

RELIABILITY OF EUROFIT TEST BATTERY WITH CHILDREN IN PRIMARY SCHOOL**Besnik Morina¹, Hazir Salihu¹ and Rašid Hadžić²**¹Faculty of Physical Education and Sport, University of Pristina, Kosovo²Faculty of Sport and Physical Education, University of Niksic, Montenegro*Original scientific paper***Abstract**

This paper presents research results on reliability of Eurofit Test Battery which were applied in two various European countries, Kosovo and Montenegro. The aim of this paper is to verify credibility of Eurofit tests. Data were processed according to basic statistical parameters: mean, standard deviation, skewness and kurtosis, and reliability is established by three coefficients of reliability: Cronbach α , Spearman-Brown's coefficient of reliability and inter item's coefficient of correlation. In the research are included in total 200 primary school pupils, 14 years old, male, amongst them 100 pupils from Kosovo and 100 from Montenegro. In the research were used 9 motoric tests from Eurofit Test Battery. Each team was repeated three times. All data are from 2017. The research shows that all applied tests reveal high liability coefficient. As a conclusion, the Eurofit Test Battery might be used and applied in practice as well.

Key words: testing, Eurofit, Kosovo, Montenegro, reliability coefficients.

Introduction

We may say that a basic characteristic of tests is reliability. According to Mijanović & Vojvodiq (2008, 2010), by word "reliability" is implied the precision of measuring conducted without errors. It is clear that conclusions of scientific aims are achieved through tests and measuring that includes tools and adequate equipment for measuring which meet international assessment standards. Eurofit Test Battery is a proper tool which includes motoric tests for measuring. All tests which the test battery includes are standardized and reliable tests, but in some cases it is necessary to carry out a security control of their measuring characteristics. One of the reasons that made us conduct this research is the fact that these tests are used for the first time in the secondary schools in Kosovo and Montenegro. This is the reason why we thought that we should conduct a reliability control of these tests. The research included primary school pupils, age 14, from Kosovo and Montenegro, which were testes through EUROFIT tests. The main aim of the research is to assess the reliability of EUROFIT tests with 14 years old male primary school pupils from Kosovo and Montenegro.

Methods

This research includes in total 200 primary school pupils, age 14 years old, male, of which 100 pupils from Kosovo and 100 from Montenegro. The research material has been collected in 2017 during the collection of data for my PhD thesis project. The testing of pupils has been conducted through Eurofit Test Battery (Adam, Klissouras, Ravazzolo, Rensondhe, Tuxworth, 1988) which includes the following tests: 1. Flamingo Balance test (FLB) - single leg balance test; 2. Plate Tapping (PLT) - tests speed of limb movement; 3. Sit-and-Reach (SAR) - flexibility test (using 15cm

at the level of the feet); 4. Standing Broad Jump (SBJ) - measures explosive leg power; 5. Handgrip Test (HGR) - measures static arm strength; 6. Sit-Ups in 30 seconds (SUP) - measures trunk strength; 7. Bent Arm Hang (BAH) - muscular endurance/functional strength; 8. 10 x 5 meter Shuttle Run (SHR) - measures running speed and agility and 9. 20 m endurance shuttle-run (ESR) - cardiorespiratory endurance. All tests are repeated three times.

The measuring characteristics of test's Reliability (Bala, 1990, Thomas, Nelson & Silverman, 2005) has been created by using the following statistical parameters: arithmetical mean (Mean), standard deviation (Std.Dev.), skewness, kurtosis, Cronbach coefficient of generalizability (Cronbach α), Spearman-Brown's coefficient of reliability (SB) and coefficient of inter items correlation (IIC). The achieved results will be processed with the statistical package SPSS, 20.0.

Results

Table 1. shows results of Kosovo pupils. All applied tests show logical results. This is referred to arithmetic tools and standard deviations. The results obtained from skewness and kurtosis, show that tested pupils have homogeneous results.

Based on all applied tests, it is not concluded that there is a considerable deviation of results from the normal distributions. As regards reliability expressed by three coefficients: Cronbach coefficient of generalizability (Cronbach α), Spearman-Brown's coefficient of reliability (SB) and coefficient of inter item's correlation (IIC), they are high in all applied tests, over 0,970 to 0,997. Table 2. Shows results of Montenegro pupils. All applied tests show logical results.

Table 1. Basic statistic parameters and coefficients of reliability with 14-year-old male pupils from Kosovo.

Tests	Mean	Std.Dev.	Skewness	Kurtosis	Cronbach α	SB	IIC
FLB1	15,09	6,99	-0,29	-0,18			
FLB2	14,04	7,11	-0,23	-0,25	0,990	0,990	0,970
FLB3	15,00	7,25	-0,15	-0,10			
PLT1	10,18	1,23	0,33	0,33			
PLT2	10,17	1,22	0,19	-0,04	0,995	0,995	0,997
PLT3	10,17	1,23	0,16	0,12			
SAR1	24,17	7,63	0,24	-0,78			
SAR2	23,54	7,34	0,22	-0,75	0,997	0,997	0,991
SAR3	23,68	7,54	0,26	-0,75			
SBJ1	167,22	29,73	0,69	1,41			
SBJ2	166,22	28,07	0,74	2,09	0,982	0,982	0,966
SBJ3	166,83	30,04	0,82	2,00			
HGR1	30,17	8,36	0,30	-0,77			
HGR2	30,00	4,44	0,31	-0,81	0,993	0,993	0,981
HGR3	30,27	8,24	0,26	-0,86			
SUP1	18,52	3,84	-0,27	0,59			
SUP2	18,61	4,06	-0,17	0,40	0,988	0,988	0,967
SUP3	18,74	3,95	-0,18	0,23			
BAH1	27,12	23,79	0,79	-0,23			
BAH2	27,40	24,09	0,78	-0,27	0,998	0,998	0,996
BAH3	27,12	23,86	0,80	-0,26			
SHR1	19,07	1,16	0,33	-0,33			
SHR2	19,15	1,15	0,40	-0,55	0,996	0,996	0,990
SHR3	19,05	1,14	0,47	-0,60			
ESR1	5,16	1,76	0,62	-0,14			
ESR2	5,17	1,80	0,69	-0,04	0,999	0,999	0,997
ESR3	5,18	1,77	0,65	-0,26			

FLB - Flamingo Balance test, PLT - Plate Tapping, SAR - Sit-and-Reach, SBJ - Standing Broad Jump, HGT - Handgrip Test, SUP - Sit-Ups in 30 seconds, BAH - Bent Arm Hang, SHR - 10 x 5 meter Shuttle Run and ESR - 20 m endurance shuttle-run. "1", "2" or "3" are items ("1" are first item etc.). Mean – arithmetical mean, Std.Dev. – standard deviation, skewness, kurtosis, Cronbach α – are coefficient of generalizability, SB – Spearman-Brown's coefficient of reliability, IIC – inter items correlation.

Table 2. Basic statistic parameters and coefficients of reliability with 14-year-old male pupils (Montenegro).

Tests	Mean	Std.Dev.	Skewness	Kurtosis	Cronbach α	SB	IIC
FLB1	13,30	4,83	-0,20	0,78			
FLB2	12,13	4,76	-0,02	0,58	0,995	0,996	0,997
FLB3	12,99	4,96	-0,09	0,59			
PLT1	10,83	2,33	4,00	20,85			
PLT2	10,64	2,32	3,99	20,78	0,999	0,999	0,998
PLT3	10,85	2,31	4,04	21,15			
SAR1	24,62	8,16	0,12	0,13			
SAR2	25,52	8,13	0,13	0,25	0,996	0,996	0,987
SAR3	25,13	8,14	-0,01	0,21			
SBJ1	149,89	27,57	0,32	-0,35			
SBJ2	157,82	27,20	0,34	-0,43	0,996	0,996	0,989
SBJ3	149,55	27,30	0,42	-0,47			
HGR1	29,79	7,26	0,64	1,12			
HGR2	31,24	7,23	0,66	1,22	0,998	0,998	0,995
HGR3	29,83	7,21	0,68	1,25			
SUP1	18,14	3,62	-0,16	0,15			
SUP2	19,32	3,69	-0,21	0,26	0,991	0,991	0,977
SUP3	18,30	3,65	-0,12	0,07			
BAH1	25,37	22,40	1,32	1,20			
BAH2	25,58	22,12	1,32	1,20	0,999	0,999	0,999
BAH3	25,37	21,86	1,32	1,21			
SHR1	21,14	2,15	0,74	0,18			
SHR2	20,95	2,16	0,75	0,18	0,999	0,999	0,998
SHR3	21,14	2,15	0,74	0,19			
ESR1	5,06	1,65	0,17	-0,65			
ESR2	4,98	1,65	0,09	-0,55	0,992	0,992	0,980
ESR3	4,85	1,64	0,13	-0,61			

FLB - Flamingo Balance test, PLT - Plate Tapping, SAR - Sit-and-Reach, SBJ - Standing Broad Jump, HGT - Handgrip Test, SUP - Sit-Ups in 30 seconds, BAH - Bent Arm Hang, SHR - 10 x 5 meter Shuttle Run and ESR - 20 m endurance shuttle-run. "1", "2" or "3" are items ("1" are first item etc.). Mean – arithmetical mean, Std.Dev. – standard deviation, skewness, kurtosis, Cronbach α – are coefficient of generalizability, SB – Spearman-Brown's coefficient of reliability, IIC – inter items correlation.

This is referred to arithmetic tools and standard deviations. The results obtained from skewness and kurtosis, show that tested pupils have homogeneous results. Based on all applied tests, it is not concluded that there is a considerable deviation of results from the normal distributions. As regards reliability expressed by three coefficients: Cronbach coefficient of generalizability (Cronbach α), Spearman-Brown's coefficient of reliability (SB) and coefficient of inter items correlation (IIC), they are high in all applied tests, over 0,977 to 0,999.

Discussion and conclusion

The aim of most various authors is confirmation of reliability of EUROFIT Motoric Test Battery. Many authors dealt with this problematics: Metikoš, Prot, Hofman, Pintar and Oreb (1989); Cvenić (2007); Čuljak, Čorluka and Čavar (2009); Stanković, Joksimović, Raković, Michailov and Piršl

(2009); Foretić, Rogulj and Čavala (2010); Mijanović and Vojvodić (2010). Within the field of kinesiology there are a considerable number of researches which deal with the reliability of EUROFIT motoric tests. With respect to this, the following researches should be mentioned: Jennings, Viljoen, Duran and Lambert (2005); Begatović, Čuk and Atiković (2010); Bubanj, S., Stanković, Bubanj, R., Bojić, Đinđić and Dimić (2010). Based on the listed items, we may say that measuring characteristics of tests (measuring instruments) present a research object which remains current. Taking into account all the items discussed, we suppose that they are of support to the realization of the research. Based on the obtained results, we concluded that the application of all EUROFIT motoric Tests Batteries have been conducted in order to have high characteristics of measuring reliability. As a conclusion, we may say that their application is reliable for assessment of motoric status of pupils from both countries.

References

- Adam, C., Klissouras, V., Ravazzolo, M., Renson, R., & Tuxworth, W. (1988). *Eurofit: European Test of Physical Fitness*. Rome: Council of European Committee for Development of Sport.
- Begatović, E., Čuk, I., & Atiković, A. (2010). The reliability of the test "bunny jumps forward". *Sport Scientific and Practical Aspects*, 7(2), 29-36.
- Bala, G. (1990). *Logičke osnove metoda za analizu podataka iz istraživanja u fizičkoj kulturi*. [The logical basis of the method for analyzing data from research in physical culture. In Serbian.]. Novi Sad: Autorsko izdanje.
- Bubanj, S., Stanković, R., Bubanj, R., Bojić, I., Đinđić, B., & Dimić, A. (2010). Reliability of miotest by countermovement jump. *Acta Kinesiologica*, 4(2), 46-48.
- Cvenić, J. (2007). Neke metrijske karakteristike testa za procjenu koordinacije [Some metric characteristics of test for coordination evaluation. In Croatian.]. In Findak, V. (ed.) *Zbornik radova 16. Ljetne škole kineziologa Republike Hrvatske, Rovinj*, (pp. 415-419).
- Foretić, N., Rogulj, N., & Čavala, M. (2010). *Metrijske karakteristike novokonstruiranih testova koordinacije*. [Metric characteristics of newly-constructed coordination tests. In Croatian.]. Zagreb: 19th summer school of kinesiologists in the Republic of Croatia.
- Jennings, C.L., Viljoen, W., Duran, T.J., & Lambert, I.M. (2005). The Reliability of FitroDyne as a Measure of Muscle Power. *Journal of Force and Conditioning Research*, 19, 859-863.
- Metikoš, D., Prot, F., Hofman, E., Pintar, Ž., & Oreb, G. (1989). *Mjerenje bazičnih motoričkih dimenzija sportaša* [Measuring of athletes' basic motor dimensions. In Croatian.]. Zagreb: Faculty of Physical Education.
- Mijanović, M., & Vojvodić, M. (2010). Metric characteristics of tests for coordination estimation. *Acta Kinesiologica*, 4(2), 57-61.
- Stanković, D., Joksimović, A., Raković, A., Michailov, M., & Piršl, D. (2009). Metric characteristics of the specific strength sports climbers tests. *Facta Universitatis*, 7(2), 161-169.
- Thomas, J.R., Nelson, J.K., & Silverman, S.J. (2005). *Research methods in physical activity*. Champaign: Human Kinetics.

POUZDANOST EUROFIT TEST BATERIJE S DJECOM U OSNOVNOJ ŠKOLI**Sažetak**

Ovaj rad prikazuje rezultate istraživanja o pouzdanosti test baterije Eurofit koji su primijenjeni u dvije različite europske zemlje, Kosovo i Crnoj Gori. Cilj ovog rada je provjeriti vjerodostojnost Eurofitovih testova. Podaci su obrađeni u skladu s osnovnim statističkim parametrima: srednja vrijednost, standardna devijacija, skewness i kurtosis, a pouzdanost je uspostavljena s tri koeficijenta pouzdanosti: Cronbach α , Spearman-Brownov koeficijent pouzdanosti i koeficijent korelacije između itema. U istraživanje je uključeno ukupno 200 učenika osnovnih škola, 14 godina, muškog spola, među njima 100 učenika s Kosova i 100 iz Crne Gore. U istraživanju je korišteno 9 motoričkih testova iz Eurofit Test Battery. Svaka je grupa ponovila test tri puta. Svi podaci su iz 2017. Istraživanje pokazuje da svi primijenjeni testovi pokazuju visoki koeficijent pouzdanosti. Zaključno, Eurofit Test Battery može se koristiti i primijenjivati u praksi kao kvalitetna.

Ključne riječi: testiranje, Eurofit, Kosovo, Crna Gora, koeficijenti pouzdanosti.

Received: July 14, 2015

Accepted: December 05, 2015

Correspondence to:

Prof. Hazir Salihu, PhD

Faculty of Physical Education

University of Prishtine Priština, Kosovo

Tel.: +386 (0)49 846 918

E-mail: bhsg@live.com