

Psychological expenditure and its relationship to the serving skills of specialized volleyball players

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Abstract: *The importance of this research lies in developing a psychological expenditure scale and its relationship to the passing skills of specialized volleyball players. The research problem focused on psychological expenditure as one of the problems and challenges faced by specialized players and its negative impact, such as poor skill performance, which is reflected in the performance of the player and the team. This weakens the player's self-confidence and concentration and affects the team's performance in tournaments as well as their performance in training. The research aims to develop a psychological expenditure scale, and the researcher used the descriptive approach as it is appropriate for the nature of the research problem. The five axes of the scale are (emotional numbness, lack of sense of achievement - emotional stress - poor communication with teammates - physical effects). The scale was weighted on a five-point scale and consisted of 30 items, most of which were negative. The sample consisted of 140 players from specialized schools in Baghdad, Dhi Qar, Anbar, Maysan, Wasit, and Basra for the period from March 1, 2025, to May 1, 2025. The data was statistically processed using the SPSS statistical program, using the T-test for independent samples in the discriminative ability of the statements and Pearson's correlation for internal consistency. The researcher concluded that there is a significant relationship between psychological expenditure and serving skill, and that psychological pressure and*

Psychological and physical fatigue among players must be reduced.

Keywords: *Psychological expenditure, technical skills.*

Introduction

Psychology is very important in athletic progress, and those responsible for it must clarify and demonstrate its importance in daily life in general and in sports in particular, this is because it deals with the psychological, Psychological, and cognitive aspects of the athlete, as well as other sports sciences. If an athlete possesses physical, training, and technical skills but lacks psychological skills, this will affect their performance and prevent them from achieving the desired results. One of the factors that plays a very important role in the results of matches, both positively and negatively, is psychological expenditure, as it directly affects the sustainability of the player's performance and their ability to achieve goals. "The amount of Psychological energy and emotion that a player devotes during training or competition in order to meet the requirements of athletic performance. It includes cognitive processes such as attention and concentration, emotional processes such as emotion control and motivation, and behavioral processes such as perseverance and decision-making" (Abdul Rahman, 87:2015).

Psychological expenditure occurs to many players because of what players want in terms of development and winning, and the psychological and psychological pressure that affects development and the mindset of winning and winning the match or point to win the match. There are players who are not affected by expenditure and remain focused, and psychological expenditure increases under the pressure of competition or in decisive situations, as well as affecting the psychological state even if physical readiness is high, and greatly affects motivation towards teammates, training, and the ability to win. These factors affect physical performance, so we need to identify the degree or level of psychological expenditure and its effect on the skill level of players through a scale that measures this variable. Hence the importance of research in developing a measure of psychological expenditure, finding a suitable measure, and establishing standard levels that are very important for aspects of research, as well as developing a path and data for coaches in general to identify expenditure and ways of dealing with players for the sake of development.

Research problem

Continuous, high-quality, organized work in the fields of physical education and sports science is aimed at winning and achieving championships. The goal and objective of coaches is to guide the team towards safety, train and develop players, and provide them with a positive atmosphere that helps them achieve success and reduce the negative effects on players in the results of competitions and play. Psychological expenditure is one of the major problems faced by most volleyball players. It has many negative effects, including weakness, psychological impact, fatigue, and psychological pressure, which in turn greatly affect physical and skill performance and deprive players of moments of enjoyment and flow in practicing activities and playing, which has a positive role. It also affects the player's confidence and performance, which in turn affects the work of the team as a whole. Therefore, those interested in this field, coaches, and specialists in this field are required to find a solution to this problem by monitoring the psychological expenditure of players. Here, the problem with the study is the lack of a local measure to measure psychological expenditure.

Research objectives

- a. First: To construct a psychological expenditure scale.
- b. Second: To establish criteria and levels for the psychological expenditure scale.
- c. Third: To establish the relationship between psychological expenditure and serving skills in volleyball.

Research areas

- a. Human domain: Specialized school volleyball players.
- b. Temporal domain: March 1, 2025 to May 1, 2025.
- c. Spatial domain: Specialized school volleyball courts.

Methodology

The researcher used the descriptive method in the form of a survey to suit the nature of the research and obtain results, "as the descriptive method is one of the scientific methods that focuses on collecting accurate scientific descriptions of the phenomena under study, describing the current situation, and interpreting it" (Amer and Ibrahim, 2012:187).

Research sample

The research sample consisted of 140 players in specialized volleyball schools affiliated with the Ministry of Youth and Sports, as shown in Table 1.

Table (1): shows the distribution and preparation of the research sample

No.	School Name	Sample Size	Sample Type	Total Number
1	Baghdad	5	Exploratory	5
2	Baghdad	23	Application	50
3	Maysan	27	Application	
4	Wasit	20	Constructive	85
5	Dhi Qar	24	Constructive	
6	Anbar	21	Constructive	
7	Basra	22	Constructive	

Research tools and equipment

Questionnaires, electronic timer, data entry forms, volleyball court, five regulation balls, colored tape to mark the court, laptop computer.

Scale construction procedures

In order to achieve the first objective of the research, which is to construct a psychological expenditure scale for players at the specialized volleyball school, the researcher relied on precise scientific steps. "The scientific aspect of constructing psychological tests involves precise knowledge of how to develop the scale or test items and the skill to design it while calculating its discriminative power and level of stability if it is a test. The technical aspect involves the integrative connection between these scientific characteristics" (Al-Khaykani and Al-Jabouri, 2017: 51).

Areas of measurement

After reviewing the literature in scientific sources and references that addressed the topics of psychological expenditure and topics related to psychological expenditure, the researcher defined the areas of the scale as stress, apathy, deficiency, emotional stress, psychological fatigue, and poor communication. By presenting the areas to experts, the following areas were identified for constructing the scale: (emotional numbness, lack of sense of accomplishment, emotional stress, poor communication with teammates, and physical effects).

Preparation of paragraphs

To determine the validity of the scale items for the players, the researcher reviewed some previous scales and studies to help in developing the scale items, which included a first draft of 40 items.

Scientific basis of the scale

To determine the validity of the scale, the researcher presented 40 items to a group of experts and specialists (Appendix 1). After collecting and statistically analyzing the experts' responses, it was found that all 30 items that received a rating of 75% or higher from the judges were retained, while the remaining 10 items were deleted because they did not meet the required rating.

Validity of the scale

The researcher used construct validity to verify the scale: this type of validity is verified by conducting a statistical analysis of the statements, and the researcher verified it by extracting the following indicators:

- 1- **The distinctive power of phrases:** To achieve this, the researcher adopted the two-group method in calculating the discriminatory power of the statements using the T-test for independent samples. The aim of analyzing the statements is to retain those with high discriminatory power, which are the good statements in the scale. Experts indicate that 27% of the lower group and 27% of the upper group is the best ratio by which we obtain the highest discrimination coefficients. Therefore, the T-test was used to indicate the differences in the arithmetic means between the lower and upper groups, and it was found that all phrases are statistically significant at the 0.05 significance level, as shown in Table 2.

Table (2): Shows the discriminatory power of each statement of the psychological expenditure scale

No.	Lower group		Upper group		T value	P value	Result
	Means	SD	Means	SD			
1	2.61	.696	4.89	.315	22.1	.0	Si
90	77		47	30	46	00	g.
2	3.02	.680	3.00	.000	18.8	.0	Si
38	32		00	00	25	00	g.
3	2.35	.692	5.00	.000	24.7	.0	Si
71	17		00	00 ^a	45	00	g.
4	2.38	.824	3.00	.000	20.5	.0	Si
10	99		00	00 ^a	74	00	g.
5	2.33	.611	5.00	.000	28.2	.0	Si
33	54		00	00	60	00	g.
6	2.90	.905	3.10	.315	14.9	.0	Si
48	53		53	30	95	00	g.
7	2.78	.924	5.00	.000	15.5	.0	Si
57	88		00	00	16	00	g.
8	3.11	.889	2.68	.477	13.7	.0	Si
90	02		42	57	12	00	g.
9	3.00	0.76	5.00	.000	18.3	.0	Si
0	8		00	00	30	00	g.
10	2.46	0.61	2.73	.561	28.7	.0	Si
5	5		68	95	65	00	g.

11		2.71	0.67	4.89	.315	23.7	.0	Si
	4	7	47	30	68	00	g.	
12		3.02	0.77	3.00	.000	17.9	.0	Si
	0	7	00	00	86	00	g.	
13		2.51	0.61	5.00	.000	22.2	.0	Si
	3	0	00	00 ^a	46	00	g.	
14		2.51	0.59	3.00	.000	24.7	.0	Si
	0	8	00	00 ^a	67	00	g.	
15		2.53	0.61	5.00	.000	28.3	.0	Si
	0	5	00	00	45	00	g.	
16		2.71	0.75	3.10	.315	21.9	.0	Si
	1	3	53	30	83	00	g.	
17		3.20	0.74	5.00	.000	18.5	.0	Si
	2	9	00	00	44	00	g.	
18		3.10	0.98	2.68	.477	12.2	.0	Si
	2	4	42	57	47	00	g.	
19		2.69	0.87	5.00	.000	18.5	.0	Si
	8	0	00	00	34	00	g.	
s20		3.10	0.65	2.73	.561	20.3	.0	Si
	0	3	68	95	35	00	g.	
21		3.24	0.66	4.89	.315	18.5	.0	Si
	4	2	47	30	47	00	g.	
22		2.61	0.75	3.00	.000	21.2	.0	Si
	2	9	00	00	13	00	g.	
23		2.38	0.53	5.00	.000	34.3	.0	Si
	7	2	00	00 ^a	12	00	g.	
24		2.67	0.59	3.00	.000	27.5	.0	Si
	3	1	00	00 ^a	48	00	g.	
25		2.44	0.79	5.00	.000	22.5	.0	Si
	9	2	00	00	42	00	g.	
26		2.51	0.61	3.10	.315	22.2	.0	Si
	3	0	53	30	46	00	g.	
27		2.51	0.59	5.00	.000	24.7	.0	Si
	0	8	00	00	67	00	g.	
28		3.24	0.89	2.68	.477	20.8	.0	Si
	4	5	42	57	76	00	g.	
29		2.77	0.84	5.00	.000	17.4	.0	Si
	7	1	00	00	36	00	g.	
30		2.87	0.51	2.73	.561	17.8	.0	Si
	9	6	68	95	27	00	g.	

*: The P value is significant if it is < 0.05.

We find that all items on the psychological expenditure scale are statistically significant at the 0.05 level.

- 2- **Internal consistency coefficient:** The purpose of this procedure is to determine whether the responses as a whole for specific items are reasonably consistent with the behavioral or personality traits assumed by the scores. "The correlation between the statement score and the total score of the current scale means that the statement represents the concept or trait to be measured" (Shaker and Radi, 380:2023), as the correlation between the statement score and the total score of the scale is evidence that the statement actually measures the behavioral dimension that the test or scale

aims to measure. This indicator was extracted using Pearson's correlation coefficient between the statement score and the total score of the scale for all 85 individuals in the sample, as shown in Table 3.

Table (3): Shows the correlation coefficient between the statement score and the total score on the psychological expenditure scale.

No.	Simple correlation	Pearson	P value	Result
1	.522		.000	Sig.
2	.599		.000	Sig.
3	.238		.047	Sig.
4	.495		.000	Sig.
5	.522		.000	Sig.
6	.522		.000	Sig.
7	.599		.000	Sig.
8	.238		.047	Sig.
9	.495		.000	Sig.
10	.369		.002	Sig.
11	.522		.000	Sig.
12	.599		.000	Sig.
13	.238		.047	Sig.
14	.495		.000	Sig.
15	.369		.002	Sig.
16	.522		.000	Sig.
17	.599		.000	Sig.
18	.238		.000	Sig.
19	.495		.000	Sig.
20	.369		.000	Sig.
21	.522		.000	Sig.
22	.599		.000	Sig.
23	.238		.047	Sig.
24	.495		.000	Sig.
25	.369		.000	Sig.
26	.522		.000	Sig.
27	.599		.000	Sig.
28	.238		.047	Sig.
29	.495		.000	Sig.
30	.369		.002	Sig.

*: The P value is significant if it is < 0.05.

We find that all statements are statistically significant and their values are less than (0.05).

Scale stability

The researcher verified the stability of the scale using the Fakeronbach coefficient by using the Statistical Package for the Social Sciences (SPSS). A good scale is one that is stable. When this coefficient was applied to the sample of 85 individuals, the stability coefficient was found to be 0.856, which is a high value for stability at a significance level of 0.05.

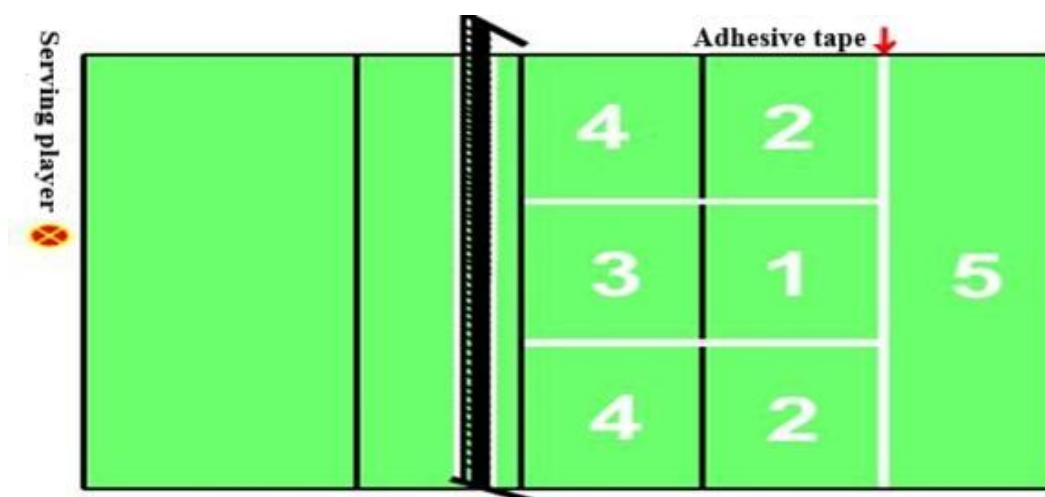


Figure 1: Accuracy test for the smash skill in volleyball

Conditions and instructions

The conditions for applying the scale to players have been prepared, provided that the experimenter indicates the appropriate choice for the paragraph, confirms the accuracy of their answers, and takes into account the researcher's concealment of the purpose of applying the scale in order to obtain honest answers. This comes within the scope of what is known as the social desirability of the scale. "One of the steps in constructing a psychological scale is to write its instructions and conditions so that the instructions emphasize the need to follow what is required and confirm that they are followed accurately and are simple, clear, and sequential" (Alam, 2014: 77).

Scale correction

This refers to assigning a score to each item on the scale, then adding these scores together to find the total score for each test taker according to the correction key. "To extract the raw scores of the examinees, a correction key must be used for all negative and positive scale items, giving specific scores for each answer to arrive at the total score of the examinees on the scale" (Alam, 2014: 79). Therefore, the highest score for the scale is 150 points, the lowest is 30 points, and the hypothetical average is 90 points.

Accuracy test for smash skill (Al-Maslamawi, 2006).

- Test objective:** To measure the accuracy of smash skill.
- Tools used:** A regulation volleyball court, five regulation volleyballs, and colored tape to divide the court into zones, as shown in Figure 1.
- Performance specifications:** The student being tested stands in the middle of the end line of the court (the half facing the marked half of the court) 9 meters from the net. From this position, the student holds the ball and performs a smash so that the ball crosses the net into the marked half of the court.
- Performance conditions:** If the ball touches the net and crosses into the marked half of the court or goes outside the court boundaries, it counts as an attempt for the test student (out of the five attempts) and is not counted towards the score.
- Scoring:** The student takes the score of the area where the ball lands for each correct serve, and since each student has five attempts and the points are distributed

across areas from 1 to 5 points, the total score for this test is 25 points. It should be noted that if the ball falls on the line separating two areas, the test taker is awarded the points for the higher area, as shown in Figure 1.

Exploratory experiment

After completing the initial draft of the paragraphs, the researcher conducted an exploratory experiment with five players from the Baghdad school on Thursday, March 20, 2025, who were taken from the sample group.

The main experiment

The final version of the scale in Appendix (2) was applied to the sample, as well as the accuracy test for the overwhelming transmitter. "The application is necessary to identify ambiguous items, cultural biases, or respondent fatigue. Observations during application often reveal problems that are not apparent to developers or researchers" (Devellis, R.F., 2017:115).

Statistical analysis

The researcher used statistical software (SPSS) to process the data.

Result and Discussion

The psychological expenditure scales

Hypothetical mean = (total alternatives ÷ highest score for the alternative) X number of scale items (Judah, 2008: 178)

Therefore, the hypothetical mean for the form as a whole = (1+2+3+4+5) ÷ 5) X 30 = 90.

Table (4): shows the arithmetic mean, the hypothetical mean, the standard deviation, the calculated T-value, the true significance, and the type of difference for psychological expenditure.

Variable	Means	SD	T value	P value	Result
psychological expenditure	116.10	22.37	12.94	0.00	Sig.
Hypothetical mean			90		

*: The P value is significant if it is < 0.05.

The relationship between psychological expenditure and smash skills

To verify the relationship between the scale scores and the volleyball smash test, the researcher presents the correlation matrix results in Table (5).

Table (5) shows the results of the correlation

Variable	Me	SD	Skewness	R value	P value	Result
Psychological expenditure	116.378	22.37	0.271	0.458	0.005	Sig.
Smash test	17.195	4.2	0.087			

*: Significant < 0.05 at a degree of freedom (139).

Discussion

The third objective, which was to find the relationship between psychological expenditure and serving skill in volleyball, was achieved. Statistical analysis and Table 5 showed that the mean of psychological expenditure was 116.100 and the standard deviation was 22.378. Meanwhile, the arithmetic mean for smashes was 17.140 and the standard deviation was 4.295, with a tabulated T-value of 12.945 at a degree of freedom of 139 and a significance level of 0.05. This means that there is a significant relationship between the two variables. The researcher interprets these results as indicating the extent to which providing players with an appropriate training and educational environment and involving them in various tournaments and competitions, as well as school competitions, makes them more knowledgeable and developed. This supports and develops their physical and technical skills and also supports their psychological skills, as contact with other players and other coaches with a high flow of information, guidance, and development, as psychological expenditure has a significant impact on the player's level, especially on skill performance, where expenditure affects the player's psychological energy and emotionality, which in turn affects the most important skill, which is serving. The researcher agrees with Weinberg & Gould "Psychological control is the hidden fuel of athletic skills: the more a player is able to manage his emotions, the better his accuracy, reaction speed, and decision-making" (147:2019, Weinberg & Gould).

The results indicate a relationship between psychological expenditure and performance, where expenditure is "the amount of effort, Psychological energy, and emotion that a player employs during athletic performance in order to achieve the requirements of the activity, which include attention, motivation, emotion control, decision-making, and perseverance under various pressures" (Abdul Rahman, 2015: 87). It is well known that serving is considered the starting point in volleyball because it requires skill and psychological performance, namely the ability to throw the ball and hit it at a specific time and place, which requires precision and attention. This requires psychological effort and emotional stability in order to perform at one's best, which affects the player's psychology and performance and, consequently, the team as a whole. The higher the psychological expenditure, the greater the impact on the skill of the serve.

Coaches and players' managers must find psychological and collective means to reduce this expenditure in volleyball, especially in serving, which requires a high level of positive psychological expenditure in order to: First: accurately time the jump and hit the ball; second: control emotions under pressure from the score; third: Quick decision-making regarding the angle and power of the hit. Studies have shown that players with high positive psychological expenditure achieve higher success rates in hitting, while low or excessive psychological exhaustion may cause errors in timing or direction (Jarrar, 165:2020).

Conclusion

Based on the results obtained, the researcher concluded that the psychological expenditure scale was constructed on a sample of specialized volleyball players, with a final form consisting of 30 items, and standard levels for the scale were also established. The

results also showed that there is a significant correlation between the level of psychological expenditure among volleyball players and their serving performance, indicating that psychological factors directly affect skill efficiency. A high level of positive psychological expenditure is associated with improved accuracy and power of the smash, which enhances the team's offensive performance. A low level of psychological expenditure or excessive psychological pressure on the player may negatively affect the timing of the smash and the accuracy of the shot. The psychological aspect is an important complement to physical and skill preparation, and any deficiency in it may limit the full utilization of the player's technical abilities.

Recommendations

Include systematic psychological training programs in volleyball training units to develop motivation, self-confidence, and the ability to control emotions during matches. Train players in strategies for controlling psychological expenditure so that psychological energy is directed toward effective performance rather than tension or negative exhaustion. Conducting periodic tests of psychological expenditure and monitoring its changes during the sports season, linking it to skill performance levels, especially serving. Involving sports psychologists in the overall preparation of the team to provide individual and group psychological support.

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