

Assessing the reliability of tests for evaluation technical skills in mini basketball

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Abstract

The assessment of technical skill is crucial in the training children in mini basketball, given the significance of ball-related abilities. To verify the present of specific criteria, a set of tests was employed in an experiment conducted as part of this research. The focus was on evaluating tests designed to assess technical skills involving the ball in mini basketball. The objective of this assessments was to provide coaches with valuable insights into the current motor skills of participating children aged 10 to 11 (n = 42). The data collected during the research underwent analysis through descriptive statistical methods. Descriptive statistics for all monitored variables are expressed through SV and SD values. To examine the reliability of the tests for the assessment of technical skills in mini basketball, the intraclass correlation coefficient ICC with a confidence interval (IP 95%) was used. One-way analysis of variance (ANOVA) and Tukey's post hoc test were used to determine any potential differences between the given measurements in the aforementioned tests. The data obtained in this experiment based on the ICC indicate a high reliability of certain tests. All of these are direct variables for assessing the technical skills of young basketball players acceptable for creating valid and efficient testing protocols. The value of these results is reflected in the fact that the current literature lacks any data on the assessment of the reliability of all these tests assessing the technical skills of basketball players. The main limitation of this experiment is the small number of participants. It should be conducted on a larger sample, whereas the reliability of the tests should be examined with both younger and older children.

Keywords: technical skills, tests, mini basketball, reliability, ball, children

Introduction

Basketball is an extremely dynamic, polystructural game with a lot of changes in speed, tempo and alternating cyclic and acyclic movements (Stojmenovic et al., 2023). The motor skills provide useful information when evaluating a physical activity (Gadzic & Nikolic, 2020). Given that technical skills with the ball are highly important in the training process for children in mini basketball, there is a need to check the existence of specific arguments by assessing technical skills with a certain type of tests. For this purpose, an experiment was conducted where the evaluation of certain tests for assessing technical skills with the ball in mini basketball was done, with the aim of obtaining the results that would help coaches gain an insight into the current motor skills in children of a certain age. According to the criterion of the level of competition in the attack phase, the teams showed homogeneity in shooting (Markovic & Milosevic, 2023). The findings obtained from a relatively large and homogeneous group of participants can significantly enhance our understanding of the training process when working with children of a certain age. In order to obtain valuable findings, the reliability of the applied tests was examined. In order to provide answers, it was necessary to examine the technical skills with the ball in mini basketball from different aspects.

The great importance of teaching a technique in basketball to the youngest players entails assessing its quality in every child who plays basketball, having in mind that basketball is a team sport with five different positions and players roles (Stojmenovic et al., 2022). The importance of assessing technical skills with the ball in mini basketball can be reflected in better planning and programming of certain training sessions for learning and improving the basic technique in basketball, so that children may master the basic technical segments. The greatest wealth and essence of any sport is the huge talent possessed by many children for a sport (Markovic & Trivun, 2020). In order to achieve all that, it is necessary to have certain tests that would show the current motor abilities of children. Therefore, any future research should raise awareness among the young regarding the importance and impact of doing a sport and physical activities (Markovic & Milosevic, 2023).

Until recently, various tests in dynamic and static conditions have been used in research and in practice to evaluate technical skills with the ball in mini basketball. The test approved by the American Health Alliance was done in static conditions, where it was assessed which ball (of different dimensions) the participants would have more accuracy with when making 15 shots near the free throw line (4.25 m from the basket, basket height being 3.05 m) (Haywood, 1978). A similar test in static conditions included the participants who performed 10 shots from the distance of 4 m from the basket (basket height being 2.60 m). With the help of cameras, they

determined whether there were any changes in coordination with the balls of different dimensions when performing a jump shot (Okazaki, et al., 2005).

In a research which included a shooting accuracy test performed under dynamic conditions, the efficiency of shooting was evaluated. The participant was required to shoot and hit the basket as many times as possible in 90 seconds, from several places and at a distance of 3.66 m from the basket (Perkos et al., 2002). Three modified tests were used to determine the shooting efficiency during this test (Zambova & Tomanek, 2012). The free-throw test and the shooting test from a distance of 3 m were performed in static conditions, where the participants had to take 10 shots in both the first and the second test, while the third passing test was performed in dynamic working conditions where the participants also had 10 shots each. Based on a modified test of shooting 5 free throws with three different balls, a total of 15 shots taken in static conditions determined which ball best suits a certain age when shooting (Regimbal, et al., 1992). In general, in the mini-basket age, no research was done to assess dribbling, except for the one conducted by using the dribbling test from the Harrison battery of tests, which under dynamic conditions evaluates dribbling dexterity and speed around set cones during 30 seconds (Perkos et al., 2002).

Again, the test which included quick bouncing the ball off the wall resulted in 10 times as the fastest possible time (Haywood, 1978). This test, which was approved by the American Health Alliance, was performed in static conditions, and it evaluated the speed-strength capabilities of the arms and shoulder girdle.

The addition test previously used in the second research was employed in another research from the Harrison battery of tests (Perkos et al., 2002; Barrow & McGee, 1979). In dynamic conditions, the participant had 30 seconds to hit the 30 cm diameter circles placed on the wall at different heights. The first height was placed at 1.51 m, the second at 1.21 m, and the third at 1.36 m above the floor. The distance from the line from which it moved was 4.50 m. Each hit scored the shooter 1 point. The test that was done in previous years assessed the accuracy as well as the speed-power abilities of the participants (Barrow & McGee, 1979).

So far, in most research, the reliability, validity, specificity and objectivity of certain tests have been examined from the metric standpoint. These used a modified free throw test (10 shots) at the age of 18 to 23, and three cameras (Fig. 1). The results indicated certain specificity (Takayuki, et al., 2011).



Figure 1. Distance from the basket from which the shot was taken and three installed cameras (Takayuki et al., 2011)

The research on boys and girls aged 9 to 12.7 years, used the two tests that were approved by the American Health Alliance – the one included a quick, stationary bouncing the ball off the wall, and here 10 bounces was the best result. In addition, the lateral shooting test was performed near the free throw line, where the participants had 15 shots and where each hit awarded 2 points, and a miss 1 point. Both tests were approved by the American Health Alliance and both demonstrated specificity and validity (Haywood, 1978).

The research with 8 boys aged 10.5 years used a modified shooting test (10 shots) with different balls with the following characteristics: B1 model weighing 300 g - 340 g, circumference 55 cm - 57 cm; B2 model weight 550 g - 570 g, circumference 74 cm - 76 cm; B3 model, weight 600 g - 650 g, girth 76 cm - 78 cm. The shots were taken from a distance of 4 m from the basket (the basket height was 2.60 m). With the help of cameras, they performed a kinematic analysis of the movement during the jump shot. The goal of the research was to determine whether balls of different dimensions affect changes in coordination when performing a jump shot (Okazaki et al., 2005). The results showed that the weight and size of the ball did not affect the changes in coordination of children when performing a jump shot. It can be stated that the mentioned test has specificity.

The mini-basket study included girls aged 7 to 10 using a test designed for children aged 3 to 10 and measuring certain motor skills TGMD-2 (Fortousi et al., 2012; Ulrich, 2000). The second study found that certain shooting drills for children aged 10 can improve shooting accuracy (Zambova & Tomanek, 2012). They used three modified tests – the layup test, the free throw test (10 shots), and the 3 m jump shot test (10 shots). All

these tests reflected specificity. The jump shot test and the free throw test showed reliability, as the results did not differ significantly at the beginning and at the end of the experiment. A study related to ball size and accuracy in basketball, determined by reviewing videos from basketball games that featured the introduction of smaller balls (size no. 6) in women's basketball, did not show efficiency in the game except when making free throws (Podmenik et al., 2014). Perkos et al. (2002) applied three tests to 12-year-old boy basketball players, and the results were the following:

1. The "dribbling" test from the Harrison Basketball Test Battery evaluated dribbling skill and speed during 30 seconds around set cones. Each successful round counts for 1 point. According to Harrison, this test showed a high reliability coefficient of 0.95 (Barrow & McGee, 1979). The test showed objectivity and specificity.
2. The "passing" test was also used by Barrow and McGee (1979). The task was to make three circles with a diameter of 30 cm that were stuck on the wall, the first which was at a height of 1.51 m, the second at a height of 1.21 m and the third at a height of 1.36 m above the floor. The distance from the line from which it moved was 4.50 m. The participant had 30 seconds to alternately hit the circles with the ball. Each hit was scored with 1 point. According to Barrow and McGee (1979), this test showed a validity coefficient of 0.738.
3. The "shooting" test required the participant to kick and hit the ball as many times as possible from several places at a distance of 3.66 m from the basket in 90 seconds. Each successful hit awarded 1 point. This test showed high reliability 0.91 (Weinberg et al., 1991) as well as objectivity and specificity.

In another study, the participants performed a modified test by shooting 5 free throws with 3 balls of different sizes with a total of 15 shots, where each hit with the ball not touching the hoop counted 2 points, while a hit with the ball touching the hoop counted 1 point, and the miss did not count. The test showed reliability because the results of repeated measurements with certain balls were approximately equal, except for the lightest ball. The test had specificity and objectivity (Regimbal, et al., 1992). The research by Maric et al. (2013) used tests for specific motor skills to determine the relationship between basic and specific motor skills of basketball players aged 13 to 15 (Blaskovic et al., 1982). One of these assessed passing accuracy in 4 different circles with a diameter of 20 cm, 40 cm, 60 cm and 80 cm. It included throwing the ball 10 times from 10 m from the center of the circle in a diagonal attitude. Each hit of the smallest circle was 8 points, a slightly larger circle 6 points, followed by the circles that awarded 4 points and 2 points. The next test assessed shooting accuracy, where the participants took 5 shots while being 5 m away from the basket. The test that assessed movement speed with the ball required the participant to dribble the ball as quickly as possible from the baseline to the center of the court and back, then to the free throw line and back to the baseline ("kamikaze"). The test of "handling" the ball is performed in a free-throw circle, where the participant dribbles the ball as fast as possible with his/her eyes closed for 30 s. During this time the participant should complete as many dribbles with the ball as possible without losing control of the ball. The test that assessed the arm and shoulder girdle strength included throwing the ball from top to bottom of the basketball court with both hands from the chest while in a standing position, while being stationary (the distance where the ball first touches the ground is recorded).

The work also used a whole battery of 12 tests for general motor skills: the agility test, the flexibility test, the 20-meter sprint test, the test of throwing a 2 kg heavy ball, the hand-tapping test, etc. Certain tests that determined specific motor skills have specificity, objectivity, and validity. Uzun and Pular (2011) tested 14-year-old basketball players' shooting technique and free throw accuracy with 10 free throws. This test showed objectivity, validity and specificity, while the high reliability of the test was in the results of the control group.

A relatively small number of tests related to this issue can be found in scientific and technical literature, and the battery of tests proposed by the American Alliance for Health, Physical Education, Recreation and Dance is used to the greatest extent. In the previous research, the results in mini basketball were mostly obtained by monitoring respondents from games. The tests that were used were mostly modified, while in some studies standardized tests were used to assess technical skills in basketball. The main aim of this study is to evaluation reliability of technical skills in mini basketball.

Material and Methods

Participants

The participants in this research ($n = 42$), were boys, aged 10 to 11 years, height and body weight (150.8 ± 7 and 42.5 ± 8.8) as well as BMI (18.5 ± 2.7), members of the basketball club "Stars" from the Serbian city of Arandjelovac, active mini basketball players. Before the test was conducted, it was ensured that the participants were completely healthy, without any chronic diseases, heart problems, locomotor apparatus injuries and that they were not under stress during the workout that would affect the results (Ilic et al, 2020). The participants were informed of the testing protocol and agreed to take part in the research voluntarily. Written consent was obtained from the parents for the children's participation in this test.

Procedure/Test protocol

Before the test started, all testing protocols were explained in detail to the participants. The test was conducted in two sessions, familiarizing the participants with both task and the experimental session, which were separated by at least two to three days. The participants performed each test three times. The whole experiment was conducted in the sports hall and recreation center "Šumadija" in Arandjelovac, where hardwood is the basic surface.

Sample of variables

The following variables were used to determine reliability: the quick shooting test in 60 seconds (QS60s), the shooting test from 5 positions in 50 s (S5P50s), and the free throw test that included 10 shots (FT10S), the shooting test from 5 positions without time limitations (S5P), the dribbling control test (DC) and the passing test while in motion during 30 seconds (PM30s).

Description of tests

Test - QS60s. The test is from the test battery proposed by the American Alliance for Health, Physical Education, Recreation, and Dance (AAHPRED, 1984). It requires a basket with the dimensions displayed in the drawn court, a ball and a stopwatch (Figure 3). The player (participant) can start the test from any of the five marked positions behind the mark that is at a distance for his age (for ages 10 to 11, the distance is 2.70 m from the center of the basketball hoop). At the designated signal, the participant shoots, rebounds the ball, and dribbles to another point from which he shoots again. A hit from the first shot is worth two points, and a hit after the missed first shot is worth one point (if the participant misses the first shot, he regains possession of the ball and quickly releases another shot from the position where he rebounded the ball). The participant performs the task three times, the first of which does not count, while the second two are scored. He tries to score as many shots as possible within 60 seconds.

Test - S5P50s. This test was used in testing young Serbian basketball players of different ages from 12 to 17 (Karalejic & Jakovljevic, 2009). It is very popular in practice and is often performed in different variants. The test requires a stopwatch, a minimum of 9 and maximum 15 balls, ball stands, 5 marked shooting positions, a hoop (Figure 2). The basketball player (participant) starts by shooting, using the jump-shot technique, from the wing position and shoots three balls in each position for a total of 15 shots. The task is to score as many shots as possible within 50 seconds. Only successful shots, i.e., hits, are counted. The test is performed twice. Basketball players up to 12 years of age shoot from a distance of 2.70 meters from the center of the basketball hoop, which is taken from the battery of tests of the American Alliance for Health, Physical Education, Recreation and Dance.

Test - FT10S. This test was used in many studies (Takayuki, et al., 2011; Zambova & Tomanek, 2012; Uzun & Pulur, 2011). It is also used often in training with basketball players of all ages. The test requires a hoop, a marked field, and a ball. A basketball player (participant) takes 10 shots from the free throw line, which is at a distance of 4.22 m from the center of the basketball hoop (Figure 2). Only successful shots, i.e., hits, are counted. The aim is to score as many hits as possible (a maximum of 10). The task is performed twice.

Test - S5P. This test was used in testing young Serbian basketball players aged from 12 to 17 (Karalejic & Jakovljevic 2009). It is the same as the 5-position shooting test with a time limit of 50 seconds. This test requires a stopwatch, minimum 9 and maximum 15 balls, ball stands, 5 marked shooting positions, a hoop (Figure 2). The player (participant) starts by taking a shot using the jump shot technique from the wing position, and shoots three times from each position for a total of 15 shots. The task is to score as many shots as possible (with a maximum of 15); only basketball players (participants) start by shooting without a time limit. The task is performed twice. Successful shots, i.e., hits, are counted. Basketball players up to 12 years of age shoot from a distance of 2.70 m from the center of the basketball hoop, which is taken from the battery of tests of the American Alliance for Health, Physical Education, Recreation and Dance.

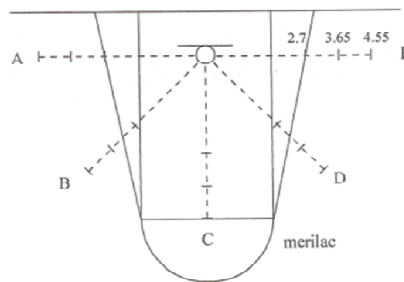


Figure 2. Display of tests for the assessment of shot accuracy: S5P50s, FT10S, S5P, QS60s.

Test - DC. The test is from the test battery proposed by the American Alliance for Health, Physical Education, Recreation and Dance – the control dribble test (AAHPRED, 1984). It was used by Karalejic et al. (2011) and Jakovljevic et al. (2016). Figure 3 shows the test polygon. The participants starts from the weaker side at the starting cone A. At the designated signal, the participant should dribble with the weaker hand and move further around the cone as shown in (Figure 3). The participant completes the task when he passes the level of cone F (the target line) with both feet. The participant must always dribble with the hand which is farther from the cone. If it falls out of motion, the test is aborted and performed again. The participant performs the task three times, the

first of which is a trial, while the second two are measured. The time is measured in tenths/hundredths of a second and the times of the two attempts are added.

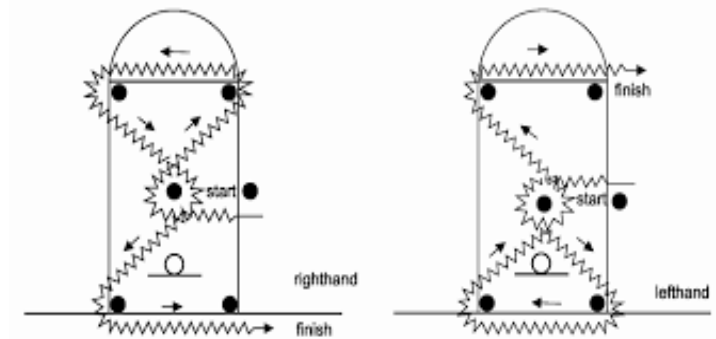


Figure 3. Test - control of dribbling and the path from start to finish with which the ball is dribbled around the cone for right-handed and left-handed players

Test – PM30s. This test was also proposed by the American Alliance for Health, Physical Education, Recreation and Dance - Passing Test (AAHPERD, 1984). It requires a polygon, such as the one in figure 4, a ball, and a stopwatch. A basketball player (participant) stands with the ball in front of the target A behind the line that is 2.50 m away from the wall. At the designated signal, he passes from his chest to target A, catches the ball bouncing off the wall, moves laterally towards target B, and shoots.

Then he moves on to target F, to which he makes two passes, and proceeds further to targets E, D, C... all the way around to A, to which he now makes two passes, and then again to B, C, etc. for a total of 30 seconds. A hit on the target or the frame of the target is scored with two points, and outside the target with one point. The participant must not cross the line, and a second consecutive pass in B, C, D or E is not scored. He uses the basic technique of passing the ball with both hands from the chest. The task is performed three times, the first of which is a trial, and the second two are scored. The final score is the sum of the two attempts.

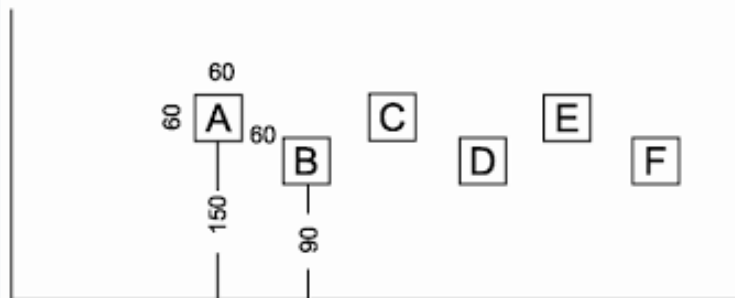


Figure 4. Test - additions in motion with marked squares and their dimensions

Statistical analysis

The data obtained in this research were analyzed using a descriptive statistical analysis. Descriptive statistics for all monitored variables are expressed through SV and SD values. To examine the reliability of the tests for the assessment of technical skills in mini basketball, the intraclass correlation coefficient ICC with a confidence interval (IP 95%) was used. To determine the reliability between given measurements in the mentioned tests, ICC was used by calculating the coefficient of variation of CV. The direction of the relationship in this correlation is positive, with, according to Cohen (1988), low strength of the relationship $r = 0.10$ to 0.29 ; mean strength of connection $r = 0.30$ to 0.49 ; high strength of relationship $r = 0.5$ to 1 . between variables. One-way analysis of variance (ANOVA) and Tukey's post hoc test were used to determine possible differences between given measurements in the aforementioned tests. The level of statistical significance was determined to be $p < 0.05$.

Results

Table 1. shows the average values and standard deviations of 42 participants aged (10.7 ± 0.5), their morphological characteristics, height and body mass (150.8 ± 7 and 42.5 ± 8.8) as well as BMI (18.5 ± 2.7).

Table 1. Basic descriptive indicators of the morphological characteristics of the participants in the first experiment (A ± SD)

Variables N=42		
Age	10.7 ± 0.5	
BH	150.8 ± 7	
BM	42.5 ± 88	
BH - Body height (m);	BMI 18.5 ± 2.7	BM- Body mass (kg);
BMI- Body mass index (kg × m ⁻²);		

Table 2. shows the reliability indicators of all tests between three measurements.

Table 2. Basic descriptive indicators (SV ± SD) and reliability indicators of all tests, between three measurements at initial testing

Variables	1measurement		2 measurement		3measurement		ICC (%)	CV (%)	p
	SV	SD	SV	SD	SV	SD			
QS60s	6.05	2.705	6.62	2.996	6.90	2.887	0.71	50.1	0.18
S5P	5.88	2.259	7.02	2.540	6.65	2.181	0.75	33.8	0.01*
FT10S	4.19	2.141	3.88	1.867	4.12	1.966	0.61	51.9	0.66
S5P50s	5.65	2.458	6.33	2.661	6.74	2.656	0.72	42.0	0.03*
DC	11.24	2.827	10.10	1.559	10.14	2.043	0.60	12.0	0.01*
PM30s	36.19	4.589	37.88	4.147	38.51	4.273	0.91	5.9	0.00*

SV – mean; SD – standard deviation; CV – coefficient of variation; ICC - intraclass correlation coefficient.

Tests: QS60s – fast shooting for 60s; S5P – shot five positions; FT10S – free throws 10 shots; S5P50s – shooting five positions for 50s; DC – dribbling control; PM30s - pass in movement for 30s.

* - p value for the level of statistical significance p < 0.05.

The indicators in Table 2. represent the mean (SV) of the results of all tests of three repeated measurements, as well as their standard deviation during the initial testing. The reliability of all tests, which is determined by ICC and CV expressed in %, as well as ANOVA, is also shown. It can be noted that a high degree of reliability in the given three measurements was found in the PM30s variable, where the ICC was 0.91% and CV 5.9%. With this variable, there were statistically significant differences in the mentioned three measurements because (p=0.00). The lowest reliability of the three measurements was found with the test - FT10S, where CV was 51.9% and ICC was 0.61%. No statistically significant differences were found between the given measurements for the mentioned variable, because the level of significance was (p=0.66).

In the fast shooting test in 60 seconds (QS60s), the lowest reliability of all three measurements was also found, as CV was 50.1%, and ICC 0.71%. Statistically significant differences were not found by applying ANOVA between the given measurements, because the threshold of significance (p=0.18) is also in this variable, i.e., it is not less than 0.05.

Table 3. shows the reliability indicators of all tests between the three retest measurements.

Table 3. Basic descriptive indicators (SV ± SD) and reliability indicators of all tests, between three measurements from the retest

Variables	1 measurement		2 measurement		3 measurement		ICC (%)	CV (%)	(p)
	SV	SD	SV	SD	SV	SD			
QS60s	6.90	2.862	7.49	2.731	8.10	3.007	0.80	43.3	0.02*
S5P	6.24	2.621	7.14	2.842	6.79	2.351	0.63	43.1	0.14
FT10S	4.45	1.611	4.45	2.308	4.55	1.941	0.62	75.1	0.95
S5P50s	6.38	2.337	7.10	2.162	7.50	2.616	0.71	33.4	0.02*
DC	9.36	1.265	9.29	0.918	9.14	0.783	0.71	7.2	0.42
PM30s	39.83	4.114	39.21	5.257	39.86	5.493	0.85	8.4	0.52

SV – mean; SD – standard deviation; CV – coefficient of variation; ICC - intraclass correlation coefficient.

Tests: QS60s – fast shooting for 60s; S5P – shot five positions; FT10S – free throws 10 shots; S5P50s – shooting five positions for 50s; DC – dribbling control; PM30s - pass in movement for 30s.

* - p value for the level of statistical significance p < 0.05.

In Table 3, data are also presented that now represent the mean (SV) of the results of the first, second and third measurements, as well as their standard deviations (SD), but as part of the test that was retaken. The reliability of all tests, which was determined with ICC and CV expressed in %, as well as one-way ANOVA, are also shown. Here, too, a high degree of reliability in the given three measurements was found in the test -PM30s, where ICC was 0.85%, and CV 8.4%. With this variable, there were no statistically significant differences in the mentioned three measurements because ($p=0.52$). The lowest reliability of the three measurements was found with the FT10S - test, where the CV was 75.1%, and the ICC was 0.62%. Statistically significant differences were not found between the given measurements for the mentioned variable, because the level of significance was ($p=0.95$).

In the test - QS60s, a significantly low reliability was also found in all three measurements, because the CV was 43.3%, and the ICC was 0.80%, as well as in the test - S5P50s, where the CV was 33.4%, and the ICC was 0.71%. However, in both tests, statistically significant differences were found using ANOVA between the given measurements, because in these variables the significance threshold is ($p=0.02$), which means that it is less than 0.05.

Discussion

Very few studies have examined the reliability of tests for assessing technical skills in basketball. Previous research has mainly determined the reliability of the accuracy of shots at the basket. No research was conducted that examined the reliability of certain tests for the assessment of the mentioned technical skills with the ball in mini basket, while the results of the reliability of the tests presented by new findings should also be emphasized in comparison to previous research. The results showed a generally high reliability for most of the observed variables. The largest was in the test - DUK, where the ICC was 0.91% in the initial testing, as well as in the retest with the same variable, where the ICC was 0.85%. In the test - KD, ICC was 0.60% from the initial testing, while in the retest with the same variable, the ICC was 0.71%. The ICC values in previous research (Zambova & Tomanek, 2012; Uzun & Pulur, 2011) were high for the SLB10S test, while in this study the ICC value was slightly lower for the mentioned variable.

In this research, a slightly lower reliability value was found for the test variable - BS60s, which is a new finding, compared to the earlier studies (Uzuna & Pulura, 2011) with a similar variable in which the reliability was extremely high. The difference in reliability between the given variables could be explained by the fact that the results of this research represent new findings and cannot be fully compared with the results of the previous research. Based on the above, it can be stated that the obtained findings in any case require further and even more extensive research in order to be explained in full practicality and integrity.

The results of this experiment are highly important due to the fact that in the current literature there is no data on the assessment of the reliability of all these tests for the assessment of basketball players' technical skills. The limitations of this experiment are related to the small number of participants, while the experiment should be tried on a larger sample. The reliability of the tests should also be examined in younger as well as in older children.

Conclusion

It can be concluded that the data obtained in this experiment based on ICC indicate a high reliability of certain tests, which represents direct variables for assessing the technical skills of young basketball players acceptable for the creation of valid and efficient testing protocols. These tests can be used in future research as reliable and valid instruments. Testing shooting accuracy, as well as passing and dribbling in basketball using these tests, can help scientists, basketball coaches, and physical education teachers in their further work. In addition, these tests can be used to train children in basketball. Future research may include further evaluation of the mentioned tests from this experiment, such as validity (factorial, construct), reliability in relation to younger age as well as older age, sensitivity to age, gender and objectivity, different measures, modification of existing and development of new tests and evaluation of variables for direct assessment of other technical skills in basketball.

Future research could generalize the obtained results on an even larger number of respondents, as well as on different groups of respondents, especially younger ones from 8 to 9 years old. It can be concluded that the data obtained in this experiment indicate satisfactory reliability of all the tests used in this experiment to assess technical skills with the ball. This would provide useful information to coaches and physical education teachers in working with children, who rely on testing, diagnostics, selection and training.

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