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Original Article

Obstetrics and Gynaecology Section

Fertility Awareness and its Association with Socio-demographic and Reproductive Variables among Women Seeking Fertility Treatment: A Cross-sectional Study

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ABSTRACT

Introduction: In the last decade, there was a substantial reduction in fertility rates in Indian women. Despite a high burden of infertility, Fertility Awareness (FA) among people of reproductive age group is generally poor. Infertility is associated with significant negative impact on social and psychological well-being of the married couple. Therefore there is a need for awareness on fertility among Indian women.

Aim: To assess the level of fertility awareness and determine the impact of socio-demographic and reproductive variables on FA among a cohort of Indian women seeking fertility treatment.

Materials and Methods: A cross-sectional study was conducted in the Department of Obstetrics and Gynaecology at Pandit Bhagwat Dayal Sharma Postgraduate Institute of Medical Sciences, Rohtak, Haryana, India, including 108 women seeking fertility treatment over a period of six months. Participants were interviewed with a 10 item questionnaire and categorised into low (score <40%), moderate (score 40-59%) or high FA level (score ≥60%) according to percentage of correct answers. The association of socio-demographic and fertility characteristics with FA levels was statistically analysed using Statistical Package for the Social Sciences (SPSS) software version 18.0.

Results: Of the total 108 participants, majority (90.7%) of women were aged between 21-35 years and primary infertility (67.6%) was the most common type. The overall FA level was low in 27.8%, moderate in 44.4% and high in 27.8% study participants. Majority answered incorrectly about fertile period (60%) and age related fertility decline (55.6%). Nearly, two-thirds respondents believed that conception is not possible by any means if fallopian tubes are blocked. FA levels differed significantly between the age groups (p-value=0.001). The other socio-demographic and reproductive variables did not demonstrate any significant association with FA levels.

Conclusion: Considerable gaps in knowledge and understanding of fertility issues were identified irrespective of their socio-demographic and fertility characteristics which warrant urgent attention. Targeted interventions are required to ensure easy to access accurate fertility information for couples' informed decision making.

Keywords: Infertility, Knowledge, Socio-economic scale

INTRODUCTION

It is an old dictum that 'the eyes do not see what the mind does not know'. This dictum seems to be true in the current scenario of poor fertility knowledge worldwide [1-3]. As we know that the prevalence of infertility is on the rise, the global estimates suggest an estimated prevalence of infertility among 48 million couples worldwide [4,5]. Recent data indicate a substantial reduction in fertility rates in Indian women in last 40 years [6]. A number of factors may be potentially contributing to this worrisome situation such as trend of delaying marriages, increasing parental age, wish to postpone childbirth, focus on education and career, financial constraints, obesity, negative lifestyle factors, misconceptions related to fertility and fertility treatment [7]. Addressing infertility is an important issue as it is associated with significant negative impact on social and psychological well-being of the couples. Despite the high burden of infertility, prior literature suggests poor FA among people of reproductive age group and it may be an attributing factor to many couples not fulfilling their aspirations of parenthood [1-3]. Although timing of childbearing should be couples' own decision, but they often overestimate the chances of conception and are not fully aware about natural age related fertility decline and are then faced with unintended infertility. Therefore, there is an urgent need for couples to understand the actual facts about fertility and ideal child bearing age range for making informed decisions regarding parenthood and family planning.

To date, most research on FA has been done in developed nations and to best of our knowledge, only two previous studies have assessed FA and knowledge about reproductive health among Indian population [7-9]. The purpose of this study was to assess the FA level and evaluate the impact of age, residence, women' education, Socio-economic Scale (SES) and duration of infertility on FA among a cohort of Indian women seeking fertility treatment at a tertiary care teaching centre.

MATERIALS AND METHODS

This was a cross-sectional study conducted in the Department of Obstetrics and Gynaecology at Pandit Bhagwat Dayal Sharma Postgraduate Institute of Medical Sciences, Rohtak, Haryana, India from March 2020 to September 2020. All the subjects fulfilling the inclusion criteria who came to the Outpatient Department (OPD) during the study period of six months were included. A total of 108 women were finally enrolled in the study who gave informed consent. Ethical approval for the study was obtained (Approval number BREC/20/21 dated 06-03-2020).

Inclusion criteria: All sub fertile women in the age group of 18-45 years who experienced difficulty in conceiving for more than six months were included in the study.

Exclusion criteria: The women who were not in the reproductive age group and those who declined to participate in the study were excluded from the study.

Questionnaire

A 10 item FA questionnaire was prepared based on previous research studies [1,7,8]. The questionnaire was discussed with topic experts and modified according to the level of understanding of the study population. The questionnaire was converted into local language and pretested on a pilot sample of 30. It included questions related to natural fertility (4 questions), factors affecting fertility (3 questions), fertility related misconceptions and treatment options (3 questions). The same investigator interviewed all the study participants and filled the questionnaire by asking the women to select one answer from the options provided after each question. Average time taken to fill the questionnaire was 10-15 minutes. The participants' socio-demographic details and fertility characteristics were noted. FA score was determined by the percentage of correct responses to 10 questions. Each right answer was given score as 1 and wrong answer as score 0. The participants were classified into three levels of FA based on their overall FA score: low FA (score <40%); moderate FA (score 40-59%) and high FA (score >60%) [7]. The association of socio-demographic and fertility characteristics (age, type of residence, women' education, SES and duration of infertility) with FA was statistically analysed. The revised BG Prasad's SES classification for the year 2020 which is based on the per capita monthly income and applicable to both rural and urban Indian population was used to determine the SES of the participants [10].

STATISTICAL ANALYSIS

Data analysis was carried out using SPSS software version 18.0. Descriptive statistics such as mean and standard deviation were calculated for normally distributed data. Categorical data were presented as frequency and percentage values. Comparison of frequency data across categories were performed using Chi-square test. For all statistical tests a two-sided probability of p-value <0.05 was considered as statistically significant.

RESULTS

A total of 108 women participated in the study and completed the questionnaire. Majority (90.7%) of women aged between 21-35 years [Table/Fig-1]. Primary infertility was the most common type (67.6%) and maximum had period of infertility for ≤5 years [Table/Fig-2].

Characteristics	n (%)
Age (Years)	
≤20	6 (5.6)
21 to 35	98 (90.7)
>35	4 (3.7)
Residence	
Rural	32 (29.6)
Urban	76 (70.4)
Women' Education	
Uneducated	9 (8.3)
Primary	9 (8.3)
Secondary	44 (40.8)
Senior secondary	27 (25.0)
Graduate and above	19 (17.6)
Socio-economic status	
I	10 (9.3)
II	39 (36.1)
III	38 (35.2)
IV	20 (18.5)
V	1 (0.9)

[Table/Fig-1]: Baseline socio-demographic profile of study participants (n=108).

Characteristics	n (%)
Type of infertility	
Primary	73 (67.6)
Secondary	35 (32.4)
Duration of infertility	
≤5 years	67 (62.0)
6-10	26 (24.1)
>10 years	15 (13.9)
Miscarriage history	4 (3.7)

[Table/Fig-2]: Fertility history of study participants (n=108).

Majority answered incorrectly about fertile period (60%), age related fertility decline (55.6%). Only 31 (28.7%) respondents believed that conception is not possible by any means if fallopian tubes are blocked [Table/Fig-3].

Q. No.	Questions (correct answers)	Frequency of correct answers n (%)
1.	During which period of menstrual cycle are maximum chances of conception? (mid cycle)	43 (39.8)
2.	When should a couple seek medical advice for inability to conceive if woman is aged <35 years? (After one year of unprotected intercourse)	39 (36.1)
3.	Do you believe that fluid coming out from vagina after sexual intercourse reduces the chances of conception? (No)	30 (27.7)
4.	At what age is there a rapid decline in women's ability to conceive? (36-40)	48 (44.4)
5.	Does smoking and drinking by husband associated with infertility? (Yes)	63 (58.3)
6.	Does the prior use of oral contraceptive pills related with infertility? (No)	35 (32.4)
7.	Do recurrent genital tract infections negatively affect a women's fertility? (Yes)	56 (51.8)
8.	Is the pregnancy possible by any technique if tubes are blocked? (Yes)	31 (28.7)
9.	Do you know that husband too needs evaluation for infertility? (Yes)	100 (92.5)
10.	Which fertility treatment option poses health risk to a woman? (In-vitro fertilisation)	44 (40.7)

[Table/Fig-3]: Overall frequency of correct answers by respondents (n=108).

The overall FA level was low in 30 (27.8%), moderate in 48 (44.4%) and high in 30 (27.8%) study participants. Regarding its association with socio-demographic and reproductive characteristics, the FA levels significantly differed between the three age groups of participants (p-value=0.001). The other variables did not demonstrate any significant association with FA levels [Table/Fig-4].

Characteristics	No. of participants (n)	Low FA n=30 n (%)	Moderate FA n=48 n (%)	High FA n=30 n (%)	p-value
Age					
≤20	6	1 (16.7)	2 (33.3)	3 (50.0)	0.001
21-35	98	26 (26.5)	46 (47.0)	26 (26.5%)	
>35	4	3 (75.0)	0	1 (25.0)	
Residence					
Rural	32	8 (25.0%)	16 (50.0%)	8 (25.0%)	0.692
Urban	76	22 (28.9%)	32 (42.2%)	22 (28.9%)	
Women education					
Uneducated	9	4 (44.5%)	3 (33.3%)	2 (22.2%)	0.051
Primary	9	2 (22.2%)	1 (11.1%)	6 (66.7%)	
Secondary	44	11 (25.0%)	23 (52.3%)	10 (22.7%)	
Senior secondary	27	8 (29.6%)	11 (40.8%)	8 (29.6%)	
Graduate and above	19	5 (26.3%)	10 (52.6%)	4 (21.1%)	

Socio-economic status					
I	10	2 (20.0%)	5 (50.0%)	3 (30.0%)	0.735
II	39	9 (23.1%)	17 (43.6%)	13 (33.3%)	
III	38	10 (26.3%)	18 (47.4%)	10 (26.3%)	
IV	20	8 (40.0%)	8 (40.0%)	4 (20.0%)	
V	1	1 (100%)	0	0	
Duration of infertility					
≤5 years	67	18 (26.9%)	29 (43.3%)	20 (29.8%)	0.382
6 to 10	26	9 (34.6%)	14 (53.8%)	3 (11.6%)	
>10 years	15	3 (20.0%)	5 (33.3%)	7 (46.7%)	

[Table/Fig-4]: Association between socio-demographic and reproductive variables with levels of FA* (n=108).
FA: fertility awareness. Chi-square test was used; *p-value<0.05 was considered statistically significant

DISCUSSION

The present cross-sectional study observed a moderate FA level among majority of study participants. This almost fits with the findings of a recent systematic review by Pedro J et al., on FA which demonstrated an overall low to moderate FA levels among the participants [7]. The studies by, Bunting L et al., (2013), Maeda E et al., (2016) and Fulford B et al., (2013) also found a moderate level of FA based on the total FA score [2,11,12]. The prior literature suggests that both men and women in reproductive age group were included as the study participants in a majority of studies [13-16]. Taken into account the fact that women are often socially stigmatised for childlessness in developing countries like India, the present study included a cohort of women seeking fertility treatment at a government hospital.

Evidence shows a paucity of literature on assessment of FA levels among Indian women. Of the two such reported studies, Mahey R et al., conducted a cross-sectional study to evaluate the FA among 205 Indian women attending an infertility clinic and found an overall low knowledge about fertility and reproduction [8]. Another study by Bloom SS et al., evaluated knowledge about male reproductive health among 120 men from rural India through structured interviews [9]. The present study was one of its kind due to two reasons, first it assessed the FA levels among the study cohort attending the Gynaecology OPD where there was no specialised assisted reproduction unit as these women are supposed to have less knowledge as compared to those attending specialised fertility centres. Secondly, it investigated the association of socio-demographic and reproductive variables with FA levels which has not been done earlier in an Indian study population.

Nearly, 60% of respondents in the present study were not aware about the concept of fertile window and ovulatory period. Similar findings were also reported by Mahey R et al., in which approximately 85% participants failed to identify the best phase of menstrual cycle for conception [8]. Hammarberg K et al., also reported a low awareness (<32%) about the fertile period among a cohort of Australian population [17]. In contrary, Bennett LR et al., and Swift BE and Liu KE reported high awareness level of 70% (Indonesian women) and 76.4% (Canadian women) respectively about the fertile period among women seeking fertility treatment [18,19]. This may be due to different geographic and ethnic background of the study population.

There was a substantial misconception among the study participants (only 36% answered correctly) regarding the right time to consult a doctor if a couple faces trouble in conceiving. This may be a contributory factor for unnecessarily delay of diagnosis and prevents early access to fertility treatment. Similar findings were demonstrated by Mahey R et al., who found that only 38.5% respondents knew the correct information about when to seek help from a fertility specialist in case of problem in conception [8]. A study conducted by Swift BE and Liu KE among Canadian women reported that 52.9% women sought medical help in less than a year, 28.9% in one to two years, 12.9% in two to three years and 5% in even four or more years of duration of infertility [19]. As we know that management of infertility is time sensitive, therefore it needs to be emphasised that it requires appropriate timing for initiating the infertility workup and begin the treatment for achieving favourable results [20].

The study reported that 44.4% were aware of the biological clock and overestimated the natural age of decline in women' fertility. These results are consistent with those of a study by Mahey R et al., in which only 26% women identified the correct cut-off age of 35 years after which fertility declines rapidly [8]. Another study by Peterson BD et al., among 206 American undergraduate students demonstrated a lack of knowledge of age related fertility reduction [21].

With regards to fertility related misconceptions, majority of women (72.3%) thought that coming out of vaginal fluid after intercourse affects chances of conception. Nearly two-thirds women in present study believed that use of Oral Contraceptive Pills (OCPs) in past may hamper chances of future pregnancy. These observations were consistent with those of Mahey R et al., who found a relatively higher rate of misconception about OCPs and future fertility in approximately 97% women [8]. This reflects the lack of proper counselling at the time of providing contraceptive advice. In the present era of advanced assisted reproduction techniques, it was surprising to know that less than one third respondents knew about the fertility treatment options in cases of tubal blockage. Swift BE and Liu KE also reported that around 45% Canadian women answered incorrectly about infertility treatment options [20].

Regarding the relationship between socio-demographic variables and FA, the present study demonstrated that FA levels differed significantly between the three age groups whereas, no association was observed with other factors such as type of residence, women education and SES. This reflects an overall lack of exposure to fundamental fertility knowledge among Indian women irrespective of their socio-demographic environment and an urgent need to address this issue. A positive association of FA with age was also reported by Bunting L et al., Garcia D et al., and Holton S et al., [2,22,23]. Swift BE and Liu KE found an increasing trend of FA with increasing age of participants though it was not statistically significant. Their findings also found a significant association with ethnicity (p-value=0.025) and level of education of participants (p-value=0.007) [19]. Mahey R et al., compared the FA among various SES categories and found upper and upper middle SES classes had better knowledge regarding age related fertility decline and assisted reproduction techniques but almost similar knowledge about fertile period as compared to lower SES classes [8].

With regards to duration of infertility, no association with FA was found in the present study. This was in contrast to a positive association as reported by Al Khazrajy LA and Al Abayechi MA among the infertile male patients [24]. This may reflect towards a hesitant attitude of Indian women to discuss their fertility issues timely with health professionals and are then, faced with unintended infertility. Reproductive health education should incorporate the information about male and female reproductive health, declining fertility rates, concept of fertile window, effect of age and health related behaviours on fertility and fertility treatment options.

Limitation(s)

The present study was limited by its small sample size, further research with large sample size is recommended to see the effectives of targeted educational interventions on the level of FA among Indian population.

CONCLUSION(S)

The present study has highlighted considerable gaps in knowledge and understanding of fertility issues among study participants which warrants urgent attention. There is a need for a multistranded

approach including educational curriculum based programs in adolescent education, public education campaigns in communities, villages, health centres, grabbing the opportunities for fertility counselling of reproductive age group men and women during routine health visits and web based approaches.

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