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DEVELOPMENT OF PERFORMANCE EVALUATION RATING SCALE IN VOLLEYBALL

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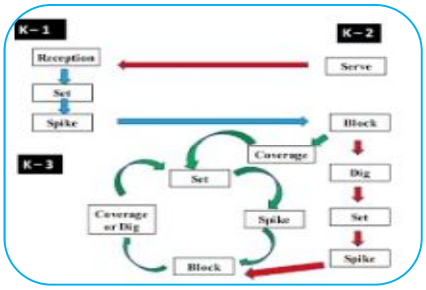
ABSTRACT:



The purpose of this study was to develop a performance evaluation rating scale to evaluate volleyball players' performance during the match as well as in training. A total of 12 sample matches from the Men's senior national volleyball championship were recorded using professional video recording cameras. The study proceeded through seven different phases and eighteen different stages, such as content development, administrative work, establishing content validity, reliability, and objectivity of the proposed rating scale, and preparation of the instruction manual. To provide the scope for subjective and objective evaluation in PRS (proposed rating scale), the content validity was established through experts' opinions. The reliability was ascertained using the test-retest method. The objectivity was established through the rating data provided by three different observers. After establishing the validity, reliability, and objectivity of the PRS (Proposed Rating Scale), its administrability was tested on a live match. Finally, a manual was prepared for PES-VB (Performance Evaluation Scale in Volleyball) to provide guidelines on how to use the criteria developed to evaluate a player's performance in a live match. Data analysis, and interpretation, revealed that the PRS could be considered a tool to be used for performance evaluation in volleyball. To ascertain the objectivity of the tool, the researcher used the intra-class reliability method in which the techniques of ANOVA and intra-class correlation coefficient were used for the three sets of data. To ascertain the reliability of PRS, Pearson's product-moment correlation coefficient was applied. The PRS try-out data was also analyzed by Pearson's product-moment correlation coefficient. The reliability and objectivity of PRS were found to be significant for the five variables but the objectivity of the set variable was found to be acceptable and comparatively low to other variables. This indicates that the PRS tool is valid and reliable in all six variables; however, the Set variable needs to be further refined to be statistically significant.

KEY WORDS: *Performance, Evaluation, Rating Scale, Volleyball.*

INTRODUCTION

Volleyball is a highly techno-tactical power game.The entire play is dominated by offensive skills, namely Serve, Attack, and Block. The offense in Volleyball is a highly complex phenomenon, to predict offensive play one must be skillful in read and react ability. Speed is also one of the dominant factor in volleyball as it ends rallies in seconds at any skill. FIVB makes time to time changes in the rules and specifications of the game, intending to popularise the game worldwide. These changes take the game to the next level of challenges for the competitors to overcome the winning (Dincer, 2015). Due to transiting nature of the game, command over the skills and tactics are highly essential. In volleyball, match winning and losing depends upon the perfect timing of skill execution, coordination amongst

players, reaction ability, quality of training, playing experience, and international exposure. Performance analysis during a match is a key factor to ensure competitive performance. There are several procedures, criteria, and software available to track, scout, analyze and evaluate the performance during live matches or training sessions. (FIVB, 2009; Data Volley, 2007; Palao, 2004; Bergeles, 2010; Carine, 2011; Marcelino, 2008). FIVB developed Volleyball Information System to generate statistical data on players' performance during the competition. FIVB provides database results to the media for increasing the popularity of the game (FIVB, 2009). Data Volley is one of the most popular and useful software to analyze the player's performance (DataVolley, 2007). Mortensen (2007) developed a notational analysis system to evaluate setting performance in Volleyball. The study aimed to find out the probabilities of specific outcomes from each setting scenario (Mortensen, 2007). Carine constructed and validated a technical-tactical performance evaluation instrument in Volleyball. This instrument evaluated the different components of technical and tactical aspects (Carine, 2011). Bergeles examine the dependence of performance effectiveness in Complex II. Performance of sequential actions of set-to-counter-attack was assessed based on a 5-point numerical rating scale by a 3-member group of expert coaches (Bergeles, 2010). Florence contributed his study on skill evaluation in women's Volleyball (Florence, 2008). The base of these criteria differs as per the requirements of the work. There are several approaches to develop these criteria. The present study aims to develop performance evaluation criteria to evaluate players' performance during the game of volleyball.

MATERIAL AND METHODS

The study was carried out on senior male volleyball players who performed in Senior National Volleyball Championship, conducted under VFI at Chennai in 2010. To develop performance evaluation criteria total of 11,623 actions were video recorded and observed (Falco, 2012; Maria, 2008) from the top 12 matches. Six Volleyball skills namely; Service, Attack, Block, Serve Reception, Set, and Dig were selected as variables in the study (Selinger's 198; Palao, 2002; Yiannis, 2005; Patsiaouras, et al., 2011; Tsivika et al., 2008; Zetou et al., 2007; Asterios et al.,2009). The Performance Evaluation Rating Scale (PRS) was developed through seven different phases. To provide the scope for subjective and objective evaluation in PERS, the content validity was established by experts' opinions (Afonso. J., 2010). The experts were certified volleyball coaches (Volleyball diploma and FIVB level II & III coaches course). The scale reliability was ascertained using the test-retest method. The scale objectivity was established through three different observers' data sets. (Coral, 2012). After establishing the validity, reliability, and objectivity of the PERS, it was tried out on a live match, to test its applicability. The performance of a try-out match was tested by applying two different methods; live match evaluation and video recorded match evaluation as per the criteria mentioned in PERS. Finally, a manual was prepared for PES-VB to provide guidelines, as to how to use the criteria developed to evaluate a player's performance in a live match.

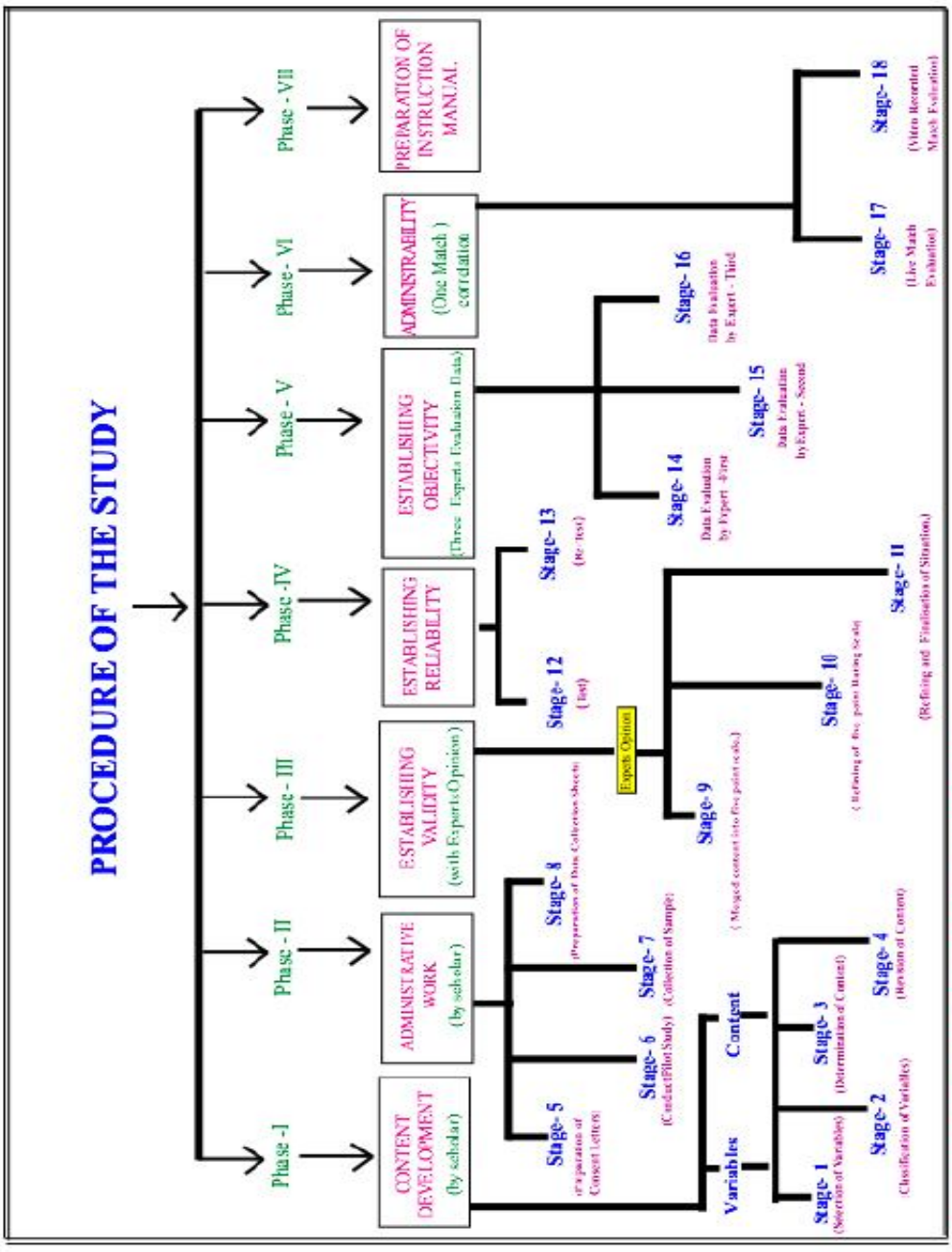


Fig. -3.1: Flow Chart Depicting the Procedure of the Study.

The data obtained from the observers were analyzed by using SPSS version 21. The objectivity (Intra rater reliability) of the developed performance evaluation rating scale was determined by finding out ANOVA between the scores of three different raters. The results of objectivity are shown in Table 1.

Table -1.
Overview of Objectivity (Inter-rater reliability)

Actions	Objectivity			
	ANOVA		Intraclass Correlation	
	F ratio	Significance	Correlation	df.
Attack	5.26	.02	0.993	188
Service	3.283	0.038	0.963	209
Block	6.9	.005	0.961	178
Pass	1.559	0.212	0.959	414
Set	1.181	0.308	0.496	133
Dig	1.948	0.143	0.959	414

**Correlation is significant at the 0.01 level (2-tailed)

Two sets of data were analysed by Pearson's Product moment correlation to establish the reliability of the PERS. The reliability of the PERS is as indicated in table 2.

Table- 2
Overview of PRS Reliability

Actions	Pearson Product Moment Correlation
Attack	.998**
Service	.988**
Block	.975**
Pass	.976**
Set	.890**
Dig	.993**

**Correlation is significant at the 0.01 level (2-tailed)

Two sets of data were analyzed by Pearson's Product moment correlation to establish the reliability of the PERS try out match. The reliability of the PERS try-out match is indicated in table 3.

Table- 3. Overview of PRS Try-Out Reliability

Actions	Pearson Product Moment Correlation
Attack	.821*
Service	.975**
Block	.878**
Pass	.788*
Set	0.348
Dig	0.655

** Correlation is significant at the 0.01 level (2-tailed)

DISCUSSION

Three sets of data from three different Experts' on scoring and nonscoring skills were analyzed by ANOVA and intraclass correlation for objectivity (intra rater reliability). The range of correlation for these skills was found to be .993, .963, and .961 for the Attack, Serve and Block respectively and .959, .496, and .959 for the Pass, Set, and Dig respectively. These correlations were found to be highly significant at the significance level of 0.01. This indicates that the rating scale used by the raters to evaluate an Attack, Serve and Block performances have high objectivity. Here, out of six skills, five skill's correlation was found to be highly significant at 0.01 level of significance but the correlation coefficient for the Set was found to be of low significance at 0.05 level. This indicates that the rating scale used by the rater to evaluate five skill performances has high objectivity. But the rating scale used by the rater to evaluate set performance has low objectivity. It may be because Set is a key skill in volleyball and as per its nature, it creates scope to judge the set performance on a wider range of judgment. Further Boredom may be a reason to influence the performance evaluation process by the rater.

The range of product moment correlation for six skills rating scales was found to be .998, .988, .975, .976, .890, and .993 for the Attack, Service, Block, Pass, Set, and Dig, respectively. These correlations were found to be highly significant at the significance level of 0.01. This indicates that the rating scale used by the rater to evaluate Attack, Serve, Block, Pass, Set, and Dig performance was highly reliable.

The range of the correlation for scoring skills, namely Attack, Serve, and Block was found to be .821, .975, and .878 respectively. These correlations were found to be high, very high, and high respectively significant at 0.05 level of significance. This indicates that the rating scale used by the rater to evaluate an attack, serve, and the block is highly reliable.

The range of the correlation for non-scoring skills, namely, Pass, Set, and Dig was found to be .788, .348, and .655 respectively. Out of these three skills, correlation of two skills namely Pass (serve reception) and Dig (floor defense) was found to be moderately significant at the significance level of 0.05. The correlation for the set rating scale was found to be low and significant at the significance level of 0.05.

The present study adopted study variables from the reviewed literature, which indicates that all six volleyball skills have their importance in the play, and without their consideration, a high level of play cannot be completed (VIS, 2000, Datavolley, 2007; Wangwad, 2001).

These variables are Service (Yiannis, 2005), Pass (Florence, 2008) Set (Bergeles, et.al, 2011), Attack (Tsivika et.al.2008), Block (Marcelino, 2008), and Dig (Michelle et.al. 2010). Most of the studies had been done on individual skills and their parameters. Where more focus was given to the type of skill, execution zone, direction (Yiannis, 2005, Quiroga, et.al, 2012, Tsivika et.al.2008, Florence, 2008), and the effect of one skill on another (Quiroga, et.al., 2010, Palao, 2011, Bergeles, et.al, 2011, Afonso,

et.al, 2012, Fellingham, et.al, 2013, Silva, 2013,) and compared effectiveness between skill. (Marcelino, 2008, Bergeles, et.al 2009, Sotiris, 2009, Bergeles, et.al. 2010, Patsiaouras, et.al. 2011, Romero, et. al. 2012), all these studies evaluated individual as well as selective incorporate skills during play by using a specific pattern of evaluation.

The present study considers "EFFECT OF ACTION' as a base of evaluation. Where the effect of one action is observed on the performance of the second action, i.e. service performance rated with serve reception performance, serve reception performance evaluated on setter position, set effect evaluated on the available block, attack evaluated on the block, and floor defense performance, block evaluated on floor defense performance, and floor defense against setter convenience. The above mentioned reviews and the present study has similarity in consideration of incorporating skill but are differentiated by individual skill and their analysis criteria. The skills analysis or evaluation at the individual level helps to improve offensive and defensive skills at a training session, whereas performance evaluation of incorporating skill during play help to provide feedback on tactical and strategical playing performance of the team.

CONCLUSION

PES-VB (performance evaluation system in volleyball) has been developed as per the standard research procedure and it has sufficient acceptability to use the scale in Volleyball. A total of six volleyball skills rating scales were developed in this study. It can objectively as well as subjectively evaluate the player performance during a volleyball match at senior levels in India with acceptable reliability, validity, objectivity, and administrability.

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