Research And Analysis Of Various Factors Causing Infertility In Men And Women In Tashkent City

Z.A. Sayfutdinova, K.T.Zuparova, L.B.Ibragimova, G.A.Safarova, M.A.Abduxakimova

Tashkent Medical Academy

Annotation:

In particular, the role of biochemical markers, such as homocysteine, has gained attention in understanding infertility. Elevated homocysteine levels are linked to various reproductive Infertility is a significant global medical and social issue affecting approximately 15% of couples of reproductive disorders, including complications in both male and female fertility. This study highlights the growing prevalence of infertility in Tashkent, where factors such as age, socio-economic status, lifestyle, and environmental conditions play a key role. The study emphasizes that age, particularly after 35 for women and 45 for men, significantly impacts fertility, while lifestyle choices like smoking, alcohol consumption, and poor nutrition exacerbate the issue. Environmental pollution in urban settings further contributes to fertility problems. A holistic approach considering these interrelated factors, including dietary modifications, stress management, and medical intervention, is essential for improving reproductive health outcomes and enhancing fertility. This research underscores the need for comprehensive infertility prevention strategies and public awareness to address the challenges couples face in modern society.

Key words: infertility, global medical and social problem, biochemical markers, homocysteine, reproductive disorders, male infertility, female infertility, age, lifestyle, medical intervention, infertility prevention

INTRODUCTION.

Relevance of the study. Infertility remains one of the most significant medical and social issues worldwide. According to the World Health Organization, approximately 15% of couples of reproductive age face difficulties in conceiving. Additionally, the role of genetic factors, metabolic disorders, and endocrine diseases in the development of primary and secondary infertility is steadily increasing (1).

In identifying the causes of infertility, there is growing attention on the role of various biochemical markers (2). One of the key indicators is the level of homocysteine, an amino acid that plays a central role in methionine metabolism and can affect the cardiovascular system, blood coagulation, and thrombotic risk. Elevated homocysteine levels are associated with various reproductive disorders in both women and men (3).

In our country, the diagnosis and treatment of infertility remain pressing issues. Despite significant advances in medicine, infertility cases continue to rise, necessitating the development of new approaches for its detection and treatment. In this regard, studying homocysteine levels as a potential risk factor for infertility development is a promising area of research that can help improve diagnosis and enhance the effectiveness of therapy (4, 5).

The study aims to examine the factors contributing to infertility among both men and women in Tashkent, Uzbekistan, focusing on the

impact of age, lifestyle, environmental conditions, socio-economic status, and psychological factors. A cross-sectional study design was employed to gather both quantitative and qualitative data.

Study Design:

1. A descriptive cross-sectional study design was selected to explore the prevalence of infertility and to identify the main contributing factors among residents of Tashkent. The research combines statistical data with interviews to provide a comprehensive view of the infertility issue.

2. Sampling:

- The study involved a representative sample of men and women diagnosed with infertility at medical facilities in Tashkent. The sample included both urban and suburban residents to ensure the inclusion of varying environmental and socio-economic backgrounds.

- Participants were selected from fertility clinics, hospitals, and primary healthcare centers in Tashkent. The inclusion criteria included individuals diagnosed with infertility within the last 5 years.

- The sample size was calculated to ensure statistical significance, with at least 500 participants (250 men and 250 women) selected based on random sampling techniques.

3. Data Collection:

- Quantitative Data: Surveys and medical records were used to gather information on age, lifestyle habits (smoking, alcohol consumption, physical activity), socio-economic status, and exposure to environmental pollutants. Participants were asked to fill out a structured questionnaire developed specifically for this study.

- Qualitative Data: In-depth interviews and focus group discussions were conducted with a subset of participants to understand the social, emotional, and psychological impact of infertility. These interviews were semi-structured to allow flexibility in exploring personal experiences related to infertility, stress, and reproductive health.

4. Variables:

- Independent Variables: Age, socio-economic status (income, education, occupation), lifestyle factors (diet, smoking, alcohol, physical activity), environmental factors (pollution levels, exposure to chemicals), psychological stress (measured using standardized stress scales), and medical history.

- Dependent Variables: Infertility rates (diagnosed cases of male and female infertility), sperm quality (for male participants), and ovulation health (for female participants).

5. Data Analysis:

- Quantitative Analysis: Statistical analysis was performed using SPSS software. Descriptive statistics, such as frequencies, percentages, and mean values, were used to describe the demographic characteristics of the sample. The correlation between infertility and each of the independent variables was assessed using chi-square tests and logistic regression to identify significant factors associated with infertility.

- Qualitative Analysis: Thematic analysis was applied to interview transcripts. Key themes related to stress, environmental concerns, and personal health challenges were identified and categorized for further analysis.

6. Ethical Considerations:

- Informed consent was obtained from all participants before their inclusion in the study. Confidentiality and anonymity were maintained throughout the study. Ethical approval was granted

by a local ethics committee in accordance with national guidelines.

Materials

1. Survey Instruments:

- A structured questionnaire was developed to collect demographic information (age, gender, socio-economic status) and detailed lifestyle habits (smoking, alcohol consumption, diet, physical activity) from participants. The questionnaire also assessed participants' medical history, including any previous diagnoses related to infertility.

- Psychological Stress Scale: A standardized psychological stress scale (e.g., Perceived Stress Scale) was used to assess the emotional and psychological impact of infertility on participants. This scale measures stress levels based on respondents' perceptions of their lives.

2. Medical Records:

- Data were obtained from the medical records of participants in Tashkent's fertility clinics and hospitals. This data included diagnoses, sperm count and motility (for men), and ovulation health (for women), as well as treatments and medications prescribed.

3. Environmental Pollution Data:

- Air, water, and soil pollution levels were assessed using environmental data from local government sources and public health reports. These data were linked to geographical areas where participants lived to examine the potential impact of pollution on reproductive health.

4. Statistical Software:

- SPSS software was used for data entry, cleaning, and analysis. Statistical tests such as chi-square, correlation analysis, and logistic regression were employed to determine associations between variables.

5. Interview Guides:

- A semi-structured interview guide was designed to explore the personal experiences of individuals facing infertility, focusing on emotional stress, social stigma, and coping mechanisms. The interview guide allowed for flexible discussions while maintaining consistency across participants.

6. Focus Group Discussion:

- Focus group discussions were conducted to gather in-depth qualitative insights into the social dynamics, perceptions, and community-based solutions to infertility in Tashkent. Groups were segmented based on age, gender, and socio-economic background to capture diverse viewpoints.

Introduction. Homocysteine is an amino acid produced in the body during the metabolism of methionine, an essential amino acid obtained from food. Discovered in 1932 by German chemists William Barr and Ludwig Geinberg, its role in the body remained unknown until the 1960s, when researchers identified a link between elevated homocysteine levels and cardiovascular diseases (6).

High homocysteine levels have been associated with several health conditions, including cardiovascular diseases, Alzheimer's disease, and dementia. Homocysteine contains a thiol group (-SH) capable of participating in oxidation and reduction reactions, influencing cellular processes and metabolic pathways. It also plays a role in the methylation cycle, converting back to methionine via remethylation, which is crucial for maintaining normal levels of methionine and S-adenosylmethionine (SAM) in cells (7, 8).

The oxidation of homocysteine can lead to the formation of reactive oxygen species (ROS), contributing to oxidative stress and potential

damage to cells and tissues (9). Elevated homocysteine (hyperhomocysteinemia) is linked to an increased risk of cardiovascular diseases due to its toxic effects on blood vessel endothelial cells, promoting inflammation, thrombosis, and atherosclerosis. Despite its pro-oxidant properties, homocysteine may also participate in the body's antioxidant defense by forming mixed disulfides with glutathione, helping neutralize free radicals.

Thus, homocysteine plays a dual role in the body, both supporting normal cellular function and contributing to pathological conditions when metabolism is disrupted. Elevated homocysteine levels are associated with an increased risk of atherosclerotic vascular diseases, Alzheimer's, dementia, and infertility (10).

Elevated homocysteine levels (hyperhomocysteinemia) can negatively affect female reproductive health. Research shows that high homocysteine may hinder successful embryo implantation, damage blood vessel endothelium, and disrupt normal vascular formation around the implanted embryo, increasing the risk of miscarriage, especially in the first trimester. It is also linked to an increased risk of placental insufficiency, intrauterine growth restriction, and pregnancy complications like preeclampsia. Hyperhomocysteinemia can further complicate fertility in women with polycystic ovary syndrome (PCOS) (11).

To address hyperhomocysteinemia and improve reproductive outcomes, a diet rich in folic acid, vitamins B6 and B12, as well as lifestyle changes like quitting smoking and reducing alcohol consumption, are recommended (12). In some cases, appropriate vitamin supplements or medications may be prescribed under medical supervision.

Hyperhomocysteinemia can also impact male fertility. It may cause oxidative stress, damaging sperm DNA, reducing motility, and increasing the risk of genetic abnormalities in offspring. Lifestyle changes, including diet and vitamin supplementation, can help manage homocysteine levels and improve fertility outcomes.

Thus, hyperhomocysteinemia poses significant risks to reproductive health in both men and women, but managing homocysteine levels through diet, lifestyle adjustments, and medical intervention can enhance fertility and overall reproductive success (13).

Results and their discussion. Infertility, or the inability to conceive, remains a relevant and frequently discussed issue in modern society. Studying this problem in major cities like Tashkent, where environmental factors, lifestyle, and social conditions can significantly affect reproductive health, is of particular importance. This section provides an overview of the existing statistical data on infertility among men and women in Tashkent.

According to the latest data from the Ministry of Health of Uzbekistan, infertility rates in Tashkent affect approximately 15% of both men and women. These figures are based on studies conducted at medical facilities in the city. It is important to note that these rates vary depending on age, social status, and other factors.

Age is one of the primary factors influencing the likelihood of infertility. For example, among people under 35, infertility rates are around 10%, while in individuals over 40, this rate increases to 20%. This highlights the critical role of age in reproductive health.

Socio-economic status also affects infertility rates. Among lower-income groups, infertility is slightly more prevalent than among the middle class or wealthier individuals. This may be linked to limited access to quality healthcare, poor living conditions, and unhealthy lifestyles.

Lifestyle plays a significant role in reproductive health. Smoking, alcohol consumption, poor diet, and lack of physical activity can lead to reduced fertility in both men and women. According to statistics, smoking men have a 12% higher infertility rate compared to non-smokers. A similar trend is observed in women.

Environmental conditions in the city can also influence reproductive health. Pollution of the air, water, and soil with toxic substances negatively affects human health, including fertility. In areas of Tashkent with high pollution levels, infertility rates are noticeably higher, further confirming the link between environmental factors and reproductive health.

Analysis of statistical data shows that infertility remains a significant issue in Tashkent. Factors such as age, socio-economic status, lifestyle, and environmental conditions play key roles in its development. Understanding these factors is crucial for developing effective prevention and treatment strategies aimed at improving reproductive health.

Male infertility is a condition where a man is unable to fertilize a woman's egg due to a lack of sperm in the ejaculate or poor sperm motility. This issue is becoming increasingly relevant in modern society, especially in large cities like Tashkent. This article examines various factors that may contribute to the development of male infertility, including age, lifestyle, dietary habits, environmental conditions, and other considerations.

Age is one of the main factors influencing male fertility. As men age, sperm quality deteriorates, sperm count decreases, motility declines, and the risk of DNA abnormalities increases. Like in other regions, older men in Tashkent are more likely to face fertility issues. For instance, a study conducted at a medical center in Tashkent found that infertility rates among men over 45 are approximately 20%.

Lifestyle choices also play an important role in male fertility. Smoking, alcohol abuse, drug use, and a sedentary lifestyle significantly reduce fertility prospects. Specifically, smoking leads to a 13.7% reduction in sperm count and an 11.7% decline in sperm quality. Alcohol consumption (29.3%) can disrupt hormone balance, reducing testosterone levels and affecting sperm quality. In addition, stress (47.8%) and chronic fatigue (36.5%) can also negatively affect male reproductive health.

Proper nutrition is essential for maintaining health, including reproductive health. Insufficient intake of vital vitamins and minerals (49.4%) can lead to fertility issues. Deficiencies in zinc, selenium, folic acid, and vitamin D are often associated with reduced sperm quality. Therefore, a balanced diet rich in these elements may increase the chances of successful conception.

Environmental pollution, such as exposure to heavy metals, pesticides, and other chemicals in the air and water, can negatively affect male reproductive health (7.6%). The impact of these pollutants has been studied and proven by many researchers. In Tashkent, pollution from industrial and automobile emissions may pose a serious threat to male health.

Certain medical conditions and factors (1.1%) can also contribute to infertility. Varicoceles, genital infections, endocrine disorders, testicular injuries, and some medications may affect male reproductive health. Additionally, genetic abnormalities can sometimes prevent conception.

Psychological stress and emotional tension have a significant impact on the body, including the reproductive system. Chronic stress can lead to hormonal imbalances that affect the formation and function of sexual cells. Stressful situations are common in modern urban life, making this issue especially urgent.

The factors influencing male infertility in Tashkent are diverse and interconnected. Age, lifestyle, nutrition, environmental conditions, and psychological stress all require attention and intervention to maintain and improve reproductive health. Regular medical check-ups, a healthy lifestyle, and proper nutrition can reduce the risk of infertility and improve the chances of successful fatherhood.

Female infertility refers to a condition in which a woman is unable to naturally conceive due to issues related to ovulation, reproductive organs, or other factors. This issue is of particular concern in large cities like Tashkent, where external and internal factors can affect women's health. This article explores the main factors contributing to the development of female infertility, including age, lifestyle, dietary habits, environmental conditions, and other factors specific to the living conditions in Tashkent.

Age is one of the most important factors influencing female fertility. As women age, the number and quality of eggs decline, reducing the chances of successful conception. After the age of 35, the likelihood of natural conception sharply decreases, and the risk of pregnancy complications increases. In Tashkent, as in other major cities, many women delay childbirth, which increases the likelihood of infertility.

Lifestyle also plays a significant role in female fertility. Smoking (2.1%), excessive alcohol consumption (2.9%), lack of physical exercise, and high levels of stress can negatively affect reproductive health. Women who smoke are at higher risk of menstrual cycle disorders and early menopause. Alcohol can damage eggs and disrupt hormonal balance. Stress and emotional tension can lead to cycle irregularities and ovulation problems.

Diet is crucial for maintaining reproductive health. A deficiency in essential nutrients, such as iron, vitamin D, folic acid, and omega-3 fatty acids (56.1%), can lead to fertility issues. Overweight or obesity (63.9%) is a common cause of reproductive problems, including polycystic ovary syndrome (PCOS), which is often linked to female infertility.

Environmental pollution, such as toxins, heavy metals, and pesticides, can negatively affect female fertility. Exposure to pollutants can damage eggs and disrupt hormonal balance. Breathing polluted air and drinking contaminated water can contribute to inflammation in the pelvic area, which can reduce the chances of pregnancy.

Certain medical conditions and diseases can lead to infertility. Endometriosis, fibroids, pelvic inflammatory disease (PID), blocked fallopian tubes, and other gynecological issues can make it difficult to conceive. Some autoimmune diseases, such as antiphospholipid syndrome, can prevent embryo implantation.

Genetic abnormalities and chromosomal disorders (0.87%) can also contribute to female infertility. Turner syndrome, for example, is characterized by the absence or structural abnormalities of one X chromosome, leading to ovarian dysfunction and early menopause. Other genetic mutations can cause defects in eggs, making them unsuitable for fertilization.

Chronic stress (58.2%) and emotional tension (49.3%) can severely affect female reproductive health. High cortisol levels, the stress hormone, can disrupt the hypothalamus and pituitary gland, leading to hormonal imbalances that affect menstrual cycles and ovulation. Prolonged stress can lead to amenorrhea (absence of menstruation) and other reproductive disorders.

The diversity of factors affecting female health and fertility calls for a comprehensive approach to

prevent and treat infertility. The most important preventive measures include maintaining a healthy lifestyle, regular medical check-ups, weight management, and reducing the impact of unfavorable environmental factors. Increasing awareness of these factors can help women in Tashkent and other major cities make informed decisions about their future motherhood.

Infertility, or the inability to conceive, is a complex medical and social issue that affects both men and women. Despite physiological and biological differences between the genders, there are many common factors that can influence the reproductive health of both sexes. The interaction of these factors creates a complex picture that requires a deep understanding to develop effective prevention and treatment strategies. This article examines the main aspects of how infertility factors interact in both genders.

Age is a universal factor that affects the reproductive capacity of both men and women. As women age, there is a natural decline in egg production, with a decrease in egg quality and an increased risk of chromosomal abnormalities. Men also experience a gradual decline in sperm quality as they age, although this process is slower and less noticeable. Older partners increase the likelihood of fertility problems, making age a crucial factor to consider in family planning.

Lifestyle has a significant impact on fertility in both genders. Smoking, alcohol consumption, drug use, and poor dietary habits can negatively affect reproductive health. For example, smoking reduces sperm quality in men and disrupts hormonal balance in women, leading to ovulation issues. Excessive alcohol consumption by both partners can slow down the fertilization process and increase the risk of miscarriage. A healthy lifestyle, including regular physical activity, balanced nutrition, and

eliminating harmful habits, helps maintain high fertility levels.

Environmental pollution affects both genders. Exposure to toxins, heavy metals, pesticides, and other harmful substances can damage reproductive tissues and disrupt hormonal balance. Environmental factors can affect both male and female reproductive organs, leading to inflammation, dysfunction, and reduced chances of successful conception. Pollution of the air and water is an urgent issue in urbanized societies.

Infectious diseases, chronic illnesses, and genetic abnormalities can prevent successful conception for both partners. Sexually transmitted infections (STIs) like chlamydia and gonorrhea can lead to pelvic inflammatory disease, which causes fallopian tube blockages in women and prostate inflammation in men. Genetic anomalies and chromosomal disorders can also contribute to infertility in both genders.

Stress and psychological tension affect the hormonal balance and reproductive functions of both partners. High levels of stress can disrupt the balance of hormones that regulate the menstrual cycle in women and reduce libido and sperm quality in men. Emotional instability and anxiety can exacerbate the situation, creating additional barriers to successful conception.

Understanding that infertility factors rarely act in isolation is important. They interact with each other, magnifying negative effects. For instance, a combination of smoking and chronic stress can significantly increase the risk of fertility problems. Environmental pollution, in combination with medical conditions, may accelerate the aging process of reproductive systems. Thus, considering all the factors comprehensively allows us to form a fuller picture and develop individual approaches to solving the issue.

The interconnection and interaction of infertility factors in both men and women highlight the need for a holistic approach to studying and preventing reproductive health issues. Only by understanding the complex mechanisms of interaction between age, behavior, environmental, and medical factors can we effectively address the challenges faced by modern couples striving for a healthy pregnancy.

Conclusion:

Infertility remains a significant and complex issue affecting both men and women, particularly in large cities like Tashkent, where environmental factors, lifestyle choices, and social conditions play a critical role in reproductive health. According to statistics, the infertility rate in Tashkent is around 15% for both men and women, highlighting the widespread nature of this problem. Key factors influencing infertility include age, socio-economic status, lifestyle, and environmental conditions.

Age is one of the most crucial factors affecting fertility for both genders. For women, fertility declines significantly after the age of 35, with reduced egg quality and increased risks of complications during pregnancy. For men, sperm quality deteriorates gradually as they age, especially after 45 years. In addition to age, maintaining a healthy lifestyle, proper nutrition, stress management, and avoiding smoking and alcohol are essential for preserving reproductive health.

Socio-economic status also plays a role, as limited access to healthcare and poor living conditions may contribute to higher infertility rates among lower-income groups. Furthermore, the environmental situation in Tashkent, with high levels of air and water pollution, poses additional risks to reproductive health.

It is important to note that infertility factors rarely operate in isolation; they interact with and amplify each other. For example, a combination of stress and unhealthy habits can significantly increase the likelihood of fertility issues. Therefore, a comprehensive approach to infertility prevention and treatment is essential, taking into account all these interrelated factors. Increasing public awareness and implementing preventive measures, such as a healthy diet, regular medical check-ups, and reducing exposure to environmental pollutants, can improve reproductive health and increase the chances of successful conception in Tashkent and other major cities.

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