



## Predictors of Quality of Life in Individuals Seeking Infertility Treatment: a Malaysian FertiQoL Study

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### Abstract

Infertility problems can lower the quality of life (QoL). This study aims to predict the factors associated with QoL using the Malaysian FertiQoL. This cross-sectional study was conducted at four fertility clinics in Malaysia. Sociodemographic details and FertiQoL responses were collected. A total of 395 participants were analysed using SPSS v24 with a mean (SD) age of 33.18 (4.45). Respondents were predominantly female (57.2%) and Malay ethnicity (82.5%). The core domain means score (SD) was 74.68 (14.35) and consisted of mind-body 77.56 (17.55), emotional 70.26 (18.98), relational 77.32 (17.19) and social 73.56 (15.74). Positive predictors for QoL are Islamic faith, higher income, and general well-being.

Keywords: Malay FertiQoL; infertile; predictor,

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### 1.0 Introduction

Infertility affects people from all walks of life. Infertility is the inability to conceive after 12-months of regular unprotected sexual intercourse. The prevalence of infertility in developed countries is between 3.5-16.7% compared to 6.9-9.3% in developing countries (Boivin *et al.*, 2007; Boivin and Bunting, 2007). The exact prevalence of infertility in Malaysia is unknown. However, from 1975 until 2010, the fertility rate in the country has declined steadily to less than half (Hanafiah and Jemain, 2013). This decline was attributed to several factors, including improved access to higher education for women, the delay in settling down, or the delay in the first conception (Hanafiah and Jemain, 2013). The psychological impact of infertility may have a long and short-term effect on life satisfaction. However, it is evident that the diagnosis of infertility, the treatment process, and the acceptance of this condition has shown to cause a significant loss in quality of life (QoL) (Aarts *et al.*, 2011; Van den Broeck *et al.*, 2010; Wischmann *et al.*, 2012).

Fertility Quality of Life (FertiQoL) was developed in 2011 and has been used to measure QoL in various populations in research and clinics (Karabulut *et al.*, 2013; Hsu *et al.*, 2013; Priangga *et al.*, 2016; Maroufizadeh *et al.*, 2017; Desai and Gundabattula.,2019). The FertiQoL is a self-reported questionnaire designed specifically for those who are infertile. The developers were experts from the

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European Society of Human Reproduction and Embryology (ESHRE) and the American Society of Reproductive Medicine (ASRM). This is the first study conducted using Malaysian FertiQoL.

Researchers have been encouraged to conduct FertiQoL studies in local populations. This is to identify predictors that are associated with higher or lower QoL among infertile individuals. So far, studies have shown that both men and women are psychologically and emotionally affected by infertility, although they may respond to it differently (Slade *et al.*, 2007; Edelmann and Connolly, 2010; Omu and Omu, 2010). These FertiQoL studies found that women have lower QoL in the emotional and mind-body domains as compared to men (Hsu *et al.*, 2013; Haica *et al.*, 2013; Bose and Roy, 2017). Higher educational level and secondary infertility were positively associated with QoL, whereas the prolonged duration of infertility and the desire for psychological support was negatively associated with QoL (Karabulut *et al.*, 2013). Studies have also suggested that QoL among infertile individuals was influenced by cultural and religious factors (Greil *et al.*, 2010; Daniluk and Frances-fischer, 2009). The purpose of this study is to identify the predictors of QoL among infertile individuals using the Malaysian FertiQoL.

## 2.0 Method

This cross-sectional study involved infertile individuals seeking treatment at four public infertility clinics in Malaysia. The determining factor for site feasibility was the willingness of the infertility centres to participate in the study. Data collection was from February 2017 until December 2017. All patients who attended the clinic on data collection day were invited and explained about this study. Inclusion criteria were Malaysian residents, men and women aged more than 18 years old, and diagnosed with primary or secondary infertility. Exclusion criteria were those unable to understand or read the Malay language. Patients who fulfilled the inclusion and exclusion criteria and agreed to participate signed a consent form. They were given the questionnaire to answer. The researcher was available on site for any questions or feedback from the participants, but the researcher was not allowed to aid participants or influence their responses. The researcher collected and checked the questionnaires.

The questionnaire had two parts. The first part was for sociodemographic details that included age, gender, race, religion, education level, income, smoking history, previous children, previous infertility counselling, past infertility treatment, and sexual activity per week. The second part was the Malaysian FertiQoL. The FertiQoL is successfully used by researchers from all over the world due to its accessibility and a robust translation process by the original developers (Donarelli *et al.*, 2016). It has quickly become a gold standard for measuring QoL in infertile individuals (Donarelli *et al.*, 2016). The FertiQoL has two general health and well-being perception questions and is divided into two parts, The Core FertiQoL, and the Treatment FertiQoL. The Treatment FertiQoL has two domains: environment and tolerability. The Core FertiQoL measures four domains: mind-body, emotional, relational, and social (Boivin *et al.*, 2011). The mind-body measures the impact of infertility on physical health such as pain or fatigue. The emotional measures the impact of infertility on an individual's emotions such as sadness, grief, and resentment. The relational measures the impact of infertility on the marital partnership such as communication, affection, and sexual relationship. The social measures the effects of infertility on the social aspect such as social inclusion, and support from family and friends (Donarelli *et al.*, 2016).

The sample size calculation used the PS software version 3.0 that recommended a minimal sample of 385 with a 5% margin error and a 95% confidence level. Statistical analysis data was analysed using SPSS v24. The Malaysian FertiQoL was validated with good internal consistency and high reliability and was discussed in a separate paper (Ariffin *et al.*, 2020). The analysis used were descriptive, Independent T-test, and Logistic Regression to identify the relationship between factors and FertiQoL scores, and the predictors for good QoL. Ethical approval was obtained from the University Ethics Committee.

## 3.0 Results

A total of 417 participant's answers were collected, and 22 excluded due to incomplete or missing data. The final sample analysed was 395 participants with a mean age of 33.18 ± 4.45 SD.

Table 1: Demographic details of participants according to categories with frequency (n) and percentage (%).

Demographic factors	Categories	Frequency (Percentage)
Age range	< 30	74 (18.7%)
	30 – 39	283 (71.6%)
	40 – 49	25 (6.3%)
	> 50	2 (5%)
Sex	Male	166 (42.8%)
	Female	226 (57.2%)
*Race	Malay	325 (82.5%)
	Chinese	30 (7.6%)
	Indian	30 (7.6%)
	Bumiputera (Sabah & Sarawak)	9 (2.3%)
*Religious faith	Islam	331 (83.8%)
	Buddhist	22 (5.6%)
	Hindu	30 (7.6%)
	Christian	9 (7.6%)
	Atheist	2 (0.5%)
*Education level	Secondary school	63 (15.9%)

	Certificate / Diploma	120 (30.4%)
	Degree	169 (42.8%)
	Masters / PhD	41 (10.4%)
*Income	< 1000	25 (6.3%)
	1001 – 3000	134 (33.9%)
	3001 – 5000	137 (34.7%)
	5001 – 10000	73 (18.5%)
	> 10000	9 (2.3%)
Smoking	Yes	66 (16.7%)
	No	323 (81.8%)
Previous children	Yes	51 (12.9%)
	No	341 (86.3%)
Years trying for a baby	1 – 2 years	73 (18.5%)
	2 – 5 years	171 (43.3%)
	> 5 years	140 (35.4%)
Previously seen by an Infertility Doctor	Yes	245 (62%)
	No	147 (37%)
Previous infertility procedure	Yes	138 (34.9%)
	No	252 (63.8%)
Frequency of sexual activity with a partner	three times or more a week	133 (33.7%)
	< three times a week	250 (63.3%)

\* For analysing association and relationship, these categories were re-coded into two variables. For race: Malay (1), Non-Malay (0); religion: Islam (1), other religions (0); education level: degree and higher (1), diploma and lower (0); income: RM3000 and higher (1), lower than RM3000 (0)

Table 1 shows the demographic details of the participants. There were more females compared to male participants, and the majority were within the 30-39 age group. For each category, the majority were Malays, Islamic faith, and non-smokers. For education, almost half were degree holders. Many participants had income within the RM1000 – RM5000 bracket. Most participants had primary infertility, and the duration of infertility was between 2-5 years.

Table 2: Descriptive analysis of the Total mean FertiQoL and mean scores for all domains.

Domain	Total mean score	SD
Mind-body	77.56	17.55
Emotional	70.26	18.98
Relational	77.32	17.20
Social	73.56	15.74
Total Core	74.68	14.35
Tolerability	42.41	19.06
Environment	62.61	27.50
Total Treatment	63.01	26.56
Total FertiQoL	71.25	13.24

Table 2 highlights the FertiQoL mean scores for each core and treatment domains; and mean scores for core, treatment, and total FertiQoL. The highest mean score was for the mind-body part, whereas the lowest score was for tolerability towards treatment.

Table 3: Association between factors and FertiQoL core mean scores (mind-body, emotional, relational, social, and core mean scores) using independent T-test for two variables and Anova-one way test for more than two variables with a significant P value of < 0.05.

Category	Variable	Mind-body	Emotional	Relational	Social	Total Core
Sex	Male	80.23±16.05	72.57±18.42	76.14±17.73	73.56±15.05	75.66±13.53
	Female	75.57±18.37	68.45±19.23	78.19±16.76	73.56±16.27	73.95±14.91
	Sig. P-value	<b>0.009**</b>	<b>0.028*</b>	0.243	1.000	0.242
Race	Malay	78.69±16.90	71.33±18.59	78.70±16.72	73.82±16.07	75.64±14.12
	Non-Malays	72.22±19.60	65.22±20.12	70.77±18.03	72.34±14.15	70.14±14.64
	Sig. P-value	<b>0.012*</b>	<b>0.015*</b>	<b>0.000***</b>	0.480	<b>0.004**</b>
Religious faith	Islam	78.81±16.75	71.31±18.52	78.94±16.65	74.02±15.99	75.77±14.01
	Others	70.97±20.16	64.75±20.53	68.78±17.63	71.16±14.24	68.92±14.81
	Sig. P-value	<b>0.005**</b>	<b>0.012*</b>	<b>0.000***</b>	0.188	<b>0.000***</b>
Education level	≥ Degree	77.52±17.95	70.71±18.78	79.56±16.98	73.67±16.55	75.37±14.99
	≤ Diploma	77.69±17.14	69.69±19.28	74.84±17.13	73.52±14.81	73.94±13.59
	Sig. P-value	0.925	0.596	<b>0.006**</b>	0.925	0.325
Personal Income	≥ RM3000	79.43±16.91	72.50±17.66	78.39±17.14	75.46±15.19	76.45±13.63
	< RM3000	74.79±18.15	66.95±20.40	75.73±17.21	70.75±16.16	72.06±15.00
	Sig. P-value	<b>0.01*</b>	<b>0.004**</b>	0.133	<b>0.003**</b>	<b>0.003**</b>
Duration of infertility	1-2 years	78.94±17.23	71.69±20.08	82.02±15.57*	75.00±14.42	76.91±14.42
	2-5 years	78.00±18.06	70.08±18.34	77.00±16.08	73.64±15.22	74.68±13.42
	> 5 years	76.34±17.20	69.64±19.70	75.57±18.82*	72.41±17.05	73.49±15.50
	Sig. P-value	> 0.05	> 0.05	<b>0.030*</b>	> 0.05	> 0.05
Frequency of sexual activity with partner per week	≥ 3 times	78.79±14.69	71.02±14.41	80.23±15.57	74.84±13.72	76.22±10.88
	< 3 times	77.40±18.86	70.10±20.85	76.17±17.38	73.30±16.37	74.24±15.55
	Sig. P-value	0.460	0.649	<b>0.025*</b>	0.328	0.147
Participant general	Good	78.98±16.89	71.05±18.37	78.23±16.96	73.69±15.59	75.49±13.86

health perception question	Poor	71.35±19.23	66.78±21.40	73.61±17.65	72.86±16.56	71.15±16.04
	Sig. P-value	<b>0.000***</b>	0.085	<b>0.046*</b>	0.687	<b>0.020*</b>
Participant general well-being perception question	Good	79.32±17.36	71.33±18.47	78.68±17.43	75.03±14.91	76.09±14.06
	Poor	72.34±17.27	66.92±20.27	73.15±15.85	69.24±17.50	70.42±14.64
	Sig. P-value	<b>0.000***</b>	0.060	<b>0.006**</b>	<b>0.004**</b>	<b>0.000***</b>

Null hypothesis (H<sub>0</sub>) states that there is no difference between the variables and Alternative hypothesis (if P-value is significant) states that there is a difference between the variables. (\* < 0.05, \*\* < 0.01, \*\*\* <0.001)

Table 3 revealed the significant associations between the factors and the individual domains. For the mind-body, higher mean QoL scores were associated with male, Islamic faith, and higher income. For the emotional, higher mean QoL scores were associated with male, Malays, Islamic faith, and frequency of sexual activity. For the relational, higher mean QoL scores were associated with Malays, Islamic faith, and higher education level. For the social, higher mean QoL scores were associated with higher income. For the total core FertiQoL, higher mean scores were associated with Malays, Islamic faith, and higher income. There were no significant associations for smoking status, children, duration of infertility, previous appointments with infertility doctors, and previous procedures. For the two perceptive questions, the general health question was significantly associated with the mind-body and relational domain. The general well-being question was significantly associated with the mind-body, relational, and social domains.

Table 4: Regression analysis for positive predictors of QoL among infertile individuals in Malaysia

SLR		B	95% CI	Beta	T	p		
(Constant)		66.464	[63.370 69.558]		42.236	0.000		
Malay		-2.868	[2.396 9.209]	0.167	3.349	0.001		
(Constant)		65.418	[62.195 68.640]		101.446	0.000		
Islam		6.943	[3.427 10.459]	0.192	3.883	0.000		
(Constant)		67.502	[64.281 70.723]		41.207	0.000		
Income		2.042	0.429 3.655	0.127	2.490	0.013		
(Constant)		60.927	[55.276 66.577]		21.200	0.000		
General well-being		3.665	[1.717 5.613]	0.185	3.699	0.000		
MLR								
		Unstandardized coefficient		Std coefficient	Collinearity			
		B	Std Error	Beta	T	Sig	Tolerance	V/F
(Constant)		51.105	3.528		14.484	0.000		
*Religion (Islam)		6.867	1.790	0.191	3.836	0.000	0.989	1.011
General well-being		3.612	0.989	0.182	3.653	0.000	0.985	1.015
Income		2.295	0.796	0.143	2.884	0.004	0.994	1.006

\*There is strong collinearity between Islam and Malay

Table 4 presents the predictors for the factors that can significantly affect QoL. In simple regression, the factors that predicted better QoL were Malays, Islamic faith, higher income, and increased general well-being scores. For the multiple linear regression, there was strong collinearity between Malays and Islamic faith. Therefore, the final model shows predictors were Islamic faith, a good perception of general well-being, and higher income. Those with Islamic faith have a 6.867 prediction of higher QoL than those from other religions. Those who reported higher scores in their perception of general well-being have a 3.612 prediction of higher QoL. Those with a unit of higher income have a 2.295 prediction of higher QoL.

#### 4.0 Discussion

This study highlighted that infertile individuals in Malaysia tend to have an excellent overall quality of life (QoL). The core mean scores for the Malaysian FertiQoL of 74.68 (SD 14.35) is comparable to the Dutch FertiQoL 70.80 (SD 13.90) and Indonesian FertiQoL 70.05 (SD 13.36) (Aarts et al., 2011; Priangga et al., 2016). The Malaysian core FertiQoL scores are much higher in comparison to the FertiQoL study in Pakistan 52.17 (SD 13.13) and Taiwan 55.12 (SD 13.72) (Karabulut et al., 2013; Hsu et al., 2013). Interestingly, the Malaysian FertiQoL domain scores are closely related to the Indonesian FertiQoL study and specifically in the relational scores with 77.32 (SD 17.20) to 75.19 (SD 15.11) respectively. A possible explanation for this similar finding is the common root language shared between the two populations.

The domain scores within the mind-body and relational were higher in comparison to the social and emotional domains. The explanation is perhaps the social and emotional aspect is more abstract and not easy for participants to express. A study on the emotional expression (EE) of Malaysians shows that culturally, Malaysians are less likely to express negative emotions such as feelings of sadness, anger, discontent, or fear. They are more likely to express themselves with positive emotions such as feeling happy (Wong., 2011). This inherent culture of secrecy and not expressing oneself with negative emotions may be the reason for the lower scores in emotional and social domains. The ability to communicate and share feelings with others is known to be an excellent coping skill that can improve the QoL (Kaliarnta et al., 2011; Galhardo et al., 2013). A review of infertility psychosocial interventions shows that either group interventions or counselling sessions (that include emotional expression) can produce positive effects, and

some reduction in distress (Boivin *et al.*, 2013). Hence, there is a role for infertility counselling to encourage sharing and expressing negative emotions within a safe environment to improve the QoL.

The study found that men have higher scores in the mind-body and emotional domain, but there was no significant difference in overall QoL. Many published gender and dyad studies have identified and predicted gender differences in QoL among those with fertility problems. This study supports the previous findings that both sexes are psychologically and emotionally affected by infertility (Slade *et al.*, 2007; Edelmann and Connolly, 2010; Omu and Omu, 2010). This FertiQoL study also agreed with previous studies that women tended to have lower QoL in the emotional and mind-body domain as compared to men (Hsu *et al.*, 2013; Haica *et al.*, 2013; Bose *et al.*, 2017; Desai and Gundabattula, 2019). Therefore, the conclusion is that infertility affects the QoL of both genders. However, women are more affected, physically, and emotionally. Studies also show that both men and women benefit from infertility counselling (Boivin, 2003).

This study identified that race and religion affect QoL, specifically in the mind-body, emotional, and relational domains. The Malay race and Islamic faith have higher QoL compared to other races and those from other religions. Since the Malays are predominantly Muslim, we can conclude that this result is harmonious. This is surprising because other infertility studies within Muslim communities have depicted a pro-natal view that emphasizes on marriage and parenthood. Such beliefs harm the QoL among those with infertility problems (Ombelet *et al.*, 2006; Omu and Omu, 2010; Obeidat *et al.*, 2014). Race and religious faith are influenced by socio-cultural context, which includes widely held ideas, beliefs, practices, and expectations (Greil *et al.*, 2010). The socio-cultural context has a significant influence on infertility since infertility relates to an experience of unintended childlessness and the society's view upon it (Slade *et al.*, 2007; Greil *et al.*, 2010). In a cross-cultural FertiQoL study involving three countries, the Jordanian group was found to be pro-natal and have lower QoL scores compared to their German and Hungarian counterparts (Sexty *et al.*, 2016). Cultures where there is the expectation of married couples to have children, or the emphasis on women to 'prove' their fertility can lead to anxiety and distress (Greil *et al.*, 2011). The possible explanation from this study is the cultural emphasis on the spiritual aspect of the Islamic faith can provide comfort to those with a fertility problem. This requires further exploration, perhaps in the form of a qualitative study to identify specific ideas or practices unique to this population.

This study showed that income also influenced the QoL, especially in the mind-body, emotional, and social domains. This is like other studies that showed economic disparity as a known factor for stress and anxiety among infertile individuals. The inequalities of health and treatment can contribute to low QoL (Bitler and Schmidt, 2006; Bell *et al.*, 2010).

Finally, the study formulated a positive prediction score for QoL that included religious faith, higher income, and a perception question on general well-being. On the surface, race or religion are non-modifiable factors. However, the cultural influences, positive beliefs, and spiritual practices may improve the QoL in infertile individuals. Exploring and identifying these factors may assist in the formulation of effective infertility counselling interventions.

## 5.0 Strength And Limitations

The strength of the study is in its sampling because data collection was from four well known public infertility centres. These centres were accessible and affordable to the public. The limitations include patients recruited were at various stages of their infertility treatment, such as the first appointment, follow up, or already on fertility treatment. The study does not represent those with infertility problems that have not registered in any infertility centres and are 'suffering in silence'. Another limitation of the study was the representation of most participants were from one ethnic and religious group. Therefore, for the data analysis, ethnic groups and religion had to be re-coded and put under two categories comparing Malay versus others and Islamic faith versus other religions which may skew the results.

The Malaysian FertiQoL used was translated by the original developers from the English language. The researchers provided a report to the developers on any feedback and discrepancies in the participant's understanding of the FertiQoL items. However, the researchers did not make any changes to the FertiQoL questionnaire.

## 6.0 Conclusion

Infertile individuals in Malaysia have high core FertiQoL scores. Being Malay with the Islamic faith, and having higher income are positive predictors for QoL. It is possible to use the general question of well-being as a short screening tool to predict good QoL among infertile individuals.

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