 2017; 130(6): 1312–1318.
35. Sundermann AC, Velez Edwards DR, Slaughter JC, Wu P, Jones SH, Torstenson ES, et al. Week-by-week alcohol consumption in early pregnancy and spontaneous abortion risk: a prospective cohort study. Am J Obstet Gynecol 2021; 224: 97.e1-16.
36. Strumpf E, Lang A, Austin N, Derksen SA, Bolton JM, Brownell MD, et al. Prevalence and clinical, social, and health care predictors of miscarriage. BMC Pregnancy and Childbirth 2021; 21(185) 1 – 9
37. Pineles BL, Park E, Samet JM. Systematic Review and Meta-Analysis of Miscarriage and Maternal Exposure to Tobacco Smoke During Pregnancy. Am J Epidemiol.2014;179(7): 807 – 823
38. Census India by Government of India, Ministry of Home affairs 2011. Available from: https://censusindia.gov.in/2011census/dchb/KarnatakaA.html Accessed on 12.10.2021
39. Debnath DJ. Kakkar R. Modified BG Prasad Socio-economic Classification, Updated – 2020. Indian J Comm Health. 2020;32(1):124-125.
40. K. Park's Textbook of Preventive and Social Medicine, 24th ed., Banarsidas Bhanot publications, 2017, 715-765.
41. National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular diseases and Stroke (NPCDCS), A Manual for Medical

Officers, Developed under the Government of India-WHO Collaborative Programme 2008- 2009, pdf, available from: https://www.searo.who.int/india/topics/cardiovascular_diseases/NCD_Resources_COMBINED_MANUAL_for_medical_officer.pdf

42. Sharma SK, Kalam MA, Ghosh S, Roy S. Prevalence and determinants of consanguineous marriage and its types in India: evidence from the National Family Health Survey, 2015–2016. Journal of Biosocial Science. 2021;53(4):566–76
43. Dutta DC. Textbook of Obstetrics. 7th ed. New Central Book Agency (P) Ltd, Kolkata. 2013; 64-158.
44. http://rchiips.org/nfhs/NFHS-5Report_KA.shtml
    Accessed on: 04.11.2021
45. Gaskins AJ, Rich-Edwards JW, Williams PL, Toth TL, Missmer SA, Chavarro JE. Pre-pregnancy caffeine and caffeinated beverage intake and risk of spontaneous abortion. Eur J Nutr. 2018; 57(1): 107 – 117
46. Zavier F ,Santhya KG, Shireen J, Jejeebhoy. Abortion among married young women: findings from a community-based study in Rajasthan and Uttar Pradesh, India. Journal of Biosocial Science. 2020;52(5):650–63
47. Jain V, Saha SC, Bagga R, Gopalan S. Unsafe abortion: A neglected tragedy. Review from a tertiary care hospital in India. J. Obstet. Gynaecol. Res. 2004; 30(3); 197 – 201
48. Yogi A, Prakash KC , Neupane S. Prevalence and factors associated with abortion and unsafe abortion in Nepal: a nationwide cross-sectional study. BMC Pregnancy and Childbirth. 2018; 18:376.

ANNEXURE

ANNEXURE I – ETHICAL CLEARANCE LETTER

K.L.E. ACADEMY OF HIGHER EDUCATION AND RESEARCH
(Deemed to be University)
Accredited 'A' Grade by NAAC (2nd Cycle) Placed in Category 'A' by MHRD (GoI)
JAWAHARLAL NEHRU MEDICAL COLLEGE,
NEHRU NAGAR, BELAGAVI-590010 (KARNATAKA-INDIA)
Website: http\\www.jnmc.edu
E-Mail : dome@jnmc.edu
Phone: (+91-(0)831 Office : 2472550
Principal: 2471701
Fax No. +91 (0)831 – 2470759

Ref: MDC/DOME/ 221 **Date: 24/12/2019**

To,
(REG NO. BD0119006)
PG student in Community Medicine,
J.N.Medical College,
BELAGAVI.

Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled "PREVALENCE OF ABORTION AMONG MARRIED WOMEN AGED 20-24 YEARS IN A RURAL AREA", is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee on Human Subjects Research.

(Dr. Anita Dalal)
Member Secretary
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

(Dr. Roopa M Bellad)
Chairman,
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

ANNEXURE II – WRITTEN INFORMED CONSENT FORM

PREVALENCE OF ABORTION AMONG MARRIED WOMEN AGED 20 – 40 YEARS IN A RURAL AREA.

INVESTIGATORS:

OBJECTIVE/PURPOSE OF THE STUDY:

Pregnancy loss is a frequent complication of human pregnancy. Almost 50-70% of pregnancies are lost prior to second trimester. Around 21.6 million abortions are unsafe out of the estimated 43.8 million abortions. Nearly 7 million women in developing countries are treated for complications from unsafe abortions annually, and atleast 22,000 die from abortion-related complications every year. So, this study will be carried with a view to know the prevalence of abortion in a rural area and various risk factors leading to it.

EXPLANATION OF PROCEDURE:

I will be personally interview you using a pre designed and pre tested questionnaire to obtain your socio-demographic detail, complete obstetric history and maternal habits. Detailed history regarding the lost pregnancies, past history, etc. will be collected. The interview will take not more than 40 minutes per participant.

POSSIBLE BENEFITS:

The investigator does not promise or guarantee that you will receive direct benefit by being in this study. It will benefit the whole community because by this study, we will be able to determine the maternal risk factors associated with abortion.

POSSIBLE RISKS:

There is no risk associated with participation in this study.

PRIVACY & CONFIDENTIALITY:

Your identity will not be revealed. All information will be collected, coded and anonymized so that no one will know the identify.

WITHDRAWAL FROM THE STUDY:

Participation in this study is voluntary. If not willing you are free to withdraw from this study at any point of time.

COSTS OF PARTICIPATION:

The cost of the study will be borne by the investigator. There will be no additional cost to you for participating in this study.

FINANCIAL INCENTIVES FOR PARTICIPATION:

There will be no incentives to you for participating in this study.

AUTHORIZATION TO PUBLISH RESULTS:

The investigator may use the information gathered from this study for presentation in scientific meets or publication in journals. However, your identity will not be disclosed in such presentation or publication.

LEGAL RIGHTS:

By signing this consent form, you are not waiving any of your legal rights.

QUESTIONS:

If you have any questions about this study, you may contact DR. RAM PRAGADEESH. S, Post graduate, J.N Medical College, Belagavi-590010, Mobile number: 9489475854 or DR. CHANDRA S. METGUD, Professor, Department of Community Medicine, J.N Medical College, Belagavi-590010, Mobile number: 9449800517. If you have any questions about your rights as a study participant, you may contact DR. ROOPA M BELLAD,Chairman, JNMC Institutional Ethics Committee on human subjects' research at 0831-2741701.

CONSENT STATEMENT

"I have been explained all the contents of this consent form in my local language and have understood and clarifies all my queries about the study to the best of my knowledge. Furthermore, I recognize that I have the complete right to withdraw the consent at any point during the study. I understand that the information given by me will be confidential and will be used for research purpose only. Further, I am aware that the result of this research will be presented / published without disclosing any personal identification of the participants.

I hereby give my voluntary consent for participation in this study. I do sign the informed consent form in front of an eyewitness whom I recognize."

Name of the participant: _____Signature/ left thumb impression

Name of the eyewitness:_____Signature/ left thumb impression

Name of investigator_____Signature:

Date: | | | |

ANNEXURE III – RESEARCH PROFORMA

PREVALENCE OF ABORTION AMONG MARRIED WOMEN AGED 20 – 40 YEARS IN A RURAL AREA.

PART-I SOCIO-DEMOGRAPHIC ASPECTS

1. Name:

2. Age: Age of Husband: _____

3. Name of the Village: Name of the sub-centre:

4. Contact number:

5. Height (cm): 6. Weight (kg): 7. BMI (kg/m^2):

8. Religion:

a. Hindu b. Muslim c. Christian d. Others (specify) _____

9. Education:

a. Illiterate b. Primary school c. High school d. Pre-university e. Degree

10. Education of Husband:

a. Illiterate b. Primary school c. High school d. Pre-university e. Degree

11. Occupation:

12. Occupation of husband:

13. Income:

a. Monthly income of the family :

b. Total number of family member :

c. Monthly per capita income :

14. Type of Family:

a. Joint b. Nuclear c. Broken family d. Problem family e. Three generation family

MATERNAL HABITS

15. H/O Drinking Coffee: Yes/ No If Yes, Number of cups per day:

16. H/O Tobacco use: Yes/No If Yes, How? : _____

Frequency? _____ (packets/ day)

Duration: _____

Age of initiation: _____

17. H/O Smoking: Yes/ No If Yes, What? _____

Frequency? _____ (packets/ day)

Duration: _____

Age of initiation: _____

18. H/O Drinking Alcohol: Yes / No If Yes, What? _____

Frequency? _____ (quantity/ day)

Duration: _____

Age of initiation: _____

19. H/O Illicit drug use: Yes/ No

20. H/O bruising following minor injuries present? Yes/No

21. H/O Domestic Violence? Yes/No

If yes, specify: _____

OBSTETRIC HISTORY

Pregnancy order	Age of mother at pregnancy (in years)	Outcome of pregnancy	H/O domestic violence (Yes/No) (If yes, specify what)
1st			
2nd			
3rd			
4th			
5th			
6th			
7th			
8th			
9th			
10th			

22. Age at Marriage:

23. Duration of Married life:

24. Consanguineous Marriage: Yes / No

If yes, how was he related to you before marriage: _____

25. Age at 1st Pregnancy:

26. Obstetric Score:

DETAILED HISTORY ABOUT ABORTIONS, IF ANY:

S. No	Period Of Gestation (in Weeks)	Confirmed pregnancy (Yes/No) If yes, how	Spontaneous Or Induced If induced reason and method - Medical/ Surgical/ Others	Conducted at (Government hospital/ Private hospital/ Home)	Conducted by (Physician/ Nurse or ANM/ Traditional Birth attendant/ Family member)	H/O invasive investigation during pregnancy (YES/ NO)	Complication following abortion Yes/No IF yes, specify
1.							
2.							
3.							
4.							

Introduction

Aim and Objectives

Review of Literature

Methodology

Results

Discussion

Conclusion

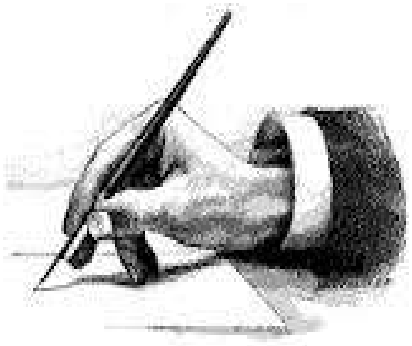
Recommendations

Strengths

Limitations

Summary

Bibliography



Annexures