



Effects of academic training curricula on cadets' mental and physical health

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Abstract

Objective of the study was to test and analyze the cadets' nervous-emotional stress by an academic weekly experiment.

Methods and structure of the study. The 4-year cadets (n=50, including 30 males and 20 females) from Putilin Belgorod Law Institute of the Ministry of Internal Affairs were sampled for the nervous-emotional stress testing experiment. The sample nervous-emotional stress and mental/ physical health was tested for a week by "Biomys" (KPF-01b/c) Test System. We also analyzed the contents and stressors of the academic lectures, workshops and practical PR classes and tested the cadets' motor activity by Omron Walking Style III pedometers.

Results and conclusion. The test data generally showed difference between the week start (warm-up time) and weekend (fatigue accumulation) states.

The academic education service contents and stresses were found to seriously affect the cadets' mental/ physical health standards, with the sample tested with the nervous-emotional stress peaks in the theoretical learning times. We would recommend the curricula being well designed and managed to make the classes lively, active and enjoyable, with a special priority to reasonable motor activity to level down the inactivity-related stressors. The cadets' motor activity in classes will be encouraged by regular active rest breaks, physical activation minutes, gymnastics etc. These revisions should still give room for the service stressors modeling situations to help the cadets develop due attention controls and mobilize the individual mental/ physical health resources for progress and success in the future service careers. Such situational trainings should be geared to attain specific service goals albeit kept under a certain mental stress threshold to avoid potential mental/ physical health disorders and pathologies.

Keywords: *motor activity, cadets, nervous-emotional stress, physical education, academic training curriculum.*

Background. Modern academic education can unlikely be fully cleared of high intellectual and mental stressors, with the academic curricula being increasingly specific and challenging due to multiple education process goals, updates to the education materials, time pressures and the rapidly expanding physical inactivity [1, 2]. It should be mentioned that departmental and special academies set their specific and challenging requirements to discipline and service duties [3], with the cadets expected to develop efficient

decision-making skills to find solutions to the learning and training problems to be perfectly fit for their future service missions and duties [4]. Since the cadets have to meet multiple requirements in the fast changing environments and situations, they need to digest and process growing data flows in the learning process in the mostly physically inactive settings being increasingly exposed to risks of nervous-emotional stress, and, hence, they need to develop good stress tolerance [5].

**Table 1.** Motor activity and academic workloads of the sample (F – females, M – males)

Time/ session		Monday		Tuesday		Wednesday		Thursday		Friday	
		F	M	F	M	F	M	F	M	F	M
Session 1	08.30-10.00	Workshop		Lecture		Workshop		Lecture		Workshop	
	Motor activity	424±79	531±61	121±19	153 ±25	384±99	501±81	172±24	213±31	301±48	422±62
Session 2	10.15-11.45	Workshop		Workshop		Lecture		Lecture		Workshop	
	Motor activity	631±62	703±59	301±56	412±28	150±39	212±21	185±28	240±25	534±82	651±91
Session 3	12.00-13.30	PE class		Workshop		Workshop		Lecture		PE class	
	Motor activity	5330±342	6860±658	340±24	391±35	404±59	546±41	151±23	232±28	4260±251	6460±364
Total motor activity		6385±284	8094±375	762±98	956±85	938±92	1259±103	508±56	685±64	5095±319	7533±401

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Methods and structure of the study. The 4-year cadets (n=50, including 30 males and 20 females) from Putilin Belgorod Law Institute of the Ministry of Internal Affairs (BLU) were sampled for the nervous-emotional stress testing experiment. The sample nervous-emotional stress and mental/ physical health was tested for a week by "Biomysh" (KPF-01b/c) Test System. We also analyzed the contents and stressors of the academic lectures, workshops and practical PR classes and tested the cadets' motor activity by Omron Walking Style III pedometers.

Results and discussion. Analyzed in Table 1 hereunder are the theoretical training sessions and two practical physical education sessions.

In the theoretical learning time, the motor activity was tested to vary within 1500 steps that may be qualified as physical inactivity with the relevant stressors. The practical physical education classes were found to partially cover the movement deficit, with the females and males tested to make 5330±342 steps and 6860±658 steps, respectively. This motor activity, however, is occasional and uneven in the academic week and, consequently, associated with its own stressors of effect on the mental/ physical health standards.

Given in Table 2 are the mental/ physical health test data yielded by the "Biomysh" Test System, including a simple response test. The female group latent sensorimotor response was tested to peak at 218ms on Wednesday, with the motor sensorimotor response peaking on Monday and Friday, with the average sensorimotor response following the same trend. The latent sensorimotor response in the males group was tested to fall from Monday to Friday. The physical ac-

tivity influences on these test rates were found to be gender-specific.

The complex sensorimotor response test rated the same qualities plus errors. The latter are omitted in Table 2 since none of the subjects made errors. Generally the complex sensorimotor response data analysis found the same trend. The Table also gives the flash detection threshold test data – indicative of the functional mobility of individual nervous processes – sensitive to the nervous-emotional stress variations in their turn. The flash detection threshold data are indicative of the high stress in the midweek time partially leveled down by the practical physical education classes on Mondays and Fridays.

The correction test data helped profile the attention control in the sample, with registration of errors. The latter were tested to peak on Monday and Thursday, with the success rate being the lowest on the same days in the female group, albeit the response pace was still about the weekly average. The male group was tested with the success variations over the week, with the error-free execution tested only on Thursday, and with the response pace relatively high all the time. These test data are indicative of the academic learning process impacts on the group mental/ physical health standards.

The sample was also tested by the Luscher test to rate the overall trait anxiety, autonomic responses and deviations from the suggestive norm. The test data generally showed difference between the week start (warm-up time) and weekend (fatigue accumulation) states. The galvanic skin response test showed peaks on Monday and Friday in both of the gender groups – apparently due to the practical physical education classes. The galvanic skin response test rate was found to fall in the midweek time – that may be inter-

Table 2. *Mental/ physical health and galvanic skin response test data of the sample*

Test	Simple sensorimotor response		Complex sensorimotor response		Flash detection threshold		Correction test			Luscher test		Galvanic skin response		
	Test rate	Latent SR time	Motor SR time	Latent CR time	Motor CR time	Threshold period	Threshold frequency	Success	Errors	Pace	Total		Ratio	Suggestive norm
	<i>ms</i>	<i>ms</i>	<i>ms</i>	<i>ms</i>	<i>ms</i>	<i>ms</i>	<i>Hz</i>	<i>%</i>	<i>n</i>	<i>ms</i>				<i>kOhm</i>
Females														
Mon	250	95,6	289,6	145,6	23,44	43,2	92	0,6	3162	1,33	1,04	13,3	25	
Tue	221	71	255	113	19,69	50,7	100	0	3876	1	1,1	12	25	
Wed	218	76	257	110	19,69	50,7	100	0	2425	3	0,82	12	14	
Thu	231	85	335	103	25,31	39,5	77	2	2854	2	1,86	12	16	
Fri	233	98,5	313	125	24,38	41,0	100	0	3125	1	1,09	15	30	
Males														
Mon	261,4	80,2	281,6	132,8	21,56	46,5	92,8	0,6	3306	4	0,96	19,2	24,8	
Tue	254	126,6	288,3	169,3	28,13	36,5	96	0,3	3843	6,33	1,26	22,6	8,67	
Wed	253,1	107,4	290,8	133,4	21,25	48,8	98,2	0,1	3168	2,57	0,78	18,8	13,86	
Thu	222,3	96,83	265,6	132,8	24,19	42,3	100	0	3427	5,17	1,01	23	13,33	
Fri	228,3	91,33	273,1	139,5	22,31	48,2	96	0,3	2673	6,17	0,81	23,6	15,17	

preted as indicative of the inactivity with the mounting stress and fatigue.

Conclusion. The academic education service contents and stresses were found to seriously affect the cadets' mental/ physical health standards, with the sample tested with the nervous-emotional stress peaks in the theoretical learning times. We would recommend the curricula being well designed and managed to make the classes lively, active and enjoyable, with a special priority to reasonable motor activity to level down the inactivity-related stressors. The cadets' motor activity in classes will be encouraged by regular active rest breaks, physical activation minutes, gymnastics etc. These revisions should still give room for the service stressors modeling situations to help the cadets develop due attention controls and mobilize the individual mental/ physical health resources for progress and success in the future service careers. Such situational trainings should be geared to attain specific service goals albeit kept under a certain mental stress threshold to avoid potential mental/ physical health disorders and pathologies.

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