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ORIGINAL

VALIDATION OF THE IOLF5C INSTRUMENT FOR THE EFFICACY OF SHOOTING ON GOAL IN FOOTBALL FOR THE BLIND

VALIDACIÓN DEL IOLF5C PARA LA EFICACIA DEL LANZAMIENTO EN FÚTBOL PARA CIEGOS

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ABSTRACT

The aim of this study was to design and validate an observational instrument to identify essential competitive performance indicators in Football 5-a-Side for blind and partially sighted players through the assistance of expert evaluators.

The sample was comprised of twelve Football 5-a-Side expert coaches. After a preliminary study, the OLF5C instrument was structured to include two groups of actions: basic actions during shots on goal in game situations and shooting actions penalty situations. *Aiken's V* statistic and confidence interval values were used to assess the content validity and Cronbach'□ value was used to assess the internal consistency of the instrument. Results indicated that the IOLF5C has good validity indices with obtained values reaching .875 in all items during game situations and 0.96 on penalty shot actions. The overall level of instrument consistency was .894. The IOLF5C is considered to be a valid and reliable instrument.

KEYWORDS: *coach, validation, Football 5-a-Side, blind, Aiken's V, Cronbach's α.*

RESUMEN

El objetivo del estudio es diseñar y validar un instrumento de observación para conocer los Indicadores de Rendimiento Competitivo en Fútbol a 5 para personas ciegas a través de jueces expertos. La muestra se compuso por 12 entrenadores expertos en Fútbol a 5. Tras la realización de un estudio preliminar, el *IOLF5C* quedó estructurado en dos partes: *acciones básicas durante el lanzamiento a portería en situaciones de juego,* y *durante el penalti*. La validez de contenido se realizó a través de la *V de Aiken* y sus intervalos de confianza. Para comprobar la consistencia interna del instrumento se empleó *α de Cronbach.* Los resultados indicaron que el *IOLF5C* dispone de niveles óptimos de validez obteniendo valores superiores a 0.875 en todos los ítems durante el juego y 0.96 en penalti. La consistencia del instrumento fue de 0.894. Por tanto, el *IOLF5C* es un instrumento válido y fiable.

PALABAS CLAVES: *entrenador, validación,* Fútbol a 5*, ciegos, Aiken's V, α de Cronbach.*

INTRODUCTION

Physical activity has been used as a means of intervention in disabled sport. Various studies and investigations have been designed in related scientific fields. Adapted Physical Activity (heretofore referred to as APA) was introduced for the first time in 1973 when a group of Canadian and Belgian experts founded the International Federation of Adapted Physical Activity (IFAPA) (Sherrill and Hutzler, 2008).

The first scientific studies conducted in relation to the APA were developed in accordance with traditional disciplines aligned with the Sport Sciences: physiology or biomechanics. These early studies were focused primarily on wheelchair sports. Subsequently, studies emerged from other scientific disciplines including sociology and medicine (Doll-Tepper and DePauw, 1996) and there was a broadening of limitations and handicaps that became the focus

of study (including educational, recreational, competitive, therapeutic and preventative applications).

Sherrill (1995) stimulated the recognition of the APA as an academic discipline consisting of a unique body of knowledge and pleaded for universities to recognize the field as a unique discipline worthy of offering the same types of doctoral coursework that was characteristic of other disciplines. Nonetheless, Reid and Stanish (2003) expressed the opinion that the field should be considered to be interdisciplinary in nature. The IFAPA also recognized the APA as a field of academic study. Sherrill and Hutzler (2008) provided the opinion that there was still a need to place greater emphasis on the different types of scientific methodologies and practices based upon evidence that was accepted within the creation of knowledge in this field of study.

Adapted Physical Activity is currently considered to be one of the disciplinary fields that are represented within the sport sciences and it is identified as such in the Sport Science directory as published by the Advisory Counsel for Sport Science and Physical Education of the United Nations (CIEFCD or ICSSPE), (Borms, 2008). Within the association there are numerous sport disciplines which are of interest. Sport for individuals with physical limitations in general, and football (or soccer as it is called in the United States) in particular, has become of the most popular sports in the world for individuals with visual limitations. Many countries, such as Spain and Brazil, have established national championships and these countries began to organize the first international friendly matches. Futsal for the blind was also integrated into the International Blind Sport Federation in 1996 through the creation of the subcommittee of Futsal (International Blind Sport Federation, to be referred to as IBSF, 2015).

IBSF (2015) supports two types of football: B1 for those players that are completely blind and B2/B3 for those players who are partially sighted. Football B1, also known as Football for the Blind, has become one of the largest sports in the Paralympic Games following its debut in the Athens Olympic Games of 2004. It is always played in a closed environment to permit optimal acoustics for the player and on a rectangular field (IBSF, 2015). Football-5-a-Side for blind or visually handicapped people is a sport that relies heavily on cooperation and is played on familiar courts or fields with the simultaneous assistance of additional contributors or assistants (Hernández, 2005) similar to other team sports for the blind such as basketball. The actual rules of competition (2014-2017) of the IBSF (2015) consider football to be “an essential means for the continuing rehabilitation that is necessary for the blind person”. The presence of studies related to Football-5-a-Side for blind people is recent or nonexistent in the scientific literature. Giagazoglou, Katis, Kellis and Natsikas (2011) examined kinematic differences between blind players and fully sighted individuals. Magno, Morato and Bilzon (2013) evaluated the characteristics and the prevalence of injuries relative to Brazilian players of Football-5-side for blind players. Finally, Suárez (2014) analyzed the role of visual guides in contributing to the work of the players. Nonetheless, these types of studies are rare in the area of sport performance relative to the sport modality of interest.

In the scientific literature, some studies exist concerning performance characteristics across various sports, for both handicapped and non-handicapped populations using what is known as *Performance Indicators*. This method is a mean of documenting and analyzing the sport context (Hughes and Franks, 2004) in which optimal quantitative and qualitative feedback can be accessed, including the provision of all relevant data for the sport of interest

One sport performance indicator involves the selection and combination of movement variables with the objective of defining some, or all, aspects of performance in the sport context (Hughes and Bartlett, 2002). The majority of sport performance indicators consist of discrete events that are quantifiable in nature, such as shots on goal, field goal attempts in basketball or number of correctly or incorrectly hit shots in tennis (Neville, Atkinson, Hughes, and Cooper, 2002). Data that is obtained for this type of analysis can then be used by coaches and analysts to improve the individual or group performance of the teams with primary focus upon the identification or individual or team strategies and tactics (Petersen, Pyne, Portus, Cordy, and Dawson, 2008). Within the different environments of application, the sport performance indicators are those actions carried out during the competition in the real context of the game and this has become one of the emerging lines of study in the advancement of sport performance analysis (Ibáñez, García, Feu, Parejo and Cañadas, 2009) where the variables of study are identified by the researcher and the collection of data is conducted by the observers.

This general line of study is becoming increasingly important with the Sport Sciences. Research within this area of study has had an emergent focus that has increased in value among researchers and sport professionals (Drust, 2010). Notational Analysis has been used as one method of investigation. Through this approach, data can be comprised of laboratory test data or information obtained through questionnaires, interviews, etc. with athletes (O'Donoghue, 2010). Despite these good intentions, it is still necessary to continue designing and testing the validity of the instruments that are employed (Nuviala, Grao-Cruces, Teva-Villén, Pérez-Ordás and Blanco-Luengo, 2016). Construct validity, according to Messick (1980), is the primary form of validity. The instrument that is most appropriate to validate is the questionnaire (Thomas, Silverman and Nelson, 2015). In order to validate the content of the instrument in a way that is valid and consistent with success and failure outcomes related to shots on goal during actual competition in Football-5-a-Side for blind and partially sighted players it is necessary to count on the utilization of experts' judgements and to have the necessary breadth of analysis to ensure that each one of the items is appropriate (Wiersma, 2001).

Expert judges are those individuals that can provide an opinion or informed judgment that is based upon their own history in a line of research (Escobar and Cuervo, 2008). These experts would be those people with sufficiently broad knowledge and experience concerning the object of study. The number of experts needed to establish the validity of an instrument is one of the major points of contention in research. Blomqvist, Vänttinen and Luhtanen (2005) designed and validated an evaluation tool for youth football players between the ages of twelve and fourteen years with the help of two experts. Serra-Olivares

and García-López (2016) validated an instrument for the evaluation of technical knowledge in football using seven expert judges. Cenizo, Ravelo, Morilla, Ramírez and Fernández-Truan (2016) designed and validated an instrument to evaluate motor coordination in primary school students using the opinions of eight physical education teaching experts. To the contrary, Barahona (2004); Dunn, Bouffard and Rogers (1999); García, Antúnez and Ibáñez (2016); Grimaldo (2008); Hyrkäs, Appelqvist-Schmidlechner and Oksa (2003); Jiménez, Salazar and Morera (2013); Mills, Butt, Maynard and Hardwood (2012); Robles, Robles, Giménez and Abad (2016); and Wiersma (2001) considered the need for ten or more subjects to provide an acceptable estimate of content validity of a tool or instrument for validation.

For the purpose of achieving the objective of this study it was necessary to design and refine an observational instrument of the variables related to shooting on goal for blind and visually limited Football 5-a-Side players during game play or on penalty shots, and to identify the steps involved in the validation process. As such it was necessary to select an instrument to utilize for the collection of information. The two possibilities were to use an existing tool or to construct a new measure with the intent of improving upon previous validity efforts (Sartori and Pasini, 2007).

The observational instrument that was designed will permit coaches and athletes to better understand the factors that contribute to sport performance. All of the variables that are analyzed in the study can contribute to the benefit of the players so that they optimize their performance thus increasing the likelihood that they will realize improved results (Gimeno, Buceta and Pérez-Llantada, 2007). As such, it is necessary to adhere to an adequate methodological process (Burgos, 2006). The evaluation of the experts ought to follow a “procedure that is born from the necessity of validity estimation for the contents of a test” (Escobar and Cuervo, 2008). Instrument validation emerges from the necessity to further expand current physical activity opportunities as practiced by individuals with visual limitations and to provide objective data to coaches such that they have help in making decisions during practices and competitions.

Consequently, given the absence of instruments that permit the study of sport performance in Football 5-a-Side for blind people this observational instrument was designed in relation to their ability to demonstrate efficacy in scoring goals during game play and on penalty shots. This general objective was operationalized with three specific objectives: 1) to design and refine an observational instrument to identify the indicators of competitive performance in Football 5-a-Side for blind individuals and for partially sighted individuals; 2) to validate an observational instrument that would help to identify the variables most relevant to offensive and defensive effectiveness and to determine the competitive efficacy in blind and visually limited players in Football 5-a-Side; c) to assess the consistency and reliability of the observational instruments.

METHOD

Design

This investigation belongs to the category of *instrumental studies* (Montero and León, 2007) in which an observational tool has been created and advanced for the purpose of obtaining empirical knowledge about success and failure efforts during shooting on goal in Football 5-a-Side for blind players during ongoing game situations as well as in penalty shootouts (to determine the winner of a tied games) using the assistance of expert coaches.

Participants

Twelve expert coaches of Football 5-a-Side for blind players participated in this study. Deliberate and intentional sampling procedures were conducted to obtain the participants (Rodríguez, Gil and García, 1996). Expert subjects were sought who were willing and accessible (Valles, 2003) and capable of providing knowledge and information relative to the objective to the study, such as providing evaluations that could yield reflections and insights beneficial to the investigators (Escobar and Cuervo, 2008). The subjects who were selected formed part of our sample of experts and had to meet three of the four criteria for inclusion established for the study. The inclusion criteria to be an expert for the observational content validation were that:

First criteria: Possess the federation qualifications for Football (Title of Football Coach or Title of Sport Coach with specialization in Football);

Second criteria. Possess a university degree in the area of Physical Activity and Sport (Undergraduate or graduate degree in Sport Science or in Education with a specialization in Physical Education);

Third Criteria: To have at least five years of experience as a coach with Football 5-a-Side for individuals with physical limitations;

Fourth criteria. To serve currently as a coach or to have served as a coach for Football 5-a-Side for individuals with the blind or partially sighted at the national or international level.

Table 1 provides the inclusion criteria that were satisfied by each of the expert subjects in Football 5-a-Side for blind players in the sample.

Table I. Characteristics of the expert coaches in the sample

	Selection Criteria			
Subjects	Criteria 1	Criteria 2	Criteria 3	Criteria 4
1		✓	✓	✓
2		✓	✓	✓
3		✓	✓	✓
4		✓	✓	✓
5	✓		✓	✓
6		✓	✓	✓
7		✓	✓	✓
8		✓	✓	✓
9		✓	✓	✓
10		✓	✓	✓
11		✓	✓	✓
12		✓	✓	✓

Variables

In order to validate the observational instrument it was necessary to follow a "procedure that is born from the necessity of validity estimation for the contents of a test*"* (Escobar and Cuervo, 2008). It should be understood that content validity estimates the extent to which the test adequately represents that which has been assessed (Thomas et al., 2015; Wiersma, 2001).

There were two general categories of variables in this part of the study that related to the examination of the validity of the instrument and its external reliability (or generalizability). In order to collect the data, an evaluation sheet was used that included all of the information of interest in the study, given that this is the optimal means of defining the construct of interest that one wishes to evaluate (Osterlind, 1989). This evaluation sheet used a quantitative form of evaluation that included a five point Likert-type response scale (with response choices of "totally disagree", "disagree", "neither agree nor disagree", "agree" and "totally agree") in relation to the extent to which each question was sufficiently appropriate to the target construct (adequacy) as well as to the level of readability (clarity). In addition, each item on the assessment provided the possibility for the respondent to add additional ideas or qualitative suggestions from an expert's perspective. In this manner, the qualitative data provided additional insights and perspectives relevant to the study.

To determine the internal consistency of the instrument Cronbach's α value for scale reliability was used. Reliability refers to the reproducibility of an instrument (Thomas, et al., 2015).

Instruments

In order to develop and refine the Observational Instrument (heretofore, *IOLF5C*) for the evaluation of shooting on goal in Football 5-a-Side for blind and visually limited players, it is essential to examine the object of study further in

relation to performance in the sport. Various studies analyze performance indicators in relation to efficacy, in relation to scoring indices (goals, baskets, winners, shots, etc.) or in relation to the quality of the performance (moves, tackles, possession passes, etc.) (Hughes and Bartlett, 2002).

The *IOLF5C* was designed to identify the different variables that affect success during shots on goal during regular game play situations and on penalty shots. It will permit us to understand relevant actions in Football 5-a-Side for blind and partially sighted individuals that can occur on each attempt and allow precise evaluation relevant to these actions.

The instrument is divided into two parts: one part is for the evaluation of the basic actions during the shot on goal in game situations (consisting of the variables *V1J, V2J, V3J, V4J, V5J, V6J, V7J, V8J y V9J)* and the other part for basic actions during a penalty shot (consisting of the variables V1P, V2P, V3P, V4P and V5P). Each group of items makes concrete reference to the sport performance indicators in Football 5-a-Side for blind and partially sighted players and allows us to understand success and failure outcomes when shooting on goal.

For the refinement of each of the variables as well as the categorical object analysis, also referred to as core categories and range of possible outcomes (Anguera, 1991), a procedure was followed which was proposed by Anguera and Mendo (2013). The operational definition of each variable and its categories had been proposed in a previous study with a group of experts comprised of coaches at the national and international level for Football 5-a-Side for blind and partially sighted players, and the specific actions of interest for evaluation were identified. In the previous study, useful information was collected to identify the underlying considerations that were to be used to evaluate the instrument. This information refers to biographic or demographic aspects (age, gender, geographical location, education, etc.) as well as the background of each expert (academic degree, experience, coaching level, etc.)

Table 2 provides a reduced representation of the variables from the first group of questions that underwent validation by the expert coaches. These variables will be used as performance indicators in the analysis (O´Donoghue, 2010). Each of these variables received a numerical categorization to facilitate subsequent statistical analysis.

Table 2. Variables that comprised the first set of items on the instrument

Variable	Core Category	Range of Possible Outcomes
V1J	*Success and failure actions*	1) Success. Goal. 2) Success. No goal but a rebound and subsequent opportunity 3) Failure. On target but not a goal and controlled by goalkeeper or opposing player. 4) Failure. Not on goal. 5) Other
V2J	*Initial zone*	1) Defensive zone 2) Predefensive zone 3) Preoffensive zone 4) Offensive zone
V3J	*Type of advancement*	1) Combination 2) Direct 3) Quick
V4J	*Shooting zone*	1) Defensive zone 2) Predefensive zone 3) Preoffensive zone 4) Offensive zone
V5J	*Circumstances leading to shot*	1) Pass – control – shot 2) Pass – shot 3) Control – shot 4) Other
V6J	*Blocks/Deflections*	1) No deflection 2) Deflection in front of the shot 3) Deflection at same height of shot 4) Deflection from behind the shot 5) Other
V7J	*Opposition to shot*	1) Without opposition 2) Goalkeeper 3) Distant opposition 4) Nearby opposition 5) Other
V8J	*Body zone (for control)*	1) Right foot 2) Left foot 3) Others
V9J	*Type of contact/touch*	1) Inside of foot 2) Instep 3) Toe kick 4) Outside of foot 5) Heel kick 6) Others

Table 3 presents the variables that constituted Block 3 in the validation process with the expert coaches.

Table 3. Variables that comprise categories and range of possible outcomes

Variable	Core Category	Range of Possible Outcomes
V1P	*Success and failure actions*	1) Success: Goal 2) Success: Goal after contact by goalkeeper 3) Failure: Hit post 4) Failure: Stopped by goalkeeper 5) Failure: Shot wide
V2P	*Technical orientation*	1) Orientation in two zones of goal 2) Orientation in four zones of goal 3) Orientation in six zones of goal
V3P	*Shooting technique*	1) Manual contact with ball 2) No manual contact with ball
V4P	*Body areas*	1) Right foot 2) Left foot 3) Other
V5P	*Type of kick*	1) Inside of foot 2) Instep 3) Toe kick 4) Outside of foot 5) Heel kick 6) Other

Materials

The Microsoft Office 2007 program was used in the observation process through the free archive provided by Google Drive, specifically through the survey tools provided to allow the expert evaluators the chance to complete the surveys online.

For the calculation of the *Aiken's V* values a program was employed that had been developed by Merino and Livia (2009) and programmed in Visual Basic 6.0 language for free use that allows for confidence intervals through an overall method score (Penfield and Giacobbi, 2004) at 90%, 95% y 99% confidence intervals. Finally, the *SPSS 21.0* statistical package was used in the evaluation of the reliability of the instrument.

Procedure

To begin the process, a literature review was conducted regarding the topic of study, Football 5-a-Side for blind and partially sighted players, and with regards to the procedures surrounding the development and validation of instruments, to remain consistent with the theoretical and research foundations of this field. Second, a preliminary instrument was designed at Phase 1 that was based on a previous study. Subsequently, in Phase 2 we proceeded to the validation of the instrument through the group of expert coaches (twelve coaches in Football 5-a-Side for blind and partially sighted players).

In Phase 1, three expert coaches participated in order to assist in the design of a preliminary version of the instrument. Included among these experts was the Spanish national team coach for Football 5-a-Side for blind and visually limited players. In addition, the specific knowledge regarding visual limitations of

players was of benefit to the study's researchers in the advancement of the process.

In Phase 2, the materials were sent to those experts willing to participate in the study including the inclusion criteria that were previously developed. These documents were transmitted electronically. Included in these documents were the formal and institutional presentation of the study along with links for the evaluation of each of the variables that comprised the observational instrument as well as some additional clarifications regarding each question on the questionnaire.

The evaluations of the experts was obtained through the Google Drive application. This application involves a tool that is accessible via the internet. The coaches provided their evaluations through an online archive which could be downloaded in various formats. To finish the process, the data was statistically analyzed.

Statistical analysis.

The validation of the instrument, *IOLF5C,* utilized *Aiken's V value* for content validity (Aiken, 1985). This coefficient is one of the principal means to "quantify and validate the content or relevancy of each item relative to the content domain for N judgments (number of expert judges). *Aiken's coefficient V value* ranges between 0.00 and 1.00 and the highest value corresponds with a perfect agreement among the experts in relation to the validity of the content evaluated (Aiken, 1985). In the calculation of this coefficient, the following algebraic equation modified by Peinfield and Giacobbi (2004) was used:

$$V = \frac{\bar{X} - l}{k}$$

In the equation, ***X*** represents the mean of the scores provided by the experts in the sample, ***l*** is the lowest score obtained and k represents the range of possible values on the Likert-type scale that was used. In our case, ***l*** = 1 and *K* = 5 and thus *K* = 5 -1= 4.

For the calculation of this coefficient and to test whether the magnitude of the coefficient was greater than the minimal established level, the free program *Visual Basic 6.0* (Merino and Livia, 2009) was used. This program allows for the attainment of a range of values (maximum score-minimum score) and *Aiken's V* value as well as the confidence interval values at 90%, 95%, and 99% which are the usual confidence levels that are estimated. In this investigation, a 95% confidence level was used to correspond with the baseline level of acceptance for researchers in the social sciences (Merino and Livia, 2009). The exact critical reference value for the acceptance of *Aiken's V* given the number of judges and the range of responses for each item was 0.69; *p*= 0.041 (Aiken, 1985).

To assess the reliability of the *IOLF5C* instrument, *Cronbach's* α statistic (Cronbach, 1990) was used. This assessment of internal consistency ranges between .00 and 1.00 and serves to determine whether the instrument has obtained response patterns that are conceptually consistent within the items comprising the scale. An alpha value around 0.70 is generally acceptable although values exceeding .80 are desirable (Gleim and Gleim, 2003, Polit and Hungler, 2000). According to Field (2009), higher values that approach 1.0 represent the strongest evidence of the reliability of an instrument.

RESULTS

It is necessary to present the results in the same order in which the study was designed and the validation occurred for the *IOLF5C.* Table 4 presents the *Aiken V* coefficient for the adequacy of the items and the confidence intervals for each of the basic actions during shots on goal in game situations as well as on penalty shots.

Table 4. Results with *Aiken's V* coefficient values and confidence intervals for each of the variables

	Adequacy of variables						
	V	*90 % CI*		*95 % CI*		*99 % CI*	
Variables	*A*	*Low*	*High*	*Low*	*High*	*Low*	*High*
V1J	0.875	0.78	0.93	0.75	0.94	0.71	0.95
V2J	0.895	0.80	0.95	0.78	0.95	0.73	0.96
V3J	0.875	0.78	0.93	0.75	0.94	0.71	0.95
V4J	0.875	0.78	0.93	0.75	0.94	0.71	0.95
V5J	0.937	0.85	0.97	0.83	0.98	0.79	0.98
V6J	0.917	0.83	0.96	0.81	0.97	0.86	0.97
V7J	0.917	0.83	0.96	0.81	0.97	0.86	0.97
V8J	0.957	0.88	0.99	0.86	0.99	0.81	0.99
V9J	0.980	0.91	1.00	0.89	1.00	0.85	1.00
V1P	0.895	0.80	0.95	0.78	0.95	0.73	0.96
V2P	0.875	0.78	0.93	0.75	0.94	0.71	0.95
V3P	0.917	0.83	0.96	0.81	0.97	0.86	0.97
V4P	0.917	0.83	0.96	0.81	0.97	0.86	0.97
V5P	0.937	0.85	0.97	0.83	0.98	0.79	0.98

VA = Variable adequacy CI = Confidence interval; Low = Lower limit; High. = Upper limit A. = Adequacy; V = Aiken's V value

Table 5 presents the results obtained for Aiken's V coefficient in relation to the clarity of the items including the confidence intervals for the basic actions that take place during the shot on goal in game situations as well as while taking penalty shots.

Table 5. *Aiken V* results and confidence intervals for the variables

	Clarity of variables						
	V	*90 % CI*		*95 % CI*		*99 % CI*	
Variables	*C*	*Low*	*High*	*Low*	*High*	*Low*	*High*
V1J	0.96	0.88	0.99	0.86	0.99	0.81	0.99
V2J	0.96	0.88	0.99	0.86	0.99	0.81	0.99
V3J	0.96	0.88	0.99	0.86	0.99	0.81	0.99
V4J	0.96	0.88	0.99	0.86	0.99	0.81	0.99
V5J	1.00	0.95	1.00	0.93	1.00	0.88	1.00
V6J	1.00	0.95	1.00	0.93	1.00	0.88	1.00
V7J	0.96	0.88	0.99	0.86	0.99	0.81	0.99
V8J	0.98	0.91	1.00	0.89	1.00	0.85	1.00
V9J	1.00	0.95	1.00	0.93	1.00	0.88	1.00
V1P	0.98	0.91	1.00	0.89	1.00	0.85	1.00
V2P	0.98	0.91	1.00	0.89	1.00	0.85	1.00
V3P	0.98	0.91	1.00	0.89	1.00	0.85	1.00
V4P	0.98	0.91	1.00	0.89	1.00	0.85	1.00
V5P	0.98	0.91	1.00	0.89	1.00	0.85	1.00

CV = Clarity of variable; CI = Confidence intervals; Low = Lower limit; High = Upper limit C.= Clarity; V = Aiken's V values

Table 6 provides the data for the qualitative insights and judgments provided by the expert judges regarding certain variables.

Table 6. Qualitative evaluations provided by the expert coaches

Experts	Qualitative Analysis
7	*V1P* If I understand well these are the different possible standards by which each player can assess their performance through their own success and failure criteria. We also can't forget the dimension of arc, or trajectory, of the shot as well as the response of the goalkeeper. It is necessary to work a lot with the players in this aspect to have a concrete chance on a penalty. Ultimately, a large quantity of games are determined by the penalty results given that many games are defensive-oriented and end up 0 to 0 in which case the shootout will decide the outcome.
9	*V2J* It isn't a typical means of dividing the field for blind players- you can break it into thirds with the first third (the defensive third in which the goalkeeper is communicating; the middle third in which the coach can communicate to the players; and the attacking third where the guide is speaking). In this sense, within the final zone it isn't the same thing to receive the ball at the penalty spot where it is centrally located and the player just has to give a move and score. To receive the ball almost in the corner and have to curve it to score is different and the percentages or likelihood of scoring vary greatly within this same zone. *V7J* I would remove the first option given that there won't be a give and go and we can think about the attacking player finishing in a balanced or unbalanced situation in relation to the defensive opponent's actions. But let's see-these are the options. *V2P* In this case I don't think it is so important to consider the quantity of touches but rather the sequence in which they are carried out. *V3P* Within the option of "without manual contact with the ball" you could have two very different types of shots such as the shot that is made on the move or on the run (which is a shot that is frequently utilized by blind players with later onset blindness that have played football with some eyesight) and the shot in which the player is controlling the ball various times prior to the shot
11	*V1J* It may not be a goal but rebounds that are retained by the attacking team. It doesn't appear to be a significant difference to me. *V1P* I think shots that hit the post ought to be considered in the same way as goals or other successful shots.

Table 7 presents the results for the reliability of the observational instrument which was comprised of the essential actions during shots on goal during game situations and during penalty shots.

Table 7. Reliability analysis for the IOLF5C

	Adequacy			*Clarity*			*Total*
	GV	*PV*	*IOLF5C*	*GV*	*PV*	*IOLF5C*	*IOLF5C*
α	*0.803*	*0.917*	*0.869*	*0.707*	*1*	*0.888*	*0.894*
Excluded	*9*	*5*	*14*	*9*	*5*	*14*	*28*
N	*9*	*5*	*14*	*9*	*5*	*14*	*28*

α = Cronbach's alpha; GV = Game Variables ; PV = Penalty Variables;

The reliability index for the instrument, by grouped content, indicated very high levels with an obtained Cronbach α value of *.894.*

DISCUSSION

The intent of this study was to design and validate an observational instrument (*IOLF5C)* to identify the contributors to competitive performance in Football 5-a-Side for blind and partially sighted players. To accomplish this goal, the methodological procedures suggested in the literature (Anguera, 1991; Anguera and Mendo, 2013; Escobar and Cuervo, 2008; Wiersma, 2001) were followed including generating a similar instrument as had been previously created (Cenizo et al., 2016; Jiménez et al., 2013; Nuviala et al., 2016; Mills et al., 2012; Serra-Olivares and García-López, 2016; Villarejo, Ortega, Gómez and Palao, 2014) for the sport context.

In order for the validation process to be satisfactory it was necessary to use a minimum number of expert judges to assure the consistency of the responses to each of the items on the observational instrument (Wiersma, 2001). The participants in the current study provided a quantitative evaluation of the items as well as a qualitative contribution that was designed to further advance the improvement of the *IOLF5C.* Additionally, the process followed the required steps proposed in the literature (Barahona, 2004; Merino and Livia, 2009; Polit and Hungler, 2000; Wiersma, 2001). The judges that participated in the study were 12 expert coaches of Football 5-a-Side for blind players. This number of expert judges is acceptable and exceeds the typical minimum of ten identified in the literature (García, et al., 2016; Hyrkäs, et al. 2003; Jiménez et al., 2013; Mills et al., 2012; Robles et al., 2016; Wiersma, 2001) and contributed an acceptable content validity estimate for the observational instrument. It should be noted that the specific nature of the study limited the number of possible experts on this topic.

The quality of the expert judges relative to Football 5-a-Side for blind players was high because each met three of the four criteria for inclusion that had been established for the study. A majority of the expert judges had a university degree in Physical Activity and Sport (undergraduate or graduate degree in sport or an undergraduate or graduate degree in education with a specialization in Physical Education) and possessed a minimum of five years of experience as a coach of Football 5-a-Side for players with visual limitations and were capable of providing knowledge and information regarding the topic of the study, such as providing reflexive assessments and insights that could enable the researchers to further reflect on the topic (Escobar and Cuervo, 2008). In addition, these individuals were accessible to the investigators which is an additional fundamental premise when conducting observational instrument work (Valles, 2003). Football 5-a-Side is an underrepresented sport/physical activity that counts on adequate resources to provide play and therapeutic outcomes for participants. As such, it is difficult to find individuals who can be categorized as experts on the topic although the sport has attained a level of success for individuals with physical limitations in Spain.

For the content validity of an observational instrument we took into account the suggestion of Anguera and Mendo (2013) to design the categories included within the instrument. In addition, the procedure suggested by Aiken (1985) was followed to calculate the index of content validity. This coefficient is known as *Aiken's V*. The quantitative evaluation of the items that comprised the instrument was divided into two parts for the *basic actions during shooting on goal in game situations (*consisting of the variables *V1J, V2J, V3J, V4J, V5J, V6J, V7J, V8J and V9J)* and a second group of variables for *basic actions during penalty shots (*consisting of the variables V1P, V2P, V3P, V4P and V5P). Both groups of variables make concrete reference to competitive performance in Football 5-a-Side for blind players which enables us to understand success and failure outcomes during shots on goal.

The items selected each met an adequate standard for an observational instrument. None of the items had *Aiken's V* values lower than the critical levels for acceptance (Aiken's V = 0.69, *p*= 0.041) keeping in mind the number of judges and the response range for each item (Aiken, 1985). The *Aiken's V* values in relation to level of adequacy (.875 and .98) and clarity (minimum .96 and maximum 1.00) met the requirements for these types of studies in the social sciences. Aiken (1985), as well as Peinfield and Giacobbi (2004) have proposed a less demanding critical level for *Aiken's V* values for initial studies in the construction of an instrument considering that values exceeding .50 could be an acceptable initial standard for the validation of the instrument.

Charter (2003) and Merino and Livia (2009) suggested the use of a more conservative critical level using an *Aiken's V* value *of* 0.70 or greater. The findings indicate that the items designed for this study possessed content validity in that the levels obtained exceeded the critical levels proposed by these experts. In this study, and following the standards of Merino and Livia (2009), the content validity indices were obtained within a 95% confidence level.

The construction of the instrument has advanced in two phases. In Phase 1 the collaboration of a smaller group of individuals with expertise in the subject matter was relied upon. In Phase 2, the validation process occurred with a larger group of expert judges. The findings make it clear that all of the developed items are appropriate for the observational instrument (IOLF5C). Other studies that have followed these construct validity procedures have included a third phase of development. In this third phase, the instrument is modified or revised through the elimination of those items that do not reach optimal *Aiken's V* values. García et al. (2016) and Ortega, Calderón, Palao, and Puigcerver (2008) suggested criteria for the exclusion or revision of those items that do not reach adequate levels during the quantitative validation process or more demanding criteria such as those proposed by Robles et al. (2016) that rely on fewer expert judges during the validation process. In this validation approach to the IOLF5C instrument, it was not necessary to eliminate any items during this phase.

In the design of the *IOLF5C* instrument the procedure proposed by Anguera and Mendo (2013) has been closely adhered to for the development of each of the items. As such, there has been great precision in the *Core Categories* and

Possible Range of Responses for each (Anguera, 1991). Despite this outcome, the evaluators have made a set of contributions to the study through qualitative analysis for the improvement in the expression of each item.

In the third phase of this study, subsequent to the attainment of valid scores on the instrument, the qualitative evaluations and insights were considered and are indispensable for the continued refinement of the instrument (Bulgner and Housner, 2007; Carretero and Pérez. 2007). There were a few additional qualitative contributions of the Football 5-a-Side for blind players scale through the comments provided by the expert judges regarding the content of the initial instrument. In this pilot study three individuals with expertise in sport for individuals with physical limitations provided this additional insight. The national team coach for Spain for Football 5-a-Side for blind players was included in this group. This group of experts of experts assisted in the development of strict criteria for the inclusion of the qualitative observations. Some additional reflections by expert judges facilitates a greater accuracy to the outcome criteria (Wiersma, 2001).

With regard to the reliability analysis, the reliability indicators were adequate for the assumption of within group reliability with acceptable levels of .70 usually set as a minimum standard although it is typically advisable to have values that exceed .80 (Polit and Hungler. 2000). In the present case, the Cronbach alpha value obtained for the *IOLF5C* was .89. In addition, it is usually advisable to examine the reliability of each variable in the content validity process (level of adequacy and level of clarity). In each of the analyses that were conducted, values exceeding .70 were obtained which can be considered to reach an appropriate standard of validity. As such, the *IOLF5C* can be considered to be a valid observational instrument.

CONCLUSION

The *IOLF5C* instrument can be used in the Sport and Physical Activity context as a valid and reliable tool for the assessment of shots on goal for Football 5-a-Side for blind and partially sighted players. The psychometric process included pilot studies that contributed to the design of the instrument as well as the use of experts in the sport of Football 5-a-Side for blind players to facilitate the development of the tool through the additional insights provided by these experts.

The development, design and validation of whichever observational instrument in Physical Activity and Sport carries with it a meticulous process in which many considerations need inclusion. Among these considerations are a thorough review of the knowledge base, the design and development of the instrument, the selection of the sample, the documentation process and the collection and analysis of the subsequent data to get the instrument in its final state.

One of the limitations of the present study involves the focus of the investigation on Football 5-a-Side for blind and partially sighted players. There are few studies to date that have been conducted on performance in this sport which

highlights the need for this study. The utilization of expert judges for the validation of the *IOLF5C* instrument in Football 5-a-Side for blind and partially sighted players contributes to the relevance and the value of this instrument in its application. Subsequent practical application of the instrument to actual competitive contests will provide relevant information to coaches and enable them to modify game strategies.

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