PASSENGERS' SATISFACTION OF THE SERVICE QUALITY AT SAUDI INTERNATIONAL AIRPORTS

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Abstract

This research examines the relationship between passenger satisfaction and service quality factors in Saudi airports. The study used convenience sampling from three major international airports in Saudi Arabia. During the last decade, seventy-two research were published evaluating service quality factors. Out of the literature review, the quality of the services found be evaluated through forty-four factors. An electronic questionnaire was designed to examine the top factors of theses service quality factors. The study focused on examining the relationship between service quality factors and passengers' satisfaction. Data was analyzed using descriptive analysis, one-sample t-Test, and ANOVA analysis. The findings reveal that eight airport service quality factors are positively related to passenger satisfaction; Check-in Staff Efficiency, Ease of Finding Way at the Airport, Comfort in the Departure Lounge, Flight Information Panels, Friendliness of Airport Staff, Walking distance at the passenger terminal, Queue time at Check-in, and Quantity & quality of snack bar restaurants. Otherwise, there is no relationship between the Speed of Baggage Claim factor and passenger satisfaction. Research can further evaluate both

expectations and perception of service quality within a single airport. Future research also could perform including the remaining factors to check their relationship with passengers' satisfaction.

Keywords: Airport Service Quality (ASQ), Passengers' Satisfaction, Saudi Airport, Customer Satisfaction, Customer Service

INTRODUCTION

Over the past few years, air transport has emerged as one of the rapidly growing modes of transport (Munoz, Laniado, & Córdoba, 2019). By 2035, it is estimated that there will be a total of over 7.2 billion air travelers all over the globe. (Airports Council International, 2017). With this expected rise in passenger demand, market competition in the aviation industry will continue to be highly aggressive (IATA, 2018). Both airports and airlines have to be very competitive quality wise so as to survive in this service industry. Understanding the airport facilities is the key to success and survival in order to provide superior quality of airport services in line with customer expectations (Gibert & Wong, 2002). As the volume of traffic grows, airports struggle to improve efficiency by enhancing infrastructures while putting the focus on the consumer (Fodness & Murray, 2007). High customer service at the airports is thought to contribute to better overall customer satisfaction as well as provide a long-term market advantage (Chen C.-F. , 2008).

One of the Saudi 2030 vision's goals is "building a unique regional logistical hub" (Vision 2030, 2020), this strategic goal has a transformation program that focuses on increasing international investment to expand and invest in infrastructure and turn the Kingdom into a global hub linking Africa, Asia, and Europe. Its geographical competitive advantage would play a significant role in this transformation, based on the accessibility of large emerging markets and significant maritime routes. The transportation and aviation sector is large and strongly supported by the government-led investment in road and airport infrastructure in order to achieve its competitive place (export.gov, 2019). Saudi airports are competing fiercely with foreign airports in the Middle East in the quality services of the airport. In Saudi Arabia, the aviation industry has contributed to the development of passenger traffic between 2017 and 2018. According to the General Authority for Civil Aviation (GACA), in 2018, a total of 99.86 million passengers and 771.828 trips were carried out, up from 92.42 million passengers and 741.923 flights in 2017, representing an increase of 8% for passengers and 4.1% for trips (Arab News, 2019). Although, in 2016, the most important airport in Saudi Arabia, king Abdulaziz International Airport in Jeddah, had been ranked as the worst airport in the world (Yu, 2017).

Therefore, Saudi airports must be improved to meet travelers' expectations of the Airport Service Quality (ASQ) and reach the related strategic goal of the Saudi 2030 vision. According to Bogicevic, Yang, Bilgihan and Bujisic (2013) improving airport quality services positively impact passengers' satisfaction

According to GACA (2020), Saudi airports are categorized as domestic and international airports. The Saudi airports serve a diverse variety of passengers, with a total of (27) airports located around the country. There are four international airports in the kingdom each with its own customs and international terminals. On the other hand, GACA operates 23 domestic airports include 10 airports running international flights to neighboring regional countries, besides 13 other airports for domestic flights only (GACA, 2020).

This research aimed to categorize service quality parameters for the purposes of assessing the ASQ of chosen airports under GACA, which have the largest number of passengers across the Kingdom. As it is clear that there is a big gap between the current quality level of Saudi airports and the aim mentioned in the Saudi 2030 vision, researching the relationship between service quality and customer satisfaction in Saudi airports will have a favorable impact on service quality and passenger satisfaction (Yu, 2017). So,

For this research, three airports were selected which are King Khalid International Airport in Riyadh (KKIA), King Abdulaziz International Airport in Jeddah (KAIA), and King Fahd International Airport in Dammam (KFIA). This research focus on these airports since they acquire more than 76% of the total number of passengers at the Kingdom's airports, and nearly %90 of the total passengers at Saudi international airports (General Authority for Statistics, 2018).

Moreover, this research analyzes service quality and passengers' satisfaction in Saudi airports, which provides the airport managers with insights that should help them construct the right strategies. Also, the research validating the relationship between ASQ factors and passenger satisfaction. In addition to that this research comparing the variance of service quality in the targeted Saudi airports (KKIA, KAIA, and KFIA).

LITERATURE REVIEW

ASQ has now become a common motif in airport-related literature. However, before the 1980s, there was little research on the topic, which was mostly concerned with evaluating the level of customer service at the terminals (Mumayiz, 1991). Later, in the 1990s, several works focused on understanding the desires of travelers and their views of the features of airline terminals and airport processes (Lemer, 1992). Travelers are more inclined to re-use an airport if they really are happy with the overall of service provided. This could have a direct impact on

tourism and related companies. Moreover, travelers are more likely to recommend an airport to other potential travelers based on their experience (Jin-Woo & Se-Yeon, Transfer Passengers' Perceptions of Airport Service Quality: A Case Study of Incheon International Airport, 2012). Improvement approaches of the airport quality service can be efficient if they are based on a sufficient identification and performance attributes. Recently, evaluation of airport quality service has become an important issue for airports' management (Pabedinskaitė & Akstinaitė, 2013). The services quality standards should be selected based on passengers' expectations in order to get their satisfaction (Jeffrey T. M., 2014). Regarding the quality services, research started to focus on airport services and passenger satisfaction. Therefore, Saudi Arabia is focused on providing tourists and visitors with satisfied and excellent services to improve efficient services in an intensely competitive international market (Vision 2030, 2020).

One of GACA values is "Customers," which GACA is committed to deliver services that meet customers' needs effectively and flexibly with transparent communication and consultation. In the same regard, GACA committed to "becoming a customer-centric organization" by fostering a customer-centric culture, enabling regional harmonization, and building joint-value relationships with key stakeholders (GACA, 2018). As a result, GACA's primary mission is to increase the quality of services given to passengers by offering unique experiences that lead to boosting customer satisfaction levels, allowing us to compete on the world stage in the aviation industry. Therefore, GACA's Quality and Customer Protection Department emphasizes the importance of services offered to travelers and the enhancement of the customer experience at Saudi Arabia's airports (GACA, 2019). The standards of passenger satisfaction that GACA takes into account are three major categories; Travel & Ground Services Procedures, Terminal Logistical & General Services, & Airport's Facilities Cleanliness according to General Management of Quality and Customer Protection reports of 2018 and 2019 (GACA, 2019).

A number of essential factors of 'Services' need to be established before assessing their quality can be made (Alotaibi & Mason, 2014). A review of the previous literature shows multiple factors with different dimensions that are used in investigating ASQ. Eighty research that were reviewed in the field of ASQ that published during the last decade.

Based on the reviewed literature, seven of the reviewed research focus on the ASQ dimensions without considering any specific service factor. These mentioned dimensions are: tangibility, reliability, courtesy, empathy, & assurance which were excluded from this research since it is out of this research scope. However, out of the reviewed literature, seven more research consider different dimensions with related factors. Yet, mentioned factors were not

clearly traced to those services dimensions. So, this research evaluates the ASQ factors with ignores of the mentioned ASQ dimensions in those publications.

As a result, Seventy-two research were considering and the quality of services evaluation is counted through forty-four factors. Out of the seventy-two considered publication, ten research used the Mean methodology for evaluating the factors. In addition, it is important to note that factors were grouped and names were given based on the meaning that reflects the services mentioned in these previous research. For example, a factor called "Public Transportation" is considered as the same as "the availability of buses or trains", and so on.

Table 1 summarize the finding of the mentioned factors in the literature which are grouped into forty-four factors. The Pareto Principle, or the 80/20 rule, is used to select the list of the top factors to focus on in this research. By applying Pareto Principle to the long list of factors found in the literature, the factors with highest frequency have been selected in order to represent almost 20% of the services factors. These factors are: check-in staff efficiency, ease of finding your way at the airport, comfort in the departure lounge, flight information panels, friendliness of airport staff, the walking distance at the passenger terminal, queue time at check-in, quantity and quality of snack bars/restaurants, and speed of baggage claim. These factors are considered the top important ones and the selected ones for more investigation in this research. These top important factors are used for measuring the satisfaction of passengers from the three selected airports, (KKIA), (KAIA), and (KFIA).

HYPOTHESIS

The investigation was proposed based on literature evaluation of research to examine the research assumptions (H) from the outcomes:

$H0$: There is no correlation between customers' satisfaction and Factor service quality(X_i)

$H1$: There is a correlation between customers' satisfaction and Factor service quality (X_i)

Where, $i = 1, 2, 3, ..., 9$

Table 1. References for Airport Services Quality Factors

Factors \ Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Check-in staff efficiency	2	4	4	4	2	7	4	5	7	11	8	58
Ease of finding your way at the airport	2	3	2	4	2	7	5	4	8	10	7	54
Comfort in the departure lounge	2	4	4	3	2	8	3	5	3	11	6	51
Flight information panels	2	3	3	3	2	6	4	5	8	6	7	49
Friendliness of airport staff	2	2	2	4	2	6	3	3	5	10	8	47
Queue time at check-in	2	3	1	3	2	4	1	3	7	9	8	43

												Total
Walking distance at the passenger terminal	1	2	2	3		5	2	4	8	9	6	42
Quantity and quality of snack bars / restaurants	3	2	2	4		5	4	4	4	8	4	40
Speed of baggage claim	1	3	1	3	3	5	2	3	7	6	6	40
Quantity and quality of commercial establishments	2	4	2	3	1	3	3	4	3	9	5	39
Baggage integrity	2	3	1	4	3	4		3	6	5	8	39
Friendliness of the check-in staff			1	3	2	6	3	4	4	10	5	38
Availability of seats in the departure lounge	2	2	2	4		6	4	3	2	8	4	37
General airport cleaning	2		2	3	2	6	4	1	4	7	6	37
Availability of luggage trolleys	1	2	2	2	1	4	3	4	5	5	4	33
Security inspection queue time	2	1	1	3	2	5	1	3	4	6	5	33
Availability of toilets	1		1	2	1	5	4	2	5	5	4	30
Information on baggage claim conveyors	1	1	1	2	2	4	1	4	5	5	4	30
Friendliness of the security inspection staff	1			3	1	5	2	4	4	6	4	30
Security inspection rigor	1		1	3		5	2	2	5	6	5	30
Ease of making connections	1		1	2	2	3	2	2	6	7	3	29
Value of restaurants & commercial products	1	3	2	2		3	1	3	2	7	4	28
Immigration & customs queuing time	1	1	1	3	2	3	1	3	2	5	5	27
Internet quality / Wi-Fi	2	1	1	4		2	2	3	1	5	5	26
Cleaning the toilets		1		2		4	2	1	5	6	4	25
Queue time at Dining / restaurants	1	1	1	3		2	1	3	1	6	6	25
Availability of banks / ATMs / exchange offices	1			2		3	1	2	4	7	4	24
Friendliness of cafeteria / restaurant staff				3		2	2	3	3	7	4	24
Vehicle parking facilities	2		2	2	1	3	1	1	2	5	4	23
Quality VIP Lounge	1	3		1		4	2	2	2	5	3	23
Friendliness of immigration & customs officials				3	1	2	2	2	2	6	4	22
Feeling of protection and security	1			1		5	2	2	2	5	4	22
Friendliness of trade officials				3		2	2	2	2	7	3	21
Public transportation	1	3	1	1	1	3		3	1	5	2	21
Airport thermal comfort				1		3	3	2	2	5	3	19
Airport acoustic comfort			1	1		3	2	1	2	5	3	18
Shopping availability	1		1	4			1	1		4	4	16
Overall passenger satisfaction	1	1			3	3		1		4	1	14
Parking cost	1			1	1	2		1	1	4	3	14
Taxi availability				1		2		1	1	5	2	12
Smoking policy and standard of smoking lounges						1	1		1	1	1	5
Disability services	1										1	2
Children's play areas			1								1	2
Availability of prayer rooms						1						1

METHODOLOGY

In order to get effective results, it is essential to have an effective methodology (Thattamparambil, 2020); The goal of this study is to determine the relationship between passenger's satisfaction and AQS. A quantitative research methodology is chosen to meet this

goal. Quantitative research allows a sample to be generalized to the entire population; research study, in particular, reveals the correlations between variables (Trochim, 2001; Babbie, 1990).

This research has five phases (Figure 1). The first phase is about choosing an appropriate research design that relates to the research topic. There are two main stages in this process. The first stage is defining the problem. The second stage is about setting the research objectives and purposes. The second phase is the summary of related literature, the results of this phase highlight the major factors that have been reviewed in the published literature during last decade.

The third phase focused on the questionnaire and survey design of the research. The data collection has been completed by distributed online survey. A pilot study is conducted by distributing the survey to five people. The purpose of this phase is to verify the questions developed for the survey. When the pilot study was completed and reviewed, a modification has been done in the survey format. A pilot study was focused on the responders' feedback of the questionnaire without analyzing any numeric results, but opinions on and ideas regarding the questionnaire were considered to enhance the questionnaire. In this research, as Hyun Kim (2011) research, the responders' feedback was reviewed to analysis the format and clarity of the questionnaire. A total of five respondents, participated in the pilot study through a Google Form. The questionnaire took on average 5 minutes to be completed. As per the results of pilot study, the questionnaire format has been changed from (Google Forms) to (Microsoft Forms) due to the respondents' feedback. So, corrective actions have been taken, and Microsoft Forms tested by the same respondents to confirm that all questions are clear and appeared in the forms.

The fourth phase of this research is the analysis of collected data. The last phase is summarizing the findings and recommendations.
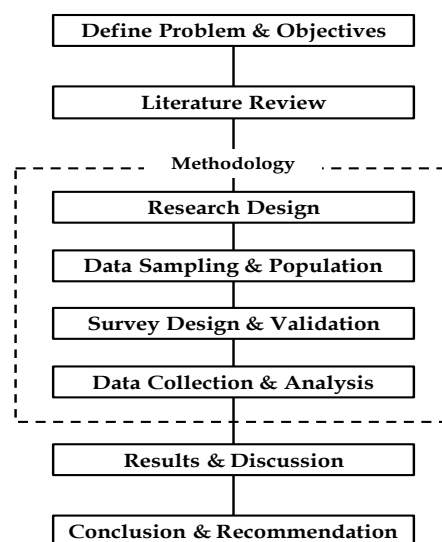
Figure 1. Research Design & Workflow Diagram

The voluntary response sampling approach is used in this research, which refers to collecting data from that easily available participants (McCombes, 2019). For this research, 415 participants responded to the survey, and 384 were accepted as correct response. The SurveySystem website was used to calculate the sample size for this research. The confidence level for this research is selected to be 95%.Waruingi (2013) stated that when determining the sample size needed for a given level of accuracy it must use the worst case percentage which is 5% margin of error (Waruingi, 2013). Thus, the margin of error for this research is decided to be equal to 5%. Thus, the sample size is calculated to be equal to 384 participants (Figure 2).

Figure 2. SurveySystem website calculator

The questionnaire is divided into two major sections. First section is about the demographic information, which includes (age, gender, educational degree, and occupation), that is section A of the questionnaire. second section is about the satisfaction of airport services in the targeted three airports in Saudi Arabia which are sections B, C, and D of the questionnaire. The nine selected ASQ factors were evaluated by calculating the weight of all attributes in the questionnaire. Those attributes ranked through the following scale (5.0 = Totally Satisfied), (4.0 = Satisfied), (3.0 = Neutral), (2.0 = Not Satisfied), and (1.0 = Totally Not Satisfied).

According to White and Marsh (2006), a versatile statistical technique that may be used to solve real world problems in information studies, whether quantitative, qualitative, or even both. The content analysis does first the analysis for quantitative content, then for qualitative content analysis. The coding scheme is set a priori, i.e., before coding begins, in quantitative content analysis. A coding scheme helps to operationalize abstractions that are inherently vague. It establishes meaningful and reliable groupings. Relevant implies that they may be used to test theories (White & Marsh , 2006). The objective of applying the content analysis is to check if there is a gap in passenger satisfaction between Saudi airports and nearby countries.

In order to achieve the research objectives and test the hypotheses, various types of statistical techniques were applied, as listed in Table 2 These techniques include basic descriptive analysis, content analysis, one-sample t-test, and one-way analysis of variance (ANOVA). Data were entered into the Statistical Package for Social Sciences (SPSS) software for the statistical analysis.

Table 2. Statistical Techniques Applied in This research

Statistical Techniques Applied	Purpose / Related Research Objective
Descriptive Analysis (Frequency, Means & Rank)	Examine the distribution of responses
Content Analysis	investigate gaps of passengers' satisfaction between Saudi airports and the nearby airports
One-Sample t-Test	Validate the relationship between ASQ factors and passengers' satisfaction
One-Way Analysis of Variance (ANOVA)	compare the variance of service quality between targeted Saudi airports

RESULTS AND DISCUSSION

As a result of the analyze data, 287 respondents traveled through KKIA in Riyadh (74.7%), 352 respondents traveled through KAIA in Jeddah (91.7%), and 171 respondents traveled through KFIA in Dammam (44.5%). Since many of the respondents have traveled through more than one airport covered in this research, 810 actual responses for each factor have been included in the analysis.

Demographic Information

Demographic information is a source to learn more about a population's characteristics for many purposes, such as policy development and economic market research by governments or commercial organizations (Hayes, 2021). According to QuestionPro website (2021), there are seven popular demographic survey questions for questionnaire: age, gender, educational degree, occupation, race & ethnicity, marital status, and income. The race & ethnicity, marital status, and income questions could be asked only if directly related to the research (Formplus, 2019). Based on the literature in the same field, four questions of that popular demographic information has been asked in the questionnaire in this research. Those demographic questions are age (Kratudnak & Tippayawong, 2018), gender (Sohail & Al-Gahtani, 2005; Seyanont, 2011; Kratudnak & Tippayawong, 2018), educational degree (Sulankey & Kazimoto, 2017), and occupation (Kratudnak & Tippayawong, 2018).

Table 3 Shows that the largest group of respondents comes from category 31 to 40 years old (22.1%), followed by group 21 to 30 years old (21.4%). The third larger group is 50 to 60 years

old (16.9%). The fourth group is 41 to 50 years old and above 60 years' old which consist of 60 respondents (15.6%) for each. The small groups go to 18 to 20 years' old which have 23 respondents (6.0%) and 9 respondents are less than 18 years old (2.3%). So, by comparing the age of the respondents to the literature it found that the majority are of the age of 21 to 40 years old (Chang, Wu, & Lin, 2012; Chao, Lin, & Chen, 2013; Sukati & Al Mashani, 2019).

Table 3 indicates the gender of respondents. As illustrated in the table, male respondent consists of 244 (63.5%) whereas female respondent consists of 144 (36.5%). By comparing the result with literature it can be seen that in Turkey almost the same percentage 63.7% male and 36.3% female (Kayapinar & Erginel, 2013). In the same regard, 66.2% of the respondents are male and 33.8% female in research done in Taiwan (Chang, Wu, & Lin, 2012).

Regarding the education level, 54.7% of the respondents were hold a Bachelor' degrees and this result in the same range of many other literatures where more than 50% of the respondents hold Bachelor' degrees (Chang, Wu, & Lin, 2012; Abdel Rady, 2018; Wickramaratne & Karunaratna, 2019).

Last demographic data in Table 3 Shows that the largest group of respondents works at a private sector (30.3%), followed by the respondents who works at a public sector (24.7%). The third larger group is either a retired or Housewife (23.7%). The fourth group is student respondents (13.8%). The smallest group is business owner respondents (7.6%).

Table 3. Distribution of the Sample Size

		Frequency	Percentage (%)
Age	< 18	9	2.3
	18 – 20	23	6.0
	21 – 30	82	21.4
	31 - 40	85	22.1
	41 - 50	60	15.6
	51 - 60	65	16.9
	> 60	60	15.6
Gender	Male	244	63.5
	Female	140	36.5
Educational Degree	High School or Less	44	11.5
	Diploma	34	8.9
	Bachelor	210	54.7
	Master	64	16.7
	PhD. or Doctorate	32	8.3
Occupation	Student	53	13.8
	Employee in Public Sector	95	24.7
	Employee in Private Sector	116	30.3
	Business Owner	29	7.6
	Other	91	23.7

Descriptive Analysis

In this research, the Likert scale, shown in Table 4, has been used to rank the ASQ factors according to Mean values of passenger satisfaction. (Celik & Oral, 2016; Alhatmi, 2019; Sözen & Güven, 2019).

Table 4. Satisfaction Mean Score Range and Corresponding Likert Scale Equivalent

Score Interval (Mean)	Likert scale equivalent
1.0 – 1.79	Totally Not Satisfied
1.80 – 2.59	Not Satisfied
2.60 – 3.39	Neutral
3.40 – 4.19	Satisfied
4.20 – 5.0	Totally Satisfied

Figure 3 show the ranking of the ASQ factors based on respondents' perspective. The ASQ factors ranked based on the mean values of passenger satisfaction as the following: Check-in Staff Efficiency (mean = 3.60), Flight Information Panels (mean = 3.58), Comfort in the Departure Lounge (mean = 3.49), Queue time at Check-in (mean = 3.48), Ease of Finding your Way at the Airport (mean = 3.42), Walking distance at the passenger terminal (mean = 3.40), Friendliness of Airport Staff (mean = 3.33), Quantity and quality of snack bar restaurants (mean = 3.14), and Speed of Baggage Claim (mean = 3.01). So, based on Table 4, Check-in Staff Efficiency, Flight Information Panels, Comfort in the Departure Lounge, Queue time at Check-in, Ease of Finding your Way at the Airport, and Walking distance at the passenger terminal factors lead to passenger satisfaction, and the other three factors (Friendliness of Airport Staff, Quantity and quality of snack bar restaurants, and Speed of Baggage Claim) are neutral.

Arisara Seyanont (2011) finds that the top attributes of ASQ for the Thai passengers that reflected the perception of the mean value of ASQ at Suvarnabhumi International Airport were: check-in staff efficiency, ease of finding your way at the airport, comfort in the departure Lounge, and quantity and quality of snack bar restaurants (Seyanont, 2011). In the same regard, Ansari & Agarwal (2015) used five Likert scales and categories the mean values as either higher than 3, which represents the satisfaction or less than 3 for dissatisfaction (Ansari & Agarwal, 2015).
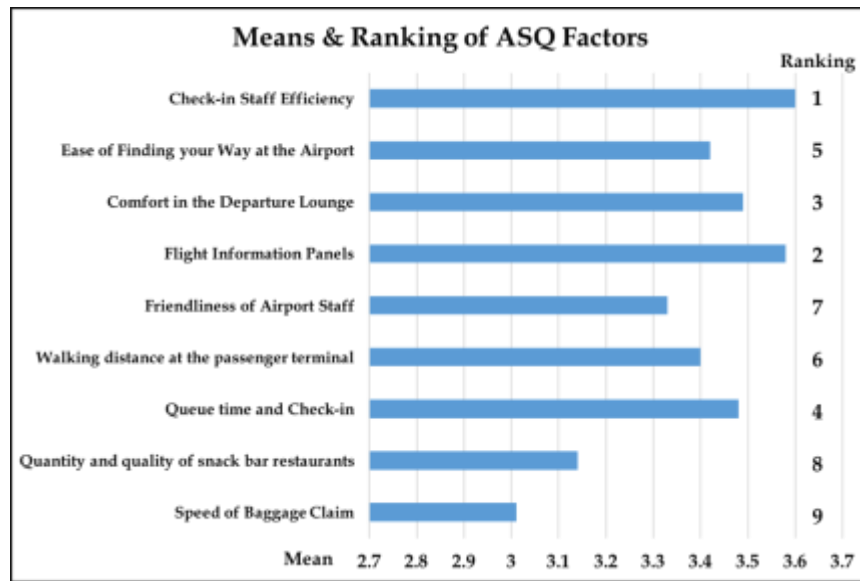
Figure 3. Means & Ranking of ASQ Factors

Content Analysis

Results shown in Figure 3 are aligned with the satisfaction in the previous literature, which evaluate their results based on the mean value. As shown in Figure, a qualitative content analysis was applied to compare the satisfaction level using the Likert scale in Table 4.

Figure 4. Passenger Satisfaction of ASQ Factors in Previous Research

ASQ Factor / Mean	Finding	Chang, Wu, & Lin (2012)	Chao, Lin, & Chen (2013)	Kayapinar & Erginel (2013)	Jiang & Zhang (2016)	Adeniran & Fadare (2018)	Abdel Rady (2018)	Sukati & Al Mashani (2019)	Wickramaratne & Karunaratna (2019)	Adeniran & Stephens (2019)	Jiang & Liang (2019)
Check-in Staff Efficiency	Satisfied	Satisfied	Satisfied	Satisfied	Satisfied	Satisfied	Not Satisfied	-	-	-	Satisfied
Ease of Finding your Way at the Airport	Satisfied	Satisfied	Satisfied	Satisfied	Satisfied	Satisfied	-	-	-	Satisfied	Satisfied
Comfort in the Departure Lounge	Satisfied	Satisfied	Satisfied	Satisfied	Satisfied	Satisfied	-	Satisfied	Neutral	Neutral	Satisfied
Flight Information Panels	Satisfied	-	Satisfied	Not Satisfied	Satisfied	Satisfied	Not Satisfied	Not Satisfied	-	Neutral	Satisfied
Friendliness of Airport Staff	Neutral	Satisfied	Satisfied	Satisfied	-	Satisfied	Not Satisfied	Satisfied	Satisfied	Satisfied	Satisfied
Walking distance at the passenger terminal	Satisfied	Satisfied	Satisfied	Satisfied	Satisfied	Satisfied	-	Satisfied	-	Satisfied	Satisfied
Queue time and Check-in	Satisfied	Satisfied	Satisfied	Neutral	Satisfied	Neutral	-	Satisfied	Satisfied	Satisfied	Satisfied
Quantity and quality of snack bar restaurants	Neutral	Satisfied	Neutral	Not Satisfied	Neutral	Neutral	Satisfied	Neutral	Neutral	Neutral	Satisfied
Speed of Baggage Claim	Neutral	Neutral	Satisfied	Neutral	Neutral	Neutral	Satisfied	Neutral	Satisfied	Neutral	Satisfied

As shown in Figure 4, the Check-in Staff Efficiency factor aligned with almost 86% of the literature, representing that the responders are satisfied with the efficiency of check-in staff. The finding of "Ease of Finding your Way at the Airport" factor shows that the responders are satisfied with this service also. This result is 100% aligned with the literature. For the factor "Comfort in the Departure Lounge" the responders are satisfied and the result aligned with the literature by 78%. The factor "Flight Information Panels" is aligned with 50% of the literature result where the responders are satisfied. The factor measuring walking distance at the passenger terminal is aligned 100% with the literature, representing that respondents are satisfied with the walking distance at the terminals. The factor "Queue time at Check-in" is aligned with 78% of the literature where the responders are satisfied with the waiting time at check-in, and the other 22% are categorized as neutral. All the above factors are categorized in the satisfied range according to the responders of this research.

One the other hand, three factors have a neutral level of satisfaction as shown in Figure 4. Factors "Quantity and quality of snack bar-restaurants" and "Speed of Baggage Claim," has 60% alignment with the literature, which classified as neutral level of satisfaction. Lastly, the factor about the "Friendliness of Airport Staff" is classified as neutral in this research while most of the previous research show it as satisfied. Researchers believe in that there is a great opportunity to improve the level of front line staff in airports especially that Saudi government established a Ministry of Tourism in 2020 in order to develop the tourism industry in the kingdom.

In fact, the part of the literature that shows the opposite result of this research is focusing on middle eastern countries, which are Turkey, Egypt, and Oman. In contrast, the aligned part of the literature with this research results are conducted on airports at Australia, Asian, and African countries. Saudi airports are classified differently from the middle eastern countries since the ranking level of Saudi airports are better than those airports in the region. In contrast, Saudi airports have smaller evaluation level as Australian, Asian, and African airports. Thus, Saudi airports have higher satisfaction levels among the nearby countries. So, from the research results it can be seen that either the ranking of KAIA was not right or there is a big gap between KKIA and KFIA among KAIA from the service quality point of view.

One-Sample t-Test

Table shows whether or not ASQ factors' mean results are statistically significant by using the one-sample t-test. The significance level for accepting the hypothesis is determined to be at least 5 percent or .05 (the P-Value ≤ 0.05). This technique compares the mean scores of the

variables to a hypothetical mean 3, which shows above-average satisfaction level on the Likert scale in Table 4 (Pokhriyal & Ghildiyal, 2011; Ansari & Agarwal, 2015).

The one-sample t-test is conducted to examine the following hypotheses:

H0: There is no relationship between passengers' satisfaction and service quality factor (X_i) (P-Value > 0.05).

H1: There is a relationship between passengers' satisfaction and service quality factor (xi) (P-Value $\leq$ 0.05).

Table 5. One-Sample t-Test Results

ASQ Factors	Mean	t	df	P-Value sig. (2-tailed)
Check-in Staff Efficiency	3.60	16.461	809	.000
Ease of Finding your Way at the Airport	3.42	10.490	809	.000
Comfort in the Departure Lounge	3.49	12.723	809	.000
Flight Information Panels	3.58	15.054	809	.000
Friendliness of Airport Staff	3.33	7.823	809	.000
Queue time at Check-in	3.48	12.500	809	.000
Walking distance at the passenger terminal	3.40	10.541	809	.000
Quantity and quality of snack bar restaurants	3.14	3.283	809	.001
Speed of Baggage Claim	3.01	.321	809	.748

The analysis in

Table shows that the t value for the variable Check-in Staff Efficiency is 16.461, and the significance level is 0.000. So, the null hypothesis is rejected at the 5% level of significance since the p-value is less than .05. This means there is relationship between Check-in Staff Efficiency in targeted Saudi airports and passengers' satisfaction based on the alternative hypothesis. The same hypothesis is used for examining the significance of the mean for other six factors indicating Ease of Finding your Way at the Airport, Comfort in the Departure Lounge, Flight Information Panels, Friendliness of Airport Staff, Queue time at Check-in, and Walking distance at the passenger terminal is evident from the above table that the p-value for all the variables is .000 which is less than .05. Therefore, the null hypothesis is rejected for all these factors, and the alternative hypothesis is accepted. This indicates that there is relationship

between each of these six factors and the passengers' satisfaction in the targeted Saudi airports. With the same way, the factor of Quantity and quality of snack bar restaurants has a p-value of .001, which is less than .05. So, the null hypothesis is also rejected for this factor, and the alternative hypothesis is accepted.

In

Table , the factor that is measuring Speed of Baggage Claim has a t-value of .321 and significance level of .748. Since the p-value is greater than .05 for this factor, the null hypothesis is not rejected. This means that the Speed of Baggage Claim as a factor has no effective relationship with passengers' satisfaction. So, it is assumed that this factor should not been listed as one of the ASQ factors affecting passengers' satisfaction. By tracing the source of "Speed of baggage claim" factor in the literature, it is found that in 1965 the International Air Transport Association (IATA) introduced the concept "level of service," which is consolidated as the guiding framework for the development of new terminal facilities as well as for the evaluation of current facilities' operational service performance (Ashford, 1988). Similarly, the relationship between the ASQ factors and passenger satisfaction was not mentioned in the literature. It is also have been found that either the ASQ factors come from IATA or the airport authority. The summary of the hypotheses testing results of ASQ factors are shown in Table .

Table 6. Hypotheses Testing Results of ASQ Factors

ASQ Factor	Hypothesis Testing Results
Check-in Staff Efficiency	Not Accept H_0 Hypothesis
Ease of Finding your Way at the Airport	Not Accept H_0 Hypothesis
Comfort in the Departure Lounge	Not Accept H_0 Hypothesis
Flight Information Panels	Not Accept H_0 Hypothesis
Friendliness of Airport Staff	Not Accept H_0 Hypothesis
Queue time at Check-in	Not Accept H_0 Hypothesis
Walking distance at the passenger terminal	Not Accept H_0 Hypothesis
Quantity and quality of snack bar restaurants	Not Accept H_0 Hypothesis
Speed of Baggage Claim	Accepted H_0 Hypothesis

One-Way Analysis of Variance (ANOVA)

The one-way ANOVA test is used to examine the differences between the passenger satisfaction in targeted Saudi airports in relation to services quality. The one-way ANOVA was applied on the ASQ factors that rejected the eight null Hypothesis in the previous part of the

analysis, "One-Sample t-Test". The following statistical analysis is done with the view of the following two main hypotheses.

- *H0: There is no significant difference in passenger satisfaction level between Saudi airports*
- *H1: There is a significant difference in passenger satisfaction level between Saudi airports*

As shown in Table , the ANOVA results revealed a statistically significant difference in ASQ factors and Passengers' satisfaction between targeted Saudi airports (KKIA, KAIA, and KFIA), where P-value = .000 for all the first seven factors and it is equal to .001 for the last factor. So, the null hypothesis is rejected for all the eight factors. This means there is a significant difference in passenger satisfaction levels between Saudi airports. As shown in Table , Tukey's HSD test is applied to highlight the different group(s). Based on this analysis, KAIA in Jeddah has a significant difference in passenger satisfaction comparing to KKIA and KFIA.

Table 7. One-Way Analysis of Variance (ANOVA) Results

ASQ Factors	Sources	F	P-Value sig. (2-tailed)
Check-in Staff Efficiency	Between Airports	15.696	.000
Ease of Finding Way at the Airport	(KKIA, KAIA, &	20.241	.000
Comfort in the Departure Lounge	KFIA)	25.074	.000
Flight Information Panels		21.617	.000
Friendliness of Airport Staff		60.329	.000
Queue time at Check-in		13.327	.000
Walking distance at the passenger terminal		8.269	.000
Quantity and quality of snack bar restaurants		29.653	.001

Table 8. Tukey's HSD Test Results

ASQ Factors	KKIA & KAIA P-Value sig.	KKIA & KFIA P-Value sig.	KAIA & KFIA P-Value sig.	Result
Check-in Staff Efficiency	.000	. 276	.000	KAIA in
Ease of Finding Way at the Airport	.000	. 887	.000	Jeddah has a
Comfort in the Departure Lounge	.000	. 140	.000	significant
Flight Information Panels	.000	. 553	.000	difference in
Friendliness of Airport Staff	.000	. 797	.000	passenger
Queue time at Check-in	.000	. 458	.000	satisfaction
Walking distance at the passenger terminal	. 016	. 337	.000	comparing to KKIA and

Quantity and quality of snack bar restaurants	.000	. 143	.000	KFIA

CONCLUSION

The purpose of this research is to investigate passenger expectations of service quality in Saudi airports, which include KKIA in Riyadh, KAIA in Jeddah, and KFIA in Dammam. These airports acquire more than 76% of the total number of passengers at the Kingdom's airports. There is seventy-two research in the literature evaluating the quality of the services through forty-four factors are considering. These research were published in the last decade. The Pareto Principle is applied to select the highest nine frequency factors among the forty-four ones mentioned in the literature, were these nine factors representing approximately to tope 20% of the factors. The data was collected using an electronic survey where the respondents were asked to evaluate ASQ factors based on their satisfaction level.

One-Sample t-Test is employed on the nine selected factors to find a relationship between passengers' satisfaction and service quality factors. The finding of the research indicates that there is a significant relationship between eight service quality factors and passengers' satisfaction, which are Check-in Staff Efficiency, Ease of Finding your Way at the Airport, Comfort in the Departure Lounge, Flight Information Panels, Friendliness of Airport Staff, Queue time at Check-in, Walking distance at the passenger terminal, and Quantity & quality of snack bar restaurants. However, the results show that there is no relationship found between passengers' satisfaction and the Speed of Baggage Claim. IATA (2015) categorized the Speed of Baggage Claim as a quantitative factor (IATA, 2015). Although from the literature published during the last decade, it is found that this factor was used as a qualitative factor.

ANOVA is employed to examine whether there are differences in passenger satisfaction levels between targeted Saudi airports or not. Also, Tukey's HSD tests is used to figure which airport is not aligned to others. The result for this analysis shows that KAIA in Jeddah has different level of passengers' satisfaction comparing to KKIA and KFIA. Yet, Tukey's HSD test does not present the direction of this difference; either if it is positive or negative.

RECOMMENDATIONS

Further research can evaluate both expectations and perception of service quality within a single airport by measuring the importance of service factors to passengers and then passenger satisfaction of an airport performance of each factor by using both quantitative and qualitative data.

Evaluate the service quality of KAIA in Jeddah to find the direction of the difference between KKIA and KFIA among KAIA.

As a result of One-Sample t-Test, the factor measuring Speed of Baggage Claim has no effective relationship with passengers' satisfaction. This factor was categorized as a qualitative factor during the last decade by the researchers, while the IATA is categorizing it as a quantitative factor. So, it is highly recommended to study this factor and decide if it should be considered as a quantitative or qualitative factor. It is also highly recommended that an extensive research should be made to investigate if there is a relationship between passengers' satisfaction and the Speed of Baggage Claim on a wider scale.

This research focused on the top nine factors out of the forty-four ASQ factors mentioned in the literature to evaluate the service quality. Future research could be performed using the same methodology for the remaining thirty-five factors to examine the relationships between these factors and passengers' satisfaction.

Airports' managers can use this research results as a reference for ASQ factors to evaluate passengers' satisfaction of the service quality of other airports. Also, managers and improvement teams in the airports could use Pareto principle to select the top 20% ASQ factors out of the eight important factors mentioned in this research, which verified their relationship with passengers' satisfaction, to be considered for the beginning of the improvement process in their airports.

Managers and quality improvement teams in airports can also focus on improving staff efficiency and their friendliness which should increase the level of passengers' satisfaction. This could be done through supporting employees in their difficult circumstances and provide them with necessary training in public relationship and customer service.

This study also could be conducted on a wider scale; and a similar research can be conducted using correlation analysis by redesigning the questionnaire to support this research findings.

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