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# Differences in performance indicators among winners and losers of group a of the spanish basketball amateur league (EBA)

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*DIFFERENCES IN PERFORMANCE INDICATORS AMONG WINNERS AND LOSERS OF GROUP A OF THE SPANISH BASKETBALL AMATEUR LEAGUE (EBA)*

KEYWORDS: Basketball, Performances indicators, EBA League, Differences.

ABSTRACT: The aim of this study is to identify differences in relation to performance indicators between winning and losing teams of Group A of Spanish Basketball Amateur League, in function of the type of game. The sample of the study is formed by 231 games ($N = 462$ cases) that were played during 2005/2006 season by teams of Group A along EBA League Regular Phase (Spanish Amateur Basketball). Variables of the study were performance indicators and secondary variables, such as ball possessions and offensive and defensive efficacy coefficients. Inferential analysis between winners and losers showed that there were significant differences in many performance indicators as well as efficacy coefficients of three type of game, increasing number of indicators that differentiate according as games become unbalanced. Relative to balanced games, 2 points failed shots, scored free shots, defensive rebounds, assists and personal fouls, as well as efficacy coefficients, are the ones that differentiate between winning and losing teams. In relation to unbalanced games, scored field shots, turnovers and blocked made must be added. For very unbalanced games almost all performance indicators, except steals, offensive rebounds and 3 points shot failed, differentiate winner from loser. It shows that there are a greater number of performance indicators on average that differentiate winners from losers teams compared to other professional leagues, because of that we can say that exists a higher heterogeneity between teams that participate in this kind of amateur leagues.

Nowadays sport Performance Analysis is a research line that is rising, many are the investigations that support it. Notational Analysis used in this kind of studies allow coaches to prepare team and players during the formative process (Hughes and Franks, 2004; Lorenzo, Gómez, Ortega, Ibáñez and Sampaio, 2010), this methodology has as principal aim of the identification of critical moments that take place during competitions, that are identified as performance indicators (Nevill, Atkinson, Hughes, and Cooper, 2002). Basketball is one of the first team sports that recognizes how important is to analyze performance indicators because it is long time ago they are collected, allowing coaches to rise their knowledge. Related bibliography highlight that there are common performance indicators that differentiate between winning and losing teams of many professional leagues, such as defensive rebounds (Akers, Wolff, and Buttross, 1991; Gómez, Lorenzo, Sampaio, Ibáñez and Ortega, 2008; Ittenbach and Esters, 1995; Trninić, Dizdar and Dezman, 2002) and 2 points field-goals scored (Akers et al., 1991; Ittenbach et al., 1992; Trninić et al., 2002). Furthermore, some other studies identified how important are for victory free throws scored (Ittenbach y Esters, 1995; Kozar, Vaughn, Whitfield, Lord, y Dye, 1994; Pim, 1986; Sampaio y Janeira, 2003), turnovers (Akers et al., 1991), assists (Melnick, 2001) and personal foults (Pim, 1986). Team sports with a high scoring, like basketball, it must be taken into account that not the same factors are the ones that establish final score differences between games with 2 points and 30 points of differences in the score (Sampaio, 2002). Because of that, basketball league studies analyze performance indicator in relation to different games according to final score difference (Gómez, Lorenzo and Sampaio, 2009; Gómez, Lorenzo, Sampaio and Ibáñez, 2006; Ibáñez, Feu, and Dorado, 2003; Sampaio and Janeira, 2003).

The objective of this study is to identify the performance indicators that differentiate between winning and losing teams in function of the type of the game of Regular Phase of Group A League EBA.

## Method

Design. The design of the study is quantitative, descriptive, observational and notational.

Sample. The sample of the study was established by 231 games ($N = 462$ cases) of 2005/2006 season of Group A during the Regular Phase of League EBA. Data was collected through Basketball Spanish Federation webpage (www.feb.com).

Variables: Variables analyzed in this study were game performance indicators (1, 2 and 3 points scored and failed goals, defensive and offensive rebounds, assists, turnovers and recovered balls, blocks, dunks, fouls committed and received), and secondary variables were team ball possessions, offensive and defensive ratings (Kubatko, Oliver, Pelton and Rosenbaum, 2007; Oliver, 2004).

Procedure: On first instance, a data filtered was done, removing all games with incomplete statistics. Secondly, all data are normalized to 100 possessions, allowing comparison between different rhythm games. After that, a *K*-means cluster analysis was developed to classify games in relation to final score differences, as habitual in this kind of studies in basketball (Gómez et al., 2009; Ibáñez, Sampaio, Saenz-López, Gimenez and Janeira, 2003; Sampaio, Ibáñez and Feu, 2004), obtaining

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three clusters or type of games: balanced (1-10 difference points, $N = 236$), unbalanced (11-20 difference points, $n = 152$) and very unbalanced (21-37 difference points, $n = 74$). Finally, a proceeding to determine statistical models appropriate to data nature was done. To choose parametrical statistic models, population values must fit to a specific mathematical pattern in function to compliance requirements (Cubo, 2011; Field, 2009): data distribution must be normal (*Kolmogorov – Smirnof* test); population data must be distributed in a random and not conditioned way (*Rachas* test); and homoscedasticity or variances sample or data equality (*Levene* test). Null hypothesis acceptation in the three models implicates assumption or requirements date series acceptation ($p > .05$). After test conducting it was determined if data nature allowed or did not allow the use of parametric statistical models for every kind of analyses, using no parametric models in those cases that established requirements that were not fulfilled.

*Statistical analysis*: For data analysis, SPSS 15.0 statistical package was used. Previous to inferential analysis, means and standards deviations of official statistics game were obtained in function of victory and defeat (Table 1).

| | **Balanced** | | **Unbalanced** | | **Very Unbalanced** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Victory (*n* =118)** | **Defeat (*n* = 118)** | **Victory (*n* = 76)** | **Defeat (*n* = 76)** | **Victory (*n* = 37)** | **Defeat (*n* = 37)** | | | | | | |
| | ***M*** | ***SD*** | ***M*** | ***SD*** | ***M*** | ***SD*** | ***M*** | ***SD*** | ***M*** | ***SD*** | ***M*** | ***SD*** |
| 2-points goals scored | 28.93 | 6.57 | 27.66 | 6.05 | 29.83 | 6.78 | 27.08 | 6.73 | 30.28 | 8.17 | 26.14 | 6.21 |
| 2-points goals failed | 24.90 | 7.08 | 27.36 | 7.49 | 25.06 | 7.00 | 29.37 | 7.75 | 22.96 | 6.64 | 30.07 | 8.51 |
| 3-points goals scored | 9.76 | 4.37 | 9.23 | 3.92 | 11.08 | 4.52 | 7.73 | 3.61 | 12.34 | 4.45 | 6.44 | 2.78 |
| 3-points goals failed | 17.72 | 5.63 | 18.76 | 5.95 | 17.21 | 6.21 | 18.64 | 6.37 | 16.19 | 4.51 | 18.05 | 6.61 |
| Free Throws scored | 21.54 | 8.32 | 17.52 | 7.52 | 21.24 | 9.21 | 17.61 | 8.58 | 24.28 | 7.76 | 16.04 | 7.96 |
| Free Throws failed | 10.02 | 4.63 | 8.81 | 5.11 | 9.63 | 4.69 | 9.19 | 4.71 | 11.24 | 4.94 | 8.07 | 4.46 |
| Defensive Rebounds | 30.66 | 8.46 | 27.46 | 7.10 | 31.80 | 7.07 | 27.73 | 8.14 | 33.22 | 8.85 | 23.90 | 5.77 |
| Offensive Rebounds | 13.11 | 4.99 | 13.05 | 5.33 | 13.35 | 5.14 | 13.56 | 6.19 | 13.75 | 7.30 | 12.16 | 5.48 |
| Assists | 13.19 | 6.63 | 10.96 | 5.44 | 15.33 | 7.58 | 9.95 | 6.11 | 17.55 | 7.63 | 9.42 | 4.97 |
| Recovered balls | 10.97 | 5.12 | 10.09 | 4.43 | 10.93 | 4.79 | 9.81 | 5.19 | 11.76 | 4.91 | 9.99 | 4.65 |
| Turnovers | 19.18 | 5.87 | 19.50 | 6.07 | 17.83 | 6.20 | 20.02 | 5.75 | 17.78 | 6.01 | 21.81 | 5.57 |
| Blocks commetted | 2.92 | 2.69 | 2.34 | 2.20 | 3.07 | 2.86 | 1.97 | 1.94 | 2.89 | 2.04 | 1.97 | 1.99 |
| Blocks received | 2.05 | 2.27 | 2.63 | 2.81 | 1.86 | 1.93 | 2.74 | 2.98 | 1.64 | 1.83 | 2.70 | 2.09 |
| Dunks | .44 | 1.09 | .29 | .92 | .38 | .99 | .35 | .89 | .43 | .91 | .04 | 0.23 |
| Fouls commetted | 28.50 | 6.27 | 30.34 | 6.18 | 27.48 | 7.20 | 28.71 | 6.91 | 25.58 | 5.75 | 31.39 | 6.40 |
| Fouls received | 30.19 | 5.85 | 28.11 | 6.47 | 28.22 | 7.55 | 27.61 | 7.05 | 30.69 | 6.09 | 25.49 | 5.87 |
| Ball Possessions | 72.56 | 7.46 | 73.30 | 8.17 | 73.84 | 7.62 | 73.36 | 8.38 | 76.92 | 7.53 | 76.45 | 7.31 |
| Offensive Rating | 108.05 | 14.22 | 100.69 | 14.08 | 114.30 | 13.39 | 94.13 | 13.13 | 122.05 | 15.34 | 87.35 | 13.28 |
| Defensive Rating | 100.69 | 14.08 | 108.05 | 14.22 | 94.13 | 13.13 | 114.30 | 13.39 | 87.35 | 13.28 | 122.05 | 15.34 |

*Table 1. Descriptive results of the performance indicators of each type of party belonging to Group A, in Season 2005/06 EBA League, in function of outcome.*

For differences between winners and losers different analyses were used, for parametric data case, *T test for independent amples*, and for no parametric data case, *U-Mann-Whitney for two independent samples*, being the last one the excellent alternative when normality and homoscedasticity assumptions were not obtained (Cubo, 2011).

## Results

Table 2 shows the results that differentiate between winner and loser performance indicators and secondary variables of the study, according to the type of games. Table 1 shows that teams who win balance, unbalance and very unbalance games get better performance indicators means and better efficiency coefficients than loser teams.

| | **Balanced (*n = 236*)** | | | **Unbalanced (*n = 152*)** | | | **Very Unbalanced (*n* = 74)** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***t*** | ***Z*** | ***p*** | ***t*** | ***Z*** | ***p*** | ***t*** | ***Z*** | ***P*** | | | |
| 2-points goals scored | 1.55 | | .12 | | 2.51 | | .01 | * | 2.45 | | .02 | * |
| 2-points goals failed | -2.60 | | .01 | * | -3.60 | | .00 | * | -4.01 | | .00 | * |
| 3-points goals scored | .97 | | .33 | | 5.04 | | .00 | * | | -5.50 | .00 | * |
| 3-points goals failed | -1.39 | | .17 | | -1.40 | | .16 | | -1.42 | | .16 | |
| Free Throws scored | 3.89 | | .00 | * | 2.51 | | .01 | * | 4.51 | | .00 | * |
| Free Throws failed | 1.90 | | .06 | | .58 | | .56 | | 2.90 | | .01 | * |
| Defensive Rebounds | | -3.48 | .00 | * | 3.29 | | .00 | * | | -4.52 | .00 | * |
| Offensive Rebounds | .09 | | .93 | | -.23 | | .82 | | 1.06 | | .29 | |
| Assists | | -2.83 | .01 | * | 4.81 | | .00 | * | | -4.69 | .00 | * |
| Recovered balls | 1.41 | | .16 | | 1.39 | | .17 | | 1.59 | | .12 | |
| Turnovers | -.41 | | .69 | | -2.26 | | .03 | * | -2.99 | | .00 | * |
| Blocks commetted | | -1.60 | .11 | | | -2.37 | .02 | * | -2.32 | | .02 | * |
| Blocks received | | -1.50 | .13 | | | -1.56 | .12 | | | -2.12 | .03 | * |
| Dunks | | -1.85 | .06 | | | -.10 | .92 | | | -2.49 | .01 | * |
| Fouls commetted | -2.28 | | .02 | * | | -1.23 | .22 | | -4.11 | | .00 | * |
| Fouls received | 2.59 | | .01 | * | .52 | | .61 | | 3.73 | | .00 | * |
| Ball Possessions | -.72 | | .47 | | .37 | | .72 | | .27 | | .79 | |
| Offensive Rating | 3.99 | | .00 | * | 9.38 | | .00 | * | 10.40 | | .00 | * |
| Defensive Rating | -3.99 | | .00 | * | -9.38 | | .00 | * | -10.40 | | .00 | * |

*$p < .05$

*Table 2. Inferential analysis results between winners and losers in the performance indicators of the games in Group A of the EBA League, Season 2005/06.*

## Discussion

This study shows that exists a performance difference between winner and loser Amateur League teams, specifically on Group A, since exist significant differences in many of the performance indicators and secondary variables of the study, in the three different type of games, rising its number when the game became more and more unbalanced. After descriptive results some differences interpretation appeared, it is corroborated that exists better valuation in performance indicators means of winner teams in relation to the loser ones. This variability between winner and loser is greater when games are more unbalanced, then performance indicators means differences between winner and loser is even higher, as it was available in the specific literature (Gómez, et al., 2008; Leite et al., 2004; Sampaio and Janeira, 2003).

Several studies show differences in a lower number of performance indicators that significantly differentiate winner teams form loser ones (Gómez et al., 2008; Leite et al., 2004; Sampaio, 2002), but it is related to professional leagues studies. Winner teams obtain better means in many performance indicators, because they get more rebounds (Akers, et al., 1991; Gómez, et al., 2008; Trninić, et al., 2002), make more assists (Melnick, 2001), steals and blocks, and receive more fouls, as well as they make significantly less personal fouls and receive less blocks than losing teams (Gómez, Lorenzo, Sampaio et al., 2006), in the three type of games studied. Gómez et al. (2009) find statistically significant differences in balanced games (1-17 final score difference points) of ACB League according to 2 points scored shots, 1 and 3 points scored and failed shots, offensive and defensive rebounds, assists, lost, steals, blocks and fouls. This study coincides with the present study, except because of offensive rebounds, which do not significant differentiate Group A winner and loser teams in this type of games. On the other hand, Leite et al. (2004) found that offensive rebounds were associated to victory, as well as defensive rebounds, 3 points failed shots, and free-throws scored shots in this type of games. Furthermore, teams that win balanced games in EBA League get significantly more mean points in relation to field shots and free shots (Kozar et al., 1994), failing significantly less field shots than loser teams. It must be highlighted that winner teams fail significantly more free shots than the loser ones (Gómez et al., 2008), except in unbalanced games were that difference is not significant. Ibáñez, Feu et al. (2003) found similar results in his study, winner teams got better results in performance indicators, except in free shots, failing more than loser teams. These performance differences were confirmed when observing that winner teams have better efficacy coefficients, insomuch as score more points per ball possession and get less points per possession than the ones who lose, being more efficient offensively and defensively. Ibáñez, Feu et al. (2003) confirmed too that exists a negative correlation between offensive efficiency coefficient and final Rank of the teams, the best teams scored more points per possession. The study did not showed statistically significant differences between winner and losers game rhythm in balanced, unbalanced and very unbalanced games. Ibáñez, Sampaio et al. (2003) found significant correlations between ball possessions and victory or final team position, asseverating that winner teams play with less ball possession, being something contradictory according to our study results. So, teams that play in this league play at the same game pace in all the game types, the differences between themselves were showed in relation to offensive and defensive effectiveness.

## Conclusions

This study shows that there are different performance indicators in any kind of basketball league or competition that differentiate winner from loser teams, which are defensive rebounds, 2 points scored shots and assists. Furthermore, it is confirmed that when games become more and more unbalanced, it means, final score differences rises, we can find more performance indicators that differentiate winner from loser teams.

Finally, in relation to A Group, exists a higher performance indicator number that differentiate winner teams form loser, so it can be said that exists a higher heterogeneity between level teams that are part of this kind of amateur leagues.

*DIFERENCIAS EN LOS INDICADORES DE RENDIMIENTO ENTRE GANADORES Y PERDEDORES DEL GRUPO A DE LA LIGA EBA*

PALABRAS CLAVE: Baloncesto, Indicadores de rendimiento, Liga EBA, Diferencias.

RESUMEN: El objetivo de este estudio es identificar las diferencias existentes en los indicadores de rendimiento entre equipos ganadores y perdedores, en función del tipo de partido, en el Grupo A de la Liga Española de Baloncesto Amateur. La muestra del estudio estuvo constituida por 231 partidos (*N* = 462 casos) disputados durante la temporada 2005/2006 por los equipos del Grupo A durante la Fase Regular de la Liga EBA (Española de Baloncesto Amateur). Las variables del estudio fueron los indicadores de rendimiento y las variables secundarias, posesiones de balón y coeficientes de eficacia ofensiva y defensiva. El análisis inferencial entre ganadores y perdedores mostró que existían diferencias significativas en varios de los indicadores de rendimiento y los coeficientes de eficacia en los tres tipos de partido, aumentando el número de indicadores que diferencian a medida que se desequilibran los encuentros. En los partidos equilibrados son los lanzamientos de 2 puntos fallados, los tiros libres anotados, los rebotes defensivos, las asistencias y las faltas personales, así como los coeficientes de eficacia, los que diferencian entre ganadores y perdedores. En los partidos desequilibrados se añaden los lanzamientos de campo anotados, las pérdidas y los tapones efectuados. En el caso de los partidos muy desequilibrados casi todos los indicadores de rendimiento excepto las recuperaciones, los rebotes ofensivos y los lanzamientos de 3 puntos fallados diferencian a los ganadores de los perdedores. Se pone de manifiesto que existen un mayor número de indicadores de rendimiento de media que diferencian a los equipos ganadores de los perdedores con respecto a otras ligas más profesionales, por lo que se puede afirmar que existe mayor heterogeneidad entre el nivel de los equipos que conforman este tipo de ligas amateur.

*DIFERENÇAS NOS INDICADORES DE RENDIMENTO ENTRE GANHADORES E PERDEDORES DO GRUPO A DA LIGA EBA*

PALAVRAS-CHAVE: Basquetebol, Indicadores de rendimento, Liga EBA, Diferenças.

RESUMO: O objetivo deste estudo é identificar as diferenças existentes nos indicadores de rendimento entre equipas ganhadoras e perdedoras, em função do tipo de jogo, no Grupo A da Liga Espanhola de Basquetebol Amador. A amostra do estudo foi constituída por 231 jogos ($N$ = 462 casos) disputados durante a temporada 2005/2006 pelas equipas do Grupo A durante a fase regular da Liga EBA (Espanhola de Basquetebol Amador). As variáveis do estudo foram os indicadores de rendimento e as variáveis secundárias, posses de bola e coeficientes de eficácia ofensiva e defensiva. A análise inferencial entre vencedores e perdedores mostrou diferenças significativas em vários indicadores de rendimento e eficácia proporções nos três tipos de jogo, aumentando o número de indicadores que diferenciam desequilibrados à medida que se desequilibram os encontros. Nos jogos equilibrados são os lançamentos de 2 pontos falhados, os lances livres convertidos, os ressaltos defensivos, as assistências e as faltas pessoais, assim como os coeficientes de eficácia, que diferenciam entre vencedores e perdedores. Nos jogos desequilibrados acrescentam-se os lançamentos de campo convertidos, as perdas e os bloqueios efectuados. No caso dos jogos muito desequilibrados quase todos os indicadores de rendimento, excepto as recuperações, os ressaltos ofensivos e os lançamentos de 3 pontos falhados diferenciam os vencedores dos perdedores. Coloca-se em relevo que há um maior número de indicadores de rendimento médio que diferenciam as equipas vencedoras das perdedoras do equipamento em comparação com outras ligas mais profissionais, podendo-se então afirmar que existe uma maior heterogeneidade entre o nível das equipas que compõem este tipo de ligas amadoras.

## References

Akers, M. D., Wolff, S. and Buttross, T. (1991). An empirical examination of the factors affecting the success of NCAA Division I College Basketball teams. *The Journal of Business and Economic Studies, 1*(2), 14-21.

Cubo, S. (2011). La investigación experimental. In S. Cubo, B. Martín and J. L. Ramos (Coords.). *Métodos de Investigación y análisis de datos en Ciencias Sociales y de la Salud* (pp. 235-328). Madrid: Pirámide.

Gómez, M. A., Lorenzo, A. and Sampaio, J. (2009). *Análisis del rendimiento en baloncesto ¿Es posible predecir los resultados?* Sevilla: Wanceulen.

Gómez, M. A., Lorenzo, A., Sampaio, J. and Ibáñez, S.J. (2006). Differences in game-related statistics between winning and losing teams in women´s basketball. *Journal of Human Movements Studies, 51, 357-369*.

Gómez, M. A., Lorenzo, A., Sampaio, J., Ibáñez, S. J. and Ortega, E. (2008). Game-Related Statistics that Discriminated winning and losing teams from the spanish men´s Professional Basketball Teams. *Collegium Antropologicum*, *32*(2), 451-456.

Hughes, M. and Franks, I. M. (2004). *Notational Analysis of Sport. Systems for better coaching and performance in sport*. London: Ed. Routledge.

Ibáñez, S. J., Sampaio, J., Saenz-López, P., Gimenez, J. and Janeira, M.A. (2003). Game statistics discriminating of junior world championship matches (Portugal 1999). *Journal of Human Movement Studies*, *45*, 001-019.

Ibáñez, S. J., Feu, S. and Dorado, G. (2003). *Análisis de las diferencias en el juego en función del género y categoría de los jugadores*. Paper presented at the II Congreso Ibérico de Baloncesto: la formación y el rendimiento en baloncesto.

Ittenbach, R. F. and Esters, I. G. (1995). Utility of Team Indices for Predicting End of Season Ranking in Two National Polls. *Journal of Sport Behavior, 18(3)*, 216-224.

Kozar, B., Vaughn, R. E., Whitfield, K. E., Lord, R.H. and Dye, B. (1994). Importance of free-throws at various stages of basketball games. *Perceptual and Motor Skills, 78(1)*, 243-248.

Kubatko, J., Oliver, D., Pelton, K. and Rosenbaum, D.T. (2007). A starting point for analyzing basketball statistics. *Journal of Quantitative Analysis in Sport, 3(*3), Article 1.

Leite, N., Sampaio, J. and Janeira, M. (2004). *Variabilidade no poder discriminatório das estatísticas dos jogos de basquetebol equilibrados*. Recuperado el 19 de abril de 2007, de http://www.efdeportes.com/efd73/basquete.htm

Lorenzo, A., Gómez, M. A., Ortega, E., Ibáñez, S. J. and Sampaio, J. (2010). Game related statistics which discriminate between winning and losing under-16 male basketball games. *Journal of Sports Science and Medicine,* 9, 664-668.

Melnick, M. J. (2001). Relationship between team assists and win-loss record in the National Basketball Association. *Perceptual and Motor Skills*, *92*(2), 595-602.

Nevill, A. M., Atkinson, G., Hughes, M. and Cooper, S.H. (2002). Statistical methods for analysis descrete and categorical data recorded in performance analysis. *Journal of Sports Sciences*, *20*, 829-844.

Oliver, D. (2004). *Basketball on paper. Rules and Tools for Performance Analysis*. Washington, DC: Brassey's Inc.

Pim, R. (1986). The effect of personal fouls on winning and losing Basketball games. *The Coaching Clinic*, *24*(4), 14-16.

Sampaio, J. (2002). Análise do jogo de basquetebol. Contributos para a intervençao do treinador nas sessoes de treino e na competiçao. In S. J. Ibáñez, and M. Macías (Eds.), *Novos Horizontes para o treino do básquetbol*. (pp. 189-205). Cruz Quebrada: Facultade de Motricidade Humana.

Sampaio, J., Ibañez, S. J. and Feu S. (2004). Discriminative power of basketball game-related statistcs by level of competition and sex. *Perceptual and motor Skills, 99*, 1231-1238.

Sampaio, J. and Janeira, M. (2003). Statistical analyses of basketball team performance: understanding team´s wins and losses according to a different index of ball possesions. *International Journal of Performance Analysis in Sport, 3(1)*, 40-49.

Trninić, S., Dizdar, D. and Dezman, B. (2002). Combined model of expert system for the actual quality assessment in basketball players. In D. Milanovic y F. Prot (Eds.), *Kinesiology New Perspectives, Proceedings Book* (pp. 664-667).