ISSN- O: 2458 - 868X, ISSN–P: 2458 – 8687
National Library of Medicine - ID: 101731606

International Journal of Medical Science and Innovative Research (IJMSIR)
IJMSIR : A Medical Publication Hub
Available Online at: www.ijmsir.com
Volume – 6, Issue – 5, October – 2021 , Page No. : 224 - 232

Knowledge and awareness of science, risk factors and treatment options for infertility among young adults - A cross sectional study

[1]Khushi Ashishkumar Lohiya, 2nd year MBBS student, Department of Obstetrics and Gynaecology, NKPSIMS and RC & LMH, Nagpur.

[2]Dr. Nikita Vijay, Associate Professor, Department of Obstetrics and Gynaecology, NKPSIMS and RC & LMH, Nagpur.

Corresponding Author: Dr. Nikita Vijay, Associate Professor, Department of Obstetrics and Gynaecology, NKPSIMS and RC & LMH, Nagpur.

Citation this Article: Khushi Ashishkumar Lohiya, Dr. Nikita Vijay, "Knowledge and awareness of science, risk factors and treatment options for infertility among young adults - A cross sectional study", IJMSIR- October - 2021, Vol – 6, Issue - 5, P. No. 224 – 232.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Infertility is defined as disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse. This study was conducted in order to determine the level of knowledge and awareness regarding science, risk factors and treatment options for infertility among young adults. 192 non-medical students were surveyed. The study concludes that there is a need and demand both for spreading awareness and knowledge about infertility among the non-medical population.

Keywords: Infertility, Risk factors of infertility, Assisted Reproductive Technology (ART), In-vitro fertilisation (IVF), Surrogacy.

Introduction-

India is a developing country with a conservative past. There are yet a few sensitive issues, those if touched can provoke it's roughly escaped traditionalism. One of such issues is 'Infertility'. It is often looked down upon as a curse and is a topic of shame, which is not at all justified. There is a lot of stigma associated with childlessness. Social stigma regarding infertility is especially common across South Asia. For e.g. in Andhra Pradesh 70% of women experiencing infertility reported being punished with physical violence for their failure to conceive [1]. This unjust behaviour rooting to societal and traditional cultural dictums needs to be eradicated from people's minds. And thus it becomes imperative to educate people about the science behind infertility. Infertility is a medical condition. The World Health Organisation defines infertility as "a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse" [2]. Infertility is becoming more and more common. One in every four couples in developing countries is affected by infertility and about 186 million people worldwide. Infertility is prevalent in about 12-15% of couples who are trying to get pregnant for a year worldwide [3][4], while in India the overall prevalence of primary infertility is between 3.9 to 16.8%[5]. A report by United Nations has stated

that the fertility rate of Indians has decreased by half in last 40 years [6][7]. There are different causes of infertility a few of which are deficiency of certain hormones, stress, overactive immune system, religious beliefs, drug and alcohol abuse, age of marriage, and urbanisation [8][9]. Inability to conceive raises the possibility of an infertile partner. It can either be the male, the female or rarely both. Inspite of the fact that the statistics show that the distribution of infertility due to male factor range from 20% to 70% and that the percentage of infertile men range from 2·5% to 12% [10] male infertility still remains a stigmatic area owing to years of patriarchy. 50% of infertility cases are due to a solely female factor, pure male factor accounts for 20-30% of the problem, and the remaining 20-30% is due to a combination of both male and female factors [11]. Meaning that even though the prevalence of male infertility as compared to female infertility is low, it's not completely nonexistent. The diagnosis of infertility is different for men and women and may include assessment of semen, the quality and quantity of sperms and their health in males, ultrasound imaging for fallopian tubes, uterus, ovaries and detection of polycystic ovarian syndrome (PCOS) in females and assessment of any endocrine hormone deficiency in both [9]. The treatment for this experience of involuntary childlessness is relative with a different trajectory for each individual and thus depending on the diagnosis, the treatment for infertility may also vary [12][13]. In 90% of the cases the cause or infertility is identifiable and in 50% of the cases appropriate therapy is required to bear a child [14]. Such as:

1) Administration of assisted reproductive technology (ART) which includes in vitro fertilisation (IVF), insemination, intracytoplasmic sperm injection (ISI), embryo cryopreservation and gestational surrogacy.
2) Administration of deficient hormones that important for maintenance of fertility.
3) Certain reproductive surgical processes e.g., salpingostomy, fimbrioplasty, or reversal of surgical contraception by tubal cannulation or tubal reanastomosis in females.
4) Taking drugs like clomiphene citrate, metformin, letrozole and bromocriptine.

The youth of our nation is its future. Making sure that the future-makers are well literate and aware is crucial. It is of immense importance that they are well aware of the science of infertility, its risk factors associated with males and females and its corresponding treatment. This will make sure that they do not pay heed to any orthodox opinion and make an informed decision, ensuring a healthy continuity of race in the future. In order to safeguard this, it is important to know what knowledge the population holds as of now and then formulate a way to educate it by discussing health promotion strategies and sex education. Because if they will to reproduce then it's crucial that they have adequate knowledge about infertility. To achieve this, a survey will be conducted among non-medical students to assess their present level of awareness. And in the light of it all, we aim to acquire in depth literature knowledge about infertility through this research which can also help in raising awareness among people.

Objectives of the research

To estimate the level of knowledge and awareness regarding science, risk factors and treatment options for infertility among young adults.

Methodology

The study, to know what knowledge of infertility a particular group of non-medical population has, was conducted by gathering primary data through a survey created and circulated online to the respondents. The study design for the survey was a quantitative cross sectional type.

The targeted population included young adults, 18-24 years of age, who were not medical students. The reason for choosing this sample population is that non-medical students don't generally get educated about issues like this unlike medical students. The sampling was of stratified random type.

A wisely designed pre-validated questionnaire form, inspired from some previous extensive research and interviews with people and published literatures on infertility[12][15][16], was circulated online to the respondents with providing them the liberty to forward it to their peers. The baseline data collected was organised and analysed in a meticulously systematic manner by using the statistical analysis and excel spreadsheet tools to produce the best quantitative output for the so performed survey.

The graded conclusion was formulated by the analysis of the given answers. Such as-

Table 1: Criteria of analysis

Percentage of respondents giving correct answers	Analysis
More than or equal to 75%	Population has a very good knowledge and is well aware of infertility
More than or equal to 50% but less than 75%	Population has a good knowledge and is passably aware of infertility
Less than 50%	Population has a poor knowledge and is not well aware of infertility

It approached towards finding out what fraction of responding population has the required knowledge about infertility and if there is a desperate need to include sex education and introduction of health promotion strategies in their curriculum.

Result

A cross-sectional study was performed among the target population of non-medical young adults belonging to the age group of 18-24 years.

A meticulously designed survey form with 17 close end questions was circulated online.

192 non-medical participants responded to the survey form. The mean age of the study population was 21.45 years and most of the respondents were residents of the urban area.

The survey form was divided into four sections-

Section 1: General information about the respondents.

Section 2: General knowledge about infertility.

Section 3: Risk factors of infertility.

Section 4: Treatment of Infertility.

Section 2

When asked how infertility is defined, 58.3% (112/192) of the participants responded 'inability to conceive after 12 months of unprotected intercourse 'which is the best definition of infertility according to WHO. 16.7% of

the participants declared not to know what infertility is at all.

1.6% (3/192) respondents think that infertility is only a woman's problem and that men can never be infertile, while 3.6% (7/192) respondents think that 'maybe ' infertility is only a woman's problem.

This is implausible. These findings suggest that there's still gender-based biases and stigma around infertility in society even among young adults.

Out of 192 respondents, only 16 (8.3%) participants know that tuberculosis can be one of the causes of infertility. Following were the other responses-

PCOS and premature menopause in women- 90.1% that's 172/192 respondents,

Vas deference obstruction, erectile dysfunction- 83.3% that's 160/192 respondents, and,

HIV-AIDS, STDs- 26% thats 50/192 respondents.

50% (96/192) of the respondents incorrectly think that there's a marked decrease in a woman's ability to become pregnant at the age of 52-55 years while the correct age of marked decrease in a woman's ability to become pregnant is 38-40 years old and only 43.8% (84/192) respondents considered this as the most appropriate option.

Males also show a marked decrease in their ability to reproduce at the age of 40-45 years due to decreased sperm production, low sperm count, decreased motility of sperm and various other qualitative and quantitative sperm disorders. But 101/192 participants, that's 52.6% of the lot, say that there's no effect of age on a man's fertility while only 42.1% (81/192) participants knew the correct answer.

Only 25% (48/192) participants knew that there is no relation between history of intake of oral contraceptive pills and infertility. 32.8% (63/192) think that these two are associated. While 42.2% (81/192) participants chose the option "I don't know" suggesting that the majority does not have the correct knowledge.

Consuming a healthy balanced diet regularly can help improve infertility. 73.4% (141/192) participants seem to agree with this statement. While there were still 21.9% (42/192) of them who said that diet does not affect one's fertility.

Following is the percentage and number of respondents who know the correct diagnostic tests for infertility in females:

1. Ovarian function test and egg quality test- 62.0% (119/192) respondents,
2. Fallopian tube and uterus x-ray- 48.4% (93/192) respondents,
3. PCR test- 8.9% (17/192) respondents, and
4. Pap smears- 13.5% (26/192) respondents.

Only 43.2% (83/192) respondents know that a complete semen analysis is required in men for diagnosis of infertility, 40.1% (77/192) respondents don't know the diagnostic tests for infertility in males.

Section 3

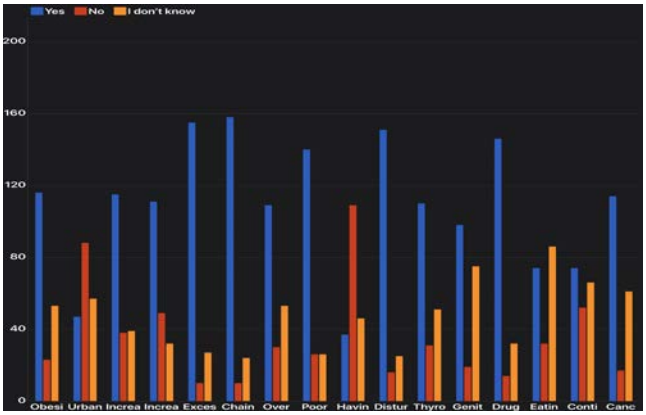
Following are the factors that increase the chances of infertility in humans and the percentage indicating the number of respondents who know that these factors are responsible for the increasing rate of infertility.

Table 2: Knowledge of respondents regarding the risk factors of infertility

Factors that increase the chances of infertility	Percentage of respondents who know the correct answer
Obesity in females	60.4% (116/192)

Factors that increase the chances of infertility	Percentage of respondents who know the correct answer
Urbanisation	24.5% (47/192)
Increased pollution and extreme climate change	59.8% (115/192)
Increasing age of marriage/ attempting for pregnancy.	57.8% (111/192)
Excessive alcohol consumption for a long period	80.7% (155/192)
Chain-smoking of tobacco, marijuana	82.3% (158/192)
Overconsumption of caffeine for a long period	56.7% (109/192)
Poor lifestyle and no exercise	72.9% (140/192)
Having multiple sex partners	19.3% (37/192)
Disturbed mental health, stress and anxiety	78.6% (151/192)
Thyroid disorders, diabetes, hypertension	57.2% (110/192)
Genital tuberculosis and STDs	51% (98/192)
Drug abuse	76% (146/192)
Eating disorders like anorexia	38.5% (74/192)
Continuous consumption of oily, spicy, unhealthy junk food	38.5% (74/192)
Cancer treatments involving radiations	59.3% (114/192)

Fig 1: Risk factors of infertility



There is a chance of becoming infertile and having trouble conceiving even after giving birth to one child owing to reasons such as complications from prior pregnancy/surgery, increasing age, STDs, fallopian tube damage, alcohol/drug abuse, increasing weight in females and impaired sperm production [17]. This is medically termed as secondary infertility.

So, while the majority of the respondents (124/192, 64.6%) think it's apparent there are still 2.1% (4/192) respondents who do not concur with the statement and think that it's nonsensical. Whereas 33.3% (64/192) respondents have no opinion on the statement.

Section 4

A huge number of respondents (71.4%, 137/192) know that infertility can be treated.

On being asked to select treatment options for infertility from the given options in a multiple answer question, 75% (144/192) respondents selected assisted reproductive technology (test tube baby) and 66.7% (128/192) selected Hormone treatments and medications, which are both correct.

88% (169/192) respondents are aware of surrogacy, which is yet another way to bear a child if a woman is unable to conceive. Surrogacy is defined as, putting embryos in other women's uterus and 86.9% of the respondents that is 146/192 accord with this definition.

The last question in the questionnaire was if there's a need to spread more awareness among non-medical students about infertility through active sex education, and the response was overwhelming.

Every respondent (100%) said yes and thinks that there's a need to actively disseminate more information about infertility.

Discussion

The findings of this questionnaire form even though do not completely coincide with the previous studies on 'knowledge and awareness about infertility' still have a few overlapping observations.

On analysing the result of the questionnaire form and corresponding it with the criteria of table 1-1 we came to know that-

The population has average knowledge and is passably aware of what infertility is and its major clinical causes. This result typically runs parallel with the one found in an international study on public perception on infertility and its treatment [18].

Although the population has very poor knowledge and is not well aware of the relation of Tuberculosis, HIV-AIDS and other STDs with infertility and also about the association between infertility and age. Worldwide studies have shown that people are unaware of biological aspects of conception, have poor knowledge about the most fertile period in the menstrual cycle, the chances of getting pregnant in one cycle and about the steep decline in fertility potential after age of 34–35 years [19][20].

The population also lacks awareness about the diagnostic tests required in males and females for infertility.

People seem to be misinformed that the history of intake of oral contraceptive pills can lead to infertility. This may result in avoiding the use of contraception and thus increasing chances of unplanned pregnancy and other complications such as STDs. These results are supported by the studies conducted in Wales and Pakistan [21][22].

The majority of respondents concur with the statement that there is a chance of becoming infertile even after giving birth to one child. Indicating that the population is slightly aware of secondary infertility.

The population is very well aware of the importance of consumption of a healthy balanced diet to help improve infertility.

Some very well discussed and common risk factors of infertility are excessive alcohol consumption for a long time, chain-smoking of tobacco and marijuana, drug abuse and disturbed mental health, stress and anxiety. The population seems to be very well aware of these risk factors. This result contradicts with the results of previous research papers[17].

People are only somewhat aware of certain risk factors such as, obesity in females, increased pollution and extreme climate change, increasing age of marriage/attempting for pregnancy, overconsumption of caffeine for a long period, poor lifestyle and no exercise, thyroid disorders, diabetes and hypertension, genital tuberculosis and STDs which also play a major role in increasing the chances of infertility.

Through the survey we also came to know that the non-medical population is very poorly aware of the fact that factors like urbanisation, having multiple sex partners, eating disorders like anorexia and continuous consumption of oily, spicy, unhealthy junk food have a significant contribution in increasing the risk of infertility. Keeping in mind the changing lifestyle of today's youth and inclination towards western culture, these are the risk factors they should be most aware of.

Surprisingly, the non-medical population seems to be very well aware of the treatment options for infertility. Some papers show similar results of great level of knowledge among upper and upper middle socio economic status regarding ART treatment options due to better education and more access to media and internet[7][18][23][24].

Conclusion

Our study is the first of its kind to be conducted in India. Through it, we have assessed the level of knowledge and awareness among the non-medical population of our country. We came to an inference that the non-medical population is only slightly aware of infertility, its causes and the risk factors overall. A significant gap in knowledge about the risk factors and dependence of fertility on age has been identified.

A good socio-economic status and adequate education do not ensure the required knowledge of infertility and the factors affecting reproduction. In the present scenario, due to extensive use of the internet and easy access to media, people may have heard and become more aware of the artificial reproductive technologies especially IVF (in vitro fertilisation- test tube baby) used to treat infertility, but they still lack the basic knowledge of infertility.

Implication

The study implies that there is a need for generalised education of non-medical masses and targeted interventions at the primary level to empower the young population mentally and to prevent them from facing involuntary childlessness. Acknowledging the fact that the population has low fertility knowledge, the British Fertility Society has started Fertility Education Initiative (FEI) in association with the Royal College of obstetricians and gynaecologists (RCOG), the Faculty of Sexual and Reproductive Healthcare (FSRH), Sex Education Forum, Brook, Sexpression, Teenage Pregnancy Knowledge Exchange, Fertility Network UK, Marie Stopes and Public Health England to help all women and men make informed choices about their fertility planning and reproduction [25]. Something like the FEI that aims towards eradicating stigmas and spreading awareness about infertility from a very base level should be employed in India. Due to the increasing prevalence of infertility, accurate information must be transferred to the non-medical population through awareness programmes, media and health care workers.

Also since every single respondent of the survey questionnaire form suggested that there's a need to include active sex education in their curriculum to disseminate more information and awareness about infertility makes it even more of a strong implication.

References

1. Daar AS, Merali Z. Infertility and social suffering: the case of ART in developing countries. Current practices and controversies in assisted reproduction. 2002 Sep 7;15:21.
2. Turchi P. Prevalence, definition, and classification of infertility. InClinical management of male infertility 2015 (pp. 5-11). Springer, Cham.
3. Inhorn MC, Patrizio P. Infertility around the globe: new thinking on gender, reproductive technologies and global movements in the 21st century. Human reproduction update. 2015 Jul 1;21(4):411-26.
4. Boivin J, Bunting L, Collins JA, Nygren KG. International estimates of infertility prevalence and treatment-seeking: potential need and demand for infertility medical care. Human reproduction. 2007 Jun 1;22(6):1506-12.
5. Adamson PC, Krupp K, Freeman AH, Klausner JD, Reingold AL, Madhivanan P. Prevalence & correlates of primary infertility among young women in Mysore, India. The Indian journal of medical research. 2011 Oct;134(4):440.
6. United Nations. World population prospects 2019: highlights. Department of Economic and Social Affairs, Population Division. 2019 May 27.
7. Mahey R, Gupta M, Kandpal S, Malhotra N, Vanamail P, Singh N, Kriplani A. Fertility awareness and knowledge among Indian women attending an infertility clinic: a cross-sectional study. BMC women's health. 2018 Dec;18(1):1-7.
8. Kumar S, Murarka S, Mishra VV, Gautam AK. Environmental & lifestyle factors in deterioration of male reproductive health. The Indian journal of medical research. 2014 Nov;140(Suppl 1):S29.
9. Sangeetha M. A study to identify the risk factors associated with infertility among women attending Infertility Clinic at Sandhya Hospital, Vallalar, Vellore (Doctoral dissertation, Arun College of Nursing, Vellore).
10. Sharlip ID, Jarow JP, Belker AM, Lipshultz LI, Sigman M, Thomas AJ, Schlegel PN, Howards SS, Nehra A, Damewood MD, Overstreet JW. Best practice policies for male infertility. Fertility and sterility. 2002 May 1;77(5):873-82.
11. Agarwal A, Mulgund A, Hamada A, Chyatte MR. A unique view on male infertility around the globe. Reproductive biology and endocrinology. 2015 Dec;13(1):1-9.
12. Sabarre KA, Khan Z, Whitten AN, Remes O, Phillips KP. A qualitative study of Ottawa university students 'awareness, knowledge and perceptions of infertility, infertility risk factors and assisted reproductive technologies (ART). Reproductive health. 2013 Dec;10(1):1-0.
13. Redshaw M, Hockley C, Davidson LL. A qualitative study of the experience of treatment for infertility among women who successfully became pregnant. Human Reproduction. 2007 Jan 1;22(1):295-304.
14. Callahan LT, Caughey AB. Infertility and assisted reproductive technologies. Blueprints Obstetrics and Gynecology. 2008;5:275-89.
15. Turner A. Questions and Answers About Infertility and Its Treatment. New York State Task Force on Life and the Law. 2003.
16. Daniluk JC, Koert E. The other side of the fertility coin: a comparison of childless men's and women's knowledge of fertility and assisted reproductive

technology. Fertility and sterility. 2013 Mar 1;99(3):839-46.

17. Sami N, Ali TS, Wasim S, Saleem S. Risk factors for secondary infertility among women in Karachi, Pakistan. PloS one. 2012 Apr 27;7(4):e35828.
18. Adashi EY, Cohen J, Hamberger L, Jones Jr HW, De Kretser DM, Lunenfeld B, Rosenwaks Z, Van Steirteghem AJ. Public perception on infertility and its treatment: an international survey. The Bertarelli Foundation Scientific Board. Human Reproduction (Oxford, England). 2000 Feb 1;15(2):330-4.
19. Bretherick KL, Fairbrother N, Avila L, Harbord SH, Robinson WP. Fertility and aging: do reproductive-aged Canadian women know what they need to know?. Fertility and sterility. 2010 May 1;93(7):2162-8.
20. Kudesia R, Chernyak E, McAvey B. Low fertility awareness in United States reproductive-aged women and medical trainees: creation and validation of the Fertility & Infertility Treatment Knowledge Score (FIT-KS). Fertility and sterility. 2017 Oct 1;108(4):711-7.
21. 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.
22. 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;11(1):1-7.
23. Bunting L, Tsibulsky I, Boivin J. Fertility knowledge and beliefs about fertility treatment: findings from the International Fertility Decision-making Study. Human reproduction. 2013 Feb 1;28(2):385-97.
24. Szalma I, Bitó T. Knowledge and attitudes about assisted reproductive technology: Findings from a Hungarian online survey. Reproductive biomedicine & society online. 2021 Aug 1;13:75-84.
25. Harper J, Boivin J, O'Neill HC, Brian K, Dhingra J, Dugdale G, Edwards G, Emmerson L, Grace B, Hadley A, Hamzic L. The need to improve fertility awareness. Reproductive biomedicine & society online. 2017 Jun 1;4:18-20.