Jurnal Kebidanan
UNIVERSITAS MUHAMMADIYAH SEMARANG

Jurnal Kebidanan – Vol 11, No 2 (2022), 103-120
ISSN 2301-8372 (print); ISSN 2549-7081 (online)
DOI: 10.26714/jk.11.2.2022.103-120

Determinants of Male and Female Infertility: A Systematic Review

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Abstract

Infertility is a problem that is still a lot in the world. Infertility cases are fertility disorders in both women and men caused by reproductive disorders and environmental factors. The purpose of this study was to determine the determinants of infertility by using studies obtained from 8 national and international databases, namely Garuda portal national system, Google Scholar and Sinta, international system with Science Direct, Scopus, Cambridge Core, Proquest, Springer Link. Then processed and selected with a prism diagram. The relevant results are 10 studies through the national system and 10 studies through the international system. It was found that there are 4 categories that are the determinants of male and female infertility, including the history of reproductive disorders, prevention in infertility, Problem Solving the mental readiness of the couple and the lifestyle of the couple.

.**Keywords**: determinants; infertility; factors; male and female

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Introduction

Infertility is a fertility disorder in both women and men caused by reproductive disorders and environmental factors. Infertility rates in the country are still high, especially in developing countries (BKKBN, 2020). Data from WHO about 50-80 million couples or one in seven couples experience fertility problems. Every year 2 million couples appear with the same problem (Organization, 2017). In Indonesia, it is estimated that more than 20% of married couples suffer from infertility. Infertility affects 15 percent of women aged 30-34 years, 30 percent of women aged 35-39 years, and 55 percent of women aged 40-44 years (Syamsiah, 2020). Infertility affected 1,712 men and 2,055 women in 2017, according to data from the Indonesian In Vitro Fertilization Association (Perfitri) (Compass, 2018). According to Central Java BKKBN statistics, the number of couples of childbearing age (EFA) in Central Java is 6 million, with 5.5 percent of them facing infertility problems (BKKBN, 2013). Infertility affects 66 percent of women of childbearing age in Semarang City (Nurullita, 2017)

Infertility in women is caused by various causes, including reproductive organ abnormalities, age, stress levels, BMI, work, hormones, and anatomical abnormalities.

Ovulation, tubal, pelvic, and uterine abnormalities such as reproductive organ abnormalities. Infertility is more likely to occur in women with reproductive organ disorders than in women who do not have them (et al., 2017). Infertility can also be influenced by external factors, namely the environment and lifestyle (Eddyman W, 2016). The causes of infertility in men are due to factors such as age, length of effort, frequency of intercourse, exposure to heavy metals, radiation, diet, cigarettes, alcohol and drugs (Amelia, Leni, 2019). Women of childbearing age and couples of childbearing age before marriage are very susceptible to infections that can cause infertility (Akbar, 2020). Research is more directed towards diagnostic treatment, and causes of infertility. The existence of this paper tries to find out what factors have the most influence on infertility in women and men from other factors related to infertility prevention behavior.

Methods

The research method used is a literature review. Data were collected with study literature from various sources of literature on infertility, qualitative analysis, the analysis was carried out using thought methods ranging from general to specific data (Priasmoro, 2019). Through the literature from 2016-2021, the use of keywords is factors and infertility, women and men. Disaggregated by inclusion criteria studies of studies related to infertility in women and men. Exclusion criteria are not studies of infertility in men and women. Results sequality article selection using the modified Critical Appraisal Process from Loney et al's research (Loney P, Chambers L, Bennett K, 1998), systematically analyzed and team discussion to make it easier to understand the determinants of infertility prevention. The use of the international system with science direct, scopus, Cambridge core, proquest, springer link and the national system of the garuda portal, google scholar and sinta obtained as follows:

Table 1. National Online Data Search System

Databases	Results
1 Garuda Portal	51
2 Google Scholar	878
3 Sinta	10
Total	939

Table 2. International Online Data Search System

Databases	Results
1 Science Direct	169
2 Scopus	880
3 Cambridge Core	11931
4 Proquests	16
5 Springer Link	11
Total	13007

Results and Discussion

Search strategies on national and international online data that are potentially relevant for research are as follows:

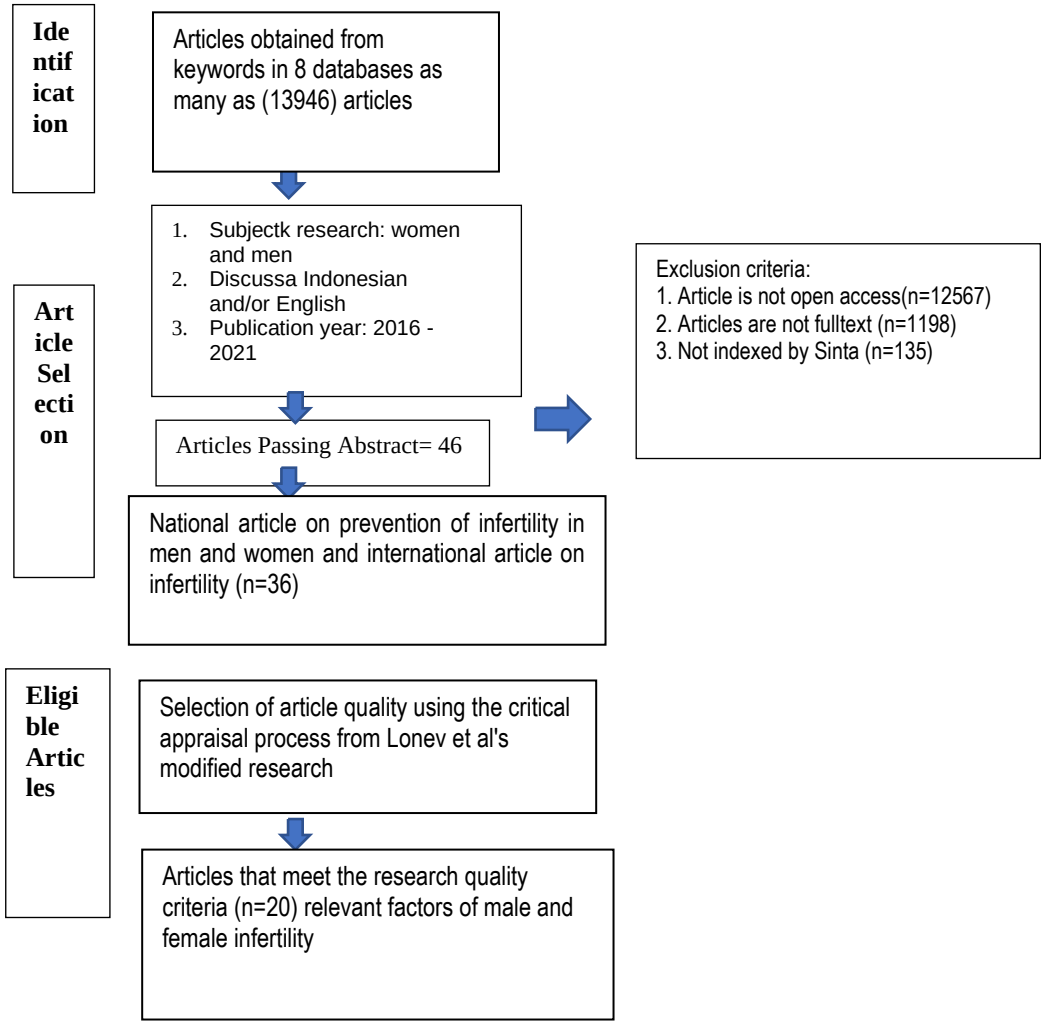

Figure 1. Article Selection FlowFigure

The strategy in searching for national online data resulted in 10 studies that were potentially relevant for research. Checking the abstracts, 10 study studies were selected and a study review was conducted as follows:

Table 3. Study Study

Author,Title	Journal,Year	The place	Respondent	Method	Results
Silvia W. Lestari,1 Meidika D. Rizki2, Epigenetic: A new approach to the etiology of infertility[13]	Medical Journal Indonesia, Vol. 25, No. 4 December 2016	Indonesia	Infertile women and men	Epigenetic modification experiment	Epigenetic modifications during oogenesis also affect oocyte quality as in other etiologies of female infertility, namely endometriosis and PCOS. Changes in the pattern of epigenetic modifications are associated with impaired spermatogenesis and oogenesis that can lead to infertility.

Author,Title	Journal,Year	The place	Respondent	Method	Results
Kadri Rusman, Effect of Smoking Activity on Sperm Analysis Results in Cases of Male Infertility in Makassar December 2015 – March 2016[14]	UMI Medical Journal, Journal of Medicine, Vol. 4 No. 2 (December, 2019)	Indonesia	182 patients consisting of 91 primary infertile smokers and 91 primary infertile non-smokers	case control	The relationship between smoking activity and sperm analysis results, there is a significant relationship, in this case an inverse (negative) relationship between sperm volume and smoking activity. The category of smokers with sperm volume (r=-0.225, p=0.002), while the length of smoking and sperm volume (r=-0.252, p=0.001).
Coresy Aquindo Tedjo Prajogo and Putu Nugrahaeni Widiasavitri, The role of problem focused coping and emotional focused coping on. marital satisfaction on wives who experience infertility (Aquindo, Coresy, Tedjo Prajogo, 2020)	Udayana Psychology Journal Special Edition Mental Health and Culture, 2020, 1, 35-43	Indonesia	A wife, both experiencing primary and secondary infertility, aged between 20 years to 35 years and a minimum of one year of marriage	Cohort	That problem focused coping and emotional focused coping together play a role in marital satisfaction. R Square coefficient value of 0.235 indicates that problem focused coping and emotional focused coping have a role of 23.5% on marital satisfaction in wives who experience infertility, while 76.5% is influenced by other factors not examined in this study.
Ayuningtyas Tri Handini, Mirfat, Relationship between Age and Obesity with Infertility in patients at the Presidential Hospital of the Gatot Soebroto Army Hospital (Tri Handini & Mirfat, 2018)	PharmaMedika Health Magazine 2017, Vol. 9 No. 1	Indonesia	50 women consist of 25 infertile patients and 25 infertile patients	Cross Sectional	There was no significant correlation between age and infertility (p = 0.572) and obesity was not significantly associated with infertility (p = 0.235). However, being overweight is a factor that needs to be considered because the ethnic variation that causes being overweight is enough to increase the risk of metabolic disorders in South Asian populations.
Hendy Hendarto, Infertility Stress Inhibits Oocyte Maturation and In Vitro Fertilization Results	Obstetrics & Gynecology Magazine, Vol. 23 No. January 1 - April 2015: 17-21	Indonesia	30 infertile women aged 20-35 years and have regular menstrual cycles and without metabolic disease,	Analytical observation with cross sectional	14 people experienced moderate stress (46.7%). Research subjects with mild stress levels were compared with those with moderate and severe stress (p=0.00). The heavier the stress level experienced by the research subjects, the less mature oocytes

Author,Title	Journal,Year	The place	Respondent	Method	Results
(Hendarto, 2015)			diabetes, hypertension, thyroid, obesity		
Novarina Sulsia Ista'in Ningtyas, Effect of Giving Red Fruit Oil (Pandanus conoideus Lam.) on Hispathology of Graafian follicles in mice (Mus musculus) Infertile model (Rahmawati, S., Tirtasari, K., Ningtyas, N. S. I. I., & Agustin, 2017)	Journal of Sangkareang Mataram Volume 3, No.3, September 2017	Indonesia	The mice in this study were divided into four groups, namely negative control (normal mice), positive control (infertile mice), infertile mice that were given 0.05 ml of red fruit oil for 14 days, and infertile mice that were given 0.1 ml of red fruit oil. for 14 days. Counting the number of follicles was obtained by reading ovarian HE preparations after treatment.	Experimental case control animal trials	Giving red fruit oil can increase the process of folliculogenesis by increasing the number of Graafian follicles. Follicular development or folliculogenesis shows the stages of development starting from primary follicles, secondary follicles, tertiary follicles to become Graafian follicles. One of the hormonal disturbances in one stage of folliculogenesis will cause the Graafian follicle to not form so that ovulation will not occur. This failure of ovulation can interfere with the reproductive rate of livestock
Dina Wahyunita, The Effect of Dhikr Relaxation Training on Improving the Subjective Welfare of Wives Who Have Infertility (Wahyunita, 2014)	Journal of Interventional Psychology Vol. 6 No. December 2, 2014	Indonesia	patients with essential hypertension, (b) are Muslim, (c) have anxiety scores from moderate to high categories, and (d) are in the categories of essential hypertension stage 1 and 2.	pretest-posttest control group design	The results of U Mann Whitney's analysis showed a Z score = -2,627 and a p value = 0.008 ($p<0.05$). This indicates that there is a significant difference in the anxiety level of essential hypertension patients between the experimental group and the control group after being given remembrance relaxation therapy. The experimental group showed lower levels of anxiety compared to the control group. This indicates that remembrance relaxation therapy has an effect on reducing anxiety in essential hypertension patients after being given remembrance relaxation therapy so that infertility can be handled in anxiety problems.
Aidil Akbar, Overview of Factors Causing Male Infertility in Indonesia	Pandu Husada Journal, No. 1 Vol. April 2, 2020	Indonesia	Men with infertility	Cross sectional	The causes of infertility in men in Indonesia are caused by internal factors (58%), external factors (32%) and other factors (10%)

Author,Title	Journal,Year	The place	Respondent	Method	Results
(Akbar, 2020) Hartanto Bayuaji, Rational and Efficient Management of Infertility to Shorten "Time to Pregnancy" (Bayuaji, 2018)	Obgynia, Volume 1 Number 2 September 2018	Indonesia	Women with infertility examination	Systematic review	In a woman's menstrual cycle, it can be used to perform several examinations selected. The focus of the examination is to identify the health background of husband and wife, to find out if there are any ovulation and ovarian reserve, tubal patency tests, anatomic evaluation of the uterus and peritoneum, and sperm analysis. After the basic data is obtained, a comprehensive evaluation is carried out to determine the treatment program appropriate
Anastasia Oktarina, Adnan Abadi, Ramli Bachsin, Factors Affecting Infertility in Women at the Fertility Clinic of Reproductive Endocrinology (Oktarina et al., 2014)	Health Magazine, Th. 46, No. 4, October 2014	Indonesia	Infertile women	Cross sectional	The age group of 25-35 years, as many as 71 cases (71%) and the lowest in the age group. The most duration of infertility found in the group of infertile women was with the duration of infertility above 3 years (61.3%). Based on the type of infertility experienced by infertile women, 49 people (79%) were primary infertility. The types of follow-up examinations that are mostly performed by infertile women are ultrasound examination and diagnostic laparoscopy. The most common comorbidities found in infertile women sampled in this study were endometriosis and uterine myomas.

Search strategy on international online data produced 10 potentially relevant papers for research. Examining the abstracts, 10 studies were selected and a study review was conducted. Looking at the inclusion criteria and obtained 10 papers included in this systematic review from *science direct, scopus, cambridge core, proquest, springer link*. According to the framework provided for the quantitative meta-analysis. Ten findings and illustrations were drawn from quantitative studies, animal trials, study studies and each finding was assigned a credibility rating according to the quantitative meta-analysis criteria. The findings are then identified according to the objective of a systematic review to produce four categories, and the similarity of the findings in a certain sense to the four categories is then treated with a meta-analysis to produce several synthesized findings that can potentially be used as a basis for evidence-based practice related to factors. -The determinants of infertility in men and women are as follows:

Table 4. Study Study

Author,Title	Journal,Year	The place	Respondent	Method	Results
Ika Indarwati1), Uki Retno Budi Hastuti2), Yulia Lanti Retno Dewi 3), Analysis of Factors Influencing Female Infertility (et al., 2017)	Journal of Maternal and Child Health (2017), 2(2): 150-161	Indonesia	Infertile woman	case control	The association between age and female infertility was statistically significant (OR=8.00; 95% CI=3.10 to 20.61; p<0.001). Job variables showed that working women (career women) were 8.72 times more likely to experience infertility, the relationship between work and female infertility was statistically significant (OR=8.72; 95% CI=3.30 to 23.01; p<0.001). Level variable stress showed that women with high (abnormal) stress levels were 6.40 times more likely to experience infertility, the body mass index variable shows that women with an abnormal body mass index of up to 22.9) have a 3.33 times greater chance of experiencing infertility. The results of the analysis show that there is a relationship between body mass index with female infertility and statistically significant (OR=3.33; 95% CI=1.42 to 7.77; p=0.004). great for infertility. The results of the analysis show that there is a relationship between reproductive organ abnormalities and female infertility and it is statistically significant (OR=7.36; 95% CI=2.97

					to 18.21; p<0.001). The most influential multivariate outcome was that women with reproductive organ disorders (ovulation disorders, tubal and pelvic disorders and uterine disorders) increased the risk of infertility 11.67 times greater than women who did not have reproductive organ disorders and was statistically significant (OR= 11.67; 95% CI). = 2.80 to 48.54; p= 0.030).
Weiwei Sun,1 Lulu Chen,1 Wei Zhang,1 Rong Wang,1 David Goltzman,2 and Dengshun Miao, Active vitamin D deficiency mediated by extracellular calcium and phosphorus results in male infertility in young mice (Sun et al., 2015)	Am J Physiol Endocrinol Metab 308: E51–E62, 2015	Canada	Infertile mice	Animal test	The results of this study showed that mineral ion deficient and 1,25(OH)2D3- deficient mice exhibited smaller testes, characterized by histologic abnormalities, and significantly lower sperm counts;
By Heather Stringer, No insurance required: Psychologists who treat the trauma of infertility (Stringer, 2017)	Psychological Review July/August 2017, Vol 48, No. 7	United States of America	Couples with infertility	Observation	The importance of the role of rebuilding the relationship between partners in understanding reproductive function and care about reproductive health
Vera Skvirsky, Orit Taubman – Ben-Ari, Shirley Ben Shlomo, Joseph Azuri & Eran Horowitz, Are mothers a source of support for women entering fertility treatment?(Skvirsky et al., 2018)	Health Care for Women International,2018	Israel	Women who come for the first visit for infertility treatment	Cross sectional	A significant positive relationship was found between overprotection and distress (RD .25, p D .003). However, no significant correlation emerged between overprotection and well-being (RD .15, PD .073). The more a woman perceived her mother's support in the form of active involvement, the higher her well-being and the

					lower the stress, whereas the more she perceived the support to be overprotective, the more he went through a lot of suffering.
Kyoko Asazawa, Mina Jitsuzaki, Akiko Mori, Tomohiko Ichikawa, Katsuko Shinozaki and Sarah E. Porter, Quality-of-life predictors for men undergoing infertility treatment in Japan (Asazawa et al., 2019)	Japan Journal of Nursing Science (2019)	Japan	Men with infertility treatment	Cross sectional	The mean age (-standard deviation) was 37.9 (-5.2) years. On average, the duration of infertility was 3 years and 1 month and the duration of infertility treatment was 1 year and 4 months. Two significant predictors of QOL were partner support (β = 0.32, P < 0.001 and period of infertility (β = 0.11). , P < 0.05) Spousal support had a positive impact, whereas prolonged duration of infertility had a negative impact on the total QOL score.
Ayla Çapık |Meyreme Aksoy Emine Yılmaz Filiz Yılmaz, Infertility Stigma Scale: A psychometric study in a Turkish sample (Çapık et al., 2019)	Willey, 2019	Turkey	Infertile women	case control	Low correlation coefficient, scale items are not reliable enough. The total item correlation in the original scale ranges from 0.60 to 0.87.21 In this study, the item-total correlation changed between 0.37 and 0.79. To consider an item acceptable, it is required that the item-total correlation coefficient must be positive and at least 0.30.31 In this case, the item-total correlation of all items is found to be sufficient. So the ISS is a valid and reliable instrument for the Turkish people. ISS consistency is enough.
Florence Naab, M'phil, RN, Roger Brown,	Journal of nursing scholarship,2013	Ghana	Infertile Woman	Cross sectional	and belief in personal control over infertility

Susan Heidrich, RN, Psychosocial Health of Infertile Ghanaian Women and Their Infertility Beliefs (Naab PhD, M'phil, RN et al., 2013)					were significant predictors of anxiety and perceived stigma. Only a few health variables related to sociodemography and infertility were significant predictors. Lower levels of education predict higher levels of stress. Marriage predicts higher stress but less perceived stigma, while length of marriage is associated with reduced social isolation. Staying on medication longer predicted less social isolation, but using alternative medicine was associated with depression. Marriage predicts higher stress but less perceived stigma, while length of marriage is associated with reduced social isolation. Staying on medication longer predicted less social isolation, but using alternative medicine was associated with depression. Marriage predicts higher stress but less perceived stigma, while length of marriage is associated with reduced social isolation. Staying on medication longer predicted less social isolation, but using alternative medicine was associated with depression.
Ramamurthi et al. Psychological Impact And Coping Strategies Among Women With Infertility (Ramamurthi, R., Kavitha, G., Pounraj,	3,2016:114-118. India India,2016		The age group of 21 to 25 years and women are at risk for infertility	Cross sectional	The age group of 21 to 25 years 35.7% and 45.5% of women had a recent risk of infertility. It is reported that 17% of women have

D., & Rajarajeswari, 2016)					difficulty falling asleep. 58.9% of women reported high levels of anxiety. 26% of women experienced noticeable weight loss. Meanwhile, 48.2% of women reported feeling guilty and 35.7% of women reported feelings of pessimism and suicidal tendencies. 16.28% of female participants reported being immersed in household activities followed by 13.95% with hobbies and 11.63% with weeping.
Pedro, Athens. Coping With Infertility: An Explorative Study Of South African Women's experiences (Pedro, 2015)	Journal Of Obstetrics And Gynecology, 5, 49-59,2015	south Africa	Women suffering from infertility	Qualitative	Severe psychological and emotional stress accompanies infertility. Coping strategies used by these women in this study included social withdrawal and women isolating themselves from social events and social gatherings, avoiding pregnant women and women with children, engaging in escape strategies on a psychological level and on a physical level. Employing escape strategies on a psychological level will involve deliberate thinking about strategies to avoid thinking about infertility.
Mousavi, Seyyedh Samira, et al. The Relationship Between Social Support And Mental Health In Infertility Women: The Mediating Role Of Problem-Focused Coping (Mousavi, S., Kalyani, M. N., Karimi,	Journal Of Applied Of Medical Science, 3,244-248. Iran: Shahid Chamran University,2015	Iran	Women with infertility	Cross sectional	The SEM equation found that the confidence interval, with one mediator (solving problem solving) did not reach zero which showed a statistically significant mediation effect. The pattern that emerges

S., Kokabi, R., & Piriaee, 2015)	shows the mediating role of problem solving coping. This research shows how social support can have direct and indirect effects on mental health in infertile women.

The study above found that the determinant factors that affect infertility in men and women can be seen in several categories, including:

1. **History of Reproductive Disorders**

The category of factors that influence infertility is a history of reproductive disorders where from the study data that Endometriosis and PCOS (PolyCystic Ovarian Syndrome) are associated with impaired spermatogenesis and oogenesis that can lead to infertility (Lestari SW, 2016). PCOS is a condition in which the ovaries produce abnormal amounts of androgens, male sex hormones that are usually present in women in small amounts, the name polycystic ovary syndrome describes the many small cysts (fluid-filled sacs) that form in the eggs (ovaries) (Hopkins, 2021). The influence of internal factors in the body can also affect reproduction in both men and women the occurrence of infertility (Akbar, 2020). Genetic factors that play a role in hormonal differences in each partner andabnormalities of ovulation, tubes, pelvis, and uterus such as reproductive organ abnormalities in women (et al., 2017). In other studies, there are also studies conducted using the multivariate method that infertility inwomen with reproductive organ disorders (ovulation disorders, tubal and pelvic disorders and uterine disorders) increase the risk of infertility 11.67 times greater than women who do not have reproductive organ disorders (et al., 2017). In accordance with the findings that reproductive organ disorders have a major influence on infertility, so that other studies are needed beforehand in preparing for optimal reproductive health by regulating lifestyle and nutrition, which can prevent infertility by reducing the presence of reproductive disorders (Ahsan B, Hakim A, 2012).

2. **Prevention In Infertility**

Studies that found that the prevention of infertility can be managed properly to minimize the occurrence of infertility include studies on the provision of nutritional intake such as giving red fruit oil can increase the folliculogenesis process by increasing the number of de Graaf follicles that have been tested on mice where there is a success rate in adding the process. folliculogenesis which can reduce infertility (Rahmawati, S., Tirtasari, K., Ningtyas, N. S. I. I., & Agustin, 2017) . Red fruit oil contentor Pandanus Conoideus is a typical Papuan plant that contains many compounds, one of which has essential compounds needed for the female reproductive system (Bahrah et al., 2019). Other studies have linked ion-deficient minerals and 1,25(OH)2D3- in deficient male rats showing smaller testes, characterized by histologic abnormalities, and significantly lower sperm counts, leading to male infertility (Sun et al., 2015). Changes in serum levels of these steroid hormones can lead to subsequent reproductive dysfunction by

interfering with the feedback regulatory mechanisms of the hypothalamic-pituitary-gonadal axis. In addition, coexpression of the cytoplasmic VDR (Vitamine D Receptor) and metabolic enzymes in Leydig cells (cells that produce testosterone in males) indicates that 1,25(OH)2D3 can affect the production of male reproductive hormones (Blomberg Jensen et al., 2010). Another study also found that treatment of infertile couples by being given remembrance relaxation therapy had an effect on reducing anxiety in essential hypertension patients with infertility after being given remembrance relaxation therapy so that infertility can be handled in anxiety problems (Wahyunita, 2014). Where relaxation techniques can reduce anxiety related to the presence of infertility, decrease anxiety in infertile couples (Retnowati, 2011).

3. *Problem Solving* In Couple's Mental Readiness

The determinant factors in infertility are many studies related to problem solving in mentally preparing couples to face infertility and prevention of infertility, such as studies on problem focused coping and emotional focused coping which have a role of 23.5% on marital satisfaction in wives who experience infertility (Aquindo, Coresy, Tedjo Prajogo, 2020). Coping mechanisms can be used by individuals to solve problems, effective coping will help individuals to be free from prolonged stress, one of which is coping with infertility (Tabong & Adongo, 2013). Another study related to couples experiencing infertility where severe stress greatly triggers low oocytes, so that the heavier the stress level experienced will produce fewer mature oocytes (Hendarto, 2015). Internal factors in the body can also be influenced by anxiety and thoughts that are too heavy, one of which affects the reproductive organs (et al., 2017).

Another study also found a solution to the problem of infertility in women where the support of the mother with active involvement can help reduce the pressure of infertility problems (Skvirsky et al., 2018). Another study found that the presence of partner support had a positive impact, while prolonged duration of infertility had a negative impact on partners' quality of life scores (Asazawa et al., 2019). This study examines the relationship between the support of a woman's mother and her partner, which contributes positively in dealing with physical, psychological and social problems in infertility (High & Steuber, 2014). Another study studies that there is a measurement parameter of stigma for infertile couples, which can prepare the couple mentally if there is stigma in the family and surrounding community (Çapık et al., 2019).

Another study studies that the belief of couples who experience long-term infertility results in stress, social isolation and depression. There is an increase in positive beliefs in partners to reduce stress, social isolation and depression (Naab PhD, M'phil, RN et al., 2013). Another study found that 58.9% of women reported high levels of anxiety with infertility (Ramamurthi, R., Kavitha, G., Pounraj, D., & Rajarajeswari, 2016). Another study that infertility problems in womensocial withdrawal practices and women isolate themselves from social events and social gatherings, avoid pregnant women and women with children, engage in escape strategies on a psychological level and on a physical level. Employing escape strategies on a psychological level will involve deliberate

thinking about strategies to avoid thinking about infertility which is a coping strategy in reducing depression in infertility problems (Pedro, 2015). Another different studyproblem-solving coping mediation, where this study demonstrates how social support can have direct and indirect effects on mental health in infertile women (Mousavi, S., Kalyani, M. N., Karimi, S., Kokabi, R., & Piriaee, 2015). These studies emphasize the importance of coping strategies so that infertile couples can solve problems by maintaining the privacy of each partner, in order to avoid severe pressure from external or social factors (Donkor et al., 2017).

4. *Lifestyle* (Lifestyle) Couple

This study is related to the couple's habits that can lead to infertility triggers. Studies show that there is a long smoking habit that is associated with sperm volume, where smoking for more than 10 years has an effect on decreasing sperm volume which can lead to a decrease in fertilizing an egg, resulting in infertility (Rusman, 2019). The content in cigarettes where nicotine when consumed for a long time and present in the body for a long time can interfere with reproduction, especially in men in the semen content (Amaruddin, 2012). The study of the relationship of lifestyle in the pattern of too much nutrition resulted in the presence of obesity factors that were not significantly associated with infertility (p = 0.235). However, being overweight is a factor that needs to be considered because the ethnic variation that causes being overweight is enough to increase the risk of metabolic disease disorders that trigger infertility (Tri Handini & Mirfat, 2018). Another study on the contrary that body mass index that is not normal up to 22.9 has a 3.33 times greater chance of experiencing infertility, where the results of the analysis show that there is a relationship between body mass index and female infertility and it is statistically significant (et al., 2017).

Conclusion

Determinants of infertility there are factors that need to be considered, from this study found 4 factors, namely: history of reproductive disorders prevention in infertility, Problem Solving the mental readiness of the couple and the lifestyle of the couple. These factors are the most widely studied studies that affect infertility, it is found that studies on problem solving mental readiness of couples can be prepared as early as possible for couples before marriage. The hope is to overcome the problem of joint infertility, both the infertility factor of both partners or one of the partners. Points of support and coping with mental health problem solving are very important for all couples to understand in infertility problems.

References

Ahsan B, Hakim A, T. M. (2012). Risk Factors Affecting Conception Delay (Infertility) Married Couples in North Palu District, Palu City. In *Hasanuddin University*.

Akbar, A. (2020). Overview of Factors Causing Male Infertility in Indonesia. *Journal of Pandu Husada*, *Volume 2*.

Amaruddin. (2012). *Effect of smoking on sperm quality in men with infertility problems case control study*.

Amelia, Leni, et al. (2019). Evaluation and Management of Male Infertility. *JIMKI*, *Volume 7*.

Aquindo, Coresy, Tedjo Prajogo, P. N. W. (2020). The role of problem focused coping and emotional focused coping on marital satisfaction in wives who experience infertility. *Journal of Psychology Udayana*, 35–43.

Asazawa, K., Jitsuzaki, M., Mori, A., Ichikawa, T., Shinozaki, K., & Porter, S. E. (2019). Quality-of-life predictors for men undergoing infertility treatment in Japan. *Japan Journal of Nursing Science*, *16*(3), 329–341. https://doi.org/10.1111/jjns.12248

Bahrah, B., Widyawati, M. N., & Suryono, S. (2019). Analisis Folikel De Graaf Akibat Pemberian Ekstrak Minyak Buah Merah. In *Repository Poltekkes Kemenkes Semarang*.

Bayuaji, H. (2018). Editorial: Tata Laksana Infertilitas yang Rasional dan Efisien untuk Mempersingkat "Time to Pregnancy." *Indonesian Journal of Obstetrics & Gynecology Science*, *1*(2), 73–78. https://doi.org/10.24198/obgynia.v1n2.91

BKKBN. (2013). *Infertility Rates*. https://www.bkkbn.go.id/detailpost/deputi-kbkr-angka-fertilitas- Wanita-Indonesia-alami-penurunan

BKKBN. (2020). *Infertility.Accessed through*. https://www.bkkbn.go.id/detailpost/pandemi-covid-19-tak-halangi-bkkbn-terus-edukasi- Masyarakat-cetak-usia-produktif-berkualitas-yang start-of-reproductive-health

Blomberg Jensen, M., Nielsen, J. E., Jørgensen, A., Rajpert-De Meyts, E., Kristensen, D. M., Jørgensen, N., Skakkebaek, N. E., Juul, A., & Leffers, H. (2010). Vitamin D receptor and vitamin D metabolizing enzymes are expressed in the human male reproductive tract. *Human Reproduction*, *25*(5), 1303–1311. https://doi.org/10.1093/humrep/deq024

Çapık, A., Aksoy, M., Yılmaz, E., & Yılmaz, F. (2019). Infertility Stigma Scale: A psychometric study in a Turkish sample. *Perspectives in Psychiatric Care*, *55*(2), 328–335. https://doi.org/10.1111/ppc.12360

Compass. (2018). *Infertility Experienced 3 out of 200 Women, Should IVF?* https://sains.kompas.com/read/2018/08/31/170000423/infertilitas-dialami-3-dari-200 women-haruskah-babi-tabung-?page=all

Donkor, E. S., Naab, F., & Kussiwaah, D. Y. (2017). "I am anxious and desperate": psychological experiences of women with infertility in The Greater Accra Region, Ghana. *Fertility Research and Practice*, *3*(1). https://doi.org/10.1186/s40738-017-0033-1

Eddyman W, F. (2016). *Study of Male Infertility and its Management*. Proceedings of the National Seminar from Basic Science to Comprehensive Education Makassar.

Hendarto, H. (2015). Stres Infertilitas Menghambat Maturasi Oosit dan Hasil Fertilisasi In Vitro. *Majalah Obstetri & Ginekologi*, *23*(1), 17. https://doi.org/10.20473/mog.v23i1.2098

High, A. C., & Steuber, K. R. (2014). An Examination of Support (In)Adequacy: Types, Sources, and Consequences of Social Support among Infertile Women. *Communication Monographs*, *81*(2), 157–178. https://doi.org/10.1080/03637751.2013.878868

Hopkins, J. (2021). AvailablePolycystic Ovary Syndrome (PCOS). *Johns Hopkins Medicine.*

Indarwati, I., Budihastuti, U. R., & Dewi, Y. L. R. (2017). Analysis of Factors Influencing Female Infertility. *Journal of Maternal and Child Health*, *02*(02), 150–161. https://doi.org/10.26911/thejmch.2017.02.02.06

Lestari SW, R. M. (2016). *Epigenetics: A new approach to the etiology of infertility*.

https://doi.org/doi:10.13181/mji.v25i4.1504.2016

Loney P, Chambers L, Bennett K, et al. (1998). *Critical Appraisal of the Health Research Literature: Prevalence or Incidence of a Health Problem*.

Mousavi, S., Kalyani, M. N., Karimi, S., Kokabi, R., & Piriaee, S. (2015). The relationship between social support and mental health in infertile women: the mediating role of problem-focused coping. *Scholars Journal of Applied Medical Sciences (SJAMS)*.

Naab PhD, M'phil, RN, F., Brown PhD, R., & Heidrich PhD, RN, S. (2013). Psychosocial Health of Infertile Ghanaian Women and Their Infertility Beliefs. *Journal of Nursing Scholarship*, *45*(2), 132–140. http://search.proquest.com/docview/1371826885?accountid=14548\nhttp://metadata.lib.hku.hk/hku?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&sid=ProQ:ProQ%3Amedicalshell&atitle=Psychosocial+Health+of+Infertile+Ghanaian+Women+and+Their+Infertility+Beliefs&title=Journal+of+Nursing+Scholarship&issn=15276546&date=2013-06-01&volume=45&issue=2&spage=132&au=Naab%2C+Florence%2C+PhD%2C+M%27phil%2C+RN%3BBrown%2C+Roger%2C+PhD%3BHeidrich%2C+Susan%2C+PhD%2C+RN&isbn=&jtitle=Journal+

Nurullita, N. (2017). *Risk Factors for Infertility in Women of Childbearing Age (Study at the Fertility Clinic at Sultan Agung Islamic Hospital, Semarang)*.

Oktarina, A., Abadi, A., Bachsin, R., Forensik, D., & Unsri, F. K. (2014). Faktor-faktor yang Memengaruhi Infertilitas pada Wanita di Klinik Fertilitas Endokrinologi Reproduksi. *Mks*, *46*(4), 295–300. ejournal.unsri.ac.id/index.php/mks/article/download/2722/pdf

Organization, W. H. (2017). *WHO Infertility Problems*. http://www.who.int

Pedro, A. (2015). Coping with Infertility: An Explorative Study of South African Women's Experiences. *Open Journal of Obstetrics and Gynecology*, *05*(01), 49–59. https://doi.org/10.4236/ojog.2015.51008

Priasmoro, A. (2019). *No Title*.

Rahmawati, S., Tirtasari, K., Ningtyas, N. S. I. I., & Agustin, A. L. D. (2017). The Effect Of Giving Red Fruit Oil (Pandanus Conoideus Lam.) On The Histopatology Of Inflamation Cells In Mice Stomach (Mus Musculus) Exposed To Plumbum. *In The 4th International Conference on One Health.*

Ramamurthi, R., Kavitha, G., Pounraj, D., & Rajarajeswari, S. (2016). Psychological impact and coping strategies among women with infertility-A hospital based cross sectional study. *International Archives of Integrated Medicine*.

Retnowati, S. (2011). Pengaruh Pelatihan Relaksasi Dengan Dzikir Untuk Mengatasi Kecemasan Ibu Hamil Pertama. *Psikoislamika : Jurnal Psikologi Dan Psikologi Islam*, *8*(1). https://doi.org/10.18860/psi.v0i1.1543

Rusman, K. (2019). Effect of Smoking Activity on Sperm Analysis Results in Cases of Male Infertility in Makassar December 2015 – March 2016. *UMI Medical Journal*, *4*. https://doi.org/10.33096/umj.v4i2.70.

Skvirsky, V., Taubman–Ben-Ari, O., Shlomo, S. Ben, Azuri, J., & Horowitz, E. (2018). Are mothers a source of support for women entering fertility treatment? *Health Care for Women International*, *39*(7), 719–733. https://doi.org/10.1080/07399332.2018.1424170

Stringer, H. (2017). Heather Stringer, No insurance required: Psychologists who

treat the trauma of infertility. *Psychological Review*, *48*.

Sun, W., Chen, L., Zhang, W., Wang, R., Goltzman, D., & Miao, D. (2015). Active vitamin d deficiency mediated by extracellular calcium and phosphorus results in male infertility in young mice. *American Journal of Physiology - Endocrinology and Metabolism*, *308*(1), E51–E60. https://doi.org/10.1152/ajpendo.00076.2014

Syamsiah. (2020). *Reproduction health*. Fitramaya.

Tabong, P. T. N., & Adongo, P. B. (2013). Infertility and childlessness: A qualitative study of the experiences of infertile couples in Northern Ghana. *BMC Pregnancy and Childbirth*, *13*. https://doi.org/10.1186/1471-2393-13-72

Tri Handini, A., & Mirfat, M. (2018). Hubungan Usia dan Obesitas dengan Infertilitas pada pasien di Rumah Sakit Kepresidenan RSPAD Gatot Soebroto. *Majalah Kesehatan Pharmamedika*, *9*(1), 033. https://doi.org/10.33476/mkp.v9i1.673

Wahyunita, D. (2014). The Effect of Remembrance Relaxation Training on Improving the Subjective Welfare of Wives Experiencing Infertility. *Journal of Interventional Psychology*, *Vol. 6 No.*

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