

Changes in the motor lifestyles of teenagers due to the effects of the SARS-Cov2 pandemic

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Abstract. The research was carried out to investigate the phenomena that led to the change in the motor lifestyles of adolescents due to the SARS-Cov2 pandemic with enforced periods of inactivity and lengthy spells of physical distancing which caused alterations in social and school behaviour. The effects were extensive, marked in particular by an increase in obesity and hypokinesia. The anthropometric measurements (weight, height) were taken and motor tests were carried out on the accuracy of the passages and shots. Basketball (1) is a team sport in which efforts are well balanced and are well proved through the efficiency of the shot, of the throw and the assist performed in a very changeable agonistic situation. The study was carried out over two periods: October-November 2020 and May-June 2021 with exercise and manual data collection for 20 individuals (12 males and 8 females) aged between 15 and 17 years old with a body weight between 55kg and 70kg.

Specific aims were improving the percentage of shooting and passing by strengthening the upper limbs through specific exercises and the use of competition balls, medicine balls, and elastics fit band. Two students having the task to count the number of passes and shoots. The effect of the pandemic has exacerbated the phenomenon of obesity, which is often one of the factors contributing to unease and distress during adolescence that slows down the process of inclusion in social and school life and increases the risks of isolation and marginalization.

The results showed an average increase in body weight and improved shot and passage percentages. The average weight increase was about 5%. At the motor level there was on average a slight percentage improvement of about 2%. Some athletes in group B showed the greatest percentage increases.

Keywords: *lifestyles, obesity, Covid-19, physical activity, inclusion, basketball.*

Introduction

The behaviour of adolescents has changed profoundly due to the Covid 19 pandemic. Enforced inactivity and lengthy periods of physical distancing have led to variations in social behaviour while daily habits, based on relationships, school and sports activities, have undergone profound changes.

The lifestyles of adolescents (1,2), normally characterised by outdoor living, participation in events with a large number of peers, have changed. They have been replaced by telephone and/or online communication and limited opportunities to meet up with a restricted number of peers.

Interpersonal relationships (3) have been profoundly affected, with significant consequences such as the increase in obesity caused by the lack of movement and the abnormal intake of calories.

Obesity (4) is frequently one of the factors that causes unease and distress during adolescence, slowing down the process of social and school inclusion. The problem of increasing body weight is the result of a prolonged carbohydrate and protein energy imbalance (5). In effect, children and adolescents, but also adults, consume calories in excess of what their bodies actually need. The global approach to obesity (6) is often hindered by the multifaceted nature of the problem. Many factors are involved in the pathogenesis, whether of an environmental, a psychological (7) or a genetic nature. The treatment of obesity cannot, and should not, be interpreted simply as the prescription of specific diets or merely encouraging people to engage in physical activity (8).

Within the school and social environment, obesity has become an increasingly significant and worrying issue since the body, appearance and the difficulty in actively participating in gratifying relationships gradually lead to unease and distress and, in some cases, to marginalization. From this perspective, the role of the school is crucial because inclusive action (9) must be able to promote the right that each individual should be considered equal to others but, at the same time, different from others. Obese adolescents (10) frequently display traits that can be traced back to those associated with learners with special educational needs (11). As well as traits of an organic nature, obese adolescents also display traits of a psychological nature.

The body transformation caused by age and the frequently negative judgments of peers often lead to psychological problems with personality disorders and with frequently inappropriate attempts to compensate the body for affective and relational disorders (12). The heightened lack of acceptance of physical appearance can give rise to compulsive behaviours such as overeating, anorexia or bulimia accompanied by an increase in anxiety and depression (13), which is significantly greater in females than in males. Obese adolescents underestimate their abilities, feel weak, passive and insecure and the difficulty in conforming to the dictates of fashion, especially for women, exacerbates their sense of inadequacy and frustration. The organic causes of obesity may be genetic or hormonal. They can lead to central obesity (or visceral or android obesity) marked by the storage of fat especially in the abdomen and recognisable by a waist-hip ratio greater than 0.85 in women and 0.95 in men, and to peripheral obesity (or subcutaneous or gynoid obesity) with a ratio of less than 0.85 in women and 0.95 in men.

Obesity, whether of a 'primary' or 'secondary' nature, represents a serious risk factor for mortality (14) and morbidity, both for cardiovascular and respiratory complications and for associated diseases such as diabetes mellitus, arterial hypertension, hyperlipidemia, gallbladder stones and arthrosis. There are three main macro-areas of preventive, diagnostic and therapeutic intervention. They consist of clinical intervention, psychological intervention, and intervention on improving motor skills, designed to help identify and develop an intervention protocol aimed at rebalancing body weight. Both at an international level and at a European level, where obesity has increased by 10-50% over the last decade, numerous organisations and bodies have issued effective guidelines and have collaborated in implementing significant initiatives designed to combat the spread of obesity.

The diagnosis of obesity, in addition to an incontrovertible physical examination finding and body weight, is carried out in relation to the concept that the human body consists of two components: fat mass (FM = fat mass): made up of all the body lipids distributed in the subcutaneous and visceral tissues; lean mass (FFM = free fat mass): made up of muscle mass, bones and non-adipose inter and intra-parenchymal tissues.

The concepts of fat mass and lean mass are embodied in the identification of the Body Mass Index (BMI) which is calculated through pre-established formulas, $BMI = \text{weight (kg)}/\text{height (m}^2\text{)}$, whose results provide intervals which determine the categories at risk.

However, measurement using the BMI, whose criteria have been defined by the World Health Organization (WHO), does not provide exhaustive data so that plicometry and the consideration of energy needs are combined with this diagnostic evaluation, together with the resting and basal metabolic rate, according to the Harris - Benedict scale (BMR).

The well-being created by physical activity and healthy eating habits are extremely important when organising campaigns about the prevention of obesity and providing accurate information about energy needs. Teaching a teenager to adopt correct eating habits and engage in physical exercise (15) means reducing the risk of obesity in adulthood as well as encouraging a change in lifestyle. A sedentary lifestyle, compulsive attitudes towards food and erroneous dietary choices all provide fertile terrain for the onset of obesity which must be prevented through adequate dietary programmes (clinical-organic context), physical activity (ambitious sports with motor skills) and behavioural aspects (psychological field). With regard to weight gain (16), it is advisable to return to a weight that is consistent with anthropometric parameters, and ensure a gradual reduction in calorie intake, supported by healthy physical activity and the resumption of a healthy lifestyle.

In consideration of this, it was important to propose a motor activity with both technical and inclusive and collaborative characteristics.

Basketball is a team sport which efforts are well balanced and are well proved in the efficiency of the shot, of the throw and the assist performed in a very changeable agonistic situation; as a matter of fact the basketball player must use his/her abilities in a very speed way and with great mastery, in particular, he/she must be able to show the so-called open skills.

The sport has a structured and finalized motor path that can lead to significant improvements in relational and collaborative behaviors as well as in the acquisition and explanation of motor skills.

The study, conducted on a sample of 20 individuals volunteers (12 males and 8 females) aged between 15 and 17, was prompted by careful reflection on these phenomena caused by the prolonged stay at home and the development of distance learning.

Styles and Quality of Life. Psychophysical well-being and good health (17) depend on a series of biological, genetic, psychological and environmental factors that vary from individual to individual.

The issue of health has been debated in major international meetings promoted by various specialist bodies and organisations including the WHO. From 1948, the concept of health was long correlated with bodily health, the absence of pathologies, but Leriche had previously stated that "*Health is life untroubled by one's body*" ... it is "*life lived in the silence of the organs*" and only when some of them do not work well do we actually realise this. In recent decades, the concept has been repeatedly redefined, ranging from the definition "*Health is the state of complete physical, mental and social well-being and not just the absence of disease or infirmity*", which combines the mental and social dimension of a person, highlighting the need to consider their interpersonal relationships, to the definition given in 1985 according to which health promotion aims "*to enable all people to achieve their fullest health potential. This includes a secure foundation in a supportive environment*". Lastly, Principle 1 of the Rio Declaration on Environment and Development asserts that "*(human beings) are entitled to a healthy and productive life in harmony with nature*". Health is therefore considered to be a combination of physical and psychological well-being. It is the capacity to feel good about oneself and others, something much broader and more global than the mere absence of disease. This concept does not identify health as a generally utopian state or situation, but focuses on the development of the individual's abilities according to a permanent process of interaction with the environment, bearing in mind that health is a dynamic process which nevertheless involves levels of diseases, small and continuous crises of imbalance. The concept of health and well-being is closely linked to the notion of Quality of Life (QoL). Health must be safeguarded and defended, both by implementing the necessary health regulations for every aspect of individual behaviour, and by contributing to the improvement of the living standards of the community. In other words, it is necessary to show concern for the health of everyone, even though humans are currently focusing on the effects of *progress*, and the development of *technology* and *telecommunications* rather than devoting sufficient attention to the issue of *health* which represents the primary goal of every human being. The acknowledged importance of ensuring adequate QoL is embodied in the eight constructs listed below (emotional well-being; interpersonal relationships; material well-being; personal development; physical well-being; self-determination; what is the QoL of the person: GOL-ANALYSIS; social inclusion; rights and empowerment).

QoL therefore varies for a wide range of reasons and the daily restrictions on work activities, free time, sports activities and socialisation have led to a lack of tangible feedback of positive emotions, a sense of satisfaction and well-being which may have increased the unease and distress of adolescents and the increase in the syndrome of lack of or insufficient physical exercise which Kraus and Raab defined in 1961 as *hypokinetic disease*, a concept that is now used worldwide. It is precisely this lack of movement (18) or, worse still, the complete lack of physical exercise that leads not just to problems of excess weight and obesity which, in some countries such as Italy, are reaching danger levels, but also to problems linked to poor posture and degenerative behaviour. Health therefore also needs to be safeguarded through movement and the benefits that ensue from physical activity, both in order to maintain an adequate psycho-physical balance and to restore impaired functionality. Movement has a beneficial effect on the whole body. In particular, bones, joints and muscles need constant stimuli to maintain optimal efficiency. Correct and adequate movement is essential since daily habits are not sufficient to provide sufficient stimulation for all motor skills. Physical activity not only makes our body more functional but causes a modification in relation to shape and volume which also become significant from an aesthetic perspective. The absence of movement, or reduced physical activity, leads to deficiencies that can degenerate into pathological forms that cause functional deficits or disabilities that have a negative impact on social life, and therefore on health and the quality of life. Movement encourages detoxification of the organism, helps to dispose of excess calories, keeps the musculoskeletal system in good shape, maintains the equilibrium of density of bone mass, preventing the risk of osteoporosis, helps the cardiorespiratory system, and keeps the nervous system sufficiently well-trained. A healthier body means feeling good about oneself. For experts, the improvement of self-esteem, the control of emotions, and increased tolerance of frustrations are some of the components of the personality that benefit most from movement.

Material and Method

The course of the research was conducted by six members of the university teaching staff, coordinated by the author, and was divided into two periods, October - November 2020 and May - June 2021, with an observational method and manual collection and recording of the initial and final results of the anthropometric measurements and the percentages of passes and shots for a field goal.

The study included initial and final tests. In the light of the result of the initial test a subdivision of the athletes in two groups was made: the control group, consisting of athletes having the higher percentage of shoots and passings (group A) and the experimental group, consisting of athletes having the lower percentage (group B).

During the four months performances, the two groups followed an ordinary training planned, consisting of one weekly training sessions, characterized by athletic activities, technique and tactics, proposed to the players at alternating times and requiring a prevailing neuromuscular effort. Group B was asked to do supplementary shooting and passing training sessions for an amount of two for month.

Were used an analytical method, great attention was put on the development of each singular passing and shooting fundamentals in each training session alternating the use of official balls and medicine balls.

Strengthening through fit band elastics was implemented, during gym training session, twice a month, on different days from the team training ones.

During training sessions, in order to improve the passing, athletes used medicine balls from 1 to 3 kilos while, to improve the shooting technique, they used only a medicine ball of 1 kilo.

Participants and Objectives. The specific objective of the research was to examine the possible increase in body weight and to assess average percentage the skills used in passing and shooting of basketball. The analysed sample consisted of 20 individuals, 12 males and 8 females, aged between 15 and 17 years old with a body weight between 55 kilos and 70 kilos.

Research phases: First phase – October 2020: initial survey of anthropometric measurements and motor test. Second phase - November 2020: weekly workouts and, for group B, two additional monthly workouts. Third phase – May 2021: weekly workouts and, for group B, two additional monthly workouts. Fourth phase - June 2021: final survey of the results.

Training tests

1. Exercises with the records of percentages of passing with one hand in five stations (Number of passes required =20).

From station n. 1 the athletes, in turn:

- n. 5 passes towards station n. 2;
- n. 5 passes towards station n. 3;
- n 5 passes towards station n. 4;
- n. 5 passes towards station n. 5.
- Station n. 5 was located under the basket.
- Station n 1 was 8-9 m from stations n .2,3,4 while station n 5 was located at 15 m

This test/exercise was given during the initial and final tests.

2. Exercises recording the percentage of shots (Total amount of shots N =20).

- N. 2 shots towards the basket from each station (1-10), for an amount of 20 shots.
- Progressive execution from station n 1 to n 10 using shots in movement without going beyond the demarcation line below the basket and the free-throw lane.
- Stations n. 1,2,3,8,9,10 were located opposite the side lines.
- Stations n 4,5,6,7 were located 1m from the half court line.

This test/exercise was given during the initial and final tests.

Extra training sessions

Strengthening isotonic and isometric exercises using medicine balls of different weight ranging, from 1kilo to 3 kilos, as well as elastics fit band used during indoor training.

Used Materials: indoor stadium, ball normally used in the game, medicine ball (1, 2, 3Kg), elastic fitband, reporting grids, PC.

Results

The results showed an average increase in body weight and improved shot and passage percentages. The average weight increase was about 5%. At the motor level there was on average a slight percentage improvement of about 2%. Some athletes in group B showed the greatest percentage increases. At the end of the study, the participants stated that the experience had had positive effects both in terms of inclusion and of the awareness that movement helps to protect good health.

The inclusive purpose of the study enabled adolescents to strengthen relationships in class groups and make new friends.

Table I. Initial detection Groups A/B average percentage between passes and shots

Group A		Group B	
Athlete	% average	Athlete	% average
1 m	90	2 m	67.5
3 f	100	5 f	80
4 m	85	8 f	75
6 f	87.5	9 m	75
7 m	100	10 f	77.5
11 m	87.5	12 m	62.5
13 f	95	14 m	77.5
16 m	95	15 m	72.5
18 m	90	17 f	77.5
19 f	82.5	20 m	75

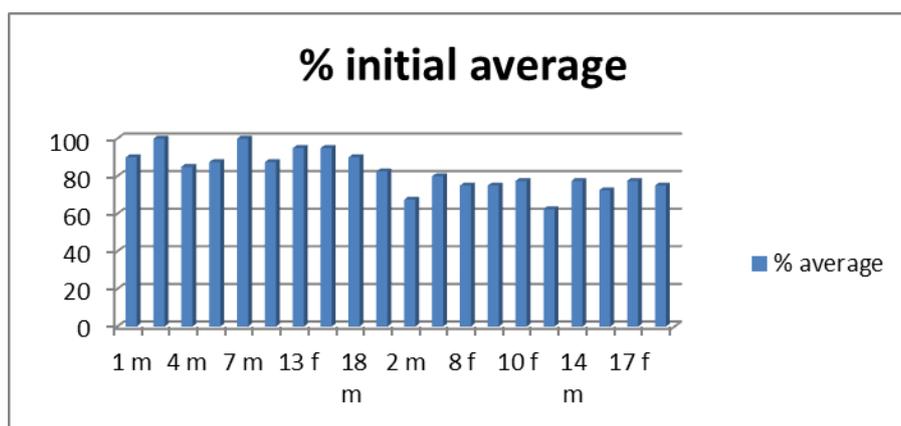


Figure 1. Initial detection Groups A/B average percentage between passes and shots

Table II. Final detection Groups A/B and average percentage between passes and shots

Group A		Group B	
Athlete	% average	Athlete	% average
1 m	92,5	2 m	80
3 f	100	5 f	82.5
4 m	85	8 f	80
6 f	90	9 m	85
7 m	100	10 f	82.5
11 m	87,5	12 m	72.5
13 f	85	14 m	82.5
16 m	90	15 m	82.5
18 m	95	17 f	80
19 f	95	20 m	80

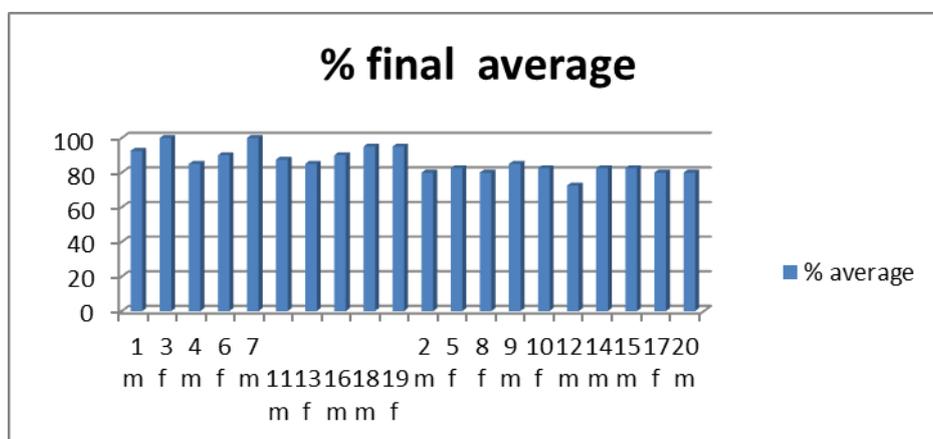


Figure 2. Final detection Groups A/B and average percentage between passes and shots

Table III. Initial and final percentage weight increase

Weight range	Initial Number subject	Initial percentage	Final Number subject	Final percentage
55-60	4(f)	20	3(f)	15
60-65	10(3f – 7m)	50	9(3f-5m)	45
65-70	6(1f – 5m)	30	8(1f – 7m)	40

Discussion and Conclusion

The fear of the future, the lack of knowledge of the developments of the pandemic, the lack of relationships between peers have led to distress and unease among adolescents. The significant difference between face-to-face relationships and distance relationships has led adolescents to display slow reactivity to the stimuli presented online by the teachers.

The impossibility of going out with peers, spending free time outdoors and engaging in adequate physical activity (19) has highlighted an increase in anxiety disorders and a fluctuating decline in self-esteem.

Enforced inactivity led to an imbalance in anthropometric parameters with a consequent weight gain (16) and excessive calorie intake. In order to return to a healthy lifestyle, a gradual reduction in calorie intake is necessary, backed up by healthy physical activity. The beneficial effects (20) of doing sport are widely acknowledged and encourage an improvement in physical conditions (cardiovascular and respiratory systems, muscle tone, neuronal connections, neuro-vegetative functions, etc.) with considerable benefits for those individuals who tend to have a sedentary lifestyle (21) and are not very responsive to the dynamic stimuli that should usually characterise people's daily lives (walking, running, jumping, cycling, going up and down stairs, travelling by bus, etc.).

Physical activity, whether recreational or involving sport, also has a high educational value especially if done within a group, in relation to team-bonding, based on interpersonal relationships, interaction, cooperation and the sharing of tasks between group/team members, since they are all involved in the success of an activity, and in achieving a common goal. These conditions have ceased to exist due to the spread of the SARS-Cov2 pandemic. Enforced social distancing has had a negative impact on relationships, on levels of self-esteem, highlighting a regression in postures focused entirely on implosive attitudes and on the increase in body weight.

The lockdown has led to a complete or partial absence of movement and difficulty in organising movement activities and games. The lengthy periods spent in front of the television and/or video games have encouraged poor posture (22).

The interruptions in teaching caused by the pandemic, with alternating face-to-face and distance learning, have caused a persistent state of unease and distress among adolescents, the effects of which cannot be assessed in the short term.

Teenagers have lost important social points of reference, such as school, friends, grandparents and trainers and educators. Proceeding cautiously, and under the guidance of adults, it is important to return to the 'normality' by resuming the daily rhythms of the pre-lockdown periods as closely as possible. The reorganisation of daily life requires a new approach by providing clear information that is appropriate to the age and level of development of each adolescent, restoring healthy lifestyles, especially engines. The initial festive atmosphere has gradually been replaced by concern, and in some cases anxiety, of not being able to go back to school, of not being able to see schoolmates and teammates again, of not being able to see relatives, and in particular grandparents, and being confined very frequently to a single domestic environment. The activation of distance learning (DAD) and the spread of video calls and other IT / computer tools has only partly managed to compensate for the radical change in habits which cannot ignore the learning processes developed through face-to-face contact and based on interaction, sharing experiences and emotions. The behaviour of adolescents has led to a regression in levels of autonomy that had already been achieved, the emergence of fears, sadness and crying, behavioural outbursts of anger and aggression. The increase in the demand for food and the adoption of poor, implosive postures are clear indicators of further distress and unease on which both family members and teachers need to focus their attention.

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