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Title: Restaurant containment measures and perceived service quality: implications for future pandemics

Abstract

Purpose: This study aims to identify the impact of restaurant pandemic mitigation measures on perceived service quality.

Design/methodology/approach: 15,251 reviews were collected from 300 TripAdvisor Lisbon restaurant webpages between March 2020 and December 2021, when Covid-19 contingency measures were in place. Grounded on the online reviews, a word frequency matrix was created and used as input on Partial Least Squares – Structural Equation Modeling (PLS-SEM) to test the proposed hypotheses.

Findings: The results suggest that precaution measures, such as the Vaccination Certificate, negative tests, and restaurant layout configuration, positively influenced perceived service quality and consumer satisfaction, moderated by consumers' beliefs.

Originality: This study provides relevant information for restaurant managers, which will help them to implement strategies to guarantee service quality, consumer satisfaction, and revisit intentions in future pandemic scenarios.

Keywords

Future pandemics; Perceived service quality; Consumer satisfaction; Restaurants

1. Introduction

Epidemics and pandemics have impacted tourism and hospitality, leading to a new preventive paradigm (Gössling *et al.*, 2021). A notable 2020 example is the Covid-19 pandemic. Health and government entities implemented measures against the virus, including confinement, distancing, and closures (Li *et al.*, 2022). Globally, the hospitality industry faced daily losses of around USD 534 million (Kostromitina *et al.*, 2021). As a preventive measure, the restaurant sector was forced to close (Dube *et al.*, 2021; Muneeb *et al.*, 2023). Therefore, consumers were reluctant to visit restaurants, leading to changes in consumer behavior (Byrd *et al.*, 2021). Kim *et al.* (2021) acknowledged that restaurants' cleanliness and safe-oriented message framing positively influence consumer behavior. Applying strategies such as take-away and delivery was relevant since consumers tended to avoid being in shared public spaces. During the Covid-19 pandemic and the beginning of restaurant reopening, restaurant managers had to implement safety measures, comply with health and government guidelines, and enhance consumer safety and comfort (Dube *et al.*, 2021; Gursoy and Chi, 2020).

As the risk of new pandemics is more significant than ever (Smith, 2021), it has become vital to learn from the Covid-19 pandemic to develop new multifaceted approaches that will enable to respond successfully to future pandemics (The Lancet Respiratory Medicine, 2022). Since restaurants have become an important feature of national tourist activities (Daries *et al.*, 2021), assessing which factors impact service quality and contribute to consumer satisfaction during pandemics is essential. This is particularly relevant since there is evidence that they will become increasingly frequent (Byrd *et al.*, 2021).

Several studies have attempted to explain the influence of pandemics on consumer behavior. For instance, Krostromitina *et al.* (2021) aimed to understand how the pandemic changed the desired satisfaction criteria. Byrd *et al.* (2021) aimed to understand consumer risk perceptions during the pandemic, while Kang *et al.* (2021) revealed how consumers evaluate restaurant containment measures. Jeong *et al.* (2022) highlighted the key factors that affected restaurant dining behavior during the COVID-19 pandemic, suggesting that the dining environment, communication, hygiene, and contactless features made customers feel comfortable. Vandenhoute *et al.* (2022) examined consumer attitudes and perceptions regarding the Covid-19 safety measures transparency and identified the determinants of consumers' intentions and behavior after restaurants and bars reopen. However, there is no evidence of studies on how pandemic containment measures and

consumer threat beliefs influence and moderate restaurants' consumer satisfaction and perceived service quality.

Accordingly, this study aims to answer the following research question: how do pandemic containment measures impact restaurants' perceived service quality and consumers' satisfaction? TripAdvisor online reviews published between March 2020 and December 2021 were collected from 300 Lisbon restaurants. The data were analyzed using text mining techniques to create a word frequency matrix for each review, which then became the input for Partial Least Squares – Structural Equation Modeling (PLS-SEM). This study aims to help restaurant managers implement strategies that may improve service quality and promote consumer satisfaction.

2. Literature Review

2.1. The influence of restaurant containment measures and health and government protocols on the perceived service quality of restaurants

Perceived service quality is the difference between customers' expectations and perceptions (Grönroos and Ojasalo, 2004). Service quality reflects subjective judgments on the overall service and its attributes (Grönroos, 2001). It is an essential predictor of consumer satisfaction, gaining competitive advantages, and determining intentions to revisit (Cheng *et al.*, 2021; George *et al.*, 2019).

Virus concerns reduced restaurant visits (Kim *et al.*, 2021). Accordingly, restaurants implemented health and government safety measures, addressing customers' fears (Chuenyindee *et al.*, 2022). Portugal restaurant containment measures include hand sanitizers, thorough cleaning, masks, and contactless payment (Hao *et al.*, 2022). Consumers expect restaurants to uphold social distancing, hygiene, and contactless precautions (Jeong *et al.*, 2022).

Portugal government authorities and health professionals defined strategies and measures to mitigate the spread of the virus, following the approach of other European Union countries, at different pandemic stages/curbs (Gössling *et al.*, 2021). These strategies involved population confinement, social distancing, stay-at-home orders, and mobility restrictions (Gursoy and Chi, 2020). Additionally, the restaurant industry drew up containment plans – *Restaurant containment measures* (Centers for Disease Control and Prevention, 2021; Luo and Xu, 2021).

With the emergence of a vaccine and tests for pandemic control, health authorities in many countries, including Portugal, made it mandatory for customers to present a valid Covid-19 vaccination Certificate or a negative test to enter a restaurant (Crego *et al.*, 2022; High Commission for Migration, 2022). Restaurant managers found this discouraging, considering that the containment measures would imply that restaurants were contagious places, thereby increasing customers' reluctance to dine out and influencing perceived service quality (Bizarro, 2021). Nevertheless, customers would only be willing to visit restaurants when sufficient and viable testing and vaccine methods were in place (Gursoy *et al.*, 2020).

Since the relationship between containment measures and perceived service quality has not been previously explored, it is essential to understand how government and restaurant control measures influence customers' perceptions of service quality. Specifically, within the Portuguese context, the government adopted measures such as physical distancing, masks, and ventilation, following what other European Union countries were doing at different pandemic stages/curbs (i.e., peaks and declines of the infected and death rates) (Silva *et al.*, 2021).

As containment plans create safe conditions for consumers (Zhang *et al.*, 2021) and influence their perceptions (Kostromitina *et al.*, 2021), it can be inferred that:

H1: Restaurant containment measures positively influence Perceived Service Quality.

Health and governmental protocols were developed to control the spread of the virus (Neise *et al.*, 2021), impacting restaurants' functioning and service (Kostromitina *et al.*, 2021). Although health and governmental impacts on restaurant operations are recognized, there remains a gap in understanding how these protocols influence perceived service quality. Consequently, it can be inferred that:

H2: Health and government protocols positively influence the Perceived Service Quality of restaurants.

2.2. Consumers' Threat Beliefs

It is vital to evaluate how threats to consumers moderate their perceptions of service quality (Eroglu *et al.*, 2022). Consumers' threat beliefs refer to the the relationship between risk perceptions and behavior (Freeman *et al.*, 2022).

Perceptions of pandemic severity shape preventive behaviors based on health beliefs (Gursoy and Chi, 2020), provoking anxiety and depression (Chuah *et al.*, 2022). These

individuals agree with the strictest health and government measures (Eroglu *et al.*, 2022). Others deny the virus's severity or deem it non-existent (Kellaris *et al.*, 2020), resulting in unwillingness to comply with measures like mask-wearing and distancing (Freeman *et al.*, 2022).

Satisfaction decreased for people concerned about the virus and perceived it as a severe threat when there were high levels of crowding and no evidence of control measures (Eroglu *et al.*, 2022). The opposite was true for those who did not believe this. The cultural background of each country needs to be accounted for when simulating the spread and severity of the COVID-19 pandemic. In a Southwestern European country like Portugal, citizens moderately feared the pandemic (e.g., compared to Asian countries), thus less keen on appreciating restaurant changes (Duarte *et al.*, 2022). While studies show varied pandemic impacts on satisfaction due to personal beliefs, there is still uncertainty about how consumer beliefs affect perceived service quality.

Since the perception of the risks posed by the virus was not the same for the entire population, it is relevant to assess how:

H3: Consumers' threats beliefs moderate the effects of perceived service quality and consumer satisfaction.

2.3. Relationship between perceived service quality and consumer satisfaction

Superior service quality influences the revisit intention (Park *et al.*, 2019). Accordingly, it is essential to assess perceived service quality and consumer satisfaction, taking restaurant containment measures and health and government pandemic protocols into consideration.

The expectation-disconfirmation theory posits that consumer satisfaction arises when product or service expectations are met or surpassed (Cassar *et al.*, 2023). The gap between expectations and perceived quality determines it. The integrative service quality-satisfaction theory highlights expectation, service, and quality as key to consumer satisfaction (de Ruyter *et al.*, 1997). It links service quality to consumer satisfaction. Satisfaction occurs when experiences outmatch expectations, influencing positive post-purchase decisions (Xu, 2021).

Nilashi *et al.* (2021) suggested that a hotel's perceived service quality influenced consumer satisfaction during the pandemic. Sun *et al.* (2022) stressed that hotel's

consumer satisfaction was enhanced when preventive measures to control the pandemic were observed. Before the emergence of Covid-19, studies suggested that perceived service quality influences consumer satisfaction (Keller and Kostromitina, 2020), and this assumption is also valid in the context of a pandemic in the hotel’s context (Sun *et al.*, 2022). While research has studied the link between service quality and satisfaction, there is limited investigation into these dynamics in restaurants, especially during the pandemic’s containment measures. Accordingly:

H4: Restaurant consumers’ perceptions of service quality positively influence consumer satisfaction.

The conceptual model is presented in Figure 1.

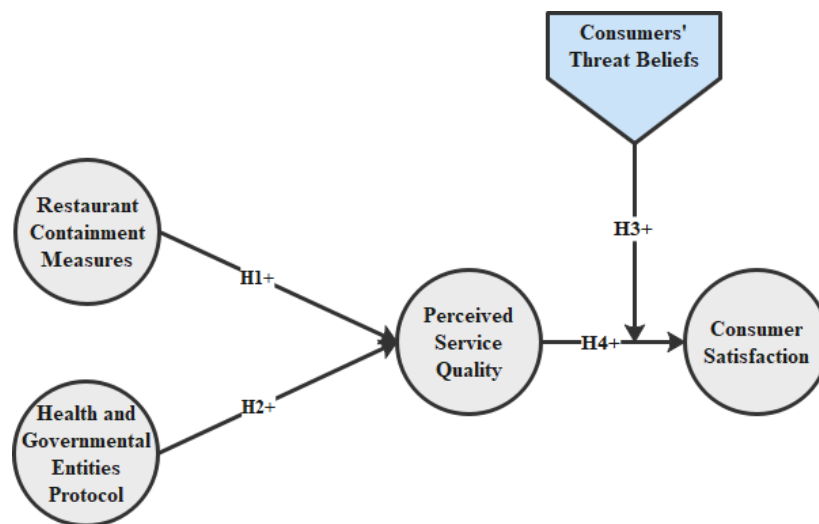


Figure 1 - Conceptual model; Source: created by author.

3. Methodology

This study examines how pandemic measures affect service quality perceptions and consumer satisfaction. The sample included clients reviewing TripAdvisor’s top-ranked rating of 300 Lisbon restaurants (Figure 2) from March 2020 to December 2021. We chose Lisbon for its robust tourism and high international visits. Lisbon earned tourism awards like Europe’s Leading City 2022 and World’s Leading Seaside Metropolitan Destination 2022 (World Travel Awards, 2022). Data collection started in March 2020, when the WHO (WHO, 2020) declared Covid-19 a pandemic. TripAdvisor, founded in 2000, is a top opinion site with 859 million reviews and 459 million monthly visits (Cassar *et al.*, 2023). Following Ramos *et al.* (2022) approach, mixed text mining and PLS-SEM methods were used to analyze restaurant reviews. PLS-SEM suits theory development research due to its flexibility with formative measures and single-item use

(Hair *et al.*, 2019; Richter *et al.*, 2020). Unlike traditional questionnaires, the study captured freely expressed customer perceptions (Pereira *et al.*, 2023).

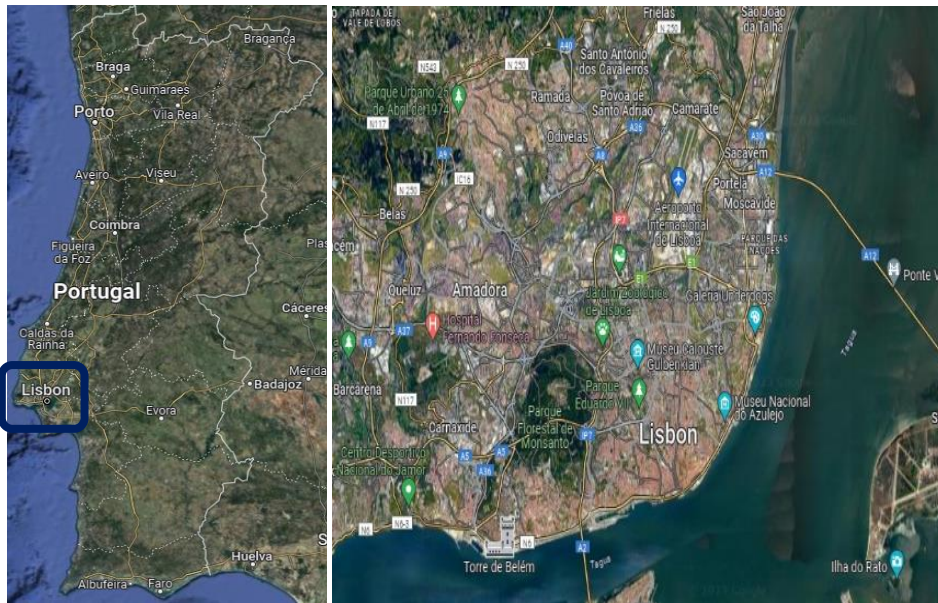


Figure 2 - Study map location (Google Maps, 2023).

3.1. Data collection and preparation

15,251 individual (i.e., after removing duplicates) online reviews were collected by a web scraper using the R software package ‘rvest’. Online reviews not written in English were translated using the Yandex translate API from the R package ‘RYandexTranslate’ (Piccinelli *et al.*, 2021). A sample of 5% of randomly non-English reviews was validated by an expert acknowledged in English to check if the resulting English sentences are consistent and make sense.

The reviews were transformed into a structure used as input for PLS-SEM. A text mining technique prepared the dataset by eliminating stopwords (frequently used words with no semantic value, e.g., “the”, “and”, “for”), adverbs, and articles, converting all words to lowercase and applying stemming (i.e., merging similar words into a common term, e.g., “cheaper” or “cheapest” = “cheap”). The ‘tm’ package in R was used for this process. The number of occurrences of each term was counted and grouped into each of the models’ theoretical constructs (e.g., lockdown, virus, and pandemic = ‘Health and Government Protocol’), thus creating a dictionary (Piccinelli *et al.*, 2021; Ramos *et al.*, 2019). Two methods were used to validate the dictionary and eliminate the inherent subjectivity involved in creating a dictionary. Firstly, a random check was carried out on 5% of the reviews to confirm whether the terms were associated with the items. Secondly, a panel of three independent marketing (2) and tourism (1) experts validated the dictionary (Ramos *et al.*, 2022). The experts could add or eliminate terms or reallocate

them to other theoretical constructs. Table 1 presents the dictionary, showing the model constructs, items, and a sample of terms associated with each item.

Table 1- Dictionary; Source: created by author.

Construct	Items	Sample of terms
Restaurant Containment Measures	Restaurant Precautions	clean, safety, hygiene
Health and Governmental Entities Protocol	Health and Governmental Entities Protocol	vaccine, lockdown, mask
Perceived Service Quality	Empathy	sympathy, cordial, gentil
	Reliability	helpful, loyal, honest
	Responsiveness	fast, help, efficacy
	Physical environment	decoration, atmosphere, comfort
	Facilities / Commodities	Wi-Fi, bathroom, TV
	Place / Convenience	sea, downtown, Lisbon
	Staff appearance	mask, glove, uniform
	Food Quality	delicious, tasteless, flavor
	Price	money, paycheck, cheap
Consumer Satisfaction	Satisfaction	good, brilliant, fabulous
	Emotions	love, happy, pleasant
	Revisit intentions	return, repeat, revisit
Consumers' Threats Beliefs	Covid-19 Believers	risk, caution, stress

Each review was analyzed individually by identifying the word frequency associated with each theoretical dimension. By cross-referencing the individual reviews with the dictionary, a word frequency matrix connected with each construct was built, creating continuous variables for each individual customer review (i.e., each value represented the frequency with which a given construct was mentioned). Each line in the matrix corresponds to one of the 15,251 individual reviews, and the columns show the construct items listed in Table 1. Each word frequency matrix cell shows the number of times the item was referred to in each review. For instance, the review “*Fabulous dinner with fast, efficient service and brilliant cuisine*” captured two terms related to “responsiveness” (*fast, efficient*), two terms related to “satisfaction” (*brilliant, fabulous*), and one term related to “facilities/commodities” (*cuisine*). This matrix mimicked individual responses to questions in a survey related to theoretical concepts on a case-by-case basis. If an item was mentioned frequently, then it was deemed important for that individual. This method captures the nuances and variations in attitudes and perceptions more accurately than a Likert Scale, which limits responses to a few discrete categories. It allows a more detailed analysis of customers’ feelings about certain aspects of their experience (Tang and Guo, 2015). The word frequency matrix was used as input for the PLS-SEM to evaluate the

relationships between the theoretical constructs of the model. The methodological scheme is shown in Figure 3.

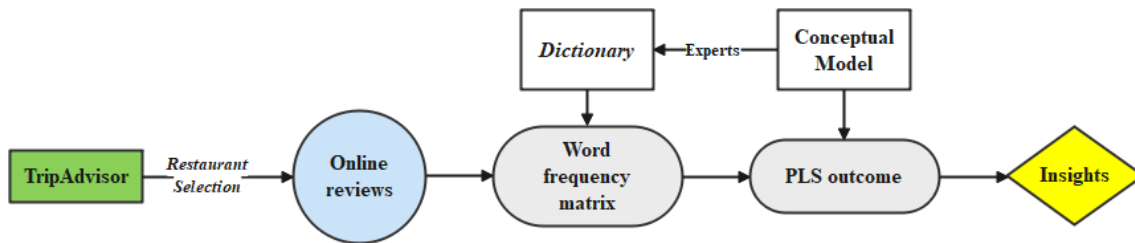


Figure 3 - Methodological approach; Source: created by author.

3.2. Data analysis

To validate the proposed theoretical model (Figure 1), we employed PLS-SEM. Such a procedure enabled the analysis of causal linkages between variables anchored in a theoretical model (Hair *et al.*, 2019). This methodology facilitates the delineation of intricate linear interrelations among variables. It exhibits an aptitude for secondary data, particularly within the purview of metric or quasi-metric paradigms, accommodating unidimensional items and formative measures (Richter *et al.*, 2020). The constructs encompassing Restaurant Containment Measures, Health and Government Protocol, and Consumers' Treat Beliefs underwent assessment via single-item measures. The variable Restaurant Containment Measures evaluates how restaurants ensure customer safety and health. It was defined by terms like clean, safety, and hygiene. The variable Health and Government Protocol measures adherence to health and government protocols. Terms like vaccine, lockdown, and mask defined it. Consumers' Threat Beliefs assesses consumers' perceptions of threats and risks through terms like risk, caution, and stress. More of these terms emphasize the variable in the customers' reviews. All items were measured using formative measures since the items associated with each variable had led to their formation, converging into a variable. Formative measures involve the construct's measurement variables, indicating that the observed variables represent different dimensions (Hair *et al.*, 2019). Although the items may not be directly related, they collectively contribute to constructing the latent variable (Gefen *et al.*, 2000).

Conversely, in the reflexive models, the observed variables reflect the latent variable and the construct representation should be unidimensional and correlated (Ali *et al.*, 2018). In our formative model, each item contains specific aspects of the construct domain, determining the overall meaning of the construct (Hair *et al.*, 2020).

The measurement model was evaluated according to Hair *et al.* (2020). Convergent validity was accessed to verify the correlation between the formative and reflexive measures of the same construct for each variable. Path coefficient values greater than 0.80 were verified. Additionally, multicollinearity ($VIF < 3.0$) was evaluated. To assess the significance, load, and item weight in the variable construction, bootstrapping was applied to 10,000 subsamples. A 5% significance level was defined as critical for the t -values of the path coefficients (t -value > 1.96). The model's internal multicollinearity and direct effects were evaluated using regression analysis, examining the size and significance of the path coefficients between the variables. Finally, the predictive capacity was evaluated based on R^2 and Q^2 values. Q^2 values were obtained from the blindfolding test for a D value of 12. These results formed the basis for the discussion and conclusions of the research study.

4. Results and discussion

4.1. Measurement model evaluation

The measurement model showed a high correlation between the formative measured constructs and their reflexive measure. Their path coefficients (β) were greater than 0.80 ($0.985 < \beta < 1.000$) for all constructs. Thus, all the indicators contributed significantly to the variable explanation. The external VIF values for all indicators were below 3.0 ($1.000 < VIF < 1.259$), showing the absence of multicollinearity issues (Hair *et al.*, 2020).

Table 2 shows the outer weights, outer loadings, and t values for a significance level of 5% (Hair *et al.*, 2020). The indicators associated with the Perceived Service Quality variable were significant, except for the Empathy item. The Empathy indicator is not significant in explaining Perceived Service Quality (p -value = 0.082 $>$ p -value = 0.05; t -value = 1.739 $<$ t -value recommended ≥ 1.96). The Food Quality, Physical Environment, Responsiveness, and Facilities/Commodities items had outer loadings values of over 0.50, contributing to Perceived Service Quality (0.764; 0.674; 0.573; 0.507, respectively). Although the Reliability, Place/Convenience, Staff Appearance, and Price outer loadings were lower than the recommended 0.50 criterion (Hair *et al.*, 2019), they were statistically significant for the formative measure of Perceived Service Quality.

Table 2 – Outer weights, *t*-values, *p*-values, and outer loading to a 5% significance level; Source: created by author.

Variable / Indicators	Outer Weights	<i>t</i> -values (<i>p</i> -values)	Outer Loadings
Restaurant Containment Measures			
Restaurant Precautions	1.000	NA*	NA*
Health and governmental entities protocol			
Health and Governmental Entities Protocol	1.000	NA*	NA*
Perceived Service Quality			
Empathy	0.028	1.739 (0.082)	0.103
Reliability	0.075	4.008 (0.000)	0.211
Responsiveness	0.297	12.859 (0.000)	0.573
Physical Environment	0.345	16.909 (0.000)	0.674
Facilities / Commodities	0.165	6.834 (0.000)	0.507
Place / Convenience	0.161	8.785 (0.000)	0.452
Food Quality	0.466	22.965 (0.000)	0.764
Price	0.130	6.141 (0.000)	0.439
Staff appearance	0.066	3.575 (0.000)	0.132
Consumer Satisfaction			
Satisfaction	0.712	37.951 (0.000)	0.835
Emotions	0.481	21.876 (0.000)	0.644
Revisit intentions	0,229	9,551 (0.000)	0.418
Consumers' Threat Beliefs			
Covid-19 Believers	1.000	NA*	NA*

* NA = Not applicable.

Regarding the Consumer Satisfaction variable, three associated indicators are significant in explaining the variable. The outer loadings were higher than 0.50 for the Satisfaction and Emotions indicators, suggesting a significant influence on Consumer Satisfaction. The Revisit Intentions outer loading was lower than the recommended 0.50 criterion. However, the indicator was statistically significant for the formative measure of the Consumer Satisfaction variable.

When there is neither significance for an indicator, nor the outer loading result is less than 0.50, it should be removed from the model (Hair *et al.*, 2019). When the indicator's outer loading is less than 0.50 but significant, its removal should be considered. However, removing the indicator requires careful analysis since its elimination may omit unique parts of the variable's composition, thus reducing its theoretical validity (Ramos *et al.*, 2022). Following these recommendations, the Empathy indicator was removed (outer loading = 0.103; *p*-value = 0.082). During the pandemic, consumers' priorities regarding service quality may have changed. For instance, aspects such as responsiveness, physical environment, or food quality may have been more valued by customers than empathy. Indicators with outer loadings of less than 0.50 (Reliability, Place/Convenience, Staff Appearance, Price) but with significance were retained.

Food Quality and Physical Environment were the indicators with the highest outer loadings (0.764; 0.674), suggesting that these indicators were the ones that had the greatest impact on Perceived Service Quality. Hence, the result suggests that when Covid-19 contingency measures were in force, Perceived Service Quality was majorly influenced by criteria such as food quality and physical environment (Keller and Kostromitina, 2020). Regarding the Consumer Satisfaction variable, the Revisit Intentions indicator had an outer loading below 0.50, but with significance. For this reason, it was retained.

4.2. Structural model evaluation

The internal structural model's VIF values were lower than 3.0 for all variables, revealing the absence of multicollinearity (Hair *et al.*, 2019). The structural model explains 13.3% ($R^2 = 0.133$) of Perceived Service Quality variance and 23.1% ($R^2 = 0.231$) of Consumer Satisfaction variance. Since this study typology is related to consumer behavior, the model has a higher explanatory power regarding Consumer Satisfaction and Perceived Service Quality (Hair *et al.*, 2017). Accordingly, the model reveals a good predictive capacity to evaluate the influence of Perceived Service Quality on Consumer Satisfaction in the context of the pandemic. Q^2 values range from 0 to the same variables (Table 3), reinforcing the predictive model's capacity.

Table 3 – Explain variance (R^2) and predictive capacity (Q^2); Source: created by author.

Variable	Explained Variance		Predictive capacity	
		R^2 value		Q^2 value
Perceived Service Quality		0.133		0.032
Consumer Satisfaction		0.231		0.098

Table 4 shows the path coefficient values (β) between the constructs and significance, providing information on the relationship between variables and the validity of the hypotheses under study.

Table 4 – Path, coefficients, *t*-value, *p*-value, and confidence interval to a significance level of 5%; Source: created by author.

Path	Coefficients (β)	<i>t</i> -value (<i>p</i> -value)	LLCI*	ULCI*
Restaurant Containment Measures -> Perceived Service Quality	0.282	20.485 (0.000)	0.255	0.309
Health and Governmental Entities Protocol -> Perceived Service Quality	0.185	7.919 (0.000)	0.140	0.229
Perceived Service Quality -> Consumer Satisfaction	0.464	41.843 (0.000)	0.442	0.486
Moderate Effect Consumers' Threats Beliefs* Perceived Service Quality-> Consumer Satisfaction	0.025	1.976 (0.017)	0.003	0.044

* LLCI = lower-level confidence interval; ULCI = upper-level confidence interval

All relationships between variables are significant. Thus, the structural model showed that Restaurant Containment Measures and Health and Governmental Protocols influence Perceived Service Quality, influencing Consumer Satisfaction (Park *et al.*, 2019). In addition, Consumers' Treat Belief moderates the effect of Perceived Service Quality on Consumer Satisfaction (Eroglu *et al.*, 2022).

The results suggest that Restaurant Containment Measures positively influence Perceived Service Quality, thus validating H1 ($\beta = 0.282$, *p*-value = 0.000). This result suggests that restaurant precautions impact Perceived Service Quality. Following the measures implemented by Lisbon restaurants, such as layout reconfiguration, frequent cleaning, dividers, or limiting the number of customers, influenced Perceived Service Quality. Therefore, consumers' expectations were met.

The relationship between Health and Government Protocol and Perceived Service Quality was verified. The former positively influences the latter, thus validating H2 ($\beta = 0.185$, *p*-value = 0.000). Government and health professionals' strategies for mitigating the spread of the virus offered great confidence and positively impacted Perceived Quality Service (Crego *et al.*, 2022). Hence, the results suggest that customers felt secure and comfortable.

The Consumer Threat Beliefs results revealed a positive and significant moderation effect on Consumer Satisfaction when influenced by Perceived Service Quality, thus supporting H3. However, although the moderate effect is significant, the β value showed that the relationship moderation was lower ($\beta = 0.025$, *p*-value = 0.017). Such a result may relate to the Portuguese cultural background (Duarte *et al.*, 2022). Nevertheless, this result suggests that Consumer Threat Beliefs, characterized by fear and risk (Chuah *et al.*, 2022), positively moderate the impact of Perceived Service Quality on Consumer

Satisfaction. Consumers feeling threatened by the virus positively perceive service quality when restaurants employ measures to mitigate the spread of the virus. Accordingly, restaurant containment measures were essential for those who believed in the dangers of the pandemic. Moreover, it can be inferred that Restaurant Containment Measures and Health and Government Protocol, which influenced Perceived Service Quality, were important in reducing reluctance to visit restaurants due to the risk of contracting the virus (Byrd *et al.*, 2021).

The relationship between Perceived Service Quality and Consumer Satisfaction showed a significant path coefficient of 0.464. This result suggests that Perceived Service Quality strongly influenced Consumer Satisfaction, thus validating H4. Perceived service quality affected by Covid-19 conditions influences future consumer behavior and satisfaction (George *et al.*, 2019; Sun *et al.*, 2022). Following the service quality-satisfaction theory, expectation, service, and quality are decisive in Customer Satisfaction (de Ruyter *et al.*, 1997). Accordingly, results suggest that the service provided by restaurants, influenced by the pandemic containment measures, met or even exceeded customers' expectations, generating Customer Satisfaction and future repeat behavior Consumer satisfaction, confirming the expectation-confirmation theory (Cheng *et al.*, 2021). Hence, this result suggests less reluctance to visit restaurants (Kim *et al.*, 2021). Perceived service quality is a pivotal factor in consumer satisfaction (Grönroos and Ojasalo, 2004), corroborated by the higher path coefficient observed for this relationship, amounting to a 5% significance level.

From the perspective of the emergence of future pandemics with similar characteristics, these results provide relevant input for restaurant managers. The containment measures will be relevant for good business performance in atypical times.

Figure 4 provides a schematic structural model of the results presented and discussed above.

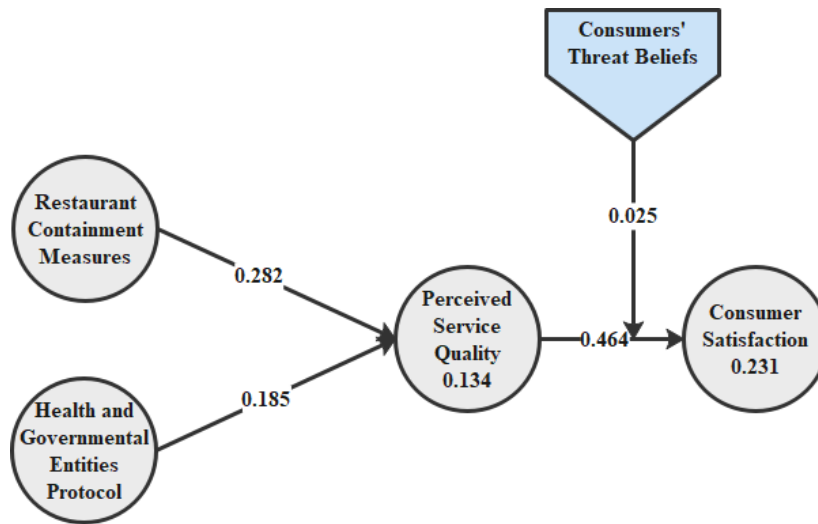


Figure 4 - Summary results of the structural model to significance level of 5%; Source: created by author.

5. Conclusions

This study aimed to verify the pandemic crisis's impact on perceived restaurant service quality and satisfaction. The results reveal a clear positive relationship between containment measures and customer satisfaction, moderated by the consumers' perceptions of threat from the pandemic. Such insights are critical, as they provide a nuanced understanding of consumer behavior during crises.

Our approach, applying text mining techniques and PLS-SEM analysis on 15,251 online reviews, stands out in pandemic-related research, offering a novel perspective into the intricate relationship between pandemic containment measures and service quality in the restaurant industry.

This study bridges a gap in existing literature, by focusing on an underexplored aspect of the pandemic's impact. This unique angle complements existing studies and adds new insights and perspectives to the literature, contributing to a deeper understanding of the complex relationship between pandemic containment strategies and service quality in the restaurant industry. It reveals the delicate balance that needs to be struck to ensure customer satisfaction during unprecedented times.

5.1. Theoretical and managerial implications

Results suggest that measures implemented by health and government entities and restaurant managers were necessary regarding perceived service quality and customer satisfaction, aligned with the expectation-disconfirmation and the integrative service

quality-satisfaction theories (de Ruyter *et al.*, 1997). The results may contribute to a better understanding of the pandemic crisis and its impact on the hospitality sector's performance, particularly in the restaurant industry. Restaurant managers should include measures such as hand sanitizing stations, using masks and gloves, improved cleaning and disinfection procedures, and adequate employee training. Employees should understand the importance of the mitigation measures and know how to implement them (Chen and Qi, 2022). Pedagogical actions highlighting security measures and impacts may influence the customers' security and concern perception (Grönroos, 2001). Informing customers about the procedures and how they are being updated may increase the feeling of safety (Gursoy and Chi, 2020). Managers can also implement a system to collect customer feedback on their experience of safety and hygiene in the restaurant.

This study's results help health and government entities provide guidelines for virus mitigation. Health and government entities can raise awareness of the importance of mitigation measures. This could include public hygiene and safety campaigns that customers should expect when visiting a restaurant.

5.2. *Limitations and future research*

Limitations should be acknowledged. Reviews that do not follow the standard pagination format may not have been captured due to using a web scraper. Although a panel of experts validated the dictionary, this process will always contain inherent subjectivity (Ramos *et al.*, 2022), influencing final results. The accuracy and authenticity of TripAdvisor's online reviews could not be confirmed. The study was limited to 300 Lisbon restaurants. Negative feelings such as dissatisfaction and disloyalty were not considered, although most reviews from TripAdvisor have positive polarity (Furtado *et al.*, 2022; Rita *et al.*, 2022). Future studies could investigate the roles of customer perceptions of value, adaptability, and flexibility in service delivery as crucial customer experience variables in restaurants during pandemics. Future studies should confirm these results by conducting a study based on primary data and an extensive sample from different world regions. Restaurant lockdowns led to delivery and take-away services (Gössling *et al.*, 2021). Future research could analyze the perceived service quality of these services since the risk of new pandemics is becoming increasingly likely. Additionally, it would be interesting to acknowledge longitudinal changes in customer perceptions during a pandemic and compare the impact of containment measures in restaurants that adopt them versus those that do not.

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