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CORRELATION BETWEEN PHYSICAL ACTIVITY AND BODY COMPOSITION CHANGES IN ADULT WOMEN

Overweight and obesity are a major public health problem and their management is a key objective of health and fitness programs. Physical activity is considered a key component in combating obesity, overweight and improving body composition. This paper investigates the correlation between exercise and changes in body composition in overweight and obese adults, focusing on the impact of exercise on fat mass reduction and muscle mass gain. Objectives: to study the relationship between physical activity and changes in body composition; to evaluate the effects of different types of exercise on adults with obesity: to measure physical and body composition progress in a training program. The hypothesis of this paper hypothesizes that regular physical activity exerts a significant impact on changes in body composition in adults with obesity, facilitating a reduction in body fat percentage and promoting an increase in muscle mass. These changes would contribute to an overall improvement in physical fitness and metabolic parameters, supporting the effectiveness of therapeutic interventions in treating obesity. The aim of this study is to analyze the relationship between physical activity and changes in body composition in overweight and obese adults in order to identify the most effective physical exercises for reducing body weight. The study involved women aged 30 to 39 years, with a general health condition without serious illnesses, an average level of physical fitness, swimming skills, a desire to attend 2 classes per week, signing an informed consent, and consent to be evaluated before and after the program. The results of the study were analyzed and the most effective physical exercises for weight loss were determined.

Keywords: correlation, physical activity, body composition, women, overweight, obesity

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1. INTRODUCTION

In the context of recent research on obesity and weight loss programs, various studies have emphasized the importance of physical activity and lifestyle changes to combat it. The World Health Organization (WHO) defines obesity as a condition related to the abnormal accumulation of body fat, which can seriously affect health. Urban women, in particular, are at increased risk of obesity and aerobic exercise has been recognized for its significant benefits in improving health. The study [6] demonstrated that moderate aerobic activity can help improve the body composition and lipid profile of obese women. Despite the overall benefits of exercise, the authors of the study [13] emphasized that women tend to compensate increased energy expenditure (EE) with increased energy intake (EI), which may reduce the effect on body mass and fat mass compared to men. This highlights the complexity of the relationship between physical activity and weight management, particularly among women. Another important study [1] investigated the long-term effects of physical activity and weight loss on body composition in overweight or obese older adults. Their results showed that physical programs can contribute significantly to improving health and reducing cardiometabolic risks associated with obesity. In support of these programs, another significant study [8] demonstrated that weight loss caused by lifestyle changes can lead to selective changes in body composition parameters. These changes are related to prevention of sarcopenic obesity and healthier redistribution of total and regional fat mass and visceral adipose tissue. These findings emphasize the importance of accurate measurements, such as DXA, for assessing the efficacy of anti-obesity treatments. In another study, the authors [5] implemented a 17-week weight loss program for obese women that included walking and calisthenics. This was a structured program that demonstrated the effectiveness of exercise combined with diet compared to diet therapy alone. Participants, who had previously failed to lose weight through dieting alone, experienced significant improvements in fitness and body

composition. Another study [9] emphasizes that obesity is on the rise and negatively affects the economic and psychological health of the population. The authors of the study [10] observed that average weight increases with age and that BMI values are quite high in all age groups. These findings emphasize the need to monitor and manage body weight to prevent complications associated with obesity such as osteoporosis and other metabolic disorders.

2. METHODOLOGY AND ORGANIZATION OF RESEARCH

The objectives of the work: to study the relationship between physical activity and changes in body composition; to evaluate the effects of different types of exercise on adults with obesity: to measure the physical and body composition progress in a physical activity program. Hypothesis: it is hypothesized that regular physical activity has a significant impact on changes in body composition in overweight and obese women, facilitating a reduction in body fat percentage and promoting an increase in muscle mass, also improving their physical fitness. The aim of this study is to analyze the correlation between the proposed physical activity and changes in body composition in overweight and obese adults in order to identify the most effective physical exercises for reducing body weight. Research methods: literature review method; observation method; pedagogical experiment method; test method; mathematical-statistical and graphical method. Inclusion criteria: women between 30 and 39 years of age, body mass index (BMI), general health with no major medical conditions, average level of physical fitness, swimming skills, willingness to attend 2 sessions per week, signing informed consent, acceptance of pre and post program evaluation.

3. ORGANIZATION AND CONDUCT OF THE EXPERIMENT

The experiment was carried out between February and July 2024, in two locations: the swimming pool, where the therapeutic swimming program was carried out, and the Reflexo Tox SRL center, which was the location for the therapeutic jogging program. Both locations are specifically designed for therapeutic physical activities with appropriate equipment to ensure a safe and effective environment. Measurement of body composition parameters was performed with the Tanita BC-730, an advanced body composition analysis device using Bioelectrical Impedance Analysis (BIA) technology, which allows accurate assessment of various body components such as fat mass, muscle mass, body water percentage and body mass index (BMI). The device provides a fast and non-invasive method of monitoring changes in body composition, essential in assessing progress in weight loss programs and improving fitness. Twenty-five women were selected to participate in the experiment. Of these, 15 overweight women were included in the therapeutic jogging program and 10 obese women participated in the therapeutic swimming program. Participants were chosen based on strict criteria, including age between 30 and 39 years, absence of other medical conditions and an average level of physical fitness. Therapeutic jogging-training program - for overweight women: Training days: Tuesdays and Thursdays, session duration between 30 and 55 minutes, Location: Str: Cabinet Reflexo Tox SRL, Objective: to reduce body fat percentage and increase muscle mass through lightly adapted workouts, with an emphasis on moderate intensity jogging. Therapeutic swimming - for women with obesity: Training days: Wednesdays and Fridays, Duration of session between 30 and 55 minutes, Location: swimming pool, the water temperature is between 28.5^0 and 29^0 degrees Celsius to ensure adequate thermal comfort and to stimulate performance during training. Objective: to reduce body weight and improve general fitness by swimming with minimal impact on the joints, favoring moderate intensity. Each woman attended two sessions per week, lasting 30 to 55 minutes/session, during the 6-month program. In the first month, the program was structured around an adaptation phase, where the women learned the correct execution techniques and began to improve their physical condition. After this acclimatization period, the training intensity was gradually increased to maximize results. Model training program for the two physical activities. Program objectives: Stabilization of body weight by improving metabolism and increasing physical activity. Improving overall fitness by increasing aerobic capacity, increasing muscle mass and decreasing body fat percentage. Developing an active lifestyle through sustained and progressive workouts that can be maintained over the long term. Improving joint mobility and

flexibility to prevent accidents and promote quick recovery after workouts.

Table 1

Increasing the degree of adaptation to physical effort, improving mobility and breathing technique

Week	Therapeutic jogging (overweight women)	Jogging exercises	Therapeutic swimming (obese women)	Swimming exercises	Objective
1-4	30 min (fast walking + easy running)	Sports walking + easy running (alternating 1 min of brisk walking with 1 min of easy running)	30 minutes (floating + light breaststroke procedure)	Buoyancy exercises, active floating, breaststroke	Adaptation to easy effort, starting from the correct technique
5-8	35 min (moderate jogging)	Continuous running at a moderate pace, low intensity. Alternating big steps with small steps for relaxation	35 min (easy back procedure + floating)	Backstroke, buoyancy, controlled breathing	Increasing general physical endurance
Consolidation of running and swimming technique, improvement of breathing and physical endurance					
Week	Therapeutic jogging (overweight women)	Jogging exercises	Therapeutic swimming (obese women)	Swimming exercises	Objective
9-12	40 min (continuous running with varied pace)	Fartlek (alternation of intense rhythm), relaxation techniques every 5 min	40 min (freestyle + backstroke)	Backstroke+ breaststroke, alternate swimming rhythms (slow and moderate)	Increases aerobic capacity and endurance
13-16	45 min (continuous running at medium intensity)	Running on varied terrain (flat terrain + easy slopes)	45 min (combination of freestyle + backstroke+ breaststroke)	Freestyle + backstroke+ breaststroke, breathing techniques, buoyancy	Improving endurance and technique
Progressively increasing intensity to improve fitness and performance					
Week	Therapeutic jogging (overweight women)	Jogging exercises	Therapeutic swimming (obese women)	Swimming exercises	Objective
17-20	50 min (moderate running + intervals)	Interval running (fast pace for 2 minutes, followed by 3 minutes of brisk walking)	50 min (50 min (swim at different distances)	Long distance swimming, alternation of procedures, breathing techniques	Improving overall performance and endurance
21-24	55 min (sustained running)	Sustained running on flat ground + easy climbs	55 min (series with combined procedures)	Freestyle + backstroke+ breaststroke	Maintaining physical shape, stabilizing weight

Means used for therapeutic jogging (overweight women): fast walking: prevents overstrain on the joints, contributing to warm-up and an easy transition to running. Easy running: It is done at short intervals to allow the body to adapt to the accelerated pace without overtaxing it. Fartlek: Alternate intervals of fast running with periods of jogging or easy walking, which helps increase aerobic capacity and endurance. Correct Posture: Maintaining correct posture throughout the workout to reduce the risk of injury and increase the efficiency of movements.

Means used for therapeutic swimming (obese women): Poolside Support Exercises: Performing slow swimming strokes to improve joint mobility. Cork on the chest, float on the back and vertical floating. Using the buoyancy of water to reduce impact on joints, starting with floating exercises. Swimming exercises in freestyle, backstroke and breaststroke to improve muscle tone and cardiovascular endurance. Underwater breathing: learning how to breathe correctly underwater while swimming to increase effort efficiency and prevent premature fatigue.

Results and Discussion: The results are presented in the form of graphs that highlight the main trends and observations. These data are correlated with the study objectives, facilitating a detailed understanding of the investigated phenomena**.**

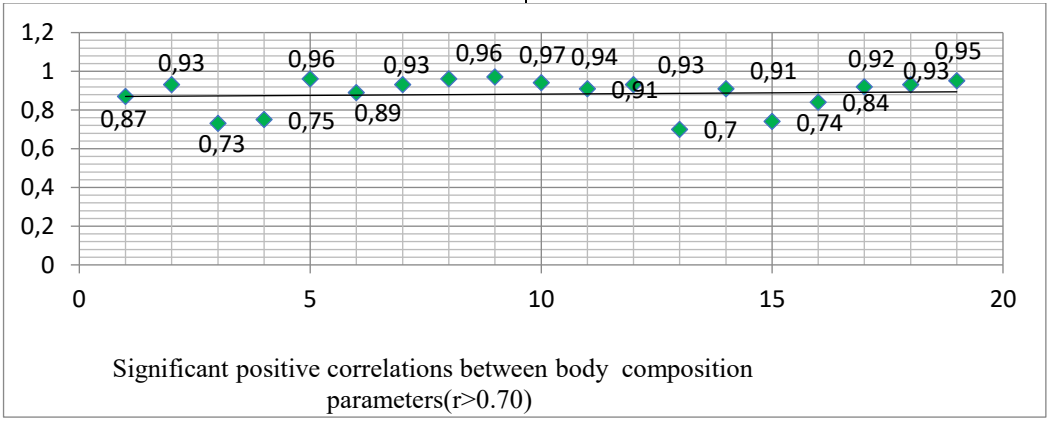

Fig. 1 Analysis of strong positive correlations: jogging and health parameters for women

Correlation analysis highlights strong and significant associations between body composition parameters. The coefficient of 0.87 indicates a strong positive correlation between initial and final weight, suggesting weight stability during monitoring. The relationship between initial weight and initial BMI (r=0.93) underlines the close link between weight and this body composition indicator. The moderate positive correlation between initial weight and initial muscle mass (r=0.73) suggests an association between higher weight and increased muscle mass. The correlations between initial weight and total body water (r=0.75) and between initial weight and visceral fat (r=0.96) indicate that higher weight is associated with increased water and visceral fat content. Initial BMI showed a very strong correlation with initial body fat (r=0.96) and final BMI (r=0.89), confirming that a high BMI is linked to an increased percentage of fat. Initial muscle mass was strongly correlated with final muscle mass (r=0.91), highlighting a maintenance of muscle mass over the study period. The correlations between muscle mass and body water (r=0.84) and between final muscle mass and total water (r=0.92) underline the direct association between these variables. The strong correlation between initial and final visceral fat levels (r=0.93) and metabolic age (r=0.95) suggests a stability of these parameters throughout the study. The results indicate close relationships between body composition parameters, highlighting the coherence of the data and the persistence of initial trends throughout the analyzed period.

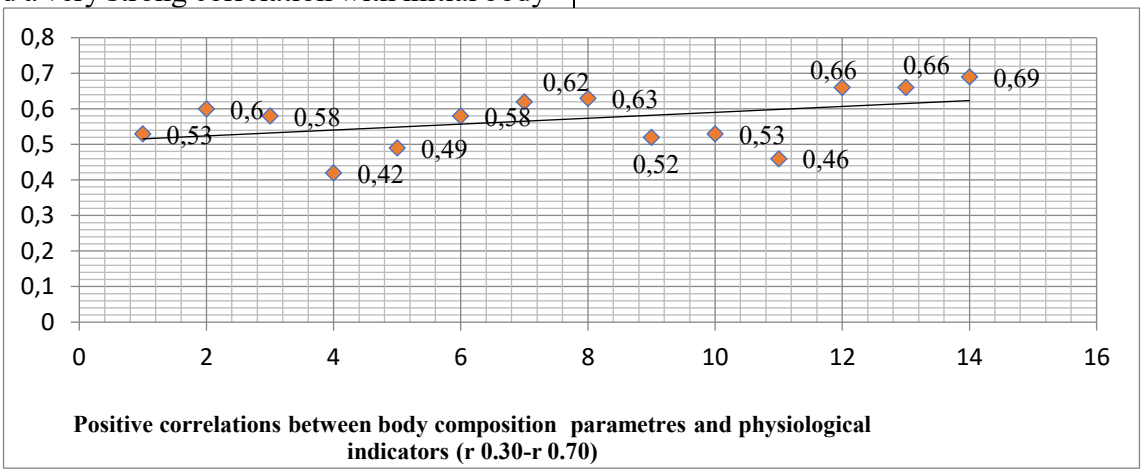

Fig. 2 Analysis of moderate positive correlations: jogging and health parameters for women

The moderate positive correlations identified indicate relevant associations between body composition parameters in obese adults. Baseline weight was positively correlated with bone mineral mass (r=0.53), muscle mass (r=0.60), and metabolic age (r=0.58), suggesting that higher weight may be associated with both greater muscle and bone mass and potentially slower metabolism. . Body mass index (BMI) showed moderate correlations with baseline (r=0.49) and

final body fat (r=0.58), indicating that a high BMI may reflect an increased percentage of adipose tissue. Also, the correlations between BMI and bone mineral mass (r=0.62) or initial muscle mass (r=0.63) suggest an association between increased body mass index and tissue masses. The relationships between body fat and muscle mass revealed moderate positive correlations (r=0.53 and r=0.46), indicating a possible coexistence of increased muscle mass in the presence of initially high body fat. At the same time, initial muscle mass was positively correlated with bone mineral mass (r=0.66) and inversely with metabolic age (r=0.66), suggesting a more efficient metabolism in individuals with increased muscle mass. The results highlight significant relationships between body composition parameters, highlighting the complexity of interactions between weight, adipose tissue, muscle mass, and metabolism.

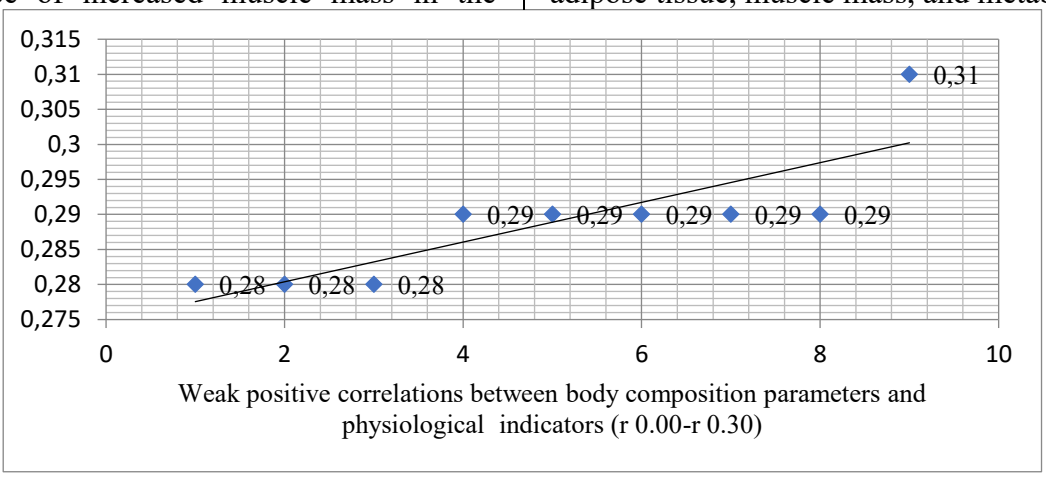

Fig. 3 Weak correlation analysis: jogging and health parameters for women

Correlation analysis indicates weak to moderate relationships between body composition parameters and physical performance indicators. The weak correlations between initial weight and initial visceral fat (r=0.28) and between initial body fat and initial visceral fat (r=0.28) suggest a modest association between these variables, indicating that an increased level of weight or body fat may slightly influence visceral fat accumulation. Also, the correlations between baseline visceral fat and baseline metabolic age (r=0.28) and between baseline visceral fat and baseline maximum heart rate (r=0.29) indicate a weak association, suggesting an insignificant link between visceral fat and these physiological parameters. The relationships between baseline body fat and Cooper test performance (r=0.29), as well as between baseline visceral fat and Cooper test performance (r=0.31) indicate a slightly stronger, but still weak, correlation. This may reflect a minor impact of fat mass on cardiovascular performance. In conclusion, although there are positive correlations between body composition parameters and physical performance variables, these are generally weak, indicating that other factors may have a more significant influence on the results obtained in fitness assessments and metabolic health.

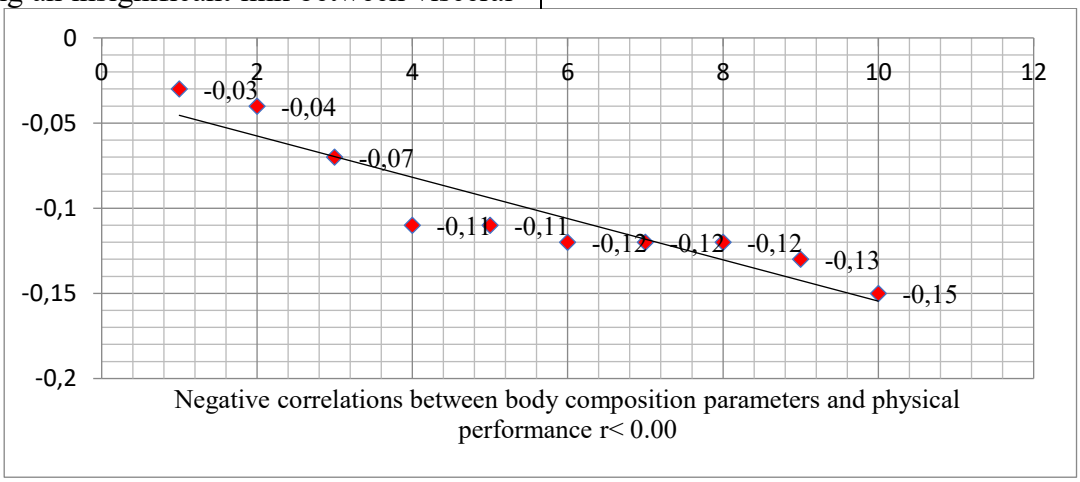

Fig. 4 Negative correlation analysis: jogging and health parameters for women

The analysis of weak negative correlations reveals a minimal association between the initial and final parameters of body composition and physical performance. The correlation between initial weight and initial Cooper test performance (r=-0.03) indicates a non-significant relationship, suggesting that body weight does not significantly influence physical performance. Similarly, the correlation between initial visceral fat and final body fat (r=-0.04) shows a very weak association, indicating the lack of a significant relationship between these two parameters. The negative correlations between baseline visceral fat and final Cooper Test performance (r=-0.07) and between baseline visceral fat and final maximum heart rate (r=-0.11) are also weak, suggesting a minimal influence of baseline visceral fat on physical performance and cardiovascular function. Similarly, the relationship between baseline body fat and final metabolic age (r=-0.11) indicates a weak correlation, suggesting that reductions in baseline body fat do not translate into notable changes in metabolic age. The correlations between baseline body fat and final Cooper Test performance (r=-0.12) and between baseline body fat and final visceral fat (r=-0.12) highlight a weak influence on physical performance and visceral fat distribution over time. The relationships between initial weight and final metabolic age (r=-0.12) or between initial metabolic age and final Cooper Test performance (r=-0.13) are also very weak, suggesting a minimal influence on metabolic parameters and physical performance.

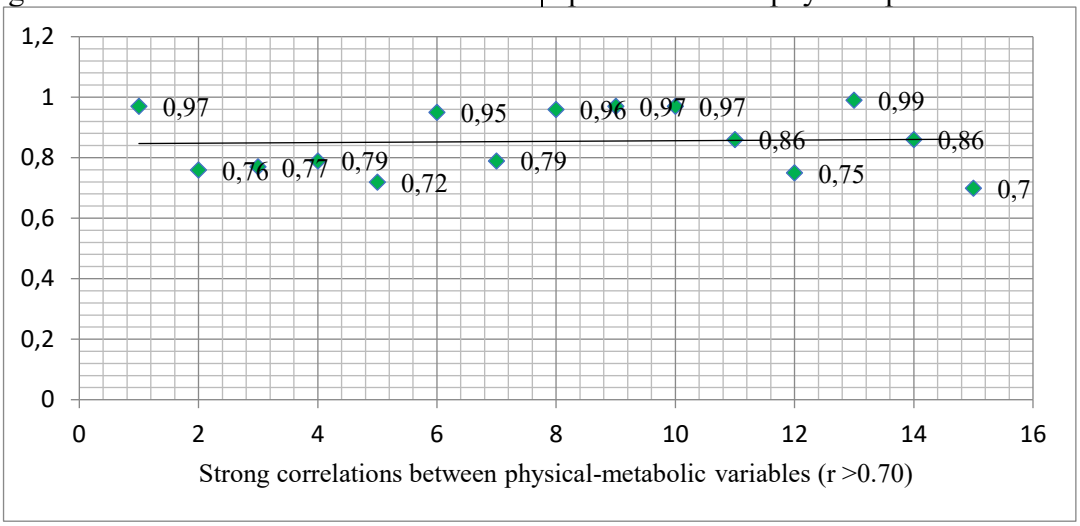

Fig. 5 Analysis of strong positive correlations: therapeutic swimming and health parameters for women

The extremely strong correlation between initial weight (Ti) and final weight (TF) (r=0.97) indicates a marked stability of body mass throughout the monitored period, suggesting minimal variations. Also, the correlation between initial weight and Ti-TF weight difference (r=0.76) and between final weight and weight difference (r=0.77) underline that weight changes are more pronounced in people with a higher initial weight. The correlation between initial weight and initial BMI (r=0.79) and between final weight and initial BMI (r=0.72) indicate a strong relationship between body mass and body mass index, a measure derived directly from weight. The relationship between initial and final BMI (r=0.95) suggests a consistency of this indicator during monitoring. The correlation between BMI changes (BMI Ti-TF) and the initial BMI value (r=0.79) indicates that changes in BMI are more pronounced in people with a higher initial BMI. Regarding body fat, the strong correlation between initial and final body fat (r=0.96) underlines a stability of this parameter. A similar relationship also appears for bone mineral mass (r=0.97) and muscle mass (r=0.97) between initial and final values, indicating the constancy of these biological parameters over time. Initial and final visceral fat show a significant correlation (r=0.86), indicating a tendency to maintain this type of fat throughout the analyzed period. The relationship between changes in visceral fat (TI-TF) and the final value of visceral fat (r=0.75) suggests an influence of the final level on variations over time. The correlation between initial and final metabolic age (r=0.99) indicates an extremely high stability of this parameter, and the link between changes in metabolic age and its initial value (r=0.86) supports the idea that variations in this metabolic indicator are influenced by the starting value.

Regarding physical performance, the correlation between the initial and final results of the Cooper test (r=0.70) suggests a significant link, indicating that the initial level of physical performance influences subsequent performances.

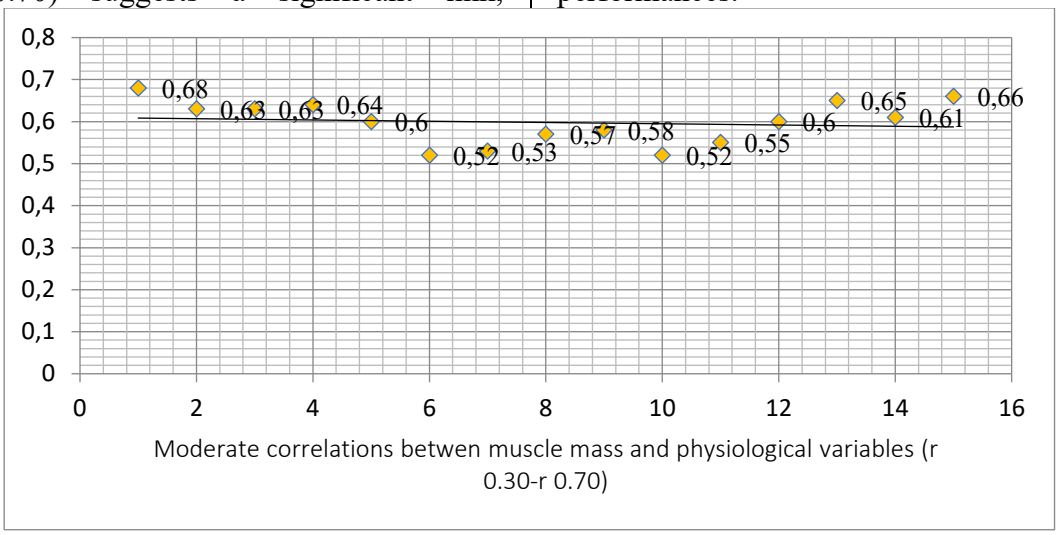

Fig. 6 Moderate positive correlation analysis: therapeutic swimming and health parameters for women

The moderate correlations highlighted in the data provided indicate significant, but not extremely strong, links between weight, body composition and physical performance. The correlations between initial weight (Ti) and initial muscle mass (r=0.68) and between final weight (TF) and final muscle mass (r=0.63) suggest a moderate association, indicating that people with higher weight tend to also have increased muscle mass, but the relationship is not directly proportional. Similar correlations occur between BMI and muscle mass both at the beginning (r=0.64) and at the end (r=0.60). The moderate relationships between body fat and muscle mass, both at baseline (r=0.52) and at the end (r=0.53), indicate a trend in which individuals with higher levels of body fat tend to also have higher muscle mass, although the relationship is not predominant. The correlations between bone mineral mass and muscle mass, at baseline (r=0.57) and at the end (r=0.58), reflect a natural biological relationship, where higher muscle mass is often associated with increased bone density. Visceral fat also shows a moderate correlation with muscle mass, both at baseline (r=0.52) and at the end (r=0.55), suggesting that individuals with higher visceral fat may have increased muscle mass, but without a clear direct relationship. Metabolic age and muscle mass have a moderate relationship (r=0.60 initially and r=0.65 finally), indicating that a higher metabolic age may be associated with increased muscle mass, but not in a determinative way. Regarding Cooper Test performance, moderate correlations with initial (r=0.61) and final (r=0.66) muscle mass suggest that people with better physical performance tend to have higher muscle mass, without this relationship being extremely strong.

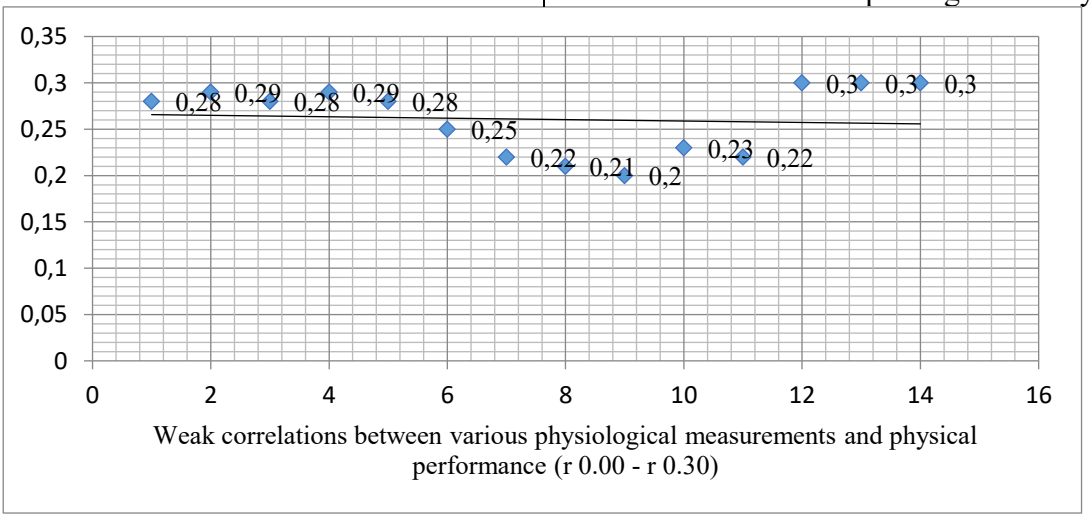

Fig. 7 Weak correlation analysis: therapeutic swimming and health parameters for women

Correlations between weight differences and bone mineral mass (r=0.28-0.29) indicate a minimal association. Weight changes do not appear to significantly influence bone mass. Weak correlations between body fat and body water at both baseline (r=0.25) and end (r=0.22) suggest that these two variables are weakly correlated, with no strong influence of fat level on water content. Correlations between muscle mass and differences in muscle mass between the two time points (r=0.20-0.21) indicate a weak association. Similarly, muscle mass is weakly correlated with body water (r=0.22-0.23). Slightly higher correlations between body water and Cooper Test performance (r=0.31) suggest a moderate but not strong association. Better hydration may have a small positive effect on physical performance.

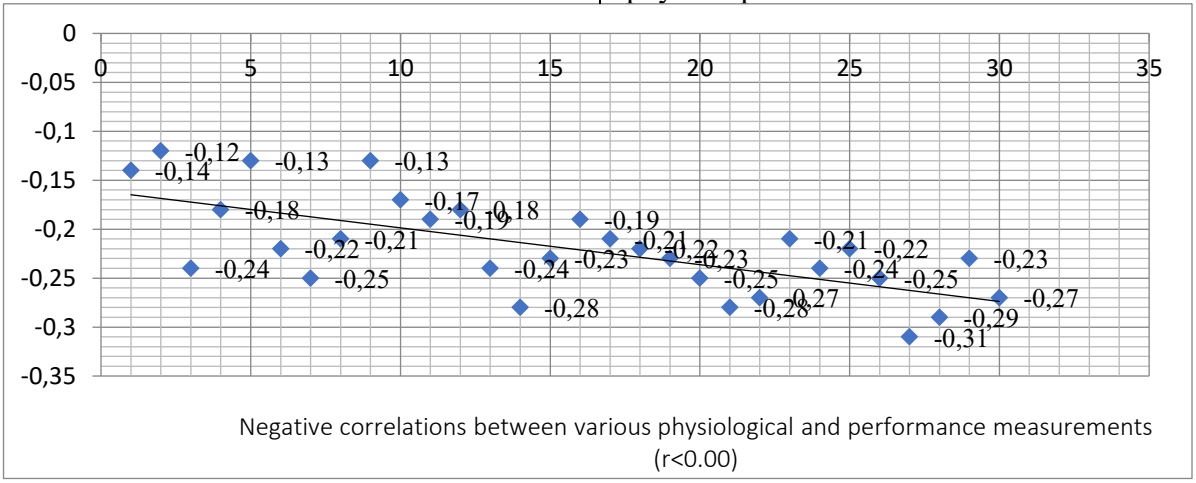

Fig. 8 Negative correlation analysis: therapeutic swimming and health parameters for women

Negative correlations, ranging from -0.13 to -0.25, suggest a weak relationship between body mass index (BMI) and various measures, such as muscle mass, fluid retention, Cooper test performance, or oxygen consumption. This indicates that women with higher BMI tend to have less muscle mass and perform worse on physical tests, although the effect is small in magnitude. The negative correlations observed between body fat and muscle mass, such as -0.19 for initial muscle mass and -0.18 for final muscle mass, suggest an inverse relationship between these two variables. This indicates that a higher proportion of body fat is associated with lower muscle mass. Similarly, the negative correlations with physical performance suggest that a higher percentage of body fat may negatively affect an individual's physical capacity. Negative correlations with values between -0.22 and -0.27 indicate that individuals with higher bone mineral mass tend to have lower muscle mass and lower physical performance. These relationships are weak but significant, and suggest a possible interdependence between these variables. The negative correlations between fluid retention and muscle mass (e.g., -0.22 with initial muscle mass and -0.25 with final muscle mass) suggest that women with greater fluid retention may have lower muscle mass. The negative correlations with physical test performance suggest that fluid retention may negatively influence their physical capacity.

Discussion: In discussions of the effects of physical interventions on body composition and fitness, several authors have highlighted the importance of structured physical activity programs in improving health, especially among overweight or obese individuals. The authors of one study [2] demonstrated that a yoga program with a fitness ball had a significant impact on flexibility, balance, strength, and muscular endurance, also recording decreases in weight, BMI, waist circumference, and percentage fat, along with increases in muscle mass. They suggest that such a program can effectively address fitness and body composition issues in overweight or obese women, thus highlighting the effectiveness of this type of training for improving overall health. In the same vein, the authors of the study [7] highlighted that an 8-week physical activity program helped maintain body composition and fitness in obese students. Their results suggest that integrating physical activity into schools, along with adequate nutritional support, is essential for preventing and combating obesity, having a significant role in supporting the health and well-being of students. The study [11] also showed the effectiveness of therapeutic swimming in increasing muscle mass and reducing body and visceral fat. They noted

significant differences between the initial and final tests, and the low variability of the collected data indicates a high validity of the tests. Their study highlights the importance of specific physical activity in optimizing health, emphasizing the effectiveness of swimming as a therapeutic method.

4. CONCLUSIONS

1. For the women who practiced therapeutic jogging, the analysis of strong positive correlations suggests several important effects. The correlation of 0.87 between initial and final weight and the correlation of 0.73 between muscle mass and weight indicate that these women were able to maintain muscle mass during training, which led to weight stabilization. This suggests that the exercises contributed to the preservation of muscle mass and prevented muscle tissue loss. Also, the correlations of 0.75 at baseline and 0.92 at the end between body water indicate that hydration was maintained constant throughout the program, which is essential for overall health and body function. The correlation of 0.96 between initial and final visceral fat suggests that the training had a positive impact on reducing or stabilizing visceral fat, an important factor for metabolic health. In addition, the correlation of 0.95 between initial and final metabolic age suggests that the therapeutic jogging training maintained the stability of this parameter, which contributes to preventing the risks associated with premature aging.

2. Based on the positive correlations observed between the different variables measured before and after the therapeutic swimming training, we can conclude the following for the women who practiced this physical activity: The strong correlations between initial and final weight (r = 0.87) suggest that the women were able to maintain their weight throughout the therapeutic swimming program. Also, the correlations between weight and muscle mass (r = 0.73) suggest that, despite the weight changes, muscle mass was maintained, which could indicate a favorable change in body composition. The significant correlations between body water, both at the beginning (r = 0.75) and at the end (r = 0.92), reflect that the therapeutic swimming training had a positive effect on maintaining a correct water balance. This is an essential condition for general health and for the optimal functioning of the body, especially during physical exertion. The very strong correlation between the initial and final visceral fat (r = 0.96) suggests that the therapeutic swimming training had a beneficial effect on stabilizing or reducing visceral fat, an important factor for metabolic health and cardiovascular risks. The correlation between initial and final metabolic age (r = 0.95) suggests that, although there were no significant changes, metabolic age was maintained constant, which is beneficial for preventing premature aging of the body.

3. The negative correlations observed in the therapeutic jogging and swimming program for women aged 30 to 39 may indicate the need for adjustments to the current parameters. The duration of only 6 months and the frequency of 2 sessions per week may be insufficient to produce significant improvements, and inadequate nutrition may negatively influence the results. Optimizing these factors, such as extending the program, increasing training frequency, and adopting a balanced diet, could contribute to achieving more consistent benefits and stronger positive correlations.

4. One study concluded that physical activity and body composition follow a typical pattern throughout life. Fat-free mass and physical performance typically peak in adolescence and early adulthood [12].

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Анотація

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КОРЕЛЯЦІЯ МІЖ ФІЗИЧНОЮ АКТИВНІСТЮ ТА ЗМІНАМИ СКЛАДУ ТІЛА У ДОРОСЛИХ ЖІНОК

Надмірна вага та ожиріння є основною проблемою громадського здоров'я, а їх подолання - ключовим завданням фізкультурно-оздоровчих програм. Фізична активність вважається ключовим компонентом у боротьбі з ожирінням, надмірною вагою та покращенні складу тіла. У цій статті досліджується взаємозв'язок між фізичними вправами і змінами складу тіла у дорослих з надмірною вагою та ожирінням, з акцентом на вплив фізичних вправ на зменшення жирової маси і збільшення м'язової маси. Завдання: вивчити взаємозв'язок між фізичною активністю та змінами складу тіла; оцінити вплив різних видів фізичних вправ на дорослих з ожирінням: виміряти прогрес у фізичному розвитку та зміні складу тіла під час тренувальної програми. Гіпотеза дослідження полягає в тому, що регулярна фізична активність має значний вплив на зміни складу тіла у дорослих з ожирінням, сприяючи зменшенню відсотка жиру в організмі та збільшенню м'язової маси. Ці зміни сприятимуть загальному покращенню фізичної форми та метаболічних параметрів, підтримуючи ефективність терапевтичних втручань у лікуванні ожиріння. Метою цього дослідження є аналіз взаємозв'язку між фізичною активністю та змінами складу тіла у дорослих з надмірною вагою та ожирінням для визначення найбільш ефективних фізичних вправ для зниження маси тіла. У дослідженні брали участь жінки віком від 30 до 39 років, загальний стан здоров'я яких без серйозних захворювань, середній рівень фізичної підготовки, навички плавання, бажання відвідувати 2 заняття на тиждень, підписання інформованої згоди, згода на оцінку до та після програми. Результати дослідження проаналізовано та визначено найбільш ефективні фізичні вправи для зниження маси тіла.

Ключові слова: кореляція, фізична активність, склад тіла, жінки, надмірна вага, ожиріння.

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