

Access Barriers of Infertility Services for Urban and Rural Patients

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Abstract: The infertility problem is faced by 15-20% of couples of childbearing age that have an impact on couples social and psychological problems, families and communities. Infertility services in Indonesia are not well distributed and most are in urban areas. The infertility services in rural areas are normally difficult to access. This study aims to detect differences in barriers to access the infertility services in urban and rural communities who seek treatment at IVF Clinic. The study was conducted by quantitative methods using a questionnaire. A total of 130 respondents were divided into two groups each 65 respondents for rural and urban, respectively. The analyzed variables include knowledge, economic status, geography, social culture, psychological, and religious. The data obtained were analyzed by chi-square and multivariate. It was found three out of six significant variables ($p = 0.014$, $p = 0.023$ and $p = 0.005$) in multivariate analysis which are the economic level, geographic location, and socio-cultural with an OR values of 2.606, 3.905, and 5.299, respectively. The economic status in urban areas was higher than rural, geographical barriers in rural areas were more than urban, and socio-cultural barriers with less support in rural compared to urban areas.

1 INTRODUCTION

Infertility is the failure of a partner to get pregnant at least within 12 months of having sex regularly without contraception. Infertility problems can have a major impact on married couples who experience them, in addition to causing medical problems, infertility can also cause economic and psychological problems (HIFERI, 2013). Normally, couples who experience infertility will go through a long process, where this process can be a physical and psychological burden for infertility couples (Irianto, 2014). Fertility or fertility of a person can be influenced by genetics, heredity, and age. The infertility is classified into two types, namely primary and secondary infertilities (Anwar, 2005).

The problem of infertility is not only a gynecological problem, but it becomes a serious health problem because these problems often affect the quality of life, not only on the physical but also have an impact on the psychological, social and economic of the individuals and couples.^{9,10,11}

In the United States, health service gaps also occur in infertility services. High medical costs, barriers to access of services cause problems in getting fertility services. The majority of patients undergoing treatment with the Invitro Fertilization

(IVF) method in the United States pay for themselves because they do not have health insurance that covers IVF costs (Wu et al., 2014). Other factors that contribute to barriers to access of the infertility services are the level of education and knowledge, race, ethnicity, religion, sexual orientation, gender identity, marital status, and conscious or unconscious discrimination (Peterson, 2005; Bennett et al. , 2012; Harzif et al., 2019; Thompson, 2006; Domar et al., 2005).

Harris et al. (2017) and Chin et al. (2017) found that geographical influence on access to infertility services (Harris et al., 2017; Chin et al., 2017). Ho et al. (2017) and Udgiri et al. (2019) found a socio-cultural influence on access to infertility services (Ho et al. 2017; Udgiri et al. 2019). Economic barriers in the form of large income also affect access to infertility services where financial support such as health insurance is needed especially in rural communities with lower economic status (Insogna et al., 2018; Maxwell et al., 2017; Kaur et al., 2018 ; Kunicki et al., 2018). Psychological conditions are also reported to be one of the barriers to access infertility services (Lakatos et al, 2017; Rooney et al, 2018; Omu et al, 2010; Turnip et al, 2020; Wijaya, 2019). Lakatos et al. (2017) and Rooney et al. (2018) reported that symptoms of depression and anxiety in

infertile women were more prominent than fertile women (Lakatos et al., 2017; Rooney et al., 2018).

Various psychological responses appear in couples who are facing infertility problems, including low self-esteem, anger, sadness, jealousy towards other couples who already have children, anxiety, and, finally, depression (Wiweko et al. 2017). Wiweko et al. (2017) found that the distribution of the stress levels in infertile patients in the Yasmin IVF Clinic in Indonesia accounts for 22% of the risk factors for infertility, which are mainly associated with the length of infertility. These symptoms are physical symptoms and interfere with the couple's daily activities (Wiweko et al. 2017).

World Health Organization (WHO) and the United Nations have made reproductive health a global health care priority. Encouragement needs to be given so that all stakeholders are moved to build affordable, safe and effective infertility services (Ethics Committee of the ASRM, 2015). Another problem is that most regions in the world that have high infertility rates find it difficult to access infertility clinics that are rare and expensive, so that most women become less concerned about their future without children (Inhorn et al., 2014). Only about 25% of infertile couples are able to access infertility services both in developed and developing countries (Sadeghi, 2015). The prevalence of infertility according to the WHO is estimated at 8-10%. Most infertile couples exist in developing countries (Ombelet, 2011). The infertility rate in Indonesia ranges from 12-15% or around 3 million couples (Fauziah, 2012). The normal, young aged couples have a 25% chance to conceive after 1 month of unprotected intercourse; 70% of the couple's conceive by 6 months, and 90% of the couples have a probability to conceive by 1 year (Anwar et al., 2016).

Indonesia has 34 fertility clinics that offer a variety of treatment options, but the use of these facilities is still very low. This is reflected in the number of IVF cycles per year in Indonesia which is still very low compared to other countries. The reason is that fertility clinics tend to be centered in big cities, especially in Java, and the distribution of patients and the IVF cycle are not compatible with existing clinics (Ombelet, 2011). Based on the 2017 IDHS, fertility rates in North Sumatra declined from 3% in 2012 to 2.9% in 2017. In other words, infertility rates have increased every year in North Sumatra (BKKBN, 2017). One of the fertility clinics in North Sumatra, the Halim Fertility Center, has also seen an increase in new patient visits each year where the average number of new patient visits each year is 1300 patients. However, the use of existing infertility

clinics is still inadequate and referrals are still low. The referral system from other health providers to fertility service facilities is very influential (Klitzman, 2018).

Several attempts have been made to improve access to infertility services in Indonesia. Bennett et al. (2012) in his research found that there are four keys that must be done to improve access to infertility services in Indonesia, among others, improving education and counseling, improving the referral system, reducing medical costs and equitable fertility service facilities. (Bennett et al., 2012). Harzif et al. (2019) concluded that providing information about infertility services to the community was proven to increase patient acceptance of the treatment to be provided (Harzif et al., 2019). The barriers to access faced by infertility patients to reach the fertility clinic can be different when viewed from the origin of the patient, whether coming from urban or rural areas. The barriers can be various factors such as knowledge, geographical, socio-cultural, religious, economic and psychological barriers.

This study aims to determine various variations of the obstacles faced by urban and rural communities, so that with the results of this study, researchers can map the strategy approach to help infertility patients so they can get offspring. This study is different from previous studies because the samples taken came from patients visiting IVF clinics to find out more clearly the characteristics and influential factors in relation to their visits to IVF clinics so that solutions can be found for more optimal infertility services.

2 METHOD

In this study, data collection was carried out using a closed questionnaire in the form of multiple choices with each question having a choice of 2-5 answers (a total of 42 questions consisting of 5 questions of respondents' identities and 37 questions including knowledge of fertility, economic status, geography, psychological, sociocultural and religious). We have checked the existence of such a questionnaire before designing new questionnaire but we did not find the questionnaire and we designed our own questionnaire about access barriers of infertility services.

The questionnaire consisted of six sections: First, it included personal and demographic data (age, marriage time, education levels, occupations). The second section was concerning women's knowledge of infertility and its management. It consisted of 20 single and multiple response questions about the definition, duration, etiology, and treatment of

infertility. The next section was related to economic status as a barrier to access, which consisted of 4 single questions about monthly income, knowledge of how much infertility treatment cost, financial ability, and hold health insurance to cover their infertility treatment. The fourth section was related to patient's geographical barrier with 5 single questions on accessibility to infertility care which consisted of 4 single questions about knowledge of availability of fertility clinic in North Sumatera, the distance between patients residence and fertility care, availability of transportation to fertility care, and the severity of the transportation field. Then, the fifth section was about a patient's psychological and emotional barriers consist of 3 single questions about fear of infertility treatment, an embarrassment of being infertility couple, the embarrassment of infertility treatment. Finally, the last section was about socio-cultural factors which also consisted of 4 single questions about their beliefs and culture related to infertility treatment, family endorsement for infertility treatment, and gender of the medical provider.

The questionnaire used first tested the validity with Pearson product moment correlation coefficient, called valid if the value is above 0.30. The valid questions continue with the Cronbach's alpha reliability test. (reliable if the value is above 0.619).

The study was conducted at Halim Fertility Center IVF Clinic at Stella Maris Hospital from August until October 2019. The study population was patients from IVF Clinic with an average visit of 1300 patients / year and with total sample was 130 patients. Research samples that meet the inclusion criteria are infertility >1 year, willing to participate as respondents, able to communicate well, physically and mentally. Exclusion criteria are if the questionnaire answers are incomplete where there are 130 respondents who are divided into 2 groups namely urban and rural. The sampling technique used was consecutive sampling, where every new patient who came during the study period was used as a sample. We obtained the ethical clearance from the hospital. Patients who are willing to become respondents are asked to sign a willingness form to participate in the study and are notified that the results of the research will be published later. We performed validity and reliability test to the questionnaire. The validity test was conducted on 20 respondents at Sarah General Hospital Medan and the research tool in the form of researchers conducted interviews directly with patients and read out the research questions listed in the questionnaire. The independent variables of this study were barriers of access to

infertility (knowledge, economy, geographical, psychological, social culture and religious) and dependent variables were urban and rural patients. Bivariate test analysis uses chi-square test for two-parameter data and Kruskal Wallis for data of more than two parameters, while multivariate data analysis to determine correlations uses multiple logistic regression tests. The results are presented in narrative form in accordance with the related theory (figure 1).

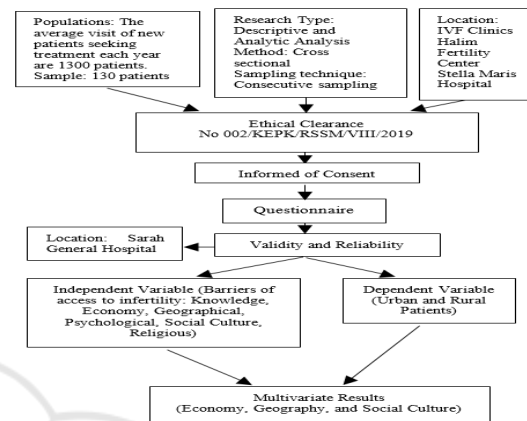


Figure 1. Scheme of Research Process

3 RESULTS AND DISCUSSIONS

3.1 Validity and Reliability Tests

This study uses a questionnaire that has been tested for validity using the Pearson product moment test. Where if $r_{count} > r_{table} > 0.3$ then the question was declared valid. In Table 1, shows from 20 items of knowledge questions obtained 12 valid items and 8 invalid. There were a number of questions for Economic, geography, psychology, social cultural, and religious variables (i.e., 5, 5, 3, 2, and 2, respectively) which all of them were valid. The detail validity tests results for each variable is shown in Table 1, where K is Knowledge; E is Economy; G is Geography; P is Psychology; S is Social Culture; and R is Religious.

Table 1. Validity Test Result of Knowledge, Economics, Geography, Psychology, Social Culture, and Religion.

No	K			No	K			E			G			P			S			R		
	rc	rt	v		rc	rt	v	rc	rt	v	rc	rt	v	rc	rt	v	rc	rt	v	rc	rt	v
1	0.269	0.361	-	11	0.615	0.361	+	0.641	0.361	+	0.724	0.361	+	0.815	0.361	+	0.331	0.361	+	0.649	0.361	+
2	0.374	0.361	+	12	0.396	0.361	+	0.815	0.361	+	0.821	0.361	+	0.526	0.361	+	0.413	0.361	+	0.881	0.361	+
3	0.423	0.361	+	13	0.377	0.361	+	0.375	0.361	+	0.815	0.361	+	0.458	0.361	+						
4	0.268	0.361	-	14	0.480	0.361	+	0.424	0.361	+	0.458	0.361	+									
5	0.261	0.361	-	15	0.284	0.361	-	0.815	0.361	+	0.424	0.361	+									
6	0.154	0.361	-	16	0.451	0.361	+															
7	0.144	0.361	-	17	0.644	0.361	+															
8	0.384	0.361	+	18	0.213	0.361	-															
9	0.375	0.361	+	19	0.488	0.361	+															
10	0.424	0.361	+	20	0.114	0.361	-															

Table 2 is the reliability test results for each observed variable. From Table 2 it can be seen that the results of the reliability test on the questionnaire questions regarding knowledge, economics, geography, psychology, social culture and religious are reliable because the Cronbach Alpha value >0.6.

Table 2. Reliability Test Results of Knowledge, Economics, Geography, Psychology, Social Culture, and Religion.

Variables	Cronbach's Alpha	Qty
Knowledge	0.633	20
Economics	0.691	5
Geography	0.687	5
Psychology	0.676	3
Social Culture	0.667	2
Religious	0.654	2

Figure 2 shows the results of variable data from 130 respondents (urban: 1-65 and rural: 66-130). The X-axis is the number of scores and the Y-axis is the number of respondents. Light blue, orange, gray, yellow, dark blue, and green colors are the variables of knowledge, economic status, geography, psychology, social culture, and religion with less, low, there are obstacles, worries, less supportive, and conflicting variables if scores ≤ 9, ≤6, ≤ 13, ≤4, ≤3, and ≤3, respectively, and vice versa if the score is greater.

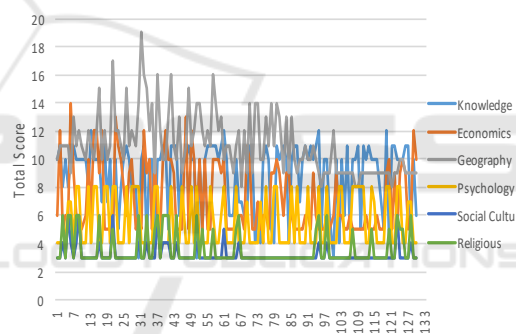


Figure 2. Measurement results for 130 respondents for each variable.

3.2 Bivariate Analysis

Table 3 shows the distribution of characteristics of urban and rural respondents. Of the 130 respondents in both the urban and rural groups, the majority of respondents were <35 years old, namely 73.8% and 64.6%; for long time married, urban groups were found 1-3 years as much as 35.4% and rural groups were found >5 years as much as 50.8%. In terms of education characteristics, the majority of urban and rural groups have Bachelor /Magister/ Doctoral degree educations, namely 81.5% and 76.9%, in terms of employment, urban and rural groups have housewives and other jobs as many as 47.7% and 63.1% Working conditions, the majority in the urban and rural groups have leave of 83.1% and 75.4%.

Table 3. Distribution of Characteristics of Urban and Rural Respondents.

Characteristics	Urban		Rural	
	n (65)	% (100)	n (65)	% (100)
Age (years)				
< 35	48	73.8	42	64.6
≥ 35	17	26.2	23	35.4
Marriage time				
< 1	5	7.7	6	9.2
1-3	23	35.4	17	26.2
4-5	15	23.1	9	13.8
> 5	22	33.8	33	50.8
Educations				
Junior&High School	12	18.5	15	23.1
Bachelor/Magister/ Doctoral Degree	53	81.5	50	76.9
Occupation				
Private	28	43.1	14	21.5
Official Government	6	9.2	10	15.4
House wive&Others	31	47.7	41	63.1

Factors affecting access to infertility services in this study are the level of knowledge, economic, geographical, psychological / emotional, socio-cultural, and religious levels (Table 4). Based on the level of knowledge of respondents obtained the results of statistical tests using the Chi Square test there were no significant differences in the level of knowledge of urban and rural groups ($p = 0.453$). Based on the perspective level of the knowledge about the fertility of the two groups does not have a significant difference, on average have enough good knowledge. This can be explained because the samples taken were patients who come for treatment at IVF clinics, which in general have already done a lot of searching information and knowledge both from the internet, social media, as well as by word of mouth and the internet has been able to reach remote areas, so rural communities also easily access information and knowledge about fertility. This is different with Harzif et al. (2019) found that populations in urban and rural areas have misperceptions about infertility, negative behavior and inadequate knowledge. This might be due to differences in the sample of patients taken and the types of questions given in the questionnaire which may have different weights (Harzif et al., 2019). The study took samples from populations directly in villages and cities and not those who came to the IVF clinic.

The rural group had a lower economic level of 70.8% compared to the urban group of 49.2%. Statistical test results at the economic level found significant differences between urban and rural groups ($p=0.012$). The level of income in the rural group was significantly lower than in urban areas, it

is understandable that usually the rich live more in cities. Of course, this economic ability influences access to fertility treatment which is quite expensive.

In the rural group (92.3%) more expressed geographical barriers compared to the urban group (76.9%). From the statistical test results obtained a significant difference in geographical factors between urban and rural groups ($p=0.015$). When viewed from geographical barriers, it clearly shows groups especially those far from the center overcoming fertility will experience difficulties. Fertility treatment requires repeated visits and requires a significant amount of time. This will also affect the level of employment, economy and costs.

In psychological / emotional factors, both rural and urban, groups that experienced more feelings of worry than those who were not worried were rural as much as 61.5% and urban as much as 60%. But from the results of statistical tests there were no significant differences at the psychological / emotional level between urban and rural groups ($p=0.857$). Basically a person has a feeling of shame or worry about fertility conditions, especially when under pressure from family, neighborhood or work environment. The diagnosis of infertility can be a tremendous burden on patients. The pain and suffering of infertility patients is a major problem. Patients should be counseled and supported when they undergo treatment (Lakatos et al., 2017; Rooney et al., 2018). The burden of the mind makes someone feel worried and maybe even stressed in doing fertility treatments.

From the socio-cultural perspective, it was seen in the rural and urban groups that more complained that they experienced obstacles, namely 92.3% and 75.4%, respectively. Statistical test results on socio-cultural factors found significant differences in socio-culture between urban and rural groups ($p = 0.009$). In rural groups more than urban areas, the level of public trust in fertility services was still lacking, there were still some worried that later offspring will not be produced from their flesh and blood because they were afraid of using other people's gamete cells. Moreover, there was public trust in fertility services was still lacking, there were still some worried that later offspring will not be produced from their flesh and blood because they were afraid of using other people's gamete cells. Moreover, there was public trust in raising infertility as karma due to errors made by his family.

In the rural group about 83.1% who stated contrary to religious while the urban group as much as 70.8%. From the results of statistical tests, no significant differences were found in groups facing religious barriers between urban and rural groups

($p=0.096$). Basically the environment in Indonesia both in cities and villages, the influence of religious in family life is still large, many still consider children a gift from God, if God still does not allow it, the spouse still will not be able to have children. In another study, there were religious barriers where the IVF program was considered to be in conflict with the religious and the values of the beliefs of the local community (Thompson et al., 2006; Domar et al., 2005).

Table 4. Proportions Distribution of Factors Affecting Access to Infertility Services

Factors	Urban		Rural		p
	n	%	n	%	
Knowledge					
Good	46	70.8	42	64.6	0.453^a
Not Good	19	29.2	23	35.4	
Economics Status					
Low	32	49.2	46	70.8	0.012^a
High	33	50.8	19	29.2	
Geographic					
With barriers	50	76.9	60	92.3	0.015^a
Without barriers	15	23.1	5	7.7	
Psychological					
Worry	39	60.0	40	61.5	0.857^a
No Worry	26	40.0	25	38.5	
Socio-cultural					
Less Supported	49	75.4	60	92.3	0.009^a
Supported	16	24.6	5	7.7	
Religious					
Contradicting	46	70.8	54	83.1	0.096^a
Not contradicting	19	29.2	11	16.9	

a=Chi-Square

Table 5 shows the results of multivariate analysis using multiple logistic regression tests. The variables that qualify for testing ($p<0.25$) are economic, geographic, socio-cultural, and religious. Based on the results of statistical tests it is known that there are three significantly different variables ($p = 0.014$; $p = 0.023$ and $p = 0.005$) in multivariate analysis, namely the economic level with an OR value of 2.606 (95% CI 1.210-5.611), geographic location an OR value of 3.905 (95% CI 1.203-12.677), and socio-cultural with an OR value of 5.299 (95% CI 1.659-16.929), while religious variables did not differ significantly ($p> 0.05$). Thus it can be concluded that barriers in

economic level, geographical and socio-cultural location differ in urban and rural patients in access to infertility services at IVF Clinic.

Study by Deatsman et al. showed that Ages ranged from 18 to 67. One third (30.5%) were aware fertility begins to decline at age 35, however this varied among groups depending on prior history of infertility or requiring fertility treatment. Nulliparous women were more unaware of the health risks of pregnancy over age 35 (1.4% vs 13.6%, $P 0.02$). African Americans (AA) women were less likely to think obesity (76% Caucasian vs 47.8% AA vs 66.7% other, $P < 0.05$) and older age (88% Caucasian vs 60.9% AA vs 82.7% other, $P 0.02$) affected fertility (Deatsman et al., 2016).

Table 5. Multivariate Analysis

Variables	Coeffisients	p	OR	95% CI
Selection 1				
Economics	0.965	0.014	2.625	1.216-5.669
Geography	1.362	0.023	3.905	1.205-12.653
Socio-cultural	2.026	0.018	7.583	1.412-40.727
Religious	-0.404	0.559	0.668	0.172-2.589
Constant	-2.184	0.001	0.113	
Selection 2				
Economics	0.958	0.014	2.606	1.210-5.611
Geography	1.362	0.023	3.905	1.203-12.677
Socio-cultural	1.668	0.005	5.299	1.659-16.929
Constant	-2.187	0.001		

P =Probability; OR=Odd Rasio; CI=confidence interval.

Roupa et al examined 110 infertile women and found that regarding marital status 94.4% (106) of the participants were married and 3.6% (4) unmarried. Regarding age, 64.5% were 20–29 years old, 20.0% were 30-39 years old, 11,8% were 40-49 years old and 3.7% were over 50 years old. As to occupation status, 35% of the participants were employees in the private sector, 27% were employees in the public sector, 24% were self employees and 14% dealt with the household. Regarding educational status, 3.6% had finished primary school, 31.8% had finished high school, 56.4% were University graduates and 8.2% were graduates of another school (Roupa et al., 2009).

Socioeconomic status (SES) is an important social determinant that can have profound impacts on reproductive health. In the last decades, populations of urban and rural regions have been subject to categorization by various means of measuring SES. A number of socioeconomic factors such as the woman’s educational status, income per capita, having a job, age at first marriage, life expectancy, and infant mortality rates have been reported to be associated with fertility rates by social scientists. In recent years, the serum level of AMH has been

considered a new marker of ovarian reserve. It is influenced by age and exhibits a declining trend until a woman reaches menopause. Both ovarian reserve parameters, namely anti-Mullerian hormone level and antral follicle count, exhibited a significant association with socioeconomic status ($p=0.000$ and $p=0.000$, respectively). The association between follicle stimulating hormone level and socioeconomic status was also significant ($p=0.000$) (Barut et al., 2016).

Reports also link fertility transition to socioeconomic development. In 1993–94, 36% of the population in India lived below the poverty line and this rate dropped to 22% in 2005–2006, and this drop was linked to the socioeconomic development. In addition to a declining poverty rate, the fertility rate declined from 3.5 to 2.9 among Indians in the same time period (Barut et al., 2016).

Ali et al. in their study found that correct knowledge of infertility was found to be limited amongst the participants. Only 25% correctly identified when infertility is pathological and only 46% knew about the fertile period in women's cycle. People are misinformed that use of intra-uterine device (IUD) (53%) and oral contraceptive Pil (OCPs) (61%) may cause infertility. Beliefs in evil forces and supernatural powers as a cause of infertility are still prevalent especially amongst people with lower level of education. Seeking alternative treatment for infertility remains a popular option for 28% of the participant as a primary preference and 75% as a secondary preference. IVF remains an unfamiliar (78%) and an unacceptable option (55%). Social stigma regarding infertility is especially common across South Asia. For e.g. in Andhra Pradesh, India 70% of women experiencing infertility reported being punished with physical violence for their failure. Women are verbally or physically abused in their own homes, deprived of their inheritance, sent back to their parents, ostracized, looked down upon by society, or even have their marriage dissolved or terminated if they are unable to conceive (Ali et al., 2011).

Roudsari et al. in their study examined religion impact women's perspective of infertility. Religion and spirituality are a fundamental part of culture and influence how individuals experience and interpret infertility counseling. Emerging categories included: Appraising the meaning of infertility religiously, applying religious coping strategies, and gaining a faith-based strength. These were encompassed in the core category of 'relying on a higher being'. Religious infertile women experienced infertility as an enriching experience for spiritual growth. This

perspective helped them to acquire a feeling of self confidence and strength to manage their emotions. Hence, they relied more on their own religious coping strategies and less on formal support resources like counselling services. However, they expected counsellors to be open to taking time to discuss their spiritual concerns in counseling sessions. In addition to focusing on clients' psychosocial needs, infertility counsellors should also consider religious and spiritual issues. Establishing a sympathetic and accepting relationship with infertile women will allow them to discuss their religious perspectives, which consequently may enhance their usage of counselling services (Roudsari et al., 2011).

4 CONCLUSIONS

The results of the study of 65 respondents with 6 test variables (ie, knowledge, economic status, geography, social culture, psychological, and religious) found that: (i) No significant differences were found in the obstacles in the level of knowledge, emotional / psychological level and religious between the two urban and rural groups ($p = 0.453$; $p = 0.857$; $p = 0.096$). (ii) Significant differences were found in the barriers to economic, geographical and socio-cultural status between urban and rural groups ($p = 0.014$; $p = 0.023$; $p = 0.005$). (iii) The most significant correlations in rural access barriers compared to urban areas are economic, geographical and socio-cultural (OR 2.606; OR 3.905; OR 5.299).

From this study, we can map some strategies to help infertility patients, for instance making telemedicine to overcome geographical barriers, improving the referral system and reducing medical costs to overcome economic barrier.

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