

Research Article

Improving “quality of life” through exercise and proper nutrition

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Abstract

In line with what is defined by W.H.O. (World Health Organization) the objective of the work is to observe and define the interconnection between a healthy lifestyle and the quality of life perceived by people.

For this purpose, 30 healthy subjects, who had never practiced sports at a competitive level, were recruited. All individuals were evaluated at T0 and T1 through clinical evaluation and specific functional tests to define the psycho-physical well-being of the person. For three months they were followed with a personalized diet. Subjects were divided into two randomized groups: group A called experimental that followed the protocol for the duration of the study, and group B said evaluation group that performed only evaluations at the same time as group A. both groups were evaluated twice, the first immediately after the last training session, the second evaluation was performed after 30 days from the first.

The objective of the project was to analyze, after three months, the cognitive changes in memory and concentration skills, stress experienced at work or study, and psycho-physical well-being perceived by interested parties. The data collected during the evaluations showed that the interconnection between a healthy lifestyle and the quality of life perceived by people is evident.

Introduction

W.H.O. defines health as “a state of complete physical, social and mental well-being, not just the absence of disease”, describing the quality of life as “a very broad and complex concept, which includes the state of health of each individual, level of independence, social and relational with the environment that surrounds him. “ W.H.O. has identified six main areas to identify an intercultural level the key aspects of quality of life: physical (e.g. energy, fatigue, tiredness) psychological (for example, positive feelings), independence, social relationships, and personal/spiritual beliefs” [1]. It has been shown that there is a strong association between the pursuit of a healthy lifestyle and the perceived quality of life [2,3]. W.H.O. identifies physical inactivity possible cause of pathologies that cause about 2 million deaths each year in the world; on the contrary, any increase in physical activity results in a health benefit [4]. For this reason, physical activity can be an ideal tool to promote the quality of life, increase the therapeutic pathways for health, prevent pathologies, ensuring psycho-physical well-being. Regular physical activity is known to be a key prevention strategy for cardiovascular diseases, obesity, diabetes mellitus, depression, and cancer,

also in association with interventions that reduce other risk factors, such as smoking, stress, and overweight [2,5-7]. Scientific literature shows how exercise can be a real therapeutic method [8,9], demonstrating its effectiveness in combination with conventional drug treatment [10,11]. This is more evident for pathological conditions such as metabolic syndrome [12], diabetes mellitus [13-15], arterial hypertension [16,17], obesity [18,19], COPD [20,21], cardiovascular disease [22,23] and heart failure [24-27]. Exercise, strengthening, and increasing muscle resilience, it is also the main method to restore proper body alignment [28-35]. Several studies have shown the positive effects of regular physical and/or sports activity on mood [36-38], concentration, and cognitive processes [39,40]. Young athletes have higher-than-average grades compared to their non-sports peers, graduate on time, and have lower dropout rates. In addition, it has been shown that the sense of self-discipline acquired in sports it is also reflected in the frequency in the classroom, in the concentration, and in the performance of homework [41]. For this reason, O’Donnell, et al. stress the need to promote health and psycho-physical well-being, within Universities and schools, in order to more efficiently promote more effective learning [42]. Mechanisms have been hypothesized, through

More Information

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which the exercise exerts an influence on the cognitive process: an increase in the flow of oxygen in the blood and brain [43]; increased levels of norepinephrine and endorphins [44], resulting in stress reduction and mood improvement [45,46]; increased synaptic plasticity [47,48]. Together with sport, to maintain a state of psycho-physical health and optimal quality of life, it is necessary to eat correctly, avoiding malnutrition both by excess and by default. The World Health Organization (WHO) considers malnutrition the greatest threat to public health in the world [49]. A suitable nutritional status depends on the food that is ingested and the body's ability to digest, absorb and use the molecules deriving from the foods ingested. Obviously, food choices are essential to guarantee the body's necessary nutrients. If these choices are not correct, conditions of deficiency of one or more nutrients could occur with a negative effect on cells, organs, and tissues, consequent malfunction of the organism, and alteration of the clinical picture both from a physical and psychic point of view [50,51].

There are 3 main groups in malnutrition:

1. Malnutrition, i.e. wasting, stunting, and underweight, due to insufficient nutrition intake;
2. Malnutrition related to micronutrients (deficiency or excess of vitamins and mineral salts);
3. Overweight, obesity, and non-communicable diseases related to diet (cardiovascular diseases, diabetes, and some types of cancer); [52].

The diet, which by its etymology means “way of life”, declined in the food sector to ensure a suitable state of health should be as varied as possible, as no food contains all the necessary nutrients. In addition to varying, the food diet should be balanced and respect the amounts of macro and micronutrients necessary for everyone according to sex, age, type of work activity, type of sports activity, and, when present, type of pathology [53-55]. If the diet is not correct, it would not only affect the psycho-physical well-being, but it would also be one of the main risk factors, together with a sedentary lifestyle, for chronic non-communicable diseases [56-59]. One of the main prevention tools is education on proper nutrition, which should be taught already in first-grade schools [60].

The goal of the work is to verify and quantify how a healthy lifestyle (physical activity and proper nutrition) is perceived as a better quality of life.

Materials and methods

The sample was randomized into two groups each consisting of 50.

Subjects: Experimental group (A) and control group (B).

All participants were given instructions on how to feed.

The rules to be respected consist of avoiding foods produced with refined flours, sweets in general (both homemade and industrial, including biscuits, croissants, candies, and ice creams), sausages, fatty meats and poultry skin, alcohol, carbonated and sugary drinks, butter and fatty cheeses [61-63].

Indications have been given on the foods to be preferred, namely vegetables, fresh fruit, oily nuts, whole grains and their unsweetened derivatives, legumes, lean meats (especially white meats) and barbed fish, spices, and extra virgin olive oil [64-66].

In addition, suggestions were made on the combinations between the various foods and on the quantities not to be exceeded [67,68].

Finally, it is also recommended to drink enough water [69,70].

Group A

Individuals in this group were subject to

- Training, 3 times a week for 12 weeks
- Correction of eating habits through nutritional advice and the compilation of a 3-day dietary diary, consisting of 2 weekdays and one day on weekends;

Group B

Subjects in this group received instructions on how to correct eating habits.

Inclusion criteria for both groups

- Healthy subjects aged between 19 and 21 years;
- Subjects who have never practiced sports at a competitive level.
- No osteoarticular trauma in the previous 12 months
- Subjects deemed suitable for physical activity.

Exclusion criteria for both groups

- Drug therapy in place;
- Chronic or acute pathologies;
- Subjects undergoing surgery (at least 12 months).

Patient evaluation

Both groups were evaluated three times T0 T1 and T2 in relation to T0 before T1 treatment at the end of the quarterly training carried out by group A T2 30 days after the last follow-up training session

Both groups were evaluated with:



1. Bioelectrical impedance analysis (BIA);
2. Anthropometric parameters;
3. 5 - Digit Span Test;
4. Questionnaire on quality of life and satisfaction- short form.

Bioimpedance

Performed with "AKERN BIA 101 ANNIVERSARY", a non-invasive, fast, painless, reliable, and repeatable measuring instrument that offers quantitative and qualitative data on body composition, hydration and nutritional status. The parameters analyzed are T.B.W. (Total Body Water), B.C.M. (Cell Mass or Cell Mass), B.C.M.I. (Body Cell Mass Index), Phase angle (ratio of resistance to reactance) [71,72].

Anthropometric parameters

The parameters analyzed for the anthropometric study are weight, BMI, life circumference and hips, lower limb circumference, 4-point grip, both right and left, with point 0 on the crown, +10 and +15 cm proximal on the thigh, and -10 cm distally on the leg [73,74].

Digit Span Test

The Digit Span Test is a subtest of Wechsler's Adult Intelligence Scale and Wechsler memory scale. With the help of the software "Attention and MemoryErikson", this evaluates the ability of the subject to memorize the sequence numbers ranging from 0 to 9 with two different modes: in forward digits (A), The sequence must be repeated in chronological order when the appearance of figures; in the backward digits (B), the sequence must be repeated from the menu the last digit on the screen. The score given comes from the sum of the modes (A) and mode (B), the highest scores are the positivity index. 89% of normal subjects have a Forward Span between 5 and 8 (Kaplan Fein, et al. 1991) [75].

Quality of life pleasure and satisfaction questionnaire-short form

This questionnaire aims to assess the degree of pleasure and satisfaction experienced during the previous week, through 16 articles.

Processing methods

As for nutrition, the subjects of the experimental group were undergoing nutritional advice in which they were informed about the benefits of proper nutrition and pathologies deriving from wrong foods education. Next, they compiled a 3 - day diary, consisting of 2 on weekdays and one day on weekends. Regarding physical activity, Group A has undergone functional training to develop the main motor skills, such as the conditional ability. (strength, endurance, power); Coordination skills (balance, motor, and postural

control, agility, motor adaptation); joint mobility muscle, holding the position for a period of time ranging from 15 to 30 seconds and repeating the exercise 3 - 4 times. In the Coach Phase, the subject must play 4 circuits, each consisting of bodyweight exercises, with contains a variable number depending on the work required for the subject. The quarterly exercise activity in the gym was divided into four circuit phases with a production activity of increase. In the first phase, each exercise takes place for 20 seconds, the subject stops for 10 seconds before starting the next exercise. As for the circuits, the subject has a 1 - minute break after performing the second circuit or half of the functional activity. In the second, each exercise takes place for 30 seconds, the subject stops for 10 seconds before starting the next exercise. As for the circuits, the subject has 1 minute of pause after running the second circuit or half of the functional activity. In the third stage, each exercise takes place for 30 seconds without interruption between exercises. As for the circuits, the subject has 1 minute of pause after performing the second circuit or half of the functional activity. In the cool-down phase, the subject performs a low-intensity muscle activity of 10 minutes with the help of cycling, treadmill, or elliptical exercises, adding a static stretching that provides a slow and complete stretching of the muscle, maintaining the position for a period ranging from 15 to 30 seconds and repetition of the exercise for 3 - 4 times.

Anthropometric parameters

In Group A, with regard to weight and B.M.I. data, it was observed an improvement of these two values at T1 compared to T0. The average weight value varies from 63.3 kg to 61.8 kg. The average BMI value between T0 and T1 decreased, from 21.61 to 21.27. At T2 the average value remains Constant in all subjects examined. With regard to the measurement of waist circumference, an average decrease in cm was highlighted as Equal to 3 going from an average value of 99.2 to 95.8. At T2, this value has an increase, of 1 cm in 30% of the subjects evaluated. . With regard to the measurement of the circumference of the lower limbs, there was a slight increase in circumference at T1 compared to T0. However, this change is temporary, in reality, at T2 the values tend to return to the situation found in the initial assessment (T0). The weight of patients, between T1 and T2, increases from 68.68 kg to 68.17 kg on average. For B.M.I. we have minimal changes, not statistically relevant.

Digit span test

To assess the effects of exercise on cognitive function, the Digit Span Test in the Forward and Backward versions was sent to both groups. At T0 all subjects examined fell within the normal ranges between 5 and 8 with an average of 7.40. In group A, we note at T1 an average increase in the average score in the 50 subjects examined equally to 7.80 value that undergoes constancy of T2 follow-up. This value showed an increase in the valuation in Q2. In group B, there is substantial



stability of the average values at the time of the 3 evaluations, maintaining T0, T1 and T2 with an average score of for the 50 subjects examined 7.

Q-LES-Q-SF - Questionnaire on quality of life and satisfaction mulo module

All subjects examined at T0 fell within the parameters of normal 76.4 plus or minus 10. Group A shows an increase to Q1 76.1 Plus or minus 12 and constant to T2, the group. Group B, does not achieve a deviation between T0, T1 and T2 while remaining in the normal range of 76.2.

Discussion

Bioimpedance data

Group A shows how a correct lifestyle (personalized diet and physical activity protocol) can influence or positively change body composition. Group B results show that a sedentary lifestyle does not allow the body to improve its general condition.

Anthropometric parameters

In group A, with regard to weight, B.M.I., and anthropometric data, it is highlighted that the correct lifestyle modifies these parameters to T1 and T2.

Evaluation with Digit Span Test and Q-LES-Q-SF

The results of the Digit Span Test show how physical activity positively affects short-term memory and therefore concentration, this influence does not cease at the end of the activity carried out but is perceived at the Follow up in 70% of the subjects examined in group A. The evaluations carried out through the Q-LES-Q-SF show us how there is a positive influence on the cognitive sphere and on the perception of quality of life after only 3 months in 80% of the people examined in group A.

Conclusion

Well-being is a general term that encompasses the entire bio-psycho-social human system.

The precise and real definition of a “good quality of life” refers to the perception of self that everyone possesses. Several factors can positively or negatively change the health of a population. Health, in fact, is the result of a series of social activities, environmental, economic, and genetic determinants and not just the product of a health organization. In this context, the role played by healthcare must deal with health also in terms of lifestyle (physical activity as primary, secondary, and tertiary prevention) and then to consider the person in his broad context, is therefore to consider the individual perception of his own state of health and individual quality of life. Therefore, a healthy lifestyle, proper nutrition, and physical activity are able to highlight the quality of life perceived by people.

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