UDC: 796.325.012.572.07(497.7)
*Original scientific paper*

# THE RELATIONSHIP BETWEEN THE ACCURACY OF HITTING THE BALL AND ITS EFFICIENCY IN THE GAME OF VOLLEYBALL

**Laureta ABAZI[1*], Hamza VESELI[1], Shpresa MEMISHI[1]**

*[1]University of Tetova, Faculty of Physical Education, Tetovo, Republic of North Macedonia*
*[*]Corresponding author e-mail: laureta.abazi@unite.edu.mk*

**Abstract**

The purpose of this research is to determine the characteristic relation of situation-motor skills (volleyball accuracy), hitting the targets by using the shooting technique as well as its efficiency in the volleyball game. The research involved 100 entities-volleyball players, active racers, divided into two subsamples, 50 volleyball players - entities competing in the first league and 50 volleyball players racing entities from the second league.
The used variables were with the stroke of the horizontal shot from the 4th zone to the position V, VI and position I, on the other side of the field were assessed the situation-motor skills, while the correcting skills were: winning shots, positive shots, negative shots and wrong shooting and assessing the efficiency of the game [3].
The results gained show that the situation-motor skills system has significant statistical impact on negative shot variables on second-league volleyball players, while in first-league volleyball players the system of situation-motor skills in volleyball players has significant statistical impact on the ideal ball pass.
With the analysis of individual regressive coefficients in first-league volleyball players the significant connection of coefficients and criteria have two variables, which are: hitting the horizontal target with shots from the jump from area IV to the position of VI, on the other side of the field [7].

*Keywords:* relation, precision, volleyball, pass, shooting

## 1. Problem, subject, goals, and hypotheses of research

Based on the problem and research the objectives of the research were established. The main objective of this research is the definition of the characteristic relation of situation – motor skills (volleyball accuracy), hitting targets with the exploitation of its shots, as well as their efficiency during the volleyball game[1].

Regarding the purposes of the research, were established hypothetical analyses, hypotheses of research which have been dedicated to the existence or not of the relationship between attack as a strong element in volleyball, and efficiency in the game, in samples of active volleyball players who have competed in the first league[5]. In the end we come to some hypotheses, as follows:

XO - There will be significant statistical differences between the shooting of the ball and its efficiency during the volleyball game between first league and second league senior competitors.

X1 - There will be significant statistical differences between shooting the ball, and its efficiency during the volleyball game in favor of senior first league competitors over senior second league competitors.

X2 - There will be significant statistical differences between shooting the ball and their efficiency during the volleyball game in favor of senior league competitors vs. those of the first league.

## 2. Research methods

*2.1. Samples of entities:* The population of which the sample of entities is selected is defined as populations of first league volleyball players and second league volleyball players in North Macedonia. In the research were include 100 entities – volleyball players, first league active players, and that of the second league, divided into

two subsamples;

- The first subsample comprises 50 entities – volleyball players, active players who have been an integral part of three volleyball clubs of the first senior league and the first league: K.V. "University of Tetova", senior competitors of the first league K.V "Shkendija" – Tetovo " and senior competitors of the first league K.V " Liria" - Tetovo.
- the second subsample also comprises 50 entities that have competed in three lower league clubs from that preliminary, i.e. second league volleyball clubs, senior league competitors and ; K.V." Dibra"-Dibra, senior competitors of the second league; K.V. "Janta Volej"- Skopje, senior league competitors; K.V. "UGD-Stip",

*2.2. Samples of variables:* The used variables that have assessed the accuracy of the entities towards the situation-motor state in shooting are;

**Shots**

1. The shot at the horizontal target with the shot from the 4th zone in position V, on the other side of the field (shot IV–V)
2. The shot at the horizontal target with the shot from the 4th zone in position of VI, on the other side of the field (shot IV-VI)
3. The shot at the horizontal target with a shot from the jump from area IV to position I, on the other side of the field (shot IV-I)

The criteria variables have assessed efficiency in the game, in shooting the ball, like:

**Shooting (GJ)**

- individual shots (SHi), positive shots (SH +), negative shots (SH-), wrong shots (SH=)

After the individual shot by which the direct point is good, it is marked with a sign SH
What is recorded and registered during shooting and fraud;

- Attacker,
- The area of belonging,
- From which area and from which the shot ball is followed,
- Shooting mode,

the direction of the shot followed and the success of the shot as well as,
With which ball is carried out the attack (with the first, second or third time).

**Statistical data methods**

For processing the results gained, were used procedures:
statistically regressive and descriptive. (Multipla regression by statistical package, STATISTICS 7.1, StatSoft, Inc., Tulsa, O.K).

## 3. Research results

The basic information, acquired with the descriptive statistic for samples of the variables investigated, given is in the first (1) and second table (2).
All arithmetic mean results are valid, because the standard arithmetic mean error on all variables is always more than five (5) times less than its average values. The high coefficient in (GCHPASK) in second league volleyball players indicates that the results are quite heterogeneous[11].

**Table 1.** Descriptive statistics of situation-motor accuracy, and game efficiency in the Second Volleyball League players

| | | PRECISION SITUATION - MOTOR SKILLS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Variables | N | M | Min | Max | Range | Varies. | DS | CV | Error | Skew | When |
| GCHPARK | 50 | 1.32 | 0.00 | 3.00 | 3.00 | 0.75 | 0.87 | 65.72 | 0.12 | 0.10 | -0.63 |
| GCHPASK | 50 | 0.62 | 0.00 | 3.00 | 3.00 | 0.53 | 0.73 | 116.99 | 0.10 | 1.07 | 1.03 |
| KNEE IV-V | 50 | 1.94 | 0.00 | 5.00 | 5.00 | 1.61 | 1.27 | 65.38 | 0.18 | 0.62 | 0.40 |
| KNEE IV-VI | 50 | 2.00 | 0.00 | 5.00 | 5.00 | 1.71 | 1.31 | 65.47 | 0.19 | 0.34 | -0.27 |
| KNEE IV-I | 50 | 2.40 | 0.00 | 5.00 | 5.00 | 1.96 | 1.40 | 58.32 | 0.20 | -0.11 | -0.68 |
| KNEE IV-I | 50 | 2.40 | 0.00 | 5.00 | 5.00 | 1.96 | 1.40 | 58.32 | 0.20 | -0.11 | -0.68 |
| | | Efficiency in the game | | | | | | | | | |
| SHOT | 50 | 2.19 | 0.0 | 9.00 | 9.00 | 4.88 | 2.21 | 100.80 | 0.20 | 0.85 | 0.17 |
| SHOT+ | 50 | 1.40 | 0.00 | 5.00 | 5.00 | 1.76 | 1.33 | 95.01 | 0.12 | 0.57 | -0.58 |
| SHOT- | 50 | 0.76 | 0.00 | 4.00 | 4.00 | 0.85 | 0.92 | 121.35 | 0.08 | 0.99 | 0.24 |
| SHOT= | 50 | 1.00 | 0.00 | 4.00 | 4.00 | 1.37 | 1.17 | 117.09 | 0.10 | 1.04 | 0.29 |

**Tabel 2.** Descriptive statistics and situation-motor accuracy, and game efficiency in the Second Volleyball League players

| | | PRECISION OF SITUACIO MOTOR SKILLS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Variables | N | Mean | Min | Max | Range | Varies. | SD | CV | Error | Skew | Kurt |
| GCHPARK | 50 | 1.70 | 0.00 | 4.00 | 4.00 | 0.68 | 0.82 | 48.31 | 0.12 | 0.61 | 0.15 |
| GCHPASK | 50 | 0.75 | 0.00 | 3.00 | 3.00 | 0.56 | 0.75 | 100.13 | 0.11 | 0.80 | 0.45 |
| GJ IV-V | 50 | 2.86 | 1.00 | 5.00 | 4.00 | 1.33 | 1.15 | 40.27 | 0.17 | 0.28 | -0.84 |
| GJIV-VI | 50 | 2.91 | 1.00 | 5.00 | 4.00 | 1.57 | 1.25 | 43.11 | 0.19 | -0.04 | -1.11 |
| GJ IV-I | 50 | 3.93 | 2.00 | 5.00 | 3.00 | 0.76 | 0.87 | 22.21 | 0.13 | -0.74 | 0.21 |
| | | Efficiency in the game | | | | | | | | | |
| SHOT | 50 | 3.05 | 0.00 | 14.00 | 14.00 | 11.84 | 3.44 | 112.89 | 0.31 | 1.14 | 0.59 |
| SHOT+ | 50 | 1.08 | 0.00 | 6.00 | 6.00 | 1.98 | 1.41 | 130.29 | 0.13 | 1.17 | 0.59 |
| SHOT- | 50 | 0.87 | 0.00 | 7.00 | 7.00 | 1.47 | 1.21 | 138.96 | 0.11 | 1.89 | 5.00 |
| SHOT= | 50 | 1.16 | 0.00 | 11.00 | 11.00 | 3.43 | 1.85 | 159.85 | 0.17 | 2.37 | 7.28 |

Basic information gained by descriptive statistic for samples of acquired variables, data is in the first table (1), and that of the second table (2).
All arithmetic mean results are valid, because the standard arithmetic mean error in all variables is five times higher than its average values. The high coefficient in the GCHPASK variable in second league volleyball players shows that the results are quite heterogeneous.
The values of the applied elementary, central and dispersive parameters of used variables and criteria, at the interval of minimum and maximum results always contain nearly four (4) or more standard deviations, on the basis of which it can be confirmed - considerable sensitivity of applied tests[7].
If we take into account the gained results of negative shot (GJ-) and wrong shot (GJ=), where the gained results show that the situation-motor (precision) system has significant statistical impact on the impact of shooting negative balls and wrong balls (P< 0.05), indeed, the prediction is that in the situational game when shooters have tried to perform successful shots when the ball's rise has not been accurate, where such shots have ended unsuccessfully, exactly having had the character of negative shooting or misfiring[4].

**Tabel 3.** Regressive analysis of SHi variables (individual-winning shot), SH+ (Shoot-positive), SH- (Negative shot) and SH= (Wrong shot)

| SHi - SHOOTING (winning) | | | | |
|---|---|---|---|---|
| | BETA | PART-R | R | P |
| GCHPARK | 0.14 | 0.15 | 0.12 | 0.43 |
| GCHPASK | 0.08 | 0.08 | 0.06 | 0.69 |
| SHOT IV-V | -0.03 | -0.03 | -0.02 | 0.88 |
| SHOT IV-VI | -0.17 | -0.18 | -0.15 | 0.34 |
| SHOT IV-I | -0.15 | -0.15 | -0.12 | 0.43 |
| Ro =.62 | | DELTA =.38 | P =.34 | |

| SHOT + SHOOTING (positive) | | | | |
|---|---|---|---|---|
| | BETA | PART-R | R | P |
| GCHPARK | -0.00 | -0.00 | -0.00 | 0.99 |
| GCHPASK | 0.38 | 0.36 | 0.29 | 0.05 |
| SH IV-V | -0.02 | -0.02 | -0.01 | 0.93 |
| SH IV-VI | -0.29 | -0.30 | -0.24 | 0.10 |
| SH IV-I | 0.12 | 0.12 | 0.09 | 0.53 |
| Ro =.66 | | DELTA =.43 | P =.20 | |

**Tabel 4.** Follow-up

| SHOT- Shooting (negative) | | | | |
|---|---|---|---|---|
| BETA | | PART-R | R | P |
| GCHPARK | 0.02 | 0.03 | 0.02 | 0.88 |
| GCHPASK | 0.14 | 0.14 | 0.10 | 0.47 |
| SH IV-V | -0.34 | -0.31 | -0.25 | 0.09 |
| SH IV-VI | 0.10 | 0.11 | 0.09 | 0.55 |
| SH IV-I | -0.17 | -0.18 | -0.13 | 0.35 |
| Ro =.66 DELTA =.44 P =.05 | | | | |

SH= SHOOTING
(error)

| BETA | | PART-R | R | P |
|---|---|---|---|---|
| GCHPARK | -0.01 | -0.01 | -0.01 | 0.94 |
| GCHPASK | 0.13 | 0.13 | 0.10 | 0.49 |
| SH IV-V | -0.27 | -0.27 | -0.20 | 0.15 |
| SH IV-VI | 0.06 | 0.08 | 0.05 | 0.69 |
| SH IV-I | -0.24 | -0.25 | -0.18 | 0.19 |
| Ro =.70 | DELTA =.49 | | P =.05 | |

The results gained from all the variables that rated the ball shots –BSH (individual shot (iSH), positive shooting (SH+), negative shooting (SH-) and misfiring (SH=) have shown that there is no significant statistical connectivity of the system at both the multivariant and univariant level, indeed, the system itself has no significant statistical impact on the variables that have evaluated the shot[2].

If we take into account the situation that often occurs in the game, and you were dedicated to volleyball shots, expected were other results, especially in the variation positive prey and individual shot in relation to negative shot and error in the shot, where it was also answered that the First League volleyball players are more precise and efficient in those situations when with its lifting characteristics it has been corrected or safe in relation to Second League volleyball players.

The results gained from the variable that have rated the ball shot to Second League volleyball players in relation to First League volleyball players have shown that League Two volleyball players are less or more efficient during the succession of inaccurate balls, exactly the volleyball players of the first league were more wrong , that can be explained the technical-tactical characteristics of Second League and First League volleyball players, with their conditions, training and experience in volleyball, etc[9].

**Tabel 5.** Regressive analysis of the SHi variable (Shot - individual), SHi+ (SHOT-positive), SHi- (SHOT-negative), SHi= (SHOT-error)

SHi Shooting (individual)

| | BETA | PART-R | R | P |
|---|---|---|---|---|
| GCHPARK | -0.10 | -0.11 | -0.09 | 0.53 |
| GCHPASK | -0.18 | -0.17 | -0.14 | 0.32 |
| KNEE IV-V | 0.15 | 0.14 | 0.11 | 0.43 |
| SH IV-VI | -0.23 | -0.20 | -0.16 | 0.25 |
| SH IV-I | 0.32 | 0.30 | 0.24 | 0.08 |
| Ro =.61 | | DELTA =.37 | P =.22 | |

SH + Shooting (positive)

| | BETA | PART-R | R | P |
|---|---|---|---|---|
| GCHPARK | -0.01 | -0.01 | -0.01 | 0.97 |
| GCHPASK | 0.14 | 0.13 | 0.11 | 0.44 |
| SH IV-V | -0.12 | -0.10 | -0.08 | 0.55 |
| SH IV-VI | -0.11 | -0.10 | -0.08 | 0.58 |
| SH IV-I | 0.35 | 0.31 | 0.27 | 0.06 |
| Ro =.59 | | DELTA =.35 | P =.31 | |

SH - Shooting (negative)

| | BETA | PART-R | R | P |
|---|---|---|---|---|
| GCHPARK | 0.02 | 0.02 | 0.02 | 0.89 |
| GCHPASK | 0.23 | 0.20 | 0.17 | 0.25 |
| SH IV-V | -0.04 | -0.04 | -0.03 | 0.84 |
| SH IV-VI | 0.17 | 0.14 | 0.12 | 0.43 |
| SH IV-I | 0.03 | 0.02 | 0.02 | 0.89 |
| Ro =.52 | | DELTA =.27 | P =.64 | |

SH= Shooting (error)

| | BETA | PART-R | R | P |
|---|---|---|---|---|
| GCHPARK | -0.10 | -0.11 | -0.09 | 0.52 |
| GCHPASK | 0.04 | 0.04 | 0.03 | 0.83 |
| SH IV-V | 0.17 | 0.15 | 0.12 | 0.37 |
| SH IV-VI | 0.29 | -0.25 | -0.20 | 0.15 |
| SH IV-I | 0.01 | 0.01 | 0.01 | 0.95 |
| Ro =.63 | | DELTA =.40 | P =.15 | |

## 4. Conclusion

The research is carried out in order to determine the situation-motor relations of the accuracy of volleyball players under racing conditions, indeed to determine the characteristics of the precision of the impact of the checks using the shooting technique, and its efficiency in the game.

The results gained show that the situation-motor skills system has significant statistical influence on negative shot variables and wrong shooting in volleyball players.

The results gained show that the situation-motor skills system has significant statistical impact on variables; Negative shots, and wrong shots at league two volleyball players, until the first league volleyball players the system of situation-motor skills of volleyball players has significant impact of ideal succession. The theoretical case of research is reflected in the realization of urgent methodological problems, when questioning the assessment of motor situation precision, sized which are highly important for game efficiency in volleyball players, active racers, and which is still not sufficient research space. The practical importance of research consists primarily in that, that based on defined models of technical-tactical activities in volleyball players can create in the process of content exercises that would guide learning processes and player training according to the models given.

Especially coaches who work with the categories of young people to whom you need to improve the efficiency of the realization of technical-tactical elements of volleyball players, as well as the overall efficiency that would then successfully be achieved in the game.

## References


[1]. Alic Partić, M. (2002). Volleyball technique and tactics games. Tuzla: University of Tuzla, Faculty of Physical Education and Sports.

[2]. Bajrić, O., Šmigalović, M., Bašinac, I. i Bajrić, S. (2012). Global quantitative changes in basic and situational motor skills influenced by volleyball programs. Sports Science and Health, 1 (2), 22\u201228. Pan-European University Aperion, Banja Luka.

[3]. Ball. G., Stojanović, M. V. and Stojanović, M. (2007). Measuring and defining children's motor skills. Novi Sad: Faculty

of Sports and Physical Education.
[4]. Bala, G. (2008). Logical basis of methods for analyzing data from research in physical culture. Novi Sad: Self-author's edition.
[5]. Bala, G. (2010). Methodology of kinesiomytry research with a special focus on motor measurements. Novi Sad: Faculty of Sports and Physical Education.
[6]. Barnes, J., Schilling, B., Falvo, M., Weiss, L., Creasy, A., & Fry, A. (2007). Relationship of jumping and agility performance in female volleyball athletes. Journal Strength Cond Res. 21 (4), 1192–1196.
[7]. Bartlett, J., Smith, L., Davis, K., & Peel, J. (1991). Development of a valid volleyball skills test battery. Journal of Physical Education Recreation and Dance, 62 (2), 19–21.
[8]. Bernstein, A. (1990). Physiology of movements and activities. Journal of General Biology, 51 (2), 373−392.
[9]. Bertucci, B., & Hippolyte, R. (1984). Championship volleyball drills. Vol 1. Champaign, IL: Leisure Press.
[10]. Bishop, D., Burnett, A., & Farrow, D. (2006). Sports-science round table: does sportsscience research influence practice. International Journal of Sports Physiology and Performance, 1 (2), 161–168.
[11]. Bishop, D. (2008). An Applied Research Model for the Sport Science. Sports Medicine, 38 (3), 253–263.
[12]. Bjelica, D. (2004). The impact of sports training on anthropomorphic abilities. Podgorica: Montenegrin Sports Academy.
[13]. Bjelica, D. (2005). Sports training and its impact on the anthropomorphic abilities of footballers from the 14-year-old Mediterranean region in Montenegro. Podgorica: Montenegrin Sports Academy.
[14]. Bjelica, D. (2006). Sports practice. Podgorica: Montenegrin Sports Academy. Bjelica, D. (2007). Theoretical basis of body and health education. Podgorica: Montenegrin Sports Academy.
[15]. Bjelica, D. and Fratric, F. (2011). Sports training \u2012 theory, methodical and diagnostics. Niksic: Faculty of Sports and Physical Education.