RESEARCH PAPER

The Role Of Life Style Factors In Infertility

Dr, Aneela Mumtaz[1], Dr. Iffat Kehkashan[2], Dr. Nusrat Ullah Khan[3], Dr. Shamim Akhtar[4], Dr. Sarwat Siddiqui[5], Maryam Binte Naseer[6], Priyanka Kumari[7], Dr. Bibi Sakina[8*], Dr. Marwah Mohamad Amen Fallath[9], Mustafa Mudawi Ahmed[10], Hamdan Siddig Sirag Ahmad[11], Sana Adil[12]

[1]Assistant Professor, Department of Obstetrics and Gynaecology, Women and Children Hospital MTI, Bannu, Pakistan
[2]Women Medical Officer, Department of Obstetrics and Gynaecology, DHQ Hospital Lower Chitral, Khyber Pakhtunkhwa, Pakistan
[3]Professor, Department of Biochemistry, Mekran Medical College, Turbat, Pakistan
[4]Associate Professor, Department of Obstetrics and Gynaecology, Kuwait Teaching Hospital, Peshawar Medical College, Peshawar, Khyber Pakhtunkhwa, Pakistan
[5]Assistant Professor, Department of Medicine, Isra university hospital Hyderabad
[6]Lecturer, Department of Community Medicine, NUST School of Health Sciences, Islamabad, Pakistan
[7]Medical Officer, Department of Emergency Medicine, Lohana Medical Centre, Pakistan
[8]Women Medical Officer, Department of Obstetrics and Gynaecology Shahbaz Ghari Hospital, Mardan, Khyber Pakhtunkhwa, Pakistan
[9]Resident Doctor, Department of Obstetrics and Gynecology, Ibn Sina College, Jeddah Saudi Arabia
[10]Assistant Professor, Department of Obstetrics and Gynecology, Faculty of Medicine, Najran University, Najran, Saudi Arabia
[11]Assistant Professor, Department of Obstetrics and Gynecology, Faculty of Medicine, Najran University, Najran, Saudi Arabia
[12]Second Fellowship Trainee, Reproductive Endocrinology and Infertility, Peshawar General Hospital, Peshawar, Pakistan

Corresponding Author
Dr. Bibi Sakina
Women Medical Officer, Department of Obstetrics and Gynaecology, Shahbaz Ghari Hospital, Mardan, Khyber Pakhtunkhwa, Pakistan
Email:ID: Abbottonian1983@gmail.com

ABSTRACT

Background: Infertility is a growing reproductive health problem worldwide. Lifestyle habits can affect hormonal balance, ovulation and fertility outcomes. This study evaluated the role of different lifestyle factors in women presenting with infertility.

Methods: This cross-sectional study was conducted at the Department of Gynecology and Obstetrics, DHQ Teaching Hospital Mardan, Pakistan, from January to June 2025. A total of 203 infertile women aged 18–45 years were included through consecutive sampling. Data regarding body mass index (BMI), physical activity, dietary habits, sleep duration, caffeine intake, screen time, smoking exposure and psychological stress were collected through a structured questionnaire. Statistical analysis was performed using SPSS version 26. Logistic regression analysis was used to identify independent factors associated with primary infertility.

Results: The mean age of participants was 30.8 ± 5.4 years. Primary infertility was present in 127 (62.6%) women. Overweight or obesity was observed in 144 (70.9%) participants. Physical inactivity was present in 118 (58.1%), unhealthy dietary habits in 124 (61.1%) and moderate to severe stress in 121 (59.6%) women. Women with primary infertility had significantly higher BMI (28.9 ± 4.5 vs 26.8 ± 4.3 kg/m², p=0.001), greater physical inactivity (64.6% vs 47.4%, p=0.017) and higher stress levels (66.1% vs 48.7%, p=0.014). Multivariable analysis showed obesity (OR=2.41, p=0.006), physical inactivity (OR=2.08, p=0.020), unhealthy diet (OR=1.94, p=0.034) and psychological stress (OR=2.31, p=0.008) as independent factors associated with primary infertility.

Conclusion: Obesity, poor dietary habits, physical inactivity and psychological stress were significantly associated with infertility. Early lifestyle counselling may help improve reproductive health and fertility outcomes.

Keywords: Infertility; Lifestyle factors; Obesity; Physical activity; Psychological stress.

How to cite this article*:* Mumtaz A, Kehkashan I, Khan NU, Akhtar S, Siddiqui S, Naseer MB, Kumari P, Sakina B, Fallath MMA, Ahmed MM, Ahmad HSS, Adil S. The Role of Life Style Factors in Infertility. Int J Drug Deliv Technol. 2026;16(59s): 769-773. DOI: 10.25258/ijddt.16.59s.91

Source of support: Nil.

Conflict of interest: Nil.

INTRODUCTION

Infertility is an important reproductive health problem and affects millions of couples around the world [1]. It is usually

defined as failure to achieve pregnancy after one year of regular unprotected marital life. The burden of infertility is increasing in both developed and developing countries [2]. In Pakistan, infertility not only affects physical health but also causes emotional, social and family problems. Infertility can occur due to many reasons. Some women have hormonal problems, while others may have structural abnormalities or reproductive disorders [3]. However, in many cases, no clear medical cause is identified. In recent years, researchers have started paying more attention to daily lifestyle habits as possible contributors to infertility [4]. Changes in lifestyle have become common in both urban and rural populations. Reduced physical activity, increased body weight, unhealthy eating habits and mental stress are frequently seen among women of reproductive age [5]. These factors may affect overall health and can also influence reproductive function. Several studies have reported that women with obesity and sedentary lifestyles experience more fertility-related problems than women with healthier lifestyles [6]. Stress is another issue that is often overlooked during infertility management. Women undergoing infertility treatment commonly face emotional pressure from family and society [2]. Sleep disturbances, prolonged screen use, smoking exposure and excessive caffeine intake have also been investigated in relation to fertility [7], although the available evidence is not fully consistent. The present study was conducted to assess the role of lifestyle factors among infertile women attending the Department of Gynecology and Obstetrics at DHQ Teaching Hospital, Mardan.

METHODOLOGY

This cross-sectional study was conducted in the Department of Gynecology and Obstetrics, DHQ Teaching Hospital, Mardan, from January to June 2025. Ethical approval was obtained from the hospital ethical review committee (Ref No. DHQTHM/ERC/2024/197). The study was reported according to STROBE recommendations. A total of 203 infertile women were included in the study. Participants were recruited through consecutive sampling during routine outpatient visits. Women aged 18 to 45 years with primary or secondary infertility of at least one year's duration were eligible for inclusion. Patients with congenital reproductive tract abnormalities, genetic disorders, malignancy, severe systemic disease or incomplete information were not included. After informed consent, information was collected through direct interviews and review of available medical records. Data regarding age, duration and type of infertility, body mass index, smoking exposure, physical activity, dietary habits, sleep pattern, caffeine consumption, screen time and perceived stress were recorded. Height and weight were measured in the clinic and body mass index was calculated using standard methods. Information on age, education, socioeconomic status, duration of marriage and relevant medical history was also collected because these factors could influence fertility outcomes. These variables were considered during statistical analysis to reduce the effect of confounding. Records with more than 10% missing information were excluded, while minor missing values were handled by complete-case analysis. Data were analyzed using SPSS version 26. Quantitative variables were presented as mean ± standard deviation, while categorical variables were expressed as frequency and percentage. Independent sample t-test and chi-square test were used for group comparisons. Multivariable logistic regression analysis was performed to identify lifestyle factors independently associated with infertility. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 203 women with infertility were included in the study. The mean age of participants was 30.8 ± 5.4 years. Primary infertility was present in 127 (62.6%) women, while 76 (37.4%) had secondary infertility. The mean duration of infertility was 4.3 ± 2.1 years. Most participants were overweight or obese and a considerable proportion reported unhealthy lifestyle habits (Table 1).

Table 1. Baseline demographic and clinical characteristics of study participants (n=203)

Variable	Value
Age (years), Mean ± SD	30.8 ± 5.4
Duration of infertility (years), Mean ± SD	4.3 ± 2.1
Primary infertility, n (%)	127 (62.6)
Secondary infertility, n (%)	76 (37.4)
BMI (kg/m²), Mean ± SD	28.1 ± 4.6
Normal BMI (<25 kg/m²), n (%)	59 (29.1)
Overweight (25–29.9 kg/m²), n (%)	83 (40.9)
Obese (≥30 kg/m²), n (%)	61 (30.0)
Duration of marriage (years), Mean ± SD	5.8 ± 2.9
College education or above, n (%)	88 (43.3)
Monthly family income <50,000 PKR, n (%)	117 (57.6)

Values are presented as mean ± SD or frequency (%). BMI: Body Mass Index.

As shown in Table 2, overweight/obesity, physical inactivity, unhealthy dietary habits, inadequate sleep, high caffeine intake, increased screen time, and psychological stress were common among participants.

Table 2. Distribution of lifestyle factors among infertile women (n=203)

Lifestyle factor	n (%)
Overweight/Obese BMI	144 (70.9)
Current smoker	31 (15.3)
Passive smoking exposure	82 (40.4)
Physically inactive	118 (58.1)
Unhealthy dietary habits	124 (61.1)
Sleep duration <7 hours/day	111 (54.7)
High caffeine intake (>2 cups/day)	96 (47.3)
Screen time >4 hours/day	109 (53.7)
Moderate to severe psychological stress	121 (59.6)

Lifestyle variables were obtained through structured interviews. Frequencies are presented as n (%).

A comparison between women with primary and secondary infertility is shown in Table 3. Higher BMI, physical inactivity, psychological stress, and unhealthy diet were significantly more common among women with primary infertility.

Table 3. Comparison of lifestyle factors according to type of infertility

Variable	Primary Infertility (n=127)	Secondary Infertility (n=76)	Test Statistic	p-value
Age (years), Mean ± SD	29.7 ± 4.9	32.6 ± 5.7	t=3.71	<0.001
BMI (kg/m²), Mean ± SD	28.9 ± 4.5	26.8 ± 4.3	t=3.24	0.001
Physically inactive, n (%)	82 (64.6)	36 (47.4)	χ^2=5.74	0.017
Unhealthy diet, n (%)	86 (67.7)	38 (50.0)	χ^2=6.32	0.012
Sleep <7 hours/day, n (%)	74 (58.3)	37 (48.7)	χ^2=1.75	0.186
High caffeine intake, n (%)	65 (51.2)	31 (40.8)	χ^2=2.06	0.151
Screen time >4 hours/day, n (%)	74 (58.3)	35 (46.1)	χ^2=2.92	0.087
Moderate-Severe stress, n (%)	84 (66.1)	37 (48.7)	χ^2=6.09	0.014
Passive smoking exposure, n (%)	55 (43.3)	27 (35.5)	χ^2=1.20	0.273

Independent sample t-test was used for continuous variables and chi-square test for categorical variables. $p<0.05$ was considered statistically significant.

Multivariable logistic regression analysis identified obesity, physical inactivity, unhealthy diet, and psychological stress as independent lifestyle factors associated with primary infertility (Table 4).

Table 4. Multivariable logistic regression analysis for factors associated with primary infertility

Variable	Adjusted OR	95% CI	p-value
Obesity (BMI ≥30 kg/m²)	2.41	1.28–4.56	0.006
Physical inactivity	2.08	1.12–3.84	0.020
Unhealthy dietary habits	1.94	1.05–3.58	0.034
Moderate-Severe stress	2.31	1.24–4.29	0.008
Sleep duration <7 hours	1.39	0.77–2.51	0.268
High caffeine intake	1.27	0.69–2.34	0.439
Screen time >4 hours/day	1.51	0.83–2.76	0.177
Passive smoking exposure	1.22	0.66–2.24	0.523

Logistic regression model adjusted for age, education level, monthly income, duration of marriage, and duration of infertility. OR: Odds Ratio; CI: Confidence Interval.

DISCUSSION

Infertility is becoming a common health problem in developing countries. Along with medical causes, daily lifestyle habits also affect reproductive health. In the present study, a large number of women had raised BMI, physical inactivity, unhealthy dietary habits and psychological stress. These factors were more common in women with primary infertility. Similar findings have been reported in different international studies where lifestyle factors were found to influence fertility potential and reproductive outcomes. The mean BMI of our participants was high and more than two-thirds of women were overweight or obese. Obesity also remained an independent predictor of primary infertility in our regression model. This finding agrees with previous studies which reported a strong association between obesity and female infertility

[7]. Literature reported that overweight women have higher rates of menstrual disturbances, anovulation and reduced fertility. One possible reason is that excess body fat disturbs the hypothalamic-pituitary-ovarian axis [4]. It also increases insulin resistance and androgen production. These hormonal changes may affect follicular development and ovulation. In our population, reduced physical activity, unhealthy food intake and sedentary routine may explain the high frequency of obesity among infertile women [8].

Physical inactivity, dietary habits and stress were among the important findings of our study. Women with primary infertility reported higher stress levels than those with secondary infertility. Similar observations have been described in earlier studies [9]. In our society, infertility often places a considerable emotional burden on women [10]. Questions from relatives, social expectations and concerns about future childbearing can increase psychological stress [11]. This may explain the higher stress levels observed among our participants. Although short sleep duration, prolonged screen use, caffeine intake and passive smoking were frequently reported, they did not show an independent association in the final regression model. Similar findings have been reported in some previous studies [12]. Their effects may be less pronounced than factors such as obesity, physical inactivity and stress. It is also possible that a larger sample size may have shown clearer associations [13]. Similar findings have been reported in some previous studies where their effects became weaker after adjustment for obesity and other lifestyle variables [14]. It is possible that these factors act indirectly through weight gain, stress or reduced physical activity [8]. Another reason may be the limited sample size of the present study. Their true effect may become more evident in larger populations [13]. Despite non-significant results, these habits should not be ignored because they may still contribute to poor reproductive health [15]. The clinical importance of this study is that most identified risk factors are modifiable. Lifestyle assessment is simple, low cost and can easily be included in infertility clinics. Weight reduction, healthy eating habits, stress management and regular physical activity may improve fertility outcomes and may reduce the need for expensive interventions in some patients. The present study has some limitations. Its cross-sectional design does not establish a causal relationship. Lifestyle information was based on participant responses and recall bias may be present. The study was also conducted at a single center. Future multicenter studies with larger samples and long-term follow-up are needed. Intervention-based studies should also evaluate whether lifestyle modification improves conception rates in infertile women.

CONCLUSION

Raised BMI, physical inactivity, unhealthy dietary habits and psychological stress were significantly associated with infertility in the present study. These factors remained important even after adjustment for confounding variables. Lifestyle modification should be considered an essential part of infertility management. Early counselling regarding weight control, healthy diet, regular exercise and stress reduction may help improve reproductive health and fertility outcomes

REFERENCE

1. Practice Committee of the American Society for Reproductive Medicine. Definitions of infertility and recurrent pregnancy loss: a committee opinion. Fertil Steril. 2020;113(3):533-535. doi:10.1016/j.fertnstert.2019.11.025.
2. Harris E. Infertility affects 1 in 6 people globally. JAMA. 2023;329(17):1443. doi:10.1001/jama.2023.6251.
3. Cox CM, Thoma ME, Tchangalova N, Mburu G, Bornstein MJ, Johnson CL, et al. Infertility prevalence and the methods of estimation from 1990 to 2021: a systematic review and meta-analysis. Hum Reprod Open. 2022;2022(4):hoac051. doi:10.1093/hropen/hoac051.
4. Nik Hazlina NH, Norhayati MN, Shaiful Bahari I, Nik Muhammad Arif NA. Worldwide prevalence, risk factors and psychological impact of infertility among women: a systematic review and meta-analysis. BMJ Open. 2022;12(3):e057132. doi:10.1136/bmjopen-2021-057132.
5. Sachdev D, Yamada R, Lee R, Sauer MV, Ananth CV. Risk of stroke hospitalization after infertility treatment. JAMA Netw Open. 2023;6(8):e2331470. doi:10.1001/jamanetworkopen.2023.31470.
6. Sørensen M, Poulsen AH, Nøhr B, Khan J, Ketzel M, Brandt J, et al. Long term exposure to road traffic noise and air pollution and risk of infertility in men and women: nationwide Danish cohort study. BMJ. 2024;386:e080664. doi:10.1136/bmj-2024-080664.
7. Lee J, Choo CW, Moon KY, Lyu SW, Kim H, Lee JY, et al. Risk factors for infertility in Korean women. J Korean Med Sci. 2024;39(10):e85. doi:10.3346/jkms.2024.39.e85.
8. Carson SA, Kallen AN. Diagnosis and management of infertility: a review. JAMA. 2021;326(1):65-76. doi:10.1001/jama.2021.4788.
9. Harris BS, Jukic AM, Truong T, Nagle CT, Erkanli A, Steiner AZ. Markers of ovarian reserve as predictors of future fertility. Fertil Steril. 2023;119(1):99-106. doi:10.1016/j.fertnstert.2022.09.017.
10. Ennab F, Atiomo W. Obesity and female infertility. Best Pract Res Clin Obstet Gynaecol. 2023;89:102336. doi:10.1016/j.bpobgyn.2023.102336.
11. Venkatesh SS, Ferreira T, Benonisdottir S, Rahmioglu N, Becker CM, Granne I, et al. Obesity and risk of female reproductive conditions: a Mendelian randomisation study. PLoS Med. 2022;19(2):e1003679. doi:10.1371/journal.pmed.1003679.
12. Yin YH, Zhou SY, Lu DF, Chen XP, Liu B, Lu S, et al. Higher waist circumference is associated with increased likelihood of female infertility: NHANES 2017-2020 results. Front Endocrinol (Lausanne). 2023;14:1216413. doi:10.3389/fendo.2023.1216413.

13. Łakoma K, Kukharuk O, Śliż D. The influence of metabolic factors and diet on fertility. Nutrients. 2023;15(5):1180. doi:10.3390/nu15051180.
14. Phillips K, Olanrewaju RA, Omole F. Infertility: evaluation and management. Am Fam Physician. 2023;107(6):623-630.
15. Zhu C, Yan L, He C, Wang Y, Wu J, Chen L, et al. Incidence and risk factors of infertility among couples who desire a first and second child in Shanghai, China: a facility-based prospective cohort study. Reprod Health. 2022;19(1):155. doi:10.1186/s12978-022-01459-6...

.