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Psychometric Pre-Testing of a SERVQUAL-Based Revisit Intention Instrument for Chinese Fertility Tourists in Malaysia

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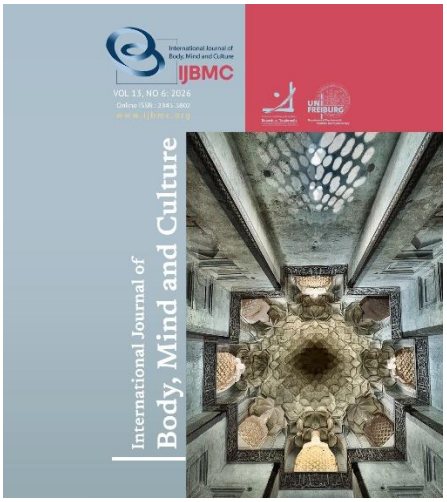

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ABSTRACT

Objective: This pilot study aimed to pre-test a SERVQUAL-based instrument for measuring revisit intention among Mainland Chinese fertility tourists receiving assisted reproductive technology services in Malaysia.

Methods and Materials: A cross-sectional pilot design was used in 2024. Thirty Mainland Chinese patients receiving or recently completing IVF or preimplantation genetic testing services in Malaysian private fertility clinics were recruited through convenience sampling. The adapted questionnaire included SERVQUAL-based service quality, privacy, cultural proximity, cost, and revisit intention dimensions, measured on a five-point Likert scale. The instrument was translated using forward–back translation and reviewed by experts in medical tourism and fertility services. Internal consistency was assessed using Cronbach's alpha and corrected item–total correlations. Factorability was examined using Kaiser–Meyer–Olkin values and Bartlett's test of sphericity. Multivariate normality was assessed using Mardia's skewness and kurtosis statistics.

Findings: Internal consistency was high for service quality, $\alpha = .953$, privacy, $\alpha = .934$, cultural proximity, $\alpha = .949$, cost, $\alpha = .942$, and revisit intention, $\alpha = .947$. Corrected item–total correlations exceeded .40 for all items. Factorability was supported by KMO values above .70 for all constructs and significant Bartlett's tests, $p < .001$. Mardia's test indicated violation of multivariate normality, particularly for kurtosis, suggesting that covariance-based SEM is not appropriate at this pilot stage. The findings support the preliminary reliability and factorability of the instrument but do not establish full construct validity.

Conclusion: The adapted instrument showed promising preliminary psychometric properties. A larger study using EFA/CFA and variance-based structural modeling is recommended.

Keywords: Medical Tourism, Fertility Treatment, Revisit Intention, SERVQUAL, Pilot Study, Psychometrics.

Introduction

With the medical tourism market growth globally (Vovk et al., 2021), fertility medical tourism has grown to become a substantial sub-industry within the more general medical tourism sector, as rising attention is given to it being one of the key contributors to the overall medical tourism industry (Kunwar, 2019; Strickland & Ratten, 2023). The advances in this field are driven by the growing demand for transnational ART (Sánchez et al., 2022). In this regard, Malaysia also emerged as an attractive destination in the worldwide fertility medical tourism market thanks to its developed ART (in vitro fertilisation [IVF] and preimplantation genetic testing [PGT]) techniques (Liu et al., 2023; Salleh et al., 2024). The flexibility in its regulations, relatively low cost of treatment and multilingual service capability have helped Malaysia to establish itself as a competent destination in the ART market. Comparative success-rate claims, however, vary by reporting systems and patients' characteristics, and clinic-level protocols influence them. Thus, this research is not aimed at assessing clinical outcomes but rather at measuring service-experience (Chen et al., 2020; Huang, 2022). In addition, PGT policy is less restrictive in Malaysia, with no clear regulations on its application (Muhsin et al., 2024; Salleh et al., 2024). This method increases the chances of success in conception and at the same time decreases the risks of single-gene inherited diseases (Muhsin et al., 2024; Salleh et al., 2024). Furthermore, Malaysia is a "high cost-effectiveness" ($5,000 US dollars per IVF cycle) and privacy protection ("one-on-one consultation model") country as well as "40% of medical staff fluent in Mandarin/Cantonese (Chen et al., 2020)," so it has become an attractive destination for Chinese infertile patients seeking ART services (Wu et al., 2021).

Two potential gaps in the existing literature of medical tourism studies exist.

First, the mediating variables chosen are simplistic. The majority of previous researchers treat "satisfaction" as a pivotal mediating variable and investigated the influence of different stimuli on satisfaction, which in turn affects the intention to revisit (Xu et al., 2020). It still lacks a selective focus on the mediating effect of service quality, though these studies employ the SERVQUAL model as a centrifugal tool to measure service satisfaction as well (Toni et al., 2024).

Second, there is a lack of research on the adaptability of the fertility medical tourism context Strickland & Ratten (2023). While Malaysia holds a leading position in the global medical tourism industry (Chandran et al., 2017) and has significant advantages in fertility medicine (e.g., ART techniques) (Liu et al., 2023; Salleh et al., 2024), existing studies have not sufficiently addressed the specific needs of Chinese fertility tourists, such as the high demands for cross-cultural communication and privacy protection (Chen et al., 2020; Huang, 2022; Wu et al., 2021). Furthermore, these studies have not systematically analysed how these needs influence service quality and, in turn, revisit intention through the SERVQUAL model, leading to a disconnect between theory and practice.

Although it is common to find mediation effects such that satisfaction mediates between service quality and revisit intention in the literature available, the immediate pilot research does not mediate effects. It, instead, is concerned with instrument pre-testing to assure that constructs like service quality, privacy, cultural proximity, cost, and revisit intention can be reliably and consistently measured before testing structural relationships in a follow-up full-scale study (Heydari Fard et al., 2021; Heydari et al., 2019; Strickland & Ratten, 2023). The study should position service quality, as assessed by the SERVQUAL model, as the central mediator and explore how factors such as cultural proximity, privacy, and cost influence revisit intention through service quality, thus filling the existing research gap.

Revisit Intention for Medical Tourism

Tourists' revisit intention is typically formed through the evaluation of previous experiences, which in turn influences their future consumption behaviour (Jamalludin et al., 2022). Under the theoretical lens of TPB, revisit intention is a factor shaped by attitude toward experience in medical tourism, subjective norms, and perceived behavioural control (Ajzen, 1991; Almodawer et al., 2025). The intention of medical tourists can be divided into different dimensions:

Destination Selection Intention to Revisit Dimension: The image of a destination is an important factor among all which tourists consider and has an impact on their approach toward revisiting (Boguszewicz-Kreft et al., 2020). Quality affordable health care services play a role

in destination image (Cham et al., 2021), in turn influencing tourists' attitudes and intentions to choose (Boguszewicz-Kreft et al., 2020; Cham et al., 2021).

External Recommendation Influence Intention to Revisit Dimension: Subjective norms are defined in TPB as an individual's perceived social pressures from significant others such as family, friends, or colleagues (Ajzen, 1991; Conner, 2020). The social norms of these referent others impact how consumers form their perception towards a destination and thus influence consumers' subjective norms, as well as tourists' intention to revisit (Cham et al., 2021). Positive recommendations that correspond to the attitudes of social groups' expectations thus enhance the consumers' intention to revisit when recommendations are positive (Taheri et al., 2021).

Planning Effort Intention to Revisit Dimension: Perceived Behavioural Control (PBC) represents an individual's perception of either ease or difficulty in performing a behaviour (Ajzen, 1991; Conner, 2020). If visitors perceive enabling resources and support available to them for organising and making the trip, the intention of going again becomes stronger (Cham et al., 2021; Chaulagain et al., 2021).

Satisfaction-Driven Intention to Revisit Dimension: The dimension of patient satisfaction determines the effect on intention to revisit (Heydari Fard et al., 2021). If tourists are pleased with the health service quality and overall tourism experience, they tend to develop repeat visit intentions (Cham et al., 2021).

Intention to Revisit-Driven Recommendation Dimension: The relationship between intention to revisit and recommendation intention is positive (Aljumah et al., 2020; Cham et al., 2021). Tourists are more likely to recommend a destination which they have plans to return to (as an indicator of their loyalty and confidence towards the destination) (Aljumah et al., 2020).

Fertility among the Chinese

In China, the infertility rate had reached 17.6% by 2020, and as a consequence, the demand for assisted reproductive technologies (ART) has grown in tandem with this trend (Bai et al., 2020). However, ART services face several bottlenecks in China: first, there is an uneven distribution of resources, with 76.2% of ART institutions concentrated in core eastern cities, while the number of IVF cycles per million people in western provinces is less than 50% of that in the east (Huang, 2022); second, technical restrictions are relatively strict, with PGT available only for patients with "two or more previous failed pregnancies" or "diagnosed single-gene diseases" (Liu et al., 2023);finally, the cost of a single IVF cycle in private hospitals is approximately USD 12,000, which is prohibitively expensive (Huang 2022), and public hospitals often face privacy risks: waiting areas at public hospitals are often overcrowded and noisy, forcing patients to discuss sensitive medical information in public spaces, further increasing the likelihood of privacy breaches (Huang, 2022; Wu et al., 2021).These challenges have prompted infertile patients in China to seek cross-border fertility medical services.

Service Quality

Service quality focuses on the relative difference between perceptions and expectations of consumers (Grönroos, 1982; Zeithaml et al., 1996). Proposed by Grönroos (1982) and further developed into the SERVQUAL model by the PZB group (Zeithaml et al., 1996), it has been established as a classic model for measuring service quality in various industries (Shi & Shang, 2020).

In the medical tourism domain, service quality refers to both the attributes of being "medical" and "tourism": on one aspect, it is expected to meet professional standards for medical services (such as diagnostic techniques and healthcare qualifications), and on another, it should cover experiential dimensions related to tourism services (like ease of procedures and comfort in the environment) (Bagga et al., 2020).

The five dimensions of the SERVQUAL model—tangibles, reliability, responsiveness, assurance, and empathy (Zeithaml et al., 1996)—Tangible: the physical structure of the equipment provided by the service, the associated service facilities and the appearance of the service personnel; Reliability: Service providers provide consumers with the reliability and consistency of quality services and the ability to accurately fulfill service commitments; Responsiveness: Service providers can provide services and responses to consumers promptly; Assurance: Service providers build rapport with consumers and consumer trust in the services provided; Empathy: The extent to which service providers provide emotional care and extended emotional support to consumers—be applicable in the context of medical tourism (Shi & Shang, 2020).

Fertility ART tourism is a high-involvement and high-

risk situation in medical decisions, which involves some emotional vulnerability, financial investment, and outcome uncertainty. Despite the availability of healthcare-specific quality models, SERVQUAL is still applicable since it is capable of capturing the two dimensions of technical reliability and interpersonal responsiveness that are especially relevant in cross-border reproductive care. Empathy, assurance, and clarity of communication in ART settings might have a more significant effect on perceived trust compared to clinical outcome indicators.

Privacy

Privacy is fundamental to medical ethics (Baghaei et al., 2021). In a medical context, privacy is variously defined as "a state of being free from observation or intrusion," with little agreement on what this means as medicine continues to expand into new areas (Smith et al., 2024). The Code of Medical Ethics of the American Medical Association (AMA) states that patient privacy is a multi-faceted concept that has four core components: personal space (physical privacy), personal data (informational privacy), personal choices including cultural and religious affiliations (decisional privacy), and personal relationships with family members and other intimates (associational privacy) (Riddick, 2003).

Specifically, Physical Privacy refers to an individual's need to be "free from unauthorised contact or observation" regarding their own body in a medical setting, which is specifically reflected in the perception of physical contact, visibility, and exposure during the diagnostic and treatment process (Valizadeh & Ghasemi, 2020).

Informational Privacy is concerned with the security and safety of a patient's personal health data, and needs to encompass all supports of information which are likely to threaten privacy (Enaizan et al., 2020).

This aspect of ITA is related to the notion of Decisional Privacy, which occurs as an expression (in practice) of patients' autonomy in health care whereby they are to "make decisions with information that influences their own decisions about whether and how it will be shared, used, and who has access" (Bjørlo, 2024)

Associational Privacy focuses on safeguarding personal intimate relationships (e.g., lovers, family members, and close friends), prioritising emotional security and information privacy among a collection of interrelating people or objects (Froomkin et al., 2022).

Privacy was operationalised in the current pilot instrument in items that majorly represented physical, decisional, and associational privacy. This pilot version conceptually recognised informational privacy, but was not fully operationalised. The main study will overcome this limitation by expanding the items and validating them with experts.

Culture Proximity

Cultural proximity is generally understood as the extent to which values, practices, and beliefs in one country are similar to those in another (Doan, 2023). Such closeness commonly entails diverse effects on the part of medical tourists in choosing a destination, which includes language, religion, and halal food (Akbar et al., 2020). To get a sense of the impact, it helps to take a closer look at three elements of cultural proximity: language, religion, and food.

Religious tourists, in particular, are likely to prefer visiting countries that share their religious and cultural background since these provide them with greater comfort to practice their religion traditionally (Zarei et al., 2020).

As medical tourism becomes more popular, top hospitals often create special teams that help would-be patients navigate their offerings. To make themselves more appealing, some hospitals have staff that are sourced from the countries where medical tourists originate to allow cultural and linguistic familiarity, which in turn leads to a pleasant experience (Bagga et al., 2020).

In addition, language services, adherence to the food culture, and religion are all important cultural aspects that have a large impact on the decision of medical tourism destinations (Çapar & Aslan, 2020).

Cost

Medical tourists can achieve a cost saving of 25 to 90% relative, considering types of treatments and host countries, with the majority being in developing nations where labour costs are lower, and exchange rates for medical services are favourable, particularly for tourists from developed nations (Abd Mutalib et al., 2016; Weis et al., 2017).

As medical tourism continues to grow, it can be broadly classified into two types: First, mild medical service together with a relaxing tour (so-called leisure tour); Second, major medical treatment, which is called health tourism (Beladi et al., 2023). Consequently,

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medical tourism only adds the cost of treatment and transportation.

Taheri et al. (2021) emphasise that the affordability of medical services abroad relative to those in neighbouring countries is one of the main motivators encouraging medical tourists. The research further disaggregates the cost of medical tourism into five components: low treatment costs, lower medical fees, affordable accommodation, reduced transportation costs, and reasonably priced flights (Taheri et al., 2021). Kadir & Nayan (2021) suggest that the cost of medical treatment as well as itinerary costs play an important role in demand generation, and lower travel costs will improve the attractiveness of a destination (Kadir & Nayan, 2021). Chaulagain et al. (2021) note that the perceived price of medical tourism is dominated by the treatment and healthcare service fees (Chaulagain et al., 2021). Furthermore, the expenses of tourists contain room cost, dining and shopping expenses, as well as local transportation charges (Park et al., 2020).

Cohen et al. (2020) further stress the need to consider over and above "loss of wage" time cost during treatment. Time cost reflects the time that a patient expends in travelling and being treated, and wage loss refers to the money a patient would have been paid if he or she were not undergoing treatment. These hidden costs are a part of the total cost estimation for medical tourism (Cohen et al., 2020).

Methods and Materials

Study Design

The research design used is a cross-sectional pilot to test the initial psychometric attributes of an adapted questionnaire.

Sampling and Recruitment: The respondents included Mainland Chinese patients undergoing ART services (IVF/PGT) in Malaysian private fertility clinics in 2024. The convenience sampling was based on the limitations of feasibility that are inherent to pilot testing. The inclusion criteria were: (1) age 18 and above, (2) patronised by ART treatment or recently completed treatment in Malaysia and (3) able to communicate in Mandarin. Incomplete responses were among the exclusion criteria. The last pilot sample was comprised of 30 respondents. Due to the small sample size, internal consistency and factorability checks were the only ones to be performed with the analysis. Proper exploratory/confirmatory factor analysis was deliberately left to the main study.

Instrument Adaptation and Pre-Testing Procedure: The questionnaire was modified after the validation scales that exist. Linguistic equivalence was achieved by a forward-back translation procedure. Two scholarly experts pertinent to the issue of medical tourism and one administrator of a fertility clinic assessed content validity. Minor wording changes were made based on the feedback provided by the participants in the pilot administration. There were no details of the formal protocols of cognitive interviewing, which is a limitation.

Scale Anchors: The measurements were done on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The composite scores were calculated as the mean scores of each construct. Absent data was insignificant (Less than 5%) and replaced with means because of the size of the pilots.

SPSS 27.0 software was used for reliability and validity analysis; for the normality test, along with SPSS-processed data, an online calculator was used to get skewness and kurtosis values for univariate as well as multivariate tests, as follows in detail.

Reliability Analysis: The internal consistency of the scale was evaluated by means of Cronbach's α coefficient, where a value of $\alpha > 0.7$ indicated good reliability (Cronbach, 1951). The CITC was used to measure how well individual items correlated with their dimensions, and a CITC >0.4 is an indicator of good association (Lord & Novick, 2008). The "α coefficient if item deleted" was also analysed to further examine the usefulness of potential items (Zhang et al., 2019).

Validity Analysis The requirements for structural validity were assessed through the Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity (Bucci et al., 2018). A KMO value of over 0.7 indicated that our data were acceptable for factor analysis (Shrestha, 2021) and statistically significant on Bartlett's Test of Sphericity ($p < 0.05$), which represented the fact that it would be possible to perform the factor analysis on our study set (Tobias & Carlson, 1969).

Normality test: Mardia calculated multivariate skew and kurtosis using his coefficients. Even though an online computation tool was employed in order to be convenient, the actual input dataset involved standardised construct scores, which were exported in

SPSS. Reproducible statistical programs, reproducible statistical scripts (e.g. R or SPSS syntax) will be used in future research to ensure complete transparency. For testing the data of distribution characters according to the value of skewness and kurtosis, an operation order was set up as follows: The primary data were pre-processed with SPSS. Subsequently, the processed dataset was uploaded to the online calculator accessible at https://webpower.psychstat.org/models/kurtosis/, through which skewness and kurtosis values for both univariate and multivariate analyses were generated(Hair, 2009; Neuman & Fawcett, 2002). For the assessment of univariate normality, the critical thresholds were set as ±1 for skewness and ±7 for kurtosis. For the evaluation of Mardia's multivariate normality, the criteria proposed by Mardia (1974) were adopted, with critical values of ±1 for multivariate skewness and ±20 for multivariate kurtosis. If the calculated values of each indicator fell within their respective critical ranges, the data could be deemed to conform to the normal distribution characteristics at the corresponding dimensional level (Mardia, 1974).

Findings and Results

Reliability Analysis

Since the pilot sample (n=30) was too small, the alpha value was computed based on Cronbach's alpha and should be regarded as a preliminary measure of internal consistency. In the case of two-item subscales, alpha can underestimate the reliability; thus, the Spearman-Brown coefficients and omega of McDonald will be calculated in the study under consideration with the bigger sample. Table 1 shows the reliability analysis results. Calculated using SPSS, the internal consistency (Cronbach's Alpha) is all bigger than 0.7. An Alpha above 0.7 is considered to provide good reliability Cronbach (1951). Furthermore, another look at the (CITC) Corrected Item-Total Correlation indicates that none of the items is below 0.4 in explaining its respective factor. This indicates that the subjects have given a consistent response to the items and also testifies to the high stability of the data (Taber, 2018). High Alpha coefficients as well as positive items-to-total correlation values suggest the data in this study are internally consistent and reliable (Lord & Novick, 2008). In addition, "Cronbach's alpha coefficient if item deleted" was less than the original scale for all items Zhang et al., (2019) This finding suggests no redundant items in the scale with a consistent and brief structure.

Table 1

The Results of Reliability Analysis

Variable	Item	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Tangibles	Tan1	0.711	0.804	0.851
	Tan2	0.733	0.779	
	Tan3	0.725	0.789	
Reliability	Re1	0.691	0.725	0.809
	Re2	0.684	0.713	
	Re3	0.637	0.787	
Responsiveness	Res1	0.841	0.812	0.896
	Res2	0.774	0.869	
	Res3	0.777	0.872	
Assurance	Ass1	0.771	0.855	0.889
	Ass2	0.84	0.792	
	Ass3	0.76	0.871	
Empathy	Emp1	0.761	0.869	0.891
	Emp2	0.763	0.865	
	Emp3	0.839	0.799	
service quality			15 items	0.953
Physical Privacy	Phy1	0.715	-	0.833
	Phy2	0.715	-	
Decisional Privacy	De1	0.687	0.837	0.853
	De2	0.731	0.789	
	De3	0.762	0.761	
Associational Privacy	Asp1	0.638	0.746	0.804
	Asp2	0.707	0.675	

	Asp3	0.614	0.776	
privacy		9 items		0.934
Language Dimension	Lan1	0.816	0.858	0.904
	Lan2	0.803	0.868	
	Lan3	0.812	0.862	
Food Dimension	Fo1	0.706	0.813	0.852
	Fo2	0.732	0.786	
	Fo3	0.735	0.783	
Religious	Reg1	0.742	0.836	0.874
	Reg2	0.797	0.787	
	Reg3	0.738	0.843	
Culture Proximity			9 items	0.949
Treatmentor Health care Cost	THC1	0.642		0.768
	THC2	0.642		
Accommodation Cost	AC1	0.714		0.831
	AC2	0.714		
Transportation Cost	TC1	0.735		0.828
	TC2	0.735		
Time Cost	TiC1	0.693		0.817
	TiC2	0.693		
Wage Loss	WL1	0.613		0.742
	WL2	0.613		
Cost			10 items	0.942
Destination Selection Intention	DSI1	0.785	0.827	0.878
to Revisit	DSI2	0.808	0.802	
	DSI3	0.773	0.865	
External Recommendation	ERI1	0.571	0.745	0.777
Influence Intention	ERI2	0.709	0.591	
to Revisit	ERI3	0.564	0.751	
Planning Effort Intention	PEI1	0.643	0.694	0.782
to Revisit	PEI2	0.63	0.711	
	PEI3	0.617	0.707	
Satisfaction-Driven Intention	SDI1	0.719	0.859	0.875
to Revisit Dimension	SDI2	0.744	0.843	
	SDI3	0.825	0.768	
Intention to Revisit-Driven	IRD1	0.752	0.836	0.87
Recommendation Dimension	IRD2	0.79	0.823	
	IRD3	0.788	0.791	
Intention to revisit			15 items	0.947

Validity Analysis

The results of the Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity are presented in Table 2. In the validity analysis, the KMO values for all dimensions were above 0.7, and the results of Bartlett's test of sphericity were significant (Sig. < 0.05). The KMO value measures the partial correlations among variables. A value greater than 0.7 indicates strong common factors among the variables, making them suitable for factor analysis (Shrestha, 2021). The significant result from Bartlett's test suggests that the correlation matrix is not an identity matrix, thus rejecting the null hypothesis (Knapp & Swoyer, 1967). This further confirms that there are significant correlations between the original variables. These results imply that the data can be factorable, but it is not only that KMO and the test of Bartlett show construct validity. The main study will need exploratory and confirmatory factor analysis to assess the convergent and discriminant validity.

Table 2

The Results of Validity Analysis

Variable Dimension	KMO Measure	Bartlett's Test of Sphericity		
		Approximate Chi-Square	df	Sig.
Quality Service	0.848	383.564	105	0
privacy	0.833	192.303	36	0
Culture Proximity	0.909	211.529	36	0

Cost	0.901	216.096	45	0
Intention to Revisit	0.732	359.304	105	0

Normality Test

The results of the normality test are shown in Figure 1. Among the relevant statistics for multivariate skewness, the "b" value is 812, and the calculated "z" value is 4060.00000, with a corresponding p-value of 1 (> 0.05). From the perspective of the skewness index alone, the data do not show significant non-normal characteristics. For multivariate kurtosis, the "b" value is 841, the "z" value is -86.62942, and the corresponding p-value is 0 (< 0.05), which is statistically significant, indicating that the steepness or tail thickness of the overall data distribution significantly deviates from the requirements of multivariate normal distribution. Since multivariate normality requires both skewness and kurtosis to be statistically non-significant (both p-values > 0.05), although the skewness index is not abnormal, the kurtosis index violates the assumption of multivariate normality. Combined with the determination criteria of Mardia's test, it is finally concluded that the data do not satisfy a multivariate normal distribution.

The skewness and kurtosis statistics of Mardia were used to determine the multivariate normality. The statistics of multivariate kurtosis were higher than the recommended values, which implies that it did not follow the multivariate normality. The interpretation of multivariate skewness, however, must be done with due caution by separating between raw coefficients and standardised z-scores. The values of kurtosis in this pilot data indicate non-normal distribution. Notably, the covariance-based SEM needs multivariate normality, but this is not the case with the variance-based methods like PLS-SEM. Thus, PLS-SEM is more suitable for further analysis of large-scale samples due to non-normality in the pilot sample. There were also univariate skew and kurtosis statistics that were checked but are not tabulated here because of pilot reporting restrictions; this will be fully reported in the main study.

Output of skewness and kurtosis calculation

Sample size: 30
Number of variables: 58

Univariate skewness and kurtosis

	Skewness	SE_skew	Z_skew	Kurtosis	SE_kurt	Z_kurt
Tan1	-0.498	0.427	-1.167	-0.449	0.833	-0.539
Tan2	-0.231	0.427	-0.541	-1.068	0.833	-1.282
Tan3	-0.277	0.427	-0.650	-1.146	0.833	-1.376
Re1	-0.392	0.427	-0.917	-0.250	0.833	-0.300
Re2	-0.386	0.427	-0.904	-0.762	0.833	-0.915
Re3	-0.331	0.427	-0.775	-1.255	0.833	-1.507
Res1	-0.723	0.427	-1.694	-0.756	0.833	-0.907
Res2	-0.406	0.427	-0.952	-1.132	0.833	-1.359
Res3	-0.633	0.427	-1.482	-0.967	0.833	-1.161
Ass1	-0.327	0.427	-0.765	-0.942	0.833	-1.131
Ass2	-0.576	0.427	-1.348	-0.377	0.833	-0.453
Ass3	-0.855	0.427	-2.002	1.093	0.833	1.313
Emp1	-0.388	0.427	-0.909	-0.474	0.833	-0.569
Emp2	-0.723	0.427	-1.693	-0.248	0.833	-0.298
Emp3	-0.342	0.427	-0.801	-0.656	0.833	-0.788
Phy1	-0.168	0.427	-0.394	-0.397	0.833	-0.477
Phy2	-0.026	0.427	-0.061	-0.289	0.833	-0.347
Inf1	-0.269	0.427	-0.630	-0.535	0.833	-0.642
De1	-0.165	0.427	-0.387	-1.111	0.833	-1.335
De2	-0.164	0.427	-0.383	-0.999	0.833	-1.199
De3	-0.283	0.427	-0.662	-0.580	0.833	-0.697
Asp1	-0.507	0.427	-1.188	-1.129	0.833	-1.356
Asp2	-0.150	0.427	-0.352	-1.010	0.833	-1.212
Asp3	-0.414	0.427	-0.969	-0.847	0.833	-1.017
Lan1	-0.487	0.427	-1.140	-0.983	0.833	-1.181
Lan2	-0.569	0.427	-1.333	-0.801	0.833	-0.962
Lan3	-0.319	0.427	-0.748	-1.533	0.833	-1.841
Fo1	-0.271	0.427	-0.634	-1.189	0.833	-1.428
Fo2	-0.503	0.427	-1.179	-0.596	0.833	-0.716
Fo3	-0.266	0.427	-0.623	-1.038	0.833	-1.246
Reg1	-0.715	0.427	-1.674	-0.504	0.833	-0.605
Reg2	-0.343	0.427	-0.802	-1.272	0.833	-1.528
Reg3	-0.656	0.427	-1.536	-0.932	0.833	-1.119
THC1	0.706	0.427	1.653	-0.883	0.833	-1.060
THC2	-0.642	0.427	-1.503	-0.347	0.833	-0.417
AC1	-0.538	0.427	-1.261	-0.796	0.833	-0.956
AC2	-0.769	0.427	-1.801	-0.391	0.833	-0.470
TC1	-0.297	0.427	-0.697	0.784	0.833	0.941
TC2	-0.149	0.427	-0.349	-0.476	0.833	-0.571
TiC1	-0.768	0.427	-1.799	-0.474	0.833	-0.570
TiC2	-0.826	0.427	-1.935	-0.558	0.833	-0.670
WL1	-0.736	0.427	-1.725	-0.436	0.833	-0.524
WL2	-1.518	0.427	-3.555	3.243	0.833	3.894
DSI1	-0.480	0.427	-1.124	-0.798	0.833	-0.959
DSI2	-0.310	0.427	-0.725	-1.148	0.833	-1.379
DSI3	-0.609	0.427	-1.428	-1.078	0.833	-1.295
ERI1	-0.788	0.427	-1.847	-0.574	0.833	-0.689
ERI2	-0.905	0.427	-2.119	-0.175	0.833	-0.210
ERI3	-0.867	0.427	-2.032	-0.397	0.833	-0.477
PEI1	-0.609	0.427	-1.428	-1.078	0.833	-1.295
PEI2	-0.634	0.427	-1.485	-0.273	0.833	-0.328
PEI3	-0.589	0.427	-1.380	-0.770	0.833	-0.925
SDI1	-0.341	0.427	-0.798	-1.013	0.833	-1.217
SDI2	-0.039	0.427	-0.092	-1.433	0.833	-1.720
SDI3	-0.217	0.427	-0.508	-1.175	0.833	-1.411
IRD1	-0.623	0.427	-1.460	0.258	0.833	0.310
IRD2	-0.489	0.427	-1.145	-1.263	0.833	-1.516
IRD3	-0.566	0.427	-1.325	-0.703	0.833	-0.844

Mardia's multivariate skewness and kurtosis

	b	z	p-value
Skewness	812	4060.00000	1
Kurtosis	841	-86.62942	0

Figure 1

Statistical analysis of an online calculator for univariate and multivariate tests

Discussion and Conclusion

Results of the reliability analysis showed that the Cronbach's alpha coefficients for both the overall scale and its individual dimensions were all greater than 0.93 (service quality: 0.953; privacy: 0.934; cultural proximity: 0.949; cost: 0.942; revisit intention: 0.947). Alpha coefficients exceeding 0.90 could be a sign of possible redundancy of the items. Nonetheless, since this pilot was exploratory and no inter-item correlation diagnostics had been done, no items were eliminated at this point. In the complete study, EFA/CFA will involve redundancy diagnostics.

Additionally, the Corrected Item-Total Correlation (CITC) for all items exceeded 0.4, and removing any single item did not lead to a significant increase in the alpha coefficient. These findings confirm the scale's strong internal consistency (Koo & Li, 2016). For validity analysis, the Kaiser-Meyer-Olkin (KMO) values for all dimensions were above 0.73, and Bartlett's Test of Sphericity yielded p-values < 0.001 for all cases, indicating the data were suitable for factor analysis (Shrestha, 2021). The normality test was conducted using Mardia's test method. According to the multivariate normality determination criteria proposed by Mardia (1974), the critical value for skewness is ±1, and that for kurtosis is ±20. From the test results, the "z" value calculated for multivariate skewness is 4060.00000, which far exceeds the upper critical value of +1 for skewness. The "z" value for multivariate kurtosis is -86.62942, also exceeding the lower critical value of -20 for kurtosis. Neither the skewness nor the kurtosis index value falls within the corresponding critical range. Therefore, it can be determined that the data do not satisfy the characteristics of a multivariate normal distribution.

Since it is a pilot study, informally, feasibility outcomes were observed, i.e. completion time (about 12-15 minutes), no systematic non-response and participant understanding, but were not documented. Structured feasibility metrics will be used in future data collection.

Conclusion

Based on the SERVQUAL model, this pilot study integrated variables necessary for the medical tourism context, including "privacy," "cultural proximity," and "cost", to adapt a measurement scale tailored to Chinese tourists' revisit intention for fertility medical tourism in Malaysia. The reliability, validity, and normality of the data associated with the scale were confirmed using a sample of 30 participants.

The contribution of this pilot study is the systematic validation of an adapted questionnaire (obtained from indigenized literature) through reliability testing (as measured by Cronbach's Alpha), validity testing (estimated by KMO), and normality tests using Mardia's test method. The results confirm that the questionnaire has good internal consistency and structural fit, and its data distribution features meet the required assumption check of later statistical analysis methods, e.g., PLS-SEM. By this, the risk of result bias in the actual study's formal research due to measurement errors in the measuring instrument is substantially reduced.

The purpose of the pilot study was to test the initial reliability and factorability of a modified measurement tool to measure revisit intention using a group of mainland Chinese fertility tourists as the target population in Malaysia. Findings indicate reasonable internal consistency and adequate sampling, but the construct validity is yet to be determined as the pilot sample is too small and no modelling is carried out. There was also a lack of multivariate normality, which also justifies the use of variance-based structural modelling techniques in the further analysis. The pilot fails to test the mediation relationships and fails to verify the measurement structure. Instead, it gives a preliminary data screening of item performance before a full-scale data collection. The second research phase will comprise a larger sample and formal EFA/CFA processes, and then structural modelling will be undertaken.

A larger scale is to be tested on a different sample for further research, as suggested by this pilot study, and PLS-SEM is to be conducted based on the empirical verification of mediation effects among those factors.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Ethical considerations in this study were that participation was entirely optional.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contribute to this study.

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