



CHANGES IN POLICE CADETS' PHYSICAL ACTIVITY AND STRENGTH ABILITIES DURING COVID-19 RESTRICTIONS

Epp Jalakas, MA

Estonian Academy of Security Sciences

Head of sport-lecturer

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ABSTRACT

The COVID-19 situation changed police cadets' training process and prohibited their access to gyms during virus restrictions.

The Estonian Academy of Security Services (EASS) 161 police cadets' strength tests results in January 2021 with self-evaluated physical activity (PA) levels were examined. 1st course students' strength tests (front lat pulldowns (PD) with 75% of body weight (BW), bench press (BP) with 50% of BW and leg press (LP) with 200% of BW) average repetitions were in the lowest level at the beginning of studies in September 2020 (male cadets: PD=14 (St. D 7.6); BP=20 (St. D 6.6); LP=18 (St. D 8.5), female cadets: PD=3 (St. D 3.4), BP= 6 (St. D 6.7), LP=13 (St. D 7.7)) in comparison with 2nd and 3rd course cadets in 2020 and the same sample in 2021. Average results increased in all 1st course strength tests by January 2021 while some older courses results, especially among male cadets, had declined.

Altogether from 2 questionnaires, (47 and 50 participants) 48-70% of police cadets reported decreases in PA during COVID-19 restriction periods, 44-46% experienced the negative influence of restrictions on their mental health or stress level. The decline in self-esteem from reduced strength capabilities was higher than it was according to physical tests results. 61% of cadets improved their strength tests scores despite fewer opportunities to exercise.

Regular PA is necessary to improve physical and mental health, thus the knowledge on how influential the restrictions were on police cadets' preparation and their strength abilities can be used in future recommendations. Abbreviations are listed at the end of article.

INTRODUCTION

The policing profession can be very physically demanding and there are different tests in place to measure a police officer's (hereafter PO) physical abilities (Lonsway, 2003). Since psychologically stressful moments are inherent in a PO's duties, a large amount of physical preparation is recommended to be included in the curriculum of police cadets to reduce mental health problems (Goodwin, 2003) in addition to serving as motivation for extra PA. As the physical fitness of middle-aged POs seems to be predicted strongly by PA level in early adulthood (Sørensen, et al 2000) and this level may drop after some years of PO work (Lagestad, et al 2014b), regular exercise for building stronger bodies during police training is essential.

The COVID-19 crisis increased the need for frontline workers. The Estonian Police and Border Guard Board called upon the Estonian Academy of Security Sciences (EASS) police cadets, who had to cope with stress in disaster risk mitigation supportive tasks instead of continuing with their regular studies and training during the State of Emergency (SOE). These changes could affect their habits, including PA level.

Surveys have been conducted in many countries about changes in lifestyle during COVID-19. Decrease in leisure time, sport and exercise was found for example in Germany, where 31% of respondents reduced their PA at the beginning of the pandemic and the most important factor for reduced PA was the lockdown of sports infrastructure (Mutz and Gerke, 2021). Decrease in PA during COVID-19 restrictions was also mentioned in Middle East and North Africa (Abouzid, et al. 2021) and the U.S. (Duncan, et al. 2020), but a slight PA increase, especially in bodyweight exercises, was found in Italy (Di Renzo, et al. 2020) and maintenance or increase in PA during the lockdown period was reported in the UK (Spence, et al. 2021).

Police cadets' physical capabilities vary individually, and some studies show that these abilities improve constantly during the years in police academy (Cvorovic, Maamari, 2017), whereas other studies show that

cadets' physical abilities improved during the semester and worsened during the semester breaks (Kukić, F. et al., 2019). There has been a tendency to prioritise maximum strength training among police cadets (Lagestad, et al 2014a) and studies show a high correlation between PA and performance during physical tests (Jalakas, Järvelaid 2005).

The focus of this article is on future PO's regular PA and strength abilities during COVID-19 restrictions to monitor gym equipment-based tests results. In addition to periodical police work, the COVID-19 pandemic caused long periods of distance learning and restrictions in the use of sports facilities. Thus, police cadets had insufficient accessibility to gyms which may have consequently affected their PA and reduced strength capabilities. The decline of entrance tests and first months' physical abilities test averages in EASS in past years (Ülevaade... 2021) require more precise monitoring of their PA and physical abilities.

This survey was conducted to identify police cadets PA during COVID-19 restrictions period and their physical abilities after training restrictions.

1. METHODOLOGY AND DATA

To see if there were changes in police cadets' PA during COVID-19 related restrictions' periods, and how the changed situation influenced their strength capabilities, the empirical data of the survey is based on 3 methods.

First, a comparison of changes in Police and Border Guard College higher education studies cadets' regular strength tests scores during the COVID-19 period with cadet's strength test score changes before COVID-19.

Second, focus group interviews (Krueger, Casey 2009) held during January 2021, when all sports clubs and gyms were closed in 2 districts of Estonia. These interviews were held in groups of 8-13 persons, and notes were taken to register every person's answers.

Third, anonymous voluntary questionnaires among police cadets during the state of emergency (SOE) in May 2020 and during restrictions in April 2021.

Regular strength testing with gym equipment is included in the EASS police cadets' curriculum at least once a semester, and the tests for male and female cadets are: lat front pulldown with 75% of the participant's BW, bench press with 50% of BW and leg press with 200% of BW (the physical tests complex also contains sit-ups during 2 min and 3000 m run, but these tests results were not recorded in January 2021). Before testing, cadets' bodyweights were measured by the body composition monitor Tanita UM-072, after which weights for tests were calculated for each participant.

Male cadets' maximum points level in each strength test was 25 repetitions, except leg press for the 3rd course, where the maximum points level was 30 repetitions. Female cadets' maximum points level was 20 repetitions in every test.

The test results of January 2021 were compared with previous strength tests results of the same cadet. In some calculations the participants who

got maximum points from all previous strength tests were not included because it was not possible to determine that their effort level was maximal in those tests.

EASS buildings including sports facilities were closed prior to the strength tests and interviews.

Strength tests were followed by focus group interviews. The interviewer explained that answering was voluntary and neither this nor the next exams' results would be influenced by cadets' answers which were collected to better understand how cadets kept up their PA levels during the restrictions' period.

A total of 161 cadets participated in physical tests and the focus group interviews, which was 90.7% of the total number of cadets in the January 2021 study. Participants were 69 female police cadets and 92 male police cadets, whose average age was 21.6 years (St. D 2.6). Anthropometric data (Table 1) shows that average BMI varied slightly.

Table 1. Anthropometric data of male (M) and female (F) police cadets in January 2021.

	Average bodymass (kg), (St. D)	Average height (cm), (St. D)	Average BMI (kg/m ²), (St. D)
1st course M (n=29)	86.8 (12.2)	183.9 (6.5)	25.7 (4.0)
2nd course M (n=33)	84.0 (12.3)	183.8 (6.7)	24.8 (3.2)
3rd course M (n=30)	86.0 (13.4)	182.3 (7.1)	25.9 (3.8)
1st course F (n=22)	63.0 (9.0)	168.9 (7.1)	22.1 (2.6)
2nd course F (n=33)	64.8 (8.8)	166.6 (6.5)	22.0 (5.0)
3rd course F (n=14)	66.2 (8.7)	168.4 (3.9)	23.3 (2.9)

The police cadets regular physical test results of 2018 and 2019 (before COVID-19) were used as the control group.

Table 2. Before COVID-19 measured and tested control groups' anthropometric data during 1st test.

	Average bodymass (kg), (St. D)	Average height (cm), (St. D)	Average BMI (kg/m ²), (St. D)
M group 2018 (n=21)	80.0 (11.3)	181.9 (7.8)	24.2 (3.1)
M group 2019 (n=34)	84.0 (12.2)	183.6 (6.6)	24.9 (3.1)
F group 2018 (n=13)	61.8 (6.0)	168.0 (3.9)	21.9 (1.8)
F group 2019 (n=34)	64.8 (8.6)	166.6 (6.5)	22.7 (4.9)

Police cadet's answers from anonymous voluntary electronic questionnaires in LimeSurvey from May 2020 (n=47) and April 2021 (n=50) were used to collect information about their PA and self-esteem evaluation in regard to their strength abilities and mental health during these periods.

Answers and tests' results were analysed with the help of IBM SPSS Statistics 20 program. The Pearson correlation and T-test were used as statistical methods.

2. RESULTS

2.1. POLICE CADETS' STRENGTH ABILITIES AT THE END OF FALL SEMESTER IN JANUARY 2021

Based on the answers of 47 of EASS police cadets during SOE in May 2020, when all sports clubs and EASS sports facilities were closed and it was only possible to exercise at home or outside, 43% maintained their PA frequency, 38% were more active before the SOE situation and 19% augmented PA frequency during SOE. These results show that preparation for physical tests at the beginning of the COVID-19 period was interrupted.

During fall semester 2021, Police and Border Guard College cadets and lecturers had to repeatedly self-isolate which necessitated distance learning and frequent postponement of some practical activities. In addition, distance learning for weeks or months was common for all universities during the fall semester. The exact figure of distance learning and isolation days was not counted since they varied greatly with contact courses.

Physical tests were conducted for all higher education studies police cadets in the middle of January 2021, immediately after the academy was closed for winter break and because of virus spread. Moreover, all gyms were closed in Harju and Viru districts which complicated the preparation for the tests.

For 1st and 2nd course participants, the tests graded their abilities in the middle of the physical education course; for the 3rd course the test was final in their curricula and grades were given according to tests results.

Table 3. Strength exercises average repetitions and St. D of male and female police cadets in January 2021 and during previous tests in 2020.

	2020 PD (75% of BW)	2021 PD (75% of BW)	2020 BP (50% of BW)	2021 BP (50% of BW)	2020 LP (200% of BW)	2021 LP (200% of BW)
1st course M (n=29)	14 (7.6)	18 (7.2)	20 (6.6)	23 (6.6)	18 (8.5)	20 (7.5)
2nd course M (n=33)	21 (7.6)	20 (6.3)	25 (6.7)	25 (6.8)	21 (5.8)	23 (3.9)
3rd course M (n=30)	21 (5.9)	20 (6.5)	26 (9.4)	25 (7.1)	28 (4.7)	27 (6.1)
1st course F (n=22)	3 (3.4)	6 (5.2)	6 (6.7)	10 (7.6)	13 (7.7)	19 (2.6)
2nd course F (n=33)	8 (3.4)	10 (5.1)	12 (5.2)	12 (5.6)	15 (6.6)	18 (4.2)
3rd course F (n=14)	14 (5.7)	13 (5.4)	14 (6.5)	15 (5.1)	20 (0.0)	20 (0.5)

Police cadets' strength tests results after restrictions period compared to previous tests results are shown in Table 3.

To compare the strength improvement in normal situations, the first semester results of 2nd and 3rd course cadets were examined and used as the control group (Table 4).

Before the COVID-19 period, the groups' average repetitions increased in 83%, maintained in 8% and decreased in 8% of cases. During the COVID-19 period the groups' average repetitions increased in 55% of cases, maintained in 17% and decreased in 28% of cases.

Table 4. Control groups’ male and female cadets’ strength tests average repetitions (and St. D) during first semester of pre-COVID-19 period.

	1st test PD (75% of BW)	2nd test PD (75% of BW)	1st test BP (50% of BW)	2nd test BP (50% of BW)	1st test LP (200% of BW)	2nd test LP (200% of BW)
M group 2018 (n=21)	17 (6.9)	20 (5.3)	23 (9.4)	28 (11.1)	17 (9.9)	22 (9.0)
M group 2019 (n=34)	16 (6.1)	18 (5.8)	22 (5.6)	24 (5.4)	17 (7.9)	22 (5.8)
F group 2018 (n=13)	7 (5.1)	6 (4.8)	7 (5.8)	9 (6.8)	15 (7.2)	15 (7.4)
F group 2019 (n=34)	2 (2.2)	7 (4.8)	4 (4.3)	9 (5.0)	13 (8.2)	19 (3.4)

Three tests’ repetitions were summarised and the change in average repetitions of strength tests’ sum was examined by T-test, with a significant difference ($p < 0.05$) found between the September and January average score changes of men (Mean=1.9; St. D 5.4) and women (Mean=3.9, St. D 6.7).

There was a significant difference between 1st course men 3 tests’ repetitions average in 2020 (52.3 repetitions) and 3rd course same result (74.6; $p < 0.001$), as well as between 1st and 2nd course men’s results (52.3 vs 67.2; $p < 0.005$). Significant differences maintained between 1st and 3rd course men’s 3 tests’ repetitions in January 2021 (60.4 vs 73.3; $p < 0.005$).

The male and female control groups’ test repetitions didn’t differ significantly between groups, but the repetitions difference from the 1st to 2nd test across the whole sample was significant for both sexes ($p < 0.001$).

To specify how strong the influence of temporary restrictions was on the strength capabilities of police cadets, January strength tests results in total repetitions were compared to previous tests scores. 1st and 3rd year cadets performed previous tests in September 2020 and 2nd year cadets in June 2020.

The majority (85%) of first year cadets raised their score of strength tests repetitions in January compared to September, 10% had fewer repetitions, while others maintained the previous level.

Second course scores had increased in 51% of cases and decreased in 39% of them. Among final year students, the percentage of score improvement was 43% and decline was 34%. In total, 67% of female and 54% of male cadets improved the gym-based physical tests results despite all obstacles.

A total of 61% of the whole sample and 69% of those who failed to obtain maximum points in 2020 tests improved their strength tests scores in January 2021. The strength tests scores decreased for 28% of all higher education police cadets compared to previous tests.

Repetitions from 3 exercises to achieve maximum points were 75 for most male (80 for male cadets of the 3rd course in January 2021) and 60 for female cadets. Cadets were encouraged to achieve their maximum repetitions, but some didn't perform more repetitions than needed for maximum points, with the explanation that they had to reserve strength for the following exercises. Test results in 3 tests' repetitions sums during the COVID-19 period are shown in Figure 1. Some female participants didn't achieve any repetitions in strength tests.

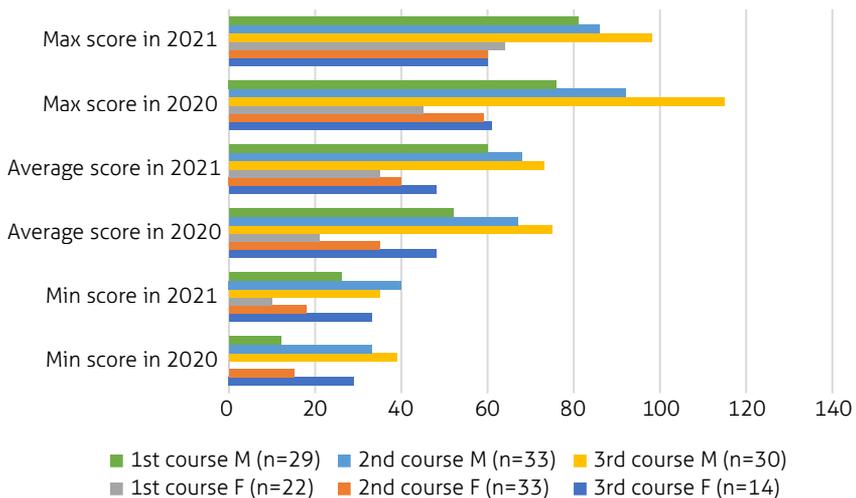


Figure 1. Strength tests' min, average and max scores in points during COVID-19 restrictions

To compare the results changes pre-COVID-19 and during, control groups' minimum, average and maximum results are presented at Figure 2.

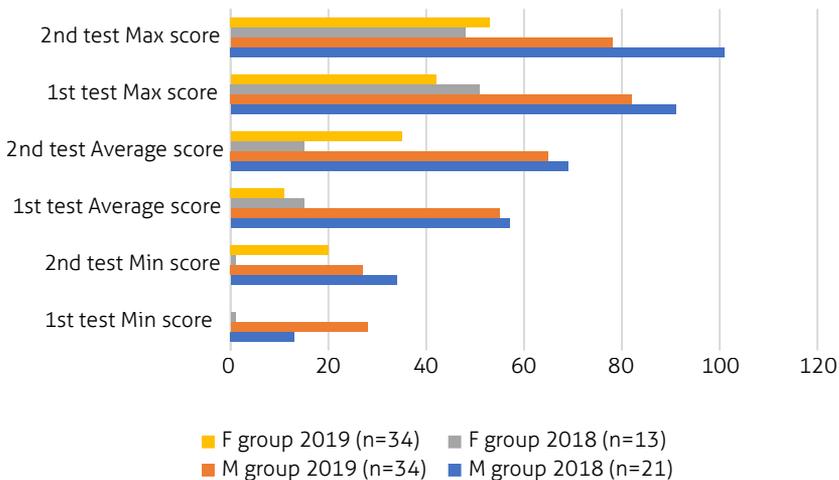


Figure 2. Strength tests' min, average and max scores before COVID-19 restrictions

The connections between upper body strength remained stronger while the upper and lower body strength correlations tended to decrease in 2021 compared to 2020 physical tests results (Table 5).

Table 5. Police cadets' strength tests correlations

	BP for same sex and year	LP for same sex and year
PD 2020 M	0.72**	0.46**
PD 2021 M	0.78**	0.26*
PD 2020 F	0.75**	0.33**
PD 2021 F	0.70**	0.26*

** p<0,01, * p<0,05

2.2. POLICE CADETS' PA ACCORDING TO FOCUS GROUP INTERVIEWS AT THE END OF FALL SEMESTER IN JANUARY 2021

Focus group interviews results showed that average exercise hours were 4.5 for male and 4.7 for female cadets. PA was reduced before physical abilities tests among 64% of first year female and 72% of male cadets; 67% of second year female and 73% of male cadets, 79% of third year female and 67% male cadets. Only a few cadets (5%) reported that they exercised more during restrictions than before.

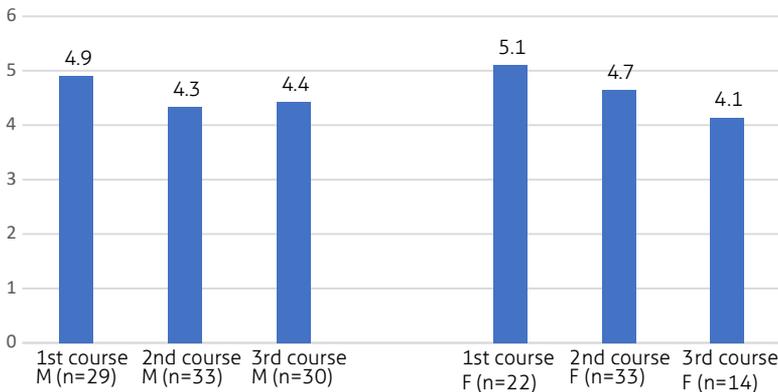


Figure 3. Police cadets' PA average hours per week in January 2021

The mean values of 1st course male and female police cadets exceeded 2nd and 3rd course means in PA repetitiveness and volume, but no significant differences were found according to the T-test.

Cadets attributed the decrease in PA to closed gyms and sports clubs, lack of strength training equipment, too cold a temperature to train outside and low motivation during distance learning and school-break. Even some usually very active athletes (members of the academy's team) reported zero training hours during previous weeks before tests. Altogether, 16% of police cadets didn't exercise at all for the 2-3 weeks before physical tests, 60% exercised at least 3 times and 19% 5 or more times per week, 68% had at least 3 hours of PA per week.

According to the focus group interviews, 30% maintained or augmented their PA level during restrictions but even 70% recognised the loss of regular PA hours.

61% of those 112 police cadets (47 women and 65 men) who compiled less PA before tests because of restrictions increased their strength test scores compared to previous tests. The average training hours per week was 3.7 for those who reported a decrease of PA but still improved their tests results versus a 2.6 hours average for those whose PA level was reduced and who didn't manage to improve their test score. 94% of cadets, who reported that their training was not limited by any obstacles, usually exercised 5 hours or more per week, the average PA hours per week for that group was 7.6. In all samples, the average PA hours per week exceeded 1 hour for 83% and 5 hours for 47% of cadets.

There was no correlation found between January 2021 tests score and PA decrease or maintenance and augmentation for the restrictions period. More impact to tests results gave self-reported PA level.

Pearson correlation coefficient between tests scores and changes in PA level before tests was not significantly important across the whole sample. Correlation between tests scores and course was 0.43 in 2020 and 0.30 in January 2021 and between difference of tests scores and course -0.44 ($p < 0.01$), which indicates that first course cadets have relatively poor results in tests compared to cadets at the 3rd course, but first course results increased more compared to previous tests.

When eliminating those who got maximum points in every strength test in 2020 and comparing the remaining 66 female and 63 male cadets, the correlations between change in PA and PA hours during restrictions was 0.40 for men and 0.38 for women, which means that those who reported maintenance or augmentation of PA tended to train more hours per week.

The results of pulldowns were statistically associated to PA hours more during restrictions among male cadets ($r = 0.43$, $p < 0.01$) than female ($r = 0.34$, $p < 0.01$), in that group and the results of bench press more among female ($r = 0.42$, $p < 0.01$) than male ($r = 0.28$, $p < 0.05$). The leg press results had no correlation with reported PA hours.

2.3. POLICE CADETS' PA AND HEALTH ACCORDING TO ANONYMOUS QUESTIONNAIRES DURING SOE IN 2020 AND RESTRICTIONS PERIOD IN APRIL 2021

Police cadets answered two anonymous voluntary electronic questionnaires made in LimeSurvey – the first during state of emergency (SOE) in May 2020 (n=47), when all sports clubs and EASS sports facilities were closed and it was only possible to exercise at home or outside, and the second during the restrictions period in April 2021 (n=50), when most of the EASS cadets were on distance learning and they came to the academy only for practical exams and tests and while it was possible to use facilities during that period, it was limited to 10 attendees. Cadets who worked partially as POs had access to police stations gyms.

As the percentage of responses was approximately 13% of all EASS police cadets in both surveys, the results are not very representative, but as this was the only possibility to get more personal information about both physical and mental health during COVID-19 the data were still analysed.

Table 6. Police cadets' PA before and during SOE and during restrictions

	Before SOE	During SOE	During April 2021 restrictions
Exercised at least twice a week	96%	93%	98%
Exercised every day or almost every day	68%	57%	46%
Exercised (sweating and breathing intensively) at least 1 hr per week	81%	75%	88%
Exercised (sweating and breathing intensively) at least 3 hrs per week	70%	60%	66%
Exercised (sweating and breathing intensively) at least 5 hrs per week	53%	32%	36%

During April 2021, 80% of police cadets exercised 3 or more times per week, the other data are shown in Table 6.

Most prevalent sports disciplines among EASS police cadets' who answered anonymous questionnaires were running (82% (2020), 78% (2021)) and strength training (62% (2020), 68% (2021)).

The most frequently mentioned moving activities during SOE in 2020 and restrictions in 2021 were running and walking near home (77% (2020), 78% (2021)). During SOE, it was impossible to train in public gyms, but in 2021 EASS gym and police stations, gyms were open and the second most popular PA among police cadets was exercising in gyms (58%).

Cadets responded that the best help from EASS for their mental and physical health were movement campaigns, physical education, self-defense, shooting and swimming classes, lectures about mental health, common training and competitions.

44% of police cadets mentioned that restrictions had a rather negative impact to their mental health. The prevalent affecting factors according to survey were lack of socialising, closed gyms and distance learning. The stress level had not increased during the restriction period for 64% of respondents.

34% of police cadets had maintained endurance abilities and 30% strength capabilities in April 2021, 18% answered that their endurance and 22% that their strength increased during the restriction period, thus the strength and endurance decrease was reported in 48% of answers. 29 police cadets from this survey had possibility to use gym, but strength decrease was still reported by 28% of them.

3. DISCUSSION

Isolation alters PA behaviours in a health compromising fashion (Ammar, et al 2020). Regarding the EASS survey, 40% of police cadets maintained the previous intensive PA hours level during SOE lockdown, 43% reduced and 17% augmented their intensive PA hours. In January 2021, while gyms in EASS were closed and there were local restrictions and suggestions to avoid contacts and training indoors, PA level decreased for 70% of cadets and only 5% were motivated to increase PA compared to the non-isolation period before strength tests.

The difference in those percentages can be influenced by the fact that a voluntary questionnaire might be preferable to those who were more interested in sport and less active cadets didn't share their data in it. To get more accurate information, the questionnaires should involve fewer active cadets' responses. Although the motivation to regularly exercise could decrease during a break in the academic year like Kukić, et al (2019) found in their study.

47% respondents in May 2020 and 48% respondents in April 2021 answered that their strength abilities decreased during restrictions period. According to the January 2021 strength tests results, total score had decreased for 29% of higher education police cadets compared to 2020 previous strength test scores, which is not as a high percentage than in the questionnaires. The evaluation of strength is wider and with described tests only some strength indicators were controlled, so the decrease of strength abilities among a bigger percentage of cadets might be possible.

The significant difference between 1st course 2 tests total average scores in the female group, which was tested before COVID-19, and the group which started in fall 2020 might be explained by lower physical entrance test demands for female candidates in 2020 compared to previous years.

Female cadets recorded lower repetitions' scores from strength tests than male cadets, but their results improvement was significantly higher. The tests results were correlated with less importance between upper body

and lower body tests. PA level before January tests was correlated with bench press and pulldowns tests results but didn't affect leg press results.

The average physical tests results were lowest among first course cadets, but they also had the highest average PA hours and the largest increase in strength tests scores. Despite the restrictions of COVID-19 during study and training processes, there was a noticeable improvement in 61% of police cadets strength abilities in January 2021 compared to previous tests results. The control group tests results before the COVID-19 period augmented more often than in groups during virus restrictions.

The change in PA forms was noted – during April 2021 over half of the respondents trained in the gym, which was impossible during the 2020 lockdown. Small increases in training with own body exercises and a decrease in riding a bike, as the most popular PA remained running and walking near home during both surveys.

The number of respondents who felt increased stress levels during restrictions was higher in spring 2021 vs SOE in 2020. Nevertheless, more than half of police cadets didn't feel restrictions' influence on their mental health.

A study of the German population during the COVID-19 pandemic demonstrated a significant decline of emotional well-being compared to the period before the pandemic for those individuals who either stopped or considerably reduced their sport and exercise activities during the pandemic (Mutz, 2021). Large observational studies suggest that exercise can reduce the risk of all cause and disease-specific mortality, which has been found to be significantly higher in the sedentary COVID-19 patients' group (Salgado-Aranda, et al 2021). Thus, regular PA of adequate intensity is essential to keep boosting the immune system which has been found to be especially important during the COVID-19 period (Khoramipour et al, 2021, da Silveira, et al 2021).

According to the Government Office of Estonia report, 45% of Estonian residents felt increased stress levels in May 2020 than before COVID-19 period (Makarova, 2020). In ensuing questionnaires, stress level was reported and in April 2021, 29% of Estonian 1252 respondents felt high or vey high stress and 48% smaller stress or pressure, 28% had suffered from

mood disorder and 24% from anxiety disorder, 45% reported signs of mental exhaustion. Stress level was higher among younger adults (Turuuringute AS, 2021). EASS surveys were not too specific regarding mental health but the percentage of police cadets who reported higher stress levels and disrupted mental health because of COVID-19 restrictions was broadly similar to the Estonian average.

Police cadets' PA per week was at least 3 hours for 60-66% of respondents in different surveys during the COVID-19 period. Cadets who answered that they had no obstacles to keep PA regularly to the same degree as they had previously in January 2021 exercised mainly 5 or more hours per week during restrictions which is good level to maintain or improve the health according to WHO suggestions (WHO Guidelines...2020). The average of PA hours per week in January 2021 was 4.5 for male and 4.7 for female police cadets, which is a good result in the context of self-reported PA decrease for 70% of them.

SUMMARY

Based on statistical analyses of EASS police cadets' strength tests results it was found that cadets' average strength capabilities were mostly improved during the fall semester of the COVID-19 period in 2020-2021. Female cadets collected lower repetition scores from strength tests than male cadets, but their result improvement during the fall semester was significantly higher.

The average 3 gym-based strength tests repetitions was significantly higher at the end of the fall semester compared to previous tests results for both male and female cadets, despite the matter that according to focus group interviews, PA level decreased for 70% of cadets in a short period before the second test. PA level before the January 2021 tests was correlated with bench press and pulldowns test results.

Before the pandemic, the groups' average repetitions increased in more cases than during the COVID-19 period, furthermore, the strength tests scores decreased in 28% of cases during the COVID-19 period compared to a 8% decrease in pre-COVID-19 cases, thus the PA and the improvement of strength capabilities was disturbed by COVID-19 influences.

The self-reported PA average levels during restrictions (M 4.5 and F 4.7 hours per week) support improvement of physical abilities, but more attention needs to be given to the tendency of loss PA hours during restrictions period compared to pre-COVID-19 period for those who tended to exercise very often, which emerged from the questionnaires.

Future studies need to be carried out for improved explanations of the PA suggested level in POs preparation and maintenance of health throughout a career.

LIMITATIONS

The weakness of this study was the low interest of police cadets to answer voluntary and anonymous questionnaires during SOE when they worked frontline and during restrictions period in April 2021. Another weakness was usage of annual tests as evaluation of cadets' strength capabilities because there was a standardisation of marks and the motivation to achieve more repetitions than necessary for maximum points was low, so it caused the elimination of those who got maximum results in 2020 tests and focus only on those who didn't get maximum repetitions during their previous tests to chase the changes in results.

The participants in described 3 surveys were partially the same, but personal changes in PA, strength capabilities and mental health were not traceable.

Contact:

Epp Jalakas, MA

Estonian Academy of Security Sciences

E-mail: epp.jalakas@sisekaitse.ee

ABBREVIATIONS

BMI – body mass index, the body mass divided by the square of the body height (kg/m^2)

BP – bench press – exercise where participant lies with back on bench, feet on floor, grips the bar with hands as wide that at the bottom of move hands are directly above the elbows; the bar has to be lowered slowly down to the chest and then pressed up to the starting position.

BW – body weight

F - female

LP – leg press – exercise on machine in sitting position, feet hip to shoulder width apart on the platform; participant lowers the platform until knees are at 90° and extends knees and hips to press the platform until legs are straight, but not locked out.

M - male

PA – physical activity

PD – front lat pulldown – exercise on machine in sitting position, knees under stabilization pads; participant needs to hold from overhead bar with arms, elbows fully extended and pull the bar down in the front of the head until it reaches under chin, the torso is maintained at a 70- to 90-degree angle with the vertical and remains motionless throughout the entire bar movement

PO – police officer

SOE – state of emergency

St. D – standard deviation

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