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Factors Affecting Patient Satisfaction in the UAE's Healthcare Sector

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Abstract

Background: The United Arab Emirates aims to provide "world-class healthcare" to its citizens. This study aims to determine the association between overall satisfaction and various aspects of healthcare services in the United Arab Emirates on a country level. **Methods:** The data was collected from 5855 respondents on the affordability, quality, accessibility, and responsiveness dimensions of health care. Besides frequency tables and descriptive statistics, statistical methods, such as Principal Component Analysis and Multiple Regression, were used to reduce and model the association between dependent (overall satisfaction) and independent (affordability, quality, accessibility, and responsiveness) variables. **Results:** The preliminary analysis using frequency tables and descriptive clearly highlighted the uncertainty associated with affordability and responsiveness dimensions of healthcare provision in the country. Analysis of variance and t-test results indicated statistically significant differences between perceptions of the respondents based on the socio-demographic factors and other factors such as the kind of insurance held by respondents, having a designated family physician, recent medical visits in the UAE, and intention to go back to home countries for medical treatment. The findings indicated higher satisfaction levels with quality and accessibility and lower satisfaction levels with affordability and responsiveness. Recommendations are provided to address the latter two factors. **Conclusion:** The study identifies healthcare service provision issues in the United Arab Emirates and recommends enhancing affordability and responsiveness.

Keywords

Service Quality, Healthcare, United Arab Emirates, Affordability, Responsiveness, Principal Component Analysis

1. Background

Intangibility, inseparability, heterogeneity, and perishability are characteristics of services [1]. Perishability refers to the "time dependency" and "time importance" of services, whereby services cannot be stored for later consumption [2]. Intangibility refers to impalpability. Inseparability refers to the instantaneous delivery and consumption of services. Heterogeneity refers to variability in service delivery. Given these characteristics of services, service-oriented industries need to comprehend client expectations and offer services accordingly. Customer satisfaction results from properly aligning consumers' demands, expectations, and service delivery [3].

In the private sector, there has been much research on the relationship between service quality and customer satisfaction, especially in the banking [4] [5] [6] [7] [8], retail [9] [10], telecommunications [9], and hotel [11] industries. Although the connection between service quality and organizational profitability in the private sector cannot be disputed, it is more crucial in the public sector's focus areas of education and healthcare. In the study and creation of policies, satisfaction with the service provided in exchange for these merit goods is crucial [12].

According to Berry and Seltman, healthcare services differ considerably from other services in a number of respects [13]. Health care services are provided as needed [14]; individuals are expected to give up their privacy [13] and have no choice over the type or delivery of labor- and skill-intensive operations that are tailored to their requirements. Additionally, the delivery of healthcare services involves both the service provider and the recipient working together [15].

Clinical or service quality is two factors used to evaluate healthcare quality [16]. Clinical quality relates to relatively rigorous measurements of excellence, such as the ratio of specialists to other doctors, unforeseen returns to the operating room, and in-patient mortality. In contrast, patients sense service quality [17] [18]. The "Iron Triangle" or "Triangle of Health Care" is a triad between cost, quality, and accessibility that is used to measure the general level of service quality in the healthcare industry [19]. The availability, acceptability, appropriateness, competency, timeliness, privacy, confidentiality, empathy, attentiveness, care, responsiveness, responsibility, correctness, dependability, comprehensiveness, continuity, equity, environment, and amenities and facilities can also be assessed [20]. Policymakers can modify or create policies that may provide better results and increase customer satisfaction by evaluating consumer views on the overlapping elements of service quality outlined above.

The provision of sustainable, high-quality healthcare to individuals across the world is a problem for governments. Healthcare expenditures are rising dramatically because of changing demographics (an aging population), population growth, non-communicable disease-causing lifestyle changes, technological advancements, and increasing consumer demands and expectations [21].

Continually assess perceived quality from the demand or end user's viewpoint

[22]. To quantify the perceived pleasure received from many areas of healthcare services in the nation, this article will concentrate on the service quality of the UAE's healthcare industry. Patients' impressions of several aspects of service quality, such as cost, quality of delivery, accessibility, and responsiveness, are assessed. This is because service quality in the healthcare industry is multifaceted [20]. This article adds to the growing literature on providing healthcare services globally. It focuses on a nation that exports oil and is working to diversify its economy and lessen its reliance on oil. Despite the present global health catastrophe, the COVID-19 pandemic, the nation's healthcare system is growing and changing quickly to serve the populace better.

This study aims to answer the following research question: To what extent do quality, affordability, accessibility, and responsiveness determine overall satisfaction in the UAE healthcare sector?

1.1. Healthcare in the United Arab Emirates

The UAE healthcare sector is categorized by public and private service providers' corresponding service utilization. Despite the prominent presence of private health care providers in the country, the general public expenditure as a percentage of the overall health care expenditure is relatively high. Between 2000 and 2015, public spending on health care was approximately 67 percent on average of the total expenditure [23].

The regulatory system in the health care industry in the UAE is multi-tiered and includes federal and emirate-level regulatory bodies[1]. The Federal Insurance Authority also plays a crucial role in the UAE healthcare sector, as the UAE government is transitioning towards universal health coverage for all residents in the UAE [24]. A handful of private healthcare providers dominate the UAE healthcare industry. During the last few years, the sector's mergers and acquisitions have further consolidated the industry [21].

International accreditation is prevalent and encouraged by the UAE regulatory authorities across the healthcare sector. According to the Ministry of Health and Prevention reports, over 70 percent of healthcare institutions and facilities have been accredited by international bodies. In contrast, the other facilities are accredited by 2021, according to reports by the Ministry of Health and Prevention [25]. Despite international accreditation of healthcare facilities, the standardization measures of quality are lacking among local private and public healthcare providers.

The importance of the insurance industry is paramount universally. The UAE's insurance industry is fragmented, with 61 insurance companies [26] serving a population of approximately nine million people. The top five insurance companies have a collective market share of 56.2 percent [27].

Significant development has been across the UAE's healthcare system over the

[1]The Ministry of Health and Prevention regulates the health care sector on a federal level (UAE Ministry of Health and Prevention, 2020). The emirate-level regulatory authorities regulate health care providers in Abu Dhabi, Dubai, and Sharjah.

last two decades, including improvements in accessibility, affordability, and service delivery of clinical quality. With such developments, the UAE government continuously financed the health industry, ensuring healthcare delivery to the population despite falling oil revenues. One of the dilemmas is to stabilize healthcare-related costs while extending accessibility and sustaining healthcare quality and affordability.

The National Agenda 2021 for UAE involved several indicators: health care, education, economy, justice, police and security, society, housing, infrastructure, and government services [28]. Under health care, the UAE government plans to cooperate with all strategic stakeholders in the health care sector and other sectors to provide health care according to national and international quality standards. It seeks to focus on preventive medicine and to reduce the prevalence of non-communicable diseases in the country [28]. In line with these objectives, AED 4.84 billion (6.89 percent of the annual budget 2020) has been allocated to health care and social services programs [29]. The actions aim to improve both clinical and service quality in the UAE healthcare sector.

This paper will primarily evaluate the perceptions regarding various service quality dimensions. The results will facilitate an understanding of the UAE's challenges in health care services.

1.2. Literature Review

The Iron Triangle of Health Care, developed by Kissick in 1994, identified three critical elements for patient satisfaction: Quality, Cost, and Accessibility. The model is based on the principle of opportunity cost and trade-off, where all three elements are interdependent, and the achievement of two factors will only occur at the expense of the third [19].

Extensive literature is available on quality in health care, and several definitions of quality have been proposed. According to Mosadeghrad [20], quality in health care can be excellence, value, conform to standards and guidelines, and meet customer needs and expectations. Compliance with these quality dimensions would result in satisfied end-users or ultimate beneficiaries of the health care service. A patient-centered approach in health care provision dictates "... [quality is that which] exceeds patient expectations and achieves the highest possible clinical outcomes with the resources available" [2]. This encompasses the health care service's clinical and service quality dimensions, encircling care and service aspects. Donabedian in 1980 [30] referred to these aspects as technical and interpersonal qualities. Donabedian highlighted that a distinction is drawn between care in health care provision, which is related to the direct technical intervention (*i.e.*, treatment, medication, check-ups, etc.) and *service*, which is concerned with the patients' experience of their interaction with the health care provider [30]. However, care and service are inseparable and essential to the overall quality of the patients' experience. While patients might not necessarily be able to assess the technical elements of care, they can evaluate

their service quality experience. Cohen highlighted that patients tend to give more weight to the interpersonal aspects of their experience with the health care provider [31].

Several factors contribute to the importance of patient satisfaction as a tool to help healthcare providers understand patients' perspectives and enhance overall quality. First, patient satisfaction and patient loyalty were found to be correlated. For example, in Yemen, a study found that patients' satisfaction with reliability, empathy, and assurance significantly influenced patient loyalty [32]. Similarly, Mortazavi *et al.* [33] concluded that there is a significant correlation between patient satisfaction and patient loyalty in nursing care, operating rooms, admission, and administration.

Second, patients can be viewed as customers from a consumerist perspective, especially in private healthcare providers' competitive market. Therefore, when healthcare delivery is commodified, patient (or consumer), satisfaction is crucial to organizational profitability. Due to dissatisfaction, patients are empowered to leave the consumption loop and find other options [34]. While there is a direct link between organizational profitability and patient satisfaction [35], the latter can reduce costs associated with resolving customer complaints [36].

Lastly, various aspects of patient satisfaction contribute to policy and organizational reform [37]. Although patient satisfaction surveys are not widely utilized in health care service assessment [38], they can identify performance gaps and indicate improvement areas.

Some healthcare professionals might dismiss patient satisfaction as being too subjective to determine healthcare quality [38]; however, patient-centered approaches to healthcare emphasize the importance of satisfying patients' expectations. In this sense, patient satisfaction is an evaluative process in which patients cognitively and emotionally react to the health care they receive [39]. Therefore, including recipients' perceptions of service quality in evaluating overall satisfaction is integral.

Another important aspect of health care is *cost*, synonymously used with *affordability*. As a generic term, affordability can be best defined as a measure of someone's purchasing power towards a good or service [40]. Glickman [41] states, affordability is not a synonym for low prices. It describes a qualitative ability to pay an interaction of price, disposable income, and judgments about the necessity of a particular good." Accordingly, affordability of health care reflects the end user's purchasing power, derived from his disposable income, to pay for health care services.

To personalize health care's actual cost and affordability, Emanuel *et al.* [42] proposed developing an "Affordability Index,"[2] which relates the average cost of health care to the average household income. The authors themselves indicated that the index is not perfect in determining the affordability of healthcare ser-

[2]Affordability Index is a ratio that relates health insurance costs to household incomes over time. It is calculated by dividing the mean cost of an employer-sponsored family health insurance policy by median household income.

vices. Glickman [41] highlighted several index limitations, such as regional and national variability in healthcare spending, the cost of insurance subsidized insurance for low-income families, and double counting employer contributions to premiums. The index is also limited in its universal applicability as many countries do not have universal or sponsored insurance.

Accessibility to health care is a complex and multidimensional construct. Levesque *et al.* highlighted that the literature on health care defines and operationalizes accessibility concerning financial, physical, and geographical accessibility, predisposing and enabling factors, availability, accommodation, affordability, acceptability, adequacy, and cultural acceptability [40]. Gulliford *et al.* broke-down *access* into "having" sufficient healthcare providers or, in other terms, availability and gaining access to such providers, which depends on actual utilization and affordability [43].

One aspect of accessibility is the availability of health care services, which can be operationalized, such as the number of patient-physician contacts [44]. Besides, availability can be determined by the number of hospitals and clinics, beds in each institution, and physicians and nurses [45]. Mosadeghrad [20] argued that accessibility (physical, financial, and conceptual) is crucial, while availability is essential. The author highlighted that accessibility is especially critical when the service costs are high, and insurance is unavailable. Gulliford *et al.* argued that from a policy perspective, facilitating access to health care refers to helping people utilize appropriate health resources to preserve or improve their health [43].

Besides the factors discussed above, Mosadeghrad [20] found that responsiveness in health care service provision is also relevant, mainly because information asymmetry exists between patients and service providers. This quality aspect may include active listening, trust, respect, confidentiality, courtesy, and effective communication, referred to as interpersonal aspects [31]. Lack of perceived responsiveness on the part of the service provider may lead to lower levels of satisfaction among healthcare services [46] [47] [48].

Besides the abovementioned factors, the literature discusses many factors that determine perceived service quality in health care provision [20]. It is evident that various aspects of healthcare delivery are highly interdependent, and their operationalization varies significantly in the literature [40]. This paper primarily focuses on three factors (cost, quality, accessibility), as suggested by Kissick [19], and responsiveness in the UAE healthcare sector.

2. Methods

The literature affirms that overall satisfaction with healthcare services is associated with various dimensions, such as quality, cost, accessibility, approachability, and responsiveness, to name a few. This study intends to investigate whether or not these associations are relevant in the context of the UAE. Based on the research question, the study hypothesizes that *there is no association between*

quality, affordability, accessibility, responsiveness, and overall satisfaction in the UAE healthcare sector.

Given the study's nature, quantitative analysis is most appropriate for data collection and analysis. Quantitative research methods allow broad data collection and analysis across many respondents [47] [48].

The target population for the research study consisted of citizens and residents of the UAE.[3] YouGov and the Mohammed Bin Rashid School of Government in Dubai collected the study data. A convenience sampling method was used to collect data. While using a convenience sample may impact how representative a sample is, a larger sample size may somewhat mitigate this limitation.

The appropriate sample size for a population of 9,121,170 was calculated through the Raosoft Sample Size calculator as an estimate [49] [50]. A sample size of n = 3382 was found to be suitable; however, the actual sample size exceeded the appropriate sample size by approximately 65 percent, and n was equal to 5855.

The respondents were asked to provide socio-demographic information. They were also asked to indicate whether or not they have a regular general physician, whether they have visited a doctor in the last three years, and lastly, whether they intend to go back to their home countries for medical consultation.

The survey items for the health services factors were adopted from the survey developed by Marshall and Hays [51] with the authors' permission. SERVQUAL [52] survey is standard in the health care literature. However, this study opted for the above instrument as it was deemed appropriate for exploratory research across the UAE's healthcare sector and was not targeted to a particular service provider. While eighteen questions were included in the survey, nine affirmative questions were used for data analysis. The survey was produced in English and was then translated into Arabic. These questions were classified under overall satisfaction, quality, affordability, accessibility, and responsiveness. The responses to all the questions were recorded on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree).

The English and Arabic surveys were disseminated online. The survey instrument fully complied with the ethics guidelines. The ethics approval (REC-04-017) was provided by the MBR School of Government Research Ethics Committee within the Government of Dubai, United Arab Emirates. All appropriate procedures related to informed consent, confidentiality, anonymity, participants' rights, and participation conditions, including the right to refuse or withdraw without penalty, were observed for the study.

A multi-step data analysis was employed to draw a conclusion about the sample and infer a conclusion about the population. In the first step, preliminary studies such as frequency tables, descriptive statistics, and correlation estimates were produced. The correlations were used to determine the need for principal component analysis (PCA) with varimax rotation. In the last step of the analysis,

[3]According to the UAE Federal Competitiveness and Statistics Authority (2018), the UAE population was 9,121,167.

the components extracted through PCA were used in a multiple regression model to estimate the association between overall satisfaction and various dimensions of service quality in the UAE healthcare industry.

2.1. Principal Component Analysis

PCA is used for dimension reduction in the presence of many variables and multicollinearity. However, another statistical method, such as regression or structural equation, needs to be subsequently used to estimate the dependence between the derived and dependent variables.

PCA was employed for dimension reduction to ensure the parsimony of the multiple regression model. The need for PCA was determined by estimating correlations between the variables included in the data collection instrument.

Field [53] indicated that the sample size is of primary consideration when using any form of factor analysis. Since the sample size in this study is substantially large relative to the number of variables involved, the use of PCA is deemed appropriate. The appropriateness of the sample size is determined by the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO). Kaiser [54] indicated that KMO values ranging between 0.7 and 0.9 are considered to be good. In addition to the sample size, Bartlett's test determined the strength of the relationship between variables. A p-value less than the significance level ($\alpha = 0.05$) associated with Bartlett's test statistic indicates the appropriateness of using factor analysis.

The appropriate number of factors extracted is determined by "eigenvalues" and "scree plots." The factors having eigenvalues of one or greater than one generally are retained. All such elements explain the most variance and are suitable for statistical methods determining the association between the dependent variable and independent factors.

2.2. Multiple Regression Analysis

Regression analysis enables the study to find an association between one dependent variable and one or more independent variables. The regression equation requires the variables to be numeric. This study uses one dependent variable: the respondents' overall satisfaction and four independent variables that resulted from the PCA. The independent variables are classified under cost, quality, accessibility, and responsiveness.

The resulting regression equation can be written as

$$\text{Overall Satisfaction} = \beta_0 + \beta_1(\text{Affordability}) + \beta_2(\text{Quality}) + \beta_3(\text{Accessibility}) + \beta_4(\text{Responsiveness}) + \varepsilon$$

where

β_0 is the constant term;

β_1 to β_4 are the coefficients of the factor's affordability, quality, accessibility, and responsiveness, and

ε is the error term.

The coefficients' magnitude will ascertain the importance of each factor in determining the respondents' overall satisfaction concerning various dimensions of healthcare services in the UAE.

3. Results

Table 1 presents the profile of the respondents. The male respondents comprised 59 percent of the sample. The sample appears to represent the population concerning age, population distribution across the seven emirates, and population composition (Emiratis and non-Emiratis) [55] [56].

For education and income, 53 percent of the participants indicated having a

Table 1. Respondents' profile.

	Frequency	*Percent*	*Education*	*Frequency*	*Percent*
Gender					
Male	3462	59%	Doctorate	226	4%
Female	2393	41%	Master's degree	1159	20%
Age			Postgraduate Diploma	835	14%
Below 20	268	5%	Bachelor's Degree	3086	53%
20 - 35 years	3072	52%	Others	549	9%
36 - 50 years	2010	34%	***Income***		
51+ years	505	9%	Low (up to 15,000 AED)	3419	58%
Nationality			Medium (15,001 to 30,000 AED)	1476	25%
Emirati	829	14%	High (Greater than 30,001 AED)	960	16%
Non-Emirati	5026	86%	***Insurance Plans***		
Emirates of Residence			Individual Plans (Self-financed)	1569	27%
Dubai	2839	48%	Family Plan (Self-financed)	1237	21%
Abu Dhabi & Al Ain	1501	26%	Company Sponsored with Co-payment	1966	34%
Ajman	398	7%	Company Sponsored without Co-payment	919	16%
Sharjah	876	15%	Traveler Plans (Self-financed)	164	3%
Umm al-Quwain	105	2%	***Regular Family Physician***		
Fujairah	50	1%	Yes	1989	34%
Ras al-Khaimah	86	1%	No	3866	66%
Household Size			***Medical Visit in the UAE in Last Three Years***		
1 - 3	2339	40%	Yes	4694	80%
4 - 6	2752	47%	No	1161	20%
7 - 9	542	9%	***Intend to go back Home for Medical Consultation***		
10+	222	4%	Yes	2991	51%
			No	2864	49%

Bachelor's degree, approximately 34 percent reported having some form of postgraduate education, and 78 percent of the respondents specified having a monthly income of AED 25,000 or less. Nearly 50 percent of the respondents indicated having a sponsored insurance plan. Approximately 66 percent of the sample does not have a family physician, and 20 percent reported not having a medical check-up in the last three years. Moreover, 51 percent of the respondents intend to return to their home countries for medical treatment if needed.

The frequencies of responses to various questions are presented in Table 2. Two factors stand out clearly, responsiveness and affordability. While all the other factors recorded more responses on the right side of the spectrum, agreed and strongly agreed, the responsiveness and cost factors have a high percentage of neutral responses, 42 percent and 36 percent, respectively. This neutrality, while ambiguous, may be interpreted as dissatisfaction with healthcare services on these dimensions.

This interpretation also strengthens due to low means and medians associated with responsiveness (mean 3.19; median 3) and affordability (mean 3.31; median 3). All other factors recorded a mean and median of 4, indicating relatively higher satisfaction levels with them.

Table 2. Frequency tables and descriptive statistics.

	1	2	3	4	5	Mean	Median	SD
Quality								
Doctors are good about explaining the reason for medical tests.	2.72	8.08	19.45	51.39	18.36	3.75	4.00	0.94
I think my doctor's office has everything needed to provide complete medical care.	0.99	5.31	19.64	54.43	19.62	3.86	4.00	0.82
When I go for medical care, they are careful to check everything when treating and examining me.	2.08	9.26	22.95	49.48	16.23	3.69	4.00	0.92
Accessibility								
I have easy access to the medical specialists I need.	2.56	8.42	20.15	51.73	17.13	3.72	4.00	0.93
I am able to get medical care whenever I need it.	2.15	8.03	20.68	53.41	15.73	3.73	4.00	0.90
My doctors treat me in a very friendly and courteous manner.	0.75	4.30	15.54	58.00	21.40	3.95	4.00	0.78
Responsiveness								
Doctors usually spend plenty of time with me.	2.63	19.06	42.22	28.90	7.19	3.19	3.00	0.91
Cost								
I feel confident that I can get the medical care I need without being set back financially.	6.75	12.93	36.29	30.38	13.65	3.31	3.00	1.07
Overall Satisfaction								
The medical care I have been receiving is just about perfect.	2.27	8.57	23.59	49.62	15.95	3.68	4.00	0.92

1 = Strongly Disagree; 2 = Disagree; 3 = Uncertain; 4 = Agree; 5 = Strongly Agree.

The correlations between various factors were statistically significant (α = 0.01). The correlation estimates were relatively high (Table 3), suggesting inter-dependence between multiple variables. Accordingly, PCA was employed for dimension reduction (Table 4).

The KMO of 0.88 indicated the suitability of employing PCA for dimension reduction purposes. Accordingly, three factors were identified a priori, and these three factors (quality, accessibility, and responsiveness) explained nearly 71 percent

Table 3. Correlations.

	Health care Service Variables	1	2	3	4	5	6	7	8
1	I think my doctor's office has everything needed to provide complete medical care.	0.532**							
2	The medical care I have been receiving is just about perfect.	0.623**	0.566**						
3	I feel confident that I can get the medical care I need without being set back financially.	0.440**	0.385**	0.488**					
4	When I go for medical care, they are careful to check everything when treating and examining me.	0.510**	0.481**	0.555**	0.458**				
5	I have easy access to the medical specialists I need.	0.438**	0.449**	0.504**	0.407**	0.481**			
6	My doctors treat me in a very friendly and courteous manner.	0.427**	0.395**	0.451**	0.312**	0.417**	0.401**		
7	Doctors usually spend plenty of time with me.	0.371**	0.304**	0.370**	0.342**	0.367**	0.322**	0.356**	
8	I am able to get medical care whenever I need it.	0.356**	0.378**	0.436**	0.364**	0.401**	0.491**	0.405**	0.326**

**Correlation is significant at the 0.01 level.

Table 4. Principal Component Analysis

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.88
Chi-Square - Bartlett's Test of Sphericity	12,039.35
df	21.00
Sig.	0.00
Quality	
Eigen Value	3.47
% of Variance	49.63
Accessibility	
Eigen Value	0.74
% of Variance	10.63
Responsiveness	
Eigen Value	0.73
% of Variance	10.36
Cumulative %	70.62

of cumulative variance. The affordability factor was excluded from the PCA as it had only one question, and it was then included as a separate independent variable in the multiple regression equation.

As presented in Table 4, the quality of health care service delivery in the UAE has the highest eigenvalue (>3) and explains nearly 50 percent of the total variance. The other two factors are also important; however, the eigenvalues are less than one. The percentage of variance explained by them is approximately one-fifth of the quality aspect and ranges between 10% - 11%.

In the last step of data analysis, four aspects (quality, accessibility, responsiveness, and affordability) were included in multiple regression analysis. The estimated model was statistically significant (F-statistic 1764.265; p-value 0.000), with an R^2 of 0.547 and an adjusted R^2 of 0.546. The R^2 and adjusted R^2 values indicate that nearly 55 percent of the perceived overall satisfaction variability can be explained by the four factors included in the model as independent variables. A negligible difference between R^2 and adjusted R^2 values suggests that the model specification is appropriate and all the factors are relevant in estimating the model. All the independent variables are statistically significant, with a p-value of 0.00 ($\alpha = 0.05$). Quality has the highest coefficient, followed by accessibility, responsiveness, and affordability. The positive coefficients indicate that better perceptions of all four factors would lead to higher overall satisfaction.

Based on the results of multiple regression, the model can be presented as:

$$\begin{aligned}&\text{Overall Satisfaction from Healthcare Delivery in the UAE}\\&= 3.3 + 0.51(\text{Quality}) + 0.28(\text{Accessibility})\\&\quad + 0.18(\text{Responsiveness}) + 0.11(\text{Affordability})\end{aligned}$$

The multiple regression model (Table 5) results indicate statistically significant relationships between the dependent and independent variables under consideration. Therefore, there is enough evidence to reject the null hypothesis.

4. Discussion

The delicate link between responsiveness and cost highlights the UAE's healthcare goals. Healthcare responsiveness refers to how health systems meet public expectations for non-health characteristics, including waiting times, quality of

Table 5. Multiple regression.

			Std. Error	t-Stat
Intercept	α	3.32	0.031	107.149*
Quality	β_2	0.51	0.009	56.573*
Accessibility	β_3	0.28	0.009	32.545*
Responsiveness	β_4	0.18	0.008	21.416*
Affordability	β_5	0.11	0.009	12.08*

*Significant at the 0.01 level.

service, and patient experience. Access to health care is affordable. High-quality healthcare services are in high demand in the UAE, noted for its rapid economic growth and expatriate population. In response, the government has prioritized timeliness and affordability for healthcare reform. Historically, the UAE has spent extensively in healthcare infrastructure to improve responsiveness. Modern hospitals, clinics, and health centers provide quick, high-quality care. This focus on responsiveness has sparked worries about rising healthcare expenses. Quality services might be expensive, compromising affordability.

The UAE has launched health insurance systems to help more people access healthcare without hefty out-of-pocket costs. The UAE seeks to combine healthcare responsiveness and cost by balancing infrastructure improvements and health insurance. Constant reviews are needed to ensure neither aspect is compromised. Based on the data analysis results, responsiveness and affordability appear to lag behind customer satisfaction. Both responsiveness and affordability have a positive association with overall satisfaction. This indicates that when the customers' expectations concerning these two factors are met, the perceived total satisfaction with healthcare services will increase. While affordability has the lowest coefficient among the four aspects of healthcare delivery in the UAE, the factor is statistically significant in the model and, therefore, requires attention. It also appears that the respondents perceive that doctors do not spend adequate time with them.

The demand and supply gap of healthcare services has increased demand-side costs, negatively impacting healthcare affordability in the UAE [57]. The country is considered to be one of the most expensive destinations in the Middle East for medical treatment. At the same time, the average price of a doctor's visit is US$ 69, approximately 80 percent higher compared to Singapore and 240 percent higher than in Saudi Arabia [57] [58]. Moreover, the UAE's medical inflation is estimated to be 9.9 percent, the highest in the GCC [21]. The UAE government has chosen to present price control mechanisms for health services and medicines [59] to ensure that the health care services' eventual recipients are not experiencing extremely high costs. Besides, the UAE government is transitioning towards universal health coverage for the population [24] [60] [61] [62] [63] to reduce out-of-pocket health care expenses.

As discussed earlier, the UAE's healthcare sector appears to be consolidated with a few players in the market. While having a few prominent players in the industry may promote investments in technology and human capital, it may also entail the risk that more significant players may exploit the end-users by offering high-cost but low-quality services. Reducing the multi-level regulatory burden may lead to lower entry barriers and promote competition, leading to increased affordability and improved service quality.

Unlike the UAE healthcare industry, the insurance industry is fragmented, with 61 insurance companies serving a population of approximately nine million. This negatively impacts insurance companies' capacity to achieve econo-

mies of scale and scope and invest in providing cost-effective health insurance policies to retail and corporate customers, which would result in increased affordability. The UAE government has tried consolidating the insurance industry by raising capital requirements for insurance providers. However, concentrated efforts may be required to strengthen the insurance industry to reduce health insurance premiums. A well-developed and mature insurance sector will enable risk pooling and diversification, resulting in lower costs and premiums for the insurers and insured.

The findings related to responsiveness require further investigation. According to the Dubai Health Authority [64] annual statistics report, there are 2.9 doctors for every 1000 residents (0.5 percentage points decline as compared to 2016) in Dubai. This ratio is high compared to that in many developed countries. For example, the United States of America, Canada, and the United Kingdom are reported by the World Health Organization to have 2.6 (2014), 2.5 (2015), and 2.8 (2016) doctors per 1000 residents, respectively [65]. Having a comparable density of physicians in developed countries does not indicate human capital's sufficiency in the healthcare industry. The shortage of doctors increases pressure to spend less time with patients, resulting in displeasure with the service quality's responsiveness factor. The most obvious solution to this is to increase the number of physicians [66]. This can be achieved by encouraging youth in the country to opt for medicine as a career of choice and attract foreign talent. The recent announcement regarding changes in immigration laws may pave the way for qualified foreign doctors to join the UAE workforce.

5. Conclusion

The purpose of this study was to investigate whether or not there is a correlation between overall happiness and factors such as affordability, quality, accessibility, and responsiveness in the healthcare sector of the UAE. To model the link between the dependent and independent variables, statistical analytic methods such as principal component analysis and multiple regression were utilized. The utilization of PCA made data-driven dimension reduction possible, which ultimately led to the formation of the four components mentioned above. According to the findings of the study of the data, the two aspects that respondents were most concerned about were responsiveness and cost. The use of convenience sampling may restrict the capacity to generalize the findings, even though the sample was significant and gave the impression of representing the population of the UAE in some respects. The research may be made more comprehensive by categorizing the respondents according to the socio-demographic profiles they provided and determining whether or not there are significant disparities in the attitudes of the various groups of respondents. In addition, using Structural Equation Modeling, research might be carried out to determine the perspectives of the respondents who intended to receive medical care in their respective home countries. In addition, to con-

duct future research towards understanding the relationship between Responsiveness and Affordability of health care in the UAE.

Ethics Approval and Consent to Participate

The local-level ethical committee considered this project to be a health-quality research project among the public 18 years or older (REC-04-017). The ethics approval (REC-04-017) was provided by the MBR School of Government Research Ethics Committee within the Government of Dubai, United Arab Emirates. The consent the authors obtained from study participants was written, at the beginning of the survey, where the participant was informed of his/her rights to participate in the survey. If they agreed to proceed further, and at any time they wanted to leave the survey, they can proceed to exit the survey.

Consent for Publication

Not Applicable: the manuscript does not contain data from any person.

Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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Authors' Contributions

HS: Made a substantial contribution to all the sections, participated in review, analysis, and interpretation, drafted the manuscript, and revised it critically for important intellectual content. IAM: Contributed substantially to the background, methods, and discussion sections, involved in drafting the manuscript and revising it critically for important academic content. LZ: Made a significant contribution to study design and participated in review, analysis, and interpretation. MM: Made a substantial contribution to the background and method sections. All authors give final approval for the version to be published and agree to be accountable for all aspects of the work.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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List of Abbreviations

GCC: Gulf Cooperation Countries

KMO: Kaiser-Meyer-Olkin Measure of Sampling Adequacy

PCA: Principal Component Analysis

UAE: United Arab Emirates