Innovation and development of fitness facility management evaluation instrument: validity and reliability

Innovación y desarrollo de un instrumento de evaluación de la gestión de instalaciones deportivas: validez y fiabilidad

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Abstract

Objective: This study aimed to develop a questionnaire as an instrument to evaluate management practices in fitness facilities.
Methods: This study uses a mixed-methods approach. The sample for the Aiken V validity test was 7 lecturers and 333 respondents from various fitness facilities, such as fitness centers, swimming pools, sports fields, fitness studios, sports arenas, and communities, for the Cronbach's Alpha reliability test, the indicators assessed in this evaluation instrument are 1) Program Background, 2) Program Objectives, 3) Human Resources, 4) Programs, 5) Funding, 6) Infrastructure Facilities, 7) Program Implementation, 8) Coordination, 9) Achievements, 10) Obstacles.
Results: Validity test includes aspects of the suitability of the material with the research objectives, suitability of the material, material sequence procedures, questionnaire design, and the language used showing an Aiken V value of 0.8 - 0.9. Then, the Cronbach's alpha value> 0.7.
Conclusion: Thus, this evaluation instrument showed a valid and reliable value. Future research is expected to further refine the instrument through a larger population sample size and additional testing methods, such as test-retest, to improve its validity and reliability.

Keywords

Sport evaluation; sport management; fitness facilities; measurement innovation.

Resumen

Objetivo: Este estudio tuvo como objetivo desarrollar un cuestionario como instrumento para evaluar las prácticas de gestión en instalaciones de fitness.
Métodos: Este estudio utiliza un enfoque de métodos mixtos. La muestra para la prueba de validez V de Aiken fue de 7 profesores y 333 encuestados de varias instalaciones de fitness, como centros de fitness, piscinas, campos deportivos, estudios de fitness, estadios deportivos y comunidades, para la prueba de confiabilidad Alfa de Cronbach, los indicadores evaluados en este instrumento de evaluación son 1) Antecedentes del programa, 2) Objetivos del programa, 3) Recursos humanos, 4) Programas, 5) Financiamiento, 6) Instalaciones de infraestructura, 7) Implementación del programa, 8) Coordinación, 9) Logros, 10) Obstáculos.
Resultados: La prueba de validez incluye aspectos de la idoneidad del material con los objetivos de la investigación, la idoneidad del material, los procedimientos de secuencia del material, el diseño del cuestionario y el lenguaje utilizado mostrando un valor V de Aiken de 0,8 - 0,9. Entonces, el valor Alfa de Cronbach > 0,7.
Conclusión: Por tanto, este instrumento de evaluación demostró ser válido y confiable. Se espera que futuras investigaciones perfeccionen aún más el instrumento mediante una muestra de población más grande y métodos de prueba adicionales, como el test-retest, para mejorar su validez y confiabilidad.

Palabras clave

Evaluación deportiva; gestión deportiva; instalaciones de fitness; innovación en medición.

Introduction

Fitness facilities have become an important part of the healthy lifestyle of modern society. With increasing awareness of the benefits of health and fitness, the demand for quality fitness facilities continues to rise (Glasgow et al., 2023). However, not all fitness facilities can meet the standards expected by users. Therefore, an effective evaluation instrument is needed to assess the quality and management of fitness facilities (Huang & Kirchhof, 2020 & Tian et al., 2022). The evaluation examines the quality of service at fitness facilities, which in turn physical activity at fitness facilities can increase motivation to exercise (Abdhi et al., 2024).

Based on the results of previous studies, if a fitness facility has never been assessed and evaluated, the quality of the services provided may decrease because the manager is not aware of any problems that affect the user experience (Wan & Tang, 2022). In addition, unsafe and uncomfortable conditions of sports facilities can result in the risk of injury and danger to the users (Arrum et al., 2025 & Prabowo et al., 2024). It can also result in losing customers, who will not return if they are dissatisfied with their experience. Without evaluation, fitness facilities will find it difficult to adapt to the latest trends and customer needs, thereby losing competitiveness. The results of previous studies explain that the reputation of facilities can also have an effect such as through Google reviews or social media, with negative reviews that can result in a decrease in the number of new members or customers (Miryam & Antonio, 2022, Roh et al., 2023, & Hafyana & Alzubi, 2024). In addition, managers may face difficulties in managing resources efficiently, and there are legal risks if facilities do not meet the required safety standards (León-Quismondo et al., 2020). Dissatisfaction can also be felt by employees, which can impact their performance and increase turnover rates (Ibrahim & Hassanain, 2022). Therefore, regular assessment and evaluation are very important to ensure the quality of service, user safety, and operational sustainability of the fitness facility (K. C. Wang et al., 2022).

Consequently, the development of valid and reliable evaluation instruments is very important to provide an accurate picture of the condition of fitness facilities. Although there have been several evaluation instruments used, many of them are still general and non-specific. Previous research studies were only limited to a separate assessment of the level of service management and consumer motivation in choosing fitness facilities (Yusof et al., 2018 & Bartha & Bába, 2022). Then, an evaluation regarding the marketing strategy in finding customers by displaying the completeness of facilities and variations of fitness training programs is also needed (F. J. Wang et al., 2022). Evaluation also includes satisfaction and loyalty to fitness center customers (Gálvez-Ruiz et al., 2023). The previous study has explored a problem that is close to the problem in this study, namely a questionnaire about risk analysis for fitness facilities (Gálvez-Ruiz et al., 2023), but the discussion of the article tends to discuss the risks during the Covid-19 pandemic.

Thus, this study aims to address the gap by developing and validating a questionnaire designed to assess various aspects of fitness facility management, including cleanliness, safety, availability of tools, and staff service. By using a systematic approach, it is expected that this questionnaire can be tested for validity and reliability, so it can be used as a valid and reliable measuring instrument. In addition, the results of this study are also expected to provide recommendations for fitness facility managers to improve the quality of services and facilities they offer to the community.

Method

Study Organizations

Quantitative and qualitative approaches (mixed methods) were employed in this study. In innovation research to develop measurement tools, a mixed methods approach is needed to obtain deeper and more measurable study results (Susiono et al., 2024 & Wedi et al., 2024). The first stage of this research was to search and examine articles in English with several keywords such as ‘sport’, ‘management’, ‘facilities’, ‘fitness center’, ‘sport evaluation’, ‘sports safety’, ‘quality of service’, ‘gym’, ‘satisfaction’, and ‘questionnaire’. The purpose of the first stage was to form indicators and sub-indicators on the prototype of this evaluation instrument. The results of the first stage were ten indicators and 13 sub-indicators (Table 1).

Table 1. Results of the first stage of the evaluation instrument

Indicators	Sub-Indicators
Program Background	Management
	Strategy/Planning
	Management policy needs
Program Objectives	Vision and Mission
	Target
Human Resources	Stakeholder
Program	Priority Scale
Funding	Administration
Infrastructure Facilities	Completeness standards
Program Implementation	Management and utilization program
Coordination	Stakeholder
Achievements	Evaluation
Obstacles	Solution

After developing the initial draft of the fitness facility management evaluation questionnaire, the second stage involved a validity test conducted by a panel of Sports Science lecturers who were experts in sports management. The Delphi technique was employed in the validity test to ensure reliability, as experts provided feedback independently. Additionally, suggestions were solicited from the experts to further refine the questionnaire. The third stage focused on reliability testing, involving members and customers from five categories of fitness facilities (K. Wang & Wang, 2020; Sayyd et al., 2021; Jia et al., 2022; Fitri et al., 2022, & Soongsawang & Rawangkarn, 2023), namely: 1) gym; 2) swimming pools and sports fields such as football fields, futsal courts, badminton courts, basketball courts, tennis courts, volleyball courts, outdoor courtyards in stadiums; 3) fitness studios, such as Zumba training, permit, pilates, crossfit, calisthenics, aerobic gymnastics; 4) sports arena, such as training in combat sports; 5) communities, such as running communities and bicycle communities. This diverse sample was chosen to ensure the instrument's applicability across various settings, and they were categorized to make them easier to analyze. Following data collection, the fourth stage involved data analysis and reporting, with the results being published in scientific articles.

Study Participants

The population of this study comprised members or customers of fitness facilities in Yogyakarta City, Indonesia. The sample included seven lecturers with doctoral qualifications and expertise in sports management for the validity test. For the reliability test, the sample consisted of 333 members or customers from five categories of fitness facilities: gyms, swimming pools and sports fields, fitness studios, sports arenas, and fitness communities. Accidental sampling was used to select participants due to the ease of access and the researchers' limited authority to choose specific individuals. The sampling process was conducted over a single day, resulting in a total sample size of 333 participants. Table 2 provides a breakdown of the sample characteristics across different facility types.

Table 2. Identification of Samples on members or customers

Fitness Facilities	Number of Samples	Age (minimum-maximum)
Gym	74	20 - 33 years old
Swimming pools and sports fields	87	19 - 54 years old
Fitness studio	53	20 - 29 years old
Sports Arena	61	15 - 44 years old
Community	58	20 - 46 years old

Statistical Analysis

The data analysis for this study used the Aiken V formula (Figure 1) for the validity test and Cronbach's alpha with the help of SPSS 26 for the reliability test. The Cronbach's alpha value set in this study was >0.7, indicating good internal consistency (Bujang et al., 2018). The scale used in this study ranged from 1 to 4, with 1 representing "very not feasible", 2 representing "not feasible", 3 representing "feasible", and 4 representing "very feasible". Five aspects were assessed using this scale for validity and reliability testing: 1) the suitability of the material to the research objectives, 2) the suitability of the material between the explanation of indicators and sub-indicators, 3) the procedure of the sequence of material in the evaluation questionnaire, 4) the design of the questionnaire (including name, age, gender, and sports activities), and 5) the language used in the questionnaire.

Figure 1. Aiken V Formula

$$\text{V Aiken's: } \frac{\sum s}{n\,(c-1)}$$

S : r – lo
Lo : lowest rating score
C : highest rating score
r : the score given by the assessor

Results

The results of this study will be discussed, starting from the second stage, which is the validity test, and the third stage, which is the reliability test. The validity test was conducted by seven Sports Science lecturers who are experts in sport management. The results of the validity test analysis are presented in Table 3.

Table 3. Validity Test Results

No	Aspects	∑S	n(c-1)	Aiken V	Description
1	The suitability of the material to the research objectives	17	21	0.809	Valid
2	The suitability of the material between the explanation of indicators and sub-indicators	18	21	0.857	Valid
3	The procedure of the sequence of material in the evaluation questionnaire	18	21	0.857	Valid
4	The design of the questionnaire	19	21	0.904	Valid
5	The language used in the questionnaire	18	21	0.857	Valid

Based on the results of Table 3, aspect 1) the suitability of the material to the research objectives shows that the Aiken V value is 0.809; aspect 2) the suitability of the material between the explanation on the indicators and the sub-indicators shows that the Aiken V value is 0.857; aspect 3) the procedure of the sequence of material in the evaluation questionnaire shows that the Aiken V value is 0.857; aspect 4) the design of the questionnaire, such as name, age, gender, sports activity to the filling out of the evaluation material shows that the Aiken V value is 0.904; aspect 5) the language used in the questionnaire shows that the Aiken V value is 0.857. Thus, the Aiken V value in these five aspects shows a valid aspect (Aiken, 1985).

After the validity test was carried out, the reliability test was conducted in the third stage. In the reliability test, the analysis of the value of Cronbach's alpha was carried out based on the place of fitness facilities that had been organized into five categories. The results of the reliability test are presented in the following Table 4.

Table 4. Reliability Test Results

Fitness Facilities	Reliability Statistics	
	Cronbach's Alpha	N of Items
Gym	0.749	5
Swimming Pools and Sports Fields	0.740	5
Fitness Studio	0.762	5
Sports Arena	0.739	5
Community	0.727	5

Based on the results of Table 4, the fitness facilities at the gym, where 74 samples were assessed, showed a Cronbach's alpha value of 0.749. Fitness facilities at the swimming pool and sports field, with 87 samples, showed a Cronbach's alpha value of 0.740. Fitness studios, with 53 samples, showed a Cronbach's alpha value of 0.762. Sports arenas, with 61 samples, showed a Cronbach's alpha value of 0.739. Finally, fitness facilities at community places, with 58 samples, showed a Cronbach's alpha value of 0.727. Therefore, the Fitness Facility Management Evaluation Instrument demonstrates reliability because Cronbach's alpha values are all greater than 0.7 (Bujang et al., 2018).

Discussion

Based on the results of this study titled "Innovation and Development of Fitness Facility Management Evaluation Instrument", the validity testing using Aiken's V revealed a high level of validity (V > 0.8). This finding aligns with previous research by Susiono et al. (2024), which also demonstrated the significance of high validity scores. The study yielded several key findings that highlight the effectiveness of the developed evaluation instruments. In terms of material suitability, the instrument was deemed valid, indicating its relevance for achieving the desired evaluation objectives. The alignment between the material and research objectives is crucial for ensuring data accuracy and reliability. The results of previous studies explain that, when the material in the evaluation instrument is by the objectives of the study, the results obtained will provide useful and reliable information (Ozener et al., 2021 & Alexe et al., 2022). Thus, it supports the appropriate decision-making in the management of fitness facilities. In addition, valid material conformity creates a more positive experience for respondents, increasing their level of participation and involvement in the evaluation process (Ozener et al., 2021). Ultimately, the validity of the instrument's material contributes to the accuracy and relevance of the evaluation results, leading to improvements in service quality and user satisfaction.

Furthermore, the aspect of the suitability of the material between the explanation of the indicators and the sub-indicators is also declared valid. These results are very important to test the level of validity because they can show that each indicator and sub-indicator contained in the questionnaire supports each other and is consistent (Camiré et al., 2021 & Ihsan et al., 2022), making it easier for respondents to understand and answer the questions asked. Findings of previous research studies that examine the development of instruments, when indicators and sub-indicators are mutually supportive and consistent, the resulting data will provide a clear picture of the phenomenon under study (Paes et al., 2021, Arthur et al., 2022, & Bauhaus et al., 2023), to reduce the risk of bias in measurement. In addition, the suitability of the valid material facilitates the analysis and interpretation of the evaluation results (Liza et al., 2024). Consequently, it allows researchers to draw relevant conclusions and communicate effectively regarding the research findings.

The aspect of the material sequence procedure in the evaluation questionnaire, which is declared valid, reflects that the material was organized logically and systematically. This approach can help respondents follow a clear line of thought (Paes et al., 2021), leading to consistent and accurate answers. In contrast, a random sequence can cause confusion and irrelevant responses. Additionally, arranging questions from simple to more complex can reduce respondent fatigue and increase motivation to finish responding to the questionnaire (Krstulović et al., 2023). Proper sequencing also allows researchers to build context before asking in-depth questions (Trpkovici et al., 2023), ensuring respondents have a sufficient understanding of the topics.

The aspect of questionnaire design including demographic information such as name, age, gender, and sports activities, were also deemed valid. A well-structured questionnaire design not only enhances respondent comfort but also improves data quality (Arthur et al., 2022). A clear layout and consistent format can reduce confusion and frustration, and it can encourage respondents to provide accurate answers (Alexe et al., 2022). Furthermore, using clear and easy-to-understand language is essential to ensure that all respondents, regardless of educational background, can provide accurate answers. Simple and clear language avoids misunderstandings that may arise from the use of complex technical (Paes et al., 2021), enabling respondents from various backgrounds to easily comprehend the questions.

The five aspects mentioned above demonstrate the instrument's strong reliability, indicating its consistency in measuring the intended constructs. Assessments based on a diverse sample of users, including gyms, swimming pools, sports courts, sports studios, sports arenas, and communities, provide a comprehensive overview of the effectiveness of these instruments across various fitness facility contexts. Sampling from diverse locations is crucial to ensure the representativeness and accuracy of research results (Imtihansyah et al., 2024), as each facility may have unique characteristics (e.g., member demographics, service offerings, and cultural factors). Sampling from a single location can introduce bias (Edmonds et al., 2023), where the results of the study only reflect the experience of members at the facility, so it is invalid if the unique characteristics do not represent the situation elsewhere. In addition, involving several facilities increases the external validity of the research

(Sveinall et al., 2023), allowing the results obtained to be more applied in various contexts. Thus, sampling in various fitness facilities produces more comprehensive, valid, and relevant data for the development of evaluation or research instruments in the field of fitness.

The results of this study indicate that the developed evaluation instruments are not only valid but also reliable, making them effective tools for managing fitness facilities. By utilizing this instrument, fitness facility managers can identify areas for improvement and take appropriate steps to enhance service quality, leading to increased member or customer satisfaction and, consequently, greater exercise motivation. The limitation of this study is the limited time and number of researchers to carry out research procedures in the third stage, namely data collection at fitness facilities. As a result, the sampling was restricted to a smaller geographical area, a city. Additionally, the evaluation instrument is still in its prototype stage and can be further refined through future research. Future research is expected to expand the sample size and conduct additional testing, such as test-retest.

Conclusions

Based on the results of this study, it can be concluded that the developed evaluation instrument demonstrates a high level of validity, with a value exceeding 0.8. This validity encompasses the suitability of the material to the research objectives, the compatibility between indicators and sub-indicators, and the logical sequence of the questionnaire's content. These aspects collectively contribute to the instrument's effectiveness in collecting accurate and relevant data, which is crucial for informed decision-making in fitness facility management. A well-designed questionnaire with clear language further enhances respondent comfort and improves data quality. Additionally, the instrument's high reliability, as evidenced by diverse sampling across various fitness facilities, including gyms, swimming pools, sports courts, sports studios, sports arenas, and communities, ensures consistent measurement and broad representation of research results. While the instrument shows promise, it is still in its prototype stage and requires further refinement through additional research with a larger sample size and rigorous testing, such as test-retest, to improve its validity and reliability.

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Conflict of Interest

The author has no conflict of interest regarding the author or the results of other studies.

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