

EFFECTIVENESS OF YOGA-AEROBIC MEANS' APPLICATION IN PHYSICAL EDUCATION OF PRIMARY SCHOOL PUPILS

Mykhno L.S., Loza T.A.
Sumy State Pedagogical University

Abstract. *Purpose:* to determine influence of health related technology on physical condition level of primary school pupils. *Material:* in the research two groups of first form pupils participated: control group (n=28) and experimental group (n=26). Level of children's physical fitness was determined with the help of isolated motor tests. At home pupils fulfilled independently and with parents the learned at classes exercises for prophylaxis of posture disorders and for stretching. During fulfillment home tasks or other work in sitting position children were involved by parents in practicing of the worked out by us physical exercises' breaks. *Results:* we observed rising of pupils' physical fitness level: flexibility, ability to keep static balance, power endurance of back and abdomen muscles. To the highest extent yoga aerobic means influenced on flexibility and static balance indicators. *Conclusions:* when choosing physical exercises for short break in work we considered content of pupils' learning functioning at definite lesson. All complexes of exercises are to be fulfilled reading texts of the worked out by us verses. It facilitates pupils to better memorize sequence of exercises' fulfillment and gives emotional coloring to physical exercises.

Key words: first form pupils, technology, asanas, stretching, relaxation, physical qualities.

Introduction

In opinion of specialists in physical education junior school age is the most favorable for development of practically all physical qualities age [4; 6; 10; 17]. However, modern researches point at weakening of physical fitness and health of children and youth in learning conditions [3; 6; 8; 9; 10]. Specialists stress on demand in searching new means of schoolchildren's physical education. It is connected with the fact that application of traditional means to day does not facilitate increase of children's and youth's physical fitness [4; 10; 17; 25].

Nowadays in the whole world fitness programs, based on Hatha yoga methods, are popular. For example, 8.7% of adult population practices different kinds of Yoga in the USA [25]. A number of publications proves effectiveness of physical rehabilitation programs, worked out on the base of Hatha yoga [5; 13; 15; 16; 18; 22; 23], programs of sportsmen's training [1; 5], and students' physical education [11; 12; 14; 20]. There are researches, which confirm positive influence of Yoga on human psychic sphere [11; 12; 19; 21; 24]. However, we did not find researches, devoted to effectiveness of programs, based on Hatha yoga, in physical education of primary school pupils. We assume that study of static and dynamic asanas' combinations, breathing exercises, relaxation and stretching impact positively influences on physical fitness of primary school pupils.

Purpose, tasks of the work, material and methods

The purpose of the research is to study influence of the worked out by us health related technology with application of Yoga-aerobic means [7] on development of physical qualities of primary school pupils.

The methods of the research: for solution of our tasks we used such methods of research as analysis of scientific literature, pedagogic testing, pedagogic experiment and methods of mathematical statistic. For determination of children's motor fitness we used isolated motor tests, oriented on definite motor quality. Testing program included tests from physical culture school program [4] and other commonly known tests [6].

The research was conducted on the base of municipal educational establishment "Shostkinska comprehensive school of I-III grades № 7 of Shostkinska municipal council, Sumskaya region" from September 2014 to June 2015. At the beginning of experiment we formed control and experimental groups. Experimental group (EG) consisted of 26 1 A form pupils (12 girls and 14 boys). Control group (CG) consisted of 1-B form 28 pupils (16 girls and 12 boys). Mean age of experimental group girls – 6.7 years, control – 6.7 years. Mean age of experimental group boys was 6.5 years, control – 6.7 years. Pupils' parents gave permission for participation of their children in pedagogic experiment and for usage of the received experimental results.

Results of the research

On the base of analysis of health condition [8] and pupils' physical fitness [9] we worked out health related technology of junior schoolchildren's physical education with application of Yoga-aerobic means (static and dynamic asanas, balance exercises, breathing exercises, relaxation and stretching) [7]. Yoga aerobic means were used in curriculum and extra-curriculum forms: on physical culture lessons, during physical culture breaks, in pupils' independent trainings.

Physical culture lessons were conducted as per the following schema: in preparatory part of the lesson, after preliminary aerobic warming up – complexes of stretching exercises (4-5 minutes); at the beginning of main part – balance exercises (1-2 minutes); 10 minutes of work by academic plan “School of ball”, “School of movements’ culture” and so on; 7-8 minutes – “School of posture” with usage of worked out by us static and dynamic asanas of Yoga-aerobic. In final part 2 – 3 minutes are spent for breathing exercises and relaxation.

Besides, at every lesson, under control of supervisors pupils fulfilled one from four worked out by us physical culture breaks:

- for prophylaxis of posture disorders;
- for recreation of limbs' muscles;
- for regulation of mental state;
- for relief of children organism's fatigue.

When choosing the kind of physical culture break we considered the content of pupils' learning functioning at definite lesson. All complexes of exercises are to be fulfilled reading texts of the worked out by us verses. It facilitates pupils to better memorize sequence of exercises' fulfillment and gives emotional coloring to physical exercises.

At home pupils fulfilled independently and with parents the learned at classes exercises for prophylaxis of posture disorders and for stretching. Besides, during fulfillment home tasks or other work in sitting position (drawing, computer games, watching TV and etc) children were involved by parents in practicing of the worked out by us physical exercises' breaks.

Results of the researches showed that after conducted pedagogic experiment physical fitness indicators of girls (see table 1) and boys (see table 2) changed in both groups.

Table 1. Dynamic of girls' physical fitness indicators in experimental and control groups before and after experiment

Test exercises	Contingent	Before experiment			After experiment			t	p
		\bar{X}	S	V (%)	\bar{X}	S	V (%)		
30 meters' run (sec.)	EG, n=12	7,7	1.0	13.7	6.9	1.0	15.0	4.483	<0.01
	CG, n=16	7.6	0.5	7.2	6.4	0.5	8.9	11.310	<0.01
Shuttle run 4x9m (sec.)	EG, n=12	15.0	1.3	8.8	13.7	0.9	6.7	5.928	<0.01
	CG, n=16	14.5	1.4	9.5	13.2	0.5	3.8	4.312	<0.01
Long jump from the spot (cm)	EG, n=12	91.6	19.6	21.4	110.2	14.1	12.8	6.536	<0.01
	CG, n=16	96.5	18.4	19.1	100.4	16.3	16.3	1.111	>0.05
Torso bending from sitting position (cm)	EG, n=12	3.1	2.2	72.5	7.5	4.4	59.5	5.443	<0.01
	CG, n=16	5.5	5.0	90.7	5.9	4.3	73.5	0.396	>0.05
Power endurance of back muscles (sec.)	EG, n=12	39.8	14.0	35.2	52.6	23.3	44.3	8.532	<0.01
	CG, n=16	36.7	16.5	45.0	32.7	11.4	34.8	1.775	>0.05
Power endurance of abdomen muscles (sec.)	EG, n=12	34.3	16.6	48.4	44.5	18.8	42.3	3.463	<0.01
	CG, n=16	29.3	15.7	53.5	29.5	14.5	49.3	0.091	>0.05
Test “Flamingo” (q-ty of attempts)	EG, n=12	14.4	8.7	60.8	5.9	6.1	102	3.644	<0.01
	CG, n=16	17.1	7.7	45.1	15	6.5	43.1	1.681	>0.05

Table 2. Dynamic of boys' physical fitness indicators in experimental and control groups before and after experiment

Test exercises	Contingent	Before experiment			After experiment			t	p
		\bar{X}	S	V (%)	\bar{X}	S	V (%)		
30 meters' run (sec.)	EG, n=14	7.4	0.7	9.1	6.4	0.6	9.9	4.698	<0.01
	CG, n=12	7.4	1.2	17.1	6.3	0.8	13.0	3.966	<0.01
Shuttle run 4x9m (sec.)	EG, n=14	15.0	1.5	10.1	13.2	1.0	8.0	4.970	<0.01
	CG, n=12	14.3	1.5	10.8	13.1	1.0	8.0	2.871	<0.05
Long jump from the spot (cm)	EG, n=14	98.2	10.7	10.9	114.8	8.7	7.5	6.583	<0.01
	CG, n=12	107.0	18.3	17.1	105.7	12.6	11.9	0.427	>0.05
Torso bending from sitting position (cm)	EG, n=14	1.1	3.6	336.4	4.9	4.5	92.3	3.838	<0.01
	CG, n=12	1.8	5.1	278.0	0.6	4.9	844.4	1.564	>0.05
Power endurance of back muscles (sec.)	EG, n=14	40.8	17.4	42.8	58.4	20.0	34.2	4.002	<0.01
	CG, n=12	41.0	15.4	37.6	42.6	18.0	42.3	0.784	>0.05
Power endurance of abdomen muscles (sec.)	EG, n=14	36.7	17.8	48.5	50.4	16.4	32.5	3.117	<0.01
	CG, n=12	42.9	10.6	24.6	47.1	15.0	31.8	2.209	<0.05
Test "Flamingo" (q-ty of attempts)	EG, n=14	18.1	7.9	43.6	6.8	3.3	49.1	7.868	<0.01
	CG, n=12	18.8	9.0	48.1	11.2	4.3	38.9	1.448	>0.05

After pedagogic experiment we registered statistically confident difference in all tested indicators of EG boys' and girls' physical fitness ($p < 0.01$). Having generalized the data we found that the best improvement was in tests for flexibility (torso bending in sitting position): the girls' results improved 1.5 times; the boys' – nearly 3.5 times. Also indicators of static balance improved (test "Flamingo"). Their increment was 59% (girls) and 62.4% (boys). Besides, indicators of back muscles' power endurance improved: 43.1% (boys) and 32.1% (girls). Indicators of abdomen muscles' power endurance also improved: 29.7% (girls) and 37.3% (boys).

In CG statistically confident changes ($p < 0.01$) were only in indicators of 30 meters' run and "shuttle run" 4 x 9 m as well as in indicators of boys abdomen muscles' power endurance ($p < 0.05$). In other indicators of CG physical fitness changes were not statistically confident ($p > 0.05$). Some indicators were even lower than at the beginning of experiment: indicators of back muscles' power endurance worsened by 10.9% (girls) and indicators of flexibility by 66.7% (boys).

At the same time increment of run quickness indicators (30 meters' run) was higher than in EG (girls' increment: EG – 10.4%, CG – 15.8%; boys' increment: EG – 13.5%, CG – 14.8%).

Discussion

For the first time research of influence of health related technology, worked out on the base of Yoga-aerobic means, on primary school pupils' physical qualities' development has been fulfilled. It has been found that after pedagogic experiment EG pupils had confident improvement of all tested indicators of physical fitness. The greatest influence of Yoga-aerobic means' application was on development of flexibility and static balance indicators. The received information correlates with data of other researchers [1; 20], who studied influence of Yoga exercises on students' physical qualities.

We have widened the range of fitness technologies' application in physical education of primary school pupils. The conducted research supplements the data of a number of authors about effectiveness of programs, created on the base of Hatha yoga means' application in physical education and rehabilitation of different strata of population [1; 5; 11–16; 18–24].

Conclusions

Implementation of health related technology, based on application of Yoga-aerobic means, in physical education of primary school pupils permitted to improve physical fitness of the pupils: flexibility, static balance, power endurance of back and abdomen muscles.

It has been found that used in health related technology complexes of Yoga-aerobic exercises directly influence not on all indicators of primary school pupils' physical fitness. We can affirm that these complexes of Yoga exercises can be widely used in process of physical education of children, who study at primary schools. It is confirmed by improvement of physical fitness indicators of experimental group pupils, comparing with control group.

Conflict of interests

The authors declare that there is no conflict of interests.

References

1. Brynzak SS, Burko SV. Improving athletic performance of basketball student team with the classical yoga exercises. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013;10:3-6. <http://dx.doi.org/10.6084/m9.figshare.775314>
2. Bulatova MM, Usachov IuO. Suchasni fizkul'turno-ozdorovchi tekhnologii u fizichnomu vikhovanni [Modern physical culture health related technologies in physical education], *Teoriia i metodika fizichnogo vikhovannia*, 2012; 2: 320-350. (in Ukrainian)
3. Garkusha SV. Current trends in the health of children and young people in learning environments. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013;10:7-11. <http://dx.doi.org/10.6084/m9.figshare.775315>
4. Iermolova VM, Ivanova LI, Derevianko VV. *Navchaimo graiuchis'* [Teaching], Kiev; Letter LTD; 2012. (in Ukrainian)
5. Kolesnik VA. Zmienenie stabilometricheskikh pokazatelej u iunykh plovcov s narusheniiami osanki pod vliianiem korriruiushchikh kompleksov khatkha jogi [Change of stabilometric indicators of junior swimmers, who have posture disorders, under influence of correcting Hatha yoga complexes]. *Slobozhans'kij naukovosportivnij visnik*, 2012; 2: 117–120. (in Ukrainian)
6. Krucevich TIu, Vorbojov MI, Bezverkhnia GV. *Kontrol' u fizichnomu vikhovanni ditej, pidlitiv ta molodi* [Control in physical education of children, adolescents and youth], Kiev; 2011 (in Ukrainian)
7. Mykhno LS. Zdorov'iaformuiuchia tekhnologija fizichnogo vikhovannia molodshikh shkolariv z vikoristanniam zasobiv joga-aerobiki [Health related technology of junior schoolchildren's physical education with application of Yoga-aerobic means]. *Sportivnij visnik Pridniprov'ia* 2014;2:102-107. (in Ukrainian)
8. Mykhno LS. Ocinka deiakikh pokaznikov fizichnogo zdorov'ia pershoklasnikov [Assessment of some indicators of first form pupils' physical health]. *Slobozhans'kij naukovopraktichnij visnik*, 2015;1(45):91–94. <http://dx.doi.org/10.15391/sns/20151/017> (in Ukrainian)
9. Mykhno LS. Ocinka rivnia fizichnoi pidgotovlenosti suchasnikh pershoklasnikov [Assessment of physical fitness of modern first form pupils], *Fizichna kul'tura, sport ta zdorov'ia nacii*, 2015; 19(1): 304–308. (in Ukrainian)
10. Moskalenko NV. *Fizichne vikhovannia molodshikh shkolariv* [Physical education of junior schoolchildren], Dnepropetrovsk: Innovation; 2007. (in Ukrainian)
11. Pichurin VV. Psychological and psycho-physical training as a factor of personal anxiety at students. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2015;3:46-51. <http://dx.doi.org/10.15561/18189172.2015.0307>
12. Tolchieva GV. Ocinka psikhofiziologichnogo stanu studentok z dosvidom zaniat' khatkha-jogoiu [Assessment of psycho-physiological condition of girl students, who have experience in practicing of Hatha yoga]. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2011;11:128–131.
13. Iurchenko OIe. Khatkha-joga u fizichnij rehabilitacii pri pochatkovikh stupeniakh ekzogenogo ozhirinnia [Hatha yoga in physical rehabilitation at initial stages of exogenous obesity]. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2010;12:163–165.
14. Baljinder Singh Bal. Effects of short term practice of bhastrika pranayama on metabolic fitness (metf) and bone integrity (BI). *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2015;7:72-78. <http://dx.doi.org/10.15561/18189172.2015.0710>
15. Carei TR, Fyfe-Johnson AL, Breuner CC, Brown MA. Randomized controlled clinical trial of yoga in the treatment of eating disorders. *Journal of Adolescent Health*, 2010;46(4):346–351. <http://dx.doi.org/10.1016/j.jadohealth.2009.08.007>

16. Dale LP, Mattison AM, Greening K, Galen G, Neace WP, Matacin ML. Yoga workshop impacts psychological functioning and mood of women with self-reported history of eating disorders. *Eating Disorders: The Journal of Treatment and Prevention*, 2009;17(5):422–434. <http://dx.doi.org/10.1080/10640260903210222>
17. Dwayne P Sheehan, Larry Katz. The effects of a daily, 6-week exergaming curriculum on balance in fourth grade children. *Journal of Sport and Health Science*. 2013;2:131–137.
18. Tilbrook HE, Hewitt CE, Aplin JD, Semlyen A, Trehwela A, Watt I, Torgerson DJ. Compliance effects in a randomised controlled trial of yoga for chronic low back pain: a methodological study. *Physiotherapy*, 2014;100(3):256–262.
19. Impett EA, Daubenmier JJ, & Hirschman AL. Minding the body: Yoga, embodiment, and well-being. *Sexuality Research and Social Policy*, 2006;3(4):39–48. <http://dx.doi.org/10.1525/srsp.2006.3.4.39>
20. Kanwaljeet Singh, Baljinder Singh Bal, Wilfred Vaz. The effect of suryanamaskar yogasana on muscular endurance and flexibility among intercollege yoginis. *Journal of Physical Education and Sport*, 2010;10:61–67.
21. Kathleen Diehl. A Program for Improving Health and Stress Management for Adolescents from Low-income Families: Integrating Behavioral Coping Skills, Nutrition Education and Yoga. *Journal of Adolescent Health*, 2014;54(2) 73-77. <http://dx.doi.org/10.1016/j.jadohealth.2013.10.159>
22. Neumark-Sztainer D, Eisenberg ME, Wall M, Loth KA. Yoga and Pilates: Associations with body image and disordered-eating behaviors in a population-based sample of young adults. *International Journal of Eating Disorders*, 2011;44(3):276–280. <http://dx.doi.org/10.1002/eat.20858>
23. Neumark-Sztainer D, Wall M, Story M, Standish AR. Dieting and unhealthy weight control behaviors during adolescence: Do they predict changes in weight ten years later? *Journal of Adolescent Health*, 2012;50:80–86. <http://dx.doi.org/10.1016/j.jadohealth.2011.05.010>
24. Ross, A., Friedmann, E., Bevans, M., & Thomas, S. (2013). National survey of yoga practitioners: Mental and physical health benefits. *Complementary Therapies in Medicine*, 21(4), 313–323. <http://dx.doi.org/10.1016/j.ctim.2013.04.001>
25. Zan Gao, Tao Zhang, David Stodde. Children's physical activity levels and psychological correlates in interactive dance versus aerobic dance. *Journal of Sport and Health Science*, 2013;2(2):146–151.

Information about the authors:

Mykhno L.S.; <http://orcid.org/0000-0001-6340-8570>;
l_mykhno@ukr.net; Sumy State Pedagogical University;
Romenskaya str.87, Sumy, 40002, Ukraine.

Loza T.A.; <http://orcid.org/0000-0001-5340-9545>;
t_loza2013@ukr.net; Sumy State Pedagogical University;
Romenskaya str.87, Sumy, 40002, Ukraine.

Cite this article as: Mykhno L.S., Loza T.O. Effectiveness of yoga-aerobic means' application in physical education of primary school pupils. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2016;1:35–40.
<http://dx.doi.org/10.15561/18189172.2016.0105>

The electronic version of this article is the complete one and can be found online at: <http://www.sportpedagogy.org.ua/html/arhive-e.html>

This is an Open Access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited (<http://creativecommons.org/licenses/by/4.0/deed.en>).

Received: 18.01.2016
Accepted: 29.01.2016; Published: 30.01.2016