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Modeling the effects of service quality determinants on patient satisfaction: A SEM Approach in a private Afghan Hospital

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Abstract

This study delves into Mohmand International Hospital's (MIH) service quality and its impact on customer satisfaction. Using a questionnaire with 394 hospital patients, we investigated tangibility, empathy, responsiveness, assurance, and reliability. Analyzing data via AMOS 24.00 and SPSS 27.00 revealed significant positive correlations between these service quality aspects and customer satisfaction. Notably, while tangibility yielded higher satisfaction levels, responsiveness and reliability showed lower satisfaction rates. Together, these aspects accounted for 54.3% of customer satisfaction variance. Recommendations focus on improving MIH's empathy and responsiveness to enhance overall satisfaction.

Keywords: Customer Satisfaction, Responsiveness, Reliability, Responsiveness, Service Quality, SERVQUAL Model, Tangibility.

Introduction

The recent surge in attention towards hospital services arises from societal shifts demanding elevated medical care standards to enhance overall living conditions. Improving the quality of medical care has emerged as a critical concern, particularly in the realm of patient care. Hospitals increasingly recognize the pivotal role of service quality in bolstering patient satisfaction and fostering enduring loyalty (Zarei et al., 2012).

Customer satisfaction stands as a pivotal focus for both enterprises and researchers. It serves as a linchpin for organizations aiming to increase revenues, curtail expenses, and cultivate lasting customer loyalty, as underscored by studies (Upadhyai et al., 2019). Contemporary industries, especially those actively engaging with customers like

healthcare and financial services, prioritize customer contentment. In these sectors, service quality emerges as a critical differentiator, conferring competitive advantages and contributing to sustained profitability (Sharifi et al., 2021).

Enhancing service quality presents a significant challenge, notably in aligning with customer expectations and ensuring their satisfaction. This challenge holds particular importance in service industries such as hospitals. Understanding patient perspectives and identifying service quality gaps are crucial steps for hospital management in rectifying perceived deficiencies while managing resources effectively. In today's competitive market, demonstrating patientcentric hospital services is integral to delivering optimal medical care (Neupane & Devkota, 2017).

Understanding patient expectations in assessing service quality is pivotal due to its significant impact on profitability, cost management, and market share (Aghamolaei et al., 2014). Previous research underscores the correlation between superior service quality, customer retention, acquisition of new customers, reduced expenses, an enhanced corporate image, positive word of mouth endorsements, and ultimately, improved profitability (Aldamen, 2017).

Despite Kandahar Hospitals embracing quality improvement strategies, there exists limited literature on patient perceptions regarding healthcare service quality. This research aims to bridge this gap by empirically exploring the impact of healthcare service quality on patient satisfaction at Mohmand International Hospital.

This study seeks to address several key inquiries:

- What is the relationship between service quality dimensions and customer satisfaction?
- What impact does service quality have on customer satisfaction?
- Is there a significant relationship between service quality and customer satisfaction?
- Which service quality dimension notably influences customer satisfaction?

To scrutinize the influence of service quality on customer satisfaction at Mohmand International Hospital.

- To evaluate the determinants affecting service quality.
- To explore the correlation between service quality dimensions and customer satisfaction.
- To assess the impact of service quality on customer satisfaction.
- To identify the primary service quality dimension strongly linked to customer satisfaction.

This research holds significance in assessing and enhancing service quality and customer satisfaction, providing valuable insights for managerial decision making. The outcomes of this study bear relevance to academia, marketing, management in business, and researchers investigating customer contentment and service quality, especially within the healthcare domain.

Material and Method

The research adopts a descriptive and explanatory design, utilizing quantitative methods to analyze customer data. This cross-sectional study took place at MIH Hospital in Kandahar, Afghanistan, encompassing all patients seeking health services during working hours.

This research was carried out at the MIH Hospital, located in Kandahar, one of Afghanistan's wellknown provinces. Being a private hospital, MIH operates in compliance with international healthcare standards within the country. The study encompassed all individuals seeking healthcare services at the hospital throughout the week, from Saturday to Friday, during regular working hours. According to hospital records, an estimated 200,000 cases are attended to annually across all departments.

Sample Size and Sampling Technique

Determining Sample Size

The researcher intended to derive a sample size from the patient pool receiving services at MIH Hospital. Yamane's formula (1967) was utilized to calculate the sample size, considering a 95% confidence level, an expected margin of error € of 0.05, and assuming a population size (N) of 200,000 for the equation:

[n = frac{N}{1 + N \times €^2}]

Upon applying this formula to the given parameters:

[n = frac{200,000}{1 + 200,000 \times (0.05)^2} = 400]

Sampling Technique

The researcher employed a convenience sampling approach to select the target participants. This method was chosen due to its simplicity in selecting units based on their availability or easy accessibility. From the total population of 200,000, 400 samples were drawn for primary data collection.

Data Source and Collection Method

To effectively accomplish the study objectives, primary data sources were utilized. Questionnaire has six dimensions such as reliablity, assurance, empathy, responsivness, tangiablity and satisfaction adopted from Paramsuramana et al (1985). Questionnaires served as the primary means of data collection and were distributed among the hospital's customers. The variables were assessed using a Likert scale, offering five response categories: "strongly agree," "agree," "neither agree nor disagree," "disagree," and "strongly disagree."

Procedure of Data Collection

After obtaining permission from the hospital, the researcher distributed the questionnaires to the respondents. All questionnaires were completed and collected from customers within a twoweek timeframe.

Validity and Reliability Testing

Validity

In assessing the validity of the measurement model, steps were taken to ensure the model passed convergent and discriminant validity tests (Byrne, 2010). The results of these validity tests, including Convergent Validity, Average Variance Extracted (AVE), and the Discriminant Validity test, are presented in Tables.

Reliability

Reliability, concerned with the consistency of measures, was evaluated (Byrne, 2010; Ho et al., 2016). When α exceeds 0.7, it signifies high reliability, while values below 0.3 imply low reliability. For the service quality dimensions questionnaire, Cronbach's alpha values for all service quality dimensions surpassed 0.7, indicating high reliability.

Results of Cronbach's Alpha for Service Quality Dimensions:

- Tangibility: 0.870
- Reliability: 0.861
- Responsiveness: 0.855
- Empathy: 0.850
- Assurance: 0.856

Method of Data Analysis

The Statistical Package for Social Science (SPSS) version 27.0 and AMOS 24.0 were utilized for data analysis in this study. Various statistical tools were employed, including descriptive analysis, tests for Classical Linear Regression Model (CLRM) assumptions, correlation analysis, multiple regression analysis, Factor Analysis (both Exploratory and Confirmatory), and Structural Equation Modeling (SEM).

Findings

This section encapsulates the outcomes derived from data analysis, encompassing descriptive statistics and data normality assessment. Descriptive statistics are vital in characterizing fundamental features of the study's data, delineated into measures of central tendency (mean, median, mode) and measures of variability (standard deviation, variance, minimum and maximum variables, kurtosis, and skewness). These latter parameters were evaluated in this study to affirm the normality of the data.

Following this, the study delves into analyzing the correlation matrix, crucial for testing linearity, homoscedasticity between variables, and detecting multicollinearity among the independent variables. Reliability analysis was then conducted to ensure consistency among survey items, employing Cronbach's alpha tests to evaluate the reliability of multiquestion Likert scale surveys and establish relationships among individual items in the scale.

Subsequently, the study proceeded with Exploratory Factor Analysis (EFA), a pivotal quantitative method used to identify relationships between indicators of manifest variables in constructing a construct, thereby determining its suitability for subsequent model analysis.

Confirmatory Factor Analysis (CFA) was then conducted for all variables to verify whether the collected data adhered to the previously established model. Finally, the section culminates in hypothesis testing through Structural Equation Modeling (SEM) to ascertain the implications drawn from the established model.

Respondents' Demographic Profile

In the descriptive analysis of the respondents, the gender distribution showed that 90.36% were male, while females represented 9.64%. The age distribution among respondents was as follows: 34% were between 18–25 years old, 28% between 26–35 years old, 18% between 36–45 years old, and 20% were above 45 years old. Regarding educational qualifications, the survey revealed that 28% held a certificate/diploma, 46% possessed professional

qualifications, 23% held a bachelor's degree, 2% had a master's degree, and 1% were PhD holders. Table 1 illustrates that 90.4% of the respondents were frequent visitors to the hospital, whereas 9.6% were visiting for the first time. Concerning payment methods, 90.1% of the respondents made payments, while 9.9% received free services.

Table 1: Respondents' Demographic Profile

Description	Frequency	% Percentage
Gender		
Male	356	90.36
Female	38	9.64
Age Group		
18-25	135	34.3
26-35	109	27.7
36-45	73	18.5
Up to 45	77	19.5
Reason for visit		
Illness	354	89.8
Vaccination	7	1.8
Family Planning	6	1.5
Other	27	6.9
Educational Level		
High School	109	27.7
Bachelor	91	23.1
Master	7	1.8
PhD	4	1.0
Uneducated	183	46.4
Payment Status		
Free	39	9.9
Payment	355	90.1
Frequency of Visit		
First	38	9.6
Frequent	356	90.4

Source: Authors' calculations.

Normality Tests

Skewness demonstrates the deviation of the data from the mean, while kurtosis reflects the peakedness of the distribution. For a normal distribution, skewness values should ideally fall within ±3.00 standard errors, and kurtosis within ±5.00 standard errors (Ho et al., 2016). The statistics for skewness and kurtosis for each variable in this study are as follows:

- Reliability: Skewness = 0.584, Kurtosis = -0.504
- Assurance: Skewness = 0.654, Kurtosis = -0.554
- Tangibility: Skewness = 0.780, Kurtosis = -0.202
- Empathy: Skewness = 0.549, Kurtosis = -0.410
- Responsiveness: Skewness = 0.593, Kurtosis = -0.321

Overall, Customer Satisfaction had statistics for Skewness = 0.612 and for Kurtosis = -0.514. Based on these results, it appears that the data in this research is normally distributed. For more detailed information, please refer to Table 2 for the skewness and kurtosis data of all variables.

Table 2: Testing for Normality using Skewness and Kurtosis

Variables	Skewness		Kurtosis	
	Statistic	Standard error	Statistic	Standard error
Reliability	.584	.123	-.504	.245
Assurance	.654	.123	-.554	.245
Tangibility	.780	.123	-.202	.245
Empathy	.549	.123	-.410	.245
Responsiveness	.593	.123	-.321	.245
Customer Satisfaction	.612	.123	-.514	.245

Source: Authors' calculations

Correlation Matrix Results

The findings in Table 3 demonstrate a satisfactory degree of relationship among all exploratory variables in the model. Specifically:

Reliability exhibited moderate relationships with:

- Assurance (r = 0.597)
- Tangibility (r = 0.424)
- Empathy (r = 0.498)
- Responsiveness (r = 0.500)
- Customer Satisfaction (r = 0.609)

Assurance demonstrated moderate relationships with:

- Tangibility (r = 0.414)
- Empathy (r = 0.610)
- Responsiveness (r = 0.526)
- Customer Satisfaction (r = 0.603)

Tangibility has moderate relationships with:

- Empathy (r = 0.531)
- Responsiveness (r = 0.507)
- Customer Satisfaction (r = 0.528)

Empathy exhibits moderate relationships with:

- Responsiveness (r = 0.649)
- Customer Satisfaction (r = 0.578)

Responsiveness shows a moderate relationship with Customer Satisfaction (r = 0.587).

Table 3: Correlation matrix result among the variables.

Variables	Reliability	Assurance	Tangibility	Empathy	Responsiveness	Satisfaction
Reliability	1.000					
Assurance	.597	1.000				
Tangibility	.424	.414	1.000			
Empathy	.498	.610	.531	1.000		
Responsiveness	.500	.526	.507	.649	1.000	
Customer Satisfaction	.609	.603	.528	.578	.587	1.000

Source: Authors' calculations.

While all six variables exhibit significant correlations, the strengths of these correlations range from low to moderate. This suggests that the assumption of linearity and homoscedasticity between variables is achieved, as the correlations remain within moderate bounds without demonstrating high correlation.

Additionally, this correlation matrix result signifies the absence of multicollinearity among the independent variables. The criterion for assessing multicollinearity suggests variance inflation factors (VIFs) exceeding 10 or tolerance values below 1. However, in this study, the highest VIF observed was 2.234, below the threshold of 10, and the lowest tolerance

value was 0.448, above the required threshold of 1. For more detailed results, please refer to Table 4.

Table 4: Multicollinearity Test

Variables	Tolerance	VIF
Reliability	.579	1.727
Assurance	.506	1.977
Tangibility	.655	1.526
Empathy	.448	2.234
Responsiveness	.509	1.966

Source: Authors' calculations

Reliability Analysis

Reliability assesses the consistency between multiple measurements of variables (Ho et al., 2016; Byrne, 2010). In this study, Cronbach's alpha was employed to evaluate the internal consistency of 27 items across six dimensions. Cronbach's alpha scores range from 0 to 1, with values closer to 1 indicating higher consistency (Ho et al., 2016).

Table 5 displays the Cronbach's alpha scores for the five factors of service quality at MIH in Kandahar, Afghanistan. The alpha values ranged from 0.843 to 0.870, surpassing the minimum criterion of 0.60 for Cronbach's alpha as suggested by Byrne (2010). These values signify strong internal consistency among the measured dimensions.

Table 5: Relaibility Test Results

Variables	No. of Item	Coronach's Alpha
Reliability	5	.861
Assurance	4	.854
Tangibility	4	.870
Empathy	5	.848
Responsiveness	4	.853
Customer Satisfaction	5	.846

Source: Authors' calculations.

Exploratory Factor Analysis (EFA)

Exploratory Factor Analysis (EFA) is a crucial process aimed at condensing numerous instruments into factors based on their strong correlations (Byrne, 2010; Ho et al., 2016). In this study, 394 usable responses were employed to conduct the analyses. EFA utilized the principal component extraction method with direct varimax rotation applied to all questionnaire items to identify potential underlying factors.

Before running the EFA, data screening involved examining descriptive statistics on each item, correlations among variables, and validating necessary statistical assumptions (Ho et al., 2016). The minimum KaiserMeyerOlkin (KMO) value obtained was 0.880 for the factor of relative advantage (refer to Table 6), indicating the suitability of the data for principal component analysis.

Both the KMO and Bartlett's Test of Sphericity yielded significant results, affirming sample adequacy for the factor analysis in this study (Ho et al., 2016; Byrne, 2010). In factor analysis, loadings above 0.4 are considered important, while those exceeding 0.5 are deemed significant (Sharma et al., 2005). The EFA in this study revealed a minimum factor loading of 0.5, meeting the specified requirement. The overall results suggest that 6 factors have been identified and will be utilized for further analysis.

Table 6: KMO and Bartlett's test results.

Kaiser Meyer Olkin Measure of Sampling Adequacy		0.880
Bartlett's Test of Sphericity	Approx. Chi-Square	1096.081
	Df	15
	Sig.	0.000

Source: Authors' calculations.

Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis (CFA) assesses the suitability of a measurement model, measuring perceived indicators that signify a latent variable (Ho et al., 2016). This assessment determines model adequacy by considering four fit indices: chi-square statistic, normed chi-square, root mean square approximation (RMSEA), and comparative fit index (CFI). For model adequacy, standard benchmarks recommend values: Normed Chi-Square and RMSEA should be below 5 and 0.088 respectively, while CFI values should exceed 0.9 (Byrne, 2010).

In this study, Table 7 illustrates the results of CFAs conducted on six constructs: reliability, assurance, tangibility, empathy, responsiveness, and customer satisfaction. Furthermore, to enhance the model's goodness-of-fit, factors with a loading below 0.40 were excluded. Consequently, after eliminating the aforementioned values, the structural model showed strong and satisfactory goodness-of-fit, with a relative chi-square value of CMIN/df at 1.97, CFI at 0.921, NFI at 0.853, and an RMSEA of 0.05 (refer to Fig. 1). The comprehensive summary of the structural model confirmed its absolute fit.

Table 7: Goodness-of-fit of the model.

Types of Measure	Fit index	Modal Summary	
		Acceptable Value	Observed Value
Absolute fit index __ To Examine the level of effectiveness of the Model Reproduce Data	Normed Chi-Squared (CMIN/df)	≤ 3	1.97
	RMSEA	≤ 0.08	0.05
Incremental Fit index __ Modal Fit to relative Bassline Modal	Normed Fit Index (NFI)	≥ 0.9	0.853
	Comparative Fit Index (CFI)	≥ 0.9	0.921

Source: Authors' calculations.

Construct Validity Test

In assessing the validity of the measurement model, it's crucial to verify that the model successfully clears the convergent and discriminant validity tests (Byrne, 2010). The results of these validity tests, including Convergent Validity, Average Variance Extracted (AVE), and Discriminant Validity (correlation), are detailed in Table 7.

Table 8: Convergent and Discriminate Validity.

Latent Variables	Square of Standard Loading	Sum of Squared Standard Loading	No. of Indicators	AVE	Square root of AVE
Reliability	0.707107	4.17	5.00	0.83	0.91
Assurance	0.724569	3.23	4.00	0.81	0.90
Tangibility	0.707107	3.28	4.00	0.82	0.91
Empathy	0.69857	3.88	5.00	0.78	0.88
Responsiveness	0.72111	3.22	4.00	0.81	0.90
Satisfaction	0.707107	4.17	5.00	0.83	0.91

Source: Authors' calculations.

The findings Indicate that the convergent validity has been established, evident from the higher value of the convergent validity test (0.83) compared to the AVE test values, all of which exceed 0.50. Additionally, discriminant validity has been successfully established across all studied factors, as all AVE values surpass the respective correlations (Ho et al., 2016). This highlights the robustness of the model in demonstrating both convergent and discriminant validity.

Analysis of the Baseline Structural Model

The analysis of the Full Baseline model depicted in Fig. 1 is summarized in Table 8. Notably, significant relationships were observed within the structural model, such as:

- The relationship between Reliability and Satisfaction ($\beta = 0.430$, p value = 0.000)
- The relationship between Assurance and Satisfaction ($\beta = 0.40$, p value = 0.002)
- The relationship between Tangibility and Satisfaction ($\beta = 0.399$, p value = 0.017)

Additionally, the R2 value for customer satisfaction was found to be 0.544, indicating that the variables under study collectively contributed to explaining approximately 54.4% of the variance observed in customer satisfaction. These findings underscore the substantial impact of the studied factors on customer satisfaction within the model. Overall there were significant relationships observed between reliability and satisfaction, assurance, tangibility, empathy, and responsiveness within the MIH customer services. This suggests a higher level of satisfaction among MIH customers due to these specific service factors.
Furthermore, the goodness of fit results for the Full Baseline model, as indicated in Table 7, displayed robust and satisfactory goodness of fit indices:

- Relative chi-square value (CMIN/df) of 1.97
- Comparative Fit Index (CFI) of 0.921
- Normed Fit Index (NFI) of 0.85
- Root Mean Square Error of Approximation (RMSEA) of 0.05

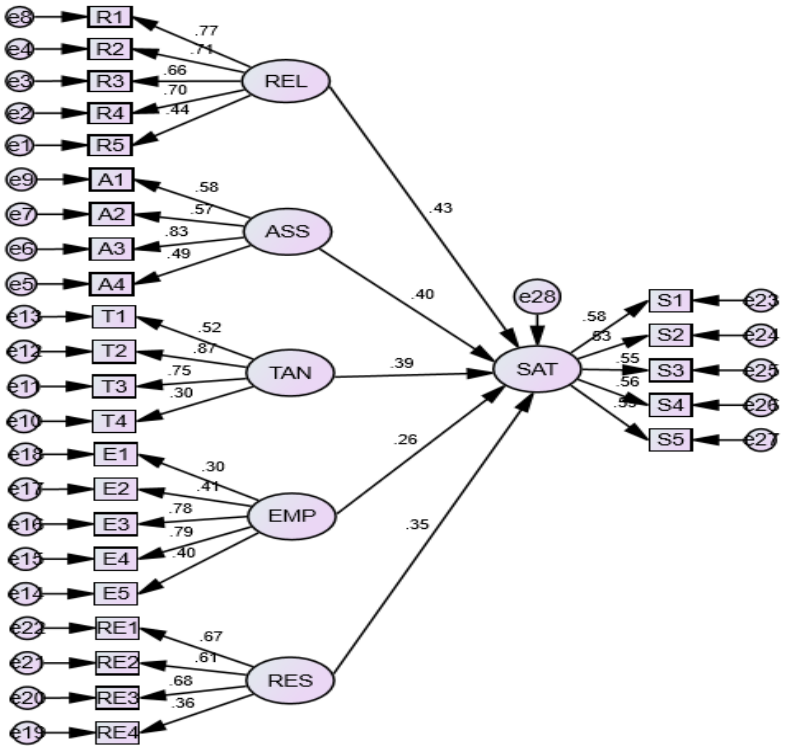

Figure 1: Full Baseline Model Analysis

These results collectively signify a strong and satisfactory fit of the Full Baseline model, reaffirming the model's effectiveness in explaining the relationships between various service factors and customer satisfaction within MIH.

Discussion

The discussion revolves around the study's findings in comparison with existing literature and previous research. It's evident from this study that customers expressed higher satisfaction with the tangibility dimension of service quality. However, there was comparatively lower satisfaction observed in the reliability and responsiveness dimensions of service quality. The correlation analysis unveiled a positive and significant relationship between the five SERVQUAL quality dimensions and customer satisfaction. Notably, the strongest relationship was discovered between reliability and customer satisfaction.

The overall satisfaction level of patients at MIH Hospital was found to be 90.1%, aligning with certain previous studies conducted in Ethiopia but varying from studies in other

locations such as Kuwait and Nigeria. The disparity in satisfaction levels might stem from differences in calculating demarcation thresholds among these studies.

Moreover, the study's results indicate that tangibility significantly impacts customer satisfaction, a finding corroborated by some previous research studies highlighting the positive effect of tangibility on customer satisfaction. However, conflicting opinions also exist in the literature, as some studies reported that tangibility does not significantly contribute to customer satisfaction.

These disparities in findings from various studies underscore the complexity of factors influencing customer satisfaction, potentially influenced by contextual variables, diverse methodologies, and possibly unique customer expectations across different healthcare settings.

The study's findings echo previous research indicating the impact of various service quality dimensions on customer satisfaction. Reliability, for instance, was observed to have a positive and significant effect on customer satisfaction in this study, aligning with several studies that support this relationship. However, conflicting opinions exist in the literature, with some studies reporting contradictory findings, such as Munusamy et al. (2010) suggesting a negative and insignificant impact of reliability on customer satisfaction.

Similarly, responsiveness and assurance were found to have positive and significant effects on customer satisfaction in this study, findings corroborated by previous research studies indicating the positive relationship between these dimensions and customer satisfaction. This alignment in findings with prior studies reinforces the significance of these dimensions in influencing customer satisfaction.

Furthermore, empathy exhibited a positive and significant effect on customer satisfaction in this study, consistent with certain studies highlighting the positive impact of empathy on customer satisfaction. However, dissenting views, such as Munusamy et al.'s (2010) findings indicating a negative effect of empathy on customer satisfaction, showcase the complexity and variability in research outcomes.

The collective Impact of these service quality dimensions on customer satisfaction accounted for 54% of the variance observed in customer satisfaction in this study ($R2 = 0.541$). This indicates that a substantial portion of customer satisfaction variability can be attributed to these dimensions, leaving approximately 46% unexplained, potentially influenced by other unexplored variables or factors not considered in this study.

Notably, the findings suggest that assurance emerges as the most influential factor in positively affecting customer satisfaction. This highlights the critical role of assurance in shaping and enhancing customer satisfaction within the context of the studied healthcare services.

Conclusion

The study aimed to explore the influence of customer service quality on customer satisfaction at MIH Hospital. The findings underscore that customers at MIH Hospital expressed satisfaction across five service quality dimensions (tangibility, reliability, responsiveness, assurance, and empathy). Notably, customers exhibited higher satisfaction with tangibility, while comparatively lower satisfaction was observed in reliability and responsiveness dimensions. Correlation analyses demonstrated a strong positive relationship between the five service quality dimensions and customer satisfaction. Moreover, all five dimensions—tangibility, reliability, responsiveness, assurance, and empathy—significantly and positively impacted customer satisfaction. Particularly, assurance emerged as the most crucial factor, exerting a substantial positive effect on customer satisfaction.

Additionally, these five service quality dimensions collectively accounted for significant variations in customer satisfaction. This reinforces their substantial roles in shaping and influencing the overall satisfaction experienced by customers at MIH Hospital.

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Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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