

## **Chapter One**

### **Introduction**

#### **1.1 Background to the Study**

Mental well-being is so important that it comes under goal 3 of the Sustainable Development Goals (SDG), when you are mentally stable you will be more productive, happier and contribute meaningfully to humanity.

Mental well-being could be defined to be a dynamic state, in which the individual is able to develop his/her potential, work productively, build strong and positive relationships with others, and contribute to his/her community. It is enhanced when an individual is able to fulfill his/her personal and social goals and achieve sense of purpose in the society.

Mental well-being problems exist along a continuum from mild, time-limited distress to chronic, progressive and severely disabling conditions. The binary approach to diagnosing mental disorders, although useful for clinical practice, does not accurately reflect the diversity and complexity of the mental health needs of individuals or population<sup>1</sup>.

Mental well-being is a positive perception of life challenges and efforts to realize true potential. It requires a perception of the existential challenges of life. This approach examines the growth and development of the individual in the face of the challenges of life. Mental well-being can be examined in self-acceptance, purpose in life, personal growth, positive relations with others, environmental mastery and autonomy<sup>2</sup>.

The World Health Organization's (WHO) defines of health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" had the merit of widening concepts of health to include psychological and social aspects, but is of no practical use<sup>3</sup>.

Mental well-being have been identified as important causative factors. Major Depressive Disorders (MDD) have been reported to be twice as common in women as in their male counterparts with onset in the childbearing years. Psychosocial stressors seem to be the precipitating factor particularly in women. High marital conflicts as experienced by infertile couples and attendant low psychosocial support may be reinforcing factors in Africans, who place a high premium on child bearing. Major Depressive Disorders may be recurrent or chronic, thus affecting the individuals for several years, and with profound impact on their families. The prevalence of psychiatric morbidity amongst infertile women has been shown to be quite high with values as high as 46.4%. Depression and anxiety disorders have been identified as important causative factors<sup>4</sup>.

In a study that was centered on infertility, questionnaires were administered to 112 women with infertility at the time of their first presentation to a fertility clinic in a tertiary referral centre. The comparison group comprised of 96 women presenting at the family planning clinic of the same institution. In addition to demographic data, a structured questionnaire was used to collect obstetric information and clinical details from the participants.

The result revealed that prevalence of psychiatric morbidity was 46.4% (GHQ cases) in the infertile women, 37.5% and 42.9% were cases of anxiety and depression respectively. Women suffering from infertility scored significantly higher on all outcome measures of psychopathology. The results of the multiple regression analysis showed that the

sociodemographic variables of the women with infertility contributed to the prediction of psychiatric morbidity (GHQ-30 score), because of the effects of age, not having at least one child and poor support from spouse.

Lack of support from husband also predicted depression and anxiety. Low level of education, polygamous marriage, unemployment, lack of support from in-laws and duration of illness were not predictors of mental ill health.

Consequently, mental wellbeing can be traceable to the cause of high fertility state of individual(s) under consideration.

Poor mental well-being is a general condition connected with infertility, but is poorly recognized and treated in women with infertility disorder attending many fertility clinics<sup>5</sup>. The effect of infertility on women's mental health is an important area for research, specifically, the impact of family function or husband support on depression severity in women with infertility. Women with infertility disorder can, for diverse reasons, suffer from depression.

Consequently, infertility is defined as the failure to achieve clinical pregnancy after 12months or more of regular unprotected sexual intercourse<sup>6</sup>. One can also assumed that infertility also includes the inability to carry a pregnancy to the delivery of a live baby. Infertility can either be that the man is infertile or the woman is infertile, and at times both are infertile. Impaired infertility affects 10-17% of couples. In 40% of infertile couples, the root of the couples infertility is due to female partner (female factor) while 20% of all infertile males and females, the root of the couples infertility is due to problem with male partner (male factor), couples with combined infertility comprises an additional 30% of the total infertile population<sup>6</sup>. Infertility in male refers to inability of a man to impregnate a woman after 12months of regular unprotected

sexual intercourse, if the woman has no gynaecological problems<sup>7</sup>. Female infertility means impossibility of becoming pregnant after trying for at least one year<sup>8</sup>. Worldwide infertility is generally quoted as occurring in 8-12% of couples; this incidence varies from one region of the world to another, being highest in Nigeria.

The infertility-related-stress might be attributed to the fact that having a child is considered to be important in general society. Affected individual may be exposed to social pressure thus they reduced their social interaction especially with pregnant women and friends who have children.

Women who can get pregnant but have recurrent miscarriages are also considered to be infertile. Infertility affect an estimated 10 to 15% of reproductive age, worldwide. A previous studies<sup>3,4</sup> indicated that infertile males and females are subjected to greater stress and have an increased risk of developing psychological disorder compared with fertile males and females<sup>9</sup>. As a result, one can say that reactions to infertility include, shock, depression, anger, frustration, loss of self-esteem, and self-confidence and the general loss of sense of self control.

It has been demonstrated that women with infertility present greater levels of depression compared with infertile men<sup>10</sup>. Women with infertility have revealed cognitive dysfunction and increased anxiety and depression which invariable affect their mental health<sup>11</sup>. In addition, a greater level of experienced stress and a deteriorated quality of life has been indicated among infertile men and women with elevated alexithymia characteristics but highly pronounced in women than men<sup>12</sup>. A possible explanation for these results may be that women feel more responsible and guilty than men during the process of trying to conceive, as a result, women with infertility are exposed to greater social pressure and stigma<sup>13</sup>.

Numerous studies have examined depression and anxiety symptoms in women with newly diagnosed infertility. Also the affected male and female may begin to deem himself /herself in the stead of a wrong-doer which results in a strong sense of guilt.

Essentially from the above scholarly position, it is noteworthy that infertility is a disease of both the male and female reproductive systems. Both males and females are equally likely to experience infertility. Statistically, about one-third of infertility cases can be attributed to males, another third can be attributed to females while a third is attributed to a mixture of male and female problems or untraceable<sup>14</sup>.

The challenge of Infertility-related-stress has been debated for years. Women with infertility report elevated levels of anxiety and depression, so it is clear that infertility causes stress. What is less clear, however, is whether or not stress causes infertility. The impact of Infertility-related-stress has been debated for years on treatment outcome is difficult to investigate for a number of factors, including inaccurate self-report measures and feelings of increased optimism at treatment onset. However, the most recent research has documented the efficacy of psychological interventions in lowering psychological distress as well as being associated with significant increases in pregnancy rates. A cognitive-behavioral group approach may be the most efficient way to achieve both goals. Given the Infertility-related-stress has been debated for years levels reported by many infertile men and women, it is vital to expand the availability of these programs<sup>15</sup>.

The problems of infertile males and females are complicated and they are influenced by different factors such as sex differences and the cause and length of infertility<sup>16</sup>. Stress, depression and anxiety could be regarded as common causes of infertility. One out of every five women experience a major depressive episode during their lifetime<sup>16</sup>. Young women of reproductive age,

in particular, have a high risk for depression. The point prevalence of major depressive episodes is around 6% in women<sup>17</sup>. Numerous studies have examined depression and anxiety symptoms in women with newly diagnosed infertility<sup>18,19,20</sup>. Most but not all studies reported an increased symptom load where 10 to 50% of subjects reported mild to moderate depression symptoms. Severe depression symptoms also predict infertility-related distress<sup>18</sup>. Depression and anxiety in women with infertility are both associated with higher rates of problematic personality traits like neuroticism<sup>19</sup>.

The psychological reactions however vary from one individual to another. More like a domino effect i.e. one psychological effect could lead to another in the affected individuals. These reactions in some infertile adults are in form of despair, sadness, and denial<sup>17</sup>. Also, the affected male and female may begin to deem him/herself in the stead of a wrong-doer which results in a strong sense of guilt<sup>18</sup>. A careful observation of infertile males and females over the past also showed that they are most likely to become depressed due to their predicament<sup>19</sup>. Not only limited to the above, a host of other psychological feelings that is spurred in infertile males and females are disappointment, hopelessness, reduction and, low self-esteem<sup>20</sup>. In a worst-case scenario whereby the affected individual has been triggered to a state of abject hopelessness and worthlessness, an infertile adult could go as far as taking his or her own life<sup>21</sup>. Infertility causes stigma, shame and blame especially for women putting them at high risk for elevated mental health distress, anxiety and depression and greater psychological consequences for a woman's status and value is significantly linked to her fertility, conception (Pregnancy) and childbirth. Approximately 11% of males and females reproductive of reproductive age worldwide have difficulties achieving pregnancy. Infertile individuals experience considerable stress because of failing to achieve a meaningful life goal such as parenthood and its accompanying social stigma<sup>6</sup>.

Without debate, Infertility is a common clinical problem which has affected about 60 to 80 millions of males and females all over the world and its prevalence is estimated to be around 10 to 15%, worldwide. Meanwhile, this problem is more prevalent in developing countries. Infertile people experience depression, grief, fear, inefficiency, lack of control, and high levels of anxiety and guilt, and they are concerned about their body and sexual function disorders all of which are the symptoms of lack of fertility problems adjustment.

When we consider the effect of coping strategy as predictor of mental wellbeing, the influence of coping strategies is depended on the specific constraints imposed by the stressful situation<sup>22</sup>. One important factor in adoptions of coping strategies is the appraisal of controllability. In a study, scholars discovered that appraisal of high controllability has a relationship to adopting active coping strategies<sup>23</sup>. Similarly related is the use of more passive and less active coping strategies to psychological distress in patients with chronic illnesses (12). The adverse effect of infertility is on both men and women, but females seem to suffer more. The pressure on women to conceive is greater than men. According to some studies, in some cultures and societies, there is a relatively high pressure on women to have a child (13). They see children as an important source of social desirability. These children are the link that binds family together from one generation to another (14). This make infertility to have a more devastating effect on women's mental health than men. It is obvious that the the impact of certain coping strategies on mental health differs from one individual to another, it is therefore important to understand which coping strategies are more adopted by infertile women.

In previous studies of infertility and coping, women have been reported to cope through challenging, accepting responsibility, social support, avoiding or escaping. It is also reported that infertile females use emotion-focused coping more often than males, who tend to turn to problem-solving methods. The cognitive, emotional and behavioral responses of infertile males and females to the problem of infertility have situation-specific features.

It is quite obvious that the amount of maladjustment in the above-mentioned research cases varies due to the intensity of the stressful experiences caused by infertility. Therefore, it is very important to ask questions about how those who live with infertility cope with the challenges in this pronatalist society where we strongly believe in promoting the reproduction of life, childbearing and parenthood as desirable for social reasons thereby ensuring the continuance of humanity.

However, most empirical studies focus when considering infertility has always been the female gender, which results from diverse studies, have shown that women are more vulnerable personality when it comes to infertility issues. Therefore, this study intends to change trajectory by considering the place of both genders in terms of coping strategies and infertility related stress as a function of mental wellbeing.

This study has three variables, two independent variables which are infertility-related stress and coping strategies; one dependent variable which is mental well-being. We want to study how infertility-related-stress affect the mental well-being of individuals with reproductive health challenges, the effect of the coping strategies adopted by the affected individual on mental well-being and the impact of coping strategies on infertility-related-stress of the infertile males and females.

## 1.2 Statement of the Problem

Over the years, infertility related stress and the coping strategies have been the major concern as they relate to mental well-being of individuals. Globally, infertility as it relates to well-being is a leading cause of chronic health problem faced by 1 in 10 couples<sup>24</sup>. It is defined by scholars as failure to conceive after a series of regular, unprotected sexual intercourse for 2 years in the absence of known reproductive pathology<sup>25</sup>. The prevalence of infertility in Africa is higher than in the rest of the world<sup>26</sup>. The prevalence in sub-Saharan Africa ranges between 14-32%<sup>27</sup> and in Nigeria it is estimated to be from 10.5-14.6%<sup>28,29</sup>. The uniqueness of infertility problems in the sub-Saharan regions earned it the 'infertility belt' title that runs from west to central, and down to southern African regions<sup>30,31</sup>.

In Nigeria, 3 in 100 Nigerian women of all ages were reported never to have mothered a child<sup>32</sup>. Infertility was observed to account for 50% of attendance at gynaecological clinics in Nigeria and seems to be on the increase at the current rate of 20%. This increase suggested that there will be a proportional rise in infertility various sequelae and co-morbidities among Nigeria infertile population.

Furthermore, in respect to infertility in relation to coping strategy, Studies confirm that women experience greater amounts of infertility-related stress than men<sup>33</sup>. Women are also more likely than men to report depression and anxiety symptoms, and also take a more active role in medical treatment, and respond poorly following treatment failure<sup>34</sup>. Men experience stress more in infertility but look less emotionally affected, and they are willing to consider treatment termination. With regard to counseling services, women have more positive attitudes toward seeking psychological help than men and are more likely to seek couple counseling for general distress<sup>35</sup>.

Similarly, a qualitative study conducted in the United States, found out that women used coping strategies such as avoidance of reminders of infertility, being the best, regaining control, sharing the burden and giving into feelings in dealing with the problems of infertility<sup>36</sup>. Another study also conducted in the United States by researchers found that women who coped through escape avoidance and through accepting responsibility for their infertility showed more distress, whereas women who sought more social support were less distressed. This shows that seeking social support was an important coping mechanism used by couple during the process of taking treatment for infertility<sup>37</sup>.

The prevalence of infertility in Nigeria has been studied in demographic surveys, epidemiological surveys and through clinical observations. The Nigeria DHS survey for the period 1994–2000 reported a prevalence rate of primary infertility of 22.7% in 15–49-year-old women and 7.1% in 25–49-year-olds<sup>38</sup>. However, demographic surveys of infertility are usually inadequate for programmatic action as they are based on a five-year period of exposure to the risk of pregnancy. By contrast, epidemiological surveys are more useful as they are based on a shorter time frame; however, very few such studies have ever been conducted in Nigeria. A survey of a representative sample of 1,075 ever-married women using a validated WHO protocol revealed a prevalence rate of 20% infertility in Ile-Ife, Southwest Nigeria<sup>2</sup>. As expected, the survey showed a higher prevalence of infertility in the rural parts of the city than in the urban area.

Currently, it is estimated that as many as 80 million males and females are affected by infertility worldwide.<sup>39</sup> It is also given that infertility is a stressful experience that has a high impact on the mental well-being of infertile individuals<sup>40</sup>. It is also noteworthy that infertility cases are known to be of two forms primary infertility in which the affected individual has never experienced

conception before and secondary infertility in which the affected individual has once been pregnant but unable to achieve subsequent pregnancy<sup>41</sup>. Although there is an insufficiency of national vital statistics in Nigeria, essentially, hospital-based studies constitute the main sources of information. However, it is by far the most common presenting complaint in gynaecological clinics with the prevalence of 14.8% to 38.8% of outpatient gynaecological consultation has been reported.<sup>42</sup> It is unequivocal that infertility cases in both men and women are usually accompanied by mental stress aggravated by socio-cultural expectations, studies have however established that the differences that exist between men and women concerning infertility can sometimes cause mutual problems between the male and female. Women usually externalize the problem and show emotional reactions, while men seldom express themselves which is sometimes wrongly interpreted as being indifferent<sup>43</sup>. In fact, women show stronger emotional responses and speak more about the problem than men.<sup>44</sup>

In addition, another predictor of mental wellbeing of individuals affected is infertility-related-stress. Stress can affect immune system activity and thus lead to physical and mental vulnerability. Implications of infertility-related-stress include physical symptoms, reduced psychological well-being and quality of life, feelings of guilt and shame, use of negative avoidance coping strategies, and social isolation<sup>45</sup>.

The causal role of psychological disturbances in the development of infertility is still a matter of debate. A study was carried out involving 58 women of child-bearing age reported a twofold increase in risk of infertility among those with a history of depressive symptoms<sup>16</sup>. However, it did not control for other factors that might influence fertility, such as cigarette smoking, alcohol use, decreased libido and body mass index. Proposed mechanisms through which depression could directly affect infertility involve the physiology of the depressed state, such as elevated

prolactin levels, disruption of the hypothalamic–pituitary–adrenal (HPA) axis and thyroid dysfunction.

Indeed, identifying patient needs by fertility staff has been recommended by the European Society of Human Reproduction and Embryology (ESHRE) guidelines for routine psychosocial care to reduce stress and improve patient well-being and compliance with treatment<sup>12-13</sup>.

Altogether, whether the specific stress associated with infertility (social, relationship, and sexual concerns, need for parenthood, and negative evaluation of childlessness) and its treatment can have long-lasting psychosocial consequences on infertile individuals and couples remain open to verification<sup>46</sup>.

Therefore, it is unequivocal that quite a lot of research has been conducted on this concept globally and even in various zones in Nigeria, much work is, however, yet to be done precisely on the holistic approach in studying infertility-related-stress and coping strategies as to whether they play a significant function in the mental well-being of infertile males and females in Ibadan or not. The uniqueness of this study is also hinge on the wellbeing of both male and female as the identified problem is not gender specific especially women in the following studies <sup>12, 13</sup>. Therefore, this study examines the infertility-related-stress and coping strategies as predictors of mental well-being among infertile male and female in Ibadan and to investigate the impact of coping strategies on infertility-related-stress.

### **1.3 Aim And Objectives Of The Study**

The aim of this study is to investigate infertility-related-stress and coping strategies as predictors of mental well-being among individuals with reproductive health challenges in Ibadan.

To investigate gender differences on Mental well-being among individuals with reproductive health challenges in Ibadan.

To examine the impact of coping strategies on Mental well-being among the participants.

To determine the influence of infertility-related-stress on Mental well-being among individuals with reproductive health challenges.

To investigate the joint influence of infertility-related-stress and coping strategies on the Mental well-being among individuals with reproductive health challenges in Ibadan.

#### **1.4 Research Questions**

The following research questions guide this study:

- i. In what way does gender differ on mental well-being among individuals with reproductive health challenges in Ibadan.?
- ii. What coping strategy is commonly used or adopted by the participants on their mental well-being?
- iii. How does Infertility-related-stress affect mental well-being of the participants?
- iv. To what extent can infertility-related-stress and coping strategies can jointly influence the Mental well-being of individuals with reproductive health challenges ?.

#### **1.5 Hypotheses Of The Study**

Based on the objectives of the study, the following alternate hypotheses were formulated and will be tested at a 0.05 level of significance.

**H<sub>i1</sub>:** Gender differences will significantly affect mental well-being among individuals with reproductive health challenges in Ibadan.

**H<sub>i2</sub>:** There will be a positive significant impact of coping strategies on mental well-being among the participants.

**H<sub>i3</sub>:** There will be influence of infertility-related-stress on mental well-being among individuals with reproductive health challenges.

**H<sub>i4</sub>:** Infertility-related-stress, coping strategies will jointly and independently influence mental well-being among the participants.

## **1.6 Significance Of The Study**

This study has both theoretical and practical significance. Expectedly, it will add to the existing body of knowledge and literature. This study has the potential of assisting healthcare personnel or redirecting their focus in designing psychological, mental well-being and emotional support programs for infertile individuals. It is also an important source of data-driven information in understanding the pattern of psychological, mental and emotional stress associated with infertility. Furthermore, the findings of this study could help to bring to the awareness of individuals with reproductive health challenges, the salient practices and coping strategies to alleviate the emotional problem they could experience due to childlessness.

## **1.7 Scope Of The Study**

This study covers the infertility-related-stress and coping strategies as predictors of mental well-being among individuals with reproductive health challenges in Ibadan.

. The study focused specifically on the pattern of psychological stress encountered by infertile males and females and also assesses the significant factors which influence their coping ability in Ibadan.

### **1.8 Limitations Of The Study**

This study is restricted to the South-Western region of the country, and the capital of Oyo State, Ibadan is chosen. The research method is also within the boundary of making effort to figure out the infertility-related-stress and coping strategies as a predictor of mental wellbeing among individuals with reproductive health challenges residing in Ibadan only.

### **1.9 Operational Definition Of Terms**

**Infertility:** The inability to achieve pregnancy or impregnate a woman after 12 months of having regular and unprotected sexual intercourse without usage of any form of birth control method.

**Infertility-related-stress:** This is the emotional and psychological pressure suffered by an affected individual due to the issue of childlessness.

**Coping Strategies:** These are the means devised by the affected individual in managing the psychological and emotional experience that emanates from infertility.

**Mental Well-Being:** This state of being free from emotional, psychological and social challenges.

## Endnotes

1. World Health Organization: *Comprehensive Mental Health Action Plan 2013-2030*.  
<https://www.who.int/publications/i/item/9789240031029>. ISBN: 9789240031029
2. Ryf CD. Psychological well-being revisited: advances in the science and practice of eudaimonia. *Send to Psychother Psychosom*. 2014;83(1):10–28.
3. WHO: *Health and Well-Being*. The global health observatory. 2023.  
<https://www.who.int/data/gho/data/major-themes/health-and-well-being#:~:text=The%20WHO%20constitution%20states%3A%20%22Health,of%20mental%20disorders%20or%20disabilities>.
4. G.O. Obajimi , O. Esan , B.N. Ogunkinle: *Depression and Anxiety Disorders amongst a Cohort of Infertile Women Attending an In-Vitro Fertilization Clinic in South-western Nigeria*. *Medical Journal of Zambia*, Vol. 46 (3): 2019. 192 - 196
5. H. Fallahzadeh, Zareei, A. H. Mahmood, M. Momayyezi, M.H. Malaki & N. Keyghobadi, *The comparison of depression and anxiety between fertile and infertile couples: a meta-analysis study*. *Int. J. Reprod. Biomed.* (Yazd). 17(3), 2019. 153–162.
6. A.A. Paints, & T.Y. Sununu, *The profile of infertility in a teaching hospital in north west Nigeria*. Retrieved from: [\(www.smjonline.org/artile.asp?issn=1118-8561;year=2014;volume=IT;Issue=1;spage=7;epage=11;last=part\)](http://www.smjonline.org/artile.asp?issn=1118-8561;year=2014;volume=IT;Issue=1;spage=7;epage=11;last=part). (2014).

7. P.o. Uadia & A.M. Emokpae, Male infertility in Nigeria: A neglected reproductive health issue requiring attention. *Journal of Basic and Clinical Reproductive Sciences*, 4(2), 2015.45-53.
8. A. Tersoo, *Prevalence of infertility in Nigeria*.2018. Retrieved from: <https://www.naija.ng/114452prevalence-infertility-nigeria.html>.
9. P.S. Deshpande & A.S. Gupta: *Causes and prevalence of factors causing infertility in a public health facility*. *J Hum Reprod Sci*. 12:287–293. 2019.
10. J. Hunt & J. H Monach: *Beyond bereavement model the significance of depression for infertile women*. *Fertil Steril*. 58:1158–1163. 1992
11. F. Atherton & D. Howel: *Psychological morbidity and the availability of assisted conception: A group comparison study*. *J Public Health Med*. 17:157–160. 1995.
12. R. Conrad, G. Schilling, M. Langenbuch, G. Haidl & R. Liedtke: *Alexythymia in male infertility*. *Hum Reprod*. 16:587–592. 2001.
13. A. Abbey, F.M. Andrews & L.J. Halman: *Gender's role in responses to infertility*. *Psychol Women Q*. 15:295–316. 1991

14. J. Seladi-Schulman, E. Holly, *Everything You Need to Know About Infertility* (Healthline Media a Red Ventures Company, 2019)
15. KL. Rooney, A,D, Domar; *The relationship between stress and infertility*. Dialogues Clin Neurosci. 2018 Mar;20(1):41-47. doi: 10.31887/DCNS.2018.20.1/krooney. PMID: 29946210; PMCID: PMC6016043.
16. F. Ramezanzadeh, M.M. Aghssa, N. Abedinia,, F. Zayeri, & N. Khanafshar, M. Shariat & M. Jafarabadi, *A survey of relationship between anxiety, depression and duration of infertility*. BMC women'sHealth, Bio Med central.2004.
17. S. HematiGorgani, *Emotional Aspects of Infertility*. – *Essay Abstracts of Tehran Symposium on Psychological aspects of Infertility*: EbneSina Research Center.2001.
18. M. Saki, M. Saki, F. Jenani, & P. Asti, *Emotional and Psychological Sides of the Infertile Couples Applying for Sperm or Ovum*. *Infertility and Fertility Quarterly* .Essay Abstract of the First Overall Seminar on Sperm- Ovum donation for Infertility Treatment – Appendix no 5.2005.
19. Z.M.A. Shariat: *Presenting Socio- Psychological Solutions for infertility*. *Tehran Essay Abstracts of the Symposium On Environmental Factors Effecting Infertility- EbnSina Research Center*.2000.

20. <http://www.Clevelandclinic.org/health>
21. M. DehganPour: *Infertility: A Scar on Women's Narcissism* -Essay Abstracts of Tehran Symposium on Psychological Aspects of Infertility: EbneSina Research Center.
22. A. Aflakseir & M. Zarei: *Association between Coping Strategies and Infertility Stress among a Group of Women with Fertility Problem in Shiraz, Iran*. *J Reprod Infertil*. 2013 Oct;14(4):202-6. PMID: 24551575; PMCID: PMC3911816.
23. Sp. Bento, BR. Goodin, LA. Fabian, GG. Page, NB. Quinn & L. McGuire: *Perceived control moderates the influence of active coping on salivary cortisol response to acute pain among women but not men*. *Psychoneuroendocrinology*. 2010;35(6):944–8.
24. World Health Organization (WHO). *International Classification of Diseases, 11th Revision (ICD-11)* Geneva: WHO 2018.
25. National Institute for Health and Clinical Excellence: *Clinical Guideline 11- Fertility: assessment and treatment for people with fertility problems*. Published by the National Institute for Clinical Excellence; 2004; on [www.nice.org.uk](http://www.nice.org.uk) accessed on 09-02-2010 by 7.52 p.m.
26. Cates W., Farley T. M., and Rowe P. J.: *Worldwide patterns of infertility: is Africa different?* *Lancet*, 1985, 14: 2(8455); pp 596-8.

27. *Infertility, Causes, Prevention and Programmatic strategies Module 12*. The Johns Hopkins Bloomberg School of Public Health/ The Johns Hopkins University; 2006.
28. National Population Commission (NPC) [Nigeria] and ICF Macro: *Nigeria Demographic and Health Survey 2008*. Abuja, Nigeria: National Population Commission and ICF Macro; 2009.
29. M. Taebi, N. Kariman, A. Montazeri, M.H. Alavi: *Infertility Stigma: A Qualitative Study on Feelings and Experiences of Infertile Women*. Int J Fertil Steril. 2021 Jul;15(3):189-196. doi: 10.22074/IJFS.2021.139093.1039. Epub 2021 Jun 22. PMID: 34155865; PMCID: PMC8233927.
30. N. Chimatata & C. Malimba, *Infertility in Sub-Saharan Africa: A Woman's Issue for How Long? A Qualitative Review of Literature*. Open Journal of Social Sciences, 4,2016.96-102. doi: 10.4236/jss.2016.48012.
31. A. Mohammed-Durosolorun, J. Adze, S. Bature, A. Abubakar, C. Mohammed, M. Taingson & L. Airede: *Use and pattern of previous care received by infertile Nigerian women*. Fertil Res Pract. 2019 Dec 3;5:14. doi: 10.1186/s40738-019-0068-6. PMID: 31827875; PMCID: PMC6889738.

32. M. Patel: *The socioeconomic impact of infertility on women in developing countries*. Facts, Views and Vision in Obstetrics and Gynaecology. 2016;8(1):59–61.
33. D. Davis, E. Dearman: *Coping strategies of nontraditional female students in Southwest Michigan and Northern Indian*. Educ Psychol 2017;5:1-11.
34. A. Pedro: *Coping with infertility: An explorative study of South African women's experiences*. Open J Obstet Gynecol 2015;5:49-59
35. The UC Davis Obstetrics and Gynecology Department in Collaboration with California IVF Fertility Center in Sacramento. *Reproductive Endocrinology and infertility*. UC Davis Health; 2018. p. 3-7.
36. TR. Segal, L.C. Giudice: *Before the beginning: environmental exposures and reproductive and obstetrical outcomes*. Fertility and Sterility 2019;112(4):613-21.
37. V. D'Souza, J.A. Noronha, S. Kamath: *Psychosocial wellbeing and coping strategies of infertile women seeking infertility treatment*. Journal of Infertility and Reproductive Biology, Volume 3, Issue 2, 2015, Pages: 174-178
38. F.E. Okonofua, LFC. Ntoimo, A. Omonkhua, O. Ayodeji, C. Olafusi, E. Unuabonah & V. Ohenhen: *Causes and Risk Factors for Male Infertility: A Scoping Review of Published Studies*. Int J Gen Med. 2022;15:5985-5997  
<https://doi.org/10.2147/IJGM.S363959>

39. S.C. Bergstrom, J.B. Lawson, K.A. Harrison, S. Bergstrom, *Maternity care in developing countries* RCOG PRESS: 2001: 360-368.
40. A.O. Olatunji & A.O. Sule-Odu: *The Pattern of Infertility Cases at a University Hospital*. West Afr J Med 2003; 22 (3): 205-207
41. MWH . Yao & DJ. Schust: *Infertility*. In: Berek J. S., (ed) Novak's Gynaecology 13th ed. Lippincott William and Wilkin: 2002: 973 1066.
42. Olatunji AO, Sule-Odu AO. The Pattern of Infertility Cases at a University Hospital. West Afr J Med 2003; 22 (3): 205-207.
43. LH. Burns: *Psychiatric aspects of infertility and infertility treatments*. Psychiatr Clin North Am. 30:689–716. 2007.
44. S. HematiGorgani, *Emotional Aspects of Infertility*. – Essay Abstracts of Tehran Symposium on Psychological aspects of Infertility: EbneSina Research Center.2001.
45. N. Maleki-Saghooni, M. Amirian, R. Sadeghi & R. R. Latifnejad: *Effectiveness of infertility counseling on pregnancy rate in infertile patients undergoing assisted reproductive technologies: A systematic review and meta-analysis*. Int J Reprod Biomed. 15:391–402. 2017

46. A. Aflakseir & M. Zarei: *Association between Coping Strategies and Infertility Stress among a Group of Women with Fertility Problem in Shiraz, Iran*. J Reprod Infertil. 2013

Oct;14(4):202-6. PMID: 24551575; PMCID: PMC3911816.

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## **Chapter Two**

### **Literature Review**

#### **2.0 Introduction**

In this chapter, concepts, theories as well as literatures relevant to this study: Infertility-related-stress and Coping Strategies as Predictors of Mental Well-being among individuals with reproductive health challenges in Ibadan will be reviewed. To understand it better, a critical review of the literature is necessary. Different studies have been conducted on Infertility-related-stress and Coping Strategies as Predictors of Mental Well-being among individuals with reproductive health challenges in Ibadan by academicians and they are unanimous in their views that there is positive relationship between the two terms.

The review is presented under the following sub-headings

2.1 Conceptual Review

2.2 Theoretical Review and framework

2.3 Empirical Review

2.4 Conceptual Framework

2.5 Summary of Gaps

#### **2.1 Conceptual Review**

##### **2.1.1 Concept of Mental Well-being**

It is challenging to conceptualize mental well-being, as no single definition is collectively recognized by scholars in the area of mental well-being. It is a socially generated and definite idea, that is, diverse cultures, groups, beliefs, and expertise have diverse means of conceptualizing its environment of what is psychologically fit. To most educated persons, the

concept of mental well-being has been confused with the idea of mental illness. Mental well-being is more than the mere nonexistence of mental illness. Mental well-being is an important and indispensable constituent of health. It is a condition of welfare in which a person recognizes his or her capabilities, deal with the typical pressures of life, labor efficiently and is competent to contribute meaningfully to his or her society. In the optimistic view, mental well-being is the basis for individual well-being and the proper running of society<sup>47</sup>.

According to scholars, there Six Dimensions of Well-being (Wellness). These six Dimensions of Wellness Model was created by scholar, the co-founder of the National Wellness Institute (NWI). This popular model is utilized by many wellness organizations to derive resources and services<sup>48</sup>.

### **1. Physical Wellness**

Physical well-being (wellness) is met through the combination of exercise and good eating habits. It entails personal responsibility and care.

Physical wellness follows these tenets:

- i. It is better to consume foods and beverages that enhance good health rather than those which impair it.
- ii. It is better to be physically fit than out of shape.

### **2. Emotional Wellness**

The emotional dimension recognizes awareness and acceptance of one's feelings. Emotional wellness includes the degree to which one feels positive and enthusiastic about one's self and life. It includes the capacity to manage one's feelings and related behaviors including the realistic

assessment of one's limitations, development of autonomy, and ability to cope effectively with stress.

Emotional wellness follows these tenets:

- i. It is better to be aware of and accept our feelings than to deny them.
- ii. It is better to be optimistic in our approach to life than pessimistic.

### **3. Spiritual Wellness**

The spiritual dimension recognizes our search for meaning and purpose in human existence. It includes the development of a deep appreciation for the depth and expanse of life and natural forces that exist in the universe.

Spiritual wellness follows these tenets:

- i. It is better to ponder the meaning of life for ourselves and to be tolerant of the beliefs of others than to close our minds and become intolerant.
- ii. It is better to live each day in a way that is consistent with our values and beliefs than to do otherwise and feel untrue to ourselves.

### **4. Social Wellness**

The social dimension encourages contributing to one's environment and community. It emphasizes the interdependence between others and nature.

Social wellness follows these tenets:

- i It is better to contribute to the common welfare of our community than to think only of ourselves.

ii. It is better to live in harmony with others and our environment than to live in conflict with them.

## **5. Intellectual Wellness**

The intellectual dimension recognizes one's creative, stimulating mental activities. A well person expands his or her knowledge and skills while discovering the potential for sharing his or her gifts with others.

Intellectual wellness follows these tenets:

- i. It is better to stretch and challenge our minds with intellectual and creative pursuits than to become self-satisfied and unproductive.
- ii. It is better to identify potential problems and choose appropriate courses of action based on available information than to wait, worry, and contend with major concerns later.

## **6. Occupational Wellness**

The occupational dimension recognizes personal satisfaction and enrichment in one's life through work. At the center of occupational wellness is the premise that occupational development is related to one's attitude about one's work.

Occupational wellness follows these tenets:

- i. It is better to choose a career which is consistent with our personal values, interests, and beliefs than to select one that is unrewarding to us.
- ii. It is better to develop functional, transferable skills through structured involvement opportunities than to remain inactive and uninvolved.

Furthermore, researchers argued that assessing mental well-being is not as simple to do as measuring physical health<sup>49</sup>. The contributory factors to how well people can adapt in the society include their physical condition, genetic makeup, learning, reasoning, and socialization<sup>50</sup>. Others are culture, life experiences, drugs, diseases and psychological mechanisms. The variety of meanings presented can be challenged on some grounds, relating to their compatibility with one another and their internal reliability<sup>51</sup>.

However, a statistical norm can be used to define mental well-being, but what is common in one culture may be strange in another society. It is not easy to draw a firm line between normal and abnormal mental states. Diverse scholarly works have focused on various scopes of mental health, used diverse meanings of mental illness and considered different populations, and a large portion of them have not measured for all the mystifying issues<sup>52</sup>.

The characteristics of mental well-being include ability to enjoy life, self-actualization, flexibility, balance, and resilience<sup>4</sup>. A scholar further divides the concept of mental well-being into three independent domains, namely:

1. Emotional Well-being,
2. Psychological, and
3. Social well-being.

These domains are satisfied with the quality of life, and positive affect, self-acceptance, and a sense of purpose in life, having a thriving social life<sup>53</sup>.

### **1. Emotional Well-being**

Emotional well-being can be defined as an overall positive state of a person's emotions, life satisfactions, sense of meaning and purpose, and ability to pursue self-defined goals<sup>54</sup>. Elements

of emotional well-being include a sense of balance in emotion, thoughts, social relationships, and pursuits. The relative importance of each construct will vary across subpopulations and developmental stages. Longitudinal studies have demonstrated a strong correlation between overall emotional wellbeing and health.

For instance, emotional well-being has been shown to be associated with reduced risk of death from all causes by almost 20 percent among healthy people<sup>55</sup>; while having a sense of purpose in life reduces the risk of heart attack and stroke by 17 percent<sup>56</sup>. Emotional well-being has been examined across the life course, from birth through older age. High school girls with high emotional well-being are 70 percent less likely to take up smoking than their peers<sup>57</sup>; and older adults with positive emotions are 36 percent less likely to develop mobility problems than their peers<sup>58</sup>.

Prevention studies, particularly in childhood and adolescence, have established that it is possible to intervene on risk and protective factors for children<sup>59,60</sup>; and change developmental trajectories<sup>61,62</sup> with long-term effects, on a broad array of behaviors<sup>63,64,65</sup>, including behaviors not precisely targeted by the intervention<sup>66,67,68</sup> and positively affecting neurobiological outcomes. Interventions to promote emotional well-being are being explored in many ways, for instance, to improve development across the life course, from early childhood through older adulthood, and to decrease burnout, stress, and mental health problems in at-risk populations.

Instances include mindfulness-based interventions implemented to improve preparations for childbirth<sup>69</sup>, improve social-emotional development in grade school children<sup>70</sup>, and reduce burnout and improve social emotional development in teachers<sup>71</sup>. Increasingly, interventions such as mindfulness practices, enhanced psychosocial supports, spiritual interventions, and meditative exercise are being explored as strategies to improve emotional well-being across the

life span. Better understanding and implementation of the approaches for developing emotional well-being, both as a mediator of other health outcomes or as an end, can substantially affect public health.

## **2. Psychological Well-being**

Psychological well-being is an vital aspect of the life of every human being. According to scholars, psychological well-being refers to the effort that is made to achieve perfection based on the state of one's true potential<sup>72</sup>.

While a scholar refers to psychological well-being as a healthy emotion based on high self-esteem and positive relationships with others, less anxious, less depressed and less delinquent<sup>73</sup>.

The above definitions are in line with the definition by the World Health Organization in which psychological well-being refers to healthy and mentally healthy individuals who are capable of maintaining harmonious relationships with others, engaging in community activities and being able to provide contributions to society<sup>74</sup>.

Meanwhile, in another study psychological well-being as a person's ability to deal with stress, avoid conflict, increase peace, stimulate motivation and increase self-esteem in life. While from the another perspective, psychological well-being refers to spiritual aspects that reflect the human heart, soul, mind and psychology<sup>25</sup>.

To define psychological well-being, a scholar, philosophical and psychological perspective is applied through six dimensions of psychological well-being:

- (i) environmental mastery,
- (ii) personal growth,
- (iii) purpose of life,

- (iv) self-acceptance,
- (v) autonomy, and
- (vi) positive relationships with others<sup>75</sup>.

Environmental mastery is related to the ability to manage one's environment and the ability to choose and create appropriate contexts to meet their needs. Personal growth refers to one's feelings of continuous personal development<sup>25</sup>.

It is closely related to self-realization, which has been defined as 'the process of self-realization. Life goals are related to someone who has a sense of direction and purpose in life<sup>76</sup>. Self-acceptance is a positive attitude toward oneself<sup>29</sup>. It is closely related to self-esteem and the extent to which a person is proud of themselves<sup>25</sup>.

Autonomy consists of the desire and ability of the individual to make independent decisions<sup>29</sup>. While positive relationships with others are related to friendly and positive relationships rather than satisfying others.

Psychological well-being has various definitions in many fields<sup>77,78</sup>. It integrates positive aspects across all aspects of life such as life satisfaction, both physical and spiritual and can function optimally<sup>79</sup>. In addition, psychological well-being also refers to how people are able to control their lives and activities. The psychology of wellbeing is not only when we feel good all the time but also involves negative emotions such as frustration, failure, and sadness that are common in life<sup>32</sup>. Therefore, managing negative emotions is important for long-term psychological well-being<sup>80</sup>. Emotional support and positive social support play a fundamental role in the development of psychological well-being<sup>25</sup>. An individual with a high degree of psychological well-being will lead a happy and contented life with professional and personal life, capable and well-supported<sup>81</sup>.

Based on the theory of psychological well-being, the health of an individual's psychology is determined by its function in certain aspects of life. An individual should have a good relationship with others, respect the environment, accept themselves now and in the past, have goals in life, strive to build and make their own decisions<sup>82</sup>.

However, the World Health Organization has predicted that mental illness is among the top five diseases in the world and by 2020 is expected to be the second highest in the world<sup>27</sup>. Therefore, the issue of psychological well-being should be given serious attention. Furthermore, according to the research work, 10.1% of 16 years of age and older have mental health problems. Meanwhile, in 2001, the Ministry of Health reported that 18.8% of adults and children had mental health problems<sup>25</sup>.

A study by scholars on factors affecting stress and psychological well-being among adult women in Iran found that 64.7% reported mental health problems and 74.3% reported levels high pressure<sup>83</sup>.

Psychological distress poses negative impacts on the physical, mental and academic. What is more worrying is that students who faced this kind of problem do not seek help or treatment because of the public stigma against mental illness<sup>84</sup>.

Therefore, this study emphasized on the well-being aspects of psychological well-being among students at higher learning institution in Malaysia. This study also attempted to provide a definition of well-being and dimensions or construct of well-being. Undergraduate students who were selected as respondents of the study due to several factors. One of the factors is that higher education students are more prone to psychological well-being<sup>25</sup>. This statement is also supported by researchers in which students were believed to be more vulnerable group of

psychological well-being as a result of the transition from home and school to university or college environments. In addition, the increase number of students entering institutions of higher learning year after year led to competition among students including competition for employment, financial burden and pressure to earn a degree<sup>85</sup>.

If this condition is not well managed, it will put pressure on the students. Therefore, due to various factors contributing to well-being, especially psychological well-being among students, this study was conducted to define and identify the dimensions or constructs of well-being that help students to lead a better life and achieve greater levels of personal development<sup>25</sup>.

A Framework of Psychological Well-Being in a series of articles, put forth a framework based on five components that addressed three over-arching areas: cognition, affect, and behavior<sup>86</sup>.

According to scholars, the components in the model included<sup>87</sup>:

1. Self-awareness includes the acknowledgement of an individual's state of being. That is, the recognition of triggers and their subsequent emotions are crucial to self-awareness.
2. Social awareness includes the ability to recognize the emotional states of other individuals as well as the recognition of resources an individual can reach out to for help.
3. Relationship skills require using healthy communication to preserve friendships and relationships with others. It also refers to an individual's ability to withstand peer pressure.
4. Self-management, or also referred to as emotional regulation, requires the ability to internally buffer emotions, as to not act emotionally inappropriate.

5. Responsible decision-making refers to an individual's ability to consider the moral and ethical implications of decisions and consequently make the most optimal decision. (p. 4)

The promotion of these components across settings (e.g., home, school, community) is ideal in order to increase individuals' social-emotional skills.

Furthermore, according to scholars, mental illness refers to a psychological form that takes place in persons and relates to suffering or ill health that is not likely to be a feature of the ways of life in the society<sup>25</sup>. It is used to describe the situations of health that is characterized by variations in philosophy, the frame of mind or conduct connected to suffering and weakened functioning (United States Department of Health and Human Services, 1999).

### **3. Social well-being.**

Social well-being is one of the six dimensions of wellness that encourages contributing to one's environment and community". Individuals develop social wellness through positive interactions with one another.

The World Health Organization offered a bold definition of well-being as defining it as 'a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment'<sup>88</sup>.

This definition reveals the importance of health, psychological well-being and social well-being. Accordingly, social well-being is one of the aspects of individual's public health. Individuals'

health is one of the basic foundations of a balanced society and clearly the survival of any society depends on its members. Health has a direct impact on individual's quality of life; hence, that's why scientists have considered health issues for a long time and conducted many studies on physical and mental health. However, social well-being is one of the most important aspects of health that has been ignored and less attention has been paid to it by researchers. Extensive previous studies have been conducted on the well-being of older adults from healthcare, psychological and sociological perspectives<sup>89</sup>.

Positive interactions in healthcare settings contribute to beneficial health outcomes. They can provide older patients with information about their health status and treatment process<sup>90</sup>, and guarantee patients' safety and privacy<sup>91</sup>. In addition, psychological well-being has been found strongly linked to the quality of interaction in psychological and sociological settings. It has been noted that negative interactions lead to psychological problems such as depression<sup>42</sup>, which increase the likelihood of societal issues such as loneliness and isolation among older adults, whereas, intimate and supportive relationships with families and friends is one of the most active indicators of older adults' psychological well-being. However, how hospitality services can contribute to tackling these societal issues is still unknown<sup>42</sup>.

Transformative service researchers have examined well-being in financial, socioeconomic and health dimensions, whereas, relatively little attention has been paid to the social functioning of well-being<sup>92</sup>. Scholars advocate that fulfilling an individual's social needs leads to the achievement of their total well-being<sup>93</sup>. Consequently, measuring sub-dimensions provides more specific information on improving overall wellbeing<sup>94</sup>.

## **Social Connectedness**

When people experience a feeling of being excluded, lonely or isolated, they often seek counselling or psychotherapy help. Scholars propose that it is important to ensure customers' access to counselling or supportive services for health care service providers<sup>95</sup>. They also point out that keeping customers socially connected through the Internet or local communities can help them maintain their social ties and well-being. Social connectedness is defined as the relationship between an individual and the outside world, which indicates a sense of belongingness<sup>42</sup>.

Previous researches have illustrated that the support provided by financial counselling services can develop a sense of belonging among customers, which in turn affects their financial well-being<sup>96</sup>. Moreover, the social support provided by on-line health care services can satisfy patients' needs to be socially connected with others<sup>97</sup>, which improves patients' well-being.

Therefore, according to scholars, service design can help integrate supportive resources to facilitate transformative values within service encounters. They discovered that supportive service programmes designed to develop an individual's skills, such as supportive accommodation and job training, generate social connectedness which may lead to psychological well-being among individuals<sup>98</sup>.

It has been found that older customers seek social connectedness in commercial settings<sup>42</sup>. Social scientists have explored the fact that customers visit commercial places to extend their social networks, receive social support and establish friendships with others through interaction<sup>99</sup>.

Well-being can be developed through the use of proper resources and tools. Therefore, this study perceives social connectedness as a resource to achieve social well-being which is reinforced by social interaction<sup>100</sup>.

## **Social Interaction**

An extensive number of scholars have identified different forms of social interaction<sup>42</sup>. A scholar identifies two types of social interaction: focused and unfocused. Subsequently, two broad forms of social interaction have been introduced by other groups of scholars: people-to-people interaction and people-to-machine interaction<sup>42</sup>. People-to-people interaction does not always occur at an individual level, but it concerns groups or aggregated agents on some occasions<sup>101</sup>. Therefore, people-to-people interaction can be divided into individual-to-individual interaction (e.g., nurse-patient, staff-customer), individual-to-group interaction (e.g., lecturer-students, actor-audience) and group-to-group interaction (e.g., two teams in a game, two departments of employees in a meeting).

It is advocated that positive interactions between service entities and customer entities greatly contribute to well-being<sup>102</sup>. Several researches validate the significant influence of different interactions on patients' well-being in healthcare services, such as interactions with medical staff<sup>103</sup>, with peer patients<sup>104</sup> and with volunteers<sup>105</sup>.

### **2.1.2 Concept Of Infertility-Related Stress**

Infertility may be conceptualised as a failure on the part of the male or female reproductive system to achieve pregnancy after one year of regular unprotected sexual intercourse.<sup>1</sup>

Infertility is a global health issue affecting millions of people of reproductive age worldwide. Available data suggest that between 40 and 80 millions individuals have infertility globally. Infertility is a disease of the male or female reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse. Primary infertility is the inability to have any pregnancy i.e the person has never been pregnant either the

pregnancy is carried to term or not, while secondary infertility is the inability to achieve a life birth or to have another pregnancy after a previously successful conception. WHO's International Classification of Diseases provides more information on the many primary and secondary causes of infertility in both men and women. In addition, infertility may occur due to male factors, female factors, or a combination of male and female factors or may be unexplained. For both men and women, however, environmental and lifestyle factors such as smoking, excessive alcohol intake, obesity and exposure to environmental pollutants have been associated with lower fertility rates

Psychological effects of infertility on life of infertile couple seems to be concomitant with tensions between families and also unsatisfaction of their marriage. Due to increased global population and higher age of marriage, number of infertile couples is increasing. Prevalence of infertility is different in different countries. Some data shows that there are about 80 million infertile couples worldwide. Infertility is a main problem in fertility health that has different physical, psychological and social dimensions. Psychological pressures and concerns about infertility have direct effects on normal<sup>106</sup>.

### **2.1.3 Causes Of Infertility**

There are a number of forms of infertility that occur in both women and men. Male factor infertility accounts for 26-30% of all cases of infertility while female factor infertility accounts for 35%<sup>107</sup>. Approximately 25-28% of cases of infertility are unexplained. Forty-percent of cases of infertility are due to combined factors, either from a combination of male and female factors or multiple female factors<sup>108</sup>.

**The Female factor.** :In females, issues ranging from ovarian factors such as polycystic ovarian syndrome [PCOS] which accounts for irregular menstruation and sometimes no ovulation, uterine factors e.g absent uterus, small uterus [ hypoplastic uterus ], uterine masses like fibroids , perforated uterus from previous uterine surgery , surgical removal of uterus [hysterectomy] , tubal factors e.g tubal blockage , nutritional deficiencies and anaemia, pelvic inflammatory disease [PID], sexually transmitted diseases, coital disorder ,endometriosis [inflammation of the endometrium which is the lining of the uterus], endocrine factors e.g thyroid dysfunction , genetic disorder , decrease libido due to substance abuse, stress and depression, smoking and excessive alcohol consumption , certain medical prescriptions like antihypertensive and antiseizure medications have been identified to be risk factors contributing immensely to reproductive health challenges in females<sup>109</sup>.

**Ovulatory-factor.**

Ovulatory-factor infertility, which accounts for 21-25% of cases of female-factor infertility, refers to an inability to conceive due to failures in the occurrence of ovulation, the most common form of ovulatory dysfunction being Polycystic Ovary Syndrome (PCOS)<sup>110</sup>. PCOS, which affects 6-10% of women, alters a woman's hormonal and metabolic processes, which interfere with ovulation. Women's diagnosis of PCOS is contingent upon experiencing two of either

- 1) hyperandrogenism,
- 2) ovulatory dysfunction, or
- 3) polycystic ovaries.

There are a number of key symptoms of PCOS which can be impactful to women's functioning, such as hirsutism, weight gain, increase in acne, and disturbance in menstrual cycles<sup>111</sup>. Women with PCOS also commonly experience alterations in their psychological well-being. There is a considerable body of evidence demonstrating the link between PCOS and having lower mental health, lower self-efficacy, and decreased quality of life<sup>112</sup>.

### **Tubal-factor.**

Fallopian tube disease, in which the fallopian tubes are dysfunctional or obstructed, account for 20-30% of female-factor infertility and occur in about 2% of all women<sup>113</sup>. Tubal dysfunctions can be due to a variety of different disorders such as pelvic inflammatory disease, chlamydia, endometriosis, pelvic or abdominal surgery, appendix rupture, tuberculosis, or hydrosalpinx<sup>114</sup>. Pelvic inflammatory disease is one of the most common acquired causes of tubal occlusion. Hydrosalpinx which is the build of fluid in a malfunctioning fallopian tube has been associated with an increase in miscarriage. Tubal infertility can be unilateral or bilateral<sup>115</sup>.

### **Uterine-factor.**

Infertility due to uterine abnormalities is one of the least common causes of infertility. Like tubal-factor infertility, uterine-factor can be congenital or acquired. Abnormal uterine physiology occurs in 5.5% of women, but not all uterine abnormalities will result in infertility. Most treatments for uterine malformation involve surgery<sup>116</sup>.

## **Endometriosis.**

Endometriosis is one of the few infertility-related chronic diseases which can impact multiple areas of the reproductive system. Due to the nature of the endometrial-like tissue attaching itself outside the uterus, endometriosis can be the cause of ovulatory, tubal, or uterine-factor infertility.

Endometriosis is associated with chronic pelvic pain and is a large contributor to disability and decreased quality of life in reproductive aged women. Approximately 10% of reproductive aged women will be diagnosed with endometriosis with some estimating 50% of individuals experiencing infertility experiencing the disease<sup>70</sup>.

## **Male-factor.**

Male-factor infertility, an umbrella term used to reference any infertility where the male is the root of the cause<sup>117</sup>, is as prevalent as female-factor infertility. Male-factor infertility can refer to a number of conditions such as low sperm concentration, poor sperm motility, and sperm with physical abnormalities. Approximately 2-7% of men will experience unfavorable sperm parameters<sup>118</sup>. Enlarged veins in the scrotum, genetic disorders, excessive heat exposure, injury to the scrotum or testicles, low sperm count [ oligospermia ], no sperm count [ azoospermia ], watery sperm, low testosterone [ male reproductive hormone ], erectile dysfunction, premature ejaculation, undescended testis, enlarged scrotum, certain medical prescription e.g anti hypertensive and antizeisure medications, nutritional deficiencies, smoking and excessive alcohol consumption and a host of other risk factors have been studied to cause infertility.

## **Assisted Reproductive Technologies**

A number of assisted reproductive technologies (ART) currently exist directed at addressing fertility difficulties in couples. The three most common methods of ART are ovulation induction, intrauterine insemination (IUI), and in vitro fertilization (IVF).

Depending on the root cause of the infertility, the less invasive and less costly methods of ovulation induction and/or IUI will often be attempted first and IVF will only be used if these two methods fail to result in pregnancy<sup>60</sup>.

### **Ovulation induction.**

Ovulation induction is the method commonly used for women who are anovulatory or who do not experience or rarely experience ovulation, including women with PCOS<sup>119</sup>. Clomifene citrate is a selective estrogen receptor modulator and is a first-line medication used for women with anovulation<sup>120</sup>. Through processes in the hypothalamus, clomifene creates an increase in folliclestimulating hormone, thus stimulating follicular development. Aromatase inhibitors are another medication used for ovulation induction<sup>121</sup>. Aromatase inhibitors decrease the aromatization of androgens into oestradiol which also results in an increase in follicle-stimulating hormone. Insulin-sensitizing agents are another form of medication that is used for ovulation induction. Insulinsensitizing agents are used typically in women with PCOS as they have insulin resistance and insulin-sensitizing agents has been shown to increase ovulation in women with PCOS<sup>122</sup>. Success rates associated with clomifene citrate, aromatase inhibitors, and insulin-sensitizing agents are similar, hovering at approximately 10-20% per cycle. Directly injecting gonadotropins (LH and FSH) is a second-line treatment for anovulation and involves

women injecting themselves daily (usually in the stomach) throughout the follicular phase. Success rates for gonadotropin therapy are about 12%<sup>79</sup>.

## **IUI.**

IUI is a method of ART that is typically performed on couples with infertility that is not related to the fallopian tubes<sup>123</sup>. During an IUI procedure, pre-treated semen that is highly concentrated is placed in the uterine cavity using a catheter. Pregnancy rates for this form of ART are relatively low with success rates between 5.7-17.7%. IUI is sometimes used in conjunction with ovulation induction to increase the probability of successful implantation<sup>80</sup>.

## **IVF.**

IVF was developed initially for women who were experiencing tubal-factor infertility but is currently used as a treatment for all causes of infertility<sup>124</sup>. Current methods of IVF typically involve a standardized procedure utilizing ovarian stimulation (via gonadotropin injection) and oocyte retrieval using an ultrasound.

The retrieved oocyte is then inseminated in the laboratory and is placed in the woman's uterus once the embryo has developed into the blastocyst stage (3-5 days after insemination)<sup>125</sup>. The success rate for one IVF cycle is, on average 30%, but varies with couple characteristics (e.g., female's age)<sup>80</sup>.

Though the most successful of all the available fertility treatments, IVF is very expensive, costing approximately \$15-20,000 per cycle in Canada<sup>126</sup>. Though somewhat less expensive, IUI is still approximately \$1,000 per cycle. Thus, it is not surprising that only 56% of infertile

couples ever seek medical treatment; furthermore, only 22% of infertile couples ever actually receive treatment<sup>83</sup>. Thus, a full 88% of infertile couples struggle to conceive without any form of medical intervention. However, as will become clear throughout the remainder of this thesis, the vast majority of research examining the psychology of infertility is conducted in women who are undergoing IVF. There is, therefore, an enormous lack of psychological research amongst the remaining 88% of women who struggle to conceive outside the context of ART.

## **The Psychological Burden of Infertility**

### **Gender Differences in the Experience of Infertility**

Men and women have unique psychological experiences of infertility. In line with long-held cultural and societal ideologies surrounding fecundity as being solely women's responsibility and largely indicative of a woman's value in her family and society<sup>127</sup>, the onus is commonly on the woman to seek information and undergo fertility testing and treatment<sup>128</sup>. The process of attempting to conceive is also physically more burdensome for women. Though most obvious in the context of ART, which requires that women undergo invasive medical procedures<sup>129</sup>, it is also true of natural cycles as women are typically the ones to track the onset of the "fertile window" using the methods described above<sup>130</sup>. It is therefore perhaps unsurprising that infertility has been shown to take a greater psychological toll on women: in fact, half of infertile women describe infertility as the most upsetting event of their life, whereas only 15% of their male partners do<sup>131</sup>. A more recent study by Scholars also examined 100 couples with infertility and found that the women experienced increased symptoms of somatization, obsessive symptoms, interpersonal sensitivity, and phobias when compared to the men<sup>132</sup>. The women also had lower self-esteem and higher levels of psychological distress, anxiety, and depression.

Scholars explored the experience of 1000 couples who were undergoing IVF<sup>133</sup>. It was discovered that there was a substantial gender difference in mental well-being, with women being three times more likely to experience anxiety and two times more likely to experience depressive symptoms than men. This gender difference in the psychological toll of infertility has been confirmed in numerous other studies<sup>134,135,136</sup>.

### **Psychopathology and Quality of Life**

Approximately one-third of women undergoing ART meet clinical criteria for an anxiety disorder or for major depressive disorder<sup>86</sup>. Generalized anxiety disorder (GAD), the most common anxiety disorder in this population, affects approximately 15-23% while 26-32% meet criteria for a major mood disorder<sup>137</sup>. Several studies also find that quality of life is severely affected in women undergoing ART<sup>138,86</sup>. In fact, one study compared six groups of women struggling with chronic health conditions – infertility, chronic pain, cardiovascular disease, cancer, hypertension, and HIV – and found that quality of life among women with infertility was comparable to the levels of individuals with cancer, cardiovascular disease, and hypertension<sup>86</sup>. In a retrospective study, it was found that compared to women who spontaneously conceived, women who become pregnant using ART report a lower physical and social quality of life<sup>139</sup>.

Although the majority of the research examining psychological health in women struggling with infertility has been cross-sectional in nature, six studies measuring emotions multiple times over the course of an IVF cycle suggest that distress related to infertility, at least in the context of ART, is highly cyclical<sup>140,86</sup>. Four of these studies measured anxiety and depression two to three times over the course of an IVF cycle<sup>141,142,143</sup> and found that symptoms of anxiety and depression fluctuate throughout the treatment cycle. Specifically, anxiety was found to be

heightened at the start of ART compared to baseline. Depression was found to be heightened before taking a pregnancy test<sup>144,145</sup>. The final two studies have examined daily psychological well-being over the course of an IVF cycle<sup>146</sup>. The first study by scholars assessed daily stress ratings in 40 women and found that stress was highest at egg retrieval and at the time of the pregnancy test. A more recent study by scholars measured daily ratings of depression and anxiety over the course of one IVF cycle in 61 women<sup>103</sup>. It was found that levels of anxiety and depression were relatively low during the treatment phase, but that anxiety steadily increased across the 14-day waiting period, peaking in the days leading up to the pregnancy test result, rapidly declining upon the revelation of a negative test. Self-reported depression also increased in the days leading up to the test result but continued to rise after the negative outcome, remaining high on the last assessment day, which was four days test post-test.

There are considerably fewer studies examining rates of psychopathology among infertile women who are not undergoing ART, though there is some literature to suggest that rates are high in this population as well. For example, one study of 580 women with fertility difficulties found that 23% of non-treatment seeking women met clinical criteria for major depressive disorder<sup>147</sup>. Similarly, a study comparing emotional distress in 81 couples who were infertile but not yet undergoing fertility treatments and 70 fertile controls found that the infertile women had higher rates of psychopathology: 28% met criteria for an adjustment disorder with anxiety and depression mixed, 18% met criteria for binge eating disorder and 12% met criteria for generalized anxiety disorder<sup>148</sup>. In comparison, 3% of the fertile controls met criteria for an adjustment disorder with anxiety and depression mixed, 0% met criteria for binge eating disorder and 8% met criteria for generalized anxiety disorder.

Despite the few above-mentioned studies suggesting that women who are struggling with infertility but are not undergoing ART suffer from elevated levels of psychopathology, there have not been any longitudinal studies examining whether symptoms of depression or anxiety show the same cyclicity over the course of a nonART menstrual cycle. It is also unknown how the behaviours aimed at tracking fertility –use of ovulation predictor tests, cervical mucus checking, basal body temperature measurement – positively or negatively impact emotional wellbeing across the cycle.

### **Marital Satisfaction**

As with the literature on psychopathology and quality of life, the majority of the research on marital satisfaction and infertility has focused on couples undergoing ART. Curiously, a systematic review identifying 18 studies examining the relationship between marital satisfaction and infertility found that couples struggling with male-factor infertility do not report reduced marital satisfaction but that among couples struggling with female-factor infertility, women report less satisfaction in their marital relationship<sup>149</sup>. Women commonly report changes in marital satisfaction when first learning of their infertility.

One factor that may contributor to the decline in marital satisfaction that occurs in the context of infertility is a couple's sex life. Experiences of infertility have been demonstrated to negatively impact sexual satisfaction as some women report that they now only engage in sexual intercourse for the purpose of attempting to conceive<sup>106</sup>. With this in mind, it is possible that marital satisfaction might suffer more in the context of female-factor infertility than male-factor infertility because of a greater emphasis on identifying a woman's fertile window, and therefore greater negative effects on sexual satisfaction. This hypothesis remains to be tested, however.

## **Psychological Interventions for Infertility-Related Distress**

Although the psychological burden of infertility is well documented, currently available psychological interventions have proven largely ineffective in improving outcomes for infertile women. The most recent meta-analysis identifying 21 randomized controlled trials, illustrated that psychological interventions are able to improve pregnancy success, and have small reductions in anxiety but are ineffective for improving symptoms of depression, infertility distress and marital dissatisfaction<sup>150</sup>. Effect sizes for the randomized control trials of psychological interventions for the combined outcomes were not significant. Efficacy was not found to differ according to intervention type – five mindfulness-based interventions, four cognitive behavioural therapy, and 12 counselling interventions. These findings highlight the need for research aimed at improving our understanding of the daily experiences of women struggling with infertility so that more effective tailored interventions can be developed<sup>151</sup>

## **Coping with Infertility**

### **1. Cross-Sectional Studies**

A number of cross-sectional studies have assessed the extent to which infertile women endorse various psychological coping styles and the extent to which these styles are correlated with distress<sup>152,153,154,106</sup>. In general, these studies find that women who endorse an “active” or “problem-focused” coping style to handling stressful situations, typically characterised by behaviours such as problem solving, seeking information and/or professional help, report less distress<sup>155,106,156</sup>. In contrast, a “passive” or “avoidant” coping style, which typically includes a

tendency to avoid thoughts and feelings that are uncomfortable, has been found in various studies to be associated with greater distress<sup>157,106,113</sup>.

However, some inconsistencies exist: for example, in one study of 404 women undergoing ART, active coping was associated with increased anxiety<sup>111</sup>.

## **2. Longitudinal Studies**

In contrast to the many existing cross-sectional studies, there have been only three studies examining whether coping strategies are longitudinally predictive of psychological wellbeing in the context of infertility. The first study, which included 157 women undergoing IVF, found that an avoidant coping style, as assessed at baseline, was predictive of depressive and anxious symptoms at follow-up 18 months later<sup>158</sup>. Similarly, a study of 91 female IVF patients found that an avoidant coping style predicted increases in depressive and anxious symptoms from the pre-treatment to the post-treatment assessment<sup>115</sup>.

The third study by scholars of 180 women undergoing ART found that “normalization” – that is, the maintenance of regular life routines despite infertility – was positively correlated with quality of life at baseline but did not predict changes in adjustment at the eight-month follow-up in the full sample, but was protective against a decrease in wellbeing among women with a child already<sup>159</sup>.

## **3. The Psychology of Waiting for an Uncertain Outcome**

While the coping literature to date suggests that infertile women with an active coping style typically fare better than women with an avoidant coping style in terms of their psychological

wellbeing, these findings are somewhat difficult to translate into practical recommendations for women on a day-to-day basis. For example, what does effective “active coping” entail in the days leading up to a much-anticipated pregnancy test? Or following yet another devastating negative result? Do these two phases require different coping strategies? It seems likely that they do, but the current literature does not provide any clear recommendations.

One body of research that is of relevance here is the work of Sweeney and colleagues at the University of California, Riverside, on the psychology of waiting. Through her research that has primarily included students waiting for exam results (e.g., the California bar exam), she has developed the Uncertainty Navigation Model, which summarizes the specific coping strategies that individuals use most often during waiting periods<sup>160</sup>. These include: consequence mitigation (preventive action and proactive coping), reappraisal (expectation management, pre-emptive benefit finding, and distancing), direct emotion management (distraction and suppression), and information seeking. In her model, scholars theorizes that, generally, a bi-directional relationship exists between the use of these “uncertainty navigation strategies” and anxiety and rumination: individuals use them in an effort to reduce distress but that, in many cases, they actually have the opposite effect. However, she also posits that there are a number of baseline characteristics, such as intolerance of uncertainty and defensive pessimism, that are likely to moderate the efficacy of the various strategies<sup>161</sup>.

#### **2.1.4 Coping Strategies and Mental well-being**

According to the theory of Dahlquist, many researches have argued that the effectiveness of a coping strategy is related to the duration and nature of the stressful situation<sup>162</sup>. Avoiding strategies are more effective as a primary reaction to the cause of stress when the emotional

arousal is high and the situation is out of control. In chronic cases, when alertness or taking action is needed, approaching strategies can be more effective. In a meta-analysis done by scholars, it has been shown that women use more emotion-focused coping method in case of their infertility<sup>163</sup>. Apart from minor skills such as the ability of coping or problem solving other specific vulnerable factors such as personality traits; OCD, inflexibility and impatience cause stress<sup>164</sup>. Evidences show that personality is related to both stress and method of coping with stress for example, regarding the coping method, it is clear that people with different personality traits show different coping methods (passive in contrast with active) and different levels of vulnerability in experiencing a stressful situation<sup>165</sup>.

Scholars emphasized that personality predicts the emotional reaction to stressful experiences by affecting the perception of threat or loss and the accompanying emotional and psychological reactions<sup>166</sup>. Personality predicts the stressful experiences of a person in different situations by means of a relation with the important collection of coping and evaluation<sup>167</sup>.

Available external sources (social support) function as barriers for people in stress processes. Some studies reported that a lack of social support can be a source of stress. Psychological factors are important in coping with chronic diseases and their outcomes especially the concept of the patient from his own disease, his coping method and external source of support, like social support, are very important<sup>168</sup>. Social support is defined as the level of receiving kindness and companionship and attention of family members, friends and others<sup>100</sup>.

In mid 1970s, there was an increasing interest in studying the role of social support as an external coping source. Perceived social support as an effective source in stress process means that one

can receive others' help if he/she needs it<sup>121</sup>. Social support is consisted of those social sources which a person has perceived or been suggested.

Perceived social support is one of the most common scales used for social support which is the perception of the person of the availability of others' support such as family and friends. Perceived social support signifies the cognitive evaluation of the availability and adequacy of support<sup>191</sup>. The main function of the perceived social support is that mental evaluation and expecting support help the person to believe that he is respected and is part of a network of mutual duties. In coping with infertility, seeking social support is an important coping mechanism used by couple treated for infertility. In the process of seeking social support from friends and family, infertile couple sometimes has to reveal some confidential information of their life<sup>169</sup>.

Regarding the stated background for the importance of psycho-social factors in infertility stress, the present study intended to assess the relation of personality traits, coping methods and perceived social support with infertility stress in infertile women. It is also going to determine the share of each of these variables as the predicting variables in infertility stress as the criterion variable.

### **Coping Strategies with Infertility: Women**

It is not uncommon that most literature search often lead to results on the impact of infertility on mental health. However, the focus of this review is on the effect of psychological intervention and / or psychological coping strategies on chances of achieving pregnancy<sup>170</sup>.

Scholars have ranked infertility as the ‘fourth most distressing experience’ in a woman’s life<sup>171</sup>. Accompanied by elevated stress levels, infertility was found to be associated with feelings of grief, depression, guilt, and anxiety. This is consistent with the work of scholars<sup>172</sup>. More so, there are studies that reveal that when matched to women who can achieve pregnancy via natural means, ‘distress in infertile women was reported to be significantly higher<sup>128</sup>.

Interestingly, Scholars work on women in the United States aimed at determining the relationship between infertility diagnosis, treatment type, distress levels, and self-identification as infertile<sup>173</sup>. Found that women who were medically diagnosed as infertile were more likely to self-identify as infertile. Women seeking treatment for male factor infertility were less likely to identify as infertile. Women who identified as infertile endorsed higher levels of distress. The researchers concluded that ‘self-identification-as-infertile, as opposed to type of infertility diagnosis was directly related to distress levels.

In the context of the present study, besides highlighting the tremendous psychological burden experienced by women desiring pregnancy; it is also important to highlight how affected individuals are able to cope with the burden of infertility during treatment courses.

Several researchers in a study developed a “fifty-one-item measure, ‘Coping with Infertility Questionnaire’ to assess styles of coping related to the infertility experience<sup>174</sup>. Three main coping areas were revealed from their study and each is composed of more specific coping styles as mentioned in a study: The approach-avoidance coping strategy which includes aspects of social withdrawal, denial, self-blame, self-neglect, disclosure, acceptance, and positive re-interpretation. Relationship coping strategy which includes seeking spousal support. Practical

management coping strategy which includes self-nurturing, seeking social support, planning and information-seeking, and faith<sup>131</sup>.

The same scholars also compared 'coping with psychological adjustment, which was assessed through measures of well-being, distress, life satisfaction, and somatic symptoms<sup>131</sup>. They found that emotional approach coping such as self-nurturing, and problem appraisal strategies such as positive reinterpretation were associated with better psychological adjustment. On the other hand, emotional avoidance, and problem-management strategies such as seeking social support and information-seeking were associated with worse adjustment.' This however conflicted with the work of scholars that suggested that strong social support, including marital support, was associated with lower distress levels<sup>131</sup>.

The study by scholars was further corroborated by a scholar that found that women experiencing primary or secondary infertility typically used social support, problem solving, and positive reappraisal in coping with distress<sup>175</sup>. They were less likely to use avoidance, self-controlling, distancing, accepting responsibility, and confrontational coping to resolve the situation. For those experiencing primary infertility, accepting responsibility and avoidance were associated with increased levels of distress.

Another interesting investigation has been on the interaction of various coping strategies across various phases of the infertility treatment. In one study by scholars: the affected women were most likely to use seeking social support and escape avoidance across all treatment stages<sup>130</sup>. Self-control was also commonly used, though women no longer undergoing treatment were less likely to use this coping technique. More so, those with five or more years of unsuccessful

medical interventions) were more likely to use accepting responsibility than those who had concluded infertility treatment.’

A study by scholars revealed that women experiencing infertility demonstrated lower resilience than normal populations and that lower resilience was associated with higher levels of infertility-related and general distress<sup>128</sup>.

Lastly, as indicated in the aforementioned scholarly works, there is a need to investigate the psychological dimensions to female infertility. This is also based on the position by some scholars that claim ‘women experience peak prevalence of psychiatric disorders occurs during the childbearing years<sup>176</sup>.

#### **Coping Strategies with Infertility: Men**

Similar to women, there exists scholarly works that reveal that male fertility could be impacted by psychogenic stress<sup>177</sup>. Although as it has been aptly observed there exists a disproportionately low body of work on the male experience during infertility treatment including their support needs, or their decisions to end treatment<sup>134</sup>. Scholars argued that the paucity of research may be due to the fact that infertility treatments may mainly and unconsciously target the female partner in the relationship<sup>178</sup>.

Meanwhile, considering the psychological coping strategies favored by men undergoing fertility treatment; a study by Schmidt and other researchers carried out in the Netherland found that men of higher social class, as determined by ‘education, vocational training, and occupation, were more likely to use active-avoidance coping than men of middle or lower social class.’ The use of

‘avoidance coping and self-blame’ techniques have been linked to increased psychological stress levels<sup>134</sup>.

Furthermore, scholars studied the differences in coping with infertility between men and women<sup>179</sup>. Their findings pointed to the fact that the male partner was more likely to employ distancing, more organised problem-solving, and self-control strategies to cope with infertility compared to their female partners.’ They added that the male partners were more like to adopt social support in response to the psychological stress that comes with infertility and infertility treatment compared to the women.

Interestingly, the likelihood for affected individuals to adopt ‘social support, distancing and organised problem solving approach has been reported to correlate with lower infertility-related distress. On the other hand, adopting self-control has associated with increased infertility-related distress<sup>133</sup>.

From other researchers; it was concluded that the (i) male partners diagnosed to be infertile used fewer coping strategies unlike their female partners<sup>134</sup>. Although when compared with fertile men; ‘greater utilization of coping strategies’ among sub-fertile males<sup>130</sup>. (ii) men were more likely to adopt coping a strategy of withholding information on their psychological stress, which has further been correlated with higher fertility and general distress levels<sup>132</sup>. (iii) self-control, relaxation, search for self-affirmation, intrusive thoughts, disparagement, avoidance, and escape are among several commonly employed coping mechanisms for managing male infertility psychological stress as reported in a doctoral research by scholars<sup>134</sup>.

## **The Impact of Infertility on the Couple**

Fundamentally, as observed in various literature; the level of stress induced by infertility in the lives of couples can quite overwhelming. Therefore, the role played by the partners towards themselves cannot be downplayed. Scholars in their report noted that couple undergoing infertility treatment programs typically serve as ‘primary source of support’ for each other<sup>180</sup>.

Regardless of the source of the infertility, research has shown that the success or failure of achieving pregnancy following the diagnosis of infertility may depend on the effectiveness of the coping strategies adopted by the couple.

Various studies in varying degrees have been able to link more ‘negative affect’ or the inability to control psychological distress (resulting in psychological traits such as anxiety disorders, depression) during the ‘infertility journey’ to the potential for success in achieving pregnancy and ‘marital satisfaction’<sup>181,182,183</sup>.

In similar manner, other studies have investigated the beneficial effect of infertility including sexual performance and other marital advantages<sup>133,135,120</sup>. This was underscored in a study where negative psychological traits and coping strategies was associated with lower sexual performance. Similarly, there are reports that suggest the positive outcomes in the marital lives of couples undergoing assisted reproduction technologies<sup>140</sup>.

On the other hand, other researchers have held opposing views in support of the negative consequences of infertility over long period and failure of infertility treatment with reduced marital benefits<sup>139</sup>.

Considering these studies, it is important to note how they highlight the ‘dyadic potential of the infertility experience how ‘understanding the potential benefits of infertility may assist couples to adopting more effective stress-coping mechanisms<sup>140</sup>.

### **Overview of Psychological Interventions**

Various literature on mental health have continued to advocate on standard routines for stress management such as psychological interventions<sup>184</sup>. In the context of reproductive medicine and infertility, psychological interventions are specific therapies designed to assist couples affected by infertility, in meeting their psychological needs in the period of infertility and infertility treatment.

Since recent history, researchers and healthcare professionals have gained new perspectives on the role of psychotherapy in relation to achieving pregnancy. Other researchers highlighted common interventions employed in the course of the infertility treatments including psychological and educational interventions<sup>185,186</sup>. Fundamentally, psychological treatment is targeted towards behavioral changes while educational interventions is aimed at providing vital medical or procedural information on infertility including its causes, treatment, and techniques on ‘self-management and self-efficacy’ such as skills training, psycho-education<sup>143</sup>.

In the context of this review; the goals of psychological interventions in providing support for individuals affected by infertility and its treatment has been categorized in the following dimensions designated as cognitive, behavioural, and psychodynamic therapies<sup>143</sup>. In another way, the aim of the interventions for infertility patients is to improve their mental health and increase their pregnancy rate.’

Briefly, cognitive therapeutic interventions encompass changing dysfunctional cognitions and beliefs about infertility and its consequences.’ Studies have shown that holding certain negative beliefs about stressful situations often pre-dispose individuals to psychological stress and distress. Therefore, an effective approach at managing detect such dysfunctional beliefs have been theorized to alleviating psychological stress<sup>143</sup>.

The cognitive therapeutic interventions are often joined with behavioural interventions. The behavioural interventions are designed toward a shift in negative behavior associated with infertility.

Lastly, psychodynamic interventions are developed in a bid to alleviating internal conflicts that are believed to involve strong negative emotion about pregnancy for instance. Such emotions often originate from childhood experiences in women<sup>143</sup>.

## **2.2 Theoretical Framework**

This section captures the theories for the study; these include Life history theory, Crisis theory, Family theory and Mental wellbeing theory.

### **2.2.1 Life History Theory**

Organisms follow a species-specific sequence in their life, with gestation, birth, growth during childhood, sexual maturation, reproduction, aging and death being significant milestones. Life history theory assumes that this sequence is shaped by evolution and also individually calibrated by early life experiences. Adverse conditions in childhood may foster a fast life history strategy including impulsive behavior, activation of the hypothalamic-adrenal pituitary axis, early reproduction and low investment in personal mental and physical well-being. As a matter of fact,

empirical research has shown that having survived a serious medical disorder by age 10 is associated with women reproducing at an earlier age<sup>74</sup>. Low socioeconomic status is equally associated with a lower age at first birth<sup>75</sup>.

### **2.2.2 Crisis Theory**

Crisis theory advocates that the emotions that accompany a traumatic crisis like infertility can be described in different ways. The description has existential base being grounded on the emotional experience of being a human being. Dostoevsky said everybody has a basic need of a kind of existential structure and everybody seeks a position for being human in a place and function in the world. Infertility among males and females is a situation that demands maximum adjustment (coping). If the affected males and females can learn new and appropriate reactions and coping mechanisms, the crisis will lead to development of an individual.<sup>187</sup>

### **2.2.3 Family Theory**

Family theory established that members of the family system are expected to respond to each other in a certain way according to their role which is determined by relationship agreements. Melissa theorised that maintaining the same pattern of behaviours within a system may lead to balance in the family system but also to dysfunction.<sup>188</sup>

### **2.2.4 Mental Well Being Theory**

The network theory holds that a person is in the state of mental well-being if she instantiates a homeostatically clustered network of feelings, emotions, attitudes, behaviors, traits, and

interactions with the world that tends to have a relatively high number of states that feel good, that lead to states that feel good, or that are valued by the agent or her culture.

A person with a high degree of well-being is in a positive rut or groove, he or she is enmeshed in a positive causal web involving positive feelings, attitudes, behaviors, traits and successful interactions with the world<sup>189</sup>.

## **2.3 Review of Empirical Studies**

### **2.3.1 Infertility Related Stress And Mental Well-Being**

We grow up to the belief that stress can cause fertility. Infertility leads to significant distress and psychological interventions are likely to reduce depression and increase pregnancy rates. One major difficulty in assessing the distress levels in men and women with infertility is the accuracy of self-report measures. Some women appear good, though not really good internally, they do this to appear mentally healthier than they are. It is also possible that women feel optimistic and hopeful prior to initiating infertility treatment, which is when most assessments of distress are collected. In a study where structured psychiatric interview was used<sup>190</sup>. A total of 122 women were interviewed prior to their first infertility clinic visit and the results were surprising; 40% of the women were diagnosed as having anxiety, depression, or both. Other research has also supported these findings. The report gave a 31% prevalence of psychiatric symptoms, the most common of which was major depression<sup>191</sup>. In a large Danish study of 42 000 women<sup>192</sup> who passed through assisted reproductive treatment (ART) treatment and were screened for depression before treatment, 35% were screened positive. In a recent study, 174 women undergoing infertility treatment, 39% of them met the criteria for major depressive

disorder<sup>193</sup>. In one of the largest studies to date,<sup>194</sup> 352 women and 274 men were assessed in infertility clinics in Northern California, 56% of the women and 32% of the men reported significant symptoms of depression while 76% of the women and 61% of the men reported symptoms of anxiety. It is not surprising that a recent research documents shows that infertility patients consistently report significantly more symptoms of anxiety and depression than fertile individuals.<sup>195</sup> A study on suicidality was conducted recently in 106 women with infertility, 9.4% of the women reported have suicidal thoughts or attempts.<sup>196</sup> A recent literature review on the prevalence of psychological symptoms in infertility affirmed that 25% to 60% of infertile individuals shows psychiatric symptoms and that their levels of anxiety and depression are significantly higher than in fertile controls.<sup>197</sup>

The medications used to treat infertility, including clomiphene, leuprolide, and gonadotropins, are associated with psychological symptoms such as anxiety, depression, and irritability. Thus, when assessing symptoms of women mid-treatment, it is difficult to differentiate between the psychological impact of infertility versus the side effects of the medication. Thus, studies which included measures of these symptoms prior to beginning medication, or after going off it, may be more accurate than those done only on women as they cycle. The further into treatment a patient goes, the more often they display symptoms of depression and anxiety. Patients with one treatment failure had significantly higher levels of anxiety, and patients with two failures experienced more depression when compared with those without a history of treatment.<sup>198</sup>

However, it has also been shown that the more depressed the infertile woman, the less likely she is to start infertility treatment and the more likely she is to drop out after only one cycle.<sup>199</sup> Researchers have also shown that despite a good prognosis and having the finances available to pay for treatment, discontinuation is most often due to psychological reasons.<sup>200-</sup>

<sup>201</sup>The impact of stress on treatment outcome One of the most controversial areas in the field of reproductive medicine is the potential impact of psychological factors on pregnancy rates. Although there are a variety of old wives' tales which support the notion that stress hampers reproduction function, this theory has been challenging to confirm. There have been dozens of studies which have investigated the relationship between psychological symptoms prior to and during assisted reproductive treatment [ART] cycles and subsequent pregnancy rates, with conflicting results. Some have shown that the more distressed the women prior to and during treatment, the lower the pregnancy rates,<sup>202-203</sup> while other studies have not.<sup>204-205</sup> There are several possible explanations for these discrepancies. One is that individuals may not accurately report their level of distress when completing psychological questionnaires. Research supports this theory. In a study of fecundity in 339 women in the United Kingdom trying to conceive,<sup>206</sup> self-reported symptoms of depression, anxiety, and stress were not significantly associated with time to pregnancy. However, in a similar study on 501 women in the United States, levels of salivary a-amylase, a biomarker of stress, were significantly correlated with time to pregnancy.<sup>23</sup> Women in the highest quartile of a-amylase levels at baseline were twice as likely to subsequently experience infertility. Finally, in a recent study in 135 in vitro fertilization [IVF] patients, cortisol was measured through samplings of hair, which measures levels from the prior 3 to 6 months.<sup>207</sup> The hair cortisol levels were significantly correlated to pregnancy rates ( $P=0.017$ ). These findings match what most infertility patients believe; that psychological symptoms have a negative impact on fertility.<sup>208</sup>

Infertile individuals experience a strong psychological stress. This stress could affect the relationship between man and woman.<sup>209</sup> The infertile individuals experience the symptoms of depression, grief, loss of control, and high levels of anxiety.<sup>210</sup> In a very recent study, the main

emotional disorders of 500 infertile males and females from different socioeconomic milieus were shock, anxiety, low self-worth , depression, marital disharmony, anger, feelings of guilt, frustration, and sense of failure. The infertile individuals had, in all mentioned factors, poor mental well-being than fertile counterpart, so they were susceptible to more physical and psychological stressors.<sup>211</sup> Some studies reported that the level of depression and anxiety in infertile people is equal to cancer patients.<sup>212</sup> A new study reported depression in 57% and anxiety in 67.2% of infertile women.<sup>213</sup> There are different reasons for psychological problems in infertile people. In societies with cultural norms considering high value for the role of a woman as a mother, the consequences of infertility are more severe, and some results such as instability of normal life, home violence, and loneliness have been observed.

From the above it is clear that infertility causes stress and it is important to note that stress can lead to hormonal imbalance and menstrual irregularities thus preventing ovulation in woman affected leading to infertility .

In a study conducted, it was reported that infertile individuals may experience relief from depression with the support of the family members. It is needful to say that coping strategies refer to cognitive or behavioural efforts to manage a stressful event that is perceived to exceed an individual's personal resources. Social support is fundamental to one's physical and psychological well-being.<sup>214</sup>

The experience of infertility is not only a medical one, but it is also an emotional experience. Those experiencing infertility encounter a variety of feelings<sup>215</sup>. These feelings vary widely from

stress, reactions to diagnosis and medical treatments to the experience created by the physician and medical environment. Gender is sometimes linked with couple infertility.<sup>216</sup>

The underlying cause of infertility may be a male factor (40%), a female factor (40%) or a combination (20%) of problems. In a study conducted in Nigeria, it was found that about 15% of people aged 19 to 45 years have various forms of infertility problems<sup>217</sup>. Of these, 23.6% had primary infertility, 28.3% had secondary infertility while the remaining 48.1% had other gynaecological disorders and 60 to 80 million males and females worldwide currently suffer from infertility.

Although a vast amount of research over the years have focused more on women when it comes to issue of infertility, however, the results of more recent studies with sophisticated methodological designs showed that the emotional impact of infertility may be quite balanced: men suffer as well, and this has to be addressed in infertility counseling too.<sup>218</sup>

Regarding this, the way we are expressing our feelings is basically linked to a learning history and therefore culturally determined. In many cultures, male infertility remains a stigmatized condition and is associated with a lack of masculinity. For men, this may result in secrecy surrounding diagnosis, sometimes to the point where the female partner takes the blame for the couple's inability to conceive.<sup>219</sup>

The stress background of male infertility usually refers to life style cues as smoking tobacco or marijuana, drinking habits, weight and eating habits, and a complete lack of exercise, because of the lowering effects of testosterone blood levels and steroids intake. Lifestyle approaches also include vitamins intake and avoiding exposure to toxins. The stress research was during the '90s and still is now one of the core topics of male infertility research. Infertile couples may easily

cope with common day to day stressors, but coping with infertility issues, including the ART treatments, may be considerably more difficult.

A series of studies showed that infertile men display lower rates of self-esteem, higher anxiety and more somatic symptoms than fertile men. Such distress may persist 18 months after treatment, regardless of whether a live birth was achieved. Furthermore, some men experience transient episodes of impotence and sexual performance anxiety when confronted with infertility. It appears that emotional stress and marital difficulties are increased in couples where the infertility lies with the man.<sup>220</sup>

Also, a qualitative study conducted in the United States<sup>221</sup>. It showed that women used a variety of coping strategies to solve infertility problems. In Pakistan, some women resorted to adoption in coping with infertility.<sup>222</sup> However, from an African viewpoint, adoption is seen as the least viable option possible.

### **2.3.2 Coping Strategies And Mental Well Being**

Coping is the constant change in cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person.<sup>223</sup> Coping strategies are conscious efforts to solve a personal or interpersonal problem that will help in overcoming, minimizing, or tolerating stress or conflict.<sup>224</sup>

Parenthood achievement is one of the major life goals for most men and women. In planning a life together, most of the infertile individuals have a vision about how their life should be, and most of them wish to have children of their own for the future life. When fertility fails, the affected person become depressed psychologically and can experience a wide range of emotions. They may blame themselves even though it is not a personal failure or punishment<sup>28</sup>. Childless

women will undergo varied psychological distress and in order to overcome psychological distress and maintain their quality of life they need to use appropriate coping strategies<sup>25</sup>. In a qualitative study conducted in the United States, it was found that women used coping strategies such as avoidance of reminders of infertility, being the best, regaining control, sharing the burden and giving into feelings in dealing with the problems of infertility<sup>30</sup>. Another study also conducted in the United States by Stanton et al found that women who coped through escape avoidance and through accepting responsibility for their infertility showed more distress, whereas women who sought more social support were less distressed. Seeking social support was an important coping mechanism used by people involved during the process of taking treatment for infertility <sup>26</sup>. This study aims to identify the psychological and mental wellbeing and coping strategies of women seeking treatment for infertility. The findings have the potential of enabling the healthcare personnel in designing and implementing supportive psychological programs for women faced with fertility problems.

Infertility is a source of stress that can impact the wellbeing of people with fertility disorders. This impact is influenced by the coping strategies: Active-confronting (asking for advice), active-avoidance (avoiding contact with pregnant women, keeping feelings for themselves), passive-avoidance (expecting a miracle, waiting as the only solution), meaning-based coping (linking the experience with the improvement of the marriage or personal growth). Studies that involved women undergoing in vitro fertility (IVF) treatment showed that those that mainly used emotion-focused strategies had higher levels of stress and more difficulties adjusting to their situation. Furthermore, denial as part of an avoidant coping strategy predicted higher stress levels related to infertility <sup>32</sup>. The results of a recent study <sup>33</sup> showed a positive association between seeking social support, avoidance coping, and state anxiety these findings support the results<sup>34</sup>.

Positive attitude coping was negatively associated with state of anxiety, at least regarding women<sup>33</sup>. It was similar to the results of another study which studied coping strategies centered on positive reframing<sup>17</sup>. The results of another study discovered that passive coping (meaning emotion focused coping) was a positive predictor for stress, while active coping (problem-focused coping) was a negative predictor for stress<sup>34</sup>. Regarding emotion-focused and problem focused strategies, the difference between couples was not significant, but women had less self-control compared to men<sup>35</sup>. In addition, anxiety associated with infertility had a direct influence on active-oriented coping strategies. Taking into account a few of the difficulties that women with infertility face (among them being uncertainty and lack of control),<sup>36</sup> examined the association between perception of infertility controllability and coping strategies, the results demonstrating a positive association between the perception of low controllability and avoidance coping. In addition, there was a positive association between the perception of a high level of controllability and problem-focused coping.

Infertile individuals are perceived to suffer from many mental difficulties such as depression, anxiety, stress and etc.. Hence, women seem to be more vulnerable to psychological distress so; the reaction to infertility in women differs from men. Infertile couples use the strategies for coping with the stress of infertility, and to apply various coping strategies to manage their personal and family crisis. Therefore it is important to gain insight into the coping mechanisms which influence the patients' life. Coping strategies refer to the individual's cognitive ability to control and manage a stressful life event. The goal of coping can be altering the problem (problem-focused coping) or reducing the emotional disturbance (emotion-focused coping). Many studies have been conducted on coping and stress within the infertility context<sup>6-9</sup>. Selection of a coping strategy depends on the type of crisis and individual's interactions with the

dominant factors within the family and society. In some societies such as Iran there is a high pressure on women to have a child and seem in these societies response to an event of stress is different among infertile patients <sup>20</sup>.

In essence, effective coping requires a fit between situational appraisals and choice of coping responses (this notion is also known as the goodness of fit model).<sup>225</sup> Specifically, perceptions of controllability of the situation should lead to the utilization of problem-focused strategies to a greater degree than emotion-focused strategies, which are more suitable for less controllable situations. Research has established that coping strategies are classified into two: problem-focused coping strategy and emotion-focused strategy.<sup>226</sup> The problem-focused strategy is directed toward reducing or eliminating a stressor, or adaptive behavioral condition.<sup>227</sup> Users of problem-focused strategies do this by getting information on the problem and learning new ways to manage the problem. Emotion-focused coping is when we feel we have little control of the situation; thus we cannot manage the source of the problem. It involves gaining strategies for regulating emotional distress. They include escape avoidance, seeking social support; exercising, relaxing, and confronting.<sup>228</sup> For this study, three of these coping strategies will be used extensively.

To be specific, escape-avoidance being a coping strategy was categorized into two namely, active-avoidance e.g avoiding being with a pregnant women and passive-avoidance e.g hoping for a miracle.<sup>229</sup>

### **2.3.3 Gender and Mental Well-Being**

Psychological aspects of infertility in men have been a matter of significantly less research than that in women. Most of the existing studies investigated women's reactions to male infertility,

while few studies examined couples facing male's infertility and the psychological experiences of men<sup>230</sup>.

In a research study conducted in Federal Medical Centre, Owerri Imo State, precisely at the fertility clinic of the hospital. The copies of the validated questionnaire were administered by the researcher to the respondents at the area of the study. 67 questionnaires were distributed the study found that age and gender have significant relationship as far as infertility is concerned. While infertility is seen to occur more in people of the age cohort 30-35 years, it is observed that women are more vulnerable than men<sup>231</sup>.

After about 32 years of age, a woman's fertility gradually declines, while men's fertility starts to fall by forty. He also opined that infertility in older women may be as a result of higher rate of chromosomal abnormalities in the eggs. This affirms that fertility decreases with age but is more significant with women<sup>232</sup>. The etiology of male and female infertility is multi factorial. They maintained that while male infertility could be caused by genetic factors, physical abnormalities, injuries, drugs, infections of the genital tract, radiation, toxins or unexplained factors, the major cause of male infertility in Nigeria are infections and hormonal abnormalities<sup>233</sup>. Furthermore, the causes of male infertility include low sperm count, low sperm motility, abnormal sperm, medical conditions like testicular infection, cancer, previous surgery, anaemia, thyroid disease, ejaculatory dysfunction, premature ejaculation, mumps, hypospadias and cystic fibrosis, among others. For female infertility<sup>34</sup>, the causes to include cervical factor cervical narrowing or stenosis and infection of the cervix, uterine factor such as presence of sub mucosal fibroids or benign tumors in the muscular wall of the uterus, congenital malformation like endometriosis and ovarian factor, Ovulation disorder, tubal factor involving abnormalities or damages to the fallopian tube. <sup>234</sup>The combined causes and recognizable causes. Nevertheless,<sup>235</sup>In their

exploratory and qualitative study on communities perception on child bearing and childlessness in Northern Ghana (Upper region) revealed that socially couples could become infertile though supernatural causes such as bewitchment and disobedience of social norms abortion, masturbation and use of contraceptives.

Infertility is not a disease, although the condition and the treatment that accompanies it can affect all aspects of people's lives, which can cause various mental disorder and consequences including turmoil, frustration, depression, anxiety, hopelessness, guilt, and feelings of worthlessness in life.

Although infertility as a psychological stressor can threat health of infertile people; but the extent of its effects is depended to cognitive and defense skills of people<sup>53-55</sup>. Infertility is a major tension in life, imposes much stress on couples and can threat psychological health of them by effect on quality of married life, fear of possible divorce, decreasing intimacy, despair and depression or other psychological disorders like anxiety, irritability, lack of self-efficacy, sexual disorders etc.<sup>56</sup>. Treatment approaches for infertile couples are developing; treatment with new technologies has much stresses. Also the effect of these stresses can impact on treatment success<sup>57</sup>. Evaluation of quality of life and effects of psychological treatment interventions (counseling or drugs) in infertile people can make an efficient step on infertility treatment success<sup>58</sup>. Psychological effects of infertility on life of infertile individuals are concomitant with tensions between families and also dissatisfaction of their marriage<sup>59</sup>. Due to increased global population and higher age of marriage, number of infertile couples is increasing. Prevalence of infertility is different in different countries. Some data shows that there are about 80 million infertile couples worldwide. In Iran estimations indicate that there are about two million infertile males and females<sup>60</sup>. Psychological pressures and concerns about infertility have direct effects on

normal physiology of body and can have double effect on fertility outcomes<sup>62</sup>. People that have peace of mind and are psychologically healthy are less under stresses and then have more probability of successful fertility outcomes<sup>62</sup>. Regardless of the technique which the affected individuals use for treatment of infertility (like IVF, ART, surrogacy and adoption), successful outcome can improve quality of life and general health <sup>63</sup>. Progression of the infertility treatment modalities had opened most of locks in the way of infertility problems; but had some own complications too. Various studies showed that developed treatment methods such as in vitro fertilization [ IVF] can cause depression and anxiety symptoms among 5-10% of women<sup>64 65</sup>. Experience of pregnancy, delivery and giving love to the own child, is a natural need in woman. Typically women know their first role as being a mother and infertility can cause the sense of inability and incompetence. On the other hand, infertile women are more involved in long time strict medications and the high cost of infertility treatments that can have psycho-social reaction in infertile women<sup>66</sup>. If physician give the assurance that a couple will not be able to have child, this may cause psychological crisis that can affect on their communications and job skills<sup>67</sup>. Some researchers believe that a complicated intertwined network of physical, psychological and social factors can affect infertile individuals and the reaction of patient to these situations can form the pattern of patient response to the problem <sup>68</sup>. Therefore, the prevalence of these psychosocial issues in infertile individuals can be attributed to a complexity of factors such as gender of the individual, cause of the infertility, duration of infertility, treatment methods and culture.<sup>236</sup>

The results of more recent studies with sophisticated methodological designs showed that the emotional impact of infertility may be quite balanced: men suffer as well, and this has to be addressed in infertility counseling too<sup>237</sup>. The way we are expressing our feelings is basically

linked to a learning history and therefore culturally determined. In many cultures, male infertility remains a stigmatized condition and is associated with a lack of masculinity. For men, this may result in secrecy surrounding diagnosis, sometimes to the point where the female partner takes the blame for the couple's inability to conceive<sup>238</sup>. The stress background of male infertility usually refers to life style cues as smoking tobacco or marijuana, drinking habits, weight and eating habits, and a complete lack of exercise, because of the lowering effects of testosterone blood levels and steroids intake. Lifestyle approaches also include vitamins intake and avoiding exposure to toxins. The stress research was during the '90s and still is now one of the core topics of male infertility research. Infertile individuals may easily cope with common day to day stressors, but coping with infertility issues, including the ART treatments, may be considerably more difficult<sup>239</sup>. A series of studies showed that infertile men display lower rates of self-esteem, higher anxiety and more somatic symptoms than fertile men<sup>240</sup>. Such distress may persist 18 months after treatment, regardless of whether a live birth was achieved<sup>44</sup>. Furthermore, some men experience transient episodes of impotence and sexual performance anxiety when confronted with infertility<sup>241</sup>. It appears that emotional stress and marital difficulties are increased in couples where the infertility lies with the man<sup>43-45</sup>. In-depth interviews suggested that when faced with infertility, men may experience considerable distress linked to low self-esteem and social stigma, and that it is likely to be increased in men with male-factor infertility than in men with unexplained or female-factor infertility<sup>242</sup>.<sup>43</sup> investigated couples undergoing IVF treatments (ejaculated, epididymal or testicular spermatozoa), identifying sex differences and risk factors for depression. Authors analyzed the responses of a one year cohort of couples who retrospectively sent questionnaires, with successful couples being more likely to participate in the study. As yet discussed in literature, retrospective data concerning the distress induced by

infertility are likely to be biased by the responders' inherent selection and are therefore to be considered with caution. In this study results indicated, as expected, that treatment-related distress was generally higher for women than for men. Men reported marginally elevated depression scores compared to their controls, and the treatment gave some additional burdens for men: they reported a greater subjective responsibility for the infertility, the impact of childlessness on daily life, treatment-related stress and time demands. The study also revealed for couples some factors suggesting more proneness to depression, like an unsuccessful treatment outcome, repeated treatment cycles, a low socioeconomic status, foreign nationality and for women a lack of partner support. These factors might be particularly considered for guiding psychological counseling in infertile males and females.

#### **2.3.4 Effect of Age and infertility-related-stress on Mental Well-Being**

The age of a man or woman is a factor among others that can affect fertility and mental well-being. Due to pursuit of education and other factors, many couples are choosing to delay child-bearing. Fertility peaks and then decreases over time in both men and women, thus the reproductive timeline may be one aspect to consider when determining the ideal time to start a family. As men age, testosterone levels begin to decrease and hypogonadism results. However, if testosterone is used to treat hypogonadism, it can suppress spermatogenesis<sup>243</sup>.

Semen parameters also begin a steady decline as early as age 35; semen volume and motility both decrease and morphology may become increasingly abnormal<sup>244</sup>. After the age of 40, men can have significantly more DNA damage in their sperm, as well as decline in both motility (40%) and viability (below 50%) (n = 504, p < 0.001)<sup>200</sup>. There may also be an increase in time to pregnancy with an increase in male age.

Scholars reported that when men were over the age of 45, their partner's relative risk of an increase in time to pregnancy over one year increased to 4.6, and over two years increased to 12.5 (n = 1832, CI = 24.5-38.1)<sup>200</sup>. The authors also noted that the older population tended to consume more alcohol, have intercourse less often, had longer contraceptive usage, and smoked less cigarettes which could have been confounding factors. Another study found that there are also exponentially fewer infants born to fathers  $\geq 35$  to 39 years of age and older compared to younger age groups even when controlling for female age (n = 122,061)<sup>201</sup>.

### **2.3.5 Types of Infertility-related-stress**

The following are types of infertility related stress

#### **Depression**

Depression, characterized by a sense of hopelessness and despair, is a very common consequence of the diagnosis and treatment of infertility. For some, depressive episodes are periodic and brief, often related to a sense of failure created by a rise in temperature and subsequent onset of menstruation. For others, depression-with occasional respites-is a daily curse throughout the entire process. Depression is for some incapacitating and for others heavy emotional baggage that they learn to carry<sup>245</sup>.

However it is experienced, depression is a response to "both the excessive losses and the prolonged stresses created by infertility. Loss Barbara Berg has entitled the account of her own infertility *Nothing To Cry About*. 10 This title represents an illuminating aspect of infertility its accompanying sense of profound loss. In one sense, it is wrong. There is much to cry about: the problem itself, its implications in the lives of infertile couples, and the reality that they may never have a child. But in another sense, the title is accurate. Who can mourn the loss of

someone who has never been born or possibly conceived? The fact that there is nothing tangible to represent the loss actually intensifies the pain and makes the loss more difficult to understand. There is much to cry about, and there is nothing to cry about. Everything is lost, and nothing is lost. All theories concerning factors which contribute to depression mention the concept of loss. The loss may involve a love object, a variety of reinforcers, power and control over the environment, or positive and hopeful developments in one's life. These losses usually involve a crucially important source of security, which, when lost, leads to a depressed condition and a sense of helplessness and hopelessness.

#### **Loss of Status or Prestige (in the Eyes of Others).**

Society places eminent value on parenthood, thereby safeguarding and reinforcing behavior that relates to procreation and child rearing. From the inevitable "How many children do you have?" to religious exhortations to "Multiply and replenish the earth," childless couples are duly reminded of society's expectations that they have children. Infertility does not reinforce this value<sup>202</sup>. The stigma attached to it is great. Some couples believe that divorce would be more socially acceptable than infertility. Others think that their worth to society is lessened by their inability to produce children. Childless couples may feel that being infertile jeopardizes their individual sexual identities. Because fertility and virility become intertwined for the infertile, a man who is unable to father a natural child may feel that others question his masculinity. For many women, having children is central to their identity. Society has been structured so that from the time they are very young, women think of themselves as-and others expect them to be-mothers. A woman's family and friends may be unfairly critical when this does not happen and sometimes imply that her identity as a woman is incomplete. She is different; she does not fit it<sup>202</sup>.

### **Loss of Self-Esteem (or Pride in Oneself).**

This is a common challenge among couples going through the problem of infertility as they tend to lose their self-esteem.

Other consequences of Infertility Related Stress are;

- Divorce/ Separation
- Violence
- Social Stigma
- Emotional Stress
- Depression
- Anxiety etc.

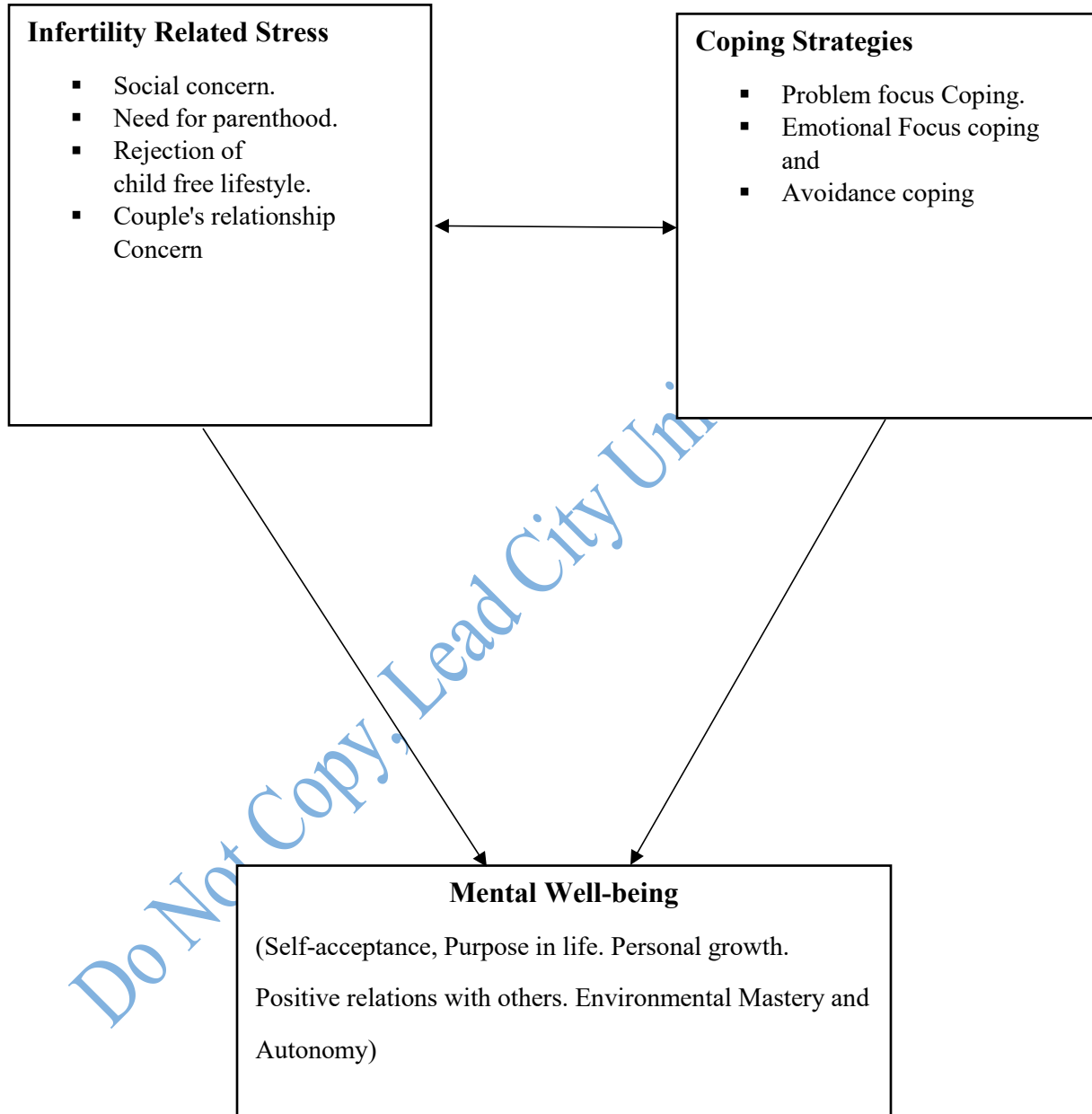
### **2.3.6. Prevalence and predictors of infertility-specific stress in individuals diagnosed with primary infertility.**

According to the existing literature on infertility, stress appears to be inevitably associated with infertility diagnosis and treatment in sub-fertile individuals. The epidemiological data on the prevalence and predictors of infertility-specific stress in cultural specific scenarios are scarce. The objective of the present study was to estimate the prevalence of infertility-specific stress and identify predictors of infertility-specific stress in women diagnosed with primary infertility<sup>246</sup>.

The prevalence of stress among women was 80%. Univariate analysis revealed that predictors of stress were years of marital life, duration of infertility, infertility type, history of gynecological surgery, cycles of ovulation induction with timed intercourse and intra-uterine inseminations, present and past psychiatric morbidity, coping difficulties, gynecological diagnosis, and severity

of premenstrual dysphoria. Multivariate analysis showed leading associations of stress with infertility type and coping difficulties<sup>202</sup>.

## 2.4 Conceptual Framework



**Figure 1.1** Showing diagrammatical representation of relationship between the dependent variable (Mental Wellbeing) and independent variables (Infertility Related Stress and Coping Strategies)

## **2.5 Summary Of The Literature Review**

The literature was reviewed from at least five perspectives comprising of the study of infertility-related-stress, coping strategies adopted by the infertile males and females. Also, empirical studies of previous research work on infertility were reviewed which was found to have concentrated on the female gender over the years until recently. The concepts of infertility and its risk-factors were also explained in the literature. The concept of infertility-related-stress and coping strategies as predictors of the mental well-being of the infertile couples can be structured thus: The dependent variable according to this study is the mental well-being of the infertile males and females; the identified independent variables are infertility related stress and the coping strategies

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## Endnotes

O.O. Oyewunmi & Y.O. Ayannike: *Mental health and the Nigerian workplace: Fallacies, facts and the way forward*. International Journal of Psychology and Counselling, 7(7): 2015.106-111

2. H. Bill: Six Dimensions of Well-being (Wellness). Health & Wellness, Nursing, Reference, <https://libguides.tcu.edu/WellnessGuide>. Jul 12, 2023

3. A. Danjuma, A. Ibrahim, A. Emmanuel, O. Sunday & I. Lateefah, *Occurrence, pattern, and effects of nonconventional use of substances among youth in North-Central, Nigeria*. World Journal of Preventive Medicine, 4(1):2016.12-19.

4. American Psychiatric Association: *Diagnostic and statistical Manual of Mental Disorders- Fifth Edition DSM-5*.2013.p. 20

5. A. Rogers & D. Pilgrim, *A sociology of mental health and illness*.4th edition. Maidenhead: Open University Press.2010.

6. E.L. Barrett, M. Teesson & K.L. Mills, *Associations between substance use, post-traumatic stress disorder and the perpetration of violence: a longitudinal investigation*. Addictive Behaviour.39,2014.1075–80.

7. A.S Jegede, *The Yoruba cultural construction of health and illness*. Nordic Journal of African Studies, 11 (3):2010.322-335
8. Community Translational Science Team (CTST). *Policy Report: Building A Public Health Model for Promoting Emotional Well-Being*. Los Angeles: University of California, Los Angeles; 2016.
9. Y. Chida & A. Steptoe, *Positive psychological well-being and mortality: A quantitative review of prospective observational studies*. Psychosomatic Medicine. 2008;70(7):741-756.
10. R. Cohen, C. Bavishi & A. Rozanski, *Purpose in life and its relationship to all-cause mortality and cardiovascular events: A meta-analysis*. Psychosomatic Medicine. 2016;78(2):122- 133.
11. O.A. Michael: *Determinants of Substance Abuse among Users with Mental Health Issues in Ogun State, Nigeria*. Doctoral Study Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Public Health. Walden University. May 2021
12. O. Gureje, V.O. Lasebikan, L. Kola & V.A. Makanjuola, *Lifetime and 12-month prevalence of mental disorders in the Nigerian Survey of Mental Health and Well-Being*. The British Journal of Psychiatry. 188 (5): 465-471. Retrieved from <https://www.cambridge.org/core/journals/the-britishjournal-of-psychiatry/article/lifetime->

and-12month-prevalence-of-mental-disorders-in-the-nigeriansurvey-of-mental-health-and-wellbeing/399785FE6103511ADBA2C3276E406CD3

13. J. Abdulmalik, L. Kola & O. Gureje, *Mental health system governance in Nigeria: challenges, opportunities and strategies for improvement*. *Global Mental Health*, 3(9).2016, March. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5314752/>

14. A.Y. Armiyau, *A Review of Stigma and Mental Illness in N. Journal of Clinical Case Reports*, 5(1).2015. Retrieved from [https://www.researchgate.net/publication/277934187\\_A\\_Review\\_of\\_Stigma\\_and\\_Mental\\_Illness\\_in\\_Nigeria](https://www.researchgate.net/publication/277934187_A_Review_of_Stigma_and_Mental_Illness_in_Nigeria)

15. O. Gureje & V.O. Lasebikan, L. Kola & V.A. Makanjuola, *Lifetime and 12-month prevalence of mental disorders in the Nigerian Survey of Mental Health and Well-Being*. *The British Journal of Psychiatry*. 188 (5):2018.465-471. Retrieved from <https://www.cambridge.org/core/journals/the-britishjournal-of-psychiatry/article/lifetime-and-12month-prevalence-of-mental-disorders-in-the-nigeriansurvey-of-mental-health-and-wellbeing/399785FE6103511ADBA2C3276E406CD3>

16. Joy, Inc. & NOI Polls. *60 million Nigerians are at risk of depression – new national depression report*. Joy, Inc.2018.

17. A. Leithead, *The city that won't stop growing: How can Lagos cope with its spiralling population?* Retrieved from BBC News: <https://www.bbc.co.uk/news/resources/ids-sh/lagos>. 2017, August 21.
18. T. McDonnell, *Slum Dwellers In Africa's Biggest Megacity Are Now Living In Canoes*. NPR. Retrieved from <https://www.npr.org/sections/goatsandsoda/2017/05/15/528461093/slum-dwellers-inafricas-biggest-megacity-are-now-living-in-canoes.2017>.
19. A.I. Okpani & S. Abimbola, *Operationalizing universal health coverage in Nigeria through social health insurance*. Nigerian Medical Journal, 56(5), 2015. 305-310. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4698843/>
20. C. Onyemelukwe, *Stigma and Mental Health in Nigeria: Some Suggestions for Law*. Journal of Law, Policy and Globalization, 55, 2016. 63-68. Retrieved from <https://www.iiste.org/Journals/index.php/JLPG/article/viewFile/34236/35208>
21. OPHI Country Briefing: Nigeria. Oxford: *Oxford Poverty and Human Development Initiative* (OPHI). 2016. Retrieved from <https://assets.documentcloud.org/documents/3719246/NGA.pdf>
22. M. Page, *A New Taxonomy for Corruption in Nigeria*. Carnegie Endowment for International Peace. 2018. Retrieved from

<https://carnegieendowment.org/2018/07/17/new-taxonomy-for-corruption-in-nigeria-pub-76811>

23. J. McLeish & M. Redshaw: *Mothers' accounts of the impact on emotional wellbeing of organised peer support in pregnancy and early parenthood: a qualitative study*. BMC Pregnancy Childbirth. 2017 Jan 13;17(1):28. doi: 10.1186/s12884-017-1220-0. PMID: 28086827; PMCID: PMC5237175.

24. Department for Education. *Positive for Youth: A New Approach to Cross-Government Policy for Young People Aged 13 to 19*. London: HMSO, 2010.

25. K. Stark, N. Daulat & S. King, *A vision for teachers' emotional well-being*. Phi Delta Kappan, 103(5),2022.24–30. <https://doi.org/10.1177/00317217221079975>

26. M.S. Kamarul, P. Jaharudin, A.T. Jasmi & M. Farah: *The Psychological Well-Being from the University Students' Perspective And Culture*. PJAEE, 17(9).2020.

27. Husted, S. Hilary, *"The Relationship Between Psychological Well-Being and Successfully Transitioning to University"* (2017). Undergraduate Honors Theses. 54. [https://ir.lib.uwo.ca/psychK\\_uht/54](https://ir.lib.uwo.ca/psychK_uht/54)

28. World Health Organisation (2020). *Maternal Mental Health*. [https://www.who.int/mental\\_health/maternal-child/maternal\\_mental\\_health/en/](https://www.who.int/mental_health/maternal-child/maternal_mental_health/en/)

29. David A. Nissan, Laretta A. Ziajko, Amanda C. Ries, Landon L. Van Dell: All's Not Quiet on the Western Front? The Stigma against Mental Health Treatment for World Leaders. *Creative Education* Vol.14 No.6, June 14, 2023
30. I.H. Ishaq, B. Sefa: *Mental Health, Religion and Suicide*. *Open Journal of Medical Psychology* Vol.11 No.1, January 5, 2022
31. J. Gao & R. Mclellan, *Using Ryff's Scales of Psychological Well-Being in Adolescents in Mainland China*. *BMC Psychology*, 6(1),2018.1-8
32. P. Gartoulla, R.J. Bell, R. Worsley & S.R. Davis, *Moderate-Severely Bothersome Vasomotor Symptoms Are Associated with Lowered Psychological General Wellbeing in Women at Midlife*. *Maturitas*, 81(4),2015.487-492.
33. E. Stamp, L. Crust, C. Swann, J. Perry, P. Clough & D. Marchant, *Relationships between Mental Toughness and Psychological Wellbeing in Undergraduate Students*. *Personality and Individual Differences*, 75,2015.170-174
34. F.A. Huppert, *Psychological Well-Being: Evidence Regarding its Causes and Consequences*. *Applied Psychology: Health and Well-Being*, 1(2),2009.137-164.
35. E. Barrett, S. Sussman, C. Smith, L.A. Roribach & D. Sparijt-Metz, *Motivational Interviewing for Adolescent Substance Use: A review of literature*, *Addictive Behavior*,

37,2012.

1325-

1334.<http://www.drugsandalcohol.ie/20350/1/AThesis%202013%20Final%20Copy%20%202405201.pdf>

36. Armiyau, A. Y. (2015). A Review of Stigma and Mental Illness in N. *Journal of Clinical Case Reports*, 5(1). Retrieved from [https://www.researchgate.net/publication/277934187\\_A\\_Review\\_of\\_Stigma\\_and\\_Mental\\_Illness\\_in\\_Nigeria](https://www.researchgate.net/publication/277934187_A_Review_of_Stigma_and_Mental_Illness_in_Nigeria)

37. K.A. Schonert-Reichl, E. Oberle, M.S. Lawlor: *Enhancing cognitive and social-emotional development through a simple-to-administer mindfulness-based school program for elementary school children: A randomized controlled trial*. *Developmental Psychology*. 2015;51(1):52-66. <http://dx.doi.org/10.1037/a0038454>

38. American Academy of Pediatrics. Promoting children's mental health (2018). Retrieved from: <https://www.aap.org/en-us/advocacy-and-policy/federaladvocacy/Pages/mentalhealth.aspx>

39. Council Report CR1 12. The Mental Health of Students in Higher Education. London: Royal College of Psychiatrists.2003.

40. R.D. Taylor, E. Oberle, J.A. Durlak, & R.P. Weissberg, *Promoting positive youth development through school-based social and emotional learning interventions: A meta-*

*analysis of follow-up effects.* Child Development, 88(4),2017.1156-1171.  
doi:10.1111/cdev.12864

41. L. Dusenbury & R.P. Weissberg, *Social-emotional learning in elementary school: Preparation for success.* The Education Digest, 83(1),2017.36-43.

42. C. Hannah: *Perceptions of the Well-Being and Sport Performance Relationship.* A thesis submitted in partial fulfilment of the requirements of Liverpool John Moores University for the degree of. Doctor of Philosophy. January 2019

43. K. Feng, L. Altinay, H. Olya, *Social well-being and transformative service research: evidence from China,* Journal of Services Marketing.2019. Doi: 10.1108/JSM-10-2018-0294.

44. L. Hafskjold, A.J. Sundler, I.K. Holmström, V. Sundling S. vanDulmen & H. Eide, *"A cross-sectional study on person-centred communication in the care of older people: the COMHOME study protocol",* BMJ open, Vol 5 No.4.2015: e007864, doi: 10.1136/bmjopen-2015-007864

45. C. Doyle, L. Lennox & D. Bell, *"A systematic review of evidence on the links between patient experience and clinical safety and effectiveness",* BMJ open, Vol 3 No.1,2013,pp. 1-18.

46. F. Kong, & S. Hu, S. Xue, Y. Song & J. Liu, "*Extraversion mediates the relationship between structural variations in the dorsolateral prefrontal cortex and social well-being*", *Neuroimage*, Vol 105,2015,pp. 269-275.
47. S. Coulthard, D. Johnson & J.A. McGregor, "*Poverty, sustainability and human wellbeing: a social wellbeing approach to the global fisheries crisis*", *Global Environmental Change*, Vol 21 No.2,2011,pp. 453-463.
48. D.L Gerritsen, N. Steverink, D.H. Frijters, M.E. Ooms & M.W. Ribbe, "*Social well-being and its measurement in the nursing home, the SWON-scale*", *Journal of Clinical Nursing*, Vol 19 No.9-10,2010,pp. 1243-1251.
49. L.T. Zayer, C.C. Otnes & E.M. Fischer, "*The nature and implications of consumers' experiential framings of failure in high-risk service contexts*", *Journal of Service Research*, Vol 18 No.3,2015,pp. 303-317.
50. M. Mende, & D.J. Van, "*Coproduction of transformative services as a pathway to improved consumer well-being: findings from a longitudinal study on financial counseling*", *Journal of Service Research*, Vol 18 No.3,2015. pp. 351-368.
51. T. Yao, Q. Zheng & X. Fan, "*The impact of online social support on patients' quality of life and the moderating role of social exclusion*", *Journal of Service Research*, Vol 18 No.3,2015,pp. 369-383.

52. C.P. Blocker & A. Barrios, "*The transformative value of a service experience*", Journal of Service Research, Vol 18 No.3,2015,pp. 265-283.
53. S. Fournier & L. Lee, "*Getting brand communities right*", Harvard business review, Vol 87 No. 4,2009,pp. 105-111.
54. M. Hepi, J. Foote, J. Finsterwalder, S. Carswell & V. Baker, "*An integrative transformative service framework to improve engagement in a social service ecosystem: the case of He Waka Tapu*", Journal of Services Marketing, Vol 31 No.4/5,2017,pp. 423-437
55. R.E. Page, *Stories and social media: Identities and interaction*, Routledge, Abingdon-on-Thames, United Kingdom,2013.
56. S. Anderson, L. Nasr & S.W. Rayburn, "*Transformative service research and service design: synergistic effects in healthcare*", The Service Industries Journal, Vol. 38 Nos1-2,2018,pp.99-113.
57. D. Njine & B. Soroka, "*Good quality interaction between the registered nurse and the patient: a systematic review*", available at: [https://www.theseus.fi/bitstream/handle/100024/120381/Njine\\_Doreen.pdf?sequence=1&isAllowed=y2016](https://www.theseus.fi/bitstream/handle/100024/120381/Njine_Doreen.pdf?sequence=1&isAllowed=y2016),.

58. S.M. Burke, A.V. Carron, M.A. Eys, N. Ntoumanis & P.A. Estabrooks, “*Group versus individual approach? A meta-analysis of the effectiveness of interventions to promote physical activity*”, *Sport and Exercise Psychology Review*, Vol 2 No.1,2006,pp. 19- 35.
59. J. White, “*Volunteers go the extra mile to prevent patient loneliness*”,available at: <http://www.healthcarebusinessstech.com/volunteers-hospital-patient/>.2016
60. World Health Organization report on global population (WHO, 2020)
61. T.M Plant & A.J. Zeleznik, *Physiology of Reproduction*. In S. Franks, K. Hardy, & G. S. Conway (Eds.), *Knobil and Neill’s Physiology of Reproduction (Fourth Edi,2015*.pp. 1363–1394). Elsevier. <https://doi.org/10.1016/B978-0-12-397175-3.00029-6>
62. American Society for Reproductive Medicine: *Definitions of infertility and recurrent pregnancy loss: a committee opinion. Fertility and Sterility*, 99(1),2013.63. <https://doi.org/10.1016/j.fertnstert.2012.09.023>
63. N. Kumar & A.K. Singh, *Trends of Male Factor Infertility, an Important Cause of Infertility: A Review of Literature*. *Journal of Human Reproductive Sciences*, 8,2015.191-196. <https://doi.org/10.4103/0974-1208.170370>

64. F. Lotti & M. Maggi: *Ultrasound of the male genital tract in relation to male reproductive health*. Hum Reprod Update. 2015 Jan-Feb;21(1):56-83. doi: 10.1093/humupd/dmu042. Epub 2014 Jul 19. PMID: 25038770.
65. A.Y. Odisho, A.K. Nangia, P.P. Katz & J.F. Smith; *Temporal and geospatial trends in male factor infertility with assisted reproductive technology in the United States from 1999-2010*. Fertil Steril. 2014 Aug;102(2):469-75. doi: 10.1016/j.fertnstert.2014.05.006. Epub 2014 Jun 12. PMID: 24931206.
66. M.J. Rovito, T.F. Gordon, S.B. Bass, J. DuCette, A.M. Tierney & N. Coles: *Developing the "Control Identity" Typology to Create More Effective Testicular Health Promotional Messaging*. American Journal of Men's Health. 2018;12(3):546-555. doi:10.1177/1557988315621143
67. K. Gassei & K.E. Orwig: *Experimental methods to preserve male fertility and treat male factor infertility*. Fertil Steril. 2016 Feb;105(2):256-66. doi: 10.1016/j.fertnstert.2015.12.020. Epub 2015 Dec 30. PMID: 26746133; PMCID: PMC4744139.
68. J.R. Zolton, P.G. Lindner, N. Terry, AH. DeCherney & M. J.Hill. *Gonadotropins versus oral ovarian stimulation agents for unexplained infertility: a systematic review and meta-analysis*. Fertil Steril. 2020 Feb;113(2):417-425.e1.

69. M. Milczarek, A. Kucharska & A. Borowiec: *Difficulties in diagnostics of polycystic ovary syndrome in adolescents - a preliminary study*. *Pediatr Endocrinol Diabetes Metab*. 2019;25(3):122-126.
70. ACOG Committee Opinion No. 738: *Aromatase Inhibitors in Gynecologic Practice*. *Obstet Gynecol*. 2018 Jun;131(6):1
71. M. Jain & M. Singh: *Assisted Reproductive Technology (ART) Techniques*. [Updated 2022 Nov 28]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK576409/>
72. A. Sakr, F. Brégeon, J.L Mège, J.M. Rolain & O. Blin: *Staphylococcus aureus Nasal Colonization: An Update on Mechanisms, Epidemiology, Risk Factors, and Subsequent Infections*. *Front Microbiol*. 2018 Oct 8;9:2419. doi: 10.3389/fmicb.2018.02419. PMID: 30349525; PMCID: PMC6186810.
73. A. Ghaheeri, A. Rasekhi, R.S. Omani & E. Hajizadeh: *Modeling In Vitro Fertilization Data Considering Multiple Outcomes Observed among Iranian Infertile Women*. *Int J Fertil Steril*. 2018 Apr;12(1):27-30. doi: 10.22074/ijfs.2018.5187. Epub 2018 Jan 7. PMID: 29334203; PMCID: PMC5767928.
74. M. Ramalingam, P. Durgadevi & T. Mahmood: *In vitro fertilization*. *Obstetrics, Gynaecology and Reproductive Medicine*. 2016;26(7):200–209.

75. 30th International Congress of the Obstetrical & Gynaecological Society of Malaysia (OGSM 2023): 20-23 July 2023 Setia SPICE Convention Centre, Penang, Malaysia. July 2023. Volume: 78 .Supplement: 1

76. A. Daniilidis, M. Nisolle, P. Papandreou, S. Gordts, H. Krentel & G. Pados: *A European survey on treatment of hydrosalpinges in infertile women on behalf of the European Society for Gynaecological Endoscopy (ESGE) Special Interest Group (SIG) on Reproductive Surgery*. Facts Views Vis Obgyn. 2020 Oct 8;12(3):241-244. PMID: 33123698; PMCID: PMC7580267.

77. E. Saridogan, C. Becker & A. Feki: *Recommendations for the Surgical Treatment of Endometriosis. Part 1: Ovarian Endometrioma Working group of ESGE, ESHRE and WES*. Hum Reprod Open. 2017:1–6.

78. A. Daniilidis, D. Balaouras & D. Chitzios: *Hydrosalpinx: tubal surgery or in vitro fertilisation? An everlasting dilemma nowadays; anarrative review*. J Obstet Gynaecol. 2017;37:550–556.

79. A.K. Gebeh & M. Metwally: *Surgical management of tubal disease and infertility*. Obstet Gynaecol Reprod Med. 2017;27:346–351.

80. D.S. Shekhawat, *Hybrid Cloud computing in E-Governance: Related Security Risks and Solutions*. Research Journal of Information Technology,4,2012.1-4.

81. B. Ramalingam, T. Parandhaman & S.K. Das: *Antibacterial Effects of Biosynthesized Silver Nanoparticles on Surface Ultrastructure and Nanomechanical Properties of Gram-Negative Bacteria viz. Escherichia coli and Pseudomonas aeruginosa*. ACS Appl Mater Interfaces. 2016 Feb;8(7):4963-76. doi: 10.1021/acsami.6b00161. Epub 2016 Feb 12. PMID: 26829373.

82. M. Jain & M. Singh: *Assisted Reproductive Technology (ART) Techniques*. [Updated 2022 Nov 28]. In: StatPearls [Internet]. Treasure Island (FL):StatPearls Publishing;2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK576409/>

83. P.R. Brezina, R. Anchan & W.G. Kearns: *Preimplantation genetic testing for aneuploidy: what technology should you use and what are the differences?* J Assist Reprod Genet. 2016 Jul;33(7):823-32.

84. M. Nagórska, A. Bartosiewicz, B. Obrzut & D. Darmochwał-Kolarz; *Gender Differences in the Experience of Infertility Concerning Polish Couples: Preliminary Research*. Int J Environ Res Public Health. 2019 Jul 2;16(13):2337. doi: 10.3390/ijerph16132337. PMID: 31269703; PMCID: PMC6651646.

85. H. Demirci & S. Sen: *Sexual experiences of infertile women: A qualitative study*. Niger J Clin Pract 2023;26:229-33.
86. ART Practice in Lagos State Regulations and Guidelines. Health Facility Monitoring and Accreditation Agency 2019.
87. N.I. Okafor, N.N. Joe-Ikechebelu & J.I. Ikechebelu: *Perceptions of Infertility and In Vitro Fertilization Treatment among Married Couples in Anambra State, Nigeria*. African Journal of Reproductive Health 2017; 21(4):55-66.
88. P.P. Okonta, R. Ajayi, K. Bamgbopa, R. Ogbeche, C.C. Okeke & K. Onwuzurigbo: *Ethical Issues in the Practice of Assisted Reproductive Technologies in Nigeria: Empirical Data from Fertility Practitioners*. African Journal of Reproductive Health 2018; 22(3): 51-58.
89. El Kissi, Y. Romdhane, A. B. Hidar, S. Bannour, S. Ayoubi Idrissi, K. Khairi, & H.B. Ben , *General psychopathology, anxiety, depression and self-esteem in couples undergoing infertility treatment: a comparative study between men and women*. European Journal of Obstetrics & Gynecology and Reproductive Biology,167, 2013.185-189

90. M.M. Casilla-Lennon, S. Meltzer-Brody & A.Z. Steiner, *The effect of antidepressants on fertility*. American Journal of Obstetrics and Gynecology, 2016.215,314.e1-314.e5
91. L.A. Pasch & K.T. Sullivan: *Stress and coping in couples facing infertility*. Curr Opin Psychol. 2017 Feb;13:131-135. doi: 10.1016/j.copsyc.2016.07.004. Epub 2016 Jul 25. PMID: 28813283.
92. A. Zaidouni, O. Fatima, B. Amal, A. Siham, H. Houyam, K. Jalal & B. Rachid: *Predictors of Infertility Stress among Couples Diagnosed in a Public Center for Assisted Reproductive Technology*. J Hum Reprod Sci. 2018 Oct-Dec;11(4):376-383. doi: 10.4103/jhrs.JHRS\_93\_18. PMID: 30787524; PMCID: PMC6333041.
93. A. Galhardo, M. Cunha & J. Pinto-Gouveia, *Psychological aspects in couples with infertility*. Sexologies,20, 2011.224-228
94. M. Awtani, K. Mathur, S. Shah & M. Banker: *Infertility stress in couples undergoing intrauterine insemination and in vitro fertilization treatments*. J Hum Reprod Sci. 2017;10:221–5.
95. A.G. Huppelschoten, N.T.L. Van Duijnhoven, P.F.J. VanBommel, J.A.M. Kremer & W.L.D.M. Nelen, *Do infertile women and their partners have equal experiences with*

*fertility care?* Fertility and Sterility, 99(3),2013.832–838.  
<https://doi.org/10.1016/j.fertnstert.2012.10.049>

96. J.H.Choi, S.H. Lee, J.H. Bae, J.S. Shim, H.S. Park & Y.S. Kim, *Effect of sleep deprivation on the male reproductive system in rats*. J Korean Med Sci. 2016;31:1624–30.

97. M. Bokaie, M. Simbar, S.M.Y. Ardekani & H.A. Majd, *Women's beliefs about infertility and sexual behaviors: A qualitative study*. Iranian journal of nursing and midwifery research,21,2016.379-384

98. A.B. Ashley & L.G. Jennifer, *The relationship between psychological coping and mood across the menstrual cycle among distressed women struggling to conceive*, Journal of Psychosomatic Research, Volume 145, 2021, 110465, ISSN 0022-3999, <https://doi.org/10.1016/j.jpsychores.2021.110465>.

(<https://www.sciencedirect.com/science/article/pii/S0022399921001100>)

99. BHP Lau, AYM Chow, DFK Wong, JSM Chan, CHY Chan, RTH Ho, TH So, TC Lam, VHF Lee & AWM Lee; *Study protocol of a randomized controlled trial comparing integrative body-mind-spirit intervention and cognitive behavioural therapy in fostering quality of life of patients with lung Cancer and their family caregivers*. J Evid Inf Soc Work 2018;15:258–276.

100. XW Ji, CHY Chan, BHP Lau, JSM Chan, CLW Chan & KF. Chung: *The interrelationship between sleep and depression: a secondary analysis of a randomized controlled trial on integrative mind-body-spirit intervention*. Sleep Med 2017;2:41–46.
101. A.D. Domar, J. Gross, K. Rooney & J. Boivin; *Exploratory randomized trial on the effect of a brief psychological intervention on emotions, quality of life, discontinuation, and pregnancy rates in in vitro fertilization patients*. Fertil Steril 2015;104:440–451.
102. CHY. Chan, THY. Chan & CLW. Chan: *Translating Daoist concepts into integrative social work practice: an empowerment program for persons with depressive symptoms*. J Relig Spiritual Soc Work. 2014a;33:61–72.
103. D. Durairajanayagam: *Lifestyle causes of male infertility*. Arab J Urol. 2018;16:10–20.
104. IFFS Surveillance: *Global Reproductive Health 2016*; 1: e1.  
<http://dx.doi.org/10.1097/GRH.0000000000000001>
105. N.I. Okafor, N.N, Joe-Ikechebelu, J.I. Ikechebelu: *Perceptions of Infertility and In Vitro Fertilization Treatment among Married Couples in Anambra State, Nigeria*. African Journal of Reproductive Health 2017; 21(4):55-66.

106. I.V. Ezeome, S.O. Akintola, A.S. Jegede: *Experiences of female clients in the assisted reproductive technology process in Nigeria*. *Afri Health Sci.* 2023;23(2):659-69. <https://dx.doi.org/10.4314/ahs.v23i2.76>

107. Z. Mustapha: *The practice of Assisted Human Reproduction Technologies (Arts) in Nigeria: the unanswered legal and ethical questions*. *Journal of Law and Judicial System* 2018; 1(1):40–50.

108. C. Farquhar, J. Marjoribanks: *Assisted reproductive technology. An overview of Cochrane Reviews*. *Cochrane Database Systematic Review* 2018; 8:1–108.

109. KT. Bamgbopa, PI. Okonta, R. Ajayi, R. Ogbeche, C. Igbokwe & K. Onwuzurigbo: *Public perceptions on ethics in the practice of assisted reproductive technologies in Nigeria*. *Global Reproductive Health* 2018; 3: e13

110. IA. Nwosu & F. Onwe: *The Plight of Infertile Women in Nigeria*. *Journal of Policy and Development Studies* 2015; 9 (3): 39-46.

111. IV. Ezeome, S.O Akintola, A.S. Jegede & E.R, Ezeome: *Perception of Key Ethical Issues in Assisted Reproductive Technology (ART) by Providers and Clients in Nigeria*. *International Journal of Women's Health* 2021;13: 1033–1052.

112. U.A. Ojedokun & E.N. Atoi: *Baby Factory Syndicates: An Emerging Child Adoption Racket in Nigeria*. African Journal of Psychological Study in Social Issues 2016; 19 (1): 47-59.
113. A. Khalid & S. Dawood: *Social support, self-efficacy, cognitive coping and psychological distress in infertile women*. Arch Gynecol Obstet. 2020 Aug;302(2):423-430. doi: 10.1007/s00404-020-05614-2. Epub 2020 May 26. PMID: 32458132.
114. B. Wiweko, U. Anggraheni, E. S. Detri & L.H. Putri: *Distribution of stress level among infertility patients*. Middle East Fertil Soc J. 2017;22:145–8. DOI:10.1016/j.mefs.2017.01.005.
115. B. H. Luk & A.Y. Loke: *The impact of infertility on the psychological well-being, marital relationships, sexual relationships, and quality of life of couples: A systematic review*. J Sex Marital Ther. 2015;41:610–25.
116. Y. Benyamini, M. Gozlan, & A. Weissman: *Normalization as a Strategy for Maintaining Quality of Life While Coping with Infertility in a Pronatalist Culture*. Int J Behav Med. 2017 Dec;24(6):871-879. doi: 10.1007/s12529-017-9656-1. PMID: 28620775.
117. T. O'Rourke, C. Vogel, D. John, R. Pryss, J. Schobel, F. Haug, J. Haug, C. Pieh, U.M. Nater, A.C. Feneberg, M. Reichert & T. Probst: *The Impact of Coping Styles and Gender*

*on Situational Coping: An Ecological Momentary Assessment Study With the mHealth Application TrackYourStress.* Front Psychol. 2022 Jun 20;13:913125. doi: 10.3389/fpsyg.2022.913125. PMID: 35795429; PMCID: PMC9252427.

118. K. Witkiewitz., C. Roos., D. Tofighi & HML. Van: *Broad coping repertoire mediates the effect of the combined behavioral intervention on alcohol outcomes in the COMBINE study: an application of latent class mediation.* J. Stud. Alcohol Drugs 79,2018.199–207. doi: 10.15288/jsad.2018.79.199

119. M. Volz, M.C. Voelkle, &K. Werheid, *General self-efficacy as a driving factor of post-stroke depression: a longitudinal study.* Neuropsychol. Rehabil. 29,2019.1426–1438. doi: 10.1080/09602011.2017.1418392

120. J. Webber, S. Skodda, T. Muth, P. Angerer & A. Loerbroks, *Stressors and resources related to academic studies and improvements suggested by medical students: a qualitative study.* BMC Med. Educ. 19:312.2019.doi: 10.1186/s12909-019-1747-z

121. C.M. Vizoso & O. Arias, *Estresores académicos percibidos por estudiantes universitarios y su relación con el burnout y el rendimiento académicos [Academic stressors perceived by university students and their relationship with academic burnout, efficacy and performance].* Anu. Psicol. 46,2016.90–97. doi: 10.1016/j.anpsic.2016.07.006

122. A.W.Y. Tran & M.N. Lumley, *Internalized stigma and student well-being: the role of adaptive and maladaptive coping*. Soc. Work Ment. Health 17,2019.408–425. doi: 10.1080/15332985.2018.1563023
123. L. Dehelean, I. Papava, M.I. Musat, M. Bondrescu, F. Bratosin, B.O. Bucatos, A.C. Bortun, D.V. Mager, R.S. Romosan & A.M. Romosan: *Coping Strategies and Stress Related Disorders in Patients with COVID-19*. Brain Sci. 2021;**11**:1287. doi: 10.3390/brainsci11101287.
124. K. Stanisławski: *The Coping Circumplex Model: An Integrative Model of the Structure of Coping With Stress*. Front. Psychol. 2019;**10**:694. doi: 10.3389/fpsyg.2019.00694.
125. J.F. Oliveira, A.M.N. Oliveira, E.L.D. Barlem & L.G. Lourenção: *The vulnerability of the family: Reflections about human condition*. Revista Brasileira de Enfermagem. 2021;**74**:e20190412. doi: 10.1590/0034-7167-2019-0412.
126. O.Y. Durgun & M. Duman, *"Effect of infertility causes related to gender differences on Women's distress levels among patients utilizing a Turkish university hospital"*, Journal of Health Research, Vol. 34:2020, No. 5, pp. 399-407. <https://doi.org/10.1108/JHR-07-2019-0149>

127. A. Sharma & D. Shrivastava: *Psychological Problems Related to Infertility*. Cureus. 2022 Oct 15;14(10):e30320. doi: 10.7759/cureus.30320. PMID: 36407201; PMCID: PMC9661871.

128. F. Yazdani, F. Elyasi, Peyvandi *Counseling-supportive interventions to decrease infertile women's perceived stress: A systematic review*. Electron Physician. 2017;9:4694–4702.

129. G. Simionescu, B. Doroftei, Maftai, *The complex relationship between infertility and psychological distress (Review)* Exp Ther Med. 2021;21:306.

130. Iordăchescu, A. Diana, I.P. Corina, E.B. Alina, G.A. Corina, P. Gheorghe, V. Alina Veduță & G. Nicolae. *"Anxiety, Difficulties, and Coping of Infertile Women"* Healthcare 9, no. 4: 2021.466. <https://doi.org/10.3390/healthcare9040466>

131. M.C. Zurlo, M.F. Cattaneo & F. Vallone, *Re-examining the role of coping strategies in the associations between infertility-related stress dimensions and state-anxiety: Implications for clinical interventions with infertile couples*. Front. Psychol. 2020, 11, 614887.

132. C. Massarotti, G. Gentile, C. Ferreccio, P. Scaruffi, V. Remorgida & P. Anserini, *Impact of infertility and infertility treatments on quality of life and levels of anxiety and*

*depression in women undergoing min vitro fertilization. Gynecol. Endocrinol. 2019, 35, 485–489.*

133. Y. Benyamini, M. Gozlan & A. Weissman, *Normalization as a strategy for maintaining quality of life while coping with infertility in a pronatalist culture. Int. J. Behav. Med. 2017, 24, 871–879*

134. S. Angelika, H. Kornélia, Z. János, Ilona, D. Éva, F. Zsuzsanna, D. Gergely & Beatrix Rafael: *Adaptive coping strategies in male infertility, paramedical counselling as a way of support, Journal of Reproductive and Infant Psychology, DOI: 10.1080/02646838.2020.1724918*

135. M. Oti-Boadi & K.O. Asante, *Psychological health and religious coping of Ghanaian women with infertility. BioPsychoSocial Med 2017; 11: 20.*

136. A. Namdar, M.M. Naghizadeh, M. Zamani, F. Yaghmaei & M.H. Sameni: *Quality of life and general health of infertile women. Health Qual Life Outcomes 2017; 15(1):139.*

137. G. Simionescu, B. Doroftei, R. Maftai, B.E. Obreja, E. Anton, D. Grab, C. Ilea & C. Anton: *The complex relationship between infertility and psychological distress (Review). Exp Ther Med. 2021 Apr;21(4):306. doi: 10.3892/etm.2021.9737. Epub 2021 Feb 1. PMID: 33717249; PMCID: PMC7885086.*

138. S. Dumbala, H. Bhargav, V. Satyanarayana, R. Arasappa, S. Varambally, G. Desai & G.N. Bangalore; *Effect of yoga on psychological distress among women receiving treatment for infertility*. Int J Yoga. 2020;13:115–119. doi: 10.4103/ijoy.IJOY\_34\_19.
139. O.A. Zahra, R. Soheila, B. Tahereh, A. Marzieh & Y. Atefeh: *The effectiveness of counseling with a cognitive-behavioral approach on infertile women's stress*. Maedica (Bucur) 2019;14:363–370. doi: 10.26574/maedica.2019.14.4.363.
140. M.L. Silveira, K.A. Ertel, N. Dole & L. Chasan-Taber: *The role of body image in prenatal and postpartum depression: A critical review of the literature*. Arch Womens Ment Health. 2015;18:409–421. doi: 10.1007/s00737-015-0525-0.
141. C. Solheim, S. Zaid & J. Ballard, *Ambiguous loss experienced by transnational Mexican immigrant families*. *Family Process*, 55(2),2016.338-353. doi:10.1111/famp.12130
142. M. Sawicka, *Searching for a narrative of loss: Interactional ordering of ambiguous grief*. *Symbolic Interaction*, 40(2),2017.229-246. doi:10.1002/symb.270
143. J. Verkuijden, C. Verhaak, W.L. Nelen, J. Wilkinson & C. Farquhar; *Psychological and educational interventions for subfertile men and women*. *Cochrane Database Syst Rev*. 2016 Mar 31;3(3):CD011034. doi: 10.1002/14651858.CD011034.pub2. PMID: 27031818; PMCID: PMC7104661.

144. M. Dustkin, *Crisis Theory: Types of Theories*.2016. Downloaded from: [www.angel.com/ns/southeasternnurse](http://www.angel.com/ns/southeasternnurse). Retrieved on: 4/7/2019

145. H. Mellisa, *Family System Theory and Changes overtime*.2017. Downloaded from: [www.human growth and development psychology courses](http://www.human growth and development psychology courses). Retrieved on: 26/10/2019.

146. B. Micheal: *Network Theory of Wellbeing*. The Baltic International Yearbook of Cognition, Logic and Communication.2017.

147. Chen TH, Chang SP, Tsai CF, Juang KD. (2004) Prevalence of depressive and anxiety disorders in an assisted reproductive technique clinic. *Hum Reprod*. 2004;19(10):2313-2318

148. Volgsten H, Skoog Svanberg A, Ekselius L, Lundkvist O, SundströmPoromaa I. Prevalence of psychiatric disorders in infertile women and men undergoing in vitro fertilization treatment. *Hum Reprod*

149. Sejbaek CS, Hageman I, Pinborg A, Hougaard CO, Schmidt L. Incidence of depression and influence of depression on the number of treatment cycles and births in a national cohort of 42 880 women treated with ART. *Hum Reprod*. 2013;28(4):1100-1109

150. Holley SR, Pasch LA, Bleil ME, Gregorich S, Katz PK, Adler NE. Prevalence and predictors of major depressive disorder for fertility treatment patients and their partners. *FertilSteril*. 2015;103(5):1332-1339
151. Pasch LA, Holley SR, Bleil ME, Shehab D, Katz PP, Adler NE. Addressing the needs of fertility treatment patients and their partners: are they informed of and do they receive mental health services? *FertilSteril*. 2016;106(1):209-215.e2.
152. Akatos E, Szigeti JF, Ujma PP, Sexty R, Balog P. Anxiety and depression among infertile women: a cross-sectional survey from Hungary. *BMC Womens Health*. 2017;17(1):48.
153. Shani C, Yelena S, Reut BK, Adrian S, Sami H. Suicidal risk among infertile women undergoing in-vitro fertilization: Incidence and risk factors. *Psychiatry Res*. 2016;240:53-59.
154. De Berardis D, Mazza M, Marini S, et al. Psychopathology, emotional aspects and psychological counselling in infertility: a review. *Clin Ter*. 2014;165(3):163-169
155. Maroufizadeh S, Karimi E, Vesali S, Omani Samani R. Anxiety and depression after failure of assisted reproductive treatment among patients experiencing infertility. *Int J GynaecolObstet*2015;130:253–256.

156. Crawford NM, Hoff HS, Mersereau JE. Infertile women who screen positive for depression are less likely to initiate fertility treatments. *Hum Reprod.* 2017;32(3):582-587
157. Gameiro S, Boivin J, Peronace L, Verhaak CM. Why do patients discontinue treatment? A systematic review of reasons and predictors of discontinuation in fertility treatment. *Hum Re*
158. Rich CW, Domar AD. Addressing the emotional barriers to access to reproductive care. *FertilSteril.* 2016;105(5):1124-1127
159. Klonoff-Cohen H, Chu E, Natarajan L, Sieber W. A prospective study of stress among women undergoing in vitro fertilization or gamete intrafallopian transfer. *FertilSteril.* 2001;76(4):675
160. Xu H, Ouyang N, Li R, Tuo P, Mai M, Wang W. The effects of anxiety and depression on in vitro fertilization outcomes of Chinese women. *Psychol Health Med.* 2017;22:37-43.
161. Boivin J, Griffiths E, Venetis CA. Emotional distress in infertile women and failure of assisted reproductive technologies: meta-analysis of prospective psychosocial studies.
162. Pasch LA, Gregorich SE, Katz PK, et al. Psychological distress and in vitro fertilization outcome. *FertilSteril.* 2012;98(2):459-464

163. Lynch CD, Sundaram R, Buck Louis GM, Lum KJ, Pyper C. Are increased levels of self-reported psychosocial stress, anxiety, and depression associated with fecundity? *FertilSteril*. 2012;98(2):453-458.
164. Massey AJ, Campbell BK, Raine-Fenning N, Pincott-Allen C, Perry J, Vedhara K. Relationship between hair and salivary cortisol and pregnancy in women undergoing IVF. *Psychoneuroendocrinology*. 2016;74:397-405
165. Rooney KL, Domar AD. The impact of stress on fertility treatment. *Curr Opin Obstet Gynecol*. 2016;28(3):198-201.
166. Moller A, Fallstrom K. Psychological factors in the etiology of infertility: a longitudinal study. *J Psychosom Obstet Gynecol*. 1991;12(1):13–21.
167. 5. Valentin DP. Psychological impact of infertility: identifying issues and needs. *Soc Work Health Care*. 1986;11(4):61–69.
168. Sudha Reddy KSN, Reddy KN, Reddy BKC. Emotional distress in infertile couples: a cross-cultural study. *Asia Pac J Soc Scien*. 2011;3(1):90–101.

169. Taheri Z, Hassanzadeh R, Ghanbarpour F, Taheri M. The effect of integrated couple therapy and group therapy with cognitive-behavioral approach on increasing sexual selfconcept and accelerating fertility. *Int J FertilSteril*. 2012;6(Suppl 1):Onm-9.

170. Ghaemi Z, Forouhari S. Psychosocial aspect of infertility. *Int J FertilSteril*. 2010;4(Suppl 1):Onm-7.

171. Ashkani, H., Akbari, A. & Heydari, S., T. 2006: Epidemiology of Depression among Infertile and Fertile Couples in Shiraz, Southern Iran. *Journal of Medical Science*: 60. (10) 399-406.

172. Greil, A. (1997). Infertility and psychological distress: A critical review of the literature. *Social Science & Medicine*, 45(11), 1679-1704

173. Daniluk, J. C. 2001. Reconstructing their lives: A longitudinal, qualitative analysis of the transition to biological childlessness for infertile couples. *Journal of Development*, 79, 439-449.

174. S.O. Akande, I.O. Dipeolu, Attitude and Willingness of Infertile Persons Towards the Uptake of Assisted Reproductive Technologies in Ibadan, Nigeria. Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria

175. Wischmann, T., & Thorn, P. (2013). (Male) infertility: what does it mean to men? New evidence from quantitative and qualitative studies. *Reproductive BioMedicine Online*, 27(3), 236-43. Retrieved from [http://www.rbmojournal.com/article/S1472-6483\(13\)00346-5/fulltext](http://www.rbmojournal.com/article/S1472-6483(13)00346-5/fulltext)
176. Greil, A. (1997). Infertility and psychological distress: A critical review of the literature. *Social Science & Medicine*, 45(11), 1679-1704.
177. Barratt, C. L. R., & Cooke, I. D. (1993). *Donor insemination*. Cambridge: Cambridge University Press
178. Davis D, Dearman E. Coping strategies of nontraditional female students in Southwest Michigan and Northern Indian. *Educ Psychol* 2017;5
179. Lazarus RS, Folkman S, Lazarus RS. Manual for the Ways of Coping Questionnaire. Research Edition, Palo Alto, C.A: Consulting Psychologists Press Inc.; 1988. p. 18-2
180. Lazarus RS, Folkman S, Lazarus RS. Manual for the Ways of Coping Questionnaire. Research Edition, Palo Alto, C.A: Consulting Psychologists Press Inc.; 1988. p. 18-25.

181. The UC Davis Obstetrics and Gynecology Department in Collaboration with California IVF Fertility Center in Sacramento. Reproductive Endocrinology and infertility. UC Davis Health; 2018. p. 3-7.
182. Folkman S, Lazarus RS. Appraisal and Coping. 2nd ed. New York: Springer; 1988. p. 23-36.
183. Buhawe J. Coping strategies in Lucena. Healthcare 2015;20:255-60.
184. World Health Organization Regional Office for Europe. Physical activity strategy for the WHO European Region 2016-2025. Geneva
185. AbdulAzizAflakseir and MasomuehZarei, Association between Coping Strategies and Infertility Stress Among a Group of Women with Infertility Problem, 2013
186. Fisher, J. R. W., &Hammarberg, K. (2012). Psychological and social aspects of infertility in men: an overview of the evidence and implications for psychologically informed clinical care and future research. Asian Journal of Andrology, 14(1), 121–129.
187. Owerri Ibebuike Julia E1\*, Ekechukwu Edith Ugoch (2021) Infertility: Age, And Gender Differences among Infertile Couples Attending Fertility Clinic in Federal Medical Centre, 1Department of Nursing Science, Imo State University, Local Government Area, 460108, Owerri, Nigeria 2 Imo State College of Nursing and

Midwifery Orlu, Owerri - Orlu Rd, Amakohia-Akwakuma 460116, Owerri, Nigeria;  
Saudi Journal of Nursing and Health Care

188. Brazier, Y. (2018). Infertility in Men and Women. Retrieved from:  
<https://www.medicalnewstoday.com/articles/165748.php>.

189. Uadia, P. O., & Emokpae, A. M. (2015). Male infertility in Nigeria: A neglected reproductive health issue requiring attention. *Journal of Basic and Clinical Reproductive Sciences*, 4(2), 45-53.

190. Pains, A. A., & Sununu, T. Y. (2014). The profile of infertility in a teaching hospital in north west Nigeria. Retrieved from: [www.smjonline.org/artile.asp?issn=1118-8561;year=2014;volume=IT;Issue=1;spage=7;epage=11&last=part](http://www.smjonline.org/artile.asp?issn=1118-8561;year=2014;volume=IT;Issue=1;spage=7;epage=11&last=part)

191. Tabong, P. T. N., & Adongo, P. B. (2013). Understanding the social meaning of infertility and childbearing: a qualitative study of the perception of childbearing and childlessness in Northern Ghana. *PloS one*, 8(1), e54429

192. Gannon K, Glover L, Abel P. Masculinity, Stigma and media reports. *Soc Sci Med*. 2004; 59:1169-1175.

Wischmann, T., & Thorn, P. (2013). (Male) infertility: what does it mean to men? New evidence from quantitative and qualitative studies. *Reproductive BioMedicine Online*,

27(3), 236-43. Retrieved from [http://www.rbmojournal.com/article/S1472-6483\(13\)00346-5/fulltext](http://www.rbmojournal.com/article/S1472-6483(13)00346-5/fulltext)

193. Greil, A. (1997). Infertility and psychological distress: A critical review of the literature. *Social Science & Medicine*, 45(11), 1679-1704.

194. Beutel, M., Kupfer, J. P., Kirchmeyer, S., Kehde, F. M., Köhn, I., Schroeder-Printzen, H., Gips, H., Herrero, & H.J., Weidner, W. (1999) Treatment-related stresses and depression in couples undergoing assisted reproductive treatment by IVF or ICSI. *Andrologia*, 31 (1), 27–35

195. Glover, L., Gannon, K., & Abel, P. D. (1999). Eighteen-month follow-up of male subfertility clinic attenders: a comparison between men whose partner subsequently became pregnant and those with continuing subfertility. *Journal of Reproductive and Infant Psychology*, 17(1), 83-87.

196. Saleh, R. A., Ranga, G. M., Raina, R., Nelson, D. R., & Agarwal, A. (2003). Sexual dysfunction in men undergoing infertility evaluation: a cohort observational study. *Fertility and Sterility*, 79(4), 909-912

197. Webb, R. E., & Daniluk, J. C. (1999). The end of the line: infertile men's experience of being unable to produce a child. *Men and Masculinities*, 2(1), 6-25.

198. R. Sharma, KR. Biedenharn, J.M. Fedor & A. Agarwal: *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. PMID: 23870423; PMCID: PMC3717046.
199. A. Agarwal, F. Deepinder, M. Cocuzza, R.A. Short & D.P .Evenson: *Effect of vaginal lubricants on sperm motility and chromatin integrity: a prospective comparative study*. *Fertil Steril*. 2008;**89**:375–379. doi: 10.1016/j.fertnstert.2007.02.050.
200. R. Klemetti, J. Raitanen, S. Sihvo, S. Saarni & P. Koponen: *Infertility, mental disorders and well-being: A nationwide survey*. *Acta Obstet Gyn Scan*. 2010;89:677–682. doi: 10.3109/00016341003623746.
201. A. Patel, P.S. Sharma, P. Narayan, V.S. Binu, N. Dinesh & P.J. Pai: *Prevalence and predictors of infertility-specific stress in women diagnosed with primary infertility: A clinic-based study*. *J Hum Reprod Sci*. 2016 Jan-Mar;9(1):28-34. doi: 10.4103/0974-1208.178630. PMID: 27110075; PMCID: PMC4817284.

## **Chapter Three**

### **Methodology**

This chapter explained the research design, the framework in which this study was carried out, a detailed description of the target participants, as well as the sampling techniques that were used to select the participants. It also encapsulated the instrument needed to sample the participants' opinions on the study's variables, the procedures guiding the data collection, and the specific statistical analysis that was used for data analysis.

#### **3.1 Research Design**

This study adopted a cross sectional research design because of its capacity and usefulness in collecting standardized data from moderately large cohorts. This survey research method worked by selecting samples from the population of study to reveal the relative distribution and relationship between the variables and to subsequently infer a larger population. The standardized data provided the information used in answering the research questions needed to properly examine the infertility-related-stress and coping strategies as predictors of mental well-being among infertile males and females in Ibadan. The primary source of data was the use of a questionnaire as it is known to be one of the most practical methods of data collection to elicit reliable information from the respondents. As such, a five-point set of Likert scale structured questionnaires was constructed and administered to provide answers to the research questions. Information from literature was also used as a secondary source to aid variables formulation and comparisons in the questionnaires constructed.

### 3.2 Population of the Study

The study population were males and females adults who were trying to achieve pregnancy after 12 months of regular and unprotected sexual intercourse without the use of any form of birth control method. The research was conducted in Ibadan, Oyo state, South west Nigeria. The respondents were mostly residents of Ibadan who were predominantly Yorubas. Eligibility criteria involved males and females that engaged in having regular, unprotected sexual intercourse without the use of any birth control method in the last one year trying to achieve pregnancy and had been diagnosed to have infertility. Four [4] hospitals were purposively selected to carry out this research; Two [2] Oyo State government hospitals in Ibadan which were Adeoyo Maternity Teaching Hospital, Yemetu, Ibadan and St. Peters State General Hospital, Aremo Ibadan for females participants as records on infertility register showed that many females with infertility issues make use of these facilities and Two [2] Private Hospitals in Ibadan which were Careforte Medical Centre Airport Ibadan and Oni- Wumi Hospital Abayomi, Iwo Road Ibadan for males participants because they are highly utilized by males with infertility related problems. Therefore, this study focused on individuals with fertility-related health issues who visited the gynaecological clinic of the facility in a year amounting to estimated population of one thousand nine hundred and eighty (1,980) for all the four hospitals.

**TABLE 1.1 Showing distribution of the population study after visitation to each hospital by the researcher**

| S/N | HOSPITAL   | POPULATION SIZE IN A YEAR |
|-----|--|---------------------------|
| 1.  | ADEOYO MATERNITY TEACHING HOSPITAL<br>YEMETU ADEOYO IBADAN | 720                       |
| 2.  | ST PETERS STATE GENERAL HOSPITAL<br>AREMO IBADAN           | 840                       |
| 3.  | CAREFORTE MEDICAL CENTER AIRPORT<br>IBADAN                 | 180                       |
| 4.  | ONI-WUMI HOSPITAL ABAYOMI IWO ROAD                         | 240                       |
|     | <b>TOTAL</b>   | <b>1980</b>               |

### 3.3 Sample And Sampling Techniques

Probability sampling method was used for it reduces bias and produces results that best represent a general population. Due to the nature of the target population, simple random techniques was employed in the study. The gynaecological clinic for females at Adeoyo Maternity Teaching Hospital and St. Peters State General Hospital was every Tuesday and Thursday where Mondays and Wednesdays for registrations and booking for new patients while Infertility clinic for males was every Wednesday at Care Forte Medical Centre and every Saturday at Oni Wumi Hospital using other days for booking and registration for new patients .

Using simple random sampling we adopted a balloting method where names of all patients at each clinic day were arranged alphabetically and numbered serially. Selection of papers were made to cover every patient present in the clinic. Numbers were later written on the pieces of paper to cover the numbers needed for the study on each clinic day. Each selected number was included in the sample. By this technique, all members of interest had equal probabilities and chances of being selected.

The register of those outpatients reporting to the gynaecological clinic was used as the sampling frame, and a total of three hundred and thirty three (333) respondents were selected from the four hospitals using Taro and Yamani 1967 formula for determining accurate sample size from relatively large population through quota sampling. The sample size for each hospital was derived from percentage of each hospital population size to the total population size of the four hospitals. Simple random sampling was considered by random selection of infertile males and females who were seeking infertility treatment from selected infertility clinics and hospitals particularly on gynecological clinic days.

$$n = \frac{N}{1 + N(e)^2}$$

n = sample size

N = population size

e = margin error (0.05) i.e 5%

$$n = \frac{1980}{1 + 1980(0.05)^2}$$

$$n = \frac{1980}{1 + 1980(0.0025)}$$

$$n = \frac{1980}{1 + 4.95}$$

n=1980/5.95

n= 332.7 Approximately 333

**Table 1.2 Showing sample size as % percentage size after determination of total sample size from Taro Yamani**

| S/N | HOSPITAL   | POPULATION<br>SIZE IN YEAR | SAMPLE SIZE |
|-----|--|----------------------------|-------------|
| 1.  | ADEOYO MATERNITY<br>TEACHING HOSPITAL<br>YEMETU IBADAN | 720                        | 121         |
| 2.  | ST PETERS STATE<br>GENERAL HOSPITAL<br>AREMO IBADAN    | 840                        | 141         |
| 3.  | CAREFORTE MEDICAL<br>CENTER AIRPORT<br>IBADAN          | 180                        | 30          |
| 4.  | ONI-WUMI HOSPITAL<br>ABAYOMI IWO ROAD<br>IBADAN        | 240                        | 41          |
|     | <b>TOTAL</b>   | <b>1980</b>                | <b>333</b>  |

Each sample size of the selected hospitals was considered purposively as a percentage of population after determination of the total population from Taro Yamani, therefore, One Hundred and Twenty One (121) from Adeoyo Maternity Teaching Hospital, One Hundred and Forty One [141] from St Peters State General Hospital Aremo , Thirty [30] from Careforte Medical Centre Airport Ibadan and Forty One [41] from Oni-Wumi Hospital Abayomi Iwo Road Ibadan .

### **3.4 Description of Instrument**

A structured questionnaire was used in data collection in the study. The questionnaire booklets was made of sections namely: Section A, B, C and D. Section A: measured the socio-demographic variables of the participants. Section B Measured Infertility Related Stress.

Section C: Measured Coping strategies . Section D: measured Mental Well-Being . The questions B and D respect 5 Likert scale response while Section C respects 4 likert scale response .

#### **Section A: Socio-Demographic Variables**

This section measured the demographic characteristics of the participants which involves; Gender (male or female), Marital status (Single, Married, Divorce, Widowed/Widower), Number of children (None,1, 2,3), Religion: Christianity, Islam, Traditional Others), Highest academic qualification (No formal education, Primary education ,Secondary education, Tertiary education), Actual age , Ethnicity [ Yoruba , Igbo , Hausa , Others ] .

## **Section B: Infertility–Related Stress Scale**

This section measured infertility-related-stress which is defined as the emotional pressure suffered by an affected individual due to the issue of childlessness. This was measured by infertility related stress inventory (IRS); it was developed by Zurlo et al., 2017 , it was measured with 27-item predicated in 5 response options which involved; Strongly Disagreed was coded as 1, Disagreed as 2 , Undecided as 3 , Agreed as 4 and Strongly Agreed as 5 . The scale was in four (4) dimensions which include; Social Concern ( $\alpha=0.88$ ) 4, 8, 13, 16, 19, 21, 22, 25, 26, 27, Need For Parenthood ( $\alpha= 0.78$ ), 1, 2, 3, 15, 18, 24, Rejection Of Childfree Lifestyle ( $\alpha=0.70$ ), 5, 11, 12, 14, 17, 23, and Couple’s Relationship Concern ( $\alpha= 0.70$ ) 6, 7, 9, 10, 20. The item in the scale had been given equal weight but the reverse items include; 11, 13, 14, 17, 23. Higher score mean higher level of stress.

## **Section C: Brief Coping Scale (BCS)**

This section measured infertility coping strategy which can be explained as means devised by the affected individual in managing the psychological and social experience that emanates from infertility. It was developed by Dias et al., 2012 .

This study coping strategy scale were in three (3) dimensions which included; Problem focus with the items ; (2, 7, 10, 12, 14, 17, 23, 25), Emotional focus (5, 9, 13, 15, 18, 20, 21, 22, 24, 26, 27, 28) and Avoidance coping (1, 3, 4, 6, 8, 11, 16, 19) with alpha ( $\alpha$ ) value of approximately 0.75. it was measured with 28-item in 4 response options which involves; I have not been doing this at all coded as 1, A little bit as 2 , A medium amount as 3, I have been doing this a lot as 4. The reverse items include 13, & 16. Higher score mean higher ability to cope otherwise, lower score. The internal consistency level of the items was confirmed to be 0.72 .

## **Section D: Warwick Mental Well Being Scale [MWBS]**

This is a state of being free from emotional, psychological and social challenges. The variables were measured by Warwick Mental Well Being scale through the dimensions of self-acceptance, purpose in life, personal growth, positive relations with others, environmental mastery and autonomy. It was developed by Warwick-Edinburg in 2006 . This involved 12 item scale with six reverse items which were item 2, 4, 6, 9, 10, 12 . The MWBS involved five (5)-point scale anchored by : None of the time was coded as 1, Rarely as 2, Some of the time as 3 , Often as 4, and All of the time as 5 . The validity and consistency coefficient is 0.73 and 0.85 respectively.

### **3.5 Validity of Research Instruments**

Validity can be viewed as the extent to which an instrument can be verified to do what it purports to do accurately. It is the soundness and effectiveness of a measuring tool. Content validity was used in checking the questionnaire, which involved the examination of content to determine whether it covered a representative sample of the behavioural domains to be measured. Further, the items or factors within variables were compared to other research factors, covering the parameters in question, to ensure that there was consistency.

Validation was also done by dividing the instrument into several sections. Each section was carefully checked to ensure that it conveyed the necessary message and attracted the relevant feedback, to achieve specific themes of the research objectives and hypotheses.

### **3.6 Reliability of the Research Instruments**

Reliability is the extent to which a research instrument can be relied upon to obtain accurately, what is needed from the research<sup>1</sup>. The reliability of the instruments (questionnaire) was

measured using Cronbach's Alpha correlation coefficient, which resulted to 0.744. Each questionnaire was checked in the field for completeness.

### **3.7 Method of Data Collection**

The study employed a cross-sectional survey method in obtaining its primary data from the respondents. Regarding this, a well-structured questionnaire was administered to the respondents for the data collection process. For female participants out of 50 to 60 that come to the clinic on each clinic day, about 25 - 30 respondents were interviewed for 6 weeks. For males participants out of 20 to 25 that appear at the clinic about 10 to 15 were interviewed for 4 weeks. The researcher was assisted by four well-trained research assistants. They were essentially trained on the subject of this research, how to objectively retrieve the instruments and general communication skills so that no aspect of the instrument would be left blank. The research assistants also offered the respondents guidance when needed. In cases of illiterate respondents, the research assistants extracted the information from the patients in form of interviews<sup>1</sup>.

### **3.8 Method of Data Analysis**

The quantitative data was collected for this research. The utilization of a well-structured questionnaire made it possible to attach numeric values to each variable. All the data that were obtained from these respondents were analyzed using descriptive and inferential statistical procedures with the aid of statistical package for social sciences (SPSS 20). Simple percentages, frequencies and basic visualizations were employed in analyzing the socio-demographic variables. In answering the research questions and testing the hypotheses, Pearson-moment

correlation was employed. All hypotheses were tested at 0.05 level of significance. The above statistical tools were employed to capture robust descriptive and inferential statistic properties<sup>2</sup>.

### **3.9 Ethical Considerations**

The ethical consent was obtained from the Ministry of Health, Oyo State Hospitals Management Board Oyo State , Ibadan. This approval covered for both Government and Private Hospitals included in the study. The universal ethical principles were observed which were: respect for persons as individual must be treated as autonomous people and people with diminished autonomy must be protected . Also, we protected every participant from all forms of harms by increasing the benefits and reduce the risks/harms . Furthermore we maintained justice by being fair and impartial. In addition, an informed consent was obtained from each participant after explaining the objectives of the study, nature of questions and what was expected of them as responses. Assurance of confidentiality of their private informations as well as their voluntariness of their participation was also guaranteed.

### Endnotes

1. A. Pyae, Calculation of TWO-WAY ANOVA and ONE-WAY ANOVA- Statistics and Scientific Programming. ResearchGate, <https://www.reseachgate.net/publication/333951232>. DOI 1013140/RG.2.235083.75041, 2019.
2. Kothari, C. (2014). Research Methodology: Methods and Techniques (2nd ed.), New age International Publisher, New Delhi, India.

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## Chapter Four

### Results and Discussion of Findings

#### 4.1: Demographic characteristics of the respondents

Infertility-related-stress and Coping Strategies as Predictors of Mental Well-being among Infertile Males and Females in Ibadan Oyo State South West Nigeria using the aid of questionnaire

The total number of participants in this study were 333 , 262 females (78.7%) and 71 males (21.3%) with age range between 21-60 years . 110 [33%] of the participants were between 21-30 years , 138 [ 41.4% ] were 31-40years , 72 [ 21.6% ] were 41-50years and 13 [ 3.9%] were 51-60years. 80 [24%] had primary education , 167 [50.2%) had secondary education and 83 [ 24.9%] had tertiary education. There were 121 [36.3%] respondents from Adeoyo Maternity Teaching Hospital Yemetu Ibadan, 141 [ 42.3%] from St Peters State General Hospital, Aremo, 30 [9.1%] from Careforte Medical centre Airport Ibadan and 41 [ 12.3%] from Oni-Wumi Hospital Iwo Road Ibadan. 190 [57.1%] of respondents had the duration of infertility for 12-60 months, 117[35.1%] 61-120months, 20 [6.0%] 121-180months and 6 [1.8%] respondents had 181-240 months. 315 (94.6%) of the respondents were of the Yoruba ethnic group, 2[0.6%] were Hausa and 14[4.2%] were Ibo. 200 (60%) of the respondent answered “in myself only” as the cause of their infertility, 6[1.8%] in partner only and 124 [37.2%] .219(65.8%) of the respondents were of the Islamic faith and 114 (36.4%) were of the Christian faith.

95[28.5%] answered YES to failure of previous treatment and 238[71.5%] said NO. 150 [45%] were suffering from primary infertility and 183[55%] from secondary infertility. 228[68.5%] had

been attending infertility clinic between 1-12 months and 105 [ 31.5%] between 13-24months. Among the 262 females that were interviewed, 114[43.5%] had the specific cause to be irregular menstruation, 67[20.1%] had Uterine fibroids, 60[22.9%] had Hormonal Imbalance, 20 [7.6%] had small uterus and 1 [0.3%] had unexplained cause. In the males, out of 71 respondents, 13[18.3%] had no sperm count, 20[28.2%] had low sperm count, 20[28.2%] had premature ejaculation and 18[25.3%] had unexplained causes.

**Table 4.1.1 Demographic Profile of Respondents by Gender and Age**

| Demographic Profile | No  | %    |
|---------------------|-----|------|
| Sex(N=333)          |     |      |
| Male                | 71  | 21.3 |
| Female              | 262 | 78.7 |
| Age(N=333)          |     |      |
| 21-30 Years         | 110 | 33.0 |
| 31-40 Years         | 138 | 41.4 |
| 41-50 Years         | 72  | 21.6 |
| 51-60 Years         | 13  | 3.9  |

**Table 4.1.2 Demographic Profile of Respondents by Highest academic qualification and****Duration of infertility**

| <b>Demographic Profile (N=333)</b>    | <b>No</b> | <b>%</b> |
|---------------------------------------|-----------|----------|
| <b>Highest academic qualification</b> |           |          |
| No formal education                   | 0         | 0        |
| Primary education                     | 80        | 24.0     |
| Secondary education                   | 167       | 50.2     |
| Tertiary education                    | 83        | 24.9     |
| Missing                               | 3         | 0.9      |
| <b>Hospital</b>                       |           |          |
| Adeoyo Maternity Teaching             | 121       | 36.3     |
| Hospital Yemetu                       |           |          |
| St Peters State General Hospital      | 141       | 42.3     |
| Areemo                                |           |          |
| Careforte Medical Center Airport      | 30        | 9.1      |
| Oni-Wumi Hospital Abayomi Iwo         | 41        | 12.3     |
| Road                                  |           |          |
| <b>Duration of infertility</b>        |           |          |
| 12-60 Months                          | 190       | 57.1     |
| 61-120 months                         | 117       | 35.1     |
| 121-180 months                        | 20        | 6.0      |
| 181-240 months                        | 6         | 1.8      |

**Table 4.1.3 Demographic Profile of Respondents by Ethnicity, Causes of infertility and Religion**

| <b>Demographic Profile (N=333)</b> | <b>No</b> | <b>%</b> |
|------------------------------------|-----------|----------|
| <b>Ethnicity</b>                   |           |          |
| Yoruba                             | 315       | 94.6     |
| Hausa                              | 2         | 0.6      |
| Igbo                               | 14        | 4.2      |
| Others                             | 2         | 0.6      |
| <b>Causes of infertility</b>       |           |          |
| In myself only                     | 200       | 60.0     |
| Partner                            | 6         | 1.8      |
| Both                               | 124       | 37.2     |
| Invalid                            | 3         | 0.9      |
| <b>Religion</b>                    |           |          |
| Christianity                       | 114       | 36.4     |
| Islam                              | 219       | 65.8     |
| Traditional                        | 0         | 0.0      |
| Others                             | 0         | 0.0      |

**Table 4.1.4 Demographic Profile of Respondents by Failure of previous treatment, Types of infertility, months for attending infertility clinic**

| <b>Demographic Profile (N=333)</b>                                | <b>No</b> | <b>%</b> |
|---|-----------|----------|
| <b>Failure of previous treatment</b>                              |           |          |
| Yes   | 95        | 28.5     |
| No  | 238       | 71.5     |
| <b>Types of infertility</b>                                       |           |          |
| Primary   | 150       | 45.0     |
| Secondary   | 183       | 55.0     |
| <b>How many months have you been attending infertility clinic</b> |           |          |
| 1-12months  | 228       | 68.5     |
| 13-24months   | 105       | 31.5     |
| <b>Female specific causes: F= 262</b>                             |           |          |
| Irregular menstruation  | 114       | 43.5%    |
| Uterine fibroid   | 67        | 25.6%    |
| Hormonal imbalance  | 60        | 22.9%    |
| Small uterus  | 20        | 7.6%     |
| Unexplained   | 1         | 0.3%     |
| <b>Male specific causes: M= 71</b>                                |           |          |

|                       |    |       |
|-----------------------|----|-------|
| No sperm count        | 13 | 18.3% |
| Low sperm count       | 20 | 28.2% |
| Premature ejaculation | 20 | 28.2% |
| Unexplained           | 18 | 25.3% |

#### 4.2 Prevalence of infertility related stress

Assessment of infertility related stress among the respondent, the following responses were elicited from the respondents. 70.2% of the respondents reported “strongly agreed” “that For me, being a parent is a more important goal then having a satisfying career”. When asked on whether their marriage needs a child/another child 71.7% strongly agreed. On the question “A future without a child/another child would frighten me” 76.9% “strongly agreed”.

When asked whether They feel like they have failed at sex 71.2% of the respondent said “strongly agreed”. When asked whether Family get-togethers are especially difficult for them 62.4% said strongly agreed.

60.0% of the respondent said strongly agreed, Talk about our fertility problem, lead to an argument. 61.9% reported strongly agreed’ I have often felt that I was born to be a parent. 62.5% reported As long as I can remember, I’ve wanted to be a parent.

When ask I find it hard to spend time with friends who have young children 68.5% of the respondents said ‘Strongly agreed’. I feel like friends or family are leaving myself and partner 71.2% said Strongly agreed.

When I see families with children, I feel left out, 64.6% said Strongly agreed’.

The overall Infertility related stress categorization of the respondents shows that 68.6% had high level IRS.

### 4.3 Infertility Coping Skills among respondent

71.2% of the respondents strongly agreed that “I've been turning to work or other activities to take my mind off things my infertility”.

71.7% of the respondents strongly agreed with the statement that I've been saying to myself "the current situation of my life isn't real".

62.5% strongly agreed that I've been getting emotional support from others for my situation.

More than one-third (48.1%) strongly agreed' with the statement that I've been giving up trying to deal with the infertility. Few (37.1%) agreed that I've been making fun of the situation.

48.1% strongly agreed with the statement I've been learning to live with it.

The overall coping skills of the respondent showed that Majority (76.9%) had been concentrating my their efforts on doing something about the situation I'm in. 35.1% had avoidance coping 33.6% had problem focus and 31.2% had emotional focus as their coping mechanism.

**Table 4.1.6 Relationship between infertility related stress and mental wellbeing of the respondents**

| Demographic variables               | Poor Mental wellbeing | Good Mental wellbeing | Total      |
|-------------------------------------|-----------------------|-----------------------|------------|
| Low infertility related stress      | 15(8.2)               | 35(23.5)              | 50(15.0)   |
| Moderate Infertility related stress | 27(14.7)              | 27(18.1)              | 54(16.2)   |
| High Infertility related stress     | 142(77.2)             | 87(58.4)              | 229(68.8)  |
| Total                               | 184(100.0)            | 149(100.0)            | 333(100.0) |

## 4.2 TEST OF HYPOTHESIS

**Hypothesis One:** Gender differences will significantly affect mental well-being among the infertile males and females was analysed with t-test of independent sample. The result is presented in Table 4.2.1

**Table 4.2.1: Summary of t-test for independent sample showing the difference between female and male on mental well-being**

| Sex    | N   | $\bar{x}$ | SD   | Df  | t     | P    |
|--------|-----|-----------|------|-----|-------|------|
| Male   | 76  | 38.75     | 6.57 | 322 | -.220 | >.05 |
| Female | 248 | 38.94     | 6.74 |     |       |      |

The results in Table 4.2.1 shows that there is no significant difference between male ( $\bar{x} = 38.75$ , SD = 6.57) and female ( $\bar{x} = 38.94$ , SD = 6.74) on mental well-being ( $t(322) = -.220$ ,  $p > 0.05$ ).

**Hypothesis Two:** There will be a positive significant impact of coping strategies on mental well-being among the infertile males and females with multiple regression analysis was used to test the hypothesis. The result is presented in Table 4.2.2.

**Table 4.2.2: Summary of Multiple Regression table showing coping strategies on mental well-being among the infertile males and females**

| Variables | B     | T      | P     | R    | R <sup>2</sup> | F      | P     |
|-----------|-------|--------|-------|------|----------------|--------|-------|
| Problems  | -.113 | -1.627 | > .05 | .301 | .091           | 10.457 | < .01 |
| Emotional | .216  | 2.619  | < .05 |      |                |        |       |

|           |      |       |       |
|-----------|------|-------|-------|
| Avoidance | .167 | 2.491 | > .05 |
|-----------|------|-------|-------|

From Table 4.2.2, the result indicates that, there is significant joint impact of problem focused, emotional focused, and avoidance coping strategies on mental well-being among the infertile males and females,  $R^2 = .091$ ,  $F(3,315) = 10.457$ ,  $p < .01$ . Also, 9.1 percentage variance observed in mental well-being is accounted for by problem focused, emotional focused, and avoidance coping strategies. From the same table emotional focused ( $\beta = .216$ ,  $p < .05$ ) and avoidance ( $\beta = .167$ ,  $p < .05$ ) independently predicted mental well-being. However, problem focused ( $\beta = -.113$ ,  $p > .05$ ) does not independently predict mental well-being among the infertile males and females. The hypothesis is confirmed.

**Hypothesis Three:** There will be a significant influence of infertility-related stress on mental well-being among the infertile males and females, multiple regression analysis was used to test the hypothesis. The result is presented in Table 4.2.3.

**Table 4.2.3: Summary of Multiple Regression table showing infertility-related stress on mental well-being among the infertile males and females**

| Variables                        | B     | T      | P     | R    | R <sup>2</sup> | F      | P     |
|----------------------------------|-------|--------|-------|------|----------------|--------|-------|
| Social concern                   | -.361 | -5.326 | < .01 | .621 | .386           | 49.340 | < .01 |
| Need for parenthood              | -.043 | -.841  | > .05 |      |                |        |       |
| Rejection of childfree lifestyle | .370  | 7.276  | < .01 |      |                |        |       |
| Couple's relationship concern    | -.025 | -.357  | > .05 |      |                |        |       |

From Table 4.2.3, the result indicates that, there is significant joint influence of infertility-related stress (social concern, need for parenthood, rejection of childfree lifestyle, and couple's relationship concern) on mental well-being among the infertile males and females,  $R^2 = .386$ ,  $F(4, 314) = 49.34$ ,  $p < .01$ . Also, 38.6 percentage variance observed in mental well-being is accounted for by infertility-related stress. From the same table social concern ( $\beta = -.361$ ,  $p < .01$ ) and rejection of childfree lifestyle ( $\beta = -.370$ ,  $p < .01$ ) independently influenced mental well-being. However, need for parenthood ( $\beta = -.043$ ,  $p > .05$ ) and couple's relationship concern ( $\beta = -.025$ ,  $p > .05$ ) are not independently predicted mental well-being among the infertile males and females. The hypothesis is confirmed.

**Hypothesis Four:** Infertility-related-stress, coping strategies will jointly and independently influence mental well-being among the infertile males and females, hierarchical multiple regression analysis was used to test the hypothesis. The result is presented in Table 4.2.4.

**Table 4.2.4: Summary of Multiple Regression table showing influence of infertility-related stress and coping strategies on mental well-being among the infertile males and females**

| Variables                        | $\beta$ | T      | P     | R    | $R^2$ | F      | P     |
|----------------------------------|---------|--------|-------|------|-------|--------|-------|
| Social concern                   | -.318   | -4.445 | < .01 |      |       |        |       |
| Need for parenthood              | -.044   | -.858  | > .05 |      |       |        |       |
| Rejection of childfree lifestyle | -.355   | -6.819 | < .01 |      |       |        |       |
| Couple's relationship concern    | .032    | .445   | > .05 | .650 | .423  | 31.591 | < .01 |
| Problems                         | -.047   | -.740  | > .05 |      |       |        |       |
| Emotional                        | .173    | 2.514  | < .05 |      |       |        |       |
| Avoidance                        | .057    | .954   | > .05 |      |       |        |       |

From Table 4.2.4, the result indicates that, there is significant joint influence of infertility-related stress (social concern, need for parenthood, rejection of childfree lifestyle, and couple's relationship concern) and coping strategies on mental well-being among the infertile males and females,  $R^2 = .423$ ,  $F(7, 302) = 31.59$ ,  $p < .01$ . Also, 42 percentage variances observed in mental well-being is accounted for by infertility-related stress and coping strategies. From the same table social concern ( $\beta = -.318$ ,  $p < .01$ ), rejection of childfree lifestyle ( $\beta = -.355$ ,  $p < .01$ ), and emotional coping strategy ( $\beta = .173$ ,  $p < .03$ ) independently influenced mental well-being. However, need for parenthood ( $\beta = -.044$ ,  $p > .05$ ), couple's relationship concern ( $\beta = .032$ ,  $p > .05$ ), problem focused strategy ( $\beta = -.047$ ,  $p > .05$ ), and avoidance coping strategy ( $\beta = .057$ ,  $p > .05$ ) are not independently influence mental well-being among the infertile males and females. The hypothesis is confirmed.

## Chapter Five

### Conclusion

#### 5.1 Summary

This study was conducted to investigate Infertility-related-stress and Coping Strategies as Predictors of Mental Well-being among Infertile Males and Females in Ibadan Oyo State South West Nigeria. This chapter would address the following; socio-demographic information; infertility related stress, coping mechanism and mental wellbeing among the male and female respondents. Other sub-sections are the implication of the findings to clinical psychologists as well as conclusion and recommendations.

78.7% of the respondent in this study were females with a range of age 21-60 which is similar to that of a study conducted by scholars<sup>247</sup>.

The findings from this study also revealed that 65.8% of the respondents were of the Islamic faith this was contrary to that of the study conducted by scholars where majority 93.3% were of the Christian faith<sup>248</sup>. 50.2% had secondary school as the highest level of education a findings similar to that of the study conducted by scholars<sup>1</sup>. 94.6% of the respondents were Yoruba ethnic group as this may be attributed to the fact that this study was conducted at the southwestern region with a significant Yoruba population. Respondents with secondary infertility have a higher percentage of 55% than those with primary infertility of 45% similar to that of the study conducted by scholars<sup>249</sup>.

## **5.2 Prevalence of infertility related stress**

The overall Infertility related stress categorization of the respondents shows that 68.8% had high level infertility related stress this is similar to a study conducted by scholars in Ethiopia maybe because procreation is commonly important in most African countries<sup>250</sup>.

## **5.3 Coping skills among infertile male and female**

The overall coping skills of the respondent showed that 35.1% had avoidance coping, 33.6% had problem focus and 31.2% had emotional focus as their coping mechanism in dealing with their infertility related stress.

## **5.4 Mental well-being of infertile male and females**

Majority, of the Female respondents had poor mental wellbeing compared to few of the male respondents who had poor mental wellbeing this may not be enough to make general conclusion as majority of the respondents were females. Overall, 68.8% of the respondents that have infertility related stress has poor mental wellbeing that means there is an association with infertility related stress and mental wellbeing this is similar to other research conducted along this line.

## **5.5 Implication for Clinical Psychologists**

Based on the findings of this study, there was high level of poor mental well-being associated with infertility despite the fact that 35.2% of the respondents had avoidance coping skills. Furthermore, 68.8% had high Infertility related stress which was a significant mental challenge on infertile males and females. Hence the findings from this study had a significant

psychological implication and thereby the need for psychological interventions for tackling the identified mental health issues among infertile males and females.

## **5.6 Conclusion and Recommendation**

The findings of this study revealed the high prevalence of poor mental wellbeing and high infertility related stress.

Hence, there is a need for clinical psychologists to organize the following psychological intervention for infertile males and females to address their mental health challenges :

- i. Mental health assessment
- ii. Cognitive behavioural therapy
- iii. Coping skills training
- iv. Motivation enhancement therapy
- v. Humanistic therapy
- vi. Couples / individual counseling

Also, the government should adopt a policy where medical management by medical personnel and psychological intervention by clinical psychologists can be jointly used to manage and alleviate the sufferings of the affected individual passing through the challenges of infertility.

## ENDNOTES

<sup>1</sup>World Health Organization: *Comprehensive Mental Health Action Plan 2013-2030*. <https://www.who.int/publications/i/item/9789240031029>. ISBN: 9789240031029

<sup>2</sup>Ryf CD. Psychological well-being revisited: advances in the science and practice of eudaimonia. *Send to Psychother Psychosom*. 2014;83(1):10–28.

<sup>3</sup>WHO: *Health and Well-Being*. The global health observatory. 2023. <https://www.who.int/data/gho/data/major-themes/health-and-well-being#:~:text=The%20WHO%20constitution%20states%3A%20%22Health,of%20mental%20disorders%20or%20disabilities>.

<sup>4</sup>G.O. Obajimi , O. Esan , B.N. Ogunkinle: *Depression and Anxiety Disorders amongst a Cohort of Infertile Women Attending an In-Vitro Fertilization Clinic in South-western Nigeria*. *Medical Journal of Zambia*, Vol. 46 (3): 2019. 192 - 196

<sup>5</sup>H. Fallahzadeh, Zareei, A. H. Mahmood, M. Momayyezi, M.H. Malaki & N. Keyghobadi, *The comparison of depression and anxiety between fertile and infertile couples: a meta-analysis study*. *Int. J. Reprod. Biomed.* (Yazd). 17(3), 2019. 153–162.

<sup>6</sup>A.A. Paints, & T.Y. Sununu, *The profile of infertility in a teaching hospital in north west Nigeria*. Retrieved from: [www.smjonline.org/artile.asp?issn=1118-8561;year=2014;volume=IT;Issue=1;spage=7;epage=11;last=part](http://www.smjonline.org/artile.asp?issn=1118-8561;year=2014;volume=IT;Issue=1;spage=7;epage=11;last=part). (2014).

<sup>7</sup>P.o. Uadia & A.M. Emokpae, Male infertility in Nigeria: A neglected reproductive health issue requiring attention. *Journal of Basic and Clinical Reproductive Sciences*, 4(2), 2015.45-53.

<sup>8</sup>A. Tersoo, *Prevalence of infertility in Nigeria*.2018. Retrieved from: [https://www.naija.ng/114452prevalence infertilitynigeria.html](https://www.naija.ng/114452prevalence%20infertility%20nigeria.html).

<sup>9</sup>P.S. Deshpande & A.S. Gupta: *Causes and prevalence of factors causing infertility in a public health facility*. *J Hum Reprod Sci*. 12:287–293. 2019.

<sup>10</sup>J. Hunt & J. H Monach: *Beyond bereavement model the significance of depression for infertile women*. *Fertil Steril*. 58:1158–1163. 1992

<sup>11</sup>F. Atherton & D. Howel: *Psychological morbidity and the availability of assisted conception: A group comparison study*. *J Public Health Med*. 17:157–160. 1995.

<sup>12</sup>R. Conrad, G. Schilling, M. Langenbuch, G. Haidl & R. Liedtke: *Alexythymia in male infertility*. *Hum Reprod*. 16:587–592. 2001.

<sup>13</sup>A. Abbey, F.M. Andrews & L.J. Halman: *Gender's role in responses to infertility*. *Psychol Women Q*. 15:295–316. 1991

<sup>14</sup>J. Seladi-Schulman, E. Holly, *Everything You Need to Know About Infertility* (Healthline Media a Red Ventures Company, 2019)

<sup>15</sup>KL. Rooney, A,D, Domar; *The relationship between stress and infertility*. *Dialogues Clin Neurosci*. 2018 Mar;20(1):41-47. doi: 10.31887/DCNS.2018.20.1/klrooney. PMID: 29946210; PMCID: PMC6016043.

<sup>16</sup>F. Ramezanzadeh, M.M. Aghssa, N. Abedinia,, F. Zayeri, & N. Khanafshar, M. Shariat & M. Jafarabadi, *A survey of relationship between anxiety, depression and duration of infertility*. *BMC women'sHealth, Bio Med central*.2004.

<sup>17</sup>S. HematiGorgani, *Emotional Aspects of Infertility*. – *Essay Abstracts of Tehran Symposium on Psychological aspects of Infertility*: EbneSina Research Center.2001.

<sup>18</sup>M. Saki, M. Saki, F. Jenani, & P. Asti, *Emotional and Psychological Sides of the Infertile Couples Applying for Sperm or Ovum*. *Infertility and Fertility Quarterly* .Essay Abstract of the First Overall Seminar on Sperm- Ovum donation for Infertility Treatment – Appendix no 5.2005.

<sup>19</sup>Z.M.A. Shariat: *Presenting Socio- Psychological Solutions for infertility*. *Tehran Essay Abstracts of the Symposium On Environmental Factors Effecting Infertility- EbnSina Research Center*.2000.

- <sup>20</sup><http://www.Clevelandclinic.org/health>
- <sup>21</sup>M. DehganPour: *Infertility: A Scar on Women's Narcissism* -Essay Abstracts of Tehran Symposium on Psychological Aspects of Infertility: EbneSina Research Center.
- <sup>22</sup>A. Aflakseir & M. Zarei: *Association between Coping Strategies and Infertility Stress among a Group of Women with Fertility Problem in Shiraz, Iran*. J Reprod Infertil. 2013 Oct;14(4):202-6. PMID: 24551575; PMCID: PMC3911816.
- <sup>23</sup>Sp. Bento, BR. Goodin, LA. Fabian, GG. Page, NB. Quinn & L. McGuire: *Perceived control moderates the influence of active coping on salivary cortisol response to acute pain among women but not men*. Psychoneuroendocrinology. 2010;35(6):944–8.
- <sup>24</sup>World Health Organization (WHO). *International Classification of Diseases*, 11th Revision (ICD-11) Geneva: WHO 2018.
- <sup>25</sup>National Institute for Health and Clinical Excellence: *Clinical Guideline 11- Fertility: assessment and treatment for people with fertility problems*. Published by the National Institute for Clinical Excellence; 2004; on [www.nice.org.uk](http://www.nice.org.uk) accessed on 09-02-2010 by 7.52 p.m.
- <sup>26</sup>Cates W., Farley T. M., and Rowe P. J.: *Worldwide patterns of infertility: is Africa different?* Lancet, 1985, 14: 2(8455); pp 596-8.
- <sup>27</sup>*Infertility, Causes, Prevention and Programmatic strategies Module 12*. The Johns Hopkins Bloomberg School of Public Health/ The Johns Hopkins University; 2006.
- <sup>28</sup>National Population Commission (NPC) [Nigeria] and ICF Macro: *Nigeria Demographic and Health Survey 2008*. Abuja, Nigeria: National Population Commission and ICF Macro; 2009.
- <sup>29</sup>M. Taebi, N. Kariman, A. Montazeri, M.H. Alavi: *Infertility Stigma: A Qualitative Study on Feelings and Experiences of Infertile Women*. Int J Fertil Steril. 2021 Jul;15(3):189-196. doi: 10.22074/IJFS.2021.139093.1039. Epub 2021 Jun 22. PMID: 34155865; PMCID: PMC8233927.
- <sup>30</sup>N. Chibatata & C. Malimba, *Infertility in Sub-Saharan Africa: A Woman's Issue for How Long? A Qualitative Review of Literature*. Open Journal of Social Sciences, 4,2016.96-102. doi: 10.4236/jss.2016.48012.
- <sup>31</sup>A. Mohammed-Durosinlorun, J. Adze, S. Bature, A. Abubakar, C. Mohammed, M. Taingson & L. Airede: *Use and pattern of previous care received by infertile Nigerian women*. Fertil Res Pract. 2019 Dec 3;5:14. doi: 10.1186/s40738-019-0068-6. PMID: 31827875; PMCID: PMC6889738.
- <sup>32</sup>M. Patel: *The socioeconomic impact of infertility on women in developing countries*. Facts, Views and Vision in Obstetrics and Gynaecology. 2016;8(1):59–61.

<sup>33</sup>D. Davis, E. Dearman: *Coping strategies of nontraditional female students in Southwest Michigan and Northern Indian*. *Educ Psychol* 2017;5:1-11.

<sup>34</sup>A. Pedro: *Coping with infertility: An explorative study of South African women's experiences*. *Open J Obstet Gynecol* 2015;5:49-59

<sup>35</sup>The UC Davis Obstetrics and Gynecology Department in Collaboration with California IVF Fertility Center in Sacramento. *Reproductive Endocrinology and infertility*. UC Davis Health; 2018. p. 3-7.

<sup>36</sup>TR. Segal, L.C. Giudice: *Before the beginning: environmental exposures and reproductive and obstetrical outcomes*. *Fertility and Sterility* 2019;112(4):613-21.

<sup>37</sup>V. D'Souza, J.A. Noronha, S. Kamath: *Psychosocial wellbeing and coping strategies of infertile women seeking infertility treatment*. *Journal of Infertility and Reproductive Biology*, Volume 3, Issue 2, 2015, Pages: 174-178

<sup>38</sup>F.E. Okonofua, LFC. Ntoimo, A. Omonkhua, O. Ayodeji, C. Olafusi, E. Unuabonah & V. Ohenhen: *Causes and Risk Factors for Male Infertility: A Scoping Review of Published Studies*. *Int J Gen Med*. 2022;15:5985-5997  
<https://doi.org/10.2147/IJGM.S363959>

<sup>39</sup>S.C. Bergstrom, J.B. Lawson, K.A. Harrison, S. Bergstrom, *Maternity care in developing countries* RCOG PRESS: 2001: 360-368.

<sup>40</sup>A.O. Olatunji & A.O. Sule-Odu: *The Pattern of Infertility Cases at a University Hospital*. *West Afr J Med* 2003; 22 (3): 205-207

<sup>41</sup>MWH . Yao & DJ. Schust: *Infertility*. In: Berek J. S., (ed) *Novak's Gynaecology* 13th ed. Lippincott William and Wilkin: 2002: 973 1066.

<sup>42</sup>Olatunji AO, Sule-Odu AO. *The Pattern of Infertility Cases at a University Hospital*. *West Afr J Med* 2003; 22 (3): 205-207.

<sup>43</sup>LH. Burns: *Psychiatric aspects of infertility and infertility treatments*. *Psychiatr Clin North Am*. 30:689–716. 2007.

<sup>44</sup>S. HematiGorgani, *Emotional Aspects of Infertility*. – Essay Abstracts of Tehran Symposium on Psychological aspects of Infertility: EbneSina Research Center.2001.

<sup>45</sup>N. Maleki-Saghooni, M. Amirian, R. Sadeghi & R. R. Latifnejad: *Effectiveness of infertility counseling on pregnancy rate in infertile patients undergoing assisted reproductive technologies: A systematic review and meta-analysis*. *Int J Reprod Biomed*. 15:391–402. 2017

<sup>46</sup>A. Aflakseir & M. Zarei: *Association between Coping Strategies and Infertility Stress among a Group of Women with Fertility Problem in Shiraz, Iran*. *J Reprod Infertil*. 2013 Oct;14(4):202-6. PMID: 24551575; PMCID: PMC3911816.

<sup>47</sup>O.O. Oyewunmi & Y.O. Ayannike: *Mental health and the Nigerian workplace: Fallacies, facts and the way forward*. International Journal of Psychology and Counselling, 7(7): 2015.106-111

<sup>48</sup>H. Bill: Six Dimensions of Well-being (Wellness). Health & Wellness, Nursing, Reference, <https://libguides.tcu.edu/WellnessGuide>. Jul 12, 2023

<sup>49</sup>A. Danjuma, A. Ibrahim, A. Emmanuel, O. Sunday & I. Lateefah, *Occurrence, pattern, and effects of nonconventional use of substances among youth in North-Central, Nigeria*. World Journal of Preventive Medicine, 4(1):2016.12-19.

<sup>50</sup>American Psychiatric Association: *Diagnostic and statistical Manual of Mental Disorders- Fifth Edition DSM-5*.2013.p. 20

<sup>51</sup>A. Rogers & D. Pilgrim, *A sociology of mental health and illness*.4th edition. Maidenhead: Open University Press.2010.

<sup>52</sup>E.L. Barrett, M. Teesson & K.L. Mills, *Associations between substance use, post-traumatic stress disorder and the perpetration of violence: a longitudinal investigation*. Addictive Behaviour.39,2014.1075–80.

<sup>53</sup>A.S Jegede, *The Yoruba cultural construction of health and illness*. Nordic Journal of African Studies, 11 (3):2010.322-335

<sup>54</sup>Community Translational Science Team (CTST). *Policy Report: Building A Public Health Model for Promoting Emotional Well-Being*. Los Angeles: University of California, Los Angeles; 2016.

<sup>55</sup>Y. Chida & A. Steptoe, *Positive psychological well-being and mortality: A quantitative review of prospective observational studies*. Psychosomatic Medicine. 2008;70(7):741-756.

<sup>56</sup>R. Cohen, C. Bavishi & A. Rozanski, *Purpose in life and its relationship to all-cause mortality and cardiovascular events: A meta-analysis*. Psychosomatic Medicine. 2016;78(2):122- 133.

<sup>57</sup>O.A. Michael: *Determinants of Substance Abuse among Users with Mental Health Issues in Ogun State, Nigeria*. Doctoral Study Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Public Health. Walden University. May 2021

<sup>58</sup>O. Gureje, V.O. Lasebikan, L. Kola & V.A. Makanjuola, *Lifetime and 12-month prevalence of mental disorders in the Nigerian Survey of Mental Health and Well-Being*. The British Journal of Psychiatry. 188 (5): 465-471. Retrieved from <https://www.cambridge.org/core/journals/the-britishjournal-of-psychiatry/article/lifetime-and-12month-prevalence-of-mental-disorders-in-the-nigeriansurvey-of-mental-health-and-wellbeing/399785FE6103511ADBA2C3276E406CD3>

<sup>59</sup>J. Abdulmalik, L. Kola & O. Gureje, *Mental health system governance in Nigeria: challenges, opportunities and strategies for improvement*. *Global Mental Health*, 3(9).2016, March. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5314752/>

<sup>60</sup>A.Y. Armiyau, *A Review of Stigma and Mental Illness in N. Journal of Clinical Case Reports*, 5(1).2015. Retrieved from [https://www.researchgate.net/publication/277934187\\_A\\_Review\\_of\\_Stigma\\_and\\_Mental\\_Illness\\_in\\_Nigeria](https://www.researchgate.net/publication/277934187_A_Review_of_Stigma_and_Mental_Illness_in_Nigeria)

<sup>61</sup>O. Gureje & V.O. Lasebikan, L. Kola & V.A. Makanjuola, *Lifetime and 12-month prevalence of mental disorders in the Nigerian Survey of Mental Health and Well-Being*. *The British Journal of Psychiatry*. 188 (5):2018.465-471. Retrieved from <https://www.cambridge.org/core/journals/the-british-journal-of-psychiatry/article/lifetime-and-12-month-prevalence-of-mental-disorders-in-the-nigeriansurvey-of-mental-health-and-wellbeing/399785FE6103511ADBA2C3276E406CD3>

<sup>62</sup>Joy, Inc. & NOI Polls. *60 million Nigerians are at risk of depression – new national depression report*. Joy, Inc.2018.

<sup>63</sup>A. Leithead, *The city that won't stop growing: How can Lagos cope with its spiralling population?* Retrieved from BBC News: <https://www.bbc.co.uk/news/resources/idt-sh/lagos>. 2017, August 21.

<sup>64</sup>T. McDonnell, *Slum Dwellers In Africa's Biggest Megacity Are Now Living In Canoes*. NPR. Retrieved from <https://www.npr.org/sections/goatsandsoda/2017/05/15/528461093/slum-dwellers-in-africas-biggest-megacity-are-now-living-in-canoes.2017>.

<sup>65</sup>A.I. Okpani & S. Abimbola, *Operationalizing universal health coverage in Nigeria through social health insurance*. *Nigerian Medical Journal*,56(5),2015.305-310. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4698843/>

<sup>66</sup>C. Onyemelukwe, *Stigma and Mental Health in Nigeria: Some Suggestions for Law*. *Journal of Law, Policy and Globalization*, 55,2016.63-68. Retrieved from <https://www.iiste.org/Journals/index.php/JLPG/article/viewFile/34236/35208>

<sup>67</sup>OPHI Country Briefing: Nigeria. Oxford: *Oxford Poverty and Human Development Initiative (OPHI)*.2016. Retrieved from <https://assets.documentcloud.org/documents/3719246/NGA.pdf>

<sup>68</sup>M. Page, *A New Taxonomy for Corruption in Nigeria*. *Carnegie Endowment for International Peace*.2018. Retrieved from <https://carnegieendowment.org/2018/07/17/new-taxonomy-for-corruption-in-nigeria-pub-76811>

<sup>69</sup>J. McLeish & M. Redshaw: *Mothers' accounts of the impact on emotional wellbeing of organised peer support in pregnancy and early parenthood: a qualitative study*. *BMC Pregnancy Childbirth*. 2017 Jan 13;17(1):28. doi: 10.1186/s12884-017-1220-0. PMID: 28086827; PMCID: PMC5237175.

<sup>70</sup>Department for Education. *Positive for Youth: A New Approach to Cross-Government Policy for Young People Aged 13 to 19*. London: HMSO, 2010.

<sup>71</sup>K. Stark, N. Daulat & S. King, *A vision for teachers' emotional well-being*. Phi Delta Kappan, 103(5),2022.24–30. <https://doi.org/10.1177/00317217221079975>

<sup>72</sup>M.S. Kamarul, P. Jaharudin, A.T. Jasmi & M. Farah: *The Psychological Well-Being from the University Students' Perspective And Culture*. PJAEE, 17(9).2020.

<sup>73</sup>Husted, S. Hilary, *"The Relationship Between Psychological Well-Being and Successfully Transitioning to University"* (2017). Undergraduate Honors Theses. 54. [https://ir.lib.uwo.ca/psychK\\_uht/54](https://ir.lib.uwo.ca/psychK_uht/54)

<sup>74</sup>World Health Organisation (2020). *Maternal, Mental Health*. [https://www.who.int/mental\\_health/maternal-child/maternal\\_mental\\_health/en/](https://www.who.int/mental_health/maternal-child/maternal_mental_health/en/)

<sup>75</sup>David A. Nissan, Laretta A. Ziajko, Amanda C. Ries, Landon L. Van Dell: *All's Not Quiet on the Western Front? The Stigma against Mental Health Treatment for World Leaders*. Creative Education Vol.14 No.6, June 14, 2023

<sup>76</sup>I.H. Ishaq, B. Sefa: *Mental Health, Religion and Suicide*. Open Journal of Medical Psychology Vol.11 No.1, January 5, 2022

<sup>77</sup>J. Gao & R. Mclellan, *Using Ryff's Scales of Psychological Well-Being in Adolescents in Mainland China*. BMC Psychology, 6(1),2018.1-8

<sup>78</sup>P. Gartoulla, R.J. Bell, R. Worsley & S.R. Davis, *Moderate-Severely Bothersome Vasomotor Symptoms Are Associated with Lowered Psychological General Wellbeing in Women at Midlife*. Maturitas, 81(4),2015.487-492.

<sup>79</sup>E. Stamp, L. Crust, C. Swann, J. Perry, P. Clough & D. Marchant, *Relationships between Mental Toughness and Psychological Wellbeing in Undergraduate Students*. Personality and Individual Differences, 75,2015.170-174

<sup>80</sup>F.A. Huppert, *Psychological Well-Being: Evidence Regarding its Causes and Consequences*. Applied Psychology: Health and Well-Being, 1(2),2009.137-164.

<sup>81</sup>E. Barrett, S. Sussman, C. Smith, L.A. Roribach & D. Sparijt-Metz, *Motivational Interviewing for Adolescent Substance Use: A review of literature*, Addictive Behavior, 37,2012. 1325-1334.<http://www.drugsandalcohol.ie/20350/1/AThesis%202013%20Final%20Copy%20%202405201.pdf>

<sup>82</sup>Armiyau, A. Y. (2015). *A Review of Stigma and Mental Illness in N*. Journal of Clinical Case Reports, 5(1). Retrieved from

[https://www.researchgate.net/publication/277934187\\_A\\_Review\\_of\\_Stigma\\_and\\_Mental\\_Illnesses\\_in\\_Nigeria](https://www.researchgate.net/publication/277934187_A_Review_of_Stigma_and_Mental_Illnesses_in_Nigeria)

<sup>83</sup>K.A. Schonert-Reichl, E. Oberle, M.S. Lawlor: *Enhancing cognitive and social-emotional development through a simple-to-administer mindfulness-based school program for elementary school children: A randomized controlled trial*. *Developmental Psychology*. 2015;51(1):52-66. <http://dx.doi.org/10.1037/a0038454>

<sup>84</sup>American Academy of Pediatrics. Promoting children's mental health (2018). Retrieved from: <https://www.aap.org/en-us/advocacy-and-policy/federaladvocacy/Pages/mentalhealth.aspx>

<sup>85</sup>Council Report CR1 12. The Mental Health of Students in Higher Education. London: Royal College of Psychiatrists.2003.

<sup>86</sup>R.D. Taylor, E. Oberle, J.A. Durlak, & R.P. Weissberg, *Promoting positive youth development through school-based social and emotional learning interventions: A meta-analysis of follow-up effects*. *Child Development*, 88(4),2017.1156-1171. doi:10.1111/cdev.12864

<sup>87</sup>L. Dusenbury & R.P. Weissberg, *Social-emotional learning in elementary school: Preparation for success*. *The Education Digest*, 83(1),2017.36-43.

<sup>88</sup>C. Hannah: *Perceptions of the Well-Being and Sport Performance Relationship*. A thesis submitted in partial fulfilment of the requirements of Liverpool John Moores University for the degree of. Doctor of Philosophy. January 2019

<sup>89</sup>K. Feng, L. Altinay, H. Olya, *Social well-being and transformative service research: evidence from China*, *Journal of Services Marketing*.2019. Doi: 10.1108/JSM-10-2018-0294.

<sup>90</sup>L. Hafskjold, A.J. Sundler, I.K. Holmström, V. Sundling S. vanDulmen & H. Eide, "*A cross-sectional study on person-centred communication in the care of older people: the COMHOME study protocol*", *BMJ open*, Vol 5 No.4.2015: e007864, doi: 10.1136/bmjopen-2015-007864

<sup>91</sup>C. Doyle, L. Lennox & D. Bell, "*A systematic review of evidence on the links between patient experience and clinical safety and effectiveness*", *BMJ open*, Vol 3 No.1,2013,pp. 1-18.

<sup>92</sup>F. Kong, & S. Hu, S. Xue, Y. Song & J. Liu, "*Extraversion mediates the relationship between structural variations in the dorsolateral prefrontal cortex and social well-being*", *Neuroimage*, Vol 105,2015,pp. 269-275.

<sup>93</sup>S. Coulthard, D. Johnson & J.A. McGregor, "*Poverty, sustainability and human wellbeing: a social wellbeing approach to the global fisheries crisis*", *Global Environmental Change*, Vol 21 No.2,2011,pp. 453-463.

<sup>94</sup>D.L Gerritsen, N. Steverink, D.H. Frijters, M.E. Ooms & M.W. Ribbe, "*Social well-being and its measurement in the nursing home, the SWON-scale*", *Journal of Clinical Nursing*, Vol 19 No.9-10,2010,pp. 1243-1251.

<sup>95</sup>L.T. Zayer, C.C. Otnes & E.M. Fischer, “*The nature and implications of consumers’ experiential framings of failure in high-risk service contexts*”, *Journal of Service Research*, Vol 18 No.3,2015,pp. 303-317.

<sup>96</sup>M. Mende, & D.J. Van, “*Coproduction of transformative services as a pathway to improved consumer well-being: findings from a longitudinal study on financial counseling*”, *Journal of Service Research*, Vol 18 No.3,2015. pp. 351-368.

<sup>97</sup>T. Yao, Q. Zheng & X. Fan, “*The impact of online social support on patients’ quality of life and the moderating role of social exclusion*”, *Journal of Service Research*, Vol 18 No.3,2015,pp. 369-383.

<sup>98</sup>C.P. Blocker & A. Barrios, “*The transformative value of a service experience*”, *Journal of Service Research*, Vol 18 No.3,2015,pp. 265-283.

<sup>99</sup>S. Fournier & L. Lee, “*Getting brand communities right*”, *Harvard business review*, Vol 87 No. 4,2009,pp. 105-111.

<sup>100</sup>M. Hepi, J. Foote, J. Finsterwalder, S. Carswell & V. Baker, “*An integrative transformative service framework to improve engagement in a social service ecosystem: the case of He Waka Tapu*”, *Journal of Services Marketing*, Vol 31 No.4/5,2017,pp. 423-437

<sup>101</sup>R.E. Page, *Stories and social media: Identities and interaction*, Routledge, Abingdon-on-Thames, United Kingdom.2013.

<sup>102</sup>S. Anderson, L. Nasr & S.W. Rayburn, “*Transformative service research and service design: synergistic effects in healthcare*”, *The Service Industries Journal*, Vol. 38 Nos1-2,2018,pp.99-113.

<sup>103</sup>D. Njine & B. Soroka, “*Good quality interaction between the registered nurse and the patient: a systematic review*”, available at: [https://www.theseus.fi/bitstream/handle/100024/120381/Njine\\_Doreen.pdf?sequence=1&isAllowed=y](https://www.theseus.fi/bitstream/handle/100024/120381/Njine_Doreen.pdf?sequence=1&isAllowed=y)2016,.

<sup>104</sup>S.M. Burke, A.V. Carron, M.A. Eys, N. Ntoumanis & P.A. Estabrooks, “*Group versus individual approach? A meta-analysis of the effectiveness of interventions to promote physical activity*”, *Sport and Exercise Psychology Review*, Vol 2 No.1,2006,pp. 19- 35.

<sup>105</sup>J. White, “*Volunteers go the extra mile to prevent patient loneliness*”, available at: <http://www.healthcarebusinesstech.com/volunteers-hospital-patient/>.2016

<sup>106</sup>World Health Organization report on global population (WHO, 2020)

- <sup>110</sup>J.R. Zolton, P.G. Lindner, N. Terry, AH. DeCherney & M. J.Hill. *Gonadotropins versus oral ovarian stimulation agents for unexplained infertility: a systematic review and meta-analysis*. Fertil Steril. 2020 Feb;113(2):417-425.e1.
- <sup>111</sup>M. Milczarek, A. Kucharska & A. Borowiec: *Difficulties in diagnostics of polycystic ovary syndrome in adolescents - a preliminary study*. Pediatr Endocrinol Diabetes Metab. 2019;25(3):122-126.
- <sup>112</sup>ACOG Committee Opinion No. 738: *Aromatase Inhibitors in Gynecologic Practice*. Obstet Gynecol. 2018 Jun;131(6):1
- <sup>113</sup>M. Jain & M. Singh: *Assisted Reproductive Technology (ART) Techniques*. [Updated 2022 Nov 28]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK576409/>
- <sup>114</sup>A. Sakr, F. Brégeon, J.L Mège, J.M. Rolain & O. Blin: *Staphylococcus aureus Nasal Colonization: An Update on Mechanisms, Epidemiology, Risk Factors, and Subsequent Infections*. Front Microbiol. 2018 Oct 8;9:2419. doi: 10.3389/fmicb.2018.02419. PMID: 30349525; PMCID: PMC6186810.
- <sup>115</sup>A. Ghaheri, A. Rasekhi, R.S. Omani & E. Hajizadeh: *Modeling In Vitro Fertilization Data Considering Multiple Outcomes Observed among Iranian Infertile Women*. Int J Fertil Steril. 2018 Apr;12(1):27-30. doi: 10.22074/ijfs.2018.5187. Epub 2018 Jan 7. PMID: 29334203; PMCID: PMC5767928.
- <sup>116</sup>M. Ramalingam, P. Durgadevi & T. Mahmood: In vitro fertilization. *Obstetrics, Gynaecology and Reproductive Medicine*. 2016;26(7):200–209.
- <sup>117</sup>N. Kumar & A.K. Singh, *Trends of Male Factor Infertility, an Important Cause of Infertility: A Review of Literature*. Journal of Human Reproductive Sciences, 8,2015.191-196. <https://doi.org/10.4103/0974-1208.170370>
- <sup>118</sup>F. Lotti & M. Maggi: *Ultrasound of the male genital tract in relation to male reproductive health*. Hum Reprod Update. 2015 Jan-Feb;21(1):56-83. doi: 10.1093/humupd/dmu042. Epub 2014 Jul 19. PMID: 25038770.
- <sup>119</sup>A. Daniilidis, M. Nisolle, P. Papandreou, S. Gordts, H. Krentel & G. Pados: *A European survey on treatment of hydrosalpinges in infertile women on behalf of the European Society for Gynaecological Endoscopy (ESGE) Special Interest Group (SIG) on Reproductive Surgery*. Facts Views Vis Obgyn. 2020 Oct 8;12(3):241-244. PMID: 33123698; PMCID: PMC7580267.
- <sup>120</sup>E. Saridogan, C. Becker & A. Feki: *Recommendations for the Surgical Treatment of Endometriosis. Part 1: Ovarian Endometrioma Working group of ESGE, ESHRE and WES*. Hum Reprod Open. 2017:1–6.

<sup>121</sup>A. Daniilidis, D. Balaouras & D. Chitzios: *Hydrosalpinx: tubal surgery or in vitro fertilisation? An everlasting dilemma nowadays; anarrative review*. J Obstet Gynaecol. 2017;37:550–556.

<sup>122</sup>A.K. Gebeh & M. Metwally: *Surgical management of tubal disease and infertility*. Obstet Gynaecol Reprod Med. 2017;27:346–351.

<sup>123</sup>D.S. Shekhawat, *Hybrid Cloud computing in E-Governance: Related Security Risks and Solutions*. Research Journal of Information Technology,4,2012.1-4.

<sup>124</sup>B. Ramalingam, T. Parandhaman & S.K. Das: *Antibacterial Effects of Biosynthesized Silver Nanoparticles on Surface Ultrastructure and Nanomechanical Properties of Gram-Negative Bacteria viz. Escherichia coli and Pseudomonas aeruginosa*. ACS Appl Mater Interfaces. 2016 Feb;8(7):4963-76. doi: 10.1021/acsami.6b00161. Epub 2016 Feb 12. PMID: 26829373.

<sup>125</sup>M. Jain & M. Singh: *Assisted Reproductive Technology (ART) Techniques*. [Updated 2022 Nov 28]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK576409/>

<sup>126</sup>P.R. Brezina, R. Anchan & W.G. Kearns: *Preimplantation genetic testing for aneuploidy: what technology should you use and what are the differences?* J Assist Reprod Genet. 2016 Jul;33(7):823-32.

<sup>127</sup>M. Nagórska, A. Bartosiewicz, B. Obrzut & D. Darmochwał-Kolarz; *Gender Differences in the Experience of Infertility Concerning Polish Couples: Preliminary Research*. Int J Environ Res Public Health. 2019 Jul 2;16(13):2337. doi: 10.3390/ijerph16132337. PMID: 31269703; PMCID: PMC6651646.

<sup>128</sup>H. Demirci & S. Sen: *Sexual experiences of infertile women: A qualitative study*. Niger J Clin Pract 2023;26:229-33.

<sup>129</sup>ART Practice in Lagos State Regulations and Guidelines. Health Facility Monitoring and Accreditation Agency 2019.

<sup>130</sup>N.I. Okafor, N.N. Joe-Ikechebelu & J.I. Ikechebelu: *Perceptions of Infertility and In Vitro Fertilization Treatment among Married Couples in Anambra State, Nigeria*. African Journal of Reproductive Health 2017; 21(4):55-66.

<sup>131</sup>P.P. Okonta, R. Ajayi, K. Bamgbopa, R. Ogbeche, C.C. Okeke & K. Onwuzurigbo: *Ethical Issues in the Practice of Assisted Reproductive Technologies in Nigeria: Empirical Data from Fertility Practitioners*. African Journal of Reproductive Health 2018; 22(3): 51-58.

<sup>132</sup>El Kissi, Y. Romdhane, A. B. Hidar, S. Bannour, S. Ayoubi Idrissi, K. Khairi, & H.B. Ben , *General psychopathology, anxiety, depression and self-esteem in couples undergoing infertility treatment: a comparative study between men and women*. European Journal of Obstetrics & Gynecology and Reproductive Biology,167, 2013.185-189

<sup>133</sup>M.M. Casilla-Lennon, S. Meltzer-Brody & A.Z. Steiner, *The effect of antidepressants on fertility*. American Journal of Obstetrics and Gynecology, 2016.215,314.e1-314.e5

<sup>134</sup>L.A. Pasch & K.T. Sullivan: *Stress and coping in couples facing infertility*. Curr Opin Psychol. 2017 Feb;13:131-135. doi: 10.1016/j.copsyc.2016.07.004. Epub 2016 Jul 25. PMID: 28813283.

<sup>135</sup>A. Zaidouni, O. Fatima, B. Amal, A. Siham, H. Houyam, K. Jalal & B. Rachid: *Predictors of Infertility Stress among Couples Diagnosed in a Public Center for Assisted Reproductive Technology*. J Hum Reprod Sci. 2018 Oct-Dec;11(4):376-383. doi: 10.4103/jhrs.JHRS\_93\_18. PMID: 30787524; PMCID: PMC6333041.

<sup>136</sup>A. Galhardo, M. Cunha & J. Pinto-Gouveia, *Psychological aspects in couples with infertility*. Sexologies,20, 2011.224-228

<sup>137</sup>M. Awtani, K. Mathur, S. Shah & M. Banker: *Infertility stress in couples undergoing intrauterine insemination and in vitro fertilization treatments*. J Hum Reprod Sci. 2017;10:221-5.

<sup>138</sup>A.G. Huppelschoten, N.T.L. Van Duijnhoven, P.F.J. VanBommel, J.A.M. Kremer & W.L.D.M. Nelen, *Do infertile women and their partners have equal experiences with fertility care?* Fertility and Sterility, 99(3),2013.832-838. <https://doi.org/10.1016/j.fertnstert.2012.10.049>

<sup>139</sup>J.H.Choi, S.H. Lee, J.H. Bae, J.S. Shim, H.S. Park & Y.S. Kim, *Effect of sleep deprivation on the male reproductive system in rats*. J Korean Med Sci. 2016;31:1624-30.

<sup>140</sup>M. Bokaie, M. Simbar, S.M.Y. Ardekani & H.A. Majd, *Women's beliefs about infertility and sexual behaviors: A qualitative study*. Iranian journal of nursing and midwifery research,21,2016.379-384

<sup>141</sup>A.B. Ashley & L.G. Jennifer, *The relationship between psychological coping and mood across the menstrual cycle among distressed women struggling to conceive*, Journal of Psychosomatic Research, Volume 145, 2021, 110465, ISSN 0022-3999, <https://doi.org/10.1016/j.jpsychores.2021.110465>.  
(<https://www.sciencedirect.com/science/article/pii/S0022399921001100>)

<sup>142</sup>BHP Lau, AYM Chow, DFK Wong, JSM Chan, CHY Chan, RTH Ho, TH So, TC Lam, VHF Lee & AWM Lee; *Study protocol of a randomized controlled trial comparing integrative body-mind-spirit intervention and cognitive behavioural therapy in fostering quality of life of patients with lung Cancer and their family caregivers*. J Evid Inf Soc Work 2018;15:258-276.

<sup>143</sup>XW Ji, CHY Chan, BHP Lau, JSM Chan, CLW Chan & KF. Chung: *The interrelationship between sleep and depression: a secondary analysis of a randomized controlled trial on integrative mind-body-spirit intervention*. Sleep Med 2017;2:41-46.

<sup>144</sup>A.D. Domar, J. Gross, K. Rooney & J. Boivin; *Exploratory randomized trial on the effect of a brief psychological intervention on emotions, quality of life, discontinuation, and pregnancy rates in in vitro fertilization patients*. *Fertil Steril* 2015;104:440–451.

<sup>145</sup>CHY. Chan, THY. Chan & CLW. Chan: *Translating Daoist concepts into integrative social work practice: an empowerment program for persons with depressive symptoms*. *J Relig Spiritual Soc Work*. 2014a;33:61–72.

<sup>146</sup>D. Durairajanayagam: *Lifestyle causes of male infertility*. *Arab J Urol*. 2018;16:10–20.

<sup>147</sup>IFFS Surveillance: *Global Reproductive Health 2016*; 1: e1. <http://dx.doi.org/10.1097/GRH.0000000000000001>

<sup>148</sup>N.I. Okafor, N.N, Joe-Ikechebel, J.I. Ikechebel: *Perceptions of Infertility and In Vitro Fertilization Treatment among Married Couples in Anambra State, Nigeria*. *African Journal of Reproductive Health* 2017; 21(4):55-66.

<sup>149</sup>I.V. Ezeome, S.O. Akintola, A.S. Jegede: *Experiences of female clients in the assisted reproductive technology process in Nigeria*. *Afri Health Sci*. 2023;23(2):659-69. <https://dx.doi.org/10.4314/ahs.v23i2.76>

<sup>150</sup>Z. Mustapha: *The practice of Assisted Human Reproduction Technologies (Arts) in Nigeria: the unanswered legal and ethical questions*. *Journal of Law and Judicial System* 2018; 1(1):40–50.

<sup>151</sup>C. Farquhar, J. Marjoribanks: *Assisted reproductive technology. An overview of Cochrane Reviews*. *Cochrane Database Systematic Review* 2018; 8:1–108.

<sup>152</sup>KT. Bamgbopa, PI. Okonta, R. Ajayi, R. Ogbeche, C. Igbokwe & K. Onwuzurigbo: *Public perceptions on ethics in the practice of assisted reproductive technologies in Nigeria*. *Global Reproductive Health* 2018; 3: e13

<sup>153</sup>IA. Nwosu & F. Onwe: *The Plight of Infertile Women in Nigeria*. *Journal of Policy and Development Studies* 2015; 9 (3): 39-46.

<sup>154</sup>IV. Ezeome, S.O Akintola, A.S. Jegede & E.R, Ezeome: *Perception of Key Ethical Issues in Assisted Reproductive Technology (ART) by Providers and Clients in Nigeria*. *International Journal of Women's Health* 2021;13: 1033–1052.

<sup>155</sup>U.A. Ojedokun & E.N. Atoi: *Baby Factory Syndicates: An Emerging Child Adoption Racket in Nigeria*. *African Journal of Psychological Study in Social Issues* 2016; 19 (1): 47-59.

<sup>156</sup>A. Khalid & S. Dawood: *Social support, self-efficacy, cognitive coping and psychological distress in infertile women*. *Arch Gynecol Obstet*. 2020 Aug;302(2):423-430. doi: 10.1007/s00404-020-05614-2. Epub 2020 May 26. PMID: 32458132.

<sup>157</sup>B. Wiweko, U. Anggraheni, E. S. Detri & L.H. Putri: *Distribution of stress level among infertility patients*. Middle East Fertil Soc J. 2017;22:145–8. DOI:10.1016/j.mefs.2017.01.005.

<sup>158</sup>B. H. Luk & A.Y. Loke: *The impact of infertility on the psychological well-being, marital relationships, sexual relationships, and quality of life of couples: A systematic review*. J Sex Marital Ther. 2015;41:610–25.

<sup>159</sup>Y. Benyamini, M. Gozlan, & A. Weissman: *Normalization as a Strategy for Maintaining Quality of Life While Coping with Infertility in a Pronatalist Culture*. Int J Behav Med. 2017 Dec;24(6):871-879. doi: 10.1007/s12529-017-9656-1. PMID: 28620775.

<sup>160</sup>T. O'Rourke, C. Vogel, D. John, R. Pryss, J. Schobel, F. Haug, J. Haug, C. Pieh, U.M. Nater, A.C. Feneberg, M. Reichert & T. Probst: *The Impact of Coping Styles and Gender on Situational Coping: An Ecological Momentary Assessment Study With the mHealth Application TrackYourStress*. Front Psychol. 2022 Jun 20;13:913125. doi: 10.3389/fpsyg.2022.913125. PMID: 35795429; PMCID: PMC9252427.

<sup>161</sup>K. Witkiewitz., C. Roos., D. Tofighi & HML. Van: *Broad coping repertoire mediates the effect of the combined behavioral intervention on alcohol outcomes in the COMBINE study: an application of latent class mediation*. J. Stud. Alcohol Drugs 79,2018.199–207. doi: 10.15288/jsad.2018.79.199

<sup>162</sup>M. Volz, M.C. Voelkle, & K. Werheid, *General self-efficacy as a driving factor of post-stroke depression: a longitudinal study*. Neuropsychol. Rehabil. 29,2019.1426–1438. doi: 10.1080/09602011.2017.1418392

<sup>163</sup>J. Webber, S. Skodda, T. Muth, P. Angerer & A. Loerbroks, *Stressors and resources related to academic studies and improvements suggested by medical students: a qualitative study*. BMC Med. Educ. 19:312.2019. doi: 10.1186/s12909-019-1747-z

<sup>164</sup>C.M. Vizoso & O. Arias, *Estresores académicos percibidos por estudiantes universitarios y su relación con el burnout y el rendimiento académicos [Academic stressors perceived by university students and their relationship with academic burnout, efficacy and performance]*. Anu. Psicol. 46,2016.90–97. doi: 10.1016/j.anpsic.2016.07.006

<sup>165</sup>A.W.Y. Tran & M.N. Lumley, *Internalized stigma and student well-being: the role of adaptive and maladaptive coping*. Soc. Work Ment. Health 17,2019.408–425. doi: 10.1080/15332985.2018.1563023

<sup>166</sup>L. Dehelean, I. Papava, M.I. Musat, M. Bondrescu, F. Bratosin, B.O. Bucatos, A.C. Bortun, D.V. Mager, R.S. Romosan & A.M. Romosan: *Coping Strategies and Stress Related Disorders in Patients with COVID-19*. Brain Sci. 2021;11:1287. doi: 10.3390/brainsci11101287.

<sup>167</sup>K. Stanisławski: *The Coping Circumplex Model: An Integrative Model of the Structure of Coping With Stress*. Front. Psychol. 2019;10:694. doi: 10.3389/fpsyg.2019.00694.

<sup>168</sup>J.F. Oliveira, A.M.N. Oliveira, E.L.D. Barlem & L.G. Lourenção: *The vulnerability of the family: Reflections about human condition*. Revista Brasileira de Enfermagem. 2021;**74**:e20190412. doi: 10.1590/0034-7167-2019-0412.

<sup>169</sup>O.Y. Durgun & M. Duman, *"Effect of infertility causes related to gender differences on Women's distress levels among patients utilizing a Turkish university hospital"*, Journal of Health Research, Vol. 34:2020, No. 5, pp. 399-407. <https://doi.org/10.1108/JHR-07-2019-0149>

<sup>170</sup>A. Sharma & D. Shrivastava: *Psychological Problems Related to Infertility*. Cureus. 2022 Oct 15;**14**(10):e30320. doi: 10.7759/cureus.30320. PMID: 36407201; PMCID: PMC9661871.

<sup>171</sup>F. Yazdani, F. Elyasi, Peyvandi *Counseling-supportive interventions to decrease infertile women's perceived stress: A systematic review*. Electron Physician. 2017;**9**:4694–4702.

<sup>172</sup>G. Simionescu, B. Doroftei, Maftai, *The complex relationship between infertility and psychological distress (Review)* Exp Ther Med. 2021;**21**:306.

<sup>173</sup>Iordăchescu, A. Diana, I.P. Corina, E.B. Alina, G.A. Corina, P. Gheorghe, V. Alina Veduță & G. Nicolae. *"Anxiety, Difficulties, and Coping of Infertile Women"* Healthcare 9, no. 4: 2021.466. <https://doi.org/10.3390/healthcare9040466>

<sup>174</sup>M.C. Zurlo, M.F. Cattaneo & F. Vallone, *Re-examining the role of coping strategies in the associations between infertility-related stress dimensions and state-anxiety: Implications for clinical interventions with infertile couples*. Front. Psychol. 2020, **11**, 614887.

<sup>175</sup>C. Massarotti, G. Gentile, C. Ferreccio, P. Scaruffi, V. Remorgida & P. Anserini, *Impact of infertility and infertility treatments on quality of life and levels of anxiety and depression in women undergoing min vitro fertilization*. Gynecol. Endocrinol. 2019, **35**, 485–489.

<sup>176</sup>Y. Benyamini, M. Gozlan & A. Weissman, *Normalization as a strategy for maintaining quality of life while coping with infertility in a pronatalist culture*. Int. J. Behav. Med. **2017**, **24**, 871–879

<sup>177</sup>S. Angelika, H. Kornélia, Z. János, Ilona, D. Éva, F. Zsuzsanna, D. Gergely & Beatrix Rafael: *Adaptive coping strategies in male infertility, paramedical counselling as a way of support*, Journal of Reproductive and Infant Psychology, DOI: 10.1080/02646838.2020.1724918

<sup>178</sup>M. Oti-Boadi & K.O. Asante; *Psychological health and religious coping of Ghanaian women with infertility*. BioPsychoSocial Med 2017; **11**: 20.

<sup>179</sup>A. Namdar, M.M. Naghizadeh, M. Zamani, F. Yaghmaei & M.H. Sameni: *Quality of life and general health of infertile women*. Health Qual Life Outcomes 2017; **15**(1):139.

<sup>180</sup>G. Simionescu, B. Doroftei, R. Maftai, B.E. Obreja, E. Anton, D. Grab, C. Ilea & C. Anton: *The complex relationship between infertility and psychological distress (Review)*. Exp

Ther Med. 2021 Apr;21(4):306. doi: 10.3892/etm.2021.9737. Epub 2021 Feb 1. PMID: 33717249; PMCID: PMC7885086.

<sup>181</sup>S. Dumbala, H. Bhargav, V. Satyanarayana, R. Arasappa, S. Varambally, G. Desai & G.N. Bangalore; *Effect of yoga on psychological distress among women receiving treatment for infertility*. Int J Yoga. 2020;13:115–119. doi: 10.4103/ijoy.IJOY\_34\_19.

<sup>182</sup>O.A. Zahra, R. Soheila, B. Tahereh, A. Marzieh & Y. Atefeh: *The effectiveness of counseling with a cognitive-behavioral approach on infertile women's stress*. Maedica (Bucur) 2019;14:363–370. doi: 10.26574/maedica.2019.14.4.363.

<sup>183</sup>M.L. Silveira, K.A. Ertel, N. Dole & L. Chasan-Taber: *The role of body image in prenatal and postpartum depression: A critical review of the literature*. Arch Womens Ment Health. 2015;18:409–421. doi: 10.1007/s00737-015-0525-0.

<sup>184</sup>C. Solheim, S. Zaid & J. Ballard, *Ambiguous loss experienced by transnational Mexican immigrant families*. Family Process, 55(2),2016.338-353. doi:10.1111/famp.12130

<sup>185</sup>M. Sawicka, *Searching for a narrative of loss: Interactional ordering of ambiguous grief*. Symbolic Interaction, 40(2),2017.229-246. doi:10.1002/symb.270

<sup>186</sup>J. Verkuijden, C. Verhaak, W.L. Nelen, J. Wilkinson & C. Farquhar; *Psychological and educational interventions for subfertile men and women*. Cochrane Database Syst Rev. 2016 Mar 31;3(3):CD011034. doi: 10.1002/14651858.CD011034.pub2. PMID: 27031818; PMCID: PMC7104661.

<sup>187</sup>M. Dustkin, *Crisis Theory: Types of Theories*.2016. Downloaded from: www.angel.com/ns/southeasternnurse. Retrieved on: 4/7/2019

<sup>188</sup>H. Mellisa, *Family System Theory and Changes overtime*.2017. Downloaded from: www.human growth and development psychology courses. Retrieved on: 26/10/2019.

<sup>189</sup>B. Micheal: *Network Theory of Wellbeing*. The Baltic International Yearbook of Cognition, Logic and Communication.2017.

<sup>190</sup>Chen TH, Chang SP, Tsai CF, Juang KD. (2004) Prevalence of depressive and anxiety disorders in an assisted reproductive technique clinic. Hum Reprod. 2004;19(10):2313-2318

<sup>191</sup>Volgsten H, Skoog Svanberg A, Ekselius L, Lundkvist O, SundströmPoromaa I. Prevalence of psychiatric disorders in infertile women and men undergoing in vitro fertilization treatment. Hum Reprod

<sup>192</sup>Sejbaek CS, Hageman I, Pinborg A, Hougaard CO, Schmidt L. Incidence of depression and influence of depression on the number of treatment cycles and births in a national cohort of 42 880 women treated with ART. Hum Reprod. 2013;28(4):1100-1109

- <sup>193</sup>Holley SR, Pasch LA, Bleil ME, Gregorich S, Katz PK, Adler NE. Prevalence and predictors of major depressive disorder for fertility treatment patients and their partners. *FertilSteril*. 2015;103(5):1332-1339
- <sup>194</sup> Pasch LA, Holley SR, Bleil ME, Shehab D, Katz PP, Adler NE. Addressing the needs of fertility treatment patients and their partners: are they informed of and do they receive mental health services? *FertilSteril*. 2016;106(1):209-215.e2.
- <sup>195</sup>Akatos E, Szigeti JF, Ujma PP, Sexty R, Balog P. Anxiety and depression among infertile women: a cross-sectional survey from Hungary. *BMC Womens Health*. 2017;17(1):48.
- <sup>196</sup>Shani C, Yelena S, Reut BK, Adrian S, Sami H. Suicidal risk among infertile women undergoing in-vitro fertilization: Incidence and risk factors. *Psychiatry Res*. 2016;240:53-59.
- <sup>197</sup> De Berardis D, Mazza M, Marini S, et al. Psychopathology, emotional aspects and psychological counselling in infertility: a review. *Clin Ter*. 2014;165(3):163-169
- <sup>198</sup>Maroufizadeh S, Karimi E, Vesali S, Omani Samani R. Anxiety and depression after failure of assisted reproductive treatment among patients experiencing infertility. *Int J GynaecolObstet*2015;130:253–256.
- <sup>199</sup> Crawford NM, Hoff HS, Mersereau JE. Infertile women who screen positive for depression are less likely to initiate fertility treatments. *Hum Reprod*. 2017;32(3):582-587
- <sup>200</sup> Gameiro S, Boivin J, Peronace L, Verhaak CM. Why do patients discontinue fertility treatment? A systematic review of reasons and predictors of discontinuation in fertility treatment. *Hum Re*
- <sup>201</sup> Rich CW, Domar AD. Addressing the emotional barriers to access to reproductive care. *FertilSteril*. 2016;105(5):1124-1127
- <sup>202</sup>Klonoff-Cohen H, Chu E, Natarajan L, Sieber W. A prospective study of stress among women undergoing in vitro fertilization or gamete intrafallopian transfer. *FertilSteril*. 2001;76(4):675
- <sup>203</sup> Xu H, Ouyang N, Li R, Tuo P, Mai M, Wang W. The effects of anxiety and depression on in vitro fertilization outcomes of Chinese women. *Psychol Health Med*. 2017;22:37-43.
- <sup>204</sup> Boivin J, Griffiths E, Venetis CA. Emotional distress in infertile women and failure of assisted reproductive technologies: meta-analysis of prospective psychosocial studies.
- <sup>205</sup> Pasch LA, Gregorich SE, Katz PK, et al. Psychological distress and in vitro fertilization outcome. *FertilSteril*. 2012;98(2):459-464

<sup>206</sup> Lynch CD, Sundaram R, Buck Louis GM, Lum KJ, Pyper C. Are increased levels of self-reported psychosocial stress, anxiety, and depression associated with fecundity? *FertilSteril*. 2012;98(2):453-458.

<sup>207</sup> Massey AJ, Campbell BK, Raine-Fenning N, Pincott-Allen C, Perry J, Vedhara K. Relationship between hair and salivary cortisol and pregnancy in women undergoing IVF. *Psychoneuroendocrinology*. 2016;74:397-405

<sup>208</sup> Rooney KL, Domar AD. The impact of stress on fertility treatment. *Curr Opin Obstet Gynecol*. 2016;28(3):198-201.

<sup>209</sup> Moller A, Fallstrom K. Psychological factors in the etiology of infertility: a longitudinal study. *J Psychosom Obstet Gynecol*. 1991;12(1):13-21.

<sup>210</sup>5. Valentin DP. Psychological impact of infertility: identifying issues and needs. *Soc Work Health Care*. 1986;11(4):61-69.

<sup>211</sup> Sudha Reddy KSN, Reddy KN, Reddy BKC. Emotional distress in infertile couples: a cross-cultural study. *Asia Pac J Soc Scien*. 2011;3(1):90-101.

<sup>212</sup> Taheri Z, Hassanzadeh R, Ghanbarpour F, Taheri M. The effect of integrated couple therapy and group therapy with cognitive-behavioral approach on increasing sexual selfconcept and accelerating fertility. *Int J FertilSteril*. 2012;6(Suppl 1):Onm-9.

<sup>213</sup> Ghaemi Z, Forouhari S. Psychosocial aspect of infertility. *Int J FertilSteril*. 2010;4(Suppl 1):Onm-7.

<sup>214</sup> Ashkani, H., Akbari, A. & Heydari, S., T. 2006: Epidemiology of Depression among Infertile and Fertile Couples in Shiraz, Southern Iran. *Journal of Medical Science*: 60. (10) 399-406.

<sup>215</sup> Greil, A. (1997). Infertility and psychological distress: A critical review of the literature. *Social Science & Medicine*, 45(11), 1679-1704

<sup>216</sup> Daniluk, J. C. 2001. Reconstructing their lives: A longitudinal, qualitative analysis of the transition to biological childlessness for infertile couples. *Journal of Development*, 79, 439-449.

<sup>217</sup> S.O. Akande, I.O. Dipeolu, Attitude and Willingness of Infertile Persons Towards the Uptake of Assisted Reproductive Technologies in Ibadan, Nigeria. Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria

<sup>218</sup> Wischmann, T., & Thorn, P. (2013). (Male) infertility: what does it mean to men? New evidence from quantitative and qualitative studies.

*Reproductive BioMedicine Online*, 27(3), 236-43. Retrieved from [http://www.rbmojournal.com/article/S1472-6483\(13\)00346-5/fulltext](http://www.rbmojournal.com/article/S1472-6483(13)00346-5/fulltext)

<sup>219</sup>Greil, A. (1997). Infertility and psychological distress: A critical review of the literature. *Social Science & Medicine*, 45(11), 1679-1704.

<sup>220</sup> Barratt, C. L. R., & Cooke, I. D. (1993). *Donor insemination*. Cambridge: Cambridge University Press

<sup>221</sup> Davis D, Dearman E. Coping strategies of nontraditional female students in Southwest Michigan and Northern Indian. *Educ Psychol* 2017;5

<sup>222</sup> Lazarus RS, Folkman S, Lazarus RS. Manual for the Ways of Coping Questionnaire. Research Edition, Palo Alto, C.A: Consulting Psychologists Press Inc.; 1988. p. 18-2

<sup>223</sup> Lazarus RS, Folkman S, Lazarus RS. Manual for the Ways of Coping Questionnaire. Research Edition, Palo Alto, C.A: Consulting Psychologists Press Inc.; 1988. p. 18-25.

<sup>224</sup>The UC Davis Obstetrics and Gynecology Department in Collaboration with California IVF Fertility Center in Sacramento. Reproductive Endocrinology and infertility. UC Davis Health; 2018. p. 3-7.

<sup>226</sup>Folkman S, Lazarus RS. Appraisal and Coping. 2nd ed. New York: Springer; 1988. p. 23-36.

<sup>227</sup>Buhawe J. Coping strategies in Lucena. *Healthcare* 2015;20:255-60.

<sup>228</sup>World Health Organization Regional Office for Europe. Physical activity strategy for the WHO European Region 2016-2025. Gene

<sup>229</sup>AbdulAzizAflakseir and MasomuehZarei, Association between Coping Strategies and Infertility Stress Among a Group of Women with Infertility Problem, 2013

<sup>230</sup>Fisher, J. R. W., &Hammarberg, K. (2012). Psychological and social aspects of infertility in men: an overview of the evidence and implications for psychologically informed clinical care and future research. *Asian Journal of Andrology*, 14(1), 121–129.

<sup>231</sup>Owerri Ibebuike Julia E1\*, Ekechukwu Edith Ugoch (2021) Infertility: Age, And Gender Differences among Infertile Couples Attending Fertility Clinic in Federal Medical Centre, 1Department of Nursing Science, Imo State University, Local Government Area, 460108, Owerri, Nigeria 2 Imo State College of Nursing and Midwifery Orlu, Owerri - Orlu Rd, Amakohia-Akwakuma 460116, Owerri, Nigeria; *Saudi Journal of Nursing and Health Care*

<sup>232</sup>Brazier, Y. (2018). Infertility in Men and Women. Retrieved from: <https://www.medicalnewstoday.com/articles/165748.php>

<sup>233</sup>Uadia, P. O., & Emokpae, A. M. (2015). Male infertility in Nigeria: A neglected reproductive health issue requiring attention. *Journal of Basic and Clinical Reproductive Sciences*, 4(2), 45-53.

<sup>234</sup>Paints, A. A., & Sununu, T. Y. (2014). The profile of infertility in a teaching hospital in north west Nigeria. Retrieved from: [www.smjonline.org/artile.asp?issn=1118-8561;year=2014;volume=IT;Issue=1;spage=7;epage=11&last=part](http://www.smjonline.org/artile.asp?issn=1118-8561;year=2014;volume=IT;Issue=1;spage=7;epage=11&last=part)

<sup>235</sup>Tabong, P. T. N., & Adongo, P. B. (2013). Understanding the social meaning of infertility and childbearing: a qualitative study of the perception of childbearing and childlessness in Northern Ghana. *PloS one*, 8(1), e54429

<sup>236</sup>Gannon K, Glover L, Abel P. Masculinity, Stigma and media reports. *Soc Sci Med*. 2004; 59:1169-1175.

<sup>237</sup>Wischmann, T., & Thorn, P. (2013). (Male) infertility: what does it mean to men? New evidence from quantitative and qualitative studies. *Reproductive BioMedicine Online*, 27(3), 236-43. Retrieved from [http://www.rbmojournal.com/article/S1472-6483\(13\)00346-5/fulltext](http://www.rbmojournal.com/article/S1472-6483(13)00346-5/fulltext)

<sup>238</sup>Greil, A. (1997). Infertility and psychological distress: A critical review of the literature. *Social Science & Medicine*, 45(11), 1679-1704.

<sup>239</sup>Beutel, M., Kupfer, J. P., Kirchmeyer, S., Kehde, F. M., Köhn, I., Schroeder-Printzen, H., Gips, H., Herrero, & H.J., Weidner, W. (1999) Treatment-related stresses and depression in couples undergoing assisted reproductive treatment by IVF or ICSI. *Andrologia*, 31 (1), 27–35

<sup>240</sup> Glover, L., Gannon, K., & Abel, P. D. (1999). Eighteen-month follow-up of male subfertility clinic attenders: a comparison between men whose partner subsequently became pregnant and those with continuing subfertility. *Journal of Reproductive and Infant Psychology*, 17(1), 83-87.

<sup>241</sup> Saleh, R. A., Ranga, G. M., Raina, R., Nelson, D. R., & Agarwal, A. (2003). Sexual dysfunction in men undergoing infertility evaluation: a cohort observational study. *Fertility and Sterility*, 79(4), 909-912

<sup>242</sup> Webb, R. E., & Daniluk, J. C. (1999). The end of the line: infertile men's experience of being unable to produce a child. *Men and Masculinities*, 2(1), 6-25.

<sup>243</sup>R. Sharma, KR. Biedenharn, J.M. Fedor & A. Agarwal: *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. PMID: 23870423; PMCID: PMC3717046.

<sup>244</sup>A. Agarwal, F. Deepinder, M. Cocuzza, R.A. Short & D.P .Evenson: *Effect of vaginal lubricants on sperm motility and chromatin integrity: a prospective comparative study*. *Fertil Steril*. 2008;**89**:375–379. doi: 10.1016/j.fertnstert.2007.02.050.

<sup>245</sup>R. Klemetti, J. Raitanen, S. Sihvo, S. Saarni & P. Koponen: *Infertility, mental disorders and well-being: A nationwide survey*. Acta Obstet Gyn Scan. 2010;89:677–682. doi: 10.3109/00016341003623746.

<sup>246</sup>A. Patel, P.S. Sharma, P. Narayan, V.S. Binu, N. Dinesh & P.J. Pai: *Prevalence and predictors of infertility-specific stress in women diagnosed with primary infertility: A clinic-based study*. J Hum Reprod Sci. 2016 Jan-Mar;9(1):28-34. doi: 10.4103/0974-1208.178630. PMID: 27110075; PMCID: PMC4817284.

<sup>247</sup>O.M. Ijeoma, A.U. Uchenna, F.N. Ifeoma, C.O. Agnes: *Coping Strategies of Infertility Clients Attending Gynecological Clinic in South-eastern Nigeria*. Nigerian Journal of Medicine. Volume 30. Issue 1. January-February 2021

<sup>248</sup> D. T. Esan, K. Q. Nnamani, A. Ogunkorode, F. Muhammad, O.O Oluwagbemi, & C.G. Ramos, *Infertility affects the quality of life of Southwestern Nigerian women and their partners*. International Journal of Africa Nursing Sciences, 17,2022.100506. <https://doi.org/10.1016/j.ijans.2022.100506>

<sup>249</sup>A.O. Olarinoye, P.O. Ajiboye; *Psychosocial characteristics of infertile women in a Nigerian tertiary hospital*. Trop J Obstet Gynaecol [serial online] 2019;36:252-7. Available from: <https://www.tjgonline.com/text.asp?2019/36/2/252/266869>

<sup>250</sup>A.G. Teklemicheal E.M. Kassa, E.K. Weldetensaye; *Prevalence and correlates of infertility related psychological stress in women with infertility: a cross-sectional hospital based survey*. BMC Psychol. 2022 Apr 7;10(1):91. doi: 10.1186/s40359-022-00804-w. PMID: 35392978; PMCID: PMC8988399.