

FUNCTIONAL ABILITY TRANSFORMATION PROCESSES OF FEMALE STUDENTS UNDER INFLUENCE OF FITNESS PROGRAM THAI-BO

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Abstract

The aim of this research is to determine the level of transformational processes in functional abilities of female students in Tuzla University under influence of fitness program Thai-Bo. The research was conducted on 64 examinees. Based on presented results that we gained through testing in the beginning and at the end of implemented fitness programs during 6 months period with a frequency 2 times a week, t-test and factor analysis under congruence model, we can conclude that fitness program Thai-Bo and functional variables applied on 64 female student produced significant quality and quantity differences.

Key words: fitness programs, Thai-Bo, quantity changes, quality changes

Introduction

Fitness training is a set of the newest and the most popular methods of training for conditional ability development based on results of applied science research. The fact is; there is a close correlation between functional abilities and health which gives as a result that those measures of functional abilities contribute health level estimation. Since the level of fitness is primarily the result of systematically implementing of physical activity (along with gene component), it is logical to accept that physical activity contribute to the protection and the improvement of health with its basically preventive, if necessary, curative and rehabilitation involvement. Due to significance of body activity and fitness correlation with health we imported the term "health fitness" (health – related fitness), which specifies certain fitness characteristic that can be positively and adversely influenced by body activity and can reflect on health status. The health fitness can be defined as ability to implement tiring daily activities with reduced risk of early development of hypokinetic diseases and conditions

Methods

Subject sample: The subjects of this research are the first year female students on their secondary Faculties of University of Tuzla. The subjects are age 19 to 21 and the research was conducted only on subjects that were healthy during this research. There were 64 participants totally. *Variables:* The sample of variables in this research included 22 functional variables. In the research we applied variables relevant for following functional transformations: VO2MAX-Astrand test to estimate maximal oxygen uptake,

SHURUN-Shuttle run 20m, Spirometry: VC, FVC, FEV1, FEV1/VC, FEV1/FVC, FMEF, FMFT, FEF, PEF and MVV IND. *Data processing methods:* Data processing for this research was performed on Faculty of physical education and sports in Tuzla with statistical program package SPSS 12.0. We applied T-test and factor analysis under congruence model in all applied variables in order to determine significant differences between two measuring and to register quantity and quality changes in final measuring.

Results and discussion

Based on results of arithmetic means in estimation of functional ability tests at the beginning and at the end of fitness program and also based on significance of changes tested with T-test for relative samples it is obvious that program Thai-Bo produced significant partial effects. With test for functional ability estimation, which are presented in this research with variables SHURUN – shuttle run 20 m, Astrand test for maximal oxygen uptake VO2MAX, and variables from spirometry, visible positive improvement of arithmetic mean value appeared in half of tested variables during final measuring. Statistically significant positive improvement of arithmetic mean values in final measuring appeared in variables: SHURUN – shuttle run 20 m (Sig. 0,00), and variables for estimating maximal oxygen uptake VO2MAX (Sig. 0,00) and other variables presented in tables on the level to Sig. 0,05. The results of T-test of half of variables for estimating functional abilities indicate statistically significant differences between initial and final measuring which means that fitness program Thai-Bo, conducted on the first group of subjects, produced significant partial effect in functional ability field.

Table 1. Statistic parameters and t-test

	Mean	Paired	Diff.	95% Confidence		t	df	Sig. (2-tailed)
		Std. Dev.	Std. Err. of Mean	Low*	Upper			
VCMJ – VCMJF	,12	,43	,05	,01	,23	2,26	63	,03
VCPROC – VCPCROCF	3,59	12,35	1,54	,51	6,68	2,33	63	,02
FVCMJ – FVCMJF	-4,50	2,20	,28	-,99	,11	-1,59	63	,12
FVCPROC – FVCPCROCF	-11,76	58,90	7,36	-26,47	2,95	-1,60	63	,12
FEV1MJ – FEV1MJF	,43	1,34	,17	,09	,76	2,56	63	,01
FEV1PROC – FEV1PROCFF	12,86	41,17	5,15	2,58	23,14	2,50	63	,02
FEV1VCMJ – FEV1VCMJF	5,36	21,48	2,68	-,01	10,72	2,00	63	,05
FEV1 VCPROC – FEV1	5,17	21,29	2,66	-,15	10,49	1,94	63	,06
FEV1FVCMJ – FEV1FVCMJF	-,95	31,10	3,89	-8,72	6,82	-,24	63	,81
FEV1FVCPCROCF – FEV1F	-2,06	30,55	3,82	-9,69	5,57	-,54	63	,59
FMEFMJ – FMEFMJF	13,79	24,32	3,04	7,71	19,86	4,54	63	,00
FMEFPROC – FEFPCROCF	233,45	252,36	31,54	170,41	296,48	7,40	63	,00
FMFTMJ – FMFTMJF	-,34	,38	,05	-,44	-,25	-7,33	63	,00
FMFTPROC – FMFTPCROCF	-75,39	113,20	14,15	-103,67	-47,11	-5,33	63	,00
FEFMJ – FEFMJF	,38	1,49	,19	,00	,75	2,02	63	,05
FEFPROC – FEFPCROCF	20,77	87,21	10,90	-1,02	42,55	1,91	63	,06
PEFMJ – PEFMJF	-13,15	169,02	21,13	-55,37	29,07	-,62	63	,54
PEFPROC – PEFPCROCF	-1,47	40,19	5,02	-11,51	8,57	-,29	63	,77
MWINDMJ – MWINDMJF	16,20	50,50	6,31	3,59	28,82	2,57	63	,01
MWINDPROC – MWINDPCROCF	13,42	41,26	5,16	3,11	23,73	2,60	63	,01
VO2MAX – VO2MAXF	-2,52	2,69	,34	-3,19	-1,84	-7,48	63	,00

Results of quality changes analysis through 22 tests for functional ability estimation on the sample of 64 female subjects of the first group fitness program Thai-Bo respondents were carried out with Factor analysis – Congruence method. First through Bartlett's test we tested possibility of submitting this set of functional variables to any type of factorization. Data from tables (initial and final measuring) confirm that data can be submitted to factorization. (Sig .000). Using matrix factorization of latent motor variable intercorrelation and applying Guttman-Kaiser criteria in initial measuring we obtained 7 characteristic roots that clarify totally 86,91% of common variance. Individually they clarify mutual variance for the first latent variable 42,86%, for the second 10,03%, third 9,47%, fourth 7,72%, fifth 6,12, sixth 5,81% and the seventh latent variable 4,86%. Rotation was carried out by using direct Oblimin method. With method of congruence – folding factor scores of initial and final measuring, we wanted to determine is there any structural changes under influence of training operators within applied fitness program Thai-Bo. Based on isolated main component characteristic roots it is obvious there have been some structural changes in final measuring regarding to initial measuring.

In the further procedure it is necessary to determine what has changed in the structure of isolated main components. By monitoring set of matrix in initial and final measuring we can conclude that partly changes occurred in structure of isolated main components. In initial measuring the largest impact on the first main component had variables for forced expiration volume estimation FEV1MJ and FEV1PROC (0,9 and 0,88) and variables for Tifneau's index estimation -FEV1VCMJ and VEV1VCPCROCF. The largest impact on the fourth component had variable SHURUN- shuttle run 20 m (0,68), on the sixth had variables for forced vital capacity factor estimation FVCMJ I FVCPCROCF (0,9 and 0,88), and on the seventh main component had variable for maximal oxygen uptake factor estimation VO2MAX (0,5).

Observing matrix of the structure in final measuring, the conclusion is; we isolated six main components and hyper cone narrowing appeared. Isolated latent variables significantly changed structure regarding their positions in initial state. The largest impact on the first main component kept variables for forced expiration volume estimation FEV1MJ and FEV1PROC (0,9 and 0,88), but with smaller coefficients.

On the third main component impact had variables for factor estimation of forced vital capacity FVCMJ I FVCPROC (0,91 i 0,89), on the fourth main component impact had variables for vital capacity estimation VCMJ and VCPROC, the fifth variable SHURUN-Shuttle run 20m (0,82) and on the sixth main component the impact had variable for maximal oxygen uptake factor estimation VO2MAX (0,86). From the results it is visible that coefficients of significance of certain variables on isolated main components are higher regarding initial state. That fact points out there are significant quality changes of functional abilities under influence of fitness program Thai-Bo, applied on the first group of respondents. We can conclude that fitness program Thai-Bo, applied on the first group of respondents affected quality changes of tested functional abilities.

Table 2. Functional abilities

Paired Differences					t	df	Sig. (2-tailed)
Mean	Std. Dev.	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper			
-6,88	4,35	0,54	-7,96	578,89	-12,65	63	.000

Table 3. Factor analysis congruence model – functional (initial)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	,67
Bartlett's Test of Approx. C hi-Square	4838,47
Sphericity df	231
Sig.	,00

Table 4. Factor analysis congruence model functional (final)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	,75
Bartlett's Test of Approx. C hi-Square	2926,28
Sphericity df	231
Sig.	,00

Table 5. Eigen values (initial)

Component	initial Eigen values		
	Total	% of Variance	Cumulative %
1	9,430	42,863	42,863
2	2,208	10,038	52,901
3	2,085	9,478	62,379
4	1,699	7,722	70,101
5	1,347	6,121	76,222
6	1,279	5,815	82,037
7	1,073	4,876	86,913

Table 6. Skew factor solution (initial)

	Component						
	1	2	3	4	5	6	7
SHURUN	,061	,051	-,122	,682	,209	,224	-,032
VCMJ	,223	,208	-,198	-,751	,071	,254	-,373
VCPROC	,202	,015	-,112	-,164	,132	,014	-,895
FVCMJ	,607	,357	-,171	-,043	,041	,006	-,061
FVC PROC	,628	,359	-,180	-,033	,081	,088	-,178
FEV1MJ	,980	,359	-,196	-,117	,134	,418	-,131
FEV1PROC	,978	,332	-,185	-,098	,150	,385	-,269
FEV1VCMJ	,983	,349	-,186	-,076	,130	,391	-,104
FEV1VCPROC	,982	,347	-,176	-,085	,126	,378	-,091
FEV1FVCMJ	,268	,983	-,130	-,065	-,068	,192	-,063
FEV1FVCPROC	,276	,983	-,125	-,071	-,068	,187	-,054
FMEFMJ	,061	-,135	,233	,014	,057	,203	,200
FMEFPROC	,779	,164	-,019	-,063	,543	,033	-,153
FMFTMJ	-,570	-,251	,196	,345	-,327	,305	,361
FMFTPROC	-,104	-,010	,284	-,076	-,681	,189	,343
FEFMJ	,627	,496	-,143	,052	,352	,729	-,194
FEFPROC	,643	,495	-,135	,045	,349	,722	-,235
PEFMJ	,108	,186	-,074	,075	-,020	,046	-,123
PEFPROC	,201	,103	-,067	,025	,010	,082	-,207
MWINDMJ	,980	,358	-,196	-,118	,132	,410	-,129
MWINDPROC	,978	,332	-,185	-,098	,150	,385	-,269
VO2MAX	,105	-,208	,275	,574	,230	-,075	,494

Table 7. Factor correlations (initial)

Com.	1	2	3	4	5	6	7
1	1,00	,31	-,15	-,12	,21	,30	-,17
2		1,00	-,17	-,04	-,04	,20	-,14
3			1,00	-,06	,01	-,04	,25
4				1,00	-,01	,06	,03
5					1,00	,01	-,07
6						1,00	,00
7							1,00

Table 8. Eigen values (final)

Component	Initial Eigen values		
	Total	% of Variance	Cumulative %
1	9,854	44,791	44,791
2	3,020	13,726	58,517
3	2,146	9,756	68,273
4	1,786	8,117	76,390
5	1,348	6,128	82,518
6	1,082	4,919	87,438

Conclusion

Based on presented results we can conclude that fitness program Thai-Bo produced significant partial effects as well as affected quality changes of tested functional abilities. We faced statistically positive arithmetic mean value motion in final measuring in variables SHURUN-Shuttle run 20m (Sig. 0,00), variables for maximal oxygen uptake estimation VO2MAX (Sig. 0,00), and other variables presented in tables on the level to Sig. 0,05.

Table 9. Skew factor solution (final)

	Component					
	1	2	3	4	5	6
VCMJ	,235	-,035	,057	,909	-,014	,192
VCPROC	,152	,068	,060	,931	,094	-,289
FVCMJ	,239	-,163	,914	,005	-,059	,066
FVCPROC	,217	-,090	,886	,177	,001	-,214
FEV1MJ	,910	-,512	,461	,197	-,184	,305
FEV1PROC	,910	-,458	,474	,316	-,159	,116
FEV1VCMJ	,842	-,490	,466	-,099	-,148	,276
FEV1 VCPROC	,843	-,512	,479	-,183	-,211	,272
FEV1FVCMJ	,840	-,158	-,055	,311	,047	-,005
FEV1FVCPROC	,844	-,206	-,106	,217	-,015	,025
FMEFMJ	,462	-,929	,203	-,052	-,122	,124
FMEFPROC	,484	-,892	,207	,010	-,137	,040
FMFTMJ	-,447	,836	-,171	-,113	,198	-,183
FMFTPROC	,189	-,877	,054	-,074	,045	,091
FEFMJ	,084	-,699	,503	-,226	,417	,384
FEFPROC	,073	-,671	,533	-,180	,441	,318
PEFMJ	,735	-,579	,276	,247	-,464	,253
PEFPROC	,750	-,572	,299	,245	-,447	,186
MVVINDMJ	,904	-,520	,464	,196	-,183	,309
MVVINDPROC	,891	-,450	,436	,323	-,157	,081
VO2MAX	,079	,042	-,189	,002	-,033	,862
SHURUN	,091	,015	-,022	,159	,829	-,039

Table 10. Factor correlations (final)

Com.	1	2	3	4	5	6
1	1,00	-,35	,20	,21	-,15	,12
2		1,00	-,26	,05	,03	-,18
3			1,00	-,01	-,00	,07
4				1,00	-,01	-,09
5					1,00	-,01
6						1,00

Observing matrix of the structure in final measuring, the conclusion is; we isolated six main components and hyper cone narrowing appeared. Isolated latent variables significantly changed structure regarding their positions in initial state. From those data we notice that significance coefficients of certain variables in isolated main components are higher regarding initial set. That fact points out there are significant quality changes of functional abilities under influence of fitness program Thai-Bo, applied on this group of respondents.

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PROMJENE FUNKCIONALNIH SPOSOBNOSTI STUDENTICA POD UTJECajem THAI-BO FITNESS PROGRAMA

Sažetak

Cilj ovog istraživanja je bio utvrđivanje razine transformacijskih procesa u funkcionalnim sposobnostima studentica Univerziteta u Tuzli pod utjecajem fitness programa Thai-Bo. Istraživanje je provedeno na 64 ispitanice. Na temelju prezentiranih rezultata dobivenih testiranjem na početku i na kraju implementiranog programa u trajanju od 6 mjeseci učestalosti dva puta tjedno, na temelju t-testa i faktorske analize pod modelom kongruencije, možemo zaključiti da fitness program Thai-bo uz praćenje funkcionalnih sposobnosti ispitanica producira značajne kvalitativne i kvantitativne razlike.

Ključne riječi: fitness programi, Thai-Bo, kvantitativne promjene, kvalitativne promjene

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