



## The feasibility and reliability of tests to assess physical fitness for female handball professional players aged 12-13 years old in Ho Chi Minh city, Vietnam

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### Abstract

The paper aims at checking the feasibility and reliability of tests to evaluate the physical fitness level of female 12-13-year-old handball athletes in Ho Chi Minh city, Vietnam. Some conventional research methods in sports were applied. 5 tests were chosen and a classification of fitness ranking was explored and applied to assess the research handball athletes.

**Keywords:** physical fitness, fitness level, handball, assessment tests, criteria, Ho Chi Minh City

### Introduction

Coaching and training athletes can be seen as a complicated process. The content of training is varied and should be fit to the athletes' physical fitness, techniques, strategies, psychological and biological traits. To assure the effectiveness of training process, assessing and testing the training proficiency can be considered necessary and the process of evaluating should be carried out scientifically and systematically. The results of assessment will be employed to see the success of training and training plan will be adjusted to fit the training objectives.

Handball is a direct competitive sport, so a modern handball player needs to achieve a high level of fitness. To help the athletes gain more strength, the coach needs to give an appropriate training method with a great number of activities. However, conducting training with a large amount of exercise must be based on a certain level of fitness. Therefore, assessing the fitness level of a handball player is very important and necessary. On the other hand, thanks to accurate information about the athletes' fitness level, the new coach can adjust the training plan, the amount of exercise, can make reliable forecasts. In Vietnam, handball is usually played by professional players and the players are trained to participate in competitions within the country or with other countries in the region. The coaching and training for Vietnamese young handball athletes require a lot of effort of trainers or coaches.

To accurately assess the fitness level of handball athletes, it is necessary to have a collection of scientific and comprehensive evaluation tests.

We recognize the necessity for a research on physical fitness assessment for handball players and conducted the study "The feasibility and reliability of tests to assess physical fitness for

female handball professional players aged 12 - 13 years old in Ho Chi Minh city, Vietnam".

### Research design and method

Some instruments were employed in the study such as reviewing related studies, questionnaire, pedagogical tests and basic statistical measures.

The research sample included two main groups. The first group is comprised of 15 female athletes aged 12-13 years old of a handball team in Ho Chi Minh City. The second one included 2 experts, 14 coaches, 2 referees, 2 administrative officers and 2 teachers of handball at a sport university in Ho Chi Minh City.

### Results

#### The process of selecting tests used to assess the fitness level of the female handball athletes aged 12-13 years old in Ho Chi Minh City.

To determine the criteria to assess the physical fitness level of these female handball players, the study was conducted in three major steps as follows.

**Step 1:** By reviewing literature of some researchers such as Nguyen, T. T. (2001), Pham, Q.B. (2000), Dao, D.K (2002), Bui K.P. (2007), Luu, T.S. (2007), Nguyen, X.Q. (2008), Nguyen, D.T. (2010), Nguyen, T.B. (2011), 8 tests were included in the survey with the second group.

**Step 2:** a questionnaire was delivered to the second sample group.

The test and re-test were carried out. The data were presented in Table 3.1 below.

**Table 1:** The results of questionnaire with the second group of the reseach population

Test		1 <sup>st</sup> time n = 24		2 <sup>nd</sup> time n = 22	
		Σ	%	Σ	%
Tests	30m run with high start (s)	108	90	100	90.91
	6 x 20m run (s)	84	70	73	66.36
	6 x 30m run (s)	66	55.83	61	55.45
	Throw the ball away (m)	118	98.33	109	99.09
	Preferred hand force (kg)	84	70	73	66.36
	shuttle run (s)	109	90.83	96	87.27
	800m run (s)	81	67.5	77	70
	Vertical Jump (cm)	102	85	97	88.18
	3 step long jump (m)	80	66.67	77	70
30m ball dribble (s)	112	93.33	102	92.73	

The results in Table 3.1 indicated that only 5 tests which received 75% agreement of the second group and can be feasible employed to assess the fitness level of the female handball athletes aged 12-13 years old in a handball team in Ho Chi Minh City. The tests include 30m run with high start (s), shuttle run (s), throw the ball away (m), vertical jump (cm), 30m ball dribble (s).

**Step 3:** the physical fitness of these female athletes was assessed. The assessment was conducted twice. The interval between the two times was 4 days and the content of the tests was the same between the two times. After that, the reliability of the tests was checked. The Pearson correlation coefficient (r) of the tests of the both times was observed.

The data of the two tests between the intervals were presented in Table 3.1 below.

**Table 2:** The results of the tests between the two intervals

Tests	1 <sup>st</sup> trial $\bar{X} \pm S$	2 <sup>nd</sup> trial $\bar{X} \pm S$	r	P
30m run with high start (s)	6.42 ± 0.38	6.41 ± 0.28	0.91	<0.01
Throw the ball away (m)	31.90 ± 6.09	31.42 ± 6.85	0.92	<0.01
shuttle run (s)	31.46 ± 0.98	31.71 ± 1.09	0.91	<0.01
Vertical Jump (cm)	228.93 ± 8.27	229.93 ± 7.53	0.87	<0.01
30m ball dribble (s)	7.77 ± 0.61	7.55 ± 0.41	0.90	<0.01

As can be seen in Table 3.2, there was coefficient reliability between the two tests (r > 0.9 and p < 0.01). The data revealed that the selected tests were reliable and feasible. In short, these tests can be used to assess the physical fitness level of the female handball athletes aged 12-13.

The discussion of the five tests is presented as follows.

**Vertical jump**

Vertical jump test is usually used to test lower body power. In handball, lower body strength is beneficial to handball players. Vertical jump is considered as a decisive factor to

create an advantage in attack and shield the opponent’s throw.

**Throwing the ball away in handball**

In handball competitions, spontaneous strength plays an important role, activities such as throwing the ball, jumping, defending depend a lot on this type of strength. In addition, the distance of ball throw can be used to assess an athlete’s technical level, the ability to manage the movement and the total body strength.

**Shuttle run**

Handball is a game requiring athletes to have speed endurance, the ability to maintain the actions at least 60 minutes.

The ability of athletes to quickly turn from attack to defense and vice versa is very important. To evaluate the ability of speed endurance, many tests have been examined and the wingate test has been widely applied to evaluate this type of endurance in handball.

**30m ball lead**

Dexterity or the ability to coordinate movements is an indispensable quality for handball players which is a highly heritable trait, with little or no impact during the training and this is considered as a special quality of athletes in general and handball players in particular.

**30m run with high start**

Quickness is a very important trait in most ball games. In handball game, the competitors are always required athletes to have this quality, especially in counter-attacking and counter-attacking situations.

**Developing the standard criteria to assess physical fitness for the female 12–13-year-old handball athletes**

**Creating the 10- mark scale:**

**Table 3:** Scales of physical fitness assessment for female 12-13 year-old handball players

Tests	Scales									
	1	2	3	4	5	6	7	8	9	10
30m Run with a high start (s)	7.19	7.00	6.81	6.62	6.43	6.24	6.05	5.86	5.67	5.48
Throw the ball away (m)	19.7	22.8	25.8	28.9	31.9	34.9	38.0	41.0	44.1	47.1
Shuttle run (s)	33.44	32.95	32.45	31.96	31.47	30.98	30.48	29.99	29.50	29.00
Vertical Jump (cm)	212	217	221	225	229	233	237	241	245	250
30m ball dribble (s)	9.00	8.69	8.39	8.08	7.78	7.47	7.16	6.86	6.55	6.25

**Creating the general criteria of classification**

From the results presented in Table 3.2, it can be seen that in order to assess the level of fitness for each female professional handball player aged 12-13 and in addition to the scale of the assessment, there should be general criteria of classification based on the values of the five selected tests. However, in order to make it easy and convenient, a five -level scale was developed as follow:

- + Good level from 9 points to 10 points
- + Fairly good level from 7 points to below 9 points
- + Average level from 5 points to below 7 points
- + Weak level from 3 points to below 5 points
- + Poor level from 3 points to below 3 points

To assess the fitness level of research subjects, 5 tests were used. The maximum value of each test is 10 points, so the

total score can reach a maximum of 50 points. From the above conventions, a classification summary is presented in Table 3.4.

**Table 4:** The five-rank scale to classify fitness level for 12- 13-year-old female handball athletes in Ho Chi Minh City

	Total Tests	Ranking				
		Good	Fairly good	Average	Weak	Poor
Fitness level	5	45→50	35→<45	25→<35	15→<25	0→<15

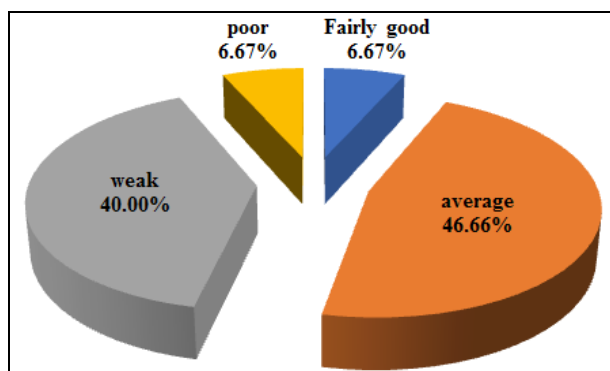
**Application of criteria to assess the professional fitness level of 12–13-year-old female handball athletes of a handball team in Ho Chi Minh City**

Based on the score classification in Table 3.4 above, we have observed each member of the athlete group and present the details in table 3.5 below.

**Table 5:** Results of the fitness assessment for the 12–13-year-old female handball players

No	Full name	30m Run with a high start (s)	Throw the ball away (m)	shuttle run (s)	Vertical Jump (cm)	30m ball dribble (s)	Total score	Ranks
1	Ngũ Mỹ Phụng	3.8	4.4	7.7	5.3	7.4	28.6	average
2	Ngô Thị Mỹ Hạnh	6.4	2.0	3.9	6.5	7.7	26.5	average
3	Phan Thị Mỹ Liên	2.6	4.8	5.3	7.2	3.0	22.8	Weak
4	Ứng Kim Yên	4.5	6.8	5.4	8.6	4.9	30.2	average
5	Đặng Ngọc Tinh	2.5	2.6	1.7	2.6	2.6	11.9	Poor
6	Lê Ngọc Yên Nhi	4.2	3.0	4.4	3.1	1.6	16.3	weak
7	Pang Tiêu Phụng	6.6	7.1	2.5	3.1	5.4	24.6	weak
8	Phan Lê Như	4.7	6.8	5.0	2.8	6.4	25.8	average
9	Nguyễn Thị Kim Anh	4.2	2.2	4.8	4.0	2.0	17.3	weak
10	Võ Thái Hà	3.4	3.3	2.3	4.5	5.5	19.0	weak
11	Hậu Tuyết Đình	3.1	8.3	8.5	4.0	4.2	28.1	average
12	Nguyễn Thiên Kim Ngân	5.4	5.0	4.4	3.6	4.4	22.7	weak
13	Chung Bội San	8.6	5.7	5.0	5.7	6.8	31.8	average
14	Tiêu Lục Yên	9.0	6.7	7.7	8.6	5.7	37.9	Fairly good
15	Huỳnh Huệ Tâm	6.0	6.2	6.6	5.3	7.3	31.4	average

The results shown in Table 3.5 indicate that: The summary in percentage of fitness ratings of female handball athletes aged 12-13 years old was presented in chart 3.1.



**Chart 1:** Percentage fitness data of female 12-13-year-old handball players

**Conclusion**

Through the research data, some conclusions could be drawn as follows.

Five tests were determined to employ for assessing fitness

level for the female handball players aged 12-13-years old in Ho Chi Minh city include 30m run with high start (s), shuttle-run (s), throw the ball away (m), vertical jump (cm), 30m ball dribble (s). The tests were found to be feasible and reliable for assessment. In addition, they were fit with the real situation of the team and the administrative department.

In summary, the results help to develop specific criteria to rank the physical fitness level for these players which would be helpful for the current and future training process.

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