

Depression Among Infertile Women Attending an IVF Center in Al-Basra: A Preliminary Case–Control Study

Aqeel Ibraheem Al-Sabbagh

Consultant Psychiatrist, Psychiatry Unit, Basrah Teaching Hospital, Assistant Professor, Basra Medical College, University of Basra, Al-Basrah, Iraq.

Received: 13. 10.2024

Accepted: 13.12. 2025

Abstract

Background: Depression is common among infertile women, partly due to social stigma and marital pressures. Data remains scarce in low-resource settings like Al-Basra. The study aims to estimate the prevalence of depression among infertile women and examine factors linked to its severity.

Methods: This pilot case–control study recruited 100 infertile women (cases) and 100 fertile women (controls) at the IVF and gynecology clinics of Al-Basra Hospital for Women and Children from August–November 2022. Participants completed the General Health Questionnaire (GHQ-30) and Beck’s Depression Inventory-II (BDI-II). Sociodemographic data (e.g., marriage order, family psychiatric history) were collected.

Results: Among infertile women, 76% met criteria for depression compared to 5% of controls ($p=0.001$). More than half reported moderate-to-severe symptoms. Second marriage status was associated with higher BDI-II scores, and a positive family history of psychiatric disorders correlated with more severe depression.

Conclusion: Depression appears highly prevalent among infertile women in Al-Basra, suggesting the need for routine psychological screening and support in fertility clinics. Future research should employ randomized samples and structured clinical interviews to confirm these findings and improve generalizability.

Keywords: Infertility, Depression, Case–Control, Pilot Study, Al-Basra

Corresponding author:

Aqeel Ibraheem Al-Sabbagh

✉ Email: akeelsabbagh@yahoo.com

Introduction

Major depressive disorder (MDD) is recognized worldwide as a leading cause of disability, with symptoms that include depressed mood, loss of interest in activities, cognitive difficulties, and disruptions in sleep or appetite [1]. Although epidemiological estimates place the prevalence of depressive disorders at around 5–10% in primary care settings and up to 30% in certain populations, a striking gender disparity exists, with women being roughly twice as likely as men to be affected [2]. Despite the availability of effective treatments, depression remains frequently underdiagnosed and undertreated, partly because patients and physicians may attribute symptoms to situational stressors rather than true clinical illness [3].

Depression can have far-reaching social impacts, straining relationships, reducing productivity, and increasing healthcare utilization [3]. In practice, it often coexists with

other life stressors—including chronic medical conditions like infertility. In such contexts, the challenge for clinicians is to recognize and manage depression early, thereby mitigating more serious morbidity or complications.

Clinical Presentation

A depressed mood and loss of pleasure (anhedonia) are cornerstone symptoms of MDD, with individuals frequently describing “agonizing emotional pain” or profound fatigue [2]. Observable signs range widely, from subtle social withdrawal to pronounced psychomotor retardation. Negative thought patterns centered on worthlessness, guilt, or hopelessness further compromise functional capacity [4].

Epidemiology

Estimates from the World Mental Health Survey (covering 18 countries) place the average 12-month prevalence of MDD at ~6%, reflecting minimal variation between high-income (5.5%) and low-/middle-income (5.9%) contexts [1]. Additional longitudinal data, such as the Zurich Study, confirm a high burden of depressive disorders in young adults [5]. Although methodological differences complicate cross-national comparisons [6], [7], key risk factors—such as female sex, psychosocial stressors, and familial predisposition—remain consistent globally.

Etiology

MDD likely arises from a dynamic interplay of genetic and environmental elements, similar to other complex diseases like cancer or diabetes [8], [9]. Genetic heritability, estimated at around 37%, confers heightened vulnerability, especially in severe forms of depression [5], [10]. Early life adversities, including childhood maltreatment, amplify the risk of both onset and chronic course [11], [12], [13], [14]. Neurobiological underpinnings include dysregulations in monoamine transmitters, hypothalamic–pituitary–adrenal (HPA) axis function, and inflammatory pathways [8], [15], [16], [17].

Infertility: A Trigger for Depression

Infertility affects 10–15% of couples globally, with factors such as delayed childbearing, contraceptive use, and social pressures contributing to rising prevalence [18], [19], [20]. Many women ultimately turn to assisted reproductive technologies (ART), incurring physical and financial burdens [21]. In conservative societies, women are often disproportionately blamed for childlessness, magnifying psychosocial stress and fueling depressive symptoms [22]. Indeed, a Basra-based study reported a 68.9% rate of depression among infertile women, underscoring an urgent need for psychological assessment and intervention [22].

Stress and depression may also interact bidirectionally with infertility. While elevated stress can stem from diagnostic uncertainties and ART procedures [23], [24], preexisting depression may disrupt hormonal processes integral to ovulation, thus complicating attempts to conceive [24]. This cyclical relationship underscores the relevance of screening and addressing depression in fertility settings

Under-recognition of Depression

General practitioners frequently contend with ambiguous presentations spanning physical and psychological complaints. As many as half of primary-care patients who meet criteria for depression remain undiagnosed at initial consultation [25]. Some subsequently improve or are recognized later, but a substantial minority remain clinically unrecognized even six months later [25]. Without baseline prevalence data—especially in unique patient subgroups such as infertile women—it becomes difficult to gauge progress toward universal depression screening or to target improvements in clinical practice [26].

Objectives

1. To determine the prevalence of depression among female patients with infertility in Al-Basra.
2. To examine the association between selected sociodemographic and clinical factors (e.g., marital history, family psychiatric history) and depression status among these patients.

Methods

Study Design & Settings

A case–control study was carried out from August 1 to November 30, 2022, at Al-Basra Hospital for Women and Children. Infertile women were recruited from the infertility outpatient clinic (cases), and fertile women from the general gynecological outpatient clinic (controls). Both clinics offer specialized services for infertility workups and a range of gynecological conditions. To accommodate participant flow, recruitment occurred three days a week throughout the study period.

Study Population and Sampling

A total of 100 infertile women (cases) and 100 fertile women (controls) were enrolled using a convenience sampling approach, due to time and resource constraints. Potential participants were included if they were of reproductive age, had a documented diagnosis of infertility for at least two years by a specialist gynecologist, and were currently married. Women who

were divorced or widowed, had less than two years of infertility, or had previously been diagnosed with any psychiatric disorder other than depression were excluded. The study's purpose was explained to each participant, and only those who provided informed (verbal) consent proceeded with the questionnaires.

Data Collection

Following consent, each participant completed a brief questionnaire that recorded sociodemographic details (age, marital status, education, employment, residence), clinical data (duration of infertility, previous IVF attempts, contraception use), and family history of psychiatric disorders. All questionnaires were administered in a private setting,

Depression Assessment

Depressive symptoms were initially screened using an Arabic version of the 30-item General Health Questionnaire (GHQ-30). A total score >5 indicated probable psychiatric morbidity. Participants who exceeded this threshold underwent the Structured Clinical Interview for DSM-5 (SCID-5), administered by the researcher, to confirm a diagnosis of major depressive disorder. Additionally, all participants completed an Arabic translation of the 21-item Beck Depression Inventory-II (BDI-II), which rates each symptom on a 0–3 scale. Higher total scores reflect more severe depression. Both the GHQ-30 and BDI-II translations had been previously reviewed by local professionals, with minor linguistic adjustments for clarity.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics (Version 26). Descriptive statistics (e.g., means, standard deviations, frequencies, percentages) were generated to characterize the sample. Associations between categorical variables were examined with chi-square or Fisher's exact tests, and independent t-tests were used for continuous variables. A p-value <0.05 was considered significant for all comparisons.

Ethical Statement

Ethical approval was obtained from the Scientific and Ethical Research Committee at the Basrah Health Directorate. All participants were assured of the confidentiality of their responses and informed that they

could withdraw from the study at any point without consequences.

Results

A total of 200 women participated in this study, comprising 100 infertile women (cases) and 100 fertile women (controls). Each participant completed the General Health Questionnaire (GHQ-30) and the Beck Depression Inventory-II (BDI-II).

Participants Demographics

The age of infertile women ranged from 17 to 48 years, whereas the controls ranged from 18 to 45 years; no significant difference was found ($p=0.641$). About half of both groups were between 21 and 30 years old (51% vs. 47%). Residence was predominantly urban (71% of cases vs. 73% of controls). Most participants in both groups were housewives (95% vs. 90%; $p=0.676$), and 44% in each group reported secondary education as their highest level. Notably, 14% of the infertile group reported being in a second marriage, compared to only 5% of controls ($p=0.027$). A family history of depression or other psychiatric disorders was present in 33% of cases versus 29% of controls (Table 1).

Clinical History of Infertility (Cases Only)

Among infertile women, six reported previous contraceptive use, and 11% had attempted in vitro fertilization (Table 2). Duration of infertility ranged from 2 to 20 years (mean= 8.27 ± 4.1), with 79% under 10 years.

Prevalence of Depression

Overall, 76% ($n=76$) of infertile women were classified as depressed, while 24% ($n=24$) were non-cases (Table 3). In contrast, only 5% ($n=5$) of controls met criteria for depression, compared to 95% who did not. This difference was statistically significant ($\chi^2=14.23$, $df=1$, $p=0.001$).

GHQ-30 Findings and Validation

Using a GHQ-30 cutoff score >5 to denote probable psychiatric morbidity, 85% ($n=85$) of infertile women screened positive, compared to 31% ($n=31$) of controls ($p=0.001$) (Table 5). Sensitivity and specificity analyses (Table 4) showed that GHQ-30 had a high sensitivity (98.68%) but moderate specificity (58.3%) among

infertile women; in controls, sensitivity was 80.0% and specificity 71.6%. This suggests GHQ-30 tends to flag almost all true depression cases but may also produce false positives, especially in the case group.

BDI-II Results

BDI-II scores indicated that only 16% of infertile women were free of depressive symptoms, whereas 85% of controls fell into the “no depression” range ($p=0.002$). Nearly 43% of the infertile group reported severe depression (24–36 on BDI-II), and 10% had very severe depression (>37), in contrast to none in the controls (Table 6).

Associations with Sociodemographic and Clinical Factors
Table 7 presents the relationship between BDI-II scores and selected variables. In the case group, second-marriage status was strongly associated with higher BDI-II scores ($p=0.001$). A positive family history of psychiatric disorders also correlated with elevated BDI-II scores in both groups ($p=0.001$). No significant links were found between depression severity and variables such as age, educational level, employment, or place of residence (all $p>0.05$). Certain infertility-specific details, such as IVF attempts, were not examined in the control group since they do not apply to fertile women.

Discussion

Infertility is a significant public health issue, and depression is a leading cause of disability worldwide. Studying depression among infertile women provides valuable insights into how these two conditions intersect and can help optimize both mental health and reproductive care. In the present study, we found that 76% of infertile women met the criteria for depression, a prevalence exceeding that reported in a 2013 Basrah-based study (68.9%) using ICD-10 criteria [22]. This higher prevalence could reflect a genuine rise in depressive symptoms among infertile women, potentially due to heightened social pressures or increased public awareness of mental health. It could also stem from methodological factors, including differing diagnostic tools and a population with more severe cases (e.g., women seeking advanced treatments).

Depression in the context of infertility can be attributed to social stigma, feelings of isolation, and the substantial

emotional and financial strain of fertility treatments. In many cultures, childbearing is considered integral to femininity and marital success, so women who cannot conceive may experience profound distress [27]. These sociocultural norms were evident in our finding that 14% of infertile participants were in a second marriage, which correlated with higher depression severity. Longer-standing infertility and the pressure to produce offspring may exacerbate stress, leading to more severe depressive symptoms [28]. By contrast, variables such as age, education, and occupation were not significantly associated with higher depression rates, consistent with other regional studies [21], [28].

GHQ-30 Performance and Depression Screening

The GHQ-30 has long been used to screen for psychological distress in various settings [29]. In our sample, GHQ-30 demonstrated excellent sensitivity (98.68%) but lower specificity (58.3%) among infertile women. This suggests that while the GHQ-30 is effective at detecting most cases of depression, it may over-identify some participants as probable cases (false positives). Such performance characteristics can inflate the observed prevalence of depression, especially when compared to populations with lower distress levels [30], [31]. Nevertheless, we employed a follow-up structured diagnostic step (i.e., DSM-5 or SCID interview) to confirm major depressive disorder, which mitigates the impact of GHQ-30’s moderate specificity on final diagnoses.

Comparison with Regional Literature

Infertile women in other neighboring countries have shown similarly elevated depression rates. For instance, a study in Saudi Arabia reported a 53.8% prevalence of depression among infertile females [32]. Socioeconomic contexts differ, but limited access to subsidized treatments, out-of-pocket expenses, and cultural expectations about motherhood likely amplify psychological burdens for Iraqi women, many of whom rely on their spouses for financial support [33]. Moreover, repeated fertility procedures, such as IVF attempts, compound stress and may intensify depressive symptomatology [34], [35].

Clinical and Genetic Correlates

Our results showed no overall difference in family history of depression between infertile and fertile women, though a positive family history did correlate with more severe depressive symptoms. This finding aligns with meta-analyses indicating that genetic vulnerability interacts with environmental factors to influence depression severity [5], [36], [37], [38], [39]. Notably, while infertility is a substantial environmental stressor, the underlying heritability of depression could amplify women's responses to the emotional toll of failed conception attempts.

Limitations

This study has several limitations. First, our control group comprised fertile women attending general gynecological clinics, rather than fertile women actively attempting to conceive. This discrepancy may introduce selection bias, as these controls may have had fewer stressors related to pregnancy planning. Future studies should ideally recruit a control group more closely matched for fertility goals. Second, the sample was drawn from women already engaged in fertility treatment, potentially excluding those who cannot afford or access such services. Consequently, the true prevalence of depression in the broader infertile population might be even higher. Third, the GHQ-30's lower specificity means some participants could be labeled as probable cases despite normal stress responses. Although we addressed this by confirming depression diagnoses through structured clinical interviews, screening tools are never entirely free of false positives. Finally, the study employed a relatively brief recruitment window, and convenience sampling may limit generalizability.

Despite these constraints, our findings highlight the considerable burden of depression among infertile women and underscore the need for integrated mental health support within fertility clinics. Addressing psychological distress can improve patients' well-being and may even affect treatment adherence and outcomes [40], [41], [42]. Emerging evidence suggests that psychosocial interventions, including cognitive-behavioral therapy, could enhance both psychological and fertility-related outcomes [43]. Furthermore, research on protective factors and coping strategies for women undergoing IVF treatment reveals several key findings. Social support

consistently emerges as a protective factor against psychological distress [44], [45]. Regarding coping strategies, problem-focused coping is associated with better outcomes [45], [46], while avoidance and escapist coping strategies increase distress risk [44], [46], [47]. Dispositional optimism serves as a protective factor against distress following IVF failure [47]. Higher perception of treatment controllability is linked to better psychological adjustment [46].

Larger, more rigorously designed studies—using matched controls actively attempting pregnancy and a randomized sampling strategy—are warranted to deepen our understanding of the infertility–depression nexus in low- to middle-income settings such as Iraq

Conclusion

This study demonstrates a notably high prevalence of depression among infertile women in Al-Basra, with more than half exhibiting moderate-to-severe forms of the disorder. The General Health Questionnaire (GHQ-30) proved highly sensitive in detecting depression, although its moderate specificity may inflate the number of probable cases. Moreover, women in a second marriage or with a positive family history of psychiatric illness emerged as particularly vulnerable subgroups warranting targeted intervention.

Despite these findings, the use of a control group not necessarily desiring pregnancy may limit the direct comparability of results, and future research should recruit fertile women who are actively trying to conceive. Large-scale, community-based surveys and longitudinal designs are needed to more accurately define the true extent of depression among infertile women, clarify the temporal relationships between infertility and mental health, and account for socioeconomic barriers to care. Special attention must be given to high-risk subgroups, ensuring they receive integrated psychological support—whether embedded in fertility clinics or coordinated through mental health services. By systematically incorporating screening, referral, and counseling at each stage of infertility care, clinicians can better address the stress and anxiety surrounding fertility treatment and ultimately improve both psychological well-being and clinical outcomes.

References

- [1] C. Otte, S. M. Gold, B. W. Penninx, C. M. Pariante, A. Etkin, and M. Fava, "Major depressive disorder," *Nat Rev Primer*, vol. 2, no. 16065, 2016.
- [2] D. Semple and R. Smyth, "Oxford Handbook of Psychiatry." Oxford University Press, 2019. doi: 10.1093/med/9780198795551.001.0001.
- [3] L. T. Park and C. A. Zarate Jr, "Depression in the Primary Care Setting," *N Engl J Med*, vol. 380, no. 6, pp. 559–68, 2019.
- [4] R. RBMVP, Kaplan & Sadock's Synopsis of Psychiatry, 12th Ed. Lippincott Williams & Wilkins (LWW, 2021.
- [5] P. F. Sullivan, M. C. Neale, and K. S. Kendler, "Genetic epidemiology of major depression: review and meta-analysis," *Am J Psychiatry*, vol. 157, no. 10, pp. 1552–62, 2000.
- [6] R. C. Kessler and E. J. Bromet, "The epidemiology of depression across cultures," *Annu Rev Public Health*, vol. 34, pp. 119–38, 2013.
- [7] K. S. Kendler, S. H. Aggen, Y. Li, C. M. Lewis, G. Breen, and D. I. Boomsma, "The similarity of the structure of DSM-IV criteria for major depression in depressed women from China, the United States and Europe," *Psychol Med*, vol. 45, no. 9, pp. 1945–54, 2015.
- [8] R. V. Saveanu and C. B. Nemeroff, "Etiology of depression: genetic and environmental factors," *Psychiatr Clin North Am*, vol. 35, no. 1, pp. 51–71, 2012.
- [9] E. Jesulola, P. Micalos, and I. J. Baguley, "Understanding the pathophysiology of depression: From monoamines to the neurogenesis hypothesis model - are we there yet?," *Behav. Brain Res.*, vol. 341, pp. 79–90, 2018.
- [10] M. Shadrina, E. A. Bondarenko, and P. A. Slominsky, "Genetics Factors in Major Depression Disease," *Front Psychiatry*, vol. 9, no. 334, 2018.
- [11] E. T. C. Lippard and C. B. Nemeroff, "The Devastating Clinical Consequences of Child Abuse and Neglect: Increased Disease Vulnerability and Poor Treatment Response in Mood Disorders," *Am J Psychiatry*, vol. 177, no. 1, pp. 20–36, 2020.
- [12] J. Nelson, A. Klumparendt, P. Doebler, and T. Ehring, "Childhood maltreatment and characteristics of adult depression: meta-analysis," *Br J Psychiatry*, vol. 210, no. 2, pp. 96–104, 2017.
- [13] A. Negele, J. Kaufhold, L. Kallenbach, and M. Leuzinger-Bohleber, "Childhood Trauma and Its Relation to Chronic Depression in Adulthood," *Depress Res Treat*, vol. 2015, no. 650804, 2015.
- [14] T. Plieger, M. Melchers, C. Montag, R. Meermann, and M. Reuter, "Life stress as potential risk factor for depression and burnout," *Burn. Res.*, vol. 2, no. 1, pp. 19–24, 2015.
- [15] P. L. Delgado, "Depression: the case for a monoamine deficiency," *J Clin Psychiatry*, vol. 6, pp. 7–11, 2000.
- [16] T. Tamura, G. Sugihara, K. Okita, Y. Mukai, H. Matsuda, and H. Shiwaku, "Dopamine dysfunction in depression: application of texture analysis to dopamine transporter single-photon emission computed tomography imaging," *Transl. Psychiatry*, vol. 12, no. 1, 2022.
- [17] D. J. Allison and D. S. Ditor, "The common inflammatory etiology of depression and cognitive impairment: a therapeutic target," *J Neuroinflammation*, vol. 11, no. 151, 2014.
- [18] "International Classification of Diseases [Internet]," WHO, 2018, [Online]. Available: [https://www.who.int/news-room/fact-sheets/detail/infertility#:~:text=Infertility%20is%20a%20disease%20of,unprotected%20sexual%20intercourse.\(1\)](https://www.who.int/news-room/fact-sheets/detail/infertility#:~:text=Infertility%20is%20a%20disease%20of,unprotected%20sexual%20intercourse.(1)).
- [19] A. Moridi, N. Roozbeh, H. Yaghoobi, S. Soltani, S. Dashti, and N. Shahrahmani, "Etiology and risk factors associated with infertility," *Int J Women's Health Reprod Sci*, vol. 7, no. 3, pp. 346–53, 2019.
- [20] M. Mirzaei, N. Namiranian, R. Dehghani Firouzabadi, and S. Gholami, "The prevalence of infertility in 20-49 years women in Yazd, 2014-2015: A

cross-sectional study,” *Int J Reprod Biomed*, vol. 16, no. 11, pp. 683–8, 2018.

[21] M. Ogawa, K. Takamatsu, and F. Horiguchi, “Evaluation of factors associated with the anxiety and depression of female infertility patients,” *Biopsychosoc Med*, vol. 5, no. 1, 2011.

[22] J. N. Al-Asadi and Z. B. Hussein, “Depression among infertile women in Basrah, Iraq: Prevalence and risk factors,” *J. Chin. Med. Assoc.*, vol. 78, no. 11, 2015.

[23] K. L. Rooney and A. D. Domar, “The relationship between stress and infertility,” *Dialogues Clin Neurosci*, vol. 20, no. 1, pp. 41–7, 2018.

[24] B. D. Peterson, C. S. Sejbaek, M. Pirritano, and L. Schmidt, “Are severe depressive symptoms associated with infertility-related distress in individuals and their partners?,” *Hum Reprod*, vol. 29, no. 1, pp. 76–82, 2014.

[25] E. S. Paykel and R. G. Priest, “Recognition and management of depression in general practice: consensus statement,” *Bmj*, vol. 305, no. 6863, pp. 1198–202, 1992.

[26] E. Kato, A. E. Borsky, S. H. Zuvekas, A. Soni, and Q. Ngo-Metzger, “Missed Opportunities for Depression Screening and Treatment in the United States,” *J Am Board Fam Med*, vol. 31, no. 3, pp. 389–97, 2018.

[27] L. Yusuf, “Depression, anxiety and stress among female patients of infertility; A case control study,” *Pak J Med Sci*, vol. 32, no. 6, pp. 1340–3, 2016.

[28] A. Elsous, E.-K. SdA, A. Salama, M. Radwan, S. Abo-Eid, and S. Baloushah, “Depression among Infertile Women in Gaza Strip: Symptom Severity and Predictors,” *Depress. Res. Treat.*, vol. 2021, no. 6616489, 2021.

[29] B. Dale, U. Söderhamn, and O. Söderhamn, “Psychometric properties of the Norwegian version of the General Health Questionnaire (GHQ-30) among older people living at home,” *Psychol Res Behav Manag*, vol. 5, pp. 151–7, 2012.

[30] A. Vodermaier, W. Linden, and C. Siu, “Screening for emotional distress in cancer patients: a

systematic review of assessment instruments,” *J Natl Cancer Inst*, vol. 101, no. 21, pp. 1464–88, 2009.

[31] M. S. B. Yusoff, “The sensitivity, specificity and reliability of the Malay version 30-item General Health Questionnaire (GHQ) in detecting distressed medical students,” *Educ. Med. J.*, vol. 2, 2010.

[32] H. T. Al-Homaidan, “Depression among Women with Primary Infertility attending an Infertility Clinic in Riyadh, Kingdom of Saudi Arabia: Rate, Severity, and Contributing Factors,” *Int J Health Sci Qassim*, vol. 5, no. 2, pp. 108–15, 2011.

[33] Z. Kiani, M. Simbar, S. Hajian, and F. Zayeri, “The prevalence of depression symptoms among infertile women: a systematic review and meta-analysis,” *Fertil Res Pr.*, vol. 7, no. 1, 2021.

[34] S. Reis, M. R. Xavier, R. Coelho, and N. Montenegro, “Psychological impact of single and multiple courses of assisted reproductive treatments in couples: a comparative study,” *Eur J Obstet Gynecol Reprod Biol*, vol. 171, no. 1, pp. 61–6, 2013.

[35] S. Maroufizadeh, E. Karimi, S. Vesali, and R. Omani Samani, “Anxiety and depression after failure of assisted reproductive treatment among patients experiencing infertility,” *Int J Gynaecol Obstet*, vol. 130, no. 3, pp. 253–6, 2015.

[36] B. Meiser, P. R. Schofield, L. Trevena, A. Wilde, K. Barlow-Stewart, and J. Proudfoot, “Cluster randomized controlled trial of a psycho-educational intervention for people with a family history of depression for use in general practice,” *BMC Psychiatry*, vol. 13, no. 1, 2013.

[37] A. Colvin, G. A. Richardson, J. M. Cyranowski, A. Youk, and J. T. Bromberger, “Does family history of depression predict major depression in midlife women? Study of Women’s Health Across the Nation Mental Health Study (SWAN MHS),” *Arch Womens Ment Health*, vol. 17, no. 4, pp. 269–78, 2014.

[38] L. S. Gorham, N. Sadeghi, L. Eisner, J. Taigman, K. Haynes, and K. Qi, “Clinical utility of family history of depression for prognosis of adolescent depression severity

and duration assessed with predictive modeling,” *J. Child Psychol. Psychiatry*, vol. 63, no. 8, pp. 939–47, 2022.

[39] B. J. Milne, A. Caspi, H. Harrington, R. Poulton, M. Rutter, and T. E. Moffitt, “Predictive value of family history on severity of illness: the case for depression, anxiety, alcohol dependence, and drug dependence,” *Arch Gen Psychiatry*, vol. 66, no. 7, pp. 738–47, 2009.

[40] G. Aimagambetova, A. Issanov, S. Terzic, G. Bapayeva, T. Ukybassova, and S. Baikoshkarova, “The effect of psychological distress on IVF outcomes: Reality or speculations?,” *PLoS One*, vol. 15, no. 12, 2020.

[41] M. B. NK, M. G. AC, M. L. NE, L. B. S. A, M. G. T. M, and G. P. C. MC, “Success of in vitro fertilization and its association with the levels of psychophysiological stress before and during the treatment,” *Health Care Women Int*, vol. 42, no. 4–6, pp. 420–45, 2021.

[42] M. McLaughlin and T. Cassidy, “Psychosocial predictors of IVF success after one year: a follow-up study,” *J Reprod Infant Psychol*, vol. 37, no. 3, pp. 311–21, 2019.

[43] Y. Frederiksen, I. Farver-Vestergaard, N. G. Skovgård, H. J. Ingerslev, and R. Zachariae, “Efficacy of psychosocial interventions for psychological and pregnancy outcomes in infertile women and men: a systematic review and meta-analysis,” *BMJ Open*, vol. 5, no. 1, 2015.

[44] Rockliff HE, Lightman SL, Rhidian E, Buchanan H, Gordon U, Vedhara K. A systematic review of psychosocial factors associated with emotional adjustment in in vitro fertilization patients. *Human Reproduction Update* [Internet]. 2014 Mar 27;20(4):594–613. Available from: <https://doi.org/10.1093/humupd/dmu010>

[45] Cassidy T. Distress and Coping with In Vitro Fertilisation (IVF): The Role of Self-Compassion, Parenthood Motivation and Attachment. *Journal of Psychology & Clinical Psychiatry*[Internet]. 2016 Aug 4;6(4). Available from: <https://doi.org/10.15406/jpcpy.2016.06.00363>

[46] Gourounti K, Anagnostopoulos F, Potamianos G, Lykeridou K, Schmidt L, Vaslamatzis G. Perception of

control, coping and psychological stress of infertile women undergoing IVF. *Reproductive BioMedicine Online* [Internet]. 2012 Mar 10;24(6):670–9. Available from: <https://doi.org/10.1016/j.rbmo.2012.03.002>

[47] Litt MD, Tennen H, Affleck G, Klock S. Coping and Cognitive factors in adaptation to in vitro fertilization failure. *Journal of Behavioral Medicine* [Internet]. 1992 Apr 1;15(2):171–87. Available from: <https://doi.org/10.1007/bf00848324>

Table 1: Sociodemographic distribution of the studied women.

Variable		Cases	Controls	p value
Age	Range	17-48	18-45	0.641
	Mean	30.7 ± 6.3	31.9 ± 5.2	
	≤20	2	3	
	21-30	51	47	
	31-40	41	43	
	>40	5	7	
Residency	Urban	71	73	0.931
	Rural	29	27	
Occupation	Houswives	95	90	0.676
	Employed	5	10	
Educational Level	Illiterate	15	14	0.980
	Primary	40	45	
	Secondary	44	39	
	University	1	2	
Marriage	1 st Marriage	86	95	0.027
	2 nd Marriage	14	5	
Psychiatric FHx	Positive	33	29	0.541
	Negative	67	71	
Total		100	100	

Table 2: Clinical history of infertility among the case group only.

Variable		No.	%
History of Contraceptive Use	Yes	6	6.0
	No	94	94.0
Previous IVF	Yes	11	11.0
	No	89	89.0
Years of Infertility	Range	2-20 years	
	Mean	8.27 ± 4.1	
	10 ≥	79	79.0
	11-15	14	14.0
	16-20	7	7.0
Total		100	100.0

Table 3: Prevalence of Depression among the subjects of the study.

Variable		Cases		Control	
		No.	%	No.	%
Depression	With	76	76.0	5	5.0
	Without	24	24.0	95	95.0
Total		100	100.0	100	100.0

Table 4: Validation assessment between GHQ and Beck's depression inventory questionnaire.

GHQ	Beck's Depression Inventory			
	Cases		Control	
	Cases	Non cases	Cases	Non cases
Probable cases	75 (True +ve)	10 (False +ve)	4 (True +ve)	27 (False +ve)
Non probable cases	1 (False -ve)	14 (True -ve)	1 (False -ve)	68 (True -ve)
Total numbers	76	24	5	95
Specificity & Sensitivity	Sensitivity = 98.68% Specificity = 58.3%		Sensitivity = 80.0% Specificity = 71.6%	

Table 5: General health questionnaire results

Variable		Cases		Control		p-value
		No.	%	No.	%	
GHQ (0-30)	Non probable cases (≤ 5)	15	15.0	69	69.0	0.001
	Probable cases (> 5)	85	85.0	31	31.0	
Total		100	100.0	100	100.0	

Table 6: Beck's depression inventory results.

Becks depression inventory	Case		Control		p-value
	No.	%	No.	%	
No depression (0-9)	16	16.0	85	85.0	0.002
Mild depression (10-15)	8	8.0	10	10.0	
Moderate depression (16-23)	23	23.0	5	5.0	
Severe depression (24-36)	43	43.0	0	0.0	
Very severe depression (> 37)	10	10.0	0	0.0	
Total	100	100.0	100	100.0	

Table 7: Relationship between Beck's depression inventory score and other variables.

Variable		Case		Control	
		Mean ± SD	p-value	Mean ± SD	p-value
Age	≤20	22.5 ± 4.9	0.167*	7.0 ± 4.2	0.678 *
	21-30	30.4 ± 8.8		6.6 ± 4.3	
	31-40	32.58 ± 7.6		9.6 ± 5.0	
	>40	26.8 ± 7.9		4.8 ± 0.8	
Residency	Urban	31.58 ± 7.71	0.366**	8.4 ± 5.5	0.364 **
	Rural	29.9 ± 9.91		7.3 ± 4.9	
Occupation	Housewives	31.34 ± 8.32	0.545**	9.3 ± 5.7	0.662 **
	Employed	28.75 ± 8.9		6.2 ± 3.1	
Marriage	First marriage	30.36 ± 8.38	0.031**	8.22 ± 5.4	0.09 *
	Second marriage	35.57 ± 7.25		6.0 ± 3.4	

Family history of depression and other psychiatric disorders	Positive	39.51 ± 5.96	0.001**	15.0 ± 4.7	0.001 **
	Negative	26.94 ± 5.96		5.3 ± 1.92	
Years of infertility	≥10	30.82 ± 8.6	0.816*		
	11-15	31.85 ± 7.3			
	16-20	32.57 ± 8.9			
Contraceptive usage	Yes	27.16 ± 7.86	0.240**		
	No	31.43 ± 8.4			
Previous IVF	Yes	32.72 ± 10.0	0.496**		
	No	30.88 ± 8.22			

*One Way Anova **Two Sample Independent T-Test