

## Factors influencing the occurrence of infertility in pregnant women in Sriamur Village in 2023

Lenny Irmawaty Sirait<sup>1</sup>, Annisa Triani<sup>2</sup>, Wiwit Desi Intarti<sup>3</sup>

<sup>1,2</sup> Program Studi Sarjana Kebidanan, Sekolah Tinggi Ilmu Kesehatan Medistra Indonesia, Jakarta, Indonesia

<sup>3</sup> Program Studi Kebidanan Pendidikan Profesi Bidan, Sekolah Tinggi Ilmu Kesehatan Medistra Indonesia, Jakarta, Indonesia

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### ABSTRACT

The study conducted in Sriamur Village, Tambun Utara District in 2023 aimed to investigate factors influencing infertility among women of reproductive age (PUS). Infertility, defined as the inability to conceive after one year of unprotected intercourse or inability to carry a pregnancy to term, was examined in relation to age, lifestyle, BMI, stress, and menstrual disorders. Using quantitative cross-sectional research, the study analyzed data from 16 infertile PUS using a total sampling technique. The results indicated significant relationships between several factors and infertility. Regarding age, both husbands and wives showed no statistically significant relationship. Similarly, lifestyle, BMI, stress, and menstrual disorders exhibited no significant association with infertility among both husbands and wives. However, the study concluded that there was a relationship between age, lifestyle, BMI, stress, and menstrual disorders with the occurrence of infertility among PUS in the study area. This research contributes valuable insights into understanding the multifactorial nature of infertility and highlights the importance of addressing various aspects such as lifestyle choices, stress management, and menstrual health in the context of reproductive health. By identifying these factors, healthcare professionals can develop targeted interventions and support strategies to help individuals facing infertility in Sriamur Village and similar communities.

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### Corresponding Author:

Lenny Irmawaty Sirait,

Program Studi Sarjana Kebidanan,

Sekolah Tinggi Ilmu Kesehatan Medistra Indonesia,

Jl. Cut Mutia Raya\_No 88A\_Kelurahan Sepanjang Jaya\_Kecamatan Rawa Lumbu\_Bekasi 17174, Indonesia

Email : franslyadriano@gmail.com

## INTRODUCTION

Infertility or infertility is a condition in which a person cannot conceive naturally or cannot undergo pregnancy completely. Infertility is a condition that shows no fertilization within 1 year after having sexual intercourse without contraceptive protection (Mansour, 2023; Noveriyanti, 2017; Şahiner & Boz, 2022). The clinical definition of infertility used by WHO is a reproductive system problem described by the failure to obtain pregnancy after 12 months or more of sexual

intercourse at least 2-3 times a week regularly without using contraceptives (Barbieri, 2019; Mascarenhas et al., 2012; Messerlian et al., 2013).

The problem of infertility can have a major impact on married couples who experience it, in addition to causing medical problems, infertility can also cause economic and psychological problems (Araoye, 2003; Cousineau & Domar, 2007; Hasanpoor-Azghdy et al., 2014). Broadly speaking, couples who experience infertility will undergo a long process of evaluation and treatment, where this process can be a physical and psychological burden for infertility couples (Baca, n.d.; INDONESIA & INDONESIA, n.d.; Indonesia, 2015). Factors associated with the incidence of infertility are age, stress, smoking, health problems that cause hormonal changes, ovulation problems (Concepción-Zavaleta et al., 2023; Deyhoul et al., 2017; Moridi et al., 2019). Some signs that women do not ovulate usually include irregular or absent menstruation caused by several things such as Polycystic Ovarian Syndrome (PCOS), which is a problem of hormonal discontinuity that can interfere with normal ovulation, and obstacles to the fallopian tubes due to pelvic inflammatory disease, endometriosis, or surgical removal of an ectopic pregnancy (Fitria, 2016; Liu et al., 2024).

This study aims to determine the factors that influence the occurrence of infertility in PUS in Sriamur Village, North Tambun Subdistrict in 2023. This research is expected to be used as basic data for further research for the benefit of developing knowledge and broadening the horizons for researchers in the field of health science in general, factors that affect infertility in PUS. The novelty of this research with previous research is from the method, research design, population, sample, and sampling technique. The hypothesis in this study is  $H_0$ : There is no relationship between Age, Lifestyle, Weight, Stress, and Reproductive System Disorders that Affect Infertility in PUS.  $H_a$ : There is a relationship between Age, Lifestyle, Weight, Stress, and Reproductive System Disorders that Affect Infertility in PUS. In this study, the independent variables are: influencing factors, and the dependent variable is: infertility in PUS.

## RESEARCH METHOD

The research method to be carried out is Quantitative. The research design is a descriptive analytic survey with a cross sectional research design, which aims to determine the factors that influence the occurrence of infertility in PUS in Sriamur Village. Population In this study, the population in this study were all infertile PUS in Sriamur Village, Tambun Utara sub-district as many as 16 infertile couples of childbearing age. The sample to be taken in this study is Total Sampling. How to take samples using Total Sampling technique in this case means that the population is used as a sample. In research, sample criteria include inclusion criteria.

Age For age questions in this study, using age groupings consisting of <20 years, 20-35 years, and >35 years. Lifestyle For lifestyle questionnaire questions in this study using a Likert scale questionnaire to determine the daily lifestyle attitudes of respondents. This questionnaire consists of 10 questions about the respondent's daily lifestyle attitude. IMT To find out the BMI in this study, the researcher measured the respondent's weight and height using a measuring instrument, after obtaining the respondent's weight and height, the researcher calculated the respondent's BMI with the formula  $BMI = \frac{\text{Body Weight (kg)}}{[\text{Body Height (m)} \times \text{Body Height (m)}}$ . After obtaining the respondent's BMI, the results are included in the thin grouping: 17-<18.5, normal: 18.5-25.0, obese: >25-27, and obesity: >27.

Stress To determine the stress scale using the Depression Anxiety Stress Scales (DASS) questionnaire. The questions in this questionnaire consisted of 14 questions. Reproductive System Disorders To determine whether respondents have reproductive system disorders or not in this study using a questionnaire whose questions lead to symptoms of reproductive system disorders which later the results can lead to respondents having reproductive disorders or not.

## RESULTS AND DISCUSSIONS

**Table 1.** Frequency distribution of husband's age

Age	Total	Percentage
<20 Years	0	0%
20-35 Years	14	85,2%
>35 Years	2	14,8%
Total	16	100.0%

Based on table 1 above, it shows that the frequency distribution of the largest age group is in the 20-35 year group as many as 14 people (85.2%) and the least group is the <20 year group as many as 0 people (0%).

**Table 2.** Frequency distribution of wife's age

Age	Total	Percentage
<20 Years	1	6,3%
20-35 Years	13	81,2%
>35 Years	2	12,5%
Total	16	100.0%

Based on table 2 above, it shows that the frequency distribution of the largest age group is in the 20-35 year group as many as 14 people (81.2%) and the least group is the <20 year group as many as 1 person (6.3%).

**Table 3.** Frequency distribution of husband's lifestyle

Lifestyle	Total	Percentage
Less	9	55,7%
Enough	5	31,3%
Good	2	13,2%
Total	16	100.0%

Based on table 3. above shows that the frequency distribution of the largest group lifestyle is in the less group as many as 9 people (55.7%) and the least group is the good group as many as 2 people (13.2%).

**Table 4.** Frequency distribution of wife's lifestyle

Lifestyle	Total	Percentage
Less	3	18,7%
Enough	10	62,6%
Good	3	18,7%
Total	16	100.0%

Based on table 4 above, it shows that the frequency distribution of the largest group lifestyle is in the moderate group as many as 10 people (62.6%) and the least group is the good group as many as 3 people (18.7%).

**Table 5.** Frequency distribution of husband's BMI

78	Total	Percentage
Skinny	2	13,2%
Normal	12	73,6%
Mild Obesity	2	13,2%
Severe Obesity	0	0%
Total	16	100.0%

Based on table 5 above, it shows that the frequency distribution of BMI, the largest group is in the normal group as many as 12 people (73.6%) and the least group is the severely obese group as many as 0 people (0%).

**Table 6.** Frequency distribution of wife's BMI

Body Mass Index	Total	Percentage
Skinny	4	26,3%
Normal	4	26,3%
Mild Obesity	7	41,2%
Severe Obesits	1	6,2%
Total	16	100.0%

Based on table 6 above, it shows that the frequency distribution of BMI in the largest group is in the mild obesity group as many as 7 people (41.2%) and the least group is the severe obesity group as many as 1 person (6.2%).

**Table 7.** Frequency distribution of husband stress

Stress	Total	Percentage
Normal	4	24,5%
Mild	7	44,1%
Severe	5	31,4%
Total	16	100.0%

Based on table 7 above, it shows that the most stress group is the Mild group with a total of 7 people (44.1%.) and the least Heavy with a total of 4 people (24.5%).

**Table 8.** Frequency distribution of wife's stress

Stress	Total	Percentage
Normal	7	43,5%
Mild	5	31,6%
Severe	4	24,9%
Total	16	100.0%

Based on table 8 above, it shows that the most stress group is the Normal group with a total of 7 people (43.5%.) and the least is Severe with a total of 4 people (24.9%).

**Table 9.** Frequency distribution of menstrual disorders

Menstrual Disorders	Total	Percentage
No	9	56,2%
Yes	7	43,8%
Total	16	100.0%

Based on table 9 above, it shows that the most mentrusasi disorder group is the never group with a total of 9 people (56.2%.) and the least is sometimes with a total of 7 people (43.8%).

**Table 10.** Relationship between husband's age factor and infertility incidence

Age	Infertility				Total	P Value
	Yes		No			
	N	%	N	%		
<20 Years	0	0	0	0	0	0,019
20-35 Years	7	42,6	7	42,6	14	
>35 Years	2	14,8	0	0	2	
Total	9	57,4	7	42,6	16	

Based on table 10 above shows that the relationship between age and infertility is obtained with a p-value  $<0.05$  (0.019) which means that  $H_0$  is rejected, which means that there is a relationship between age and the incidence of infertility.

**Table 11.** Relationship between wife's age and infertility incidence

Age	Infertility				Total	P Value
	Yes		No			
	N	%	N	%		
<20 Years	0	0	1	6,3	1	6,3
20-35 Years	8	50,2	5	31	13	81,2
>35 Years	2	12,5	0	0	2	12,5
Total	10	62,7	6	37,3	16	100

Based on table 11 above, it shows that the relationship between age and infertility is obtained with a p-value  $<0.05$  (0.021), which means that  $H_0$  is rejected, which means that there is an association between age and the incidence of infertility.

**Table 12.** Relationship between lifestyle factors and the incidence of infertility

Lifestyle	Infertility				Total	P Value
	Yes		No			
	N	%	N	%		
Good	1	6,6	1	6,6	2	13,2
Fair	2	12,55	3	18,68	5	31,3
Lack	7	43,28	2	12,29	9	55,7
Total	10	62,38	6	37,74	16	100

Based on table 12 above, it shows that the relationship between lifestyle and infertility is obtained with a p-value  $<0.05$  (0.015), which means that  $H_0$  is rejected, which means that there is a relationship between lifestyle and the incidence of infertility.

**Table 13.** Relationship between wife's lifestyle factors and the incidence of infertility

Lifestyle	Infertility				Total	P Value
	Yes		No			
	N	%	N	%		
Good	2	12,4	1	6,2	3	18,7
Fair	4	25,06	6	37,56	10	62,6
Lack	1	6,2	2	12,4	3	18,7
Total	7	43,64	9	56,16	16	100

Based on table 13 above, it shows that the relationship between lifestyle and infertility is obtained with a p-value  $<0.05$  (0.018), which means that  $H_0$  is rejected, which means that there is a relationship between lifestyle and the incidence of infertility.

**Table 14.** Relationship between husband's BMI factor and infertility incidence

IMT	Infertility				Total	P Value
	Yes		No			
	N	%	N	%		
Skinny	0	0	2	13,2	2	13,2
Normal	7	42,7	5	36,7	12	73,6
Mild Obesity	1	6,6	1	6,6	2	13,2
Severe Obesity	0	0	0	0	0	0
Total	8		8		16	100

Based on table 14 above, it shows that the relationship between BMI and infertility is obtained with a p-value <0.05 (0.027), which means that H0 is rejected, which means that there is a relationship between BMI and the incidence of infertility.

**Table 15.** Relationship between wife's BMI factor and infertility incidence

IMT	Infertility				Total	P Value
	Yes		No			
	N	%	N	%		
Skinny	1	6,8	3	19,5	4	0,029
Normal	2	13,2	2	13,1	4	
Mild Obesity	4	23,7	3	17,5	7	
Severe Obesity	1	6,2	0	0	1	
Total	4	49,9	8	50,1	16	

Based on table 15 above, it shows that the relationship between BMI and infertility is obtained with a p-value <0.05 (0.029), which means that H0 is rejected, which means that there is a relationship between BMI and the incidence of infertility.

**Table 16.** Relationship between husband stress factor and infertility incidence

Stres	Infertility				Total	P Value
	Yes		No			
	N	%	N	%		
Normal	1	6,1	3	18,4	4	0,049
Mild	5	31,5	2	12,6	7	
Heavy	4	25,2	1	6,2	5	
Total	10	62,8	6	37,2	16	

Based on table 16 above, it shows that the relationship between stress and infertility is obtained with a p-value <0.05 (0.049), which means that H0 is rejected, which means that there is an association between stress and infertility.

**Table 17.** Relationship between wife's stress factor and the incidence of infertility

Stres	Infertility				Total	P Value
	Yes		No			
	N	%	N	%		
Normal	3	18,6	4	24,9	7	0,046
Mild	4	20,9	2	10,7	6	
Heavy	1	8,3	2	16,6	3	
Total	8	47,8	8	52,2	16	

Based on table 17 above, it shows that the relationship between stress and infertility is obtained with a p-value <0.05 (0.046), which means that H0 is rejected, which means that there is an association between stress and the incidence of infertility.

**Table 18.** Relationship between Menstrual Disturbance Factors and Infertility incidence

Menstrual Disorders	Infertility				Total	P Value
	Yes		No			
	N	%	N	%		
Yes	7	42,7	0	0	7	0,015
No	0	0	9	57,3	9	
Total	7	42,7	9	57,3	16	

Based on table 18 above, it shows that the relationship between menstrual disorders and infertility is obtained with a p-value <0.05 (0.015), which means that H0 is rejected, which means that there is an association between menstrual disorders and the incidence of infertility.

## Discussion

### Relationship between Husband's Age Factor and Infertility

The relationship between the husband's age factor and the incidence of infertility is when the husband has entered fertility since the beginning of puberty, characterized by the ability of men to ejaculate sperm. Although men can fertilize until the end of their lives, the function of the reproductive organs has begun to decline above 25 years. Male fertility begins at the beginning of puberty where the process of spermatogenesis has occurred which is usually characterized by the ability of men to ejaculate sperm, in Indonesia the average puberty age is at the age of 12 years, and the stability of male reproductive organ growth is achieved at the age of 20 to 25 years. Although men can fertilize until the end of their lives, the function of the reproductive organs has begun to decline above 25 years.

Although men continue to produce sperm throughout their lives, their sperm morphology begins to decline. Research reveals that only one-third of men over 40 years old are able to impregnate their wives within 6 months compared to men under 25 years old. In addition, older age also affects sperm quality.

### Relationship between Wife's Age Factor and Infertility

The age factor is very influential on the fertility of the wife because as she gets older, the ability of the ovaries will decrease and changes in hormone balance begin to occur so that a woman's chance of getting pregnant decreases. With age, the conception rate decreases as a result of a decrease in the quality and number of ovum. This results in the chance of getting pregnant decreasing by 3% - 5% per year after the age of 30 years and will be greater after the age of 40 years.

The results of this study are in accordance with the theory of Crawford, Natalie M (2015) which states that infertility can occur due to age, the age factor is very influential on a woman's fertility along with increasing age, the ability of the ovaries will decrease and changes in hormone balance begin to occur so that a woman's chance of getting pregnant decreases.

Explanation of the results of the study, linked to the results of previous studies, critically analyzed and linked to the latest relevant literature (the maximum number of pp is 30-40% of the entire manuscript). The discussion section gives substantial meaning to the results of the analysis and comparisons with previous findings based on relevant, up-to-date and primary literature review results. The comparison should lead to differences with previous research findings so that it has the potential to state a contribution to the development of science.

### Relationship between Husband's Lifestyle Factors and the Incidence of Inertility

Husband's lifestyle factors affect the occurrence of infertility due to heavy exercise behavior, cigarette and alcohol content which has a risk of infertility in men. This is in line with research conducted by Sharma, Rakesh (2013) which concluded that there is a relationship between heavy exercise and infertility, in the study it was stated that of the 43 samples involved in it 56.1% with heavy exercise behavior experienced infertility and as many as 43.9% of respondents with light exercise behavior experienced infertility while based on the odds ratio it was concluded that heavy exercise behavior had a risk of infertility 2.752 times greater than light exercise habits.

The content of cigarettes on men The content of harmful chemicals in cigarettes is known as a class of reactive oxygen species (ROS). ROS is commonly known as oxidants or free radical substances. ROS can damage reproductive tissue cells by modifying DNA bases which will cause lesions in DNA which ultimately trigger cell apoptosis, reduce the diameter of seminiferous tubules, decrease the number of Leydig cells and sertoli cells which interfere with the process of spermatogenesis so that it affects the concentration, morphology and motility of sperm cells.

Consuming alcoholic beverages in excess or in the long term can damage the body's organs, including the reproductive organs. In addition to directly disrupting the male reproductive

organs, alcohol also causes disorders of the hypothalamus and anterior pituitary system which cause impotence, infertility and secondary sexual characteristics.

#### **Relationship between Wife's Lifestyle Factors and Infertility Incidence**

Wife's lifestyle factors affect the occurrence of infertility due to heavy exercise behavior, cigarette and alcohol content which has a risk of infertility in women. This is in line with research conducted by Sharma, Rakesh (2013) which concluded that there is a relationship between heavy exercise and the occurrence of infertility, in the research it was stated that of the 43 samples involved in it 56.1% with heavy exercise behavior experienced infertility and as many as 43.9% of respondents with light exercise behavior experienced infertility while based on the odds ratio it was concluded that heavy exercise behavior had a risk of infertility 2.752 times greater than light exercise habits.

From the content of cigarettes to women The content of harmful chemicals in cigarettes is known as a class of reactive oxygen species (ROS). ROS is commonly known as oxidants or free radical substances. ROS can damage reproductive tissue cells by modifying DNA bases which will cause lesions in DNA which in turn trigger the ovaries to age faster and deplete the number of eggs prematurely, making it difficult for pregnancy to occur. Consuming alcoholic beverages in excess or in the long term can damage the body's organs, including reproductive organs. Women who often drink alcoholic beverages are also more at risk of ovulation disorders and endometritis. Side effects of drugs, especially drugs used in the long term or high doses can interfere with ovulation and egg reproduction.

#### **Relationship between Husband's BMI Factor and Infertility Incidence**

The relationship between BMI and fertility in men has not been studied in detail. The frequency of obesity in women with anovulation and polycystic ovaries has been reported to range from 35% to 60%. Obesity is associated with three changes that interfere with normal ovulation and weight loss will improve these three conditions: decreased peripheral aromatization of androgens to estrogen, decreased levels of sex hormone binding globulin (sex hormone), hormone binding globulin (SHBG), resulting in increased levels of estradiol and free testosterone so that it can affect fertility.

#### **Relationship between Wife's BMI Factor and Infertility Incidence**

Women with excessive body weight often experience ovulation disorders, because excess weight can affect estrogen in the body and reduce the ability to conceive. Changes in body mass are known to have an influence on the occurrence of infertility. The amount of body fat leads to increased production of estrogen which the body interprets as a contraceptive, thus reducing the chance of getting pregnant (Singh et al., 2021). A study mentioned that body mass index (BMI)  $\geq$  29.5 is associated with 15 increased risk of infertility (Bolúmar et al., 2000; Provost et al., 2016; Wang et al., 2021).

According to Diarly, M (2016), obesity can cause infertility because women of reproductive age with BMI (body mass index) of more than 25 can cause Polycystic Ovary (PCO) (Misnadiarly, 2007). In women with PCO, there is no single egg sac that has an optimal size. As a result, the eggs inside never mature and the hormonal disturbances that occur cause the eggs to not be able to rupture. Obesity is associated with three damages that can affect ovulation, increased aromatization of androgens into estrogen in the periphery, decreased SHBG sex levels, so significantly infertility can be caused by obesity due to anovulation, which is the main effect responsible for failure to obtain pregnancy (Diarly, 2016; Salam, 2010).

#### **Relationship between Husband Stress Factor and Infertility Incidence**

Stress in men can affect the production of the hormone testosterone and affect sperm quality. stress can be triggered by various things, for example heat stress on the testicles which is known to cause an increase in temperature in the testicles ranging from pants that are too tight,

intense pedaling exercise. Stress due to psychological factors is also said to affect sperm quality, as reported by researcher Hidayah, Nurul (2007).

#### **Relationship between Wife's Stress Factor and Infertility Incidence**

Stress in women can affect communication between the brain, pituitary, and ovaries. Stress can trigger the release of the hormone cortisol which affects the regulation of reproductive hormones. Stress affects the maturation of egg maturation in the ovaries. During stress, there is a change in neurochemicals in the body that can alter egg maturation and release. For example, when women are under stress, spasms may occur in the fallopian tubes and uterus, which may affect the movement and implantation of mature eggs (Andrews et al., 1991).

#### **Relationship between Reproductive System Disorder Factors and Infertility Incidence**

Characterized by physical symptoms and mood changes, about 5-12 days before menstruation, and disappear 2 days after menstruation appears. The cause is unknown, but psychological and emotional factors can affect the symptoms that occur, such as emotional symptoms that arise, such as feeling sensitive, anxious, tense, depressed, sleepy, tired, and panic. Dysmenorrhea is thought to be caused by spasms in the uterine muscles due to poor blood flow. Generally, this occurs during periods that release an egg, but sometimes it occurs during periods that do not release an egg, and blood clots in the uterus. The pain occurs when the clotted blood is pushed out of the uterus, causing a spasm-like pain in the lower abdomen (Bang et al., 2013; La Marca & Mastellari, 2020; Vander Borgh & Wyns, 2018).

Amenorrhea is the state of not having menstruation for 3 consecutive months. The classification of the disorder is as follows. Primary amenorrhea occurs when there is no menstruation until the age of 18 years. Secondary Amenorrhea Meanwhile, secondary amenorrhea is when menstruation stops after menarche or has experienced menstruation, but stops consecutively for 3 months. The causes may vary. Basically, because the connection between the hypothalamus, pituitary gland, and uterus is disrupted. For example, due to emotional fluctuations, pregnancy, too much exercise, a strict diet, thyroid gland disorders, or after stopping taking birth control pills. Infrequent periods are generally normal. However, if there is no menstruation for 6 months, and it is not due to pregnancy, it is necessary to see a doctor to find out whether this disorder is caused by a certain disease or not. Heavy periods (Menorrhagia) Heavy periods can be caused by hypertension, thickening of the uterine wall, uterine polyps, or fibroids. This disorder generally resolves after the patient is given progesterone hormone or antiprostaglandin drugs. Irregular periods are caused by cancer of the uterine wall. This can be treated with hormonal treatment, as with other menstrual disorders, but if cancer is present, the doctor may perform curettage.

## **CONCLUSION**

The factors influencing infertility are multifaceted, encompassing both age and lifestyle factors for both husbands and wives. As husbands age, the decline in reproductive organ function and sperm quality becomes evident, while lifestyle habits such as heavy exercise, smoking, and alcohol consumption further exacerbate infertility risks. Similarly, wives experience a decrease in fertility with age, compounded by lifestyle factors like heavy exercise, smoking, and alcohol consumption, which can expedite ovarian aging and disrupt ovulation. Body mass index (BMI) also plays a significant role, with obesity impacting hormone levels and ovulation in both genders. Stress emerges as another influential factor, affecting hormone production and egg maturation in both men and women. Reproductive system disorders such as dysmenorrhea, amenorrhea, and menorrhagia present additional challenges to fertility. However, this review has limitations in the form of a lack of detailed investigation into certain factors, particularly BMI's impact on male fertility. Future research should delve deeper into these areas to provide a more comprehensive

understanding of infertility causes and potential interventions, ultimately aiding in the development of more effective treatment strategies.

## References

- Andrews, F. M., Abbey, A., & Halman, L. J. (1991). Stress from infertility, marriage factors, and subjective well-being of wives and husbands. *Journal of Health and Social Behavior*, 238–253.
- Araoye, M. O. (2003). Epidemiology of infertility: social problems of the infertile couples. *West African Journal of Medicine*, 22(2), 190–196.
- Baca, S. (n.d.). *Mengenal Faktor Risiko Infertilitas*.
- Bang, J. K., Lyu, S. W., Choi, J., Lee, D. R., Yoon, T. K., & Song, S.-H. (2013). Does infertility treatment increase male reproductive tract disorder? *Urology*, 81(3), 644–648.
- Barbieri, R. L. (2019). Female infertility. In *Yen and Jaffe's reproductive endocrinology* (pp. 556–581). Elsevier.
- Bolúmar, F., Olsen, J., Rebagliato, M., Sáez-Lloret, I., Bisanti, L., & Subfecundity, E. S. G. on I. and. (2000). Body mass index and delayed conception: a European Multicenter Study on Infertility and Subfecundity. *American Journal of Epidemiology*, 151(11), 1072–1079.
- Concepción-Zavaleta, M. J., Coronado-Arroyo, J. C., Quiroz-Aldave, J. E., Durand-Vásquez, M. del C., Ildefonso-Najarro, S. P., Rafael-Robles, L. del P., Concepción-Urteaga, L. A., Gamarra-Osorio, E. R., Suárez-Rojas, J., & Paz-Ibarra, J. (2023). Endocrine factors associated with infertility in women: an updated review. *Expert Review of Endocrinology & Metabolism*, 18(5), 399–417.
- Cousineau, T. M., & Domar, A. D. (2007). Psychological impact of infertility. *Best Practice & Research Clinical Obstetrics & Gynaecology*, 21(2), 293–308.
- Crawford, N. M., & Steiner, A. Z. (2015). Age-related infertility. *Obstetrics and Gynecology Clinics*, 42(1), 15–25.
- Deyhoul, N., Mohamaddoost, T., & Hosseini, M. (2017). Infertility-related risk factors: a systematic review. *Int J Womens Health Reprod Sci*, 5(1), 24–29.
- Diarly, M. (2016). Obesitas Sebagai Faktor Risiko Beberapa Penyakit. *Dinas Kesehatan Provinsi Lampung*. (2015). *Data Prevalensi Kejadian Obesitas. Lampung: Dinas Kesehatan Lampung*.
- Fitria, S. (2016). Pengaruh sindrom polistik ovarium terhadap peningkatan faktor risiko infertilitas. *Medical Journal of Lampung University*, 5(2).
- Hasanpoor-Azghdy, S. B., Simbar, M., & Vedadhir, A. (2014). The emotional-psychological consequences of infertility among infertile women seeking treatment: Results of a qualitative study. *Iranian Journal of Reproductive Medicine*, 12(2), 131.
- Hidayah, N. (2007). *Identifikasi dan pengelolaan stres infertilitas*. Universitas Ahmad Dahlan.
- INDONESIA, H. E. R. D. A. N. F., & INDONESIA, P. O. D. A. N. G. (n.d.). *KONSENSUS PENANGANAN INFERTILITAS*.
- Indonesia, I. A. U. (2015). *Panduan Penanganan Infertilitas Pria*. Guidelines on Male Infertility. Jakarta.
- La Marca, A., & Mastellari, E. (2020). Infertility: Epidemiology and etiology. *Female Reproductive Dysfunction*, 211–233.
- Liu, X., Liu, C., & Peng, Y. (2024). New advances in the causes and treatment of ectopic pregnancy: A review. *MEDS Clinical Medicine*, 5(1), 26–31.
- Mansour, H. A. E. (2023). Infertility diagnosis and management. *Beni-Suef University Journal of Basic and Applied Sciences*, 12(1), 81.
- Mascarenhas, M. N., Cheung, H., Mathers, C. D., & Stevens, G. A. (2012). Measuring infertility in populations: constructing a standard definition for use with demographic and reproductive health surveys. *Population Health Metrics*, 10, 1–11.
- Messerlian, C., Maclagan, L., & Basso, O. (2013). Infertility and the risk of adverse pregnancy outcomes: a systematic review and meta-analysis. *Human Reproduction*, 28(1), 125–137.
- Moridi, A., Roozbeh, N., Yaghoobi, H., Soltani, S., Dashti, S., Shahrahmani, N., & Banaei, M. (2019). Etiology and risk factors associated with infertility. *Int J Women's Health Reprod Sci*, 7(3), 346–353.
- Noveriyanti, N. (2017). *FAKTOR RISIKO INFERTILITAS PADA WANITA USIA SUBUR (Studi di Klinik Fertilitas Rumah Sakit Islam Sultan Agung Semarang)*. Universitas Muhammadiyah Semarang.
- Provost, M. P., Acharya, K. S., Acharya, C. R., Yeh, J. S., Steward, R. G., Eaton, J. L., Goldfarb, J. M., & Muasher, S. J. (2016). Pregnancy outcomes decline with increasing body mass index: analysis of 239,127 fresh autologous in vitro fertilization cycles from the 2008–2010 Society for Assisted Reproductive Technology registry. *Fertility and Sterility*, 105(3), 663–669.
- Şahiner, E., & Boz, I. (2022). Experiences of women undergoing infertility treatment from embryo transfer

- until pregnancy test and their conceptualization of their embryo. *Journal of Psychosomatic Obstetrics & Gynecology*, 43(2), 153–164.
- Salam, A. (2010). *Faktor risiko kejadian obesitas pada remaja*. Hasanuddin University.
- Sharma, R., Biedenharn, K. R., Fedor, J. M., & Agarwal, A. (2013). Lifestyle factors and reproductive health: taking control of your fertility. *Reproductive Biology and Endocrinology*, 11(1), 1–15.
- Singh, P., Covassin, N., Marlatt, K., Gadde, K. M., & Heymsfield, S. B. (2021). Obesity, body composition, and sex hormones: implications for cardiovascular risk. *Comprehensive Physiology*, 12(1), 2949.
- Vander Borgh, M., & Wyns, C. (2018). Fertility and infertility: Definition and epidemiology. *Clinical Biochemistry*, 62, 2–10.
- Wang, S., Sun, J., Wang, J., Ping, Z., & Liu, L. (2021). Does obesity based on body mass index affect semen quality?—a meta-analysis and systematic review from the general population rather than the infertile population. *Andrologia*, 53(7), e14099.