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ORIGINAL

VALIDATION OF AN INSTRUMENT ON TACTICAL- OFFENSIVE KNOWLEDGE IN PLAYERS WITH INTELLECTUAL DISABILITY

VALIDACIÓN DE UN INSTRUMENTO SOBRE CONOCIMIENTO TÁCTICO-OFENSIVO PARA JUGADORES CON DISCAPACIDAD INTELECTUAL

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ABSTRACT

The objective of this work is to build and validate a tool that allows, reliably, evaluate the base knowledge of players with mild intellectual impairment in aspects of offensive tactical in FS, so that it can be used as an additional initial evaluation to guide the training process of coaches. The sample size is constituted by 68 subjects ($M_{age}=27$; $SD_{age}=9.06$ y $M_{experience}=11.78$; $SD_{experience}=1,29$). The results show satisfactory internal consistency and reliability values ($\alpha=0.64$, $\omega=0.74$, $ICC=0.64$ and test-retest). In a complementary manner, a qualitative analysis was carried out, through a collective interview with a group of experts, about the utility of the instrument in this population of athletes. The results allow to establish a solid base for the use of this instrument in future studies.

RESUMEN

El objetivo de este trabajo se centra en construir y validar una herramienta que permita, de forma fiable, evaluar el conocimiento de base de jugadores con discapacidad intelectual leve en aspectos de táctica ofensiva en FS, permitiendo usarlo como evaluación inicial complementaria que guíe el proceso de entrenamiento. El tamaño muestral fue de 68 jugadores ($M_{edad}=27$; $SD_{edad}=9.06$ y $M_{experiencia}=11.78$; $SD_{experiencia}=1,29$). Los resultados muestran valores adecuados de consistencia interna y de fiabilidad ($\alpha=0.64$, $\omega=0.74$, $ICC=0.64$ y test-retest). De manera complementaria, se realizó un análisis cualitativo, mediante una entrevista colectiva a un grupo de expertos, sobre la utilidad del instrumento en esta población de deportistas. Los resultados permiten establecer una sólida base para el empleo de este instrumento en futuros estudios.

PALABRAS CLAVE: discapacidad intelectual, toma de decisiones, deporte adaptado, fútbol sala.

KEYWORDS: Intellectual disabilities, decision making, adapted sport, futsal.

INTRODUCTION

Studies involving sports for people with mild intellectual disability (MID) sustain that these athletes show lower performance in various cognitive tasks, but it can be improved through specific training. It is especially important to evaluate the cognitive aspect through the athlete's basic tactical knowledge, which is related with MacMahon and McPherson's (2009) research line about knowledge base, in order to adjust the training programme and, therefore, to optimise their sport performance (Meilán, Salgado, Arana, Carro, & Jenaro, 2008; Van Biesen, Mactavish, & Vanlandewijck, 2014).

As pointed out by Wehmeyer and Obremski (2010), problem solving requires adequate decision making, which may be affected by the limitations in intellectual functioning. These limitations include, but are not limited to: difficulty in idea comprehension, reasoning, problem solving, planning, abstract thinking and using experience to acquire new knowledge. They are all relevant aspects for optimal tactical and decisional learning (De la Vega, 2003).

Decision making can be defined as a complex process from the psychological and motor perspectives (De la Vega, Del Valle, Maldonado, & Moreno, 2008) during which the individual is exposed to several alternatives affected by the playing context and has to choose one of them to achieve an outcome, which can be right or wrong (Elwyn & Miron-Shatz, 2010; Lim & Jain, 2010; McPherson & Kernodle, 2007; Ruiz-Pérez & Arruza, 2005).

From the perspective of cognitive psychology, Anderson (1987) already mentioned how knowledge structure, of an indoor football (IF) player in our case, is conformed based on two types of knowledge: declarative and

procedural. This division is based on the difference between knowing how to do (procedural), i.e. the execution of the appropriate movement skill to solve a problem, and knowing what to do (declarative), i.e. the ability to determine the correct alternative based on an organised body of information (Abernethy, Thomas, & Thomas, 1993; Fernández, Moreno, Gil, Claver, & Moreno, 2014).

The development of declarative knowledge, according to authors like Gréhaigne, Wallian and Godbout (2005), López-Ros (2011), Raab (2003) and Ruiz-Pérez and Arruza (2005), is closely related to the command of tactical thinking, which is the player's ability to know and express the best decision regarding the motor action to be performed in each playing situation. Tactical thinking would allow for development of procedural knowledge (Allard, Deakin, Parker, & Rodgers, 1993; De la Vega et al., 2008; Matias & Greco, 2010).

A thorough literature search was conducted on the data bases Web of Science, SportDiscus, SciELO, Redalyc, Scopus, ERIC, Dialnet and Pubmed, using keywords such as *intellectual disabilities*, *decision making*, *adapted sport* and *futsal*. It revealed the low importance that has been given to the analysis of decisional elements in sports for people with MID. Taking basketball as reference, Pérez-Tejero, Polo-Más, Pinilla and Coterón-López (2017) established that the trainers and referees from their study considered individual offensive tactics to be the element with the greatest limitations among players with intellectual disability (ID). These limitations, according to Pinilla, Pérez-Tejero, Van Biesen and Vanlandewijck (2016), may be explained due to the difficulties that players with ID encounter when performing individual and collective tactics where cognitive skills are required in order to perceive, decide and execute properly.

Within the context of IF, the most relevant precedent is the research by Moya, Villagra and García (2006). This study, under the ecological paradigm, revealed a relationship between the technical and tactical level of players with ID and their performance. They agreed on the importance of individual analysis and assessment of players' abilities and competence in order to optimise their training process.

Table 1 shows other studies involving decision making in basketball and table tennis which focused on the analysis of the action's procedural aspect. The recent strong influence from the ecological paradigm (Araújo & Davids, 2011; Kelso, 2012) can be noticed, with studies based on the adaptation strategies applied by players depending on the playing situation examined (Davids, Renshaw, Pinder, Araújo, & Vilar, 2012).

Table 1: Studies addressing tactical ability in athletes with ID.

BASKETBALL	
STUDY	CONCLUSION
Guidetti, Franciosi, Emerenziani, Gallotta, & Baldari (2009)	This study proved that a basketball-specific training programme produced a general improvement in sport performance and basketball skills in all athletes with ID. Besides, the test battery proposed in this study could be useful to assess whether the individual or team technical and tactical skill levels would be appropriate to participate in a specific competition category, based on four levels of difficulty for ball handling, reception, pass and throw.
Franciosi, Gallotta, Baldari, & Emerenziani (2012)	They confirmed the results of previous studies, revealing significant improvements in basketball players with ID after a training programme focused on ball handling, reception, passing and throwing skills. Furthermore, the basketball test battery could be useful to monitor and improve training.
Pérez-Tejero, Pinilla & Vanlandewijck (2015)	There is lack of studies on aspects related with decision making during playing and the comparison with players without ID.
Pinilla et al. (2016)	People with ID presented limitations in their problem-solving capacity, which negatively affected their tactical decision making during playing situations. This allowed for distinguishing between players with and without ID.
Pinilla, Pérez-Tejero & Van Biesen (2017)	Players with ID achieved lower performance level than players without ID. Cognitive limitations may have a negative effect on playing situation interpreting, decision making and team action construction.
TABLE TENNIS	
STUDY	CONCLUSION
Van Biesen et al., (2014)	Players with ID presented reduced tactical ability when returning a serve to score a point compared to players without ID.
Van Biesen, Mactavish, Kerremans & Vanlandewijck (2016)	The cognitive limitations of players with ID prevent them from competing under equal conditions with players without ID.

This approach, despite being very relevant, does not address the need of finding instruments that allow, within the context of MID, for assessment of players' knowledge base level in order to organise the training contents based on the previous ones. In this approach, it is important to interpret the interaction between the action component (procedural) and the representation component (conceptual), since the best player's adaptation would result from their balance, after overcoming technical and tactical procedural limitations within the representation component (De la Vega, 2003; De la Vega et al., 2008).

It is at this point where this research becomes especially relevant. We believe that an individual's adaptation to the environment comes in the first instance from the knowledge of the importance of the declarative/conceptual component, trying to apply all resources available, also the motor ones, to generate new declarative and procedural knowledge. In this regard, previous studies from a neurocognitive approach (Calvo-Merino, Glaser, Grèzes, Passingham, & Haggard, 2004) have supported the idea that when we see someone performing a motor action that is already in our repertoire, our brain creates the conditions to simulate the viewed action, resulting in a useful research

methodology, since it allows for determination of motor action knowledge. This approach, included in the techniques used in sport psychology known as “visualisation”, offers an interesting perspective to interpret the importance of the connections established between the movement mental representation and the motor action (Moran, 2009).

After introducing the main conceptual aspects this research is based on and detecting the lack of studies regarding the knowledge base of players with MID in IF, the main aim of this research is to design and to validate a tool to reliably determine the knowledge base of players with MID regarding offensive tactical aspects in IF. Due to the limitations to access the population under study, given the limited number of players, this research aims to be a first pilot study on the instrument's properties.

METHOD

The research design combined quantitative and qualitative methodologies using a group interview. We believe, as stated by Castañer, Camerino and Anguera (2013), that this methodology has been consolidating in the last decade given the need of combining both aspects for human movement research.

Participants

The complexity of accessing the sample with the required characteristics must be emphasised. The sample for this pilot study was composed of 68 participants ($M_{age}=27$; $SD_{age}=9.06$ and $M_{experience}=11.78$; $SD_{experience}=1.29$). They were divided into two groups based on intellectual disability (yes/no). All participants belonging to the MID group provided the corresponding disability report. Group A: consisted of 34 IF players with MID ($M_{age}=24.5$; $SD_{age}=7.11$ and $M_{experience}=11.09$; $SD_{experience}=0.93$) who participated in the first or second division (*División de Honor* and *Primera División*, respectively) organised by the federation of sports for athletes with intellectual disabilities of Madrid (Federación Madrileña de Deportes para Discapacitados Intelectuales, FEMADDI). Group B: consisted of 34 IF players without MID ($M_{age}=29.2$; $SD_{age}=10.25$ and $M_{experience}=11.52$; $SD_{experience}=1.16$).

Group A was selected from the population with ID who practised IF. All these players had been diagnosed with MID. Group B was created incidentally. Participation was voluntary and all ethic principles of the Declaration of Helsinki (World Medical Association, 2013) were followed. The approval by the ethics committee of the Autonomous University of Madrid was obtained.

Instrument

The research methodology was based on data collection through an *ad hoc* instrument in order to validate a tool to evaluate knowledge base in decision making during the offensive phase in IF players with MID. Since this was a pilot study, the offensive phase was chosen to limit the tactical complexity and to increase the knowledge of these game principles by players with MID.

The instrument creation was based on a scientific literature review on technical-tactical actions during IF attacking phase (Gallego-Jiménez, 2013; Hermans & Engler, 2010). A similar methodology to the one proposed by De la Vega (2003) in his doctoral thesis on tactical comprehension in football and by De la Vega et al. (2008) was used. 26 possible actions were obtained according to the two variables suggested by Hernández-Moreno (2005) and Lasierra-Aguilá and Escudero-Pereira (1993): attacking player with ball (18 actions) and attacking player without ball (8 actions). These actions were confirmed by two IF experts with 20 years of experience in training players with ID (Autonomous University of Madrid and A LA PAR Foundation) as aspects to work on during the training season for this population with disability.

In order to meet all the established principles regarding criterion validity (Skjong & Wentworth, 2001), 14 expert practitioners, with more than 10 years of experience in IF training with people with ID ($M_{experience}=12.42$; $SD_{experience}=2.10$), were contacted. They were requested to score the 26 technical-tactical actions based on comprehension difficulty for players with MID. This scoring was done on a Likert-type scale (from 1-highest difficulty to 5-lowest difficulty), in order to limit the number of actions to the most comprehensible by this population. The experts scored four actions with the maximum value (5): supporting player with ball, space creation, pass and shot.

After having selected these four actions, 24 items (IT) were represented, with three plays each as possible answers (A, B or C) (De la Vega, 2003). In order to include the ITs based on their content and comprehension adequacy, the rigour criteria established by Cohen and Swerdlik (2001) and Voutilainen and Liukkonen (1995) were applied. ITs were reduced to 12, those on whose relevance more than 80% of the expert practitioners agreed.

Given the complex symbology used in the representations and the difficulties that players with MID encounter with information processing, it was decided to present each of the 12 ITs in an audiovisual form (Bailey, Willner, & Dymond, 2011; Fisher, Bailey, & Willner, 2012).

An SMX-F40BN (Samsung manual 65xintell-zoom) video camera was used, with 1/6" CCD sensor, 680 K, 52x optical zoom, H.264 recording format and 720x480 resolution. Subsequently, the videos were edited with the software "After Effects" and combined in audiovisual format (link to the final questionnaire provided). The participants in this process were selected incidentally, based on availability and experience in IF longer than 15 years.

<https://m.youtube.com/watch?feature=youtu.be&v=1H8EXW9qz7Y>

Once the instrument was designed, 28 level-one or higher IF trainers awarded by the IF federation of Madrid were requested to collaborate. This group of expert practitioners ($M_{age}=33.25$; $SD_{age}=12.33$ and $M_{experience}=12.25$; $SD_{experience}=8.51$) evaluated the plays/options (A, B, C) for every IT and assigned a score of zero to the least appropriate option, one to the acceptable

one and two to the most adequate option, following the criterion evaluation for judges to determine a standard score (Jornet-Melía & González-Shuch, 2009). After the interpretation of the scores provided by this group, a mean score was given to each play/option (described in the Results section).

To complete the tool construction process, a pilot study was conducted with three people with MID to confirm whether they were able to understand all plays/options that composed the 12 ITs of the audio-video. A test sheet was created where they could mark the chosen option with an X. The results were positive and they were able to give the answers without reporting any difficulty during the test (Carbó-Carreté, Giné, & Guardia-Olmos, 2013).

Procedure

The tool was introduced to the players under controlled laboratory conditions (French & Thomas, 1987) in an especially prepared space in the sport facilities. Every player was provided a test sheet and answered as they watched the ITs, with approximately 5 seconds after every IT. Not more than three players did the test at the same time. The data collection was conducted in the middle of the season, during the training sessions.

Before they started the test, the players were instructed to view all three plays/options of one IT and then to choose an answer. Moreover, they were informed about the instrument's goal and its development:

“The video-questionnaire is composed of offensive actions based on fundamental offensive aspects. For each action you are going to see on the screen, you must choose (make a decision) one of the three possibilities: A, B or C. These actions are shown through the recording of different plays. You are the attacking player who is marked with an arrow above his head”.

Statistical analysis

The statistical analysis was performed using the software package SPSS 22.0 for Windows (IBM-SPSS, 2013). The descriptive statistics of the answers provided by the 28 trainers yielded an *M* score for each possible play/option (A, B or C). This value was taken as reference for the answers selected by the players of our sample.

Cronbach's alpha (α) and *Omega coefficient* (ω) were calculated for the answers collected ($N=68$) in order to assess the tool's reliability (Elosua-Oliden & Zumbo, 2008). The *Intraclass correlation coefficient* (ICC) was calculated to determine the degree of intraclass agreement, as proposed by Landis and Koch (1977).

The answers' stability or repetitiveness was assessed through the *test-retest* method (Cuevas, García-López, & Contreras, 2015; Moreno, Moreno, García-

González, Gil, & Del Villar, 2010; Ruiz-Pérez & Graupera, 2005), which compares the answers of the same group with a time lapse of 10 days. This group (N=20) was taken from the sample. The answers were compared through the *Student's t* parametric method for paired samples with the aim to determine the existence of significant differences at a specific significance level (p).

With the purpose to provide specific information of both groups, a factorial analysis was performed through the principal component extraction method (PC). The Factor value (FAC) was calculated as the mean value of the 12 ITs for every player (Liu, Kuang, Gong, & Hou, 2003). This FAC allowed for comparison and for determination of significant differences between the two groups.

Qualitative analysis

The researchers considered it necessary to facilitate a better understanding of the test implementation and validation process. Thus, in keeping with the current social model (Oliver, 1992), the perceptions of the trainers with experience in IF with people with ID involved in the process were recorded. A group interview, what McKernan (1999) called 'seminar', allowed for an in-depth discussion with three experts related with the subject under study. Indeed, as it will be described later in the analysis, the conversation focused on test usefulness, validity and adequacy. Real situations were discussed and its difficulty was analysed, comparing the information obtained from the statistical analysis and the experts' opinions.

RESULTS

The application of descriptive statistics to the answers provided by the trainers on each of the three plays/options (A, B or C) of the 12 ITs yielded the M standard scores (Table 2).

Table 2. Descriptive analysis of the trainers' answers.

IT	Plays/options	N	M	SD
IT1	A	28	1.21	0.83
	B	28	0.32	0.55
	C	28	1.46	0.58
IT2	A	28	0.32	0.61
	B	28	0.86	0.59
	C	28	1.82	0.39
IT3	A	28	0.75	0.75
	B	28	0.79	0.79
	C	28	1.46	0.74
IT4	A	28	1.43	0.74
	B	28	0.89	0.83
	C	28	0.68	0.72
IT5	A	28	1.43	0.63
	B	28	0.68	0.82
	C	28	0.89	0.83
IT6	A	28	0.82	0.86
	B	28	1.5	0.75
	C	28	0.68	0.61
IT7	A	28	1.68	0.48
	B	28	0.00	0.00
	C	28	1.32	0.48
IT8	A	28	1.32	0.72
	B	28	0.29	0.66
	C	28	1.39	0.57
IT9	A	28	0.29	0.6
	B	28	1.5	0.64
	C	28	1.21	0.69
IT10	A	28	1.75	0.44
	B	28	0.61	0.79
	C	28	0.64	0.62
IT11	A	28	0.89	0.74
	B	28	0.5	0.75
	C	28	1.61	0.57
IT12	A	28	1.71	0.46
	B	28	0.00	0.26
	C	28	1.0	0.57

Subsequently, after obtaining the answers from the 68 participants of the sample, the *M* values were extrapolated for each play/option (A, B or C). By doing so, a numerical value was assigned to the decisions made by the participants when choosing one of the plays/options they viewed in the video-questionnaire for each of the 12 ITs.

After taking these values as reference, the tool reliability was assessed. The value obtained ($\alpha=0.64$) was below the acceptable level (0.7) proposed by George and Mallery (2003). By contrast, this was an acceptable reliability level

for exploratory studies, as stated by Fisher, Matthews and Gibbons (2016) and Nunnally and Bernstein (1978).

This reliability coefficient resulted from the loading of the IT covariances and the number of ITs, i.e., the proportion of the instrument total variance and the number of ITs.

$$\alpha = \frac{n}{n-1} \left(1 - \frac{\sum_i V_i}{V_t} \right)$$

The formula proposed by McDonald (1999) yielded an ω value of 0.74, which was within the acceptable reliability values:

$$\omega = \frac{(\sum_{i=1}^n \lambda_j)^2}{(\sum_{i=1}^n \lambda_j)^2 + \sum_{i=1}^n var(e)_{ii}}$$

Consistency was assessed through the ICC. The result was ICC=0.64, meaning a substantial strength of agreement, as it lay within the range [0.6-0.8] proposed by Landis and Koch (1977).

The test-retest method did not yield any significant differences at 95% confidence level in any of the 12 ITs (Table 3).

Table 3. Student's t for the group test-retest answers.

N=20	IT1	IT2	IT3	IT4	IT5	IT6	IT7	IT8	IT9	IT10	IT11	IT12
p	0.15	0.46	0.33	0.33	0.11	0.15	0.06	0.70	0.35	0.97	0.88	0.40

Once the tool validity and reliability had been assessed, the FAC value was calculated through factorial analysis using the PC extraction method. The data reduction allowed for explanation of the largest amount of information possible for the 12 questionnaire ITs. It was observed that CP1 factor loadings provided the highest percentage of model explanation (Figure 1) (Table 4).

Figure 1: Scree plot.

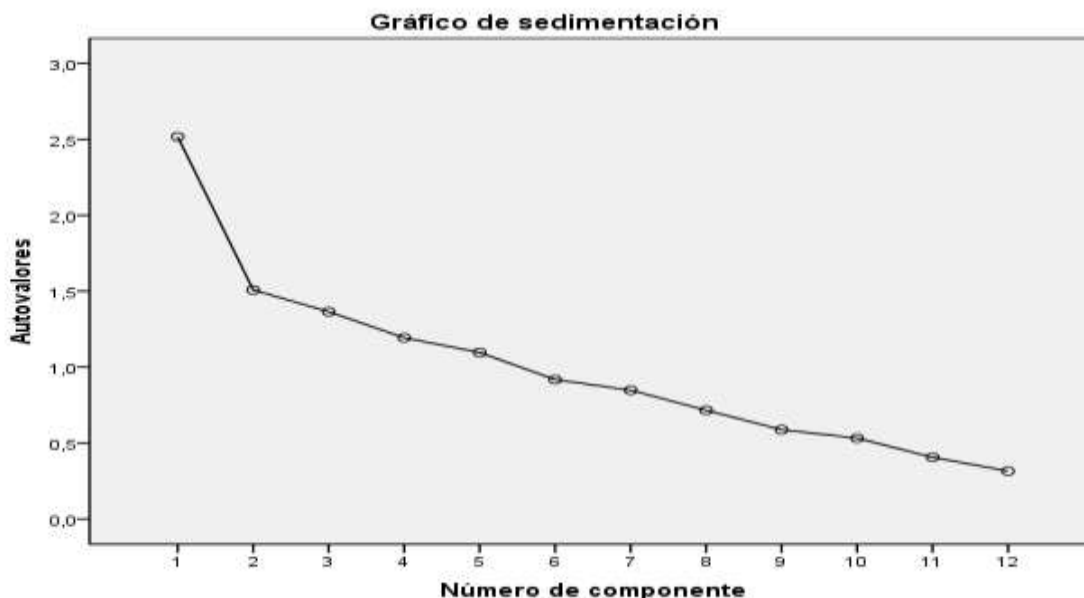


Table 4. CP1 factor loadings.

Component matrix												
	IT1	IT2	IT3	IT4	IT5	IT6	IT7	IT8	IT9	IT10	IT11	IT12
CP1	0.514	0.423	0.293	0.030	0.338	0.410	0.655	0.577	0.476	0.628	0.309	0.478

These CP1 factor loadings were used to calculate the coefficients for each IT (Table 5), which led to the FAC value through the following logarithmic formula:

$$X_{ij} = a_{i1} \cdot Z_{1j} + a_{ik} \cdot Z_{kj} = \sum_{s=1}^k a_{is} \cdot Z_{sk}$$

Table 5. Coefficients for FAC value calculation.

Component value coefficient matrix												
	IT1	IT2	IT3	IT4	IT5	IT6	IT7	IT8	IT9	IT10	IT11	IT12
CP1	0.204	0.168	0.116	0.012	0.134	0.163	0.260	0.229	0.189	0.249	0.123	0.190

The logarithmic formula for FAC calculation yielded a global numerical value for all answers from the sample. FAC mean value (*M*) was 0, with a standard deviation (SD) of 1. From this, it can be assumed that the score FAC=0 is considered acceptable, while scores of FAC<0 would be less correct and FAC>0 would be more correct.

The answers obtained from the sample followed the pattern shown in Table 6 regarding the FAC *M* value in the two groups handled in this research.

Table 6. FAC M value in both groups.

	Group A	Group B
FAC M	-0.364	0.364

As mentioned earlier, the statistical analysis was complemented with qualitative analysis for better understanding of the process. The information from the most representative questions of the group interview is presented here:

Question: From your point of view, could a test like this, offering various alternative answers, be useful to present the basic attacking principles and those alternatives as knowledge base during the learning process? (Tutor2-UCJ-28'.45").

Answer: *"I think athletes with MID would most probably understand the questionnaire images. Players with MID will generally provide the answer that has best worked for them, since it is the one they have internalised and the first one that would come to their minds. I believe they are not very willing to explore alternative answers"* (Part3-UCJ-29'.07").

This statement was supported by participant 2, who believed they could learn it, provided it was used in a real playing situation and for the necessary time:

"It is true that, if it (the behaviour) could be changed in some way, the idea of the video could be useful if it was repeated enough. It is the best test I can think of" (Part2-UCJ-30'.21").

The following statement reveals how participant 1 also agreed with the test validity, highlighting the alternatives offered:

"Yes, they will learn a new alternative that will be useful in order to choose among the different possibilities" (Part1-UCJ-30'.32").

Subsequently, the experts were asked their opinion on the tool adequacy for the age and experience of the players with MID.

Question 6: Is there any specific experience level or competition category where the questionnaire could be adequate and especially useful? (Tutor 2-UCJ-33'.39").

Answer: *"I wouldn't consider age relevant; it is not a variable to be taken into account in players with MID"* (Part2-UCJ-34'.03").

As seen above, expert 2 did not consider age a relevant variable in players with MID. Nevertheless, expert 3 would recommend the age range of 16-18 years, since a player of this age could have enough experience to understand the aim

of the test. For this expert, the major difficulty lay on applying their knowledge to the different situations:

Answer: "I would suggest the age range of 16-18 years old, when he will probably start to understand what the aim of the test is. From my point of view, one limitation is that the player understands what I am showing and that it is useful to improve his performance. The problem arises when he needs to put it into practice while playing" (Part3-UCJ-34'.12").

In this regard, expert 1 emphasised the need of giving players time to learn, at least one school year.

Answer: "I think they should receive training at a sport school for at least one school year in order to understand the game logics" (Part1-UCJ-35'.25").

DISCUSSION

The tool proposed in this research is based on the use of simulated and controlled situations and has allowed for assessment of knowledge base in players with MID. Cognitive structures were used to make decisions that involved tactical game situations, such as supporting the player with ball, space creation, passing or throwing actions.

A mixed model combining quantitative and qualitative data was applied to validate the tool in order to confirm the robustness of the results. The usefulness of this method has been introduced in the field of Physical Activity and Sport Sciences in the last few years (Castañer, Camerino, & Anguera, 2013). Besides, Johnson, Onwuegbuzie and Turner (2007) have supported the development of these mixed models to confirm research hypotheses and, therefore, to be able to acquire new knowledge.

The use of α assumes that the measuring model assigns the same loading to the error variance of all ITs (tau-equivalence), interpreting the continuous nature of the variables when they are strictly parallel in the correlation matrix (López-Pina, Sánchez-Meca, & López-López, 2012; Raykov & Marcoulides, 2015; Cronbach, 1951).

This reliability measure was discussed and questioned, since the tau-equivalence assumption of a scale that produced the same sensitivity in all ITs was not very realistic and, therefore, violated. For that reason, it was necessary to apply other reliability measures to determine internal consistency using a construct or factor, assuming the correlational errors of every IT. The error was unique for every IT and was uncorrelated with factor score and with other IT errors (Deng & Chan, 2017; Jöreskog, 1971; Zinbarg, Revelle, Yovel, & Li, 2005; Viladrich, Angulo-Brunet, & Doval, 2017).

ω is considered a practical alternative to α for reliability estimation within internal consistency in a factorial model, using the factor loading of every IT (λ_j).

It starts from a congeneric measurement model that allows for establishing discriminating values among the ITs (Revelle & Zinbarg, 2009; McDonald, 1999; Dunn, Baguley, & Brunsden, 2014; Zhang & Yuan, 2016; Raykov, 1997).

The tool, composed of 12 ITs, presented an ω value of 0.74, which lies within the optimal values for internal consistency. Similarly, the dimensions yielded a coefficient higher than 0.70, confirming its reliability (Bruner & Benson, 2018; Iturbide-Luquin & Elosua-Oliden, 2017; Viciano, Mayorga-Vega, Guijarro-Romero, & Martínez-Baena, 2017; Viladrich, Angulo-Brunet, & Doval, 2017).

The requirements that a measuring instrument should meet are: validity, reliability and stability. In order to prove these premises, the quantitative test-retest was conducted, confirming the stability of the IT answers.

By means of a qualitative test, it was discovered that all the participants in the discussion believed that these players would be able to understand the tool's purpose. Furthermore, the experts considered that the tool could be a useful complementary instrument for tactical training in IF, since it shows the players several valid options for a specific playing situation. The experts evaluated the tool positively as a method to assess the knowledge base level of players with MID.

The answers provided by group A were below what is considered acceptable for FAC score. This confirmed, when comparing *M* with group B, that there were large differences in declarative tactical knowledge base, which affects decision making. This result confirms the studies conducted by Pinilla et al. (2016), Pinilla et al. (2017), Van Biesen et al. (2014) and Van Biesen et al. (2016), where players with MID made worse decisions than players without MID, despite practising the same sport.

CONCLUSIONS

The tool created and proposed in this research meets the validity, reliability and stability criteria for data collection, analysis and result extraction. The tool allows for assessment of knowledge base regarding tactical offensive actions in IF players with MID.

The analysis of the information obtained revealed that players with MID were able to make decisions in spite of their cognitive limitations. The comparison of the answers provided by players with and without MID yielded differences in knowledge base related to offensive actions in IF. The answers provided by the group with MID were below what was considered acceptable (FAC=0).

This manuscript aims to be the beginning of a research line on decision making in people with ID within the physical activity field. Therefore, research collaboration is deemed relevant and necessary in order to contribute to innovation and progress in the assistance to people with disability using physical activity according to their different possibilities.

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