INTRODUCTION

Parenthood is a fundamental human need. Every human being has a desire to become a parent and look after his or her children. Fertility or the ability to produce children has a positive social value.\(^1\) Worldwide, 48.5 million couples are unable to have a child, of which 19.2 million couples are unable to have a first child, and 29.3 million couples are unable to have an additional.\(^2\) An increasing trend of infertility in South Asia, 6% has been noticed recently in Nepal this prevalence is higher than (4%) Bangladesh and (5%) Pakistan.\(^3\)

The total fertility rate has declined markedly in Nepal over time. The fertility decline in female already starts around 25-30 years of age.\(^4,5\) In any given month; couple has a 20% chance of conceiving. In a lifetime, 10-15% of couples will experience infertility. This number increases to 33% than the women's age is above 35 years. In about 45% of cases there is a male-originn for the infertility, female-origin infertility accounts for 30% of cases, and in 20%, both partners are the source of difficulties.\(^6\) Due to infertility several adverse consequences occur in the form of tension, hostility, anxiety, depression, self-blame and suicidal ideation too.\(^7\) Very few studies have been conducted awareness in infertility. It is important to examine the awareness to see to what extent there may be room for improvement in the light of current knowledge.

The study was aimed to assess the awareness regarding infertility among women attending Chitwan Fertility Center.

METHODS

A cross-sectional analytical study design was adopted with the aim to assess the awareness regarding infertility among women. The data was collected in Chitwan Fertility Center of Bharatpur 10, from Jun 22 to July 4, 2019. The study population included married women who had failure to conceive after one year of regular unprotected coitus. Non probability purposive sampling technique was used to select samples. Calculated sample size was 96. The questionnaire was developed by the researcher based on extensive literature review and consultation with subject expert. A semi-structured interview schedule was used as data collection tool. It consisted of two parts; part I was related to socio-demographic variables and Part II contained questions related to awareness. These questions were answered on a Yes/No basis with an additional “I don’t know” option. A correct answer was assigned 1 point and an
incorrect/unknown answer was assigned 0 points. The total knowledge score ranged from 0 to 24, with a higher score denoting a better awareness of infertility. Prior to data collection ethical approval was obtained from the Institutional Review Committee SMTC-IRC-20190524-62. The principal investigator collected the data through interview method after taken written consent. Collected data was entered in excel, analyzed in SPSS 20 version and interpreted by using descriptive statistics (frequency percentage) and inferential statistics (chi-square).

RESULTS

Table 1: Sociodemographic characteristics of the respondent n=96

| Variable                  | Frequency (%) |
|---------------------------|---------------|
| Age group (years)         |               |
| <20                       | 2(2.1)        |
| 21-25                     | 17(17.7)      |
| 26-30                     | 44(45.8)      |
| 31-35                     | 21(21.9)      |
| >35                       | 12(12.5)      |
| Mean ±SD=29.29±4.516, Min 16 ,Max 38 |
| Education                 |               |
| Literate                  | 96(100)       |
| Educational status        |               |
| Basic education           | 1(1)          |
| Secondary level           | 41(42.7)      |
| Bachelor level & above    | 54(56.3)      |
| Occupation                |               |
| Business                  | 32(33.3)      |
| Service                   | 31(32.3)      |
| Agriculture               | 27(28.1)      |
| Labor                     | 6(6.3)        |
| Family monthly income (NRs) |           |
| <20000                    | 25(26)        |
| 20000-35000               | 29(30.2)      |
| 35000-50000               | 21(21.9)      |
| 50000-65000               | 4(4.2)        |
| 65000-80000               | 11(11.5)      |
| >80000                    | 6(6.3)        |
| Mean ± SD = 40020.8333 ± 4.51644, Min 9000, Max 90000 |
| Regular menstruation cycle |           |
| Yes                       | 69(71.9)      |
| No                        | 27(28.1)      |
| Duration of marriage (years) |          |
| 1-5                       | 35(36.5)      |
| 6-10                      | 42(43.8)      |
| 11-15                     | 16(16.7)      |
| >15                       | 3(3.1)        |
| Commonly blamed for infertility |          |
| Wife                      | 68(70.8)      |
| Husband                   | 2(2.1)        |
| Both                      | 26(27.1)      |

Table 1 showed out of 96 respondents, majority of the respondents 45.8% were from age group of 25-30 years. Concerning about education, all of them were literate. Most of the respondents 56.3% had completed bachelor level and above. In occupation, 33.3% were engaged in business, 30.2% respondents had monthly family income within Rs. 20000 to 35000. Majority of respondents 71.9% had regular menstruation cycle. Most of the respondents 43.8% had married 5-10 years ago. Maximum respondents 70.8% said wife was blamed for infertility problem.

The major problems faced by infertile women were remarriage 80 (83.3%) and rejection from society 79 (82.3). The source of information for most of the respondents were health personnel 85.4% and newspaper 76% (Table 2).

Table 2: Problem faced by infertile women and sources of information on infertility (multiple responses)

| Variable                  | Frequency (%) |
|---------------------------|---------------|
| Problem faced by infertile women |         |
| Physical violence          | 51(53.1)      |
| Rejection from society     | 79(82.3)      |
| Remarriage                 | 80(83.3)      |
| Suicide                    | 25(26)        |
| Mental violence            | 18(18.8)      |
| Source of information      |               |
| Newspaper                  | 73(76)        |
| Health personnel           | 82(85.4)      |
| Friends                    | 55(57.3)      |
| Television                 | 41(42.7)      |
| Mass media                 | 22(22.9)      |

Table 3 showed that most of the respondent 87.50% had good awareness on infertility and 12.50% had poor level with mean score 21.2813 ±SD2.05556 awareness on infertility.

Table 4 showed that more than half of the respondents 66.7% knew the meaning of infertility. Most of the respondent 86.5% knew the meaning of primary infertility and 69.8% knew the meaning of secondary infertility. Maximum number of the respondents 90.6% said both male and female are responsible for infertility. Regarding the meaning of ovum and sperm, 89.6% knew the meaning of ovum as egg of female and 68.8% knew the meaning of sperm and responded it as male gamete. Regarding the period of ovulation occurrence, majority of the respondents 63.5% knew, Most of the respondents 86.5% gave correct response of conception as union of ovum and sperm. Most of the respondents 92.7% gave correct response regarding the causes of female infertility as stress. Likewise, 92.7% answered low sperm count as common causes of male infertility. Regarding the risk of female infertility, 54.2% of the respondents take age. Most of the respondents 97.9% take age group 20 to 30 years as fertile age, 95.8% preferred hospital as their first visit for treatment. Hormonal drugs were selected by 87.5% respondents for main treatment of female infertility and by 90.6%respondents for main treatment of male infertility.
Table 3: Respondents’ level of awareness on infertility  n=96

| Level of awareness | Frequency (%) | Mean score ±SD | Minimum score | Maximum score |
|--------------------|---------------|----------------|---------------|---------------|
| Good               | 84(87.50%)    | 21.2813±2.05556 | 13.00         | 26.00         |
| Poor               | 12(12.50%)    |                |               |               |

Table 4: Distribution of respondents according to awareness regarding infertility  n=96

| Awareness questions | Correct answer                                                                 | Frequency (%) |
|---------------------|-----------------------------------------------------------------------------|---------------|
| Meaning of infertility | Failure to conceive in more than years of regular unprotected coitus       | 64(66.7)      |
| Meaning of primary infertility | Couple who have never conceived.                                         | 83(86.5)      |
| Meaning of secondary infertility | Previous pregnancy and have one child                                      | 67(69.8)      |
| Responsible for infertility | Both male and female                                                        | 87(90.6)      |
| Meaning of ovum     | Egg of female                                                               | 86(89.6)      |
| Meaning of sperm    | Male gamete                                                                  | 66(68.8)      |
| Ovulation occurrence | 14 days after menstruation                                                  | 61(63.5)      |
| Meaning of conception | Union of ovum and sperm                                                      | 83(86.5)      |
| Common causes of female infertility | Lack of ovulation                                                           | 89(92.7)      |
| Common causes of male infertility | Low sperm count                                                             | 89(92.7)      |
| True about risk of female infertility | Age                                                                        | 52(54.2)      |
| Fertile age to become pregnant | 20-30                                                                      | 94(97.9)      |
| Go first for the treatment | Hospital                                                                     | 92(95.8)      |
| Main treatment for female infertility | Hormonal drugs                                                              | 84(87.5)      |
| Main treatment for male infertility | Hormonal drugs                                                              | 87(90.6)      |

Table 5: Awareness on male risk of infertility and prevention of infertility (multiple responses)

| Awareness questions | Correct answer | Frequency (%) |
|---------------------|----------------|---------------|
| Male risk of infertility | STIs           | 60(62.5)      |
|                     | Smoking        | 93(96.9)      |
|                     | Alcohol        | 81(84.4)      |
| Wearing Tight panty/pants |                   | 55(57.3)      |
| Working in hot environment |                   | 74(77.1)      |
| Prevention of infertility | Pre conception counseling | 80(83.3)      |
|                     | Avoid smoking and alcohol    | 88(91.7)      |
|                     | Early screening             | 73(76.0)      |
|                     | Proper age of marriage      | 73(76.0)      |
|                     | Personal Hygiene            | 60.4(58)      |

Majority 96.9% of the respondents take smoking as the main risk of male infertility, alcohol 84.4%, working in hot environment 77.1%, STIs 62.5 and least on wearing tight panty/pants. Regarding the prevention of infertility, maximum number of respondents 91.7% chooses avoiding smoking and alcohol for while (Table 5).

Table 6 showed that there was no statistically significant association between level of awareness and socio-demographic variables.

**DISCUSSION**

In this study awareness on infertility was assessed among married women and found mostly adequate. Out of 96 respondents, majority 87.50% had good awareness, 12.50% had poor awareness. This finding is comparable with the findings of the study conducted by Kaur et al.¹ where 79% had good knowledge, 15% had poor knowledge. However, the good awareness is not the only factor for better practices and prevention. Increasing the level of awareness may help to decrease the incidence of infertility by allowing couples to avoid certain risk factors that might lead to it.

To be able to achieve the desired number of children by spontaneous conception, couples should try to conceive no later than at the age of 32 years for a one-child family, at 27 years for a two-child family, and at 23 years for three children.² In present study, 45.8% of the respondents were in the age group of 25-30 years and 43.8% of the respondents have marriage duration of 5-10 years. Similar findings were found in the study of Dattijo et al.³ Numerous factors such as age and duration of marriage have been associated with reduced fertility.¹ The fertility decline in female already starts around 25-30 years of age.⁴ The risk factors for infertility include age, smoking, obesity, alcohol consumption menstrual cycle and current lifestyle...
Table 6: Association between level of awareness on infertility and socio-demographic variable

| Variable                        | Level of Awareness | $\chi^2$ Value | p-Value |
|---------------------------------|--------------------|----------------|---------|
|                                 | Good               | Poor           |         |
| Age Group (In years)            |                    |                |         |
| ≤20-30                          | 54(85.7)           | 9(14.3)        | 0.534   | 0.465 |
| 31- ≥40                         | 30(90.9)           | 3(9.1)         |         |       |
| Educational status              |                    |                |         |
| Below bachelor                  | 48(88.9)           | 6(11.1)        | 0.218   | 0.641 |
| Bachelor & above                | 36(85.7)           | 6(14.3)        |         |       |
| Occupation                      |                    |                |         |
| Business                        | 27(84.4)           | 5(15.6)        | 0.516   | 0.773 |
| Services                        | 28(90.3)           | 3(9.7)         |         |       |
| Agriculture and labor           | 29(87.9)           | 4(12.1)        |         |       |
| Family monthly income (NRS)     |                    |                |         |
| ≤9000-30000                     | 43(86)             | 7(14)          | 0.234   | 0.889 |
| 31000-60000                     | 26(89.7)           | 3(10.3)        |         |       |
| 61000-90000                     | 15(88.2)           | 2(11.8)        |         |       |
| Regularity of menstruation cycle|                    |                |         |
| Yes                             | 62(89.9)           | 7(10.1)        | 1.244   | 0.216 |
| No                              | 22(81.5)           | 5(18.5)        |         |       |
| Duration of marriage (Years)    |                    |                |         |
| ≤10                             | 60(87)             | 9(13)          | 0.066   | 0.797 |
| >10                             | 24(88.9)           | 3(11.1)        |         |       |
| Commonly blamed for infertility |                    |                |         |
| Wife                            | 61(89.7)           | 7(10.3)        | 2.159   | 0.340 |
| Husband                         | 1(50.0)            | 1(50.0)        |         |       |
| Both                            | 22(84.6)           | 4(15.4)        |         |       |

Habits (e.g., alcohol consumption, smoking) are common. In this study, 71.9% of the respondents had regular menstruation cycle. This finding is also supported by the study of Kaur et al. where 73% had regular menstruation cycle.

This study identified that, women 70.80%, were commonly blamed for the infertility problem. This finding is supported by the study of Dattijo et al. where 73.60% respondents said wife are commonly blamed for the infertility problem. Infertility is not merely the health problem; it is also a matter of social justice and inequality. It is also complicated marital dynamics, some time leading to marital inability and occasionally divorce, polygamy or remarriage because motherhood is considered a mandatory status, infertile women may be harassed and tormented. Women for often blamed for the infertility and men engaged in polygamy in an attempt to have children. Awareness may also help wider society to understand and empathize with the infertile couple, which may lead to a decrease in the psychological burden to those affected.

The source of information, 85.4% of the respondents had selected health personnel which contracts the similar study by Kaur et al. where 64% had selected friend as their source of information. In this study most of the respondents have 5 to 10 years of married durations and were in the regular check up with health personnel that might be the reason to select health personnel as a source person.

The present study showed that, majority of respondents 66.70% stated the correct definition of infertility, regarding the ovulation occurrence period, 63.5% knows the time of ovulation occurrence, 86.5% of respondents knew the meaning of conception as union of ovum and sperm this finding is contracts with the study conducted by Ali, et al. where only 36% choose the correct option. Only 32% were able to give the correct meaning of conception. In this study most of the respondents were educated bachelor and above.

Several studies have noted noxious effects of tobacco before and after conception, in both women and men, from the smokers’ gametes to their offspring. In this study finding, regarding risk of male infertility, 96.9% of the women take smoking as the main risk of male infertility while 84.4% said alcohol, 77.1% choose working in hot environment, 62.5% choose STIs and only 57.3% choose wearing tight panty/pants as risk of male infertility. The first place for treatment of infertility problem, most of the respondents 95.8% preferred hospital which contrasts the study of Dattijo et al. where 42.10% of respondents choose traditional healer and only 28.3% preferred hospital for treatment. This might be due to most of the respondents of this study were aware, educated and on regular checkup with health personnel.

The study population was small and conducted in Fertility Centre Chitwan Bharatpur only, hence the study findings cannot be generalized.
CONCLUSION

It can be concluded that the awareness about infertility among the respondents attending Chitwan fertility center is relatively good. Most of the participants were educated, duration of marriage was also 5-10 years that might be the reason they possess good awareness. But there is still misconception in some of the participants. Women are facing problems like physical violence, rejection from society and family member, remarriage, and mental violence. So it is necessary to implement counseling, screening, education and information services to the couple about infertility.

ACKNOWLEDGEMENT

Researchers deeply express their heartfelt thanks to all who participated in the study for immense support and cooperation. Researchers would also express their gratitude to all those experts for their valuable suggestion and constructive feedbacks throughout the study.

CONFLICT OF INTEREST: None

FINANCIAL DISCLOSURE: None

REFERENCES:

1. Kaur M, Kaur A. A Descriptive Study to assess the knowledge of Females regarding Female Infertility in selected area at Jandiala Guru Amritsar with view to develop an informational guidelines. International Journal of Advances in Nursing Management. 2016;4(3):249-53. [DOI]

2. Mascarenhas MN, Flaxman SR, Boerma T, Vanderpoel S, Stevens GA. National, regional, and global trends in infertility prevalence since 1990: a systematic analysis of 277 health surveys. PLoS Med. 2012 Dec 18;9(12):e1001356. [DOI]

3. Zegers-Hochschild F, Adamson GD, de Mouzon J, Ishihara O, Mansour R, Nygren K, Sullivan E, Van der Poel S. The international committee for monitoring assisted reproductive technology (ICMART) and the world health organization (WHO) revised glossary on ART terminology, 2009. Human reproduction. 2009 Nov 1;24(11):2683-7. [DOI]

4. Khatri RB, Mishra SR, Khanal V. Female community health volunteers in community-based health programs of Nepal: future perspective. Frontiers in public health. 2017 Jul 21;5:181. [DOI]

5. Mahesh R., Gupta, M., Kandpal, S., Malhotra, N., Vanamail, P., Singh, N. and Kriplani, A., 2018. Fertility awareness and knowledge among Indian women attending an infertility clinic: a cross-sectional study. BMC women’s health, 18(1), p.177. [DOI]

6. Vander Borght M, Wyns C. Fertility and infertility: Definition and epidemiology. Clinical biochemistry. 2018 Dec 1;62:2-10. [DOI]

7. Ali S, Sophie R, Imam AM, Khan FI, Ali SF, Shaikh A, Farid-ul-Hasnain S. Knowledge, perceptions and myths regarding infertility among selected adult population in Pakistan: a cross-sectional study. BMC Public Health. 2011 Dec 1;11(1):760. [DOI]

8. Habbema JD, Eijkemans MJ, Leridon H, te Velde ER. Realizing a desired family size: when should couples start?. Human Reproduction. 2015 Sep 1;30(9):2215-21. [DOI]

9. Dattijo L, Andreadis N, Aminu B, Umar N, Black K. Knowledge of infertility among infertile women in Bauchi, Northern Nigeria. Age (years). 2016;20(13):3-2.

10. Bunting L, Boivin J. Knowledge about infertility risk factors, fertility myths and illusory benefits of healthy habits in young people. Human Reproduction. 2008 Aug 1;23(8):1858-64. [DOI]

11. Abolfotouh MA, Alabdrabalnabi AA, Albacker RB, Al-Jughaiman UA, Has-San SN. Knowledge, attitude, and practices of infertility among Saudi couples. International journal of general medicine. 2013;6:563. [DOI]

12. Shiloh H, Baratz SL, Kolman M, Ishai D, Bidder D, Weiner-Megnazi Z, Dirnfeld M. The impact of cigarette smoking on zona pellucida thickness of oocytes and embryos prior to transfer into the uterine cavity. Human Reproduction. 2004 Jan 1;19(1):157-9. [DOI]