Journal of Medical Care Research and Review
Received 15 Nov 2021 | Revised 20 Dec 2021 | Accepted 15 Jan 2022 | Published Online 20 Feb 2022

DOI: https://doi.org/10.52845/MCRR/2021-5-2-2
JMCRR 5 (2), 1176–1181 (2022)

ISSN (O) 2589-8949 | (P) 2589-8930 IF:1.6

ORIGINAL ARTICLE

Choosing tests to assess professional volleyball physical fitness for male students majoring in physical education

Dao Chanh Thuc[1,2*]|

[1]An Giang University, Vietnam

[2]Vietnam National University, Ho Chi Minh City, Vietnam

Abstract

The present study has built 09 tests to assess professional volleyball physical fitness for male students majoring in physical education, including two tests on form, four tests on technique, and three tests on physical strength. The study has used many methods such as document references, pedagogical observations; expert interviews; pedagogical tests, and statistical analysis in the field of physical training and sports. Therefore, the author has selected 09 tests with sufficient scientific basis, reliability, and informativeness to evaluate professional volleyball physical fitness for male students majoring in Physical Education, An Giang University - Vietnam National University, Ho Chi Minh City.

Keywords: choosing tests, professional volleyball, physical fitness

1 | INTRODUCTION

Volleyball is one of the most popular sports that the majority of students, as well as Vietnamese, choose volleyball to practice, to study, and to exercise. (Thuc D.C et al., 2018). As for volleyball in the P.E module of schools in Vietnam, this sport is one of the most discussed topics in the classroom, from effective training models to the latest perspectives about evaluating technical, tactical, and professional physical fitness. (Thuc D.C, et al, 2018).

However, it can be seen that the teaching model and the traditional assessments are chosen by most teachers because the fundamentals of volleyball teaching emphasized such as setting, passing, and basis spiking to assess basic technique (Barroso & Darido, 2010), and confirmed by recent volleyball studies and analyzed basis on the fundamentals and the effectiveness (Alnedral, et al, 2020; Thuc DC, et al, 2021).

Supplementary information The online version of this article (https://doi.org/10.52845/MCRR/2021-5-2-2) contains supplementary material, which is available to authorized users.

Corresponding Author: *Dao Chanh Thuc*
Vietnam National University, Ho Chi Minh City, Vietnam

In the process of teaching and training for students majoring in Volleyball at An Giang University- Viet Nam national university Ho Chi Minh city (AGU-VNU, HCM city), in order to achieve high results in teaching and training, the teachers must use a variety of techniques, physical fitness and tactical differences (Thuc DC, 2017). In which, the issue of professional physical fitness is an important factor and determines the achievement. Good professional physical fitness will take advantage of students to promote good technique and tactics in competition. Therefore, the improvement of professional physical fitness for male students majoring in Volleyball in AGU- VNU, HCM is very necessary and indispensable for each teacher when teaching. But so far, in the process of evaluating professional physical fitness for male students majoring in volleyball has not been paid attention and there is no consensus in the assessment tests. From the above problem, the study has selected the tests to evaluate professional physical fitness contents for male volleyball at AGU-VNU, HCM, is important and necessary for teaching and training.

2 | RESEARCH METHODS

Analyzing and synthesizing documents; pedagogical observation; Interview; pedagogical testing and Statistical mathematical.

The author uses SPSS 20.0 software to support statistical analysis of research results.

3 | RESULTS

1. Theoretical and practical basis is the selection of tests to evaluate professional physical fitness content for male students majoring in Volleyball at Agu-VNU,HCM. In teaching and training professional physical fitness content for male volleyball majors, teachers and coaches, and experts can use a variety of methods in assessing the professional physical fitness development for students majoring in Volleyball.

However, the basis for the assessment is often based on influencing factors such as body form factors, functional factors, physical fitness factors, technical-tactical factors, psychological factors. To evaluate the content of professional physical fitness for male students majoring in Volleyball at Agu-VNU,HCM, we have to use a combination of biomedical, psychological and pedagogical essessment tests. In which, the pedagogical test is often used more because it is suitable for physical fitness activities. Using pedagogical tests usually makes sure reliability, informability and simplicity in the essessment process. Because the units of measure represent relative accuracy and the important thing is relevant to the tester's expertise. In addition, to assess physical fitness, it is not impossible to use tests closely related to physical fitness like body form tests. The results have obtained through the test are extremely valuable information, helping the teaching and training process to adjust the timely plan in and high effectiveness. At the same time, through the research results, it is shown that the assessment of professional fitness content for male students majoring in Volleyball is the assessment of movement abilities through physical fitness factors and competition levels. The selection of tests through the following steps:

Step 1: Refer to relevant documents to synthesize tests

Step 2: Through interviews with teachers, coaches and experts to select the most characteristic tests to give the assessment.

Step 3: Determine the reliability and informability of the selected interview tests.

To carry out these research steps, first we consult the relevant documents and research work. On that basis, the author gives the evaluation factors for the development of the professional physical fitness content for male students majoring in Volleyball, which are:

Physical fitness qualities; Psychology, will; Equipment; Nutritional conditions; Muscle fiber structure; Movement technique; Physiological function; Medical examination; Body form; Neurological type.

After synthesizing and giving the tests, we have conducted interviews with teachers, coaches and experts to select the most characteristic tests to evaluate. Before the interview, we give priority levels in the assessment according to the scales and approaches.

Priority 1: Very important (3 points); Priority 2: Important (2 points); Priority 3: Less important (1 point); Priority 4: Not important (0 points). The way to conduct the interview is through the form of a questionnaire to ensure the reliability and objectivity of the interview results.

The subject was interviewed twice, and the interval between two interviews was 15 days. The content and the method of the interview are the same. Interviewees are teachers, coaches and experts with extensive experience in teaching and training volleyball. The first interview, we interviewed 32 people including 16 teachers, 10 coaches and 6 experts all with professional qualifications from masters or higher. The second interview, There were 29 people including 15 teachers, 8 coaches and 6 experts all with professional qualifications from masters or higher. The characteristics of the interviewees are illustrated in Figure 1.

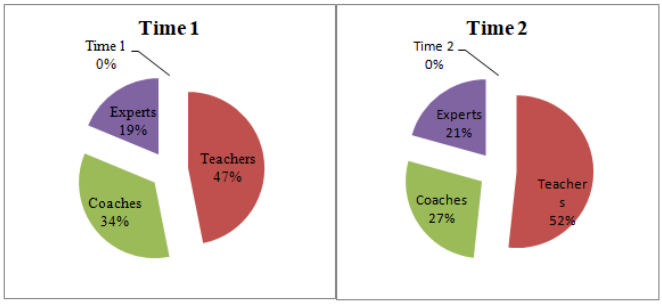

FIGURE 1: Interviewees

The results of the two interviews are presented in Table 1, and showed that there is a consensus between the two interviews ($t_{student}$ is significant at the threshold of probability $P < 0.05$). Thereby, the topic selected 3/8 factors with necessary ability to test and evaluate the content of professional physical fitness for male students majoring in Volleyball. That is the factors with 80.0% agreements are very important and important in both interviews and the total score in 2 interviews is over 70.0 points or more, which are the following factors:

Form; technique; Physical fitness qualities.

The above factors are the basis for us to refer to the general documents and interview to select the test to evaluate the professional physical fitness content for male volleyball majors to be more objective, scientific and appropriate.

2. Through analysis and synthesis of professional documents, as well as through observations, the study has identified 16 tests to evaluate the professional physical fitness content for male students majoring in Volleyball. In order to have a basis for selecting assessment tests, we have conducted two interviews with teachers, coaches and experts with extensive experience in teaching and training Volleyball. The interview results are shown in Table 2.

The results of the two interviews are shown in Table 2 and there is a high consensus between the two interviews. Thereby, the topic has selected 09/16 tests with ability of evaluating the professional physical fitness content for male students majoring in Volleyball. The selected tests have from 80.0% agreements that are very important and important in both interviews and the total score in 2 interviews accounts for over 70.0 points, which are the following tests:

Height (cm); Standing-reach height 1 hand (cm); Serving into the designated box 1 minute (times); Setting into the designated box for 1 minute (times); Passing into the designated box for 1 minute (times); Spiking number 4 for 1 minute (times); Vertical jump (cm); Crunches exercise 30 s (times); Run zigzag 9-3-6-3-9(s).

Thus, through 2 interviews, we have selected 09 tests to use to evaluate the professional physical fitness content for male students majoring in Volleyball as well as for other courses.

3. Determining the reliability and informability of the selected tests

3.1. Determining the reliability of the tests

In order to determine the reliability of the tests on research subjects, the study has conducted to determine the correlation coefficient between 2 times of testing. The test was conducted on 30 male students majoring in Volleyball in 2 tests. Each test was 2 days apart, and the test conditions between the two times were the same. The reliability of tests and experiments depends on the stability and reproducibility of results in repeated tests through the same time and conditions on the same subject, determined by referees, experimenters and various witnesses and

Tables.1 Interview results on the necessary factors to test and evaluate the professional physical fitness content for male students

Contens	1st interview (n=32)				Total		2st interview (n=29)				Total		t	P
	VI	I	LI	NI	Scores	%	VI	I	LI	NI	Scores	%		
Equipment	6	3	6	17	30	31.25	5	2	7	15	26	29.89	1.02	>0.05
Form	**24**	**3**	**2**	**3**	**80**	**83.33**	**22**	**4**	**2**	**1**	**76**	**87.36**	**5.65**	**<0.05**
Neurology	8	6	2	16	38	39.58	9	5	2	13	39	44.83	0.96	>0.05
Psychology	7	7	4	14	39	40.63	7	7	4	11	39	44.83	1.12	>0.05
Technique	**21**	**2**	**8**	**1**	**75**	**78.13**	**20**	**2**	**7**	**0**	**71**	**81.61**	**6.08**	<0.05
Nutrition	9	4	11	8	46	47.92	5	4	12	8	35	40.23	1.21	>0.05
Physical fitness	**25**	**1**	**1**	**5**	**78**	**81.25**	**23**	**1**	**1**	**4**	**72**	**82.76**	**3.24**	<0.05
Function	8	12	9	3	57	59.38	7	9	9	4	48	55.17	0.87	>0.05

Notes:Very important (VI); important (I); less important (LI); not important (NI); $t_{0.05}$=1.96 (Thuc D.C, 2018)

Table.2 Results of the interview to select tests to evaluate the content of professional physical fitness

CONTENTS	1st interview (n=32)						2st interview, n= 29					
	VI	I	LI	NI	Scores	%	VI	I	LI	NI	Scores	%
FORM												
Height (cm)	**18**	**13**	**1**	**0**	**81**	**84.38**	**15**	**13**	**1**	**0**	**72**	**82.76**
Body mass (kg)	**8**	**3**	**2**	**19**	32	33.33	**5**	**3**	**2**	**19**	23	26.44
Standing-reach height 2 hand (cm)	8	6	2	16	38	39.58	6	5	2	16	30	34.48
Standing-reach height 1 hand (cm)	**16**	**13**	**3**	**0**	**77**	**80.21**	**16**	**10**	**3**	**0**	**71**	**81.61**
TECHNIQUE												
Serving into the designated box 1 minute (times)	**21**	**9**	**0**	**2**	**81**	**84.38**	**20**	**7**	**0**	**2**	**74**	**85.06**
Setting into the designated box for 1 minute (times)	**25**	**2**	**5**	**0**	**84**	**87.50**	**22**	**2**	**5**	**0**	**75**	**86.21**
Passing into the designated box for 1 minute (times)	**19**	**12**	**1**	**0**	**82**	**85.42**	**19**	**9**	**1**	**0**	**76**	**87.36**
Spiking number 4 for 1 minute (times)	**21**	**9**	**2**	**0**	**83**	**86.46**	**21**	**6**	**2**	**0**	**77**	**88.51**
Spiking number 2 for 1 minute (times)	8	6	2	16	38	39.58	8	3	2	16	32	36.78
Spiking number 3 for 1 minute (times)	8	6	2	16	38	39.58	5	6	2	16	29	33.33
PHYSICAL FITNESS												
Vertical jump (cm)	**20**	**10**	**2**	**0**	**82**	**85.42**	**19**	**8**	**2**	**0**	**75**	**86.21**
Spike jump (cm)	7	6	3	16	36	37.50	7	6	3	13	**36**	**41.38**
Crunches exercise 30 s (times)	**18**	**12**	**2**	**0**	**80**	**83.33**	**18**	**9**	**2**	**0**	**74**	**85.06**
Back exercises 30 s (lần)	8	6	2	16	38	39.58	8	6	2	13	**38**	**43.68**
Run zigzag 9-3-6-3-9(s)	**21**	**8**	**3**	**0**	**82**	**85.42**	**19**	**7**	**3**	**0**	**74**	**85.06**
Squat jump (cm)	7	6	3	16	36	37.50	7	6	3	13	**36**	**41.38**

Notes: Very important (VI); important(I); less important (LI); notimportant (NI)

then calculating the correlation between the results of the two tests. If the test has a strong correlation coefficient, it shows high reliability. The results are presented in Table 3.

Table 3. Reliability coefficients of selected tests

No.	Tests	r (n=30)
1	*Height (cm)*	0.88
2	*Standing-reach height 1 hand (cm)*	0.91
3	*Serving into the designated box 1 minute (times)*	0.81
4	*Setting into the designated box for 1 minute (times)*	0.85
5	*Passing into the designated box for 1 minute (times)*	0.89
6	*Spiking number 4 for 1 minute (times)*	0.91
7	*Vertical jump (cm)*	0.83
8	*Crunches exercise 30 s (times)*	0.87
9	*Run zigzag 9-3-6-3-9(s)*	0.88

Note: n = 30; r=0.8 or higher test enough reliability to use.

From the results (Table 3), it is shown that in 09 tested tests for male students, 09 selected tests have correlation coefficients that are statistically significant ($P < 0.05$) to ensure the essential reliability ($r= 0.8$).

3.2. Determining the informability of the tests

This is an indispensable thing to determine the accuracy of the test. To test the test's informability, the study has conducted a research on the correlation between the research indicators for male students majoring in volleyball with academic achievement in the practice. More specifically, this is the correlation between the research indicators and the scores of the specialized subjects. The correlation between practical learning achievement and research indicators for male volleyball are presented in table 4.

From Table 4, it is shown that in all male students majoring in Volleyball, there is a strong correlation between 09/09 tests with academic achievement in practical subjects. The correlation coefficient is from 0.67 - 0.77 (Thuc DC, 2018). According to the theory of physical fitness measurement, the above 09/09 tests are highly informative for the assessment of the professional physical fitness content for students majoring in volleyball. From the research results on theory, practice and especially determining the reliability and informability of pedagogical tests, the study has selected 09 tests to ensure reliability ($r \geq 0.81$ with $P < 0.05$) and informability ($r \geq 0.64$ with $P < 0.05$). Thus, the study has identified 09 tests to evaluate the content of professional physical fitness for students majoring in Volleyball at Agu-VNU, HCM.

Table 4. Correlation coefficients of the research indicators with the practical learning achievement of male students majoring in Volleyball

No.	Tests	r (n=30)
1	*Height (cm)*	0.73
2	*Standing-reach height 1 hand (cm)*	0.79
3	*Serving into the designated box 1 minute (times)*	0.78
4	*Setting into the designated box for 1 minute (times)*	0.75
5	*Passing into the designated box for 1 minute (times)*	0.79
6	*Spiking number 4 for 1 minute (times)*	0.74
7	*Vertical jump (cm)*	0.75
8	*Crunches exercise 30 s (times)*	0.77
9	*Run zigzag 9-3-6-3-9(s)*	0.68

Notes: $|r_{0.05}|=0.755$. (ThucD.C, 2018)

4 | DISCUSSION

The aim of this study was to investigate tests of anthropometric characteristics and professional strength of male volleyball students majoring in physical education. To consider appropriate professional strength assessment tests which is made a basis for assessing professional physical fitness ability for male volleyball students majoring in physical education, is appropriate and scientific.

Although there is some research on male athletes in team sports, there is a few published studies on professional strength testing for male team volleyball players (Marques et al, MC, et al, 2008; Stanganelli, LC, 2008). At the same time, there is little objective information on the characteristics of the assessment tests that demonstrate the professional strength of male volleyball students majoring in physical education.

In volleyball competition, athletes must compete with specialized physical fitness to practice offensive and defensive skills (Marques, M.C, et al, 2009). Playing volleyball is demanded to solve some situations and specialized physical fitness activity throughout the game. Therefor height and specialized physical fitness can be considered the most important physical attributes. This is supported by the fact that the average height of volleyball players ranks among the tallest in international teams (Stanganelli, L.C, et al, 2008). Some authors suggest that

height is an important predictor of volleyball talent (Gabbett, T, et al, 2007; Viviani, F & Casagrande, G, 1990), and the presence of the tallest player is an indispensable factor to create the success of a team.

5 | CONCLUSION

From the results of the above research steps, the study has selected 09 tests to evaluate the professional physical fitness content for male volleyball majors at Agu-VNU, HCM, which are:

Form Tests: Height (cm); Standing-reach height 1 hand (cm);

TechniqueTests: Serving into the designated box 1 minute (times); Setting into the designated box for 1 minute (times); Passing into the designated box for 1 minute (times); Spiking number 4 for 1 minute (times).

Physical Fitness Tests: Vertical jump (cm); Crunches exercise 30 s (times); Run zigzag 9-3-6-3-9(s).

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How to cite this article: Thuc D.C., Choosing tests to assess professional volleyball physical fitness for male students majoring in physical education. Journal of Medical Care Re-search and Review. 2022;1176−1181. https://doi .org/10.52845/MCRR/2021-5-2-2