Prevalence of Infertility, its Risk Factors and Child Adoption Behavior in Ambala, India

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Abstract: _Background: Infertility is a significant health issue in India, impacting couples emotionally and socially. This study assesses the prevalence of infertility and explores factors affecting infertility and child adoption behavior among women aged 18–45 in Ambala. Conducted in the MMIMSR field practice area, this cross-sectional study used structured questionnaires to gather data on sociodemographic factors, lifestyle, and adoption preferences. Findings revealed primary and secondary infertility rates of 14.8% and 13.4%, respectively, with factors like age, BMI, and smoking habits strongly associated with infertility. Limited awareness of infertility treatment and child adoption laws underscores the need for educational outreach and policy reforms to support affected individuals. Aim: To study the prevalence, sociodemographic profile, lifestyle factors, treatment seeking and child adoption behaviour. Material and Method: This study was conducted in the rural and urban field practice area of MMIMSR, Mullana, Ambala. The study population included all consenting married women aged between 18 to 45 years who are living with their partner for >1 year. This study was done over a period of one year i.e., December2022 to February 2024 using pre-tested, semi structured questionnaire collecting data about the socio-demographic profile, lifestyle factors, treatment seeking and child adoption behaviour. The collected data was entered in excel sheet and analysed using IBM SPSS version 23. Results: Majority of the study population 287(57.4%) were in age group 25-35 years, and 163(32.6%) were in 35-45 years age group while 50(10%) patients were in age group 18 – 25years.Mean age of the study population being 32.65±5.616. The prevalence of primary infertility was 14.8% and that of secondary infertility is 13.4%. Infertility is associated with increasing age (P=.001), high BMI of study participant, high BMI of partner, smoking, sedentary lifestyle, frequent intake of junk food and history of TB infection. There was no increase in prevalence of infertility in patients with thyroid disease. Conclusion: There is limited knowledge among study participants and community regarding infertility, its treatment options and there is hesitancy to seek treatment. Very few participants had knowledge about child adoption and laws related to it. Regular health checkups for early detection of chronic diseases should be done. Encouraging age-appropriate marriage, promoting healthy lifestyle and early screening through healthcare programs needs to be emphasized. Establishing a country level surveillance system for gathering information about infertility is the need of the day._

Keywords: Infertility, Child adoption, treatment seeking behaviour, lifestyle factors, BMI

1. Introduction

Infertility is an emergent issue in India. Infertility remains a significant concern, even amid global population rise. Infertility is defined as the disease of reproductive system leading to failure in getting pregnant even after 12 months or more of regular sexual intercourse without use of any contraception. It can be classified as primary and secondary infertility. A woman who has never been able to conceive is classified as primary infertility. A woman who has previously successfully conceived, regardless of the outcome but is not able to do so subsequently is said to have secondary infertility.[1]

According to WHO, 17.5% of the adult population worldwide experience infertility. This emphasizes the need of equitable, affordable and high-quality fertility care [4]. According to WHO, the prevalence of infertility was 17.8% in high-income countries and 16.5% in low to middle-income countries. Globally, 48.5 million couples suffer from infertility.[5]

Infertility prevalence during 2019-2020 as per NFHS-5 data was 18.7/1000 among the women who were married for the last five years and who are living with their partner. In state level analysis; Goa, Lakshadweep and Chhattisgarh were found to have highest burden of infertility whereas States/UTs like Ladakh, Uttarakhand and Meghalaya had low prevalence of infertility. Despite its high prevalence, infertility is poorly addressed in the primary and secondary healthcare setup of our country due to its non-inclusion in any of the National health programmes.[6]

Various factors such as lifestyle changes, genetic makeup, environmental factors, delayed family planning, infectious diseases and obesity contribute to fertility issues. Both genders can be affected by age, hormonal imbalances, genetic factors, or lifestyle choices such as smoking and excessive alcohol consumption. [2]

Adoption refers to the legal process through which an adopted child gains all the rights, privileges, and responsibilities equivalent to those of a biological child within the family. The adopting parents are not the biologic parents, but are considered as legal parents after following a proper legal adoption.[7] Studies on child adoption are very rare, particularly in Northern part of India. Couples fear financial concerns, legal issues, public opinion, gender and religious preferences, and cultural customs as major challenges before adopting a child.[8,9]

2. Materials and Methodology

This Community based cross-sectional study was conducted in the rural and urban field practice area of MMIMSR, Mullana, Ambala.

Study subjects: The study population included all married women who were >18years and are of child bearing age. Consenting females of 18 to 45 years who are living with their partner for >1 year were included in the study.

Study period: The study was carried out over a period of 15 months i.e., January 2023 to March 2024.

Sample size: Sample size was estimated on the basis of prevalence of female infertility in previous literature. According to previous literature, prevalence of infertility was taken to be 12%, and with absolute precision of 3%, and by applying formula = **N=4pq/l²**, it comes out to be 470, which was rounded off to 500. Half of the calculated sample size was collected from catchment area of UHTC, Ambala and half of the sample size from catchment area of RHTC, Adhoya, Ambala.

Sampling Technique: Multistage sampling was done. There are 6 subcentres among which 2 subcentres were randomly selected from the urban and 2 from rural area.125 females were selected from each subcentre. List of all eligible females from those subcentres and 125 females were selected by random sampling.

Study tools: A pre-tested, semi structured questionnaire was used consisting of 4 sections: the socio-demographic profile, lifestyle factors, treatment seeking behaviour, child adoption behaviour.

All the selected females were approached to participate in the study. If the selected female could not be contacted or was unwilling to participate then female next in the list was included. Participants were explained in detail about the purpose of study. Written informed consent was taken and confidentiality was ensured. On an average 25-30 minutes were spent to complete the interview with one participant.

The data was entered in excel sheet and analysed using IBM SPSS version 23.

The study was submitted to the Institutional Ethics Committee of the Maharishi Markandeshwar Institute of Medical Sciences, Mullana, Ambala and received the Institutional Ethics Committee Certificate under the project number IEC -2593. This study did not impose any financial burden on the participants. Written informed consent was obtained from each participant in their vernacular language. Confidentiality for each participant was maintained throughout the study.

3. Results

Out of the 500 study participants, majority 287(57.4%) were in age group 25-35 years with the mean age of the study population being 32.65±5.616. Majority of the study population 357(71%) were Hindus, followed by 86(17%) Sikhs, 53(11%) Muslims and 4(1%) Christians. Majority of the study population 265(53%) had their age at marriage between 18-24 years followed by 213(42.6%) having their age at marriage between 25-30 years, followed by 11(2.2%) at <18 years and 11(2.2%) at >30 years. Mean age at marriage was 24.01±2.9.

Among 500 study participants, prevalence of primary infertility came out to be 14.8% and 13.4% had secondary infertility.
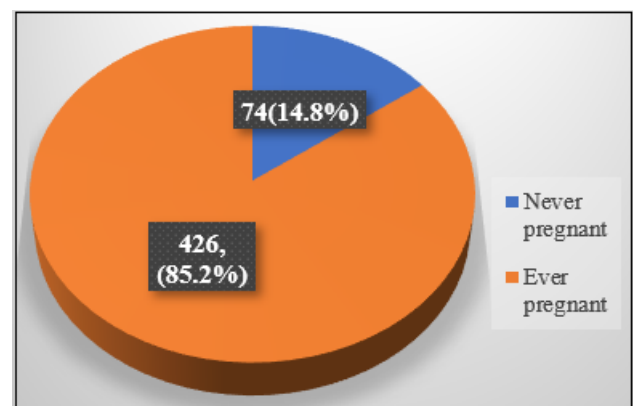

Figure 1: Distribution of study population according to prevalence of primary infertility in the study population

Table 1: Association between various socio demographic factors and primary infertility:

Variable	Categories	Ever pregnant		Total	P value
Age category	18-25 years	31(62%)	19(38%)	50(100%)	.001
	25-35 years	238(82.9%)	49(17.1%)	287(100%)	
	>35 years	157(96.3%)	6(3.7%)	163(100%)	
Religion	Hindu	306(85.7%)	51(14.3%)	357(100%)	.804
	Muslim	46(86.8%)	7(13.2%)	53(100%)	
	Sikh	71(82.6%)	15(17.4%)	86(100%)	
	Christian	3(75%)	1(25%)	4(100%)	
Type of family	Nuclear	182(86.7%)	28(13.3%)	210(100%)	.244
	Joint	209(82.9%)	43(17.1%)	252(100%)	
	Three Generation	35(92.1%)	3(7.9%)	38(100%)	
Occupation	Business	17(94.4%)	1(5.6%)	18(100%)	.008
	Daily wager	20(83.3%)	4(16.7%)	24(100%)	
	Govt job	50(94.3%)	3(5.7%)	53(100%)	
	Homemaker	175(88.8%)	22(11.2%)	197(100%)	
	Private job	149(80.1%)	37(19.9%)	186(100%)	
	Other	15(68.2%)	7(31.8%)	22(100%)	
Monthly per capita income	Upper class(I)	92(83.6%)	18(16.4%)	110(100%)	.936

Upper Middle class(II)	211(84.7%)	38(15.3%)	249(100%)	
Middle class(III)	99(87.6%)	14(12.4%)	113(100%)	
Lower Middle class(IV)	19(86.4%)	3(13.6%)	22(100%)	
Lower class(V)	5(83.3%)	1(16.7%)	6(100%)	

Table 2: Showing association between various lifestyle factors and primary infertility:

Variable	Category	Yes	No	Total	P value
Type of food intake	Homemade food	219(84.2%)	41(15.8%)	260(100%)	.651
	Packaged food	3(100%)	0(0%)	3(100%)	
	Both	204(86.1%)	33(13.9%)	237(100%)	
Frequency of intake of junk food	Everyday	63(75.9%)	20(24.1%)	83(100%)	.032
	Once in a week	296(86.8%)	45(13.2%)	341(100%)	
	Don't eat junk food	67(88.2%)	9(11.8%)	76(100%)	
History of coffee drinking	Yes	194(84%)	37(16%)	231(100%)	.47
	No	232(86.2%)	37(13.8%)	269(100%)	
History of Alcohol intake	Yes	41(82%)	9(18%)	50(100%)	.502
	No	385(85.6%)	65(14.4%)	450(100%)	
History of Smoking	Yes	11(64.7%)	6(35.3%)	17(100%)	.015
	No	415(85.9%)	68(14.1%)	483(100%)	
BMI of study participant	<18.5	18(78.3%)	5(21.7%)	23(100%)	.04
	18.5-25	155(80.3%)	38(19.7%)	193(100%)	
	25-30	199(88.4%)	26(11.6%)	225(100%)	
	>30	54(91.5%)	5(8.5%)	59(100%)	
Daily physical activity					
No daily exercise/30 mins exercise		42(72.4%)	16(27.6%)	58(100%)	.004
>30 mins exercise * 5 days/week		384(86.9%)	58(13.1%)	442(100%)	
Presence of thyroid disorder	Yes	38(79.2%)	10(20.8%)	48(100%)	.216
	No	388(85.8%)	64(14.2%)	452(100%)	
History of TB	Present	23(71.9%)	9(28.1%)	32(100%)	.028
	Absent	403(86.1%)	65(13.9%)	468(100%)	
History of STD	Yes	11(84.6%)	2(15.4%)	13(100%)	.952
	No	415(85.2%)	72(14.8%)	487(100%)	

Association between age category and infertility came out to be highly statistically significant. P=.001. Association between occupation and infertility came out to be statistically significant(P=.008) Women who were indulged in sedentary/sitting jobs which required more than 8 hours of sitting per day were at higher risk of infertility. Association between infertility and frequency of intake of junk food came out to be statistically significant. (P=.032). Those study participants who consumed junk food everyday were at higher risk of primary infertility. (P=.032). Regarding history of smoking, significant association was found between history of smoking at any point of time during their lifespan and primary infertility (P=.015). Association between BMI of the study participants and primary infertility came out to be statistically significant(P=.04). Infertility was found to be associated with malnutrition i.e. people with BMI <18.5(Underweight) were at higher risk of infertility. Association between BMI of partner and infertility also came out to be statistically significant(P=.006). Association between daily physical activity and infertility came out to be statistically significant(P=.004). Those participants who did no daily exercise/<30 mins exercise /day were having higher risk of infertility. Association between history of TB and presence of primary infertility came out to be statistically significant(P=.02). Association between history of alcohol intake, presence of thyroid disorder and infertility came out to be statistically insignificant (P= .502). Association between age at menarche, menstrual cycle duration, history of STDs and primary infertility came out to be statistically insignificant.
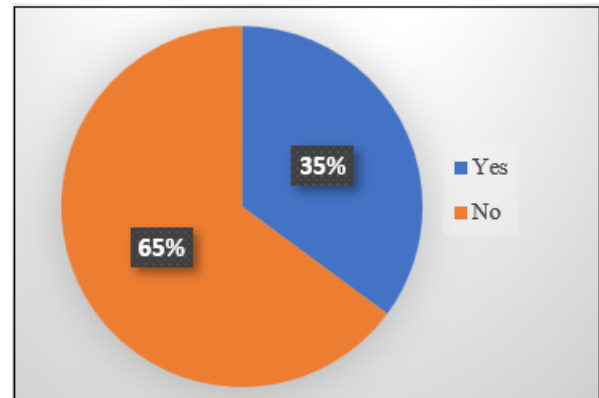
Figure 2: Distribution of primary infertile participants according to their willingness towards child adoption(n=74)
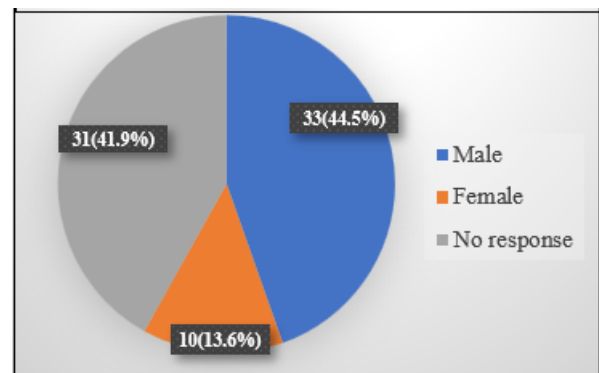
Figure 3: Distribution of primary infertile study population according to Gender Preference for Child Adoption(n=74)

For treatment seeking behaviour, 67(13.4%) of the study participants were aware and had used home based ovulation kit, whereas 269(53.8%) had not used ovulation kit at all , while 164(32.8%) were unaware of the ovulation kit .In order to get pregnant majority of the participants 123 had changed their dietary habits by consuming more healthy foods, followed by 87 study participants who had taken folic acid, 84 who had taken multivitamins to improve fertility. 62 participants exercised more to improve fertility.21 study participants responded by stopping the intake of alcohol and 8 responded by stopping smoking to get pregnant. 314 participants responded as they had taken no steps in order to get pregnant. Majority of the study participants 76(15.3%) took treatment from a specialist doctor, followed by 45(9%) from family doctor, 18(3.6%) from Nurse/other healthcare worker,18(3.6%) from dietician and 30(6%) from traditional healers.359(71.8%) study participants either gave no response or question was not applicable to them.

Out of 74 infertile study participants 26 (35.13%) were willing to adopt a child whereas 48 (64.87%). Majority among them 62(83.78%) responded that they will prefer to adopt child of age group <1 year, followed by 4(5.4%) who responded that they will prefer to adopt child of the age group 1-5 years, 8(10.8%) gave no response to the question. 33(44.5%) of the study participants responded that they will prefer to adopt a male child, whereas 10(13.51%) of study participants prefer to adopt female child while 31(41.89%) gave no response to this question. 44(59.45%) of the study participants preferred to adopt child of their own religion while 21(28.38%) of the study participants preferred child of any religion and 9(12.17%) did not respond to the question. 30(40.5%) of the primary infertile study participants preferred to adopt newborn at a hospital, followed by 16(21.6%) who preferred to adopt a child from relatives,9(12.2%) responded to adopt a child from orphanage and 19(25.7%) gave no response to the question.26(35.13%) of the study participants had awareness about child adoption laws in India, while 48(64.86%) had no awareness about child adoption laws in India.

4. Discussion

In this study, married reproductive age group women (15-45 years) were taken. Mean age of the study population was 32.65±5.616 years. Similar finding were reported in the study by Shirin et al[10] in their clinical trial in Iran where mean age of study population was 32.5 years. Similar results were seen by Kataria et al[11] in a study done in Sonipat, Haryana where the mean age of fertile women was 33.07±7.43 and infertile women was 31.58±6.59. In the present study, majority of the study population 287(57.4%) were in age group 25-35 years. Similar results were seen in a study conducted by Patra S and Unisa S et al [12] on the treatment seeking behaviour of women who experienced infertility and need for services in rural India. In that study 25–35-years age group women comprised 54.1 % of the study population. Similarly in a study by Katole A and Saoji AV et al[13] on the prevalence of primary infertility and its associated risk factors in urban population of central India, 25-35 years age group women comprised 51.6% of the study population. Similar result was found by Pal M et al[14] in their study in Amritsar where 25-35 years age group women comprised 53.9% of the study population. Prevalence of primary infertility was found to be 14.8 %. Prevalence of secondary infertility came out to be 13.4%. Similar results were found by Liang et al [15] in their study where they found overall prevalence of infertility to be 24.58% in the study population. Similar results were found in a study conducted by Akalewold M et al[16] in Addis Ababa, Ethiopia where the prevalence of primary infertility was 14.4 % and secondary infertility 13.2%. Similar results were found by AgiwalV et al[6] in their study using data from NFHS-5,2019-2021 found prevalence of infertility to be 18.7 per 1000 women among those who were married for at least five years and were living together Similar results were found by AgiwalV et al[6] in their study using data from NFHS-5,2019-2021 found prevalence of infertility to be 18.7 per 1000 women among those who were married for at least five years and were living together. Similar results were found by Zou Z et al[17] in their study where they found overall prevalence of infertility among couples of reproductive age group in China to be 25%.This study is significant as it sheds light on infertility prevalence and challenges in North India, where limited research exists, thus supporting the need for targeted health interventions and policies.

5. Limitations

The findings are based on a specific population within a particular geographic region and therefore the results may not be generalised to broader demographics. This study may have been impacted by recall bias as information was gathered from participants using a questionnaire. This study is silent as to which spouse suffers from infertility.

6. Conclusion

This study reveals a notable prevalence of infertility among women in Ambala, emphasizing the impact of lifestyle factors such as BMI and smoking. Limited knowledge about infertility treatments and child adoption highlights an urgent need for community health programs that promote awareness and support early intervention. Establishing a surveillance system for infertility data and implementing national policies for accessible infertility care would support affected individuals and families

7. Recommendations

Eating a wide range of healthy foods is advised when trying to conceive[18]. Eating foods with antioxidant properties, including fruits and vegetables, is likely to be beneficial for protecting against oxidative stress[19]. Regular and intense exercise regimes can impact both male and female fertility as it improves various body functions, including reproduction. Maintaining BMI in the normal range is advisable[20,21]Smoking, both first or second-hand smoke, negatively impacts reproductive system of both men and women.[22] To quit smoking and avoid second hand smoke as both have a negative impact on fertility. Alcohol consumption is not advised as it alters the hormonal levels resulting in impotency or infertility.[23]To allay fears, bust stigma, myths and misconceptions about the infertility[24]. Enhance role of women support groups where they can openly discuss about such sensitive issue[25].Treatment for infertility is expensive, time consuming and sometimes success rate is less, so

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adoption serves as an alternate option for infertile couples. This requires social reforms, enactment of simplified law and greater acceptance from general society. Some family planning clinics should be established to offer essential infertility evaluations, counselling, and treatment at a cheaper cost, as not all sorts of prevailing infertility treatments are affordable for the poor and the lower-middle-class people in the country. Generation of data on the burden of infertility to generate resource allocation and provision of services & developing guidelines on the prevention, diagnosis and treatment of male and female infertility, as part of the global norms and standards of quality care related to fertility treatment[26].

Conflicts of Interest: Nil

Author Contributions
Conceptualization: Saachi Sood Formal analysis: Saachi Sood, Anshu Mittal Methodology: Anshu Mittal Supervision -Anshu Mittal. Writing – review & editing: Saachi Sood, Abhinav Meelu

References

[1] Sun H, Gong TT, Jiang YT, Zhang S, Zhao YH, Wu QJ. Global, regional, and national prevalence and disability-adjusted life-years for infertility in 195 countries and territories, 1990-2017: results from a global burden of disease study, 2017. Aging (Albany NY). 2019 Dec 2;11(23):10952-10991

[2] Alderete E, Eskenazi B, Sholtz R. Effect of cigarette smoking and coffee drinking on time to conception. Epidemiology. 1995;6(4):403–8

[3] Sharma R, Biedenharn KR, Fedor JM, Agarwal A. Lifestyle factors and reproductive health: taking control of your fertility. Reprod Biol Endocrinol. 2013 Jul 16;11:66. doi: 10.1186/1477-7827-11-66.

[4] WORLD HEALTH ORGANIZATION WHO site: https://www.who.int/news-room/fact-sheets/detail/infertility Last Assesed on: 4/July/2024

[5] Reproductive Biological Endocrinology, 2015 https://rbej.biomedcentral.com/ ; last assessed on 5/July/2024

[6] Agiwal V, Madhuri RS, Chaudhuri S. Infertility Burden Across Indian States: Insights from a Nationally Representative Survey Conducted During 2019-21. J Reprod Infertil. 2023 Oct-Dec;24(4):287-292. doi: 10.18502/jri.v24i4.14156.

[7] Yassini SM, Taghavi Shavazi M, Taghavi Shavazi N. Factors associated with adoption acceptance rate from the view point of infertile couples. Iran J Reprod Med. 2012 Sep;10(5):413-8.

[8] Central Adoption Resource Authority, Ministry of Women and Child Development, Govt of India available on website www.cara.nic.in : last assessed on 5/7/2024

[9] NIC, CARA, Ministry of Women & Child Development, GOI

[10] Shirin A, Atefeh A, Mahlegha D, Katayoun A. The effect of cognitive behavior therapy on attitude of infertile individuals toward child adoption. J Prev Med Hyg. 2022 Apr 26;63(1):E97-E103. doi: 10.15167/2421-4248/jpmh2022.63.1.2411

[11] Kataria D, Rani B, Punia A, Jha SK, Narendran M, Singh J. Reproductive Risk Factors Associated with Female Infertility in Sonepat District of Haryana: A Community Based Cross-Sectional Study. J Hum Reprod Sci. 2023 Jul-Sep;16(3):204-211. doi: 10.4103/jhrs.jhrs_82_23. Epub 2023 Sep 29.

[12] Patra S and Unisa S (2022) An exploration of treatment seeking behavior of women experienced infertility and need for services in rural India. Front. Reprod. Health 4:978085. doi: 10.3389/frph.2022.978085

[13] Katole A, Saoji AV. Prevalence of Primary Infertility and its Associated Risk Factors in Urban Population of Central India: A Community-Based Cross-Sectional Study. Indian J Community Med. 2019 Oct-Dec;44(4):337-341

[14] Pal M, Devgun P, Chalana H, Kaur H, Biswas A, Sen S. A study of prevalence and socio-demographic profile of infertile couples in field practice area of tertiary care centre, Amritsar, Punjab, India. Int J Community Med Public Health 2016; 3:1472-6.

[15] Liang, S., Chen, Y., Wang, Q. et al. Prevalence and associated factors of infertility among 20–49 year old women in Henan Province, China. Reprod Health 18, 254 (2021). https://doi.org/10.1186/s12978-021-01298-2

[16] Akalewold M, Yohannes GW, Abdo ZA, Hailu Y, Negesse A. Magnitude of infertility and associated factors among women attending selected public hospitals in Addis Ababa, Ethiopia: a cross-sectional study. BMC Womens Health. 2022 Jan 11;22(1):11. doi: 10.1186/s12905-022-01601-8

[17] Zhou Z, Zheng D, Wu H, Li R, Xu S, Kang Y, Cao Y, Chen X, Zhu Y, Xu S, Chen ZJ, Mol BW, Qiao J. Epidemiology of infertility in China: a population-based study. BJOG. 2018 Mar;125(4):432-441. doi: 10.1111/1471-0528.14966. Epub 2017 Dec 28

[18] Handbook of Fertility: Nutrition, Diet, Lifestyle and Reproductive Health by Ronald Ross Watson

[19] Ayurveda: A Boon for endometrial factor infertility by Dr.Asokan Vasudevan

[20] Human Reproductive Biology and Health by Meena Yadav and Brototi Roy

[21] World Health Organisation. (2018). Physical Activity.(online)Available from https://www.who.int/news-room/fact-sheets/detail/infertility .

[22] Baird DD, Wilcox AJ. Cigarette smoking associated with delayed conception. Journal of the American Medical Association. 1985;253(20):2979–83

[23] Healthline website URL: www. healthline .com last assessed on 4/7/2024

[24] Xie Y, Ren Y, Niu C, Zheng Y, Yu P, Li L. The impact of stigma on mental health and quality of life of infertile women: A systematic review. Front Psychol. 2023 Jan 9; 13: 1093459. doi: 10.3389/fpsyg.2022.1093459.

[25] Practical Tips for Infertility Management by Malhotra Jaideep

[26] Mayoclinic: URL-
https://www.mayoclinic.org/diseases-
conditions/infertility/symptoms-causes/syc-20354317

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