

Evaluation of the Factors Affecting the Preference of Cruise Tourism with Fuzzy DEMATEL Method

Abstract

The primary objective of this study is to identify the factors influencing passengers' preferences for cruise tourism in Türkiye and to evaluate their significance level. The most important criteria were determined using the fuzzy DEMATEL method, and the results were evaluated. The most significant criterion for passengers opting for cruise tourism is travel costs. Accordingly, the criteria of activities and entertainment, ship type and structure, destination, safety, accommodation, and restaurant services have been identified. The criterion of lesser importance is port management. Cruise tourism stakeholders can design upcoming steps according to this research, in which the most important criteria have been identified and the results evaluated. The analysis of these criteria will also contribute to policymakers, practitioners, and entrepreneurs who require novel sources of information. The importance of ranking the criteria influencing the preference for cruise tourism to contribute to sustainable development demonstrated the necessity of identifying the most significant criteria. These criteria are of high significance in the contemporary worldwide cruise tourism industry, which needs to be accentuated. The factors influencing the preference for cruise tourism reveal information that can contribute to the development of this sector.

Keywords: cruise, cruise tourism, cruise destination, cruise tourist preference, fuzzy DEMATEL

1. Introduction

Irrespective of the adverse effects of the pandemic, cruise tourism has rapidly recovered and has become a significant component of the tourism industry with its potential for development (Ajagunna & Casanova, 2022; Chrysafis et al., 2024; Ilori et al., 2022; McLean, 2022; Sun et al., 2019; Zhang et al., 2022). Cruise ship, crew, cruise line, passenger, destination, and management organisations, port, travel and transportation companies, maintenance and repair firms, support companies, etc. are important elements mentioned in research regarding the formation and development of cruise tourism (Espinet-Rius et al., 2024; Jiao et al., 2024; Lau & Yip, 2020; Orive et al., 2025; Pallis & Vaggelas, 2019; Sun et al., 2019; Véronneau & Roy, 2009). Therefore, when referring to cruise ships, it denotes large vessels transporting passengers for vacation purposes, facilitating coastal excursions, and offering a luxurious hotel-like experience with various amenities on board (Ilori et al., 2022). Cruise travel is defined as encompassing a ship journey harbouring accommodations, dining, and entertainment facilities while visiting various coastal destinations according to a specified itinerary (Lau & Yip, 2020). In other words, cruise travel is a holiday journey to multiple destinations on a large ship that provides tourist services. In cruise tourism, it is expected that cruise companies offer a unique travel experience at a level that will satisfy tourists in the main port and other ports of call, and in return, passenger expenditures are expected to increase (Espinet-Rius et al., 2020; Sun et al., 2019). Thus, the substantive purpose of cruise tourism is to elate the tourists' experience and to include a certain number of activities accommodated both on board and off the ship (Satghare, 2024).

Figen Sevinç Başol, Corresponding Author, Department of Travel, Tourism and Leisure Services, Bartın University, Bartın, Türkiye;
ORCID ID: <https://orcid.org/0000-0001-5391-1818>; e-mail: fsevinc@bartin.edu.tr

Murat Yorulmaz, Department of Maritime Business Administration, Faculty of Maritime, Kocaeli University, Kocaeli, Türkiye;
ORCID ID: <https://orcid.org/0000-0002-5736-9146>; e-mail: murat.yorulmaz@kocaeli.edu.tr

In line with 2025 estimates, \$72.5 billion of revenue will be attained by the global cruise ocean line ticket sales, pointing to a 7.7% increase in comparison with 2024 figures. In this respect, it is estimated that more than 33.7 million passengers will be carried, suggesting a 4.9% increase compared to 2024 and a 22.4% increase compared to 2019 (Cruise Market Watch, 2025). Consequently, with its upgraded fleets and evolving capacities, the cruise industry offers positive prospects regarding revenue and employment opportunities, thanks to increased numbers in passenger carriage (Satghare, 2024). Nonetheless, the cruise industry can also be affected positively and adversely (Pallis & Vaggelas, 2019; Sandven et al., 2024). Over the recent years, cruise tourism perceptions have been modified, transforming it into a symbol of collective tourism (Papathanassis, 2025). Concurrently, the studies specifically aiming at delving into the industry have increased through the years, "cruise-friendly" labels are being reengineered, and cruise passengers' preferences have been contemplated profoundly (Ajagunna & Casanova, 2022; Severt & Tasci, 2020; Sun et al., 2019). Irrespective of that, it needs to be accentuated that research taking into consideration expert reviews is insufficient in the literature, and more research conducted from the cruise passengers' perspectives need to be prioritized (Ali et al., 2022; Aras, 2023; Papadopoulou & Xesfingi, 2023; Sun et al., 2019; Sun et al., 2021; Wang et al., 2022).

Tourists might opt for cruise tourism on account of the geographical locations, cultures, natural life, tourism resources, and unique experiences of destinations (Lau & Yip, 2020). Nonetheless, the factors that impact the preference for cruise tourism may vary not only according to destinations but also based on tourists' cultures, travel duration, diversity of services, quality, scope, cost, safety, characteristics of the cruise ship, etc (Chang et al., 2021; Espinet-Rius et al., 2020; Jiao et al., 2024; McLean, 2022; Petrick, 2005; Sciortino et al., 2022; Sun et al., 2019; Sun et al., 2021). Accordingly, Cruise tourism comes with a certain degree of complexity, both concerning service/product scope and preference reasons. As such, the value of products and services can be determined in line with a multitude of factors, such as value for money, potential tourists may face uncertainties, and they might inquire about secure information online (Bahattab et al., 2023; Jiao et al., 2024; Lee & Yoo, 2015; Sun et al., 2021; Sun et al., 2023). Likewise, it is worth mentioning that novel sources of information are required regarding cruise tourism for policy developers, practitioners, and entrepreneurs. Indeed, it needs to be emphasized that the knowledge produced through academic research for new generation transformational impact needs to reach decision-makers and broader communities (Papathanassis, 2025). At this juncture, the evolving demands and transformative nature of cruise tourism necessitate continuous innovation and research. It is worth mentioning that the passenger profile in cruise tourism has gone through diversification and expansion, becoming more attractive to younger generations (Cruise Lines International Association [CLIA], 2024; Papathanassis, 2020; Wang et al., 2022). Regarding Türkiye's young population, the demand for cruise tourism has been on the rise (Aras, 2023). According to Statistics pertaining to cruise tourism, encompassing the period January to November 2024, concerning the passenger ships arriving at Turkish ports are as follows: 1,167 cruise ships docked, 151.294 cruise passengers arrived, 157.458 cruise passengers departed, and the total number of cruise passengers, including those in transit, reached 1,854.364 (General Directorate for Maritime Affairs, 2024). In line with these statistics, delving into passengers' demands, perceptions, and attitudes, besides inquiring expert opinions in the field, has attained significant momentum.

The criteria affecting the preference for cruise tourism, identifying the most significant criteria, and focusing on these criteria in the development of tourism need to be prioritized. Individually, every part of this criteria are of high significance in the sector, contributing to fill the gap in the literature. Based on this point of view, the primary objective of this study is to determine the most significant criteria implementing the Fuzzy DEMATEL method, one of the multi-criteria decision-making (MCDM) techniques, and to ponder its out column through systematically testing the factors affecting cruise tourism preferences and prioritizing them, taken from the Fuzzy DEMATEL method, a technique that has been rarely applied in this context, this study contributes to the existing literature. In contrast to previous studies concentrating on general tourism preferences, this

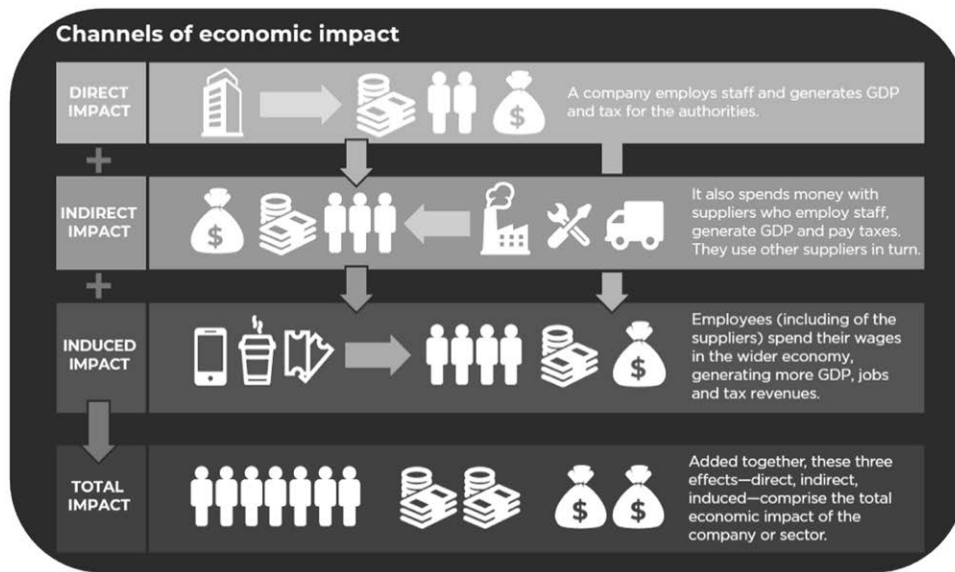
study employs a structured decision-making approach to identify the most influential factors in cruise tourism selection. The substantive goals of this study include determining the primary factors affecting cruise tourism preference, establishing causal relationships among these factors, and offering a strategic mentality for industry stakeholders, policymakers, and tourism operators to enhance cruise tourism offerings. Furthermore, the study presents a strategic vision for decision-makers developing cruise tourism plans in Türkiye.

In line with this approach, the structure of this paper is outlined considering an in-depth literature review on cruise tourism trends and influencing factors. Subsequently, the research methodology is elaborated on, providing particular information on the application of the Fuzzy DEMATEL method. Having categorized the priorities of tourism preference criteria, the findings are then presented. Later on, using a comparative approach, the findings are compared with the existing literature, and theoretical as well as practical contributions are provided. Eventually, highlighting key insights, study limitations, and recommendations for future research, the study is finalized.

2. Literature review

Cruise tourism, which has contributed to the tourism industry in recent years and become popular worldwide, is increasingly coming to the forefront in coastal countries and playing a key role in their tourism development (United Nations World Tourism Organization [UNWTO], 2020; Chrysafis et al., 2024; Pallis & Vaggelas, 2019; Yi et al., 2014). Cruising is one of the global passenger transportation sectors that predominantly provides services for sea voyages aimed at entertainment and relaxation, typically calling at multiple ports (Lau & Yip, 2020). Cruise travel is defined as a leisure activity that encompasses both tourism and hospitality aspects while journeying to various destinations (Hung et al., 2019). Cruising, often viewed as a part of the transportation industry, is observed to be focused on tourism management in some studies, while in others, the emphasis is placed on maritime transport management (Lau & Yip, 2020; Sun et al., 2023; Zhang et al., 2022). The offered products and services (accommodation, leisure, entertainment, transportation, restaurant activities, etc.), the management of the destination, and the transportation network have assumed a complex industrial structure in both the transportation and tourism industries (Björk et al., 2023; Véronneau & Roy, 2009). Therefore, the cruise industry, which has been a dynamic field from the past to the present, continues to be a significant component of the industries it is part of, constantly renewing itself, adapting to technology, expanding, and globalizing in the future as well (CLIA, 2024; Soriani et al., 2009; Lau & Yip, 2020). It is observed that cruise ships, which constitute the foundation of cruise tourism, are adapting to technological advancements, investing in carbon emission reduction trends, infrastructure, and operational efficiencies, and taking more sustainable and environmentally friendly steps (CLIA, 2024). Thus, it is possible to state that the aim is to progress with a balanced increase in passenger capacity and fleets in the future, and to maximize the socio-economic contributions of cruise tourism. Indeed, in 2023, cruise tourism generated a total economic impact of \$168.6 billion and created 1.6 million additional jobs. It is reported that 77% of this is attributed to onshore activities supporting 1.2 million additional jobs, with every 20 cruise passengers worldwide supporting additional employment (CLIA, 2023). Therefore, the contribution of cruise tourism to the sector and the country appears to be attractive in terms of economic development (Hoarau-Heemstra et al., 2023). Indeed, it has been determined that 68% of cruise passengers stay at least one night in the destination before or after their voyage, and approximately 6 out of 10 passengers return to a destination they first visited during a cruise ship journey (CLIA, 2023). Thus, the contribution to the stimulation of local and regional economies in destinations visited by cruise ships and to the national economy can be observed. In the literature, the contribution to local and regional economies is examined under two main categories: direct and indirect effects (Satghare, 2024). According to CLIA (2024), the economic impact study demonstrates the direct, indirect, and induced effects and total impact of the cruise industry on local and national economies (Figure 1).

Figure 1
Channels of economic impact from cruise



Source: CLIA, 2024.

Despite its complex structure, cruise tourism is a form of tourism that provides economic benefits to the destinations visited and is seen as an investment opportunity (Hoarau-Heemstra et al., 2023; Satghare, 2024). However, while cruise tourism has advantages such as positive economic impacts on destinations (investments, employment, increased income, development of port services and infrastructure, etc.) and contributions to cultural communication, it can also lead to negative social, cultural, environmental, and economic effects on destinations in the short, medium, and long term (Sandven et al., 2024; Spencer & Spencer, 2022). In the literature, it is observed that attention is given to the occurrence of overtourism in the destination due to cruise passengers, environmental and noise pollution, traffic congestion, increased crime rates, price inflation, low passenger expenditures, and the inability to plan excursions effectively (James et al., 2020; Jordan & Vogt, 2017; Papathanassis, 2017; Sandven et al., 2024; Sun et al., 2019; Vourdoubas, 2025). Consequently, cruise lines visiting various coastal destinations may alter their routes or remove a destination from their itineraries due to adverse conditions (environmental, social, economic, political, etc.) in ports of call. While passengers are expected to be satisfied with the ship, destinations, and port services (Sun et al., 2019), it should not be forgotten that to participate in cruise tourism, it is necessary to adapt to tourist demands, provide high-quality and safe services, and make substantial capital investments (Bahattab et al., 2023; Jiao et al., 2024; Zhang et al., 2022). In this context, while it is globally acknowledged that cruise expenditures create a significant source of income in the destination through the multiplier effect, tourists' preferences and the determinants of their spending levels continue to arouse curiosity (Domenech & Gutiérrez, 2020; James et al., 2020; Sciortino et al., 2022). Over the years, it is understood that cruise ship-centric and management-focused cruise research has, in recent years, particularly until the post-COVID-19 period, become more cruise destination-centric, with a greater emphasis on sustainability issues. Future studies are expected to shift towards areas such as new industry, new sustainability, green ports, etc. (Pallis & Vaggelas, 2019; Papathanassis, 2025). At this point, it is necessary to determine the criteria influencing the preference for cruise tourism, which is significant in terms of the sustainability of cruise tourism. To guide the sustainable development of cruise tourism in Türkiye, fill the gaps in the literature, and approach the subject from different perspectives, criteria have been established using the DEMATEL method.

3. Methodology and methods

Integrating qualitative and quantitative techniques to assess the cruise tourism preferences, a mixed-method approach is applied. The Fuzzy DEMATEL method was opted for on account of its ability to test complicated interrelations among influencing factors and perform cause-effect analysis, which is fundamental to perceiving interdependent elements like cost, entertainment, and safety. It fortifies expert-based decision-making and incorporates Fuzzy logic to decrease uncertainty, strengthening realism in assessments (Chang et al., 2011; Zhou et al., 2011). Among MCDM methods, Fuzzy DEMATEL is prioritized for its efficacy in managing linguistic variables and establishing causal links. This approach encompasses expert interviews, pairwise comparisons, and mathematical modeling, which, while minimizing bias, affirms systematic evaluation and prioritization of expert judgments (Koç, 2019).

Step 1: Defining the criteria and determining the fuzzy scale

Initially, defining the criteria is of high significance for decision-makers making assessments. To identify the affected and affecting factors, decision-makers need to conduct pairwise comparisons and institute meaningful relationships among factors. A fuzzy scale has been applied to enable decision-makers to scale pairwise comparisons. The fuzzy number equivalents corresponding to linguistic expressions are presented below in Table 1.

Table 1.
Fuzzy scale corresponding to linguistic expressions

Linguistic Expressions	Triangular Fuzzy Number Equivalents
No Effect (0)	(0;0;0.25)
Little Effect (1)	(0;0.25;0.50)
Quite Effective (2)	(0.25;0.50;0.75)
Very Effective (3)	(0.50;0.75;1)
Certainly Effective (4)	(0.75;1;1)

Source: Koç, 2019.

Step 2: Creation of the direct relation matrix

To scale the relationships between criteria, pairwise comparisons are made using fuzzy numbers corresponding to linguistic terms determined by decision-makers, resulting in a fuzzy direct relation matrix. The matrix is denoted by "Z".

Step 3: Obtaining the normalized direct relation matrix

A normalization process is applied to the direct relation matrix using Equations (1) and (2). Here, "l", "m", and "u" represent the lower, middle, and upper bounds of triangular fuzzy numbers, respectively, with $u > m > l$ and $u > m > l$. In Equation (1), the column-wise sums of "u" values are calculated, and the maximum among them is taken as "r". Each matrix value is then divided by "r", yielding the normalized direct relation matrix, denoted as \tilde{X} .

$$\tilde{X}_{ij}^{(k)} = \frac{\tilde{z}_{ij}}{r^{(k)}} = \left(\frac{l_{ij}}{r^{(k)}}, \frac{m_{ij}}{r^{(k)}}, \frac{u_{ij}}{r^{(k)}} \right) \quad (1)$$

$$r^{(k)} = \max \sum_{j=1}^n u_{ij}^{(k)} \quad (2)$$

$$\tilde{X} = \begin{bmatrix} X_{11} & X_{12} & \dots & X_{1n} \\ X_{21} & X_{22} & \dots & X_{2n} \\ \vdots & \vdots & & \\ X_{n1} & X_{n2} & \dots & X_{nn} \end{bmatrix}$$

Step 4: Total relationship matrix

After the normalization process, Equation (3) below is applied to obtain the total relationship matrix.

$$\check{T} = \check{X} + \check{X}^2 + \check{X}^3 + \dots = \sum_{i=1}^{\infty} \check{X}^i = \check{X}(I - \check{X})^{-1} \quad (3)$$

To obtain the total relation matrix, the 4th formula is applied to all values in the matrix where the first fuzzy value is "l" in the normalized direct relation matrix. Subsequently, the 4th formula is applied to the fuzzy values where the second fuzzy value is "m" and the third fuzzy value is "u", respectively. The three total relation matrices obtained are then combined to produce the final total relation matrix.

$$\check{T} = \begin{bmatrix} T_{11} & T_{12} & \dots & T_{1n} \\ T_{21} & T_{22} & \dots & T_{2n} \\ \vdots & \vdots & & \vdots \\ T_{n1} & T_{n2} & \dots & T_{nn} \end{bmatrix}$$

Step 5: Determining the influencing and influenced factors

In the total relation matrix, the \check{D}_i value is obtained by summing the row values, while the \check{R}_i value is found by summing the column values. To determine the influencing and influenced factors, the final step is to calculate the $\check{D}_i + \check{R}_i$ and $\check{D}_i - \check{R}_i$ values.

$$\left. \begin{aligned} \check{D}_i &= \sum_{j=1}^n \check{T}_{ij} \quad (i=1,2,\dots,n) \\ \check{R}_i &= \sum_{j=1}^n \check{T}_{ij} \quad (j=1,2,\dots,n) \end{aligned} \right\} \quad (4)$$

The $\check{D}_i + \check{R}_i$ and $\check{D}_i - \check{R}_i$ results found for each factor determine the affected and affecting factors, as well as the level of relationship between factors. As the result of the $\check{D}_i - \check{R}_i$ operation, factors with positive values are affecting factors, while those with negative values are affected factors. In a result of the $\check{D}_i + \check{R}_i$ operation, factors with high values tend to have more relationships with other factors, while factors with low values have fewer relationships with other factors.

Step 6: Defuzzification

$\check{D}_i + \check{R}_i$ and $\check{D}_i - \check{R}_i$ are still triangular fuzzy values at this stage. The defuzzification process is applied to simplify these values and obtain a single value. Equation (5) presents the formula for the defuzzification process.

$$\left. \begin{aligned} \check{D}_i^{def} + \check{R}_i^{def} &= \frac{1}{4}(1+2m+u) \\ \check{D}_i^{def} - \check{R}_i^{def} &= \frac{1}{4}(1+2m+u) \end{aligned} \right\} \quad (5)$$

Step 7: Creating the relationship diagram

In the final step of creating the relationship diagram, the diagram is drawn after the defuzzification step. $\check{D}_i^{def} - \check{R}_i^{def}$ forms the vertical axis, while, $\check{D}_i^{def} + \check{R}_i^{def}$ forms the horizontal axis on the coordinate plane. Based on the diagram, a directional cause-and-effect evaluation is conducted.

3.1. Problem hierarchy

The criteria affecting cruise tourism for analysis were obtained from the literature (Bahattab et al., 2023; Chang et al., 2021; Chen et al., 2016; Domenech & Gutiérrez, 2020; Espinet-Rius et al., 2020; Jiao et al., 2024; Lau & Yip, 2020; Lee & Yoo, 2015; McLean, 2022; Petrick, 2005; Sciortino et al., 2022; Sun et al., 2019). The fuzzy DEMATEL method was used to correlate the criteria and determine their degree of importance. The aim was to identify the most influential criterion in the obtained results.

Table 2
Criteria affecting cruise tourism

Criteria
A: Destination
B: Activities and Entertainment
C: Safety
D: Port Management
E: Accommodation and Restaurant Services
F: Ship Type and Structure
G: Travel Cost

Source: Author's own work.

4. Findings

When examining the findings obtained, according to the D+R results shown in Table 3, criterion "G" has the highest relationship with other criteria. Criterion "B" was found to be the second criterion with a high relationship to other criteria. The criterion with the least relationship is criterion "D". According to the D-R results, the influencing criteria were identified as "D" and "F", while the influenced criteria were determined to be "A, B, C, E", and "G".

In Table 4, the weights of the criteria were determined, and it was concluded that criterion "G" had the highest importance with 16.7%. The second most important criterion was found to be criterion "B" with 15.9%. The criterion with the lowest importance was criterion "D" with 11%. The order of importance is G-B-F-A-C-E-D.

Table 3
D+R and D-R

	D+R	D-R
A	10.269	-0.182
B	11.262	-0.043
C	10.287	-0.711
D	8.534	0.609
E	9.922	-0.294
F	10.595	0.987
G	11.586	-0.367

Source: Authors own work.

Table 4
Criteria weight results

	wi	Wi
A	5.204	0.145
B	5.7	0.159
C	4.963	0.138
D	3.941	0.110
E	4.826	0.134
F	5.299	0.147
G	6.001	0.167
Total	35.934	1

Source: Authors own work.

Fuzzy DEMATEL analysis identified 'travel cost' (0.16) and 'activities and entertainment' (0.15) as the most influential (cause) factors shaping cruise tourism preferences. These significantly affect dependent (effect) criteria like 'port management' (0.11) and 'ship type and structure' (0.14), consistent with prior findings highlighting cost and entertainment as key decision factors (Ali et al., 2022; Chang et al., 2021; Chua et al., 2015; Hosany & Witham, 2010). Tables 5 and 6, respectively, represent the decision and normalized direct relation matrices.

5. Discussion and implications

A rapid growth is observed in the cruise industry, accentuating the fact that traveller satisfaction and a customer-oriented approach are at stake (Ali et al., 2022; Lee & Ramdeen, 2013; Yi et al., 2014). Irrespective of enhanced interest in cruise tourism, further research is required to address tourist experiences and motivations (Ali et al., 2022; CLIA, 2024; Papathanassis, 2020). Arising from diversified passenger motivations and regional differences, setting preference factors is still complicated. Diverging from prior studies through its methodology, this study elaborates on determining and prioritizing the factors that impact cruise tourism preferences in Türkiye.

According to the findings, travel cost is the most important criterion, followed by activities and entertainment, ship type and structure, destination, safety, accommodation, and dining services. Price sensitivity substantially alters decision-making (Chua et al., 2015; Kawasaki & Lau, 2020; Sun et al., 2011). While reinforcing the importance of entertainment in passenger satisfaction, the study reaffirms the ship features factor and cruise scope in setting cost (Ali et al., 2022; Hosany & Witham, 2010). Ship design and onboard diversity also affect preferences (Ali et al., 2022; Hung et al., 2019), besides destination attributes and service quality (Sanz-Blas et al., 2019). Although port management ranked lower in passenger preferences, it remains crucial for regional cruise tourism development (Monpanthong, 2018). In general, the study enriches existing literature by adopting a novel methodological approach, which in turn offers a strategic vision to improve industry practices and stakeholder awareness.

The primary scope of this study is on cruise tourism in a specific region, offering precious insights for cruise operators to forge flexible pricing and safety-enhanced packages. Port authorities and policymakers can revise infrastructure enhancements, including upgraded security and efficient boarding. Tourism boards need to modify promotional strategies to bring in spot affordable onboard activities, destination appeal, safety, and services. Identifying key criteria energizes both theoretical understanding and practical advancement of cruise tourism.

5.1. Theoretical implications

Since positive experiences increase destination demand, tourist satisfaction has a significant impact on sustaining cruise tourism (Sun et al., 2019). Traveler satisfaction and behavioural intentions are forged by their experiences (Ali et al., 2022), making it substantive to contemplate passengers' perceptions, attitudes, and preferences. Assessing the ship structure, service quality, and price-performance—particularly value for money—is pivotal (Jiao et al., 2024). Onboard services are favoured by cruise tourists, and increasing service quality can elate satisfaction (Chang et al., 2021; Chen et al., 2016; Yi et al., 2014). While travel cost is a significant factor, ship services outweigh port impact in preference decisions (Chang et al., 2021; Chen et al., 2016; Jiao et al., 2024; Kawasaki & Lau, 2020). This study presents insights for both academia and the industry on cruise tourism development in Türkiye and globally. Regardless of the primary concentration of research in North America and Asia, increasing interest in Europe is signified (Lau & Yip, 2020; Ma et al., 2025; Papadopoulou & Xesfingi, 2023; Satghare, 2024). Future research is required on cruise tourism from both maritime and tourism management perspectives. This research is in line with strategic planning in Türkiye's cruise sector and informs local government policies.

5.2. Practical implications

Cruise tourism is a competitive and vibrant sector requiring ongoing adaptation to expanding tourist demands. Basic constituencies include satisfaction, entertainment, and particularly safety (Bahattab et al., 2023; Björk et al., 2023; Papadopoulou & Xesfingi, 2023; Zhang et al., 2022). The attraction of cruise travel arises from various influencing criteria (Mclean, 2022). To stir sustainability, stakeholder cooperation is vital (Domenech

& Gutiérrez, 2020; James et al., 2020; Jiao et al., 2024; Lau & Yip, 2020; Sciortino et al., 2022; Zhang et al., 2022). Factors such as destination, entertainment, safety, port management, accommodation, ship type, and cost can modify and shape sustainable strategies. Prioritizing infrastructure, operations, destination management, and eco-friendly practices are suggested as the findings of this study (Bahattab et al., 2023; Orive et al., 2025; Sun et al., 2021; Pallis & Vaggelas, 2019; Papathanassis, 2025; Peručić & Greblički, 2022; Petrick, 2005).

6. Conclusion

According to the research results, it is understood that the most important criterion for passengers who prefer cruise tourism is the journey price. It can be stated that the reason for the annual increase in the number of passengers opting for cruise tourism and the most significant factor in its preference is due to its lower price compared to other tourism sectors. However, for passengers who do not prioritize price, the next most important criterion has been found to be activities and entertainment. For cruise tourism, which is one of the rare sectors combining both travel and entertainment, the factor of activities and entertainment has been identified as one of the significant elements in passengers' preferences. Dependent on the activities and entertainment factor, other interrelated criteria such as ship type and structure, destination, safety, accommodation, and restaurant services are also influential factors in the preference for cruise tourism. Port management, a criterion that holds little to no significance for passengers or is of lesser importance in light of other criteria, is a factor that primarily affects the ship, crew, ship-owning company or individual, or the organizer rather than the passengers themselves. Consequently, this can be interpreted as the reason why it is the least influential criterion in passengers' preferences.

6.1. Limitations and further study

Even though this study sets valuable visions into cruise tourism preferences, a number of limitations should be acknowledged. First, the study is based on expert opinions, which may be derived to subjective biases. Future research could integrate larger-scale passenger surveys to rectify these findings. Second, the scope of the study is on Türkiye, and the findings may not be fully generalizable to other cruise tourism markets globally. Comparative studies specified in diverse regions could offer a more comprehensive perspective. Third, while the Fuzzy DEMATEL method effectively defines causal relationships, integrating alternative decision-making techniques, such as AHP or TOPSIS, could increase the validity. Future studies should explore hybrid models to re-master cruise tourism preferences and priorities. Instead of evaluating a specific cruise port or sector, this study aims to achieve a general and comprehensive insight by encompassing all cruise ports, ships, passengers, and the industry as a whole. Future studies need to be more specific and for this research to be applied to all cruise ports. In future studies, conducting research encompassing different regions and countries is suggested.

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Appendix A

Table 5
Direct relationship matrix

	A	B	C	D	E	F	G
A	-	(0.75;1;1)	(0.75;1;1)	(0;0.25;0.50)	(0.25;0.50;0.75)	(0;0;0.25)	(0.75;1;1)
B	(0.75;1;1)	-	(0.25;0.50;0.75)	(0;0;0.25)	(0.50;0.75;1)	(0.50;0.75;1)	(0.50;0.75;1)
C	(0.75;1;1)	(0.25;0.50;0.75)	-	(0.75;1;1)	(0;0;0.25)	(0.25;0.50;0.75)	(0;0.25;0.50)
D	(0;0;0.25)	(0;0;0.25)	(0.75;1;1)	-	(0;0.25;0.50)	(0.75;1;1)	(0.50;0.75;1)
E	(0.25;0.50;0.75)	(0.75;1;1)	(0.25;0.50;0.75)	(0;0.25;0.50)	-	(0;0;0.25)	(0.75;1;1)
F	(0;0.25;0.50)	(0.75;1;1)	(0.25;0.50;0.75)	(0.50;0.75;1)	(0.75;1;1)	-	(0.75;1;1)
G	(0.75;1;1)	(0.75;1;1)	(0.25;0.50;0.75)	(0;0;0.25)	(0.75;1;1)	(0.75;1;1)	-
	4.5	5	5	3.5	4.5	4.25	5.5

Source: Author's own work.

Appendix B

Table 6
Normalised direct relationship matrix

	A	B	C	D	E	F	G
A	-	(0.136;0.181;0.181)	(0.136;0.181;0.181)	(0;0.045;0.091)	(0.045;0.091;0.136)	(0;0;0.045)	(0.136;0.181;0.181)
B	(0.136;0.181;0.181)	-	(0.045;0.091;0.136)	(0;0;0.045)	(0.091;0.136;0.181)	(0.091;0.136;0.181)	(0.091;0.136;0.181)
C	(0.136;0.181;0.181)	(0.045;0.091;0.136)	-	(0.136;0.181;0.181)	(0;0;0.045)	(0.045;0.091;0.136)	(0;0.045;0.091)
D	(0;0;0.045)	(0;0;0.045)	(0.136;0.181;0.181)	-	(0;0.045;0.091)	(0.136;0.181;0.181)	(0.091;0.136;0.181)
E	(0.045;0.091;0.136)	(0.136;0.181;0.181)	(0.045;0.091;0.136)	(0;0.045;0.091)	-	(0;0;0.045)	(0.136;0.181;0.181)
F	(0;0.045;0.091)	(0.136;0.181;0.181)	(0.045;0.091;0.136)	(0.091;0.136;0.181)	(0.136;0.181;0.181)	-	(0.136;0.181;0.181)
G	(0.136;0.181;0.181)	(0.136;0.181;0.181)	(0.045;0.091;0.136)	(0;0;0.045)	(0.136;0.181;0.181)	(0.136;0.181;0.181)	-
	4.5	5	5	3.5	4.5	4.25	5.5

Source: Author's own work.