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Testing factorial invariance of the Questionnaire of Evaluation of the Quality Perceived in Sports Services in Spanish, Ecuadorian and Colombian users --Manuscript Draft--

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Response to Reviewers:	Reviewer #1: It is not stated in the work that the informed consent was requested from the participants. An explicit mention of the situation must be made. Thanks for the comments. However, in the procedure is explained as follows: "Authorization was requested to the different sport centers through a letter explaining the purposes of the investigation and the procedure to be carried out, accompanied by

a model of the instrument. The participants were informed of the purpose of the study, the voluntary nature of their participation, and the anonymity and confidentiality of their responses were guaranteed, in addition obtaining the informed consent from all participants included in the study. They were also informed that there were no right or wrong answers and they were asked for maximum sincerity and honesty. Participants responded to the questionnaire in about 10-12 minutes to complete all items".

We include below the informed consent document that was used for this study:

CONSENTIMIENTO INFORMADO PARA LA PARTICIPACION EN EL ESTUDIO DE EVALUACIÓN DE LA CALIDAD PERCIBIDA EN SERVICIOS DEPORTIVOS

1. Información acerca de la obtención de información

Desde la Universidad Internacional de la Rioja se está llevando a cabo un estudio con fines formativos y de desarrollo profesional para los gestores de instalaciones deportivas. La recogida de información tiene como finalidad la evaluación de la calidad percibida del servicio ofrecido a los socios de centros deportivos.

2. Uso y confidencialidad de los datos

Los datos que se obtengan de su participación serán utilizados únicamente con fines de investigación, interviniendo para ello el equipo de investigadores responsables de este proyecto. En ningún caso tendrán acceso a la base de datos de este proyecto personal ajeno al proyecto de investigación, atendiendo así al estricto cumplimiento de la Ley Orgánica 15/1999 sobre la Protección de Datos de Carácter Personal.

Por otro lado, la participación en el estudio es totalmente voluntaria y anónima, por lo que sus respuestas no serán en ningún momento identificadas ni existe un apartado para que se identifique con sus datos personales (nombre y apellidos) o documento de identidad (DNI, NIE o Pasaporte). Por favor, le rogamos no incluya datos personales en ningún apartado del cuestionario. De esta manera, se garantiza la plena confidencialidad de los datos y el cumplimiento riguroso del secreto profesional en el uso y manejo de la información obtenida relativa a las respuestas de los diferentes ítems del cuestionario.

3. Revocación del consentimiento

Si decidiera inicialmente participar y consentir su colaboración en el estudio, pero en algún momento de la cumplimentación del cuestionario desea dejar de participar, le rogamos lo comunique inmediatamente a la persona que le haya entregado el cuestionario, para que a partir de ese momento le retiren y destruyan el documento.

4. Declaración de consentimiento

Yo, D./Dña. _____ he leído el documento de consentimiento informado que me ha sido entregado, he comprendido las explicaciones en él facilitadas acerca de la participación en un estudio sobre la evaluación de la calidad percibida del servicio ofrecido a los socios de centros deportivos, y he podido resolver todas las dudas y preguntas que he planteado al respecto. Asimismo, he comprendido que en cualquier momento y sin necesidad de dar ninguna explicación, puedo revocar el consentimiento que ahora presento. También he sido informado que los datos recogidos serán utilizados únicamente con fines de formación y de desarrollo profesional de cara a gerentes de instalaciones deportivas.

Tomando todo ello en consideración y en tales condiciones, CONSIENTO participar voluntariamente en el presente estudio cumplimentando un cuestionario que me facilitarán, y que los datos que se deriven de mi participación sean utilizados exclusivamente para cubrir los objetivos especificados en el presente documento.

En _____, a ____ de _____ de 20 ____.

Firmado:

D./Dña. _____

Reviewer #2:

Thanks for the positive feedback. This paper tests an instrument for public sports

services users, and this is explained in the participants section, specifically at the beginning:

"This research involved public sport service users in three different countries including Spain, Ecuador, and Colombia. The information was gathered on the basis of a convenience sampling strategy. The total number of participants consisted of 927 participants of sport center services".

In this sense, it is sports services with direct management of the local administration aimed at the entire population and not focused on the fitness sector. Previous research in Spain with this tool also used public sports services (e.g., Gálvez, Boletó and Romero, 2015; Gálvez and Morales, 2015). Therefore, we can say that the CECASDEP has not been used in another type of sports services, since for example in fitness centers or private centers.

In reference to the Ethics Committee of the University, it has not been necessary when the manipulation of variables does not exist and does not need the full names of the participants. Participation has been entirely voluntary and confidentiality has been guaranteed, according to the Helsinki Declaration (2008).

References

Gálvez, P., Boletó, A. F., & Romero, R. P. (2015). Validation of a short version of CECASDEP in sports services users, 22(2), 78-85.

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Testing factorial invariance of the Questionnaire of Evaluation of the Quality Perceived in Sports Services in Spanish, Ecuadorian and Colombian users

Abstract

The Questionnaire of Evaluation of the Quality Perceived in Sports Services is a quantitative tool that has mainly been developed in users of public sports services. The aim of this study was to adapt the tool and determine the psychometric properties and the degree of factorial equivalence in three different countries (Spain, Ecuador and Colombia). Using a convenience sampling strategy, three samples with a total of 927 participants were analyzed, of which 330 were Spanish, 363 Ecuadorians and 234 Colombians. The CFA ratified the original structure of 25 items and showed a good fit to the data in the Spanish, Colombian and Ecuadorian sample. All constructs presented good internal consistency, convergent and discriminant validity. Lastly, a multi-group analysis showed the invariance factorial through the difference in the RMSEA, CFI and NNFI indices. The findings of the present study demonstrated evidence for the instrument validity and reliability. In conclusion, the adapted version of the tool provide insightful implications for sport management professionals for the evaluation of the quality of sport services in different countries who have the Spanish language as their mother tongue.

Keywords: sports services, perceived quality, sport management, factorial structure, factorial invariance

Introduction

Sport, as a phenomenon of global relevance, represents one of the most notable aspects of the current culture of consumption, in addition to its important role in education and culture. In the last decade of the international platform different groups have highlighted the importance of practicing sport and physical activity (European Commission 2014; Stoppani 2001). There is a great demand with regards to the use of sport services (Macintosh and Doherty 2007). This fact could be evidenced by the increase of sport promotion from public and private entities, encouraging greater participation of physical activity (García-Fernández, Gálvez-Ruiz, Vélez-Colón and Bernal-García 2017), and impacting the rapid growth of sport services worldwide (IHRSA 2016).

In Europe, the European Union has integrated sport in Strategy 2020 for its contribution to the economic growth, innovation, and job creation contributing 1.76% of the wealth of the European Union and estimating its multiplying effect at 1.22% (López and Urrestarazu 2017). In the case of Europe, the number of participants and

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4 facilities continue to increase. In Latin-America, a growth of government interest to promote healthy habits through
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6 the practice of sport has encouraged participation, the industry affirms there is still much work to be done (IHRS
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8 2016). Though the sport service industry in Latin-America has experienced rapid growth in recent years, it should
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10 still be considered in the development phase when compared to the current advancements Europe has experienced.
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12 In this sense, though from the public sector there are more and more initiatives that include physical activity and
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14 sport as a tool to improve the quality of life of the citizens, there are wide differences in the function of the countries
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16 studied and the regions or departments that comprise them.
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19 The management of organizations related to sport services require considerable emphasis on customer
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21 service, addressing their needs with serious concern in the management strategy (Chelladurai 1985; MacIntosh and
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23 Doherty 2007). In today's competitive market, organizations and businesses are trying to achieve unique advantages
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25 over its competitors to achieve a privileged position. On the other hand, customers are seeking providers for goods
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27 and better services (Najafzadeh and Shiri 2015). This competitiveness forces the management of the quality of
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29 service as fundamental for users with high levels of satisfaction and loyalty with regards to the organization as
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31 demonstrated in recent studies (e.g., Avourdiadou and Theodorakis 2014; García-Fernández, Gálvez-Ruiz,
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33 Fernández-Gavira and Vélez-Colón 2016; García-Fernández et al. 2017; García-Fernández, Gálvez-Ruiz,
34
35 Fernández-Gavira, Vélez-Colon, Pitts and Bernal-García 2018; Larson and Steinman 2009).
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38 Service quality models provide a suitable framework to assess customer satisfaction. Its antecedents such as
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40 service quality and perceived value, influence future loyalty (Howat and Assaker 2016). Assessing the quality of
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42 services are basic steps in the development program to improve the quality. Service quality and the factors
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44 influencing it is one of the most persistent challenges in the field. Management objectives have always been the
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46 focus of attention and theoretical and conceptual framework that is somehow related to customer expectations and
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48 perceptions have been studied by Najafzadeh and Shiri (2015). However, despite the assumption that providing high
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50 quality service is related to the success of a business, finding a way to provide a high-quality service is not an easy
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52 task.

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54 The definitions of service quality revolve around the idea that it is the result of the comparison that
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56 customers make between their expectations about a service and their perception of the way the service has been
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58 performed (Caruana, Ewing and Ramaseshan 2000; Parasuraman, Zeithaml and Berry 1988; Grönroos 1984).
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60 Perceived quality is defined by Grönroos (1984) as “the outcome of an evaluation process where the customers
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4 compare their expectations with service they have received” (p. 37). In studies regarding service quality, there are
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6 two models present in the last three decades: the SERVQUAL model (Parasuraman et al. 1988) composed of five
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8 dimensions and base on the discrepancy among perception and expectations, and the SERVPERF model (Cronin
9
10 and Taylor 1992) solely based on the perception of service understanding that there is an implicit comparison to an
11
12 ideal. Both instruments have been widely utilized in a number of investigations serving as a base for the
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14 development of new models and scales to evaluate quality of service (Carrizo and Freitas 2016) that has been
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16 emphasized in the multidimensionality of the construct (e.g., Alexandris, Dimitriadis and Kasiara 2001; Chang and
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18 Chelladurai 2003; Gálvez and Morales 2015; Kim and Kim 1995; Papadimitriou and Karteroliotis 2000; Tsitskari,
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20 Antoniadis and Costa 2014), since depending on the type of business the dimensions of service quality may be
21
22 considerably different (Lee, Kim, Ko and Sagas 2011). In this regard, the large volume of work addressing quality
23
24 of service suggest a lack of consensus in dimensionality, reliability, and operationalization (Thapa and Lee 2017)
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26 due to the differences established in service function or geographic environment (Batista and Coenders 2012; Lee et
27
28 al. 2011; Tsitskari, Tsiotras and Tsiotras 2006).

30
31 Additionally, the models of quality of service in the sport environment have focused more on the quality of
32
33 the process than the quality of the results (e.g., Hill and Green 2012; Liu, Taylor and Shibli 2009; Nuviala, Grao-
34
35 Cruces, Fernández-Ozcorta and Nuviala 2015), mainly because it is simpler to evaluate the tangible aspects of
36
37 service (Brady, Voorhees, Cronin and Bourdeau 2006).

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39 Evaluation of service quality tends to be a cognitive process by customers (Gallarza, Gil-Saura and
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41 Holbrook 2011; Zeithaml, Bitner and Gremler 2009). According to Howat and Assaker (2016), the dimensions of
42
43 quality process show some similarities within segments such as participating in sports and recreation although there
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45 is considerable variation between industries and cultures. In this sense, we consider it fundamental to verify the
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47 psychometric properties of a questionnaire for the evaluation of service quality in other contexts. Though there are
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49 scales to measure the perceived quality of sport services (e.g. Alexandris, Zahariadis, Tsorbatzoudis and Grouios
50
51 2004; Chang and Chelladurai 2003; Kim and Kim 1995; Ko and Pastore 2005; Lam, Zhang and Jensen 2005; Yildiz
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53 2011), no scales have been adapted or validated in countries where the language is Spanish. This seems surprising
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55 given the fact that in 2016 more than 472 million people considered Spanish their native tongue and the group of
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57 potential users of Spanish in the world reaches close to 567 million (7.8% of the world population) (Instituto
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59 Cervantes 2016).

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4 For these reasons, for the present study, the short version of Questionnaire of Evaluation of the Quality
5 Perceived in Sports Services (CECASDEP; Gálvez, Rosado and Romero 2015) was employed. We consider this
6 instrument, different from scales that focus on concrete services (e.g., Serrano-Gómez, Rial, García-García and
7 Gambau 2013; Theodorakis, Howat, Ko and Avourdiadou 2014; Tsitskari et al. 2014) is useful due to its reduced
8 number of items and addressing sport services in a global manner using five dimensions. In summary, the purpose of
9 this research was to determine the extent to which the CECASDEP is equivalent (i.e., invariant) across cultures,
10 specifically across Spanish, Ecuadorian and Colombian users, who have the Spanish language as their mother
11 tongue despite differences in grammar, pronunciation, or vocabulary. The establishment of measurement invariance
12 would lead us to a major contribution that would allow us to make appropriate comparisons between the three
13 different cultural groups studied, encouraging the development of new studies that would offer more efficient
14 management in sport service organizations in Latin-American countries. Previous research with the Spanish version
15 of CECASDEP scale using an exploratory factor (Morales and Gálvez 2011, 2012) and confirmatory factor analysis
16 (Galvez et al. 2015) provided evidence of adequate psychometric properties in Spanish users whose results
17 supported the five-dimensional hypothesis structure. In addition, the study of the first version of the scale showed
18 invariance according to gender (Gálvez and Morales 2015).

34 **Method**

35 *Participants*

36 This research involved public sport service users in three different countries including Spain, Ecuador, and
37 Colombia. The information was gathered on the basis of a convenience sampling strategy. The total number of
38 participants consisted of 927 participants of sport center services, specifically 330 from Málaga (Spain; 35.6%),
39 363 from Quito (Ecuador; 39.2%) and 234 from Cumanda (Colombia; 25.2%). With regard to the gender sample
40 profile, 48.3% of the respondents were men ($n = 448$) and 51.7% were women ($n = 479$). With respect to age range,
41 the Spanish participants were between 18 and 81 years of age ($M = 38.38$), the Ecuadorian participants were
42 between 18 to 54 years of age ($M = 22.86$) and the Colombian participants were between 18 to 69 years of age ($M =$
43 25.34). The data were examined and excluded from further analysis if the survey came from participants less than 18
44 years of age (the inclusion criterion was being 18 years old or older) and surveys not fully completed.

45 *Measures*

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4 The instrument used was the short version of Questionnaire of Evaluation of the Quality Perceived in Sports
5 Services (CECASDEP) of Gálvez et al. (2015). This questionnaire is composed of 25 items distributed in five
6 subscales: sport facilities (4 items), space for activities (4 items), changing room (6 items), physical activity
7 programs (4 items), and instructor of activities (7 items). A Likert-type response scale is used that ranges from 1
8 (*completely disagree*) to 5 (*completely agree*). The subscales showed good composite reliability (values between .65
9 and .92) in its original version (Gálvez et al. 2015) and adequate of goodness-of-fit index [$\chi^2(246) = 578.22$
10 ($p < .001$); $\chi^2/df = 2.35$; CFI = .94; TLI = .93; IFI = .94; RMSEA = .062 (CI=.055, .069)].

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18 For the current study, a panel of eight bilingual experts was formed (four Colombian and four Ecuadorian)
19 to review the scale using back-translations techniques to translate the instrument into Spanish appropriate to
20 Colombia and Ecuador (Hambleton 1994). Additionally, two experts of Spain completed the panel. Initially, the
21 cultural adaptation of the CECASDEP was based on the version that had already been validated in Spain (Gálvez et
22 al. 2015), following the guidelines proposal by Muñiz, Elosua and Hambleton (2013). The experts evaluated the
23 item's comprehension in the Colombian and Ecuadorian version, as well as each item's interpretation and clarity.
24 After achieving consensus, a first draft of the translated items was achieved and the back-translations only required
25 minor editing to obtain a final scale into Colombian and Ecuadorian context, and it was not necessary to delete any
26 items during the translation process. Once the correct translation was obtained the next step was to determine the
27 content validity through two experts from Spain, who read and affirmed the correct understanding of all the items.
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38 *Procedure*

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40 Authorization was requested to the different sport centers through a letter explaining the purposes of the
41 investigation and the procedure to be carried out, accompanied by a model of the instrument. The participants were
42 informed of the purpose of the study, the voluntary nature of their participation, and the anonymity and
43 confidentiality of their responses were guaranteed, in addition obtaining the informed consent from all participants
44 included in the study. They were also informed that there were no right or wrong answers and they were asked for
45 maximum sincerity and honesty. Participants responded to the questionnaire in about 10-12 minutes to complete all
46 items. The researchers were present during the administration of the test to provide assistance if necessary and to
47 verify the independent answer by the participants. Data collection was done during the months of February and
48 March 2016 in Spain, and during October and November 2016 in Ecuador and Colombia.
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59 *Data analysis*

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4 First, means, standard deviations, and reliability (Cronbach's alpha) were calculated. SPSS 21.0 was used to analyze
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6 some of the psychometric properties of the items. AMOS 21.0 was used to evaluate the measurement model through
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8 confirmatory factor analysis (CFA) to verify the original structure in each context. The indices taken into account in
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10 order to evaluate the fit of the models were as follows: chi-square relative to degrees of freedom (χ^2/df) (Jöreskog
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12 and Sörbom 1993), the Comparative Fit Index (CFI), Incremental Fit Index (IFI), Tucker-Lewis Index (TLI), and the
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14 Root Mean Square Error of Approximation (RMSEA) and its reliability interval. Chi-square by degrees of freedom
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16 values should be less than 3.0 (Kline 2005), CFI, IFI, and TLI indexes should surpass .90 (Worthington and
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18 Whittaker 2006), and values below .08 for the RMSEA (Hu and Bentler 1999). Internal consistency of the constructs
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20 was assessed through composite reliability (CR), and in order to examine convergent validity, average variance
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22 extracted (AVE) values were considered. Values $\geq .7$ indicates a proper value of CR (Bagozzi and Yi 1998; Hair,
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24 Black, Babin, Anderson and Tatham 2006) and values of AVE $\geq .5$ are appropriate indicators of convergent validity
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26 (Fornell and Larcker 1981). Discriminant validity was established when AVE for each construct exceeded the
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28 squared correlations between that construct and any other (Hair et al. 2006). In order to identify factorial invariance,
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30 cross validation procedures were used with a multi-group analysis strategy (Davey 2010). Thus, the factorial
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32 invariance (FI) was conducted for testing the invariance of the model across Spanish, Colombian and Ecuadorian
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34 users, specifically across samples and gender. The model's invariance among the groups was tested by comparing
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36 the unconstrained model (M1) with model constraining measurement weights (M2) (Loehlin 2003), using three
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38 criteria suggested by Cheung and Rensvold (2002) and Chen (2007): (1) the difference in RMSEA ($\Delta RMSEA$) was
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40 less than 0.01; (2) the difference in CFI (ΔCFI) was greater than .01; and (3) the difference in NNFI ($\Delta NNFI$) was
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42 greater than .01. The method of estimation of the maximum likelihood was used in all of the models tested.
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45 **Results**

46 *Preliminary Analyses*

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48 The values for univariate skewness and kurtosis for all the variables were satisfactorily within conventional criteria
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50 for normality (-3 to 3 for skewness and -7 to 7 for kurtosis) suggested by Finney & DiStefano (2006).
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53 Table 1 shows the mean scores and standard deviations of the items for each sample analyzed. The three
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55 versions were reliable and had very similar values by countries. The mean values of the items were slightly above
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57 the theoretical average response (2.5). In addition, overall SD's above 1 indicated adequate response variability
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59 except for the responses of Colombian participants. Corrected item-total correlations are always greater than .30
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4 (Nunnally and Bernstein 1995), and Cronbach's alphas were situated between .72 and .95 for participants in Spain,
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6 between .74 and .96 in Ecuador, and between .71 and .87 in Colombia, respectively.
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8 [Table 1 here]
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10 *Confirmatory Factor Analysis*

11 The measurement model was examined separately in order to assess the psychometric properties of the measure for
12 each group. The CFA showed reasonable goodness of fit indices, and suggest that the model is coherent with the
13 data (Table 2). The χ^2 and its ratio to the degrees of freedom was below the 3.0 criterion in all groups (Jöreskog and
14 Sörbom 1993), indicating a good fit. For Colombian participants, the TLI was indicative of poor fit, but the CFI and
15 IFI values were greater than the .90 criterion for good fit (Worthington and Whittaker 2006). In both groups Spanish
16 and Ecuadorian participants, the different indices were greater than the threshold of .90. In addition, the RMSEA
17 value was equal or less than .06 in all groups suggesting good fit (Hu and Bentler 1999).
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26 [Table 2 here]
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28 Further, the convergent validity is demonstrated in two ways. First because the factor loading are
29 significant and greater than 0.5 (Bagozzi and Yi 1998; Hair et al. 2006); and second because the average variance
30 extracted (AVE) for each construct is higher than 0.5 (Fornell and Larcker 1981). The reliability of the scale is also
31 demonstrated because the composite reliability (CR) indices of each of the dimensions obtained are higher than the
32 threshold of 0.7 (Bagozzi and Yi 1988; Hair et al. 2006) (Table 3).
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38 [Table 3 here]
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40 The discriminant validity of the constructs is showed in Table 4, evaluated by means of AVE values
41 (Fornell and Larcker 1981). For this, a construct must share more variance with its indicators than other constructs
42 of the model shown when the square root of the AVE between each pair of factors is higher than the estimated
43 correlation between those factors. The present results ratify the discriminant validity.
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48 [Table 4 here]
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50 *Factorial Invariance Analyses*

51 The focus was on the development of the invariance of the instrument of measure. The first step considered the
52 model for each individual sample, showing a good fit (Table 2). Next, the factorial invariance across the groups was
53 verified through the unconstrained model (M1) and the model constraining measurement weights (M2) (Loehlin
54 2003). Table 5 shows the measurement invariance across samples and gender through the criteria described in the
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4 data analysis section. In both analysis (samples and gender), we obtained adequate goodness of fit indexes in the
5 unconstrained model (CFI >.90; NNFI >.90; RMSEA <.05) indicating that the participants in the three samples use
6 the same conceptual framework to respond to the items that make up the scale, confirming the configural invariance
7 (Cheung and Rensvold 2002; Vandenberg and Lance 2000). Furthermore, the differences in RMSEA were lower
8 than .01 (Δ RMSEA=.003 and .000, respectively), the differences in CFI was higher than .01 (Δ CFI=.01 and .02,
9 respectively) as well the differences in NNFI (Δ NNFI=.01 and .01, respectively). Therefore, we can state that the
10 regression lines are equal in the samples considered.
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20 **Discussion**

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22 Perceived quality is one of the most studied variables in the context of sport services (e.g., Ko and Pastore 2005;
23 Lam et al. 2005; Tsitskari et al. 2006). Nevertheless, there is a lack of validated scales in the Spanish language and
24 even less used for transcultural analysis of Spanish speaking countries. For this reason, the purpose of this research
25 was to determine the extent to which the CECASDEP is equivalent across cultures, specifically across Spanish,
26 Ecuadorian and Colombian users, with the purpose of filling the gap of reliable instruments that allows adequate
27 measures of the variable perceived quality in Latin-American countries.
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34 Administrators of sport centers focus their attention on increasing the loyalty of their clients (Ferrand,
35 Robinson and Valette-Florence 2010; García-Fernández et al. 2016). For this, a positive perception of quality is the
36 first step for client loyalty. There are other variables, such as satisfaction, that have demonstrated to be determinants
37 of the consumer behavior under studied (Alexandris et al. 2004; García-Fernández et al. 2018; Murray and Howat
38 2002; Theodorakis et al. 2014). Previous studies have focused on the effect of service quality on new client loyalty
39 (Avourdiadou and Theodorakis 2014), for which reason this dimension is important taking into account the
40 emergent character of countries like Ecuador and Colombia with regards to sport services. In this sense, according to
41 IHRSA (2016), approximately 20 million Latin-Americans have sport club memberships. In the case of Ecuador, a
42 motion was submitted to encourage healthy living, “Plan Nacional del Buen Vivir” (2013-2017). Its objectives are to
43 support the development of activities oriented to sport promotion, improved quality of life and avoid sedentary
44 lifestyles (Senplades 2013). In the case of Colombia, the programs developed under Law 181 of 1995 do not have a
45 system in place to evaluate its effectiveness (Mesa, Arboleda, Gaviria and Guzmán, 2010). Only data of public
46 participation in sport and recreational activities has been obtained (Red de Ciudades Cómo Vamos 2014). For this
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4 reason, it is of great importance to analyze the quality of services in countries with emerging sport service industry
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6 in order to gain customer loyalty (Avourdiadou and Theodorakis 2014). This way a reduced quality in service in
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8 some of its dimensions, could establish changes in sport services and by consequence improve behavior intentions of
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10 its clients (Alexandris et al. 2001; Alexandris et al. 2004; García-Fernández et al. 2016).

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12 For the present study, psychometric properties and factorial structure from CECASDEP were analyzed
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14 after an adaptation process of context that is country specific. Initially, the scale was developed by Gálvez and
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16 Morales (2015) and is based on a quality perception measure composed by 49 items organized in a factorial
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18 structure of five dimensions. A previous study offered a reduced scale composed of 25 items while keeping the
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20 same dimensions (Gálvez et al. 2015), the same was used for this study. Evidence of trustworthiness of the scale
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22 demonstrated the items and dimensions possess an adequate internal consistency facilitating its adaptation to
23
24 different contexts. In the same manner, the estimated analysis of the adjusted homogeneity index (item-total)
25
26 demonstrated adequate values superior to .30 (Nunnally and Bernstein 1995).

27
28 The results obtained contain the adequate scale properties in Spain as well as in Ecuador and Colombia.
29
30 The CFA obtained in each independent sample supports the factorial structure of the CECASDEP, maintaining the
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32 original structure.

33
34 Factorial invariance was analyzed in the difference group samples by gender. In this sense, criteria for
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36 measurement invariance across gender and samples were completely met. The multigroup CFA indicated that the
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38 number and structures of factors and the item factor loadings were equivalent for different groups. The results of this
39
40 investigation confirm that CECASDEP presents the same configuration, furthermore, the validation of constructs in
41
42 the adapted version is accepted in sport services of different countries (Spain, Ecuador, and Colombia). In this
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44 regard, it is considered a valid instrument to conduct transcultural studies among participants in from Spain,
45
46 Colombia, and Ecuador; countries that are culturally different but share the same language.

47 48 *Practical implications*

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50 The findings demonstrate a valid and reliable scale for the evaluation of the quality of sport services. These findings
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52 impacts managers professionals of sport services in providing an instrument for the analysis of services offered. A
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54 longitudinal analysis that allows for continuous evaluation of the perception of service (Jiang and Wang 2006) will
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56 favor the detection of possible deficiencies in the service provided and can then take action to improve and develop
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58 an adequate design for their marketing strategy that can favor decision making.
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4 *Limitations and future studies*

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6 The principle limitation of this investigation was the lack of studies with scales in the Spanish language, and the lack
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8 of comparison sources to the results obtained. Furthermore, future investigations should fill in the gap with studies
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10 related to the quality of service of Spanish-speaking sport organizations. Among the limitations of this study is the
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12 sample which should be larger and representative of other populations for which reason it is important to conduct
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14 other transcultural studies of countries in Latin America. This can test the stability of the theoretical constructs
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16 among Latin-American countries that have Spanish as the mother tongue. This can also allow for comparisons
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18 among the more influential aspect of perceived quality within a cultural context. An interesting opportunity for
19
20 future investigation to corroborate the findings obtained in order to finalize the CECASDEP scale as a validated and
21
22 reliable instrument in Spanish speaking countries. Finally, the fact that it is a reliable instrument in Spanish can
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24 result in future lines of investigation that can assist in the validation of other instruments, an analysis with dependent
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26 variables such as perceived value or satisfaction.
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Table 1. Reliability and some properties of the items for each group (Spanish, Ecuadorian and Colombian).

Subscale / Items	Spain			Ecuador			Colombia		
	M (SD)	C_{it}^c	α	M (SD)	C_{it}^c	α	M (SD)	C_{it}^c	α
<i>Sport Facilities</i>			.72			.74			.71
SF1	4.43 (.81)	.51		4.46 (.94)	.50		4.67 (.56)	.48	
SF2	4.38 (.91)	.49		4.33 (1.08)	.47		4.66 (.59)	.42	
SF3	3.99 (1.03)	.59		3.85 (1.23)	.63		4.64 (.61)	.52	
SF4	4.25 (.87)	.53		4.10 (1.11)	.68		4.68 (.61)	.56	
<i>Space for activities</i>			.84			.80			.71
SA1	3.89 (1.07)	.62		3.99 (1.07)	.57		4.37 (.71)	.60	
SA2	3.79 (1.05)	.63		3.86 (1.15)	.53		4.46 (.71)	.57	
SA3	3.98 (1.03)	.66		3.28 (1.32)	.42		4.37 (.74)	.53	
SA4	3.68 (1.15)	.57		3.36 (1.30)	.49		3.82 (.68)	.47	
<i>Changing room</i>			.84			.82			.69
CR1	3.29 (1.15)	.46		3.92 (1.07)	.56		2.62 (.84)	.41	
CR2	2.95 (1.22)	.50		3.56 (1.10)	.44		2.31 (.90)	.44	
CR3	3.38 (1.13)	.62		3.61 (1.19)	.45		4.18 (.83)	.47	
CR4	3.89 (1.02)	.68		4.05 (1.04)	.53		4.09 (.85)	.50	
CR5	3.63 (1.10)	.55		3.84 (1.07)	.51		3.77 (.82)	.48	
CR6	3.83 (1.19)	.60		3.83 (1.12)	.41		4.14 (.90)	.43	
<i>Physical Activity Prog</i>			.84			.87			.80
PAP1	3.98 (1.02)	.63		4.18 (.90)	.62		4.45 (.60)	.52	
PAP2	3.83 (1.09)	.56		4.17 (.98)	.68		4.51 (.61)	.54	
PAP3	4.08 (1.03)	.60		4.32 (.93)	.57		4.61 (.60)	.53	
PAP4	4.18 (.97)	.62		4.35 (.94)	.58		4.51 (.68)	.45	
<i>Instructor of Activities</i>			.95			.96			.87
IA1	4.35 (1.06)	.59		4.09 (1.22)	.64		4.58 (.60)	.50	
IA2	4.44 (.94)	.60		4.17 (1.16)	.69		4.53 (.58)	.44	
IA3	4.36 (1.00)	.67		4.20 (1.17)	.66		3.33 (.93)	.52	
IA4	4.25 (1.02)	.66		4.16 (1.21)	.66		3.36 (.85)	.60	
IA5	4.37 (.89)	.70		4.21 (1.16)	.67		3.44 (.83)	.63	
IA6	4.34 (1.00)	.69		4.24 (1.15)	.63		3.45 (.83)	.59	
IA7	4.42 (.90)	.70		4.33 (1.14)	.63		3.49 (.84)	.57	

Note. M: mean; SD: standard deviation; C_{it}^c : corrected total-item correlations; α : Cronbach's alpha.

Table 2. Goodness of fit indices for three groups of participants.

Country	Goodness of fit index
Spain	$\chi^2/df=2.31$; CFI=.94; IFI=.94; TLI=.93; RMSEA=.06 (CI=.057, .070)
Ecuador	$\chi^2/df=2.89$; CFI=.92; IFI=.93; TLI=.91; RMSEA=.07 (CI=.066, .079)
Colombia	$\chi^2/df=2.81$; CFI=.91; IFI=.91; TLI=.89; RMSEA=.08 (CI=.080, .096)

Table 3. Composite reliability (CR) and average variance extracted (AVE).

Subscale	Spain		Ecuador		Colombia	
	CR	AVE	CR	AVE	CR	AVE
Sport Facilities	.85	.60	.91	.72	.91	.73
Space for Activities	.85	.59	.83	.55	.79	.56
Changing Room	.90	.59	.86	.51	.84	.51
Physical Activity Program	.85	.59	.97	.63	.84	.59
Instructor of Activities	.97	.80	.97	.81	.98	.88

Table 4. Discriminant validity of the scales associated with the model for three groups.

Spain	1	2	3	4	5
1.Sport Facilities	.60				
2.Space for Activities	.50	.59			
3.Changing Room	.41	.57	.59		
4.Physical Activity Program	.38	.41	.41	.59	
5.Instructor of Activities	.53	.26	.24	.32	.80
Ecuador	1	2	3	4	5
1.Sport Facilities	.72				
2.Space for Activities	.22	.55			
3.Changing Room	.30	.46	.51		
4.Physical Activity Program	.38	.18	.32	.63	
5.Instructor of Activities	.40	.04	.08	.32	.81
Colombia	1	2	3	4	5
1.Sport Facilities	.73				
2.Space for Activities	.20	.56			
3.Changing Room	.25	.30	.51		
4.Physical Activity Program	.18	.44	.15	.59	
5.Instructor of Activities	.32	.04	.10	.25	.88

Note. Below the diagonal: estimated correlation between the factors: Diagonal: square root of AVE.

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Table 5. Measurement invariance across samples and gender.

	χ^2 (df)	$\Delta\chi^2$ (df)	<i>p</i>	RMSEA	Δ RMSEA	CFI	Δ CFI	NNFI	Δ NNFI
<i>Measurement invariance across samples</i>									
M1	1975.43 (738)			.043		.92		.91	
M2	2284.44 (772)	309.01 (34)	.00	.046	.003	.91	.01	.90	.01
<i>Measurement invariance across gender</i>									
M1	1494.89 (492)			.047		.95		.92	
M2	1558.17 (509)	63.28 (17)	.00	.047	.000	.93	.02	.91	.01

Note: M1: unconstrained model; M2: model constrained measurement weights

Information title: Testing factorial invariance of the Questionnaire of Evaluation of the Quality Perceived in Sports Services in Spanish, Ecuadorian and Colombian users

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Reviewer #1: It is not stated in the work that the informed consent was requested from the participants. An explicit mention of the situation must be made.

Thanks for the comments. However, in the procedure is explained as follows:

Procedure

Authorization was requested to the different sport centers through a letter explaining the purposes of the investigation and the procedure to be carried out, accompanied by a model of the instrument. The participants were informed of the purpose of the study, the voluntary nature of their participation, and the anonymity and confidentiality of their responses were guaranteed, **in addition obtaining the informed consent from all participants included in the study.** They were also informed that there were no right or wrong answers and they were asked for

We include below the informed consent document that was used for this study:

CONSENTIMIENTO INFORMADO PARA LA PARTICIPACION EN EL ESTUDIO DE EVALUACIÓN DE LA CALIDAD PERCIBIDA EN SERVICIOS DEPORTIVOS

1. Información acerca de la obtención de información

Desde la Universidad Internacional de la Rioja se está llevando a cabo un estudio con fines formativos y de desarrollo profesional para los gestores de instalaciones deportivas. La recogida de información tiene como finalidad la evaluación de la calidad percibida del servicio ofrecido a los socios de centros deportivos.

2. Uso y confidencialidad de los datos

Los datos que se obtengan de su participación serán utilizados únicamente con fines de investigación, interviniendo para ello el equipo de investigadores responsables de este proyecto. En ningún caso tendrán acceso a la base de datos de este proyecto personal ajeno al proyecto de investigación, atendiendo así al estricto cumplimiento de la Ley Orgánica 15/1999 sobre la Protección de Datos de Carácter Personal.

Por otro lado, la participación en el estudio es totalmente voluntaria y anónima, por lo que sus respuestas no serán en ningún momento identificadas ni existe un apartado para que se identifique con sus datos personales (nombre y apellidos) o documento de identidad (DNI, NIE o Pasaporte). Por favor, le rogamos no incluya datos personales en ningún apartado del cuestionario. De esta manera, se garantiza la plena confidencialidad de los datos y el cumplimiento riguroso del secreto profesional en el uso y manejo de la información obtenida relativa a las respuestas de los diferentes ítems del cuestionario.

3. Revocación del consentimiento

Si decidiera inicialmente participar y consentir su colaboración en el estudio, pero en algún momento de la cumplimentación del cuestionario desea dejar de participar, le

rogamos lo comunique inmediatamente a la persona que le haya entregado el cuestionario, para que a partir de ese momento le retiren y destruyan el documento.

4. Declaración de consentimiento

Yo, D./Dña. _____ he leído el documento de consentimiento informado que me ha sido entregado, he comprendido las explicaciones en él facilitadas acerca de la participación en un estudio sobre la evaluación de la calidad percibida del servicio ofrecido a los socios de centros deportivos, y he podido resolver todas las dudas y preguntas que he planteado al respecto. Asimismo, he comprendido que en cualquier momento y sin necesidad de dar ninguna explicación, puedo revocar el consentimiento que ahora presento. También he sido informado que los datos recogidos serán utilizados únicamente con fines de formación y de desarrollo profesional de cara a gerentes de instalaciones deportivas.

Tomando todo ello en consideración y en tales condiciones, **CONSIENTO** participar voluntariamente en el presente estudio cumplimentando un cuestionario que me facilitarán, y que los datos que se deriven de mi participación sean utilizados exclusivamente para cubrir los objetivos especificados en el presente documento.

En _____, a ____ de _____ de 20 ____.

Firmado:

D./Dña. _____

Reviewer #2:

Thanks for the positive feedback. This paper tests an instrument for public sports services users, and this is explained in the participants section, specifically at the beginning:

Method

Participants

This research involved public sport service users in three different countries including Spain, Ecuador, and Colombia. The information was gathered on the basis of a convenience sampling strategy. The total number of participants consisted of 927 participants of sport center services, specifically 330 from Málaga (Spain; (35.6%),

In this sense, it is sports services with direct management of the local administration aimed at the entire population and not focused on the fitness sector. Previous research in Spain with this tool also used public sports services (e.g., Gálvez, Boleto and Romero, 2015; Gálvez and Morales, 2015). Therefore, we can say that the CECASDEP has not been used in another type of sports services, since for example in fitness centers or private centers.

In reference to the Ethics Committee of the University, it has not been necessary when the manipulation of variables does not exist and does not need the full names of the participants. Participation has been entirely voluntary and confidentiality has been guaranteed, according the Helsinki Declaration (2008).

References

- Gálvez, P., Boleto, A. F., & Romero, R. P. (2015). *Validation of a short version of CECASDEP in sports services users*, 22(2), 78-85.
- Gálvez, P., & Morales, V. (2015). *Development and validation of a questionnaire to assess Perceived quality in sports services*. *Cultura, Ciencia, Deporte*, 28(10), 55-66.