



THE IMPACT OF ONLINE TRAINING DURING THE COVID-19 PANDEMIC ON THE STRENGTH ENDURANCE OF FEMALE COLLEGE STUDENTS

P. Petkov*

Department of "Physical Education and Sports", Trakia University, Stara Zagora, Bulgaria

ABSTRACTS

The years of the COVID-19 pandemic (2020 - 2022) are unparalleled in modern human history. Isolation has further immobilized individuals and further impaired their physical fitness. The aim of the present study was to determine the level of strength endurance of female students after the COVID-19 pandemic and compare it with that before it. To realize the objective, we set the following tasks: to develop a test battery, to perform testing, to process and analyze the data of the testing. Research methods: testing, analysis of variance, comparative analysis, graphical method. The testing was conducted during the winter semester of the academic year 2022/2023. The contingent of the study were 67 female students with the average age of 20-24 years from Faculty of Agriculture, Faculty of Veterinary Medicine and Faculty of Economics at Trakia University, Sofia. The study population consisted of students from the study population of the University of Stara Zagora. The same test battery was administered to female students of Trakia University before the pandemic in 2017. We compare the results of female students before and after the pandemic from COVID-19. The test battery included the following tests: vis to failure, 2 kg dumbbell hold, plank, push-ups from knees to failure, abdominal crunches to failure. After the analyses of the tests performed, we concluded that the COVID-19 pandemic and the subsequent immobilization affected the strength endurance of the female students by decreasing it.

Key words: university students, physical attributes

In recent decades, there has been a trend of increasing immobilization of all people and young people in particular. The development of technology negatively affects the quality of life - less and less movement and more and more improper nutrition of man. According to (1).

The scientific evidence of the decline in people's physical activity is undeniable. The period between 2020 - 2022 is unparalleled in modern human history. These are the pandemic years of COVID-19. The imposed isolation and enclosed sporting venues have further immobilised people, further impairing their physical fitness. There was an increase in the incidence of various body systems, allergies, etc.

**Correspondence to: Plamen Petkov, Trakia University, Stara Zagora, Department of "Physical Education and Sports", Jo_team@abv.bg*

Reliable data on physical fitness and determination of the functional state of the organism reflect the achieved level of physical capabilities and the degree of development of the motor qualities of the person (3). For the sake of an efficiency of the students, the students are not alarm for the sake of being a landscape and defined goals and for the goals, which are resolved to restore themselves in the learning school (2).

The aim of the present study was to determine the level of strength endurance of female students after the COVID-19 pandemic and compare it with that before it. To realize the goal we set the following tasks:

1. To develop a test battery.
2. To carry out testing.
3. To process and analyze the test data.

Methods:

1. Testing
2. Variance analysis
3. Comparative analysis
4. Graphical method

Testing was conducted during the winter semester of the 2022/2023 school year. The contingent of the study were 67 female students with an average age of 20-24 years from the Faculty of Agriculture, Faculty of Veterinary Medicine and Faculty of Economics at the University of Thrace, Sofia. The study population consisted of students from the study population of the University of Stara Zagora. The same test battery was administered to female students of Trakia University before the pandemic in 2017. We compare the results of female students before and after the pandemic from COVID-19.

The test battery includes the following tests:

Test 1 - Height to failure

Stepping onto a chair or bench and grasping the bar at shoulder-width overhand grip. At the "Start!" signal, move the chair and start the stopwatch. Stop the stopwatch when the lever is dropped. The test shall be run to failure. The reading shall be accurate to within 1s.

Test 2 - Holding 2 kg dumbbell

Raise arms out to sides to a water level position. Palms facing down hold the dumbbells. Perform 1 attempt to failure. Time is measured to the nearest 1 s.

Test 3 - Plank

Stand in a push-up position. Bend elbows at right angles, placing them on the ground and transferring the weight of your body onto them and onto your forearms. The elbows should be just below the shoulders, and the body is straight, forming a straight line from head to toe. Hold until failure. Time is measured to the nearest 1 s.

Test 4 - Kneeling push-ups to failure

Assume a kneeling support, hands wider than shoulder width apart. Arms are flexed and extended, with arms parallel to the floor, elbows pointing out. The test is performed to failure.

Test 5 - Crunches to failure

The student stands in the starting position in a supine position, with hands grasped behind the head, with the knees being pressed by another student to prevent the legs from bending. Straighten log to right angle (90°) and return to starting position. The test is performed to failure.

ANALYSIS OF RESULTS

On the height-to-failure test, the mean scores of the female students were 27.45 sec. As the studies varied between 5 sec and 38 sec. In comparison, in 2017, the mean scores were 32.39 sec. with scores ranging between 3 sec. and 71 sec. This is up by 4.94 sec. Less than the average in 2022. The results are illustrated in **Figure 1.**

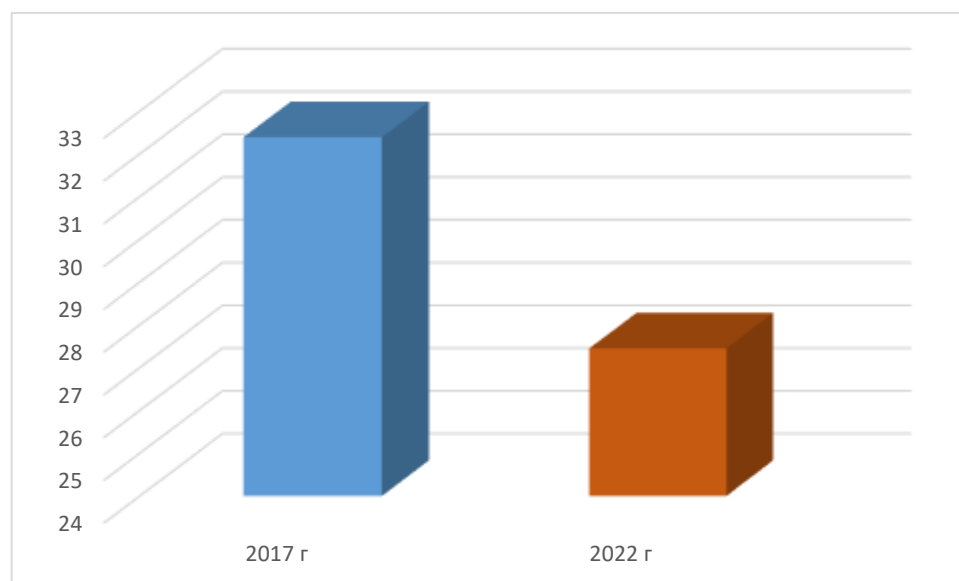


Figure 1. Comparison of the results of the test "Vis to failure"

The mean values of the "Holding the dumbbell 2 kg" test of the female students of Trakia

University in 2022 were 42,38 sec. The variability of the results was between 12 and 58

sec. In comparison, in 2017 female students had average values of the same test of 54,03 sec. Their results varied between 17 sec and 90 sec.

In 2017, female students' results were 11.65 sec better than those shown in 2022. The results are illustrated in **Figure 2**.

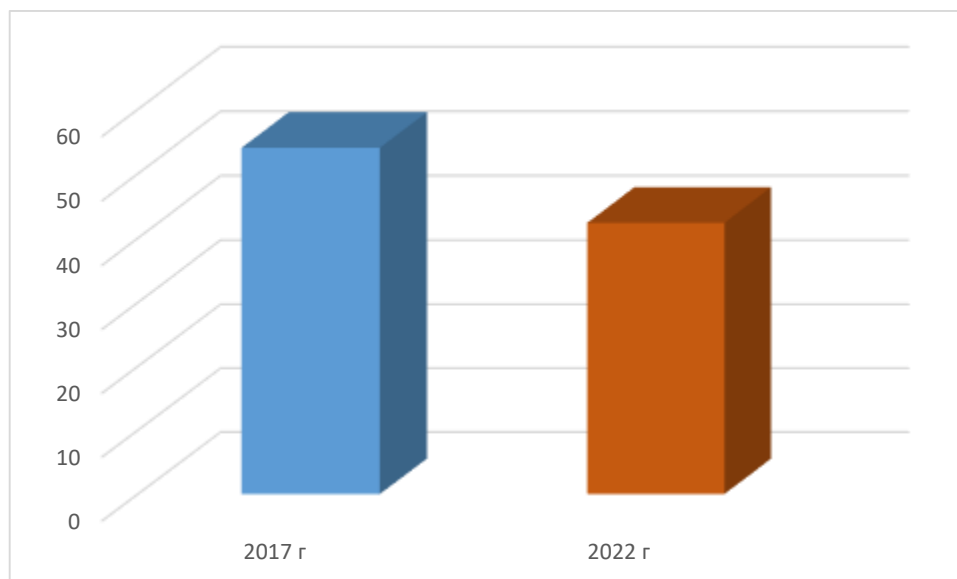


Figure 2. Comparison of the results of the 2 kg dumbbell hold test

Results in the Plank test female students in 2022 ranged between 15 and 52 sec. The average of their performances was 34.15 sec. If we compare the average of the female students

shown in 2017, which is 81.33 sec, we find a difference of 47.18 sec. In 2017, the results of this test varied between 25 and 190 sec. The results are illustrated in **Figure 3**.

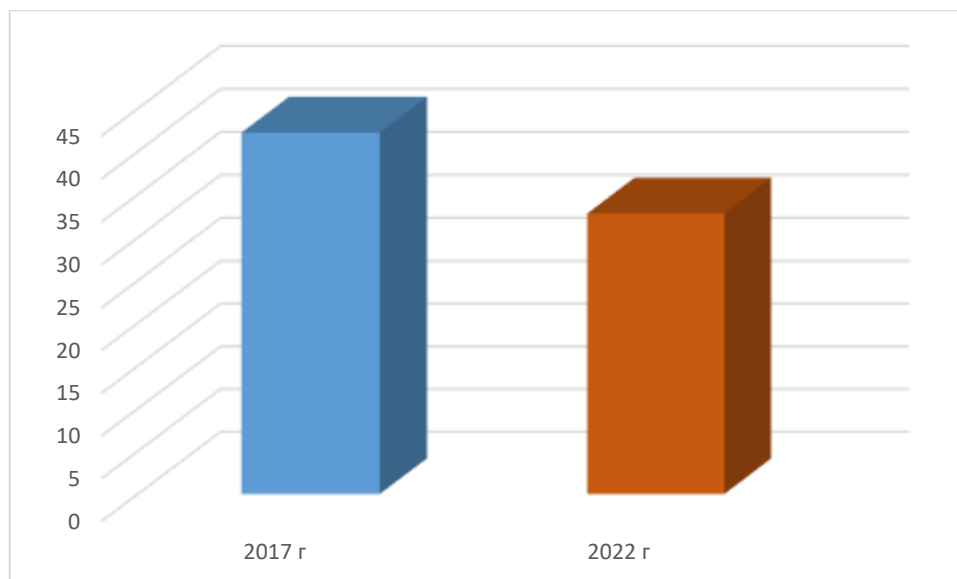


Figure 3. Comparison of Plank test results

The results in the test "Push-ups to kneeling refusal " female students in 2022 varied between 5 and 28 pcs. The average of their performance was 14.56 pts. If we compare the

average of the female students shown in 2017, which is 18,61 pcs, we find a difference of 4,05 pcs. In 2017, the results of this test varied between 5 and 40 pts. The results are illustrated in **Figure 4**.

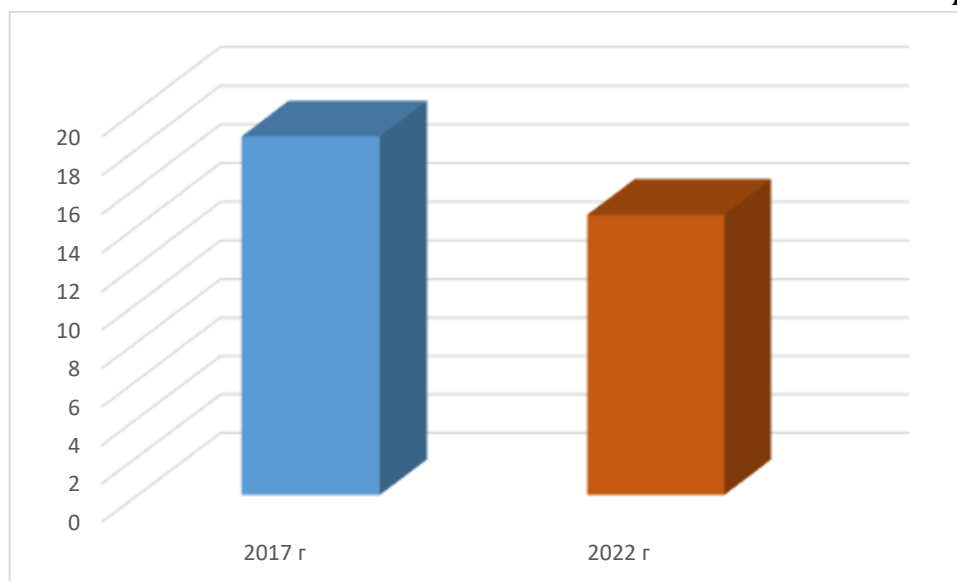


Figure 4. Comparison of the results of the test "Push-ups to kneeling failure"

The mean scores of the test "Kneeling push-ups to refusal" of female students of Trakia University in 2022 were 32.78 pts. The variability of the results is between 12 and 48 pcs. In comparison, in 2017 female students had

average values of the same test of 42,19 pcs. This is 9,41 pcs more push-ups than in 2022. Their scores ranged between 17 and 71 pc. The results are illustrated in **Figure 5**.

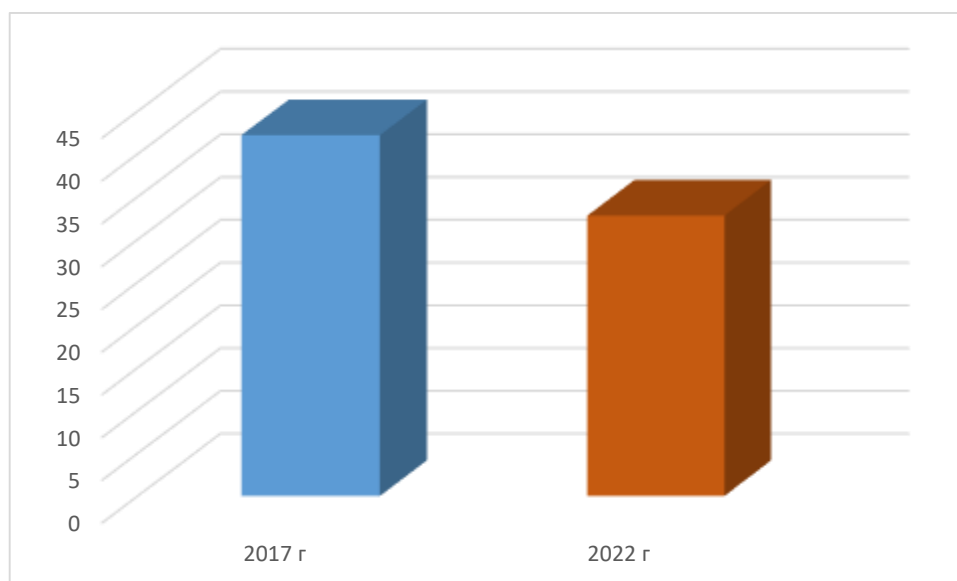


Figure 5. Comparison of the results of the Abdominal Press to Failure test

CONCLUSIONS

1. The COVID-19 pandemic and the subsequent immobilization affected the strength endurance of the female students by decreasing it.
2. A very high proportion of female students have a very poor level of development of strength endurance.
3. The decrease in strength endurance was observed in all tests.

4. Decrease in maximum and minimum performance scores of female students is observed.
5. Will power and perseverance to overcome fatigue and achieve better results are lacking.

REFERENCES

1. Angelova, P. Identification of some behavioral risk factors negatively influencing health in rehabilitation students. *Journal of Health Policy and Management*,

- Vol. 19, No. 2, pp. 56-59, ISSN 1313-4981, 2019
2. M. Ivanova, P. Petkov, Innovative Methods For Developing Physical Strengths And Endurance In Students, *Trakia Journal of Sciences*, Vol. 17, Suppl. 1, pp 821-825, 2019, ISSN 1313-3551
 3. Petkov. P, Angelova. P., Study of physiometric indices in students, Sessions schedule&Abstracts, 2018 - Ruse, Razgrad, Silistra, FRI-2G.104-1-HC-06, pp. 270 – 271
 4. P. Petkov, A study of the impact of the pandemic on the motivation of female students of the university of thrace to participate in physical education and sport classes, *Trakia Journal of Sciences*, Vol. 21, Suppl. 1, pp 339-346, 2023, ISSN 1313-3551