

Invisible but relevant? Perceived sustainability, service quality, satisfaction, and loyalty in municipal sports centres

AINHOA MARTIN-GONZALEZ¹, ELENA HIERRO-CILLER², CRISTIAN GREGORI-FAUS³,
DAVID PARRA-CAMACHO⁴

^{1,2,3,4}, University of València, Department of Physical Activity and Sports, SPAIN

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Abstract:

Sustainability is becoming increasingly important in the management of municipal sports services. However, its integration as an explicit component of users' perceived service quality, satisfaction, and loyalty remains limited. In this study, responses from 207 adult users of municipal sports services in a municipality within the Campo de Turia region (Valencia) were analyzed. The participants completed an online questionnaire using a 5-point Likert scale to assess service quality, perceived sustainability, overall satisfaction, and future intentions. Descriptive analyses, mean comparison tests by gender and age group, Pearson correlations, and a linear regression model were applied to determine the contribution of quality and sustainability to satisfaction. The results indicate high perceived service quality, with particularly high scores in interactions with technical staff and in the content of the activities, compared with more moderate assessments of changing rooms and certain environmental conditions, which are identified as areas for improvement. There is a moderate-level perception of sustainability; some environmental practices, such as waste management, are recognized, but the presence of sustainable products and specific information about environmental care are scarcely visible. The correlations show positive and significant relationships among all variables, especially between perceived service quality and satisfaction and between satisfaction and future intentions. The regression explains 64% of the variance in satisfaction, identifying overall quality as the main predictor, while sustainability does not have a significant direct effect. At the sociodemographic level, no significant gender differences in service quality, sustainability, satisfaction, or future intentions are found. These variables tend to increase progressively with age, reaching their highest values among individuals over 60 years old. Overall, the findings indicate that municipal sports facilities can generate high levels of satisfaction and loyalty, even with margins for improvement in physical infrastructure and in the visibility of sustainability, as long as staff relationships and the organization of activities align with users' expectations. The study also underscores the need to make sustainability a visible and comprehensible component of the value proposition.

Keywords: Management, Sport, Engagement, Perceptions.

Introduction

Sustainability is no longer an additional complement; rather, it has become a mandatory requirement in the management of municipal sports facilities because of regulatory demands (Campillo-Sánchez et al., 2021). Sports facilities exert a considerable environmental impact because of their high consumption of energy and water resources, as well as the waste generated from maintenance, hygiene, and cleaning activities (Lucas et al., 2017). In recent years, environmental management in sports centers has gained importance, with the aim of limiting consumption, saving resources, and improving the environmental quality of their activities, products, and services (Granero-Castro & Ferrando-Sánchez, 2005). This situation compels professionals to rethink how they manage sports facilities, not only to comply with regulations but also as an opportunity to enhance the user experience. As users of sports facilities develop a greater awareness of sustainability, the 2030 Agenda and the Sustainable Development Goals (Zheng et al., 2024), they value this aspect as an important part of service quality. Consequently, sustainable practices become a key element in the perception of quality and user loyalty, showing that environmental commitment significantly improves users' perceptions (Morán-Gámez et al., 2024). In publicly funded municipal contexts, where managers must justify the allocation of limited resources, sustainability thus becomes both an ethical obligation and a strategic dimension of service provision (Fernández-Martínez et al., 2021).

The recent literature on sustainability in the context of sports indicates that the sustainability of sports facilities has rarely been explicitly analyzed as part of users' perceived experience, even though citizens are displaying growing sensitivity to these issues (Cayolla et al., 2023; Morán-Gámez et al., 2024). However, users have been observed to attribute great importance to the implementation of sustainable measures in sports facilities, suggesting that sustainability could constitute an attribute to be included in the overall evaluation of the

services that they offer (McCullough et al., 2023). Thus, integrating sustainability into classical models of quality, satisfaction, and loyalty in sports services emerges as a necessary step to better understand the user experience in these contexts (Morán-Gámez et al., 2024). In municipal sports services, where operations are financed largely with public resources, knowing whether users recognize and value sustainability initiatives is also essential for justifying investments and designing strategies that align environmental goals with service expectations (Fernández-Martínez et al., 2021). Nonetheless, existing empirical studies have tended to focus either on environmental performance indicators or on users' service evaluations in isolation, without jointly examining how perceived sustainability and perceived quality interact in shaping satisfaction and loyalty.

Traditionally, the literature on sports service management has established a strong relationship between perceived service quality, satisfaction, and user loyalty across different sports contexts (Álvarez-García et al., 2019; Ferreira-Barbosa et al., 2025; Theodorakis et al., 2014). It has demonstrated that service quality acts as a direct antecedent of satisfaction and that both variables shape users' future behavior and loyalty (Álvarez-García et al., 2019; Loranca-Valle et al., 2021).

In this regard, recent evidence suggests that the optimization of management processes and perceived quality are determining factors for ensuring the long-term viability and success of municipal sports organizations (Fang, 2020; Ren & Liu, 2021). These relationships are particularly relevant in the context of public sports centers, where user loyalty supports the economic sustainability of organizations and promotes active lifestyles within the community (Fernández-Martínez et al., 2021). However, most of these models have been developed without explicitly incorporating sustainability as a distinct dimension of the service experience, which limits our understanding of how environmental practices interact with quality evaluations and behavioral outcomes (Cayolla et al., 2023; McCullough et al., 2023).

In this context, perceived quality in sports facilities is understood as a multidimensional construct that jointly integrates the characteristics of the physical environment, service organization, and staff, thereby going beyond a view that is focused exclusively on the material provision of such facilities (Biscaia et al., 2023). From this perspective, quality is built from several interrelated service aspects, such as facility conditions, activity spaces, changing rooms, the activity program, and the work of technical staff, which together enable a more accurate assessment of users' experience in sports centers (Gálvez, 2011). Specifically, tangible elements include aspects such as the accessibility and location of a facility, the good condition and suitability of sports equipment, the sufficiency of resources, and the comfort of spaces (cleanliness, ventilation, lighting, and temperature), which have been identified as key factors in the overall assessment of quality in gyms and sports centers (Calabuig et al., 2012). With respect to intangible components, these encompass the treatment and attention received, the organization of classes, the staff's ability to adapt activities to users' levels, communication, and the social climate created in the facility—dimensions that the literature consistently links to satisfaction and to future intentions to use and recommend the service (Biscaia et al., 2023). Within this multidimensional view, sustainability-related aspects, such as visible environmental practices, communication about responsible behaviors, and the perceived commitment of the organization to future generations, may function as additional cues that users incorporate into their quality judgments (Morán-Gámez et al., 2024).

From this perspective, satisfaction can be understood as the overall evaluation that users make of their service experience, in which they combine their perceptions of the tangible and intangible aspects of quality with their comparison between what they feel they receive and what they invest when using a facility (Álvarez-García et al., 2019). A more favorable assessment of a facility, its activity program, and staff performance translates into higher levels of satisfaction and a greater willingness to continue using the service, to recommend it, and to remain loyal to the organization (García-Pascual et al., 2020). Consequently, satisfaction occupies an intermediate position between the perceived quality of sports services and users' future behaviors, such that quality influences satisfaction and, in turn, satisfaction affects the intention to continue, recommend, or remain loyal to the service (Theodorakis et al., 2014). Adding sustainability perceptions to this sequence may clarify whether environmental practices operate merely as background conditions or whether they contribute directly or indirectly to users' global satisfaction and loyalty (Morán-Gámez et al., 2024).

However, this relationship does not manifest in the same way for all users, as perceptions of quality and satisfaction may vary according to sociodemographic characteristics such as gender and age (Calabuig et al., 2008). The current literature shows that gender may shape the evaluation of quality and satisfaction, with different assessment patterns for men and women in organized sports services (Coyle et al., 2024; Nuviala et al., 2021). Age may also influence how quality and service are evaluated since older users tend to be more critical of tangible and organizational aspects of a service, whereas younger users usually report higher ratings of their sports experience (Calabuig et al., 2008; Serrano-Valenzuela et al., 2024).

This evidence suggests that the influence of perceived quality on satisfaction and, ultimately, on future behavioral intentions is not uniform but, rather, is shaped by users' sociodemographic profiles. This shaping makes it necessary to consider gender and age when designing improvement and loyalty strategies in municipal sports services (Nuviala et al., 2021; Reyes-Robles et al., 2026).

In addition, sociodemographic differences may affect the way in which sustainability is perceived and valued, as older adults and women often report greater environmental concern and different expectations

regarding public services (Zheng et al., 2024). Examining whether these patterns are also present in municipal sports facilities can help to identify specific groups that are more receptive to sustainability initiatives and to tailor communication and management strategies accordingly.

In summary, the available literature reveals substantial development of quality, satisfaction, and loyalty models in sports services, with abundant empirical evidence linking perceived quality to satisfaction and future use intentions (e.g., Brady & Cronin, 2001; Calabuig et al., 2008, 2012; Nuviala et al., 2021; García-Pascual et al., 2020). However, although the importance of the sports context for sustainable development has been widely discussed in recent years, the specific role of sports facilities within this framework—particularly the way in which users perceive sustainability as part of service quality—remains underexplored in the academic literature (Gregori-Faus et al., 2025; McCullough et al., 2023).

In municipal sports centers, this lack of evidence limits managers' ability to design interventions that simultaneously enhance environmental performance and user satisfaction. Therefore, the aim of this research is to analyze the structural relationships among perceived sustainability, service quality, and user satisfaction in municipal sports facilities. Specifically, it seeks (1) to analyze users' perceptions of sports service quality, their level of satisfaction, their future intentions, and their perceptions of the sustainability of sports facilities and (2) to assess whether there are significant differences in these relationships according to sociodemographic variables such as gender and age.

Material & methods

Participants

The target population consisted of users of the sports services of a municipality in the Campo de Turia region (Valencia), selected through nonprobabilistic purposive sampling among those who voluntarily agreed to complete a questionnaire distributed via digital media. A total of 233 questionnaires were collected, of which 207 were deemed valid after excluding underage participants. The mean age of the sample was 47.63 years ($SD = 11.66$), indicating a predominantly adult population, with the 40–45 age range being the most represented. Regarding gender, most participants identified as female (70.0%), while the remainder identified as male or non- binary. With respect to educational level, 73.4% had university studies and 25.1% had secondary education. In terms of employment status, the majority were employed (60.4%), followed by retired participants (13.5%) (see Table 1).

Table 1. *Sample descriptive statistics*

Variable	Category	n	%
Gender	Male	60	29.0
	Female	145	70.0
	Non-binary	2	1.0
Educational level	Primary education	3	1.4
	Secondary education	52	25.1
	University education	152	73.4

Instrument

The questionnaire was designed as a quantitative measurement instrument based on a review of the previous literature and on needs identified by local sports managers. The tool comprised five dimensions: sociodemographic information, service quality, sustainability, overall satisfaction, and future intentions.

Perceived service quality was assessed using a shortened version of the CECASDEP scale (Gálvez, 2011), whose final version was applied by Gálvez et al. (2015). This scale evaluates the quality of sports facilities through eight subdimensions: location (3 items; $\alpha = 0.72$), attention (2 items; $\alpha = 0.93$), functionality of sports spaces (5 items; $\alpha = 0.90$), comfort of changing rooms (2 items; $\alpha = 0.92$), changing-room environment (4 items; $\alpha = 0.86$), characteristics of activities (3 items; $\alpha = 0.85$), interaction with the instructor or coach (2 items; $\alpha = 0.95$), and session content (5 items; $\alpha = 0.96$). Service sustainability was measured through two subdimensions: perception of green practices (6 items; $\alpha = 0.94$) and environmental social responsibility (4 items; $\alpha = 0.97$). In addition, the dimensions of overall satisfaction with the facility (2 items; $\alpha = 0.90$) and users' future intentions (2 items; $\alpha = 0.85$) were included.

The final instrument consisted of 52 items, 11 of which were sociodemographic. All non-sociodemographic items were answered using a five-point Likert-type scale (1 = strongly disagree; 5 = strongly agree). The Cronbach's alpha coefficients obtained for the different subdimensions (α between 0.72 and 0.97) indicated adequate internal consistency, supporting the reliability of the questionnaire (Roco-Videla et al., 2024) (see Table 2).

Table 2. *Dimensions and items of the scale*

Main dimension	Subdimension	No. of items	Cronbach's α
	Location	3	0.72
	Attention	2	0.93
	Functionality of sports spaces	5	0.90
	Comfort of changing rooms	2	0.92
	Changing-room environment	4	0.86
	Characteristics of activities	3	0.85
	Interaction with instructor/coach	2	0.95
	Session content	5	0.96
	Perception of green practices	6	0.94
	Environmental social responsibility	4	0.97
Overall satisfaction		2	0.90
Future intentions		2	0.85

Procedure

The study was conducted in collaboration with the sports department of a municipality in the Campo de Turia region (Valencia) and its three municipal sports centers. The project was first presented to the head of the sports department and to the facility managers, who authorized its implementation. The questionnaire was subsequently distributed via email, institutional social media, and the municipality's official website. Participation was voluntary and anonymous and included informed consent in accordance with current data protection regulations and the ethical principles of the Declaration of Helsinki. Data collection took place between 31 March and 13 April 2025.

Statistical analysis

Data analysis was performed via IBM SPSS Statistics, version 30. First, a descriptive statistical analysis of all variables was conducted, and the frequencies and percentages for categorical variables, as well as the means, standard deviations, and skewness and kurtosis levels for the scores of each item included in each dimension and subdimension of service quality, sustainability, satisfaction, and future intentions, were computed.

To examine the data distribution, the Kolmogorov–Smirnov test was applied, indicating a lack of normality ($p < 0.05$). However, given the sample size ($n = 207$) and the evidence on the robustness of the parametric tests when using aggregated Likert-type scale scores in moderate or large samples, the questionnaire dimensions were treated as approximately continuous variables, and parametric procedures were used. To analyze the impact of sociodemographic variables on the dimensions of quality, sustainability, satisfaction, and future intentions, mean comparison tests were applied. For dichotomous variables such as gender (male/female), Student's t test for independent samples was used, whereas for grouping variables with three or more categories, one-way analysis of variance (ANOVA) was conducted. When the ANOVA results were significant, post hoc comparisons with Bonferroni correction were performed to identify specific differences between groups, with a significance level of $p < 0.05$ used for all analyses.

Subsequently, Pearson correlation analysis was performed to explore the relationships between the different questionnaire dimensions. Finally, a linear regression analysis was conducted to identify the extent to which each dimension influenced the respondents' satisfaction to determine which aspects contributed to shaping users' overall satisfaction with the municipality's sports services.

Results

Descriptive statistics

This section presents the main results obtained from the descriptive statistical analysis of the evaluated variables, namely, perceived service quality, sustainability, and user satisfaction, including future intentions.

Perceived service quality

Perceived service quality was assessed through different items grouped into eight dimensions (location, attention, functionality, comfort, the environment, characteristics, interaction, and content).

The results show that the highest-rated items are related to direct interaction with technical staff and the content of activities, particularly the items “*Int2: The interaction with the instructor is pleasant*” ($M = 4.61$; $SD = 0.91$) and “*Cont5: The instructor is qualified to deliver the activity*” ($M = 4.53$; $SD = 0.99$). Other elements also received positive, albeit slightly lower, ratings, such as “*Caract3: The duration of the activity is adequate*” ($M = 4.30$; $SD = 0.87$), “*At2: The treatment received from facility staff is friendly*” ($M = 4.22$; $SD = 1.05$), and “*Ub3: It is easy for you to get to the facility*” ($M = 4.40$; $SD = 0.90$).

The lowest-rated items are related to changing-room conditions, both in the comfort dimension, “Com2: The availability of benches is sufficient for your comfort” ($M = 3.34$; $SD = 1.14$), and in the environment dimension, “Amb1: The ventilation is adequate” ($M = 3.08$; $SD = 1.25$). These findings indicate potential areas for improvement within the facility (see Table 3).

Table 3 Perceived service quality assessment by dimension

	Mean	SD	Skew	Kurt
Location				
The sports facility is well located	4.21	1.00	-1.30	1.20
It is easy for you to get to the facility	4.40	0.90	-1.95	4.27
It has been easy for you to find parking to access the facility	3.94	1.12	-0.81	-0.29
Attention				
When you have a problem, staff are willing to help you	4.16	1.05	-1.20	0.75
The treatment you receive from facility staff is friendly	4.22	1.05	-1.37	1.16
Functionality				
The sports space offers you safety	4.17	0.99	-1.33	1.48
Fixed sports equipment is appropriate for the activity	3.67	1.11	-0.63	-0.22
Consumable sports equipment is appropriate for the activity	3.37	1.29	-0.37	-0.90
The equipment is in good working condition	3.35	1.19	-0.41	-0.62
There is enough equipment for the activity	3.19	1.35	-0.17	-1.22
Comfort				
The size of the changing rooms is adequate for your comfort	3.37	1.18	-0.24	-0.68
The availability of benches in the changing rooms is sufficient	3.34	1.14	-0.10	-0.77
Environment				
The ventilation is adequate	3.08	1.25	-0.06	-0.92
The lighting is appropriate	3.42	1.19	-0.27	-0.78
The temperature is comfortable	3.10	1.25	-0.06	-0.94
The cleanliness is adequate	3.58	1.24	-0.59	-0.65
Characteristics				
The weekly distribution (frequency) of activities is adequate	4.01	1.10	-0.99	0.19
The schedule of the activity is appropriate	4.13	0.97	-1.12	0.96
The duration of the activity is adequate	4.30	0.87	-1.17	0.86
Interaction				
There is good communication between users and the instructor	4.48	1.00	-2.10	3.76
The interaction with the instructor is pleasant	4.61	0.91	-2.70	6.76
Content				
Classes are well organized	4.33	1.12	-1.64	1.60
The instructor seeks to adapt the activity to users' level	4.44	1.01	-2.00	3.36
The instructor uses the available equipment correctly	4.45	0.92	-1.84	3.16
The instructor's involvement during the activity is adequate	4.49	0.99	-2.10	3.68
The instructor is qualified to deliver the activity	4.53	0.99	-2.21	4.04
Global perceived quality	3.93	0.70		

Note: SD= standard deviation; Skew = skewness; Kurt = kurtosis

Sustainability

The sustainability variable was analyzed through two dimensions: the perception of green practices and the environmental social responsibility of the sports center. Among the highest-rated items are “Percep6: The waste generated by activities can be disposed of in appropriate containers” ($M = 3.46$; $SD = 1.16$) and “Resp2: This sports center seeks to protect the environment” ($M = 3.34$; $SD = 1.08$).

The lowest-rated items are “Resp1: I can purchase biodegradable and recyclable products at the sports center” ($M = 2.43$; $SD = 1.31$) and “Resp3: The sports center provides information on how to care for the environment” ($M = 2.45$; $SD = 1.20$). The mean overall sustainability score (Sust_global) is 3.09 ($SD = 1.10$) (see Table 4).

Table 4. Sustainability assessment by dimensions

	Mean	SD	Skew	Kurt
Perception of green practices				
I can purchase biodegradable and recyclable products at the center	2.43	1.31	0.58	-0.70
The products available at the sports center are environmentally friendly	2.85	1.23	0.24	-0.75
The center provides information on how to care for the environment	2.45	1.20	0.73	0.46
The center has measures to use water and energy efficiently	3.03	1.21	0.12	-0.80
The center provides information on how to recycle waste	2.79	1.29	0.27	-0.94
Waste from activities can be disposed of in appropriate containers	3.46	1.16	-0.22	-0.85
Environmental social responsibility				
This sports center is concerned with sustainable development for future generations	3.20	1.14	-0.13	-0.70
This sports center seeks to protect the environment	3.34	1.08	-0.18	-0.69
This sports center seeks to raise users' environmental awareness	2.96	1.21	0.01	-0.87
This sports center seeks to use renewable resources	3.09	1.21	0.00	-0.90
Global sustainability	3.09	1.10		

Note: SD= standard deviation; Skew = skewness; Kurt = kurtosis

Satisfaction and future intentions

The results indicate that user satisfaction with sports services is high. Specifically, the item "Satisf1: I am satisfied with my experiences in sports practice at the facility" had a mean score of 3.91 (SD = 1.01), while the item "Satisf2: I have truly enjoyed attending the facility" had a slightly higher, with a mean score of 4.00 (SD = 0.98). With respect to future intentions, the participants reported a strong predisposition to remain linked to the sports services. The item "Fut1: I am willing to continue attending the facility next year/season" was the highest-rated in this block, with a mean of 4.17 (SD = 1.08), and the item "Fut2: I will recommend or encourage other people to come to this facility" also received a high score, with a mean of 4.03 (SD = 1.14). The mean global satisfaction (Satisf_global) was 3.95 (SD = 0.96), whereas the mean future intentions (IntFut_global) reached 4.10 (SD = 1.07) (see Table 5).

Table 5. Assessment of satisfaction and future intentions

	Mean	SD	Skew	Kurt
Satisfaction	3.95	1.07		
I am satisfied with my experiences in sports practice at the facility	3.91	1.01	-0.89	0.44
I have truly enjoyed attending the facility	4.00	0.98	-0.94	0.70
Future intentions	4.10	1.07		
I am willing to continue attending the facility next year/season	4.17	1.08	-1.33	1.17
I will recommend/encourage other people to come to this facility	4.03	1.14	-1.01	0.12

Note: SD= standard deviation; Skew = skewness; Kurt = kurtosis

Mean differences Gender

To examine whether there were differences in service perception by gender, independent-samples t tests were conducted using the global variables of perceived service quality (Cal_global), sustainability (Sust_global), overall satisfaction (Satisf_global), and future intentions (IntFut_global). The results reveal no significant differences between men and women in terms of perceived quality, sustainability, or overall satisfaction. For global service quality, the mean scores were almost identical (males: $M = 3.93$, $SD = 0.81$; females: $M = 3.93$, $SD = 0.66$), with no significant differences ($p = 0.96$). Similarly, for global sustainability, men ($M = 3.09$, $SD = 1.17$) and women ($M = 3.10$, $SD = 1.09$) obtained virtually identical scores, with no statistically significant differences ($p = 0.96$). Regarding overall satisfaction, women reported a slightly higher mean score ($M = 3.99$, $SD = 0.89$) than men did ($M = 3.87$, $SD = 1.12$), although this difference was not statistically significant ($p = 0.39$). The only variable that showed a difference close to significance was future intentions. Women presented a higher mean ($M = 4.21$, $SD = 0.93$) than men did ($M = 3.88$, $SD = 1.29$). However, Levene's test indicated that the variances were not homogeneous ($p = 0.02$). Thus, the correction for unequal variances was applied, and with this adjustment, the difference did not reach statistical significance ($p = 0.08$) (see Table 6).

Table 6. Mean differences by gender

Variable	Gender	Mean	SD	p
Cal_global	Male	3.93	0.81	0.96
	Female	3.93	0.66	
Sust_global	Male	3.09	1.17	0.96
	Female	3.10	1.09	
Satisf_global	Male	3.87	1.12	0.39
	Female	3.99	0.89	
IntFut_global	Male	3.88	1.29	0.08
	Female	4.21	0.93	

Note: SD= standard deviation

Age

To examine whether service perception varied as a function of age, one-way ANOVA was conducted with three recoded age groups: 18–40 years, 41–60 years, and over 60 years. The analysis was applied to the four global variables (Cal_global, Sust_global, Satisf_global and IntFut_global).

The results show no significant differences in the perception of global quality between age groups ($p = 0.38$). Similarly, the global sustainability variable does not significantly differ across the three groups ($p = 0.86$), and although the results of the ANOVA for global satisfaction indicate a slight trend toward variation between groups ($p = 0.13$), the differences are not statistically significant. The only variable that shows significant differences is future intentions ($p < 0.001$); participants aged 18–40 years report significantly lower values than those in the other two groups do, with lower future intentions than those aged 41–60 years ($p < 0.05$) and those over 60 ($p < 0.001$), while individuals aged 41–60 years also report significantly lower values than those over 60 ($p < 0.05$). This pattern indicates that intentions to continue, recommend, or remain committed to the services increase progressively with age, with the over-60 group showing the greatest predisposition to maintain their future involvement with the sports center (see Table 7).

Table 7. Age group comparison

Variable	Age group	Mean	SD	p	Bonferroni significant comparisons
Cal_glob	18–40	3.97	0.82	0.38	n.s.
	41–60	3.88	0.69		
	+ 60	4.07	0.52		
Sost_glob	18–40	3.21	1.34	0.86	n.s.
	41–60	3.05	0.99		
	+ 60	3.04	1.18		
Satisf_glob	18–40	3.73	1.24	0.13	n.s.
	41–60	4.00	0.86		
	+ 60	4.14	0.74		
IntFut_glob	18–40	3.67	1.38	<.001**	18–40 < 41–60* < +60** 41–60 < +60*
	41–60	4.14	0.94		
	+ 60	4.67	0.72		

Note: SD= standard deviation; * $p < 0.05$; ** $p < 0.001$; n.s.=not significant

Relationships between variables

To explore the relationships among the different dimensions assessed in this study, Pearson correlation analysis was conducted. This choice was made because the variables used are composite scores derived from the means of several Likert-type items, which allows them to be treated as continuous, interval-level variables, and because of the adequacy of the sample size to ensure the robustness of the coefficient despite slight deviations from normality.

The results show significant and positive correlations among all variables, as presented in Table 8. Perceived quality is moderately and significantly related to sustainability ($r = .576$, $p < .001$), indicating that a better evaluation of the center's environmental aspects is associated with a higher perception of service quality. Perceived quality also shows a strong correlation with global satisfaction ($r = .748$, $p < .001$) and with future intentions ($r = .660$, $p < .001$). Perceived sustainability presents

more moderate relationships, significantly correlating with satisfaction ($r = .545, p < .001$) and with future intentions ($r = .438, p < .001$), although with lower intensity than perceived service quality. Finally, the strongest relationship observed is that between satisfaction and future intentions ($r = .827, p < .001$).

Table 8 *Pearson correlations between variables*

Variable	Cal_glob	Sost_glob	Satisf_glob	IntFut_glob
Cal_glob	1			
Sost_glob	.576**	1		
Satisf_glob	.748**	.545**	1	
IntFut_glob	.660**	.438**	.827**	1

Note: ** $p < .001$

Multiple linear regression analysis was subsequently performed to identify which dimensions have the greatest explanatory power for user satisfaction. The model obtained a coefficient of determination of $R^2 = 0.64$, indicating that 64% of the variance in satisfaction is explained by the set of variables considered in the study. Global service quality was the main predictor ($\beta = 0.72, p < .001$), whereas sustainability was not significant ($\beta = 0.13, p = .13$), and no collinearity problems were detected ($VIF < 2$). These findings suggest that satisfaction primarily depends on perceived service quality, while sustainability contributes very little to explaining the variation in it (see Table 9).

Table 9 *Linear regression analysis between dimensions*

Variable	Coefficients Beta	t	Sig.
Cal_glob	0.72	8.45	0.001**
Sost_glob	0.13	1.53	0.13

Note: ** $p < .001$

Dicussion

The literature on sports service management has consistently shown that perceived service quality, value, and satisfaction are key elements in explaining users' continuity and loyalty (Álvarez-García et al., 2019; Loranca-Valle et al., 2021). The results of this study fall within this general framework but incorporate perceived sustainability as a component of the service experience in municipal sports facilities, making it possible to analyze how this dimension relates to quality, satisfaction, and users' future intentions. In this sense, this research helps to address an existing gap in the literature, as previous studies have focused almost exclusively on classical service quality dimensions and their effects on satisfaction and future intentions, with sustainability rarely considered as part of the perceived experience, despite the growing importance of green practices and environmental responsibility in sports (Morán-Gámez et al., 2024).

With respect to service quality, several studies have shown that users particularly value interaction with technical staff and the development of activities while being more critical of the tangible elements and environmental conditions of facilities (Coyle et al., 2024; Calabuig et al., 2008). This evidence aligns with the present findings, where users rated interaction with technical staff and activity content very highly but assigned lower scores to environmental elements and certain material aspects of facilities. Coyle et al. (2024) reported that the "interaction quality" between users and instructors was the best-rated dimension, whereas "environmental quality" (cleanliness, equipment, and space conditions) received the lowest scores, leading the authors to propose targeted investments in equipment and the physical environment to improve the overall service perception. Similar results were obtained for publicly owned nautical services, where dimensions related to classes and leisure time had the highest means, compared with more moderate evaluations of the nautical environment and certain complementary services (Calabuig et al., 2008), reinforcing the interpretation that, also in this municipal context, users prioritize relational and organizational quality over material support when assessing services.

Similarly, Serrano-Valenzuela et al. (2024) reported that although service quality was generally rated positively, there were significant age-related differences in the perceptions of facilities, sports spaces, and especially changing rooms, with older users being more demanding. In the present research, while the quality of facilities and sports spaces reached acceptable values across all groups, older users tended to be more critical of changing rooms and certain environmental conditions, which is consistent with the idea of greater sensitivity in this segment to the aspects of comfort and accessibility. Overall, the pattern of very high scores in interaction and activity content, together with more moderate ratings of changing rooms and environmental conditions, suggests that relational and organizational components form the core of the quality experience in municipal services, whereas material support remains a recurrent area for improvement and is particularly relevant for older users.

The incorporation of perceived sustainability broadens this perspective by showing that users recognize certain environmental practices but do not yet integrate them as a central feature of sports services. In this study,

sustainability was the dimension with the fewest responses and most moderate scores, suggesting a limited knowledge or low visibility of the environmental actions implemented in municipal facilities. Although the sector has begun to adopt green practices, these do not always translate into clear user perceptions, either because of limited visibility or because of a lack of specific communication (Morán-Gómez et al., 2024). Similarly, Rahmani et al. (2020) found that progress toward sustainable development in sports facilities depended both on the implementation of environmental measures and on managers' ability to make them recognizable and coherent with users' expectations. The present data point in this direction: practices such as waste management or responsible resource use are perceived relatively clearly, whereas aspects such as the availability of biodegradable products or information on how to care for the environment in the facility receive lower ratings, indicating a partial and weakly visible integration of sustainability in the value proposition of sports services. Consequently, sustainability appears to operate more as an added value than as a consolidated feature of the service experience; thus, its ability to strengthen user relationships depends on how explicitly it is incorporated and communicated in facility management.

In this context, the correlation and regression results help clarify how perceived service quality, sustainability, satisfaction, and users' future intentions are interrelated. The significant, positive correlations among all variables support the well-established notion in the literature that higher service quality is associated with higher satisfaction and that, in turn, higher satisfaction is related to stronger intentions to continue using and recommending the facility (Calabuig et al., 2008). The fact that, in this study, the relationships between global quality and satisfaction and between satisfaction and future intentions are strong confirms the role of satisfaction as a linking mechanism between the service experience and decisions about continuity and recommendation, which is a particularly relevant aspect of municipal services whose economic sustainability depends on user loyalty. The moderate relationship between service quality and sustainability, together with the significant correlations of sustainability with satisfaction and future intentions, shows that environmental practices are positively associated with service evaluation and with the willingness to continue and recommend the services, although with less weight than service quality. The linear regression analysis reinforces this interpretation: the model explains 64% of the variance in satisfaction and identifies global service quality as the main predictor, whereas sustainability is not statistically significant, suggesting that sustainability currently operates more as a valued complement than as a key determinant of satisfaction. These results are consistent with studies indicating that environmental initiatives in sports provide reputational value and enhance the image of sports services but become decisive only when they clearly match users' expectations and values and are perceived as a central element of the experience (Morán-Gómez et al., 2024).

The influence of sociodemographic variables on the relationships between perceived quality, satisfaction, and future intentions constitutes another central axis of analysis. Several studies have shown that gender and age shape the expectations, perceptions, and future intentions of sports service users, although not always in a homogeneous way (Nuviala et al., 2021; Calabuig et al., 2008). Regarding gender, previous evidence has indicated that women tend to rate the quality and perceived value of sports services higher than men do (Coyle et al., 2024; Nuviala et al., 2021). Coyle et al. (2024) found that in a municipal service, women scored all quality dimensions higher than men did, with particularly marked differences in interaction and environmental perception, leading to the interpretation that female users show greater sensitivity to the relational and organizational aspects of the service. Similarly, Nuviala et al. (2021) reported that women gave higher scores to both quality and perceived value in organized sports activities and that this combination was associated with very high levels of satisfaction. In contrast, the present study did not find significant differences between men and women in terms of global service quality, sustainability, satisfaction, or future intentions, suggesting that, in this specific municipal context, gender does not substantially shape how sports services are evaluated or how the experience of these services translates into decisions about continuity and recommendation.

Regarding age, older users tend to be more demanding with respect to tangible aspects of sports services while maintaining a more stable and committed relationship with sports facilities (Calabuig et al., 2008; Serrano-Valenzuela et al., 2024; Nuviala et al., 2021). In public nautical services, Calabuig et al. (2008) identified significant age-related differences in perceived quality, with variations in the evaluation of factors such as food, equipment, and schedules and a moderate negative correlation between age and overall satisfaction, which was interpreted as evidence of greater demands among older groups. Serrano-Valenzuela et al. (2024) observed significant associations between age and sports facility perceptions, whereby older adults were more critical of aspects such as changing rooms but assigned particular importance to the instructor, whose role gained weight as users' age increased. This interpretation fits the pattern observed in this study: although no significant age differences emerged in global ratings of service quality, sustainability, or satisfaction, clear differences in future intentions were found, with the 18–40 age group showing the lowest scores, the 41–60 age group occupying an intermediate position, and those over 60 years expressing the strongest willingness to continue and recommend the facility. These results suggest that age not only shapes specific expectations and needs but also is associated with stronger loyalty among older groups when the service experience is perceived as satisfactory. This finding poses a challenge for municipal sports facilities to offer an integrated experience of quality, sustainability, and

satisfaction that is sensitive to generational differences and that is capable of translating into intentions of continuity across all age segments.

Conclusion

This study shows that municipal sports facilities can deliver a high-quality user experience, with elevated levels of satisfaction and loyalty, even when certain physical aspects still require improvement and sustainability is not highly visible, provided that staff treatment and the organization of activities are perceived as appropriate and aligned with users' expectations. The findings indicate that items related to interaction with the instructor and activity content receive the highest scores, whereas evaluations of changing rooms and environmental conditions are lower, placing staff relationships and activity design at the core of the service experience and highlighting the material environment as a clear area for improvement. Sustainability emerges in a secondary position, although it already forms part of the user experience: practices such as waste management or perceived efforts to protect the environment are rated relatively positively. In contrast, aspects such as the availability of biodegradable products or clear information on how to care for the environment receive lower scores, and the positive but moderate statistical relationships between sustainability, satisfaction, and future intentions, together with their nonsignificant role in the regression model, suggest that users currently perceive sustainability as an emerging added value that could gain importance if environmental actions were better communicated and were more visibly integrated into the facility's daily operations.

Regarding user profiles, no clear differences are observed between men and women in terms of perceived quality, sustainability, satisfaction, or future intentions. Similarly, there are no age differences in global ratings of quality, sustainability, and satisfaction. However, future intentions increase with age, with those over 60 showing the highest willingness to remain linked to the center, which suggests that when the service experience is positive, loyalty tends to be stronger among older groups.

Taken together, the results of this study indicate that perceived sustainability needs to be integrated into standard models of quality, satisfaction, and loyalty in municipal sports services, even though the current core still lies in a high-quality experience supported by staff relationships and the organization of activities. To progress toward more sustainable and socially committed facilities, management should combine improvements to the physical environment with clearer communication of environmental actions and targeted attention to gender and age characteristics so that sustainability is recognized and valued by all user profiles and contributes to strengthening their satisfaction and long-term loyalty.

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