



## Research Article

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# Particularities of physical fitness during the COVID-19 Pandemic Case study: Fitness in the city of Bistrița (Romania)

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## Abstract

The outbreak of the SARS-CoV-2 pandemic starting with December 2019 led to the introduction of measures to restrict the free movement of persons outside the home, which affected, to a certain extent, the body maintenance program and to perform physical activities of relaxation and health. However, the population has found ways to practice these activities, at home and near home, because physical exercises performs several functions during this period, such as: maintaining physical and mental health, reducing stress, relaxation, overcoming the situation of crisis. The present study aims to highlight the peculiarities of this phenomenon in the city of Bistrița from Romanian.

**Keywords:** COVID-19, Fitness, Aerobic and anaerobic exercises, Bodybuilding, Health care, State of emergency, Physical activities, Immune system, Health alert, Military ordinance.

## INTRODUCTION

In recent years, mass sports activities have increased in intensity due to several factors, such as:

- Changes in the form of work performance;
- Increasing leisure time;
- Progresses in the sports equipment industry;
- Circulation of information on the internet;
- Trend for the maintenance of health and physical condition;
- Free movement of people.

In this context, the number of people participating in various sports and leisure activities has increased, such as: physical fitness, walking, hiking, cycling, mountain biking, scooter riding, rollerblading, skateboarding, alpine skiing, cross-country skiing, ski touring etc.

With the onset of the SARS-CoV-2 pandemic, the sports habits of the population around the world suffered, but did not disappear, because by certain legislative regulations physical activities were still allowed. This is also the case of the city of Bistrița (Romania), which is the subject of this study which will show the influence of the pandemic on the physical activities practiced by its population.

Scientific studies show that exercise influences physical and mental health as well as the immunity of the human body (Kahlmeier, 2012; Nieman, Wentz, 2018; Etnier, Chang, 2019; Chen *et al.* 2020; Halabchi *et al.* 2020) [7, 11, 3, 1, 5] in the face of viral infections (Kohut *et al.* 2002; Lam *et al.* 2008; Martin *et al.* 2009) [8, 7, 10].

Moderate-intensity exercise increases the number of neutrophil and natural killer cells, increases the concentration of IgA in saliva, increases stress hormones, which leads to a reduction in excessive inflammation and increased immunity to viral infections by changing the responses of Th1 / Th2 cells (Halabchi *et al.* 2020) [5].

Moderate-intensity physical activity stimulates the immune system and decreases the risk of viral respiratory infections, while long-term, high-intensity physical activity weakens the immune system for several hours after exercise and increases the risk of respiratory tract infection.

Exercises with moderate intensity can help healthy asymptomatic people, and the occurrence of viral infections of the respiratory tract is reduced by 20-30% to 40-50% in people who engage in moderate

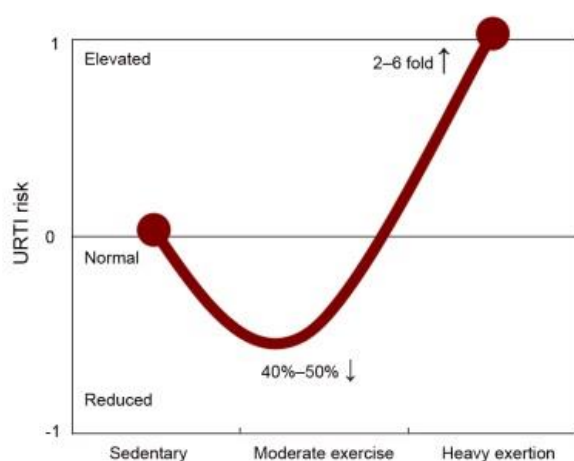
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physical activity (Martin *et al.* 2009; Nieman, Wentz, 2018; Halabchi *et al.* 2020; Pavón *et al.* 2020) [10, 11, 5, 12] (Fig. 1).



**Figure 1:** The link between physical activity and upper respiratory tract infections (after Nieman, Wentz, 2018) [11].

Given the situation induced by the COVID-19 pandemic and the restrictions imposed by the authorities to reduce the transmission of this virus, individual physical activity should be practiced at home and around the home for physical and mental maintenance.

It is recommend aerobic and anaerobic exercises that can be practiced at home (gymnastics, spinning, stepper, treadmill, abdomen, push-ups, stretches, weightlifting, pushing, pulling, squats, kneeling) or outside (rope jumping, easy running, intense running, kneeling, stretching, jumping, walking) (Hammami *et al.* 2020; Pavón *et al.* 2020) [6, 12].

## MATERIALS AND METHODS

In order to carry out this study, the following methodological steps were followed:

- Consultation of some works regarding the influence of physical exercises on the population's health and on the increase of the body's immunity in case of viral infections (Kohut *et al.* 2002; Wong *et al.* 2008; Martin *et al.* 2009; Mahmoud *et al.* 2011; Kohl *et al.* 2012; Nieman *et al.* 2018; Etnier, Chang, 2019; Haileamlak, 2019; Halabchi, *et al.* 2020; Hammami, *et al.* 2020; Pavón *et al.* 2020) [8, 13, 10, 9, 7, 11, 3, 4, 5, 6, 12];
- Consultation of the internal legislation specific to the pandemic (Military Ordinances issued by the Ministry of Internal Affairs);
- Performing direct observations on the sports activities carried out by the population in the city;
- Interviewing a sample of 20 people aged 60-80 in connection with physical activities during the pandemic;
- Performing indirect observations, through posts on facebook and instagram, on the indoor activities practiced;
- Application of an online questionnaire on indoor and outdoor sports activities carried out by the population; this questionnaire was applied to a target group of 100 people aged between 20 and 60, selected via facebook.

## Study Area

The city of Bistrița is the residence of Bistrița-Năsăud county, located in the northern part of Romania (fig.2). The city has a population of 93,820 inhabitants (2017), and in its economic profile can be mentioned industrial, agricultural and commercial activities. The neighborhoods of the city are represented by hills with altitudes between 400-600 m, and its territory is drained by the river Bistrița with its springs in the Călimani Mountains (Bistriceior Massif).



**Figure 2:** The geographic position of Bistrița city in Bistrița-Năsăud County (source: <http://www.cs.ubbcluj.ro/>-with changes)

Over time, the city of Bistrița has demonstrated its sporting vocation, underlined by several elements, such as:

- Traditions regarding the practice of sports activities (skiing, hiking, football, athletics);
- Adequate infrastructure: Jean Pădureanu municipal stadium, Sport Multipurpose Hall, private sports fields, playgrounds, swimming pools (Casa Ema, Schreiner SPA), fitness rooms (Sangym, The New Art of Body Gym, Casa Ema, Schreiner Sport, Kangoo Club, Life Gym), the ski slope and the Cocoș adventure park;
- Forms of organizing mass and performance sports activities: sports clubs, sports associations (athletics, football, handball, boxing, cross-country skiing, table tennis, orienteering);
- Local, county and national mass sports competitions in which the city's population participates (mountain marathons, ski competitions, orienteering competitions).

Also, in the city there are over 30 runners in mountain marathons / half marathons, and a large part of the practical population as well as hundreds of cyclists, people who do fitness (300 subscribers on average / gym rooms), people who run for health maintenance and hundreds of people participating in mountain hikes in the neighboring areas: Rodna, Bârgă and Călimani Mountains.

## RESULTS AND DISCUSSION

### The chronological evolution of the pandemic in Romania and in Bistrita city

At the end of December 2019, the presence of the new coronavirus called SARS Cov-2 or COVID-19 is officially announced in Wuhan (Hubei Province, China). In the next period the virus spreads all over the world, so that on 11.03.2020 the World Health Organization declares the infection with COVID-19 pandemic (Cucinotta, Vanelli, 2020).

In Romania, the first case of infection is reported on 26.02.2020, after which the repatriation process of Romanian migrants from Italy and Spain triggers an increase in the number of infected, which determines the authorities to issue on 16.03.2020 Presidential Decree no. 195/2020 on the establishment of the state of emergency at national level. Gradually, in the following days, a legislative framework will be outlined that will severely restrict sports and leisure activities in the country:

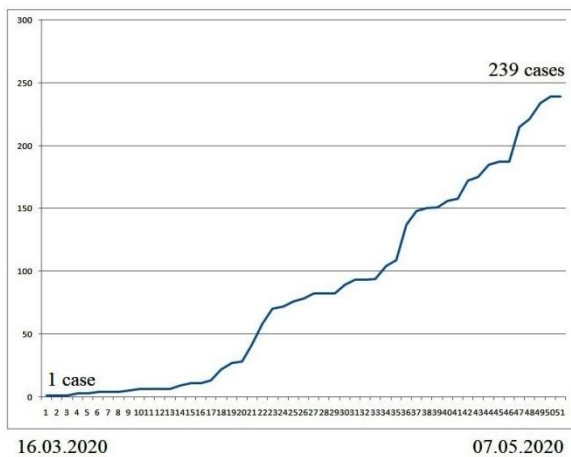
- On 18.03.2020 the Ministry of Internal Affairs issues the Military Ordinance no. 1, which suspends all cultural, scientific, artistic, religious, sports, entertainment or gambling, spa treatment and

personal care activities, performed indoors. It is also forbidden to organize and conduct any event that involves the participation of over 100 people in open spaces;

- On 20.03.2020, the Ministry of Internal Affairs issues the Military Ordinance no. 2 which restricts the movement of persons outside the home, this being done only for certain reasons (shopping, work, medical consultations, care of the elderly, individual physical activity near the home) which will be specified in a statement on their own responsibility;
- On 24.03.2020, the Ministry of Internal Affairs issues the Military Ordinance no. 3, according to which the movement of persons who have reached the age of 65, outside the dwelling/ household, is allowed only in the time interval 11.00-13.00, and on 29.03.2020 issues the Military Ordinance no. 4, through which the movement of persons over 65 years of age, outside the home / household, is also allowed between 20.00-21.00, if this is done to ensure the needs of pets only in the vicinity of the home / household, following that on 27.04.2020 to issue the Military Ordinance no. 10, which allows the movement of persons who have reached the age of 65, outside the home / household, between 7.00 - 11.00 and 19.00-22.00.

In Bistrița-Năsăud County, the first case of COVID-19 infection is registered on 16.03.2020, being a 32-year-old man repatriated from Italy (Milan), after which the number of infected people increases, the situation at this time shows 239 cases of infections with COVID-19 (fig.3).

Following this situation, starting with 23.03.2020, the Bistrița Municipal Committee for Emergency Situations decided to close the fitness rooms, parks, playgrounds and picnic areas in the city. Also, the Hervis, Decathlon, Sportissimo, Sport Center and Ideal Sport sporting goods stores have suspended their activity, some of them switching to online sales (Hervis, Deacathlon, Sportissimo).



**Figure 3:** Total number of COVID-19 diseases in Bistrița-Năsăud County (Source: Bistrița-Năsăud County Prefecture)

### Monitoring the physical activities practiced by the population

In order to establish if and how in the new conditions the population of the city practices physical activities, direct observations were made in the field and an online questionnaire was applied in which 100 respondents participated, as follows:

- 60 people aged 20-40 years;
- 40 people aged 40-60 years;

The results of this questionnaire were as follows:

a) Do you carry out indoor / outdoor sports activities during the pandemic ?;

- 80 respondents: yes;
- 20 respondents: not for different reasons (work, disinterest);

b) During this period did you purchase certain sports equipment online ?; if so, what were they ?;

- 10 respondents: yes (fitness t-shirts, tights, dumbbells, fitness mattress);
- 70 respondents: no;

c) Indoor sports activities;

1) What indoor sports activities do you practice?;

- 62 respondents: pilates, gymnastics, knee bends, abs, stationary bike, treadmill;
- 18 respondents: weight lifting, knee bends, push-ups, kettlebell exercises, isometric exercises;

2) Between what time intervals do you practice these activities ?;

- 43 respondents: 7.30-10.00;
- 16 respondents: 12.00-13.00;
- 11 respondents: 17.00-18.00; 17.00-20.00;
- 10 respondents: 7.30-9.00 and 18.30-20.00;

3) What is the duration of the physical exercises?;

- 53 respondents: 30-35 minutes;
- 24 respondents: 30-40 minutes;
- 3 respondents: 40-60 minutes;

4) Do you have a specially prepared room and appropriate equipment for indoor activities ?;

- 65 respondents: no (ordinary room);
- 15 respondents: yes (appliances, accessories);

5) Do you use certain media sources to practice these exercises?;

- 40 respondents: you tube, facebook;
- 25 respondents: google, facebook;
- 15 respondents: no;

6) For exercise, do you call a fitness trainer?;

- 25 respondents: yes (online on Skype);
- 5 respondents: yes (phone call, whatsapp);
- 50 respondents: no;

7) Do you practice physical activities every day?;

- 52 respondents: yes;
- 28 respondents: no;

8) Did you practice these physical activities even before the pandemic started?;

- 67 respondents: yes;
- 13 respondents: no;

d) Outdoor activities;

1) What outdoor sports activities do you practice ?;

- 52 respondents: easy running, sports walking, rope jumping;
- 17 respondents: intense running, cycling, rollerblading, scooter, skateboarding, tennis, badminton;
- 11 respondents: walking/strolling (including pets);

2) Between what time interval do you practice these activities ?;

- 65 respondents: 16.30-18.30;
- 15 respondents: 18.30-20.00;

3) What is the duration of the physical exercises ?;

- 14 respondents: 30 minutes;
- 45 respondents: 40-60 minutes;
- 21 respondents: 1-2 hours;

4) In what places do you practice these activities ?;

- 58 respondents: on the streets around the house, in parking lots, on sidewalks;
- 22 respondents: in the yard of the house, around the house, through the forest around the house;

5) Do you practice these physical activities daily?

- 64 respondents: yes;
- 16 respondents: no;

6) For practicing outdoor activities, what personal protection measures do you take ?;

- 62 respondents: mask, physical distance;
- 8 respondents: mask, gloves, physical distance;
- 10 respondents: physical distance;

7) Did you practice these physical activities even before the pandemic started?

- 53 respondents: yes (regular);
- 16 respondents: yes (occasionally);
- 11 respondents: no;

e) What effects do the sports activities practiced during this period have on your physique and psyche?

- 73 respondents: beneficial state, relaxation, calming, energy, reduction of stress and boredom, strength to overcome the crisis situation;
- 7 respondents: relaxation, closeness to family.

During the direct observations, we applied an interview attended by 20 people aged 60-80 years, and the results were as follows:

a) Indoor activities:

1) Do you exercise at home in this period of time?

- 7 respondents: yes;
- 13 respondents: not (various health problems, high body weight, disinterest);

2) What exercises do you do at home?

- 7 respondents: gymnastics;

3) In what time interval do you practice these exercises?;

- 4 respondents: 8.00-10.00;
- 3 respondents: 16.00-18.00;

4) How long do you give these exercises?;

- 7 respondents: 10-15 minutes;

5) Do you have the right equipment?;

- 4 respondents: yes (training, T-shirt);
- 3 respondents: no (light house clothes);

6) To carry out these exercises use different media sources (you tube, facebook)?;

- 17 respondents: no;

7) To carry out these exercises, do you call an fitness trainer by phone?;

- 15 respondents: no;
- 2 respondents: yes;

8) Do you do these physical activities daily?

- 8 respondents: yes;
- 9 respondents: no;

9) Did you perform these physical activities even before the pandemic started?;

- 13 respondents: yes;
- 4 respondents: no;

b) Outdoor activities;

1) Do you move outside the home?

- 17 respondents: yes;
- 3 respondents: no (health problems, disinterest);

2) What physical exercises do you practice outside?;

- 17 respondents: easy walk (including pet walk);

3) In what time interval do you practice these activities ?;

- 8 respondents: 7.00-8.00 and 20.00-21.00 (with walking the pet), 12.00-13.00 (including shopping);
- 4 respondents: 11.00-13.00 (including shopping);
- 5 respondents: 09.00-11.00 and 20.00-21.00 (including walking the pets);

4) Where do you do these exercises?;

- 14 respondents: on the streets near the house;
- 3 respondents: at the market place;

5) How long do you give these exercises?;

- 12 respondents: 60-90 minutes;
- 5 respondents: 2 hours;

6) Do you practice these activities daily ?;

- 14 respondents: yes;
- 3 respondents: no;

7) Did you practice these physical activities even before the pandemic started?;

- 17 respondents: yes;

8) What personal protection measures do you adopt?;

- 14 respondents: mask, physical distance;
- 3 respondents: mask, gloves, physical distance;

c) How important are these exercises on your physical and mental health?

- 12 respondents: well-being, maintaining physical condition, overcoming the state of emergency;
- 5 respondents: maintaining health, reducing stress, eliminating boredom.

## CONCLUSION

Following the study, it turns out that during the SARS-CoV-2 pandemic, the population of Bistrita city is concerned with maintaining physical and mental condition and carries out specific sports activities at home and abroad, near the home.

Most people surveyed and interviewed had these concerns before the pandemic, but on this occasion other people also discovered the benefits of exercise in such a crisis situation, and it is possible to continue even after the end of the pandemic.

Most respondents perform these physical activities daily and on their own, and a small number call by phone to fitness coaches for advice (e.g. coaches at Sangym, The New Art of Body Gym and Kangoo Club).

In the next period, after the issuance of measures to relax the state of emergency, the population of Bistrita city will be able to carry out physical activities in parks, sports fields and on the street, respecting the protection measures. Also, the gyms will operate through specific measures to protect against the spread of the virus (subscriber scheduling, small number of people, online training, etc.).

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## Competing interests

The authors declare that they have no competing interests.

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