



# In Vitro Fertilization in Central Java: Analysis of Influential Factor X Hospital

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<p><b>Track Record Article</b></p> <p>Accepted: 04 March 2024 Revised: 11 March 2024 Published: 26 March 2024</p> <p><b>How to cite :</b> Prabandani, Ayu, D., Winarni, S., &amp; Arso, Pawelas, S. (2024). In Vitro Fertilization in Central Java: Analysis of Influential Factor X Hospital. <i>Contagion: Scientific Periodical Journal of Public Health and Coastal Health</i>, 6(1), 562-574.</p>	<p style="text-align: center;"><b>Abstract</b></p> <p><i>The low utilization of IVF services can be caused by various factors influencing a person's perspective. People will consider various internal and external factors when using IVF services. The purpose of this study is to analyze the factors that influence the utilization of IVF services, as well as the development of marketing strategies and relevant marketing recommendations on IVF services at Hospital X of Central Java Province. The type of research used in this study is quantitative, with the data collection implementation using descriptive analytics and a logistic regression approach. Sampling in this study was carried out using a purposive sampling technique, with a sample size of 100 respondents. With logistic regression test results obtained. Results where service facilities (<math>p=0.001</math>), specialized health workers (<math>p=0.001</math>), fear of infertility (<math>p=0.001</math>), seriousness of infertility disease (<math>p=0.028</math>), benefits of undergoing IVF (<math>p=0.001</math>), quality of IVF services (<math>p=0.001</math>), cost (<math>p=0.001</math>), and introduction to IVF services (<math>p=0.001</math>). 001) These results indicate that the variables of predisposition, enabler, need, perceived benefits, perceived barriers, product, price, and promotion have a positive and significant effect on the utilization of IVF services at Hospital X in Central Java Province, only the variable of perceived severity is the only variable known to have no significant effect on the utilization of IVF services. This study shows that the problem of infertility is not a serious thing, so it is hoped that further research will strengthen the promotion of IVF so that people who experience infertility problems can be the initial service as a development of marketing strategies and relevant marketing recommendations for IVF services at X hospital.</i></p> <p><b>Keywords:</b> <i>In vitro fertilization, Infertility, Quality, Service</i></p>
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## INTRODUCTION

Advances in science and technology have provided various developments, including in the field of assisted reproduction services. This is one way out for married couples who cannot have children naturally by means of in vitro fertilization (IVF) (Fritz et al., 2020). In vitro fertilization is a fertilization technique where the egg cell or ovum is fertilized outside. In vitro fertilization services at a hospital have several aspects, including insemination, ovum pick up, embryo transfer, embryo freezing, sperm analysis, micro tesa, sperm freezing, PESA and varicocele (Gardner et al., 2017).

In vitro fertilization services have become a necessity for people to receive treatment for fertility disorders. IVF (In Vitro Fertilization) services have been widely used in various Southeast Asian countries such as Thailand, Malaysia, Vietnam and Indonesia (As' Adi et al.,

2021). The need for IVF services in Indonesia is low, namely 2.8% in 2021 and 3.6% in 2022. This is supported by the quality of IVF services in Indonesia which is considered not good and the costs are high. Health services themselves are assessed by the community based on the quality of human resources and adequate facilities at the hospital (Dewi et al., 2023).

In Vitro Fertilization service utilization is one form of a person's behavior to get health aspects, namely offspring through in vitro fertilization services. This is in accordance with the health belief model theory which is a concept that reveals the reasons for individuals to want or not want to perform healthy behavior (Lolonlun et al., 2023).

There are internal factors such as patient beliefs, encouragement from motivation, and so on. External factors can arise from desires or encouragement from the family (Khowaja et al., 2010). In vitro fertilization services at Hospital X, which have the support of human resources such as doctors and nurses and flexible facilities, can become a brand image to provide a good and trusted view by the community (Wirastuti et al., 2020). Health services will be more trusted by the community if they have a good track record in serving the community, especially in vitro fertilization services (Patrizio et al., 2022).

Research Wu et al., (2021) which explains that the quality of health services is also determined by the strategy used by the brand or hospital in favor of various positive values of the services provided. Research Guzman et al., (2023) explained that the needs of the community related to in vitro fertilization services contained in hospital agencies are quite increasing, because it can help overcome fertility problems that are often found in married couples who are difficult to get offspring.

The low utilization of IVF services at RS X exacerbates the deficit situation that has been experienced by hospital management. In this case, related to the gap in previous research on factors affecting the utilization of in vitro fertilization (IVF) services at X Hospital in Central Java Province, these factors are the main topics of discussion that are important to know in terms of utilization of in vitro fertilization health services, as mentioned in Andersen's theory, Resenstock's theory and Kotler's theory that the factors that influence utilization are starting from age, education level, belief in healing, knowledge of health service information, number of health service facilities, number of health workers, the amount of fear of disease, doctor's diagnosis, seriousness and complications of the disease, the impact of the disease, introduction to health services to the cost of health services. Because of these conditions, researchers are interested in conducting research related to the utilization of IVF services, with the title "Factors Affecting the Utilization of In vitro fertilization Services at X Hospital, Central Java Province".

## METHODS

The type of research used in this study is quantitative research with a cross sectional approach. This study aims to determine the relationship between factors that influence the utilization of in vitro fertilization services. This research was conducted at X Hospital in Central Java Province, the research time was carried out from July to August 2023.

The population in this study were Obgyn poly outpatients with infertility diagnoses from 2021 to 2023, totaling 2.689 patients and patients who underwent in vitro fertilization services from 2021 to April 2023 at X Hospital, Central Java Province, totaling 363 patients, with a total of 3.052 patients. Sampling in this study was carried out using purposive sampling technique. The sample calculation for this study used the Slovin formula so that the research sample was obtained as many as 97 patients.

Inclusion criteria for the research sample were patients of childbearing age at the Gynecology Specialist Polyclinic at X Hospital in Central Java Province who were diagnosed as infertile by a Gynecologist and had supporting examination results that showed an indication of the need for IVF, patients who participated in in vitro fertilization services at X Hospital in Central Java Province starting with drug stimulation in the first or second menstruation and were willing to become respondents. While the exclusion criteria are patients who stop running in vitro fertilization services at X Hospital in Central Java Province, and patients who move to other hospitals.

Data collection methods in this study are interview guidelines, observation or questionnaires containing a list of questions that have been prepared about questions about IVF service facilities, IVF special health workers, fear of infertility, seriousness of infertile disease, benefits of undergoing IVF, fear of IVF procedures, IVF service quality, IVF service costs, IVF service introduction and In Vitro Fertilization service utilization.

Independent variables in this study are experience of IVF utilization, specialized health workers, acuity in infertility, seriousness of infertile disease, benefits of undergoing IVF services, fear of IVF procedures, quality of IVF services, cost of IVF services, introduction to IVF services. And the Dependent variable in this study is the utilization of In Vitro Fertilization services.

Data analysis with descriptive univariate analysis to determine the distribution and percentage of research variables. Bivariate analysis with Chi Square test to determine the interaction or meaning of two variables in the form of comparative, associative or correlative. And multivariate analysis with logistic regression test was conducted to determine the

relationship of more than one independent variable with one dependent variable. Data processing in this study using SPSS version 20 computer software. This study has received approval from the health research ethics commission of the Faculty of Public Health, Diponegoro University with Number 469/EA/KEPK-FKM/2023.

## RESULTS

The respondents in this study were OB-GYN Polyclinic patients at Hospital The characteristics of the respondents are presented in **Table 1**. The majority of respondents were <35 years old (75%), female (100%), and had advanced education (100%). This indicates that patients diagnosed with infertility at Hospital In Vitro Fertilization service procedures at Hospital X, Jawa Tengah Province.

**Table 1. Characteristics of respondents**

Variable	n	%
Age, years old		
> 35	25	25.0
< 35	75	75.0
Sex		
Female	100	100
Male	0	0
Education		
Higer	100	100
Primary	0	0
IVF service facilities		
Low	59	59.0
Good		41.0
Specialized health workers		
Low	50	50.0
Good	50	50.0
Fear of infertility		
Yes	51	51.0
No	49	49.0
The level of seriousness of infertile disease		
Yes	30	30.0
No	70	70.0
Benefits of undergoing IVF		
Low	50	50.0
Good	50	50.0
Fear of IVF		
Yes	58	58.0
No	42	42.0
Quality of IVF services		
Low	51	51.0
Good	49	49.0
Cost of IVF services		
Affordable	22	22.0
Unreachable	78	78.0
Introduction of IVF services		
Low	72	72.0

Variable	n	%
Good	28	28.0
Utilization of IVF services		
Low	55	55.0
Good	45	45.0

\* Source: Primary Data, 2024

As many as 59.0% of respondents stated that IVF service facilities were lacking, 50.0% stated there was a lack of specialized health personnel, 51.0% of respondents expressed fear of infertility, 70.0% of respondents had infertility problems that were not too serious, 50.0 % of respondents stated that they felt the benefits of undergoing IVF, 51.0% of respondents indicated that the quality of IVF services was lacking, 78.0% of respondents stated that the costs spent were unaffordable, 72.0% stated that the introduction of IVF services was insufficient, and 55.0% stated that utilization of IVF services was underutilized. The factors that influence the use of IVF are presented in **Table 2**.

**Table 2. Factors influencing utilization of IVF facilities**

Variable	Utilization of IVF Services				P-Value
	Yes		No		
	n	%	n	%	
<b>IVF service facilities</b>					
Low	13	22	46	78	<b>0.001</b>
Good	32	78	9	22	
<b>Specialized health workers</b>					
Low	5	10	45	90	<b>0.001</b>
Good	40	80	10	20	
<b>Fear of infertility</b>					
Yes	14	27.5	37	72.5	<b>0.001</b>
No	31	63.3	18	36.7	
<b>The level of seriousness of infertile disease</b>					
Yes	26	37.1	44	62.9	<b>0.028</b>
No	19	63.3	11	36.7	
<b>Benefits of undergoing IVF</b>					
Low	6	12	44	88	<b>0.001</b>
Good	39	78	11	22	
<b>Fear of IVF</b>					
Yes	27	46.6	31	53.4	<b>0.714</b>
No	18	42.9	24	57.1	
<b>Quality of IVF services</b>					
Low	6	11.8	45	88.2	<b>0.001</b>
Good	39	79.6	10	20.4	
<b>Cost of IVF services</b>					
Affordable	27	34.6	51	65.4	<b>0.001</b>
Unreachable	18	81.8	4	18.2	
<b>Introduction of IVF services</b>					
Low	19	26.4	53	73.6	<b>0.001</b>
Good	26	92.9	2	7.1	

\* Source: Primary Data, 2024

There is a tendency that good IVF facilities, good specialized health personnel, fear of infertility, serious infertility disease, good quality of IVF services, affordable costs, and good introduction of IVF services are associated with higher IVF utilization. Table 2 shows that service facilities ( $p = 0.001$ ), special health workers ( $p = 0.001$ ), fear of infertility ( $p = 0.001$ ), seriousness of infertile disease ( $p = 0.028$ ), benefits of undergoing IVF ( $p = 0.001$ ), quality of IVF services ( $p = 0.001$ ), cost ( $p = 0.001$ ), and introduction of IVF services ( $p = 0.001$ ) influence the utilization of IVF services. Fear of IVF ( $p = 0.714$ ) did not significantly influence the use of IVF services. The results of the multivariate analysis can be seen in **Table 3**.

**Table 3. Multivariate analysis results**

Independent Variable	Significant	Exp (B)	Likelihood	Hosmer and Lemeshow Test (Sig)	Nagelkerke R Square	CI	
						Lower	Upper
Specialized health workers	0.001	66.243				6.029	727.865
Benefits of undergoing IVF	0.008	13.971	36.235	0.086	0.852	1.970	99.087
Quality of IVF services	0.013	10.350				1.630	65.711
Introduction of IVF services	0.042	13.791				1.095	173.655

\* Source: Primary Data, 2024

The results of multivariate tests on the variables of specialized health personnel, the benefits of undergoing IVF, IVF service quality, and the introduction of IVF services affect the utilization of IVF services simultaneously by 85%. If the variable of specialized health personnel is increased, patients who utilize IVF services will increase by 66 times, while if the variable of the benefits of undergoing IVF is increased, patients who are aware of the positive benefits and utilize IVF services will increase by 13.9 times, if the variable of IVF service introduction is increased, the increase in public knowledge about IVF and the increase in patients who utilize IVF services by 13.7 times, and if the variable of IVF service quality is increased, the utilization of IVF services will increase by 10 times. Outside of this study, specialized health workers will have an effect with a range of 6.0 times - 727.8 times, the benefits of undergoing IVF will have an effect with a range of 1.9 times - 99.0 times, the quality

of IVF services will have an effect with a range of 1.6 times - 65.7 times, and the introduction of IVF services will have an effect with a range of 1.0 times - 173.6 times on the utilization of In Vitro Fertilization services.

## **DISCUSSION**

### **Influence of Specialized Health Workers on Utilization of In Vitro Fertilization Services**

This study's results significantly influence specialized health workers' utilizing in vitro fertilization services at X Hospital in Central Java Province. This is evidenced by the logistic regression test results, which show a p-value of 0.001 ( $<0.05$ ). With these results, it can be ascertained that special health workers, in this case, specifically the In Vitro Fertilization service, greatly influence a person's motivation and desire to utilize IVF services at the intended hospital. The special personnel at X Hospital in Central Java Province are complete, ranging from nurses and midwives specially trained in vitro fertilization, andrology specialists who deal with sperm disorders to fertility problems in men, obstetricians with special expertise and the title of fertility consultant. These urology specialists deal with problems of urological system disorders that cause fertility, as well as psychologists who accompany patients when undergoing in vitro fertilization services.

This study is in line with the research results by Rumengan et al., which revealed the influence of health workers on the utilization of health services. In this study, it was stated that an officer's actions in providing health services greatly influenced patients in terms of the recovery of their illness. Good professional behaviour, high scientific abilities, and a fairly good level of empathy and sympathy are special attractions in providing health services to patients; this happens because it can provide psychological strength for patients and foster motivation to take advantage of the services provided as needed by patients (Rumengan et al., 2017)

The results of this study are also in line with the results of research conducted by Pangantih et al., which states that respondents who state that a hospital with the availability of health workers who are less competent and have poor attitudes tend to be less likely to utilize health services in the health service. Respondents who assess the quality of health workers, such as attitudes during service to knowledge and skills well, tend to be 3.1 times more likely to utilize these health services. This study shows a significant relationship between health workers and health service utilization (Irawan & Ainy, 2018).

This study and the two studies above align with the theory of health service utilization put forward by Andersen that the existence of trained and qualified health workers with the ability and competence to provide appropriate, professional, and empathetic care can increase individual confidence in the health service system. The role of health workers in providing information, communication, and education to patients is very important because it can establish a good relationship between health workers and patients to encourage them to utilize health services continuously (Rochim, 2018).

### **Influence of Benefits of Undergoing IVF on In Vitro Fertilization Service Utilization**

This study's results indicate a significant influence between the benefits of IVF and the utilization of In vitro fertilization services at X Hospital, Central Java Province. This is evidenced by the results of the logistic regression test, which shows a p-value of 0.001 ( $<0.005$ ). The results of this study show that the benefits of undergoing IVF at X Hospital influence the utilization of IVF services. This study's results align with research conducted by Desita Sari et al. In this study, it is stated that there is a significant influence between the benefits of undergoing health services and the utilization of these health services. The study also states that individual perceptions of benefits with practice will follow health service activities, and individuals will consider whether these health services are useful and can reduce the threat of disease (Desita Sari et al., 2017). This study is also in line with the health belief model theory put forward by Resenstock that the various efforts available in reducing the threat of disease, or the perceived advantages of taking these health efforts, can increase individual confidence, which can motivate individuals to carry out healthy behaviour can be in the form of preventive behaviour and use of health facilities (Russel & Taylor III, 2017).

This study's results differ from those of research conducted by Wahyu Mila, who stated that there was no significance in the relationship between the benefits of undergoing health services and treatment-seeking behaviour among students. This is because respondents think that the symptoms of pain experienced can be healed by not taking treatment. The study also mentioned that social support from the surrounding environment can act as an aspect that impacts individuals' ability to accept the perceived benefits of undergoing health services, which affects the decision to seek treatment (Febriani, 2019). According to Santoso, (2019), sex selection in IVF (in vitro fertilization) through the Pre-implantation genetic diagnosis method by removing other embryos is not ethically justified, except for medical indications.

The results of this study are also different from research conducted by Violita et al., which states that there is no significant influence between the benefits of services and the utilization of health services. This is due to the respondents' lack of knowledge about



reproductive health, so respondents do not have the motivation to carry out healthy behaviour in the form of prevention and treatment. This study also mentions that many respondents put aside the symptoms of the disease they feel due to their lack of knowledge of the disease and the benefits of healthy behaviour and seeking treatment to utilize health services as they need (Violita & Hadi, 2019). According to Anisah & Rachmawati (2022), in conducting psychological interventions and emotional support to reduce the psychological burden of infertile patients undergoing IVF, counseling is the most widely applied intervention in several infertility service centers in various countries.

### **Effect of IVF Service Quality on In Vitro Fertilization Service Utilization**

This study's results indicate a significant influence between the quality of IVF services and the utilization of In vitro fertilization services at X Hospital, Central Java Province. This is evidenced by the results of the logistic regression test, which shows a p-value of 0.001 ( $<0.05$ ). This confirms that the quality of IVF services at X Hospital in Central Java Province has an important role and influence IVF service utilization. This study's results align with research conducted by Rahma et al., which states the significance of the effect of the service quality product mix on health service utilization. In this study, it is stated that the quality of service products offered can provide decisions for patients in utilizing health services in health services; this is influenced by internal factors, which include experience, current needs, espoused values and expectations, which can also be influenced by external factors, namely product appearance and environmental situations. The quality of service has an important role in attracting people to use it; the more complete and better the service quality, the wider the community can be and the more motivated it is to use it (Rahma & Budi, 2014).

This research is also in line with the marketing management theory put forward by Kotler and Keller, which states that four aspects of the mix must be fulfilled to achieve optimal marketing, one of which is the aspect of the product mix in the form of service quality. The quality of service in a health agency must meet customer expectations, in this case, the community doing treatment. The quality of service in this study can be in the form of completeness of service, completeness of health workers, completeness of tools and the service facilities provided where these health services must be packaged as attractively as possible and become a superior product of a health installation. In this theory, several things need to be considered when managing hospitals: the quality of outpatient services, inpatient care, emergency units, intensive care, pharmacy, nutrition, administrative services, medical records, and so on. However, the quality of outpatient services is the main priority of hospital services (Notoatmodjo, 2014).

This study's results differ from research conducted by Napirah et al., which states that there is no significance in the effect of service quality on service utilization. This is due to the need for more people to visit health services, so people think the services provided could be more optimal. The study states that to measure service quality is to know the perception of the service from the eyes of a patient or consumer, where the patient's perception is very important because patients who are satisfied with the service will comply with treatment and want to come back for treatment (Napirah et al., 2016). This research is also different from that of Amalia et al. The study also revealed the absence of significance of the relationship between service quality and utilization of health services; this occurred because people's perceptions of the need for treatment were higher than the expected quality of service. So that the quality of service that has been obtained does not affect the patient's decision to stop or start treatment at the health service (Sary et al., 2023).

### **Effect of IVF Service Introduction on In Vitro Fertilization Service Utilization**

This study's results indicate a significant influence between the IVF service introduction variable and the utilization of In vitro fertilization services at X Hospital, Central Java Province. This is evidenced by the results of the logistic regression test, which shows a p-value of 0.001 ( $<0.05$ ). With these results, it can be ascertained that the introduction of a health service, in this case, in vitro fertilization services, which is carried out widely and continuously to the public through various promotional media, online and offline media, health education, and so on can provide information to a wider range of people so that it can attract individuals to get to know the services offered and influence these individuals to use them. This study's results align with research conducted by Amalia et al. The study mentioned the relationship between promotional factors, such as introducing the services offered to the wider community and utilizing these health services. Promoting health service introduction is communicating information in the form of content and benefits regarding the health services offered. In the study, respondents mentioned that most got good information about hospital services through family and the surrounding environment and were satisfied when utilizing health services in a hospital. This is due to good communication regarding information on a health service product carried out by all officers in the hospital, especially health workers who directly provide services to patients (Sary et al., 2023). The results of this study are also in line with research conducted by Azizah et al. This study stated that there was a relationship between the promotional mix of service introduction and the utilization of health services at Tugurejo Hospital. Respondents in the study assessed that the promotional mix carried out by Tugurejo Hospital provided easy access to promotional media in the form of official websites, brochures,

pamphlets, and the completeness of information provided by customer service, directions to polyclinics, and facilities for patients to submit suggestions and complaints about the health services obtained (Azizah et al., 2020).

The results of this study and the two studies above are in line with the marketing management theory put forward by Keller & Kotler, that the promotional mix of marketing a product, both goods and services, is an important component in providing information to consumers so that consumers can be motivated to get the goods and services offered, this will affect the income of a business or business so that the production process will continue (Notoatmodjo, 2014).

This study does not align with research conducted by Parendreng et al., who explained otherwise that health service promotion has no relationship with health utilization. This is because patients need to learn about a patient community and activities organized by the hospital for patients. As health service facility agencies, hospitals also need more activities that can bind and motivate people to become health consumers in their hospitals. In a more basic theory expressed by Kotler, this research also mentions that marketers need to check what consumers already know. What consumers buy, where, and when they buy depends on the knowledge relevant to these decisions (Parendreng et al., 2019).

## **CONCLUSIONS**

This study shows that special health workers, the benefits of undergoing IVF, the quality of IVF services, the introduction of IVF services simultaneously have an influence on the utilization of in vitro fertilization services, the variable of special health workers is the most dominant variable affecting the utilization of in vitro fertilization services at X Hospital in Central Java Province.

It is recommended for the Strengthening Hospital in the medical committee and nursing committee as well as the personnel department to find and add health workers who have special skills and have attended training in handling in vitro fertilization. These health workers can be specialist doctors with special expertise in infertility disease consultants, to nurses and midwives who have had in vitro fertilization training certificates. Hospitals can also strengthen the training department to find information related to training on in vitro fertilization that can be attended by nurses or midwives either paid or free. The importance of the need for competent professionals and experts to provide accurate information about in vitro fertilization to patients and the wider community so that patients can have the confidence and motivation to take advantage of in vitro fertilization services. This can also facilitate the marketing department in promoting the introduction of services ranging from costs, completeness of facilities, to in vitro

fertilization procedures, thus supporting the quality of in vitro fertilization services that can be provided by RS X Central Java Province.

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