Impact of intellectual impairment on basketball performance through coaches and referees’ opinion: a qualitative approach

Ignacio Polo*, Javier Pérez-Tejero*, Javier Pinilla* and Javier Coterón*

ABSTRACT: Basketball for players with intellectual impairment (II) is not included as a Paralympic modality due to the lack of evidence based eligibility systems to ensure that only athletes with significant limitations performing basketball participate in II-competitions. Eligibility systems in II-basketball are under development but is necessary to investigate the impact of the impairment in basketball. The aim of this study was to know the point of view of II-coaches and referees about the limitations of their players and the components that should be considered as eligibility criteria. Qualitative method was used in our research. For that 5 open questions were elaborated based on the components of the game identified in the literature. 47 coaches and 6 referees were interviewed through an online survey. The findings of this study indicated that tactical aspects was the component in which II-players present more limitations and should discriminate between eligible and no eligible players followed by technical skills, emotional aspects and cognitive aspects. Physical and motor skills were not considered as limitation but specific positions and roles during the game could be influenced by these components. These results as well as other similar studies that show the opinion of coaches and referees should be taken into consideration to orientate future research to develop evidence-base eligibility systems in this sport.

Keywords: Paralympic Sport, Eligibility Systems, Classification.
indicated that II-athletes seemed to present limitations to reach performance levels as high as AB-players. However, as these authors indicated, it was needed to investigate which components of basketball performance are more negatively affected by II.

Perception of coaches has contributed to better understand the influence of different variables on basketball players' development: technique, tactic, physical performance and psychology during players' development stage (Nuno, Vaz, Maçãs and Sampaio, 2009), rules adaptation in kids (Vizcaino, Conde, Sáenz-López and Rebollo, 2013), specialization per playing position (Ortega, Salado, Gómez, Palao and Piñar, 2011) and the kind of game systems that should be used training young players (Ortega, Salado and Sainz de Baranda, 2013). Provided that coaches' opinion can reveal relevant information about the components that might be determinant to perform in basketball, also, the opinion from experienced coaches and referees in II-basketball could contribute to identify how II affects II-players performing basketball.

The aim of this study was to analyze II-basketball coaches and referees' opinion about the impact of intellectual impairment on basketball performance. This study could contribute to orientate future research in the development of II-basketball systems (Tweedey and Vanlandewijck, 2011) and to re-include this modality in the Paralympic program.

**Method**

**Participants**

The sample was composed of 47 II-basketball coaches and 6 II-basketball referees. Coaches were divided into four groups according to the level of competition in which they trained: INAS (International competition), competition, adapted and ability. Coaches from INAS were from different nationalities while coaches from other groups and referees participated in Spanish competitions. Description of the sample (N, age and years experience in II-basketball) that participated in this study is presented in table 1.

**Measure**

An online survey was designed ad hoc to address the aim of the present study. Five-open questions were included referring to different topics that, based on the existing literature, might explain the influence of II on basketball performance: a) principal differences between II-players and AB-players (Pérez-Tejero et a, 2015); b) difficulty in motor and skills components (Lahtinen, Rintala and Malin, 2007; Van de Vliet et al; 2006), c) aspects influenced by IQ level during the game (Van Biesen et al; 2012; Perez-Tejero et al., 2015), d) influence by playing position in the game (Dežman, Trninic and Didzar, 2001) and e) aspects that can be considered for determinate eligibility systems (Franciosi et al; 2010 and according to inductive category development suggested by Mayring (2000). The meaning units of the answers corresponding to each question were identified, labeled and subsequently first sorted into categories in an inductive process by a researcher. Afterwords, this first grouping was reviewed by a second researcher. In line with recommendations by Miles and Huberman (1994) and Patton (2002), most categories were labeled on existing theoretical concepts and frameworks. New themes emerged were assigned following discussion. Final set of categories was defined by agreement of both researchers.

**Results**

A total of 377 meaning units were defined and distributed in categories as shown in table 2.

Related with the differences between II and AB-players, 21 of 53 participants admitted that tactical aspects were one of the most differentiating aspects between players (e.g. specific positions in the court, change between offensive and defensive role), followed by adaptive behavior (Decision making in new situations. Coach 2). Additionally, coaches expressed that emotional components play an important role in II-players due to the importance of stress management in critical situations in the game. Technical skills were the least relevant aspect coaches' opinion. Finally, 11 participants explained that differences between II-players and AB-players depend on IQ level of II-players (Depending on the level of disability of players, the difference could increase or decrease. Coach 16 and 25).

To guarantee that questions were appropriate to answer the research question, expert criteria validation was conducted (De Yébenes, Salvanés and Ortells, 2009). To do this, the last version of the questionnaire was sent independently to 6 basketball experts that met all following criteria: to have a PhD related with basketball, to be basketball professor at the University with at least five years of experience, to have the national basketball coach certificate and to have published articles in journals or books related with basketball. Experts were asked to review grammatical questions and the property of the 5 open questions. Basketball experts presented 100% agreement for inclusion of all open questions with no grammatical changes.

**Table 1 Sample description**

<table>
<thead>
<tr>
<th></th>
<th>INAS (IN)</th>
<th>Competition (COM)</th>
<th>Adapted (ADP)</th>
<th>Ability (ABL)</th>
<th>Referees (REF)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>7</td>
<td>18</td>
<td>14</td>
<td>8</td>
<td>6</td>
<td>53</td>
</tr>
<tr>
<td>Age</td>
<td>50.1 (10.98)</td>
<td>34.9 (9.86)</td>
<td>33.64 (9)</td>
<td>38.87 (11.8)</td>
<td>30.83 (5.19)</td>
<td>36.72 (10.95)</td>
</tr>
<tr>
<td>Experience</td>
<td>18.2 (14.08)</td>
<td>8.28 (7.86)</td>
<td>7.64 (4.8)</td>
<td>7.12 (7.73)</td>
<td>1.83 (0.75)</td>
<td>8.41 (7.9)</td>
</tr>
</tbody>
</table>
level (By motor skills greater level of impairment greater problem in learning technical skills and/or physical abilities. Coach 13).

Regarding the aspects in the game that could be affected by IQ level, 14 participants expressed that technical skills (specially shooting efficiency) and tactic aspects were the components most negatively influenced by IQ level. Finally, 7 participants believed that decision making could be influenced by IQ level. Most of participants believed that skills, attributes and knowledge’s level could be influenced by each player’s specific position. Moreover 8 participants expressed that physical aspects should be accounted to establish the position on the court (Basically the specific position is determined by the height. Referee 2). Finally, specific position can be influenced by total experience of II-players.

In figure 1, number of references obtained related with the aspects during the game that should distinguish between an eligible or non-eligible II-basketball player are presented. It was observed that 17 participants considered that the first step to distinguish between an eligible or non-eligible player is to have an IQ certificated (Anyone with intellectual impairment can play basketball. Coach 8). Tactical aspects were the most referenced in this question, highlighting specific position on the court followed by decision making in specific situations and defensive role. Technical skills and emotional aspects with 13 references were another term they considered that should be taken into account on eligibility systems. With regard to technical skills, participants considered shooting skills and ball handling as aspects to consider in eligibility system. To tolerate frustration in stressful situations during the game was the aspect most valued as emotional component. Another interesting result was that coaches believed that II-players must understand and apply the rules of basketball (Knowing the rules of basketball is fundamental. Coach 23).

**Discussion**

This study aimed to analyze II-basketball coaches and referees’ opinion about the impact of intellectual impairment on basketball performance. Results from this study provided relevant information that could orientate future research in the development of II-basketball eligibility systems (Tweedy and Vanlandewijck, 2011).
One aspect to analyze was the differences between II-players and AB-players. In this line, Van Biesen, Mactavish and Vanlandewijck (2014) demonstrated that II was associated with a decrease in tactical proficiency in table-tennis. Moreover, previous studies found that the learning process in II-athletes had significantly lower levels compared with AB-athletes (Van Biesen et al., 2012). Most of coaches and referees considered that tactics following by adaptive behavior were the most differentiating aspects between players. A recent study demonstrated that II-basketball players spend significantly (p≤0.05) more time to decide and execute a solution to solve a basketball game situation than AB-players (Pinilla et al., 2016). Also, II-players made more rule infractions, fakes and dribbles than AB-players. Another interesting result from the present study is stress management. This state of stress can be characterized by the decrease on players’ performance (Navarro Barragán, Gómez Ruano, Lorenzo and Jiménez, 2013).

There is some controversy about motor difficulty of II-players in opinion of coaches and it seems that technical skills and physical aspects are associated in this case. Franciosi, Guidetti, Gallotta, Emerenziani and Baldari (2010) showed that there were significant contributions between ball handling and explosive leg power and upper-body muscular strength. Forearm and upper-body muscular strength and endurance, had a positive contribution to passing. Finally, explosive leg power had a positive contribution to reception and shooting.

With regard to aspects influenced by IQ level, coaches agreed that technical skills and decision making are relevant. According to Burns (2015), II-players might present higher limitations in those activities with higher cognitive demands. That could explain the higher performance variability found between II-players at the same competition when compared with AB-players (Pinilla et al., 2015). Most of participants considered that IQ level of II-players is relevant in performance of basketball and one of the most limited aspects. However, several studies indicated that limitations in II-athletes are due to perceptual and cognitive skills and not in IQ level (Van Biesen, Verellen, Meyer and Vanlandewijck, 2010).

Most of the coaches believed that skills, attributes and knowledge’s level could be influenced by each player’s specific position. Dežman, Trninic and Dizdar (2001) designed an expert model system to orientate AB-basketball players in particular positions and/or roles in the game. Results showed that decision making system can be an auxiliary instrument on orienting players to the positions and roles in the game. Moreover, the authors found difficult to determine optimal position for forwards, shooting guards and power forwards due to versatile of these specific positions. Finally, body height was the greatest variable influence on orientation of players to specific positions in the game.

In opinion of coaches and referees, tactical aspects should be considered to distinguish between an eligible or non-eligible II basketball. In this sense, Polo, Pinilla, Pérez-Tejero and Vanlandewijck (2014) showed that II-players presented significantly more limitations in offensive individual tactics than technical skills and defensive individual tactics in opinion of national coaches. Regarding this result, it seems that tactical aspects could be a performance component to be considered in II-basketball eligibility system. Moreover technical skills are another performance component to be considered such shooting, ball handling or passing. Franciosi et al. (2012) proposed a basketball classification test including in 4 basketball abilities: ball handling, reception, passing and shooting. Results from this research showed that all II-players improved scores from the test after a training period of 8 months. The individual level scores also showed significant differences between categories from Italian II-basketball competition groups. Decision making in specific situations during the game is considered important to distinguish between an eligible or non-eligible II-basketball player in opinion of coaches and referees. In this line, Pinilla et al. (2016) compared AB and II-players to capacity to solve eight standardized game situations calculating discriminant function and the canonical correlation obtaining. Results showed that 98.6% of players could be classified correctly.

The findings of this study indicated that tactical aspects is one of the most affected performance component, also it should to be considered as eligibility criteria. Moreover coaches and referees think that IQ certificate is one of the first steps to be considered in II-basketball eligibility system. On the other hand, participants consider that technical skills are not as affected as tactic aspects or emotional components but could distinguish between eligible and non eligible II-basketball player. Coaches and referees’ opinion from these findings must be taken into consideration to orientate future research to develop evidence-based eligibility systems in this sport.
Palabras clave: Deporte Paralímpico, sistemas de elegibilidad, clasificación

Resumen: El baloncesto para personas con discapacidad intelectual (DI) no está incluido como modalidad paralímpica debido a la falta de sistemas de elegibilidad basados en la evidencia que aseguren que, sólo deportistas con limitaciones significativas para practicar baloncesto participan en competiciones específicas. Los sistemas de elegibilidad en jugadores DI están en desarrollo pero es necesario investigar sobre el impacto de la discapacidad en el baloncesto. El objetivo del presente estudio fue conocer, desde el punto de vista de los entrenadores y árbitros, las limitaciones que sus jugadores DI presentan mayores limitaciones y permitan discriminar que un jugador fuese elegible o no; seguido de las habilidades técnicas, aspectos emocionales y aspectos cognitivos. Las habilidades físicas y motoras no se consideraron como una limitación pero podrían estar influenciados por las posiciones y roles específicos durante el juego. Estos resultados, así como otros estudios similares que muestren la opinión de los entrenadores y árbitros, deberían de ser tenidos en cuenta para orientar futuras investigaciones con el fin de desarrollar sistemas de elegibilidad basados en la evidencia de este deporte.

Referencias


