

THE EFFECTS OF SELECTED PILATES EXERCISE ON THE BODY COMPOSITION OF OBESE PEOPLE

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Abstract: *The purpose of the present study was to find out the effect of selected Pilates exercises on body composition of obese people. The total sample of 60 males between the age group of 20-45 years was selected and divided into two groups i.e. 30 in the experimental group and 30 in the control group from the general population of Muzaffarnagar Uttar Pradesh. In the present study, a purposive-random sampling technique was employed to select the sample for measuring Body weight, body mass index, body fat percentage & visceral fat level. The subjects underwent training for 24-week with the Pilates exercises. The difference in the mean of each group for selected variables was tested for the significance of difference by paired 't' test. The level of significance was set at 0.05. The Result was found that the effect of selected Pilates exercises was significant Body weight, body mass index, body fat percentage & visceral fat level of the experimental group as compared to the control group.*

Key words: *body fat percentage, body mass index, visceral fat level.*

1. INTRODUCTION

Throughout most of human history, being fatty wasn't an option. The constant struggle to hunt, gather, or harvest enough food to take care of life meant most of the people were always slim. Plumpness was a symbol of excess, found only within the wealthy. So early, being fat was a standing symbol. Still, for many people, just getting enough to eat was still a large issue. Whenever food is scarce, having the ability to eat well are some things to require pride in. If food is regularly available, avoiding the desire to over-indulge would be considered a sign of self-control.

Measurement, evaluation, and analysis of human body structure are three of health care practitioners' most demanding activities. Body composition or weight is the main fat percentage metric, not giving information about metabolically active tissue and lean body mass. Human BC (Body composition) thus refers to the calculation of the real and approximate quantities of bone, muscle and fat tissue, calculated by various techniques based on the instruments at hand (e.g. body structure, hydrostatic analysis, dual-emission X-ray & absorptiometry).

From these variables, fat mass or body fat percentage has been the foremost important estimate for health purposes given the strong correlation with cardiovascular diseases (Heyward and Wagner, 2004) Genetics, behaviour (e.g., sedentary lifestyle, tobacco and alcohol consumption), and many other diseases (e.g., bulimia, anorexia), may negatively impact BC (Body composition), where overweight, obesity, or a dramatic reduction of muscle mass, are some consequences of those conditions. For eg, individuals presenting with inherited nervous anorexia displayed emotional behaviour associated with caloric and low body mass index (BMI) (Dellava et al., 2010).

About 50% of anorexic patients who have osteopenia at two test points (Ferna'ndez Soto et al., 2010). Also, a recent Thibault et al. report (2010), Relates parental exercise behaviour to the increased likelihood that their children

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will become obese and overweight adolescents. Indeed, the risk reduces when a physical activity lifestyle includes a minimum of one among the oldsters.

Wellness is that every organism works efficiently according to the tasks it defines. Refers to the parental exercise activity to the increased likelihood that obese and overweight adolescents are their off autumn. Also, the risk decreases when a physical exercise way of life needs a minimum of one of the old guys. Health is that any entity performs efficiently according to the tasks it decides.

Until coping with weight issues in youth, one must be able to accept the issue at the start. While several of the families are conscious that their children are becoming fatter and so the actual circumstance is alarming, many parents appear to hold the illusion that childhood overweight and obesity often impacts the children of

others when their children are only a touch of overweight or may have puppy fat. As part of their growth, children evolve several various ways at different ages as well as development, so it is always challenging to find out whether they are overweight. However, whether a kid huffs and puffs or goes red on his face while going up a slope, or whether they can't fit into age-sized pants, or if more lumps of fat are sometimes found around his middle, the kid might be overweight and may require support. During this juncture, a primary care worker will assist with deciding whether the infant is overweight.

Body composition (BC) refers to the components of the tissue that form the body and typically ask for the relative proportion of fat and fat-free tissue. Fat-free tissue (FFT), fat elastic mass, or visceral fat (VF), and therefore the proportion of body weight is the essential known elements within the elastic composition evaluation. The proportion of physique fat reflects the proportion of the total mass of stature which consists of fat. Fat-free volume leads to fat-free muscle tissue and is defined as lean body mass (Howley et al., 2007).

Specific methods are widely used to calculate body structure consisting of hydrostatic measuring, twin x-ray absorptiometry, plethysmography, body composition, size, and bioelectrical impedance – Hofman, (2006).

In health and wellness conditions, the main activity is that the collection of data relating to the relative amount of body mass around fat-free tissue and therefore the redistribution of fats within the body, with the added hobby within the changes in Graves, Whitehurst & Findley (2006) in these variables. One of the most reasons for an upward shift in body fat is the physical condition of becoming inactive. In the elder situation, the outward drive of body mass is controlled by utilizing the slower speed of walking and functional obstacles Steinfeld, Ngo, Satariano & Tager (2002).

Body fat is increased from 16% in the case of males and 25% in the case of females at 25 years of age and up to twenty-eight in the case of males and 41% in the case of females at 75 years of age on average, which is also around 10 kg of fat for the length of the older cycle. Fat-free body mass is stable up to 40 years of age, during which it declines by utilizing around 6% in the case of people and 10% in the case of females between 60 and 80 years of age (Holloszy&Kohrt, 1995).

Pilates isn't always just exercise; Pilates is not simply a random desire of precise movements. Pilates may be a gadget of bodily and mental conditioning which will beautify one's bodily strength, flexibility, and co-ordination also as reduce stress, improve intellectual focus, and foster an extended sense of well-being. Pilates is frequently for all people and everybody. Pilates is an exercising machine supported yoga ideas with Germanic overtones embedded within it. It mostly focuses on improving endurance and adaptability of the abdomen, decreases lower back, and hips. The movement established within the Twenties by the late Joseph Pilates used for use as a way to rehabilitate from infectious illnesses such as asthma. The true notion involves improving muscle strength, agility, and adaptability

while preserving spinal flexibility (Kloubec, 2005; Quinn, 2005; Shedden, 2006). Pilates might also be a very advantageous exercise that mixes both jap and western concepts with the aid of inclusive yoga (a mind-body method), breath, flexibility, relaxation, energy, and endurance. it's neat to make stronger both bodily and intellectual well-being. Furthermore, Pilates schooling enhances the strong, core muscle groups and increases balance, flexibility, and coordination of muscles. Pilates is excellent for health, relaxation, and improving the good overall of life (Frediani, 2005).

The Pilates cycle makes use of every floor and/or advanced equipment to complete exercises. Pilates is a special workout method that offers all forms of body and health skills for each person (Byrne, 2008). There are about 500 exercise workouts done on mats or advanced devices. Pilates' primary cause is to prepare the mind, body, and breathe to create up glossy and effective abdominal muscles, and a robust and agile back plate aims to strengthen body equilibrium, relaxation, and conditioning. Pilates for the physics measurement it provides; toned and reinforced core muscle groups, improved body coordination, prevention of injury, amplified stability and power, attitude and balance growth, and comfortable lifestyle movement (weightawareness.com).

Both Pilate's exercises are attributed to 5 relaxation requirements, spinal, ribs and scapular, pelvic stability, and the application of the muscle transverses abdominals (Kloubec, 2005). Also, Joseph Pilates focuses his fitness method on six principles: focus, power, fluid motions, precision, and respiratory (Kish, 1998; Metel, 2007). The use of the pad and a few devices (Reformer, Cadillac, Comfort Table, Swiss ball or fitness ring, over the base, pipes, and tubing) has also been achieved through Pilates workout.

2. Materials and methods

To achieve the purpose of the study total of sixty (n=60) male obese people were selected as subjects divided into two groups, thirty (n=30) experimental and, thirty (n=30) control groups general population of Muzaffarnagar Uttar Pradesh India. Purposive sampling technique was employed to select the sample. The age group ranged from 20-45 years. The Researcher has used Body Composition Analyzer and norms table to measure body weight, body fat percentage, body mass index & visceral fat level. The subjects were subjected to a twenty-four-week Pilates training programmed.

3. SELECTION OF VARIABLES

The following variables were selected for the study-Body Weight, Body Fat Percentage, Body Mass Index & Visceral Fat Level

Table 1 show that the 24-week Training programs of various Pilates exercise

CATEGORY	DURATION OF TIME	EXERCISE NAME
BEGINNER	8 WEEK	The Hundred, The Roll-Up, Standing Foot Work Series
INTERMEDIATE	8 WEEK	The Double Straight Leg Stretch, The Saw, The Criss Cross
ADVANCED	8 WEEK	The Swan Dive, The Shoulder Bridge, The Side Band, The Push-Ups, TeaserII nd

Data Analysis

The collected data were put to statistical computing t-value to find out the differences if any, between the pre and post body weight, body mass index, body fat percentage & visceral fat level of obese peoples.

Statistical Technique

In order to find out the effect of selected the effects of selected Pilate's exercises on body composition of obese people were tested for the significance of difference by paired 't' test. The level of significance was set at 0.01-0.05 level.

4. Result

Table 2 show the Bodyweight of Experimental and Control group

Group	Number	Mean	S.D	SEM	't' Value
Experimental (Pre-test)	30	91.7600	2.6602	.4856	16.879
Experimental (Post-test)	30	86.8467	2.5880	.4725	
Control (Pre-test)	30	90.5400	2.2888	.4178	-2.147
Control (Post-test)	30	91.2167	2.8529	.5208	

Significant "t" 0.05 (29) = 1.70

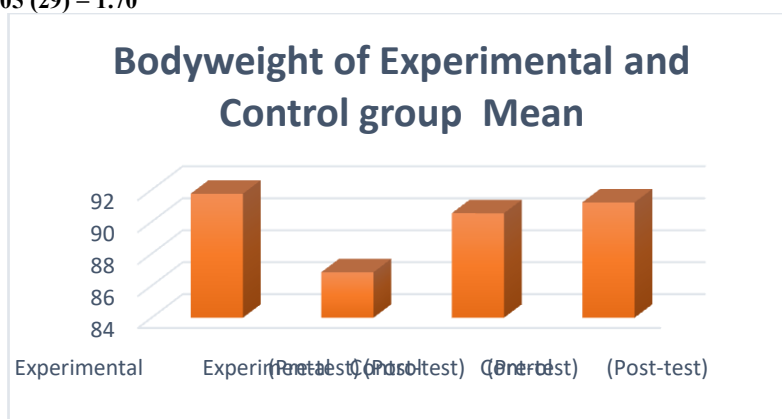


Figure 1. mean deference of body weight

Table-1.1 shows that the mean bodyweight of the pre-test of the experimental group and post-test of the experimental group was 91.7600 and 86.8467 respectively, whereas the mean body weight of pre-test of control and post-test of the control group was 90.5400 and 91.2167. The "t" value in the case of the experimental group was 16.879 and for the control group, it was -2.147. Since calculated t (=16.879) > tab t .05 (29) (=1.70), the results of this study showed that statistically significant and explained its effects positively.

Table 3 show the Body Mass Index of Experimental and Control group

Group	Number	Mean	S.D	SEM	't' Value
Experimental (Pre-test)	30	32.9930	1.40312	.25617	15.420
Experimental (Post-test)	30	31.2930	1.30288	.23787	
Control (Pre-test)	30	33.0630	1.55017	.28302	-.956
Control (Post-test)	30	33.1960	1.42764	.26065	

Significant "t" 0.05 (29) = 1.70

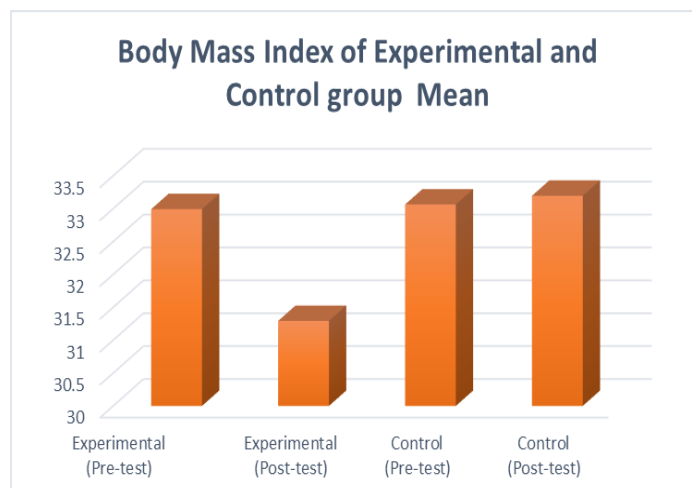


Figure 1.2 mean difference of Body Mass Index

Table-1.2 shows that the mean of Body Mass Index of pre-test of experimental group and post-test of the experimental group was 32.9930 and 31.2930 respectively, whereas the mean of B.M.I of pre-test of control and post-test of the control group was 33.0630 and 33.1960. The “t” value in the case of the experimental group was 15.420 and for the control group, it was -.956. Since calculated t (=15.420) > tab t .05 (29) (=1.70), the results of this study showed that statistically significant and explained its effects positively.

Table 1.3 show the Body Fat Percentage of Experimental and Control group

Group	Number	Mean	S.D	SEM	‘t’ Value
Experimental (Pre-test)	30	32.1403	2.3450	.4281	4.615
Experimental (Post-test)	30	29.2820	2.2160	.4046	
Control (Pre-test)	30	32.1403	2.3450	.4281	-.958
Control (Post-test)	30	32.3257	2.1940	.4005	

Significant “t” 0.05 (29) = 1.70

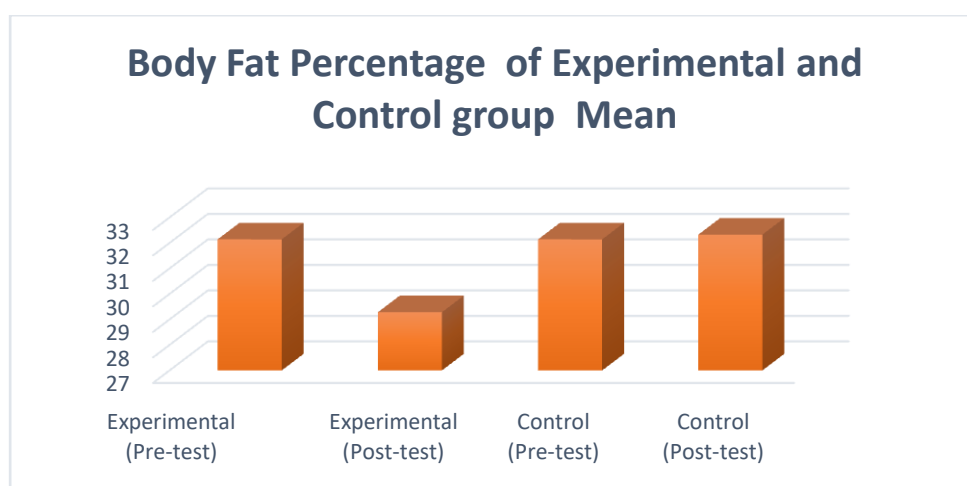


Figure 1.3 mean difference of Body Fat Percentage

Table-1.3 shows that the mean of Body Fat Percentage of pre-test of experimental group and post-test of the experimental group was 32.1403 and 29.2820 respectively, whereas the mean of Body Fat Percentage of pre-test of control and post-test of the control group was 32.1403 and 32.3257. The “t” value in the case of the experimental

group was 4.615 and for the control group it was -.958. Since calculated $t (=4.615) > \text{tab } t .05 (29) (=1.70)$, the results of this study showed that statistically significant and explained its effects positively.

Table 1.4 show the Visceral Fat Level of Experimental and Control group

Group	Number	Mean	S.D	SEM	't' Value
Experimental (Pre-test)	30	21.350	1.7672	.3226	24.37
Experimental (Post-test)	30	18.083	1.7469	.3189	
Control (Pre-test)	30	21.133	2.1573	.3938	.459
Control (Post-test)	30	21.066	2.0245	.3696	

Significant “t” 0.05 (29) = 1.70

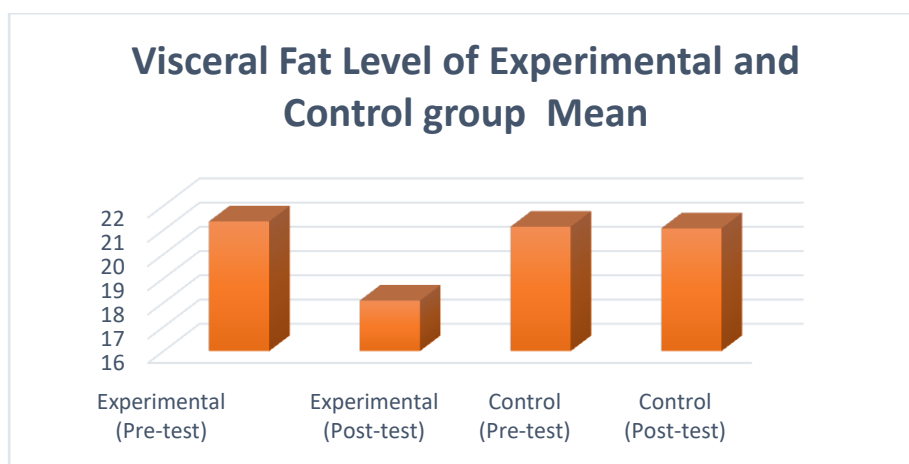


Figure 1.4 mean deference of Visceral Fat Level

Table-1.4 shows that the mean of the Visceral fat level of the pre-test of the experimental group and post-test of the experimental group was 21.3500 and 18.0833 respectively, whereas the mean of the Visceral fat level of pre-test of control and post-test of the control group was 21.1333 and 21.0667. The “t” value in the case of the experimental group was 24.374 and for the control group it was .459. Since calculated $t (=24.374) > \text{tab } t .05 (29) (=1.70)$, the results of this study showed that statistically significant and explained its effects positively.

Discussion

From the results, it is evident that the twenty-four-week Pilates training program had shown a significant effect of the experimental group as compared to the control group of obese people. Determine the effects of Pilates training on body composition of obese people showed a statistically significant “t” 0.05 (29) = 1.70

5. Conclusion

Obesity is characterized as a serious public health problem with significant impact worldwide, as represented by high rates of death. Among the major comorbidities derived from obesity, changes in body composition can be highlighted. That condition can lead to Body weight, body fat percentage, body mass index, visceral fat level. Thus, physical exercise is one effective means of therapeutic intervention for improving respiratory function. In that context, Pilates is considered to be a method of Pilates exercise that promotes overall reducing Body weight, body fat percentage, body mass index & visceral fat level. As a result, it has been gaining ground and is being popularized.

With the results found in the current literature review, the authors have observed that Pilates promotes the strengthening of abdominal muscles. That fact could possibly be related to improvement of the diaphragmatic function, which may result resolved the significant effect of selected Pilates exercises on body weight, body mass index, body fat percentage & visceral fat level of obese people.

References

1. Can, S., Demirkan, E., &Ercan, S. (2019). The Effects of Exercise Preferences on Body Fat and Body Mass Index by Self-report. *Universal Journal of Educational Research*, 7(1), 293-297.
2. Cetin, S., Ece, C., Sen, M., &Aydogan, A. (2019). The Effects of Pilates and Aerobic Exercise on Blood Pressure, Heart Rates, and Blood Serum Lipids in Sedentary Females. *Journal of Education and Training Studies*, 7 (4), 229-235.
3. Dumith, C. S., Gigante, P. D., Domingues, R. M., & Kohl, W. H. (2011). Physical activity change during adolescence: a systematic review and a pooled analysis. *International Journal of Epidemiology*, 40(3), 685-98.
4. Fernandez-Soto, L. M., Gonzalez-Jimenez, A., & Leyva-Martinez, S. (2010). Clinical and Hormonal Variables Related to Bone Mass Loss in Anorexia Nervosa Patients. *Vitamins &Harmones*, 92, 259-269.
5. Findley, W. B., Brown, E. L., Michael, W., &Tedd, k. (2006). The Influence of Body Position on Load Range During Isokinetic Knee Extension/Flexion. *Journal of Sports Science & Medicine*, 5(3), 400-406.
6. Fraser, K. L., Clarke, P. G., Cade, E. J., & Edwards, L. K. (2012). Fast Food and Obesity: A Spatial Analysis in a Large United Kingdom Population of Children Aged 13–15. *American Journal of Preventive Medicine*. 42(5), 77-85.
7. Goran, M., Reynolds, D. K., &Lindqist, H. C. (1999). Role of physical activity in the prevention of obesity in children. *International Journal of Obesity* , 23, 18–33.
8. Graf, C., Koch, B., Falkowski, G., &Dordel, S. (2004). Correlation between BMI, leisure habits and motor abilities in childhood (CHILT-Project). *International Journal of Obesity*, 28, 22–26.
9. Griffiths, C., Gately, P., Marchant, R. P.,&Cooke, B. C. (2013). A five year longitudinal study investigating the prevalence of childhood obesity: comparison of BMI and waist circumference. *Public Health*, 127 (12), 1090-1096.
10. Guidolin, M., Gradisar, M. (2012). Is shortened sleep duration a risk factor for overweight and obesity during adolescence? A review of the empirical literature. *Sleep Medicine*, 13(7), 779-786.
11. Hassink, G. S., Zapalla, F., Falini, L., &Datto, G. (2008). Exercise and the obese child. *Progress in Pediatric Cardiology*, 25(2), 153-157.
12. Heyward, V.H. (2010). *Advanced Fitness Assessment and Exercise Prescription*. 6th Edition, Human Kinetics, Champaign, 12, 465.
13. Holfman, R. J., Ratamess, A. N., &Faigenbaum, D. A. (2006). Effect of Protein Intake on Strength, Body Composition and Endocrine Changes in Strength/Power Athletes. *Journal of the International Society of Sports Nutrition*, 3(2), 12-18.
14. Kaur, H., Paul, M. (2019). Pilates Training: for Improving Respiratory Function a Systematic Review. *International Journal Of Health Sciences And Research*, 9(1), 280-286.
15. Kipping, R. R., Jago, R., Lawlor, A. D. (2008). Obesity in children. Part 1: Epidemiology, measurement, risk factors, and screening. *The BMJ*, 337, 1824.
16. Kish, Robin L. (1998). *The functional Effects of Pilates Training on College Dancers*. California State University, Master of Science, UMI: 1392499.
17. Kloubec, June A. (2005). *Pilates Exercises for Improvement of Muscle Endurance, Flexibility, Balance and Posture*. Doctor of Philosophy Thesis, UMI number: 3198106, University of Minnesota, USA.
18. Kohrt, M. W., Holloszy, O. J. (1995). Loss of skeletal muscle mass with aging: effect on glucose tolerance. *The Journals of Gerontology. Series A, Biological Sciences and Medical Sciences*, 50, 68-72.
19. Madhumathi, K., Pavatharani, J. (2019). Efficacy of Pilates and Aerobic Exercise on Body Composition in Obese Women. *International Journal of Pharmacy and Biological Sciences*, 9 (1), 1356-1366.
20. Marques, A. A., Roberta, T., Nogueira, B., & Silva, V. (2018). Pilates plus cardiovascular training in body composition: effects of adding continuous cardiovascular training to the Pilates method on adult body composition. *MOJ Sports Medicine*, 2 (1), 10-13.
21. Metel S., Milert A., & Pilates, J. (2007). Method and Possibilities of Its Application in Physiotherapy, *Medical Rehabilitation*, 11 (2), 19-28.

22. Mohammadian, M., Anvari, M., & Dehghan, F. (2018). The Changes of Homocysteine Serum Level and Body Mass Index of Overweight Young Women after Eight Weeks of Pilates Exercise. *Journal of Physical Fitness, Medicine & Treatment In Sports*, 5 (5), 01-05.
23. Mulgrew, T. A., Lawati, A. N., Ayas, T. N., & Cortes, L. (2010). Residual sleep apnea on polysomnography after 3 months of CPAP therapy: Clinical implications, predictors and patterns. *Sleep Medicine*, 11(2), 119-125.
24. Must, A., Anderson, E. S. (2003). Effects of obesity on morbidity in children and adolescents. An Official Publication of Tufts University, 6(1), 4-12.
25. Rayes, R. B. A., & Andrade, S. M. (2019). The effects of Pilates vs. aerobic training on cardiorespiratory fitness, isokinetic muscular strength, body composition, and functional tasks outcomes for individuals who are overweight/obese: a clinical trial. *PeerJ*-6022, 01-26.
26. Satariano, William A., Haight, Thaddeus, J., Tager, Ira, B. (2002). Living arrangements and participation in leisure-time physical activities in an older population. *Journal of Aging and Health*, 14(4), 427–451.
27. Shedden, Mariana & Kravitz. (2006). Pilates Exercise, A Research-Based Review *Journal*, 10 (6), 111-116.
28. Sjostrom, L., Gummesson, A., Sjostrom, D., & Olbers, T. (2009). Effects of bariatric surgery on cancer incidence in obese patients in Sweden (Swedish Obese Subjects Study): a prospective, controlled intervention trial. *The Lancet Oncology*, 10(7), 653-662.
29. Strickberger, A. S., Benson, W. D., Biaggioni, I., Callans, J. D., & Friedman, P. (2006). Scientific Statement on the Evaluation of Syncope. *Aha/Accf Journal*, 113, 316–327.
30. Thornton, M. L., Dellava, E. J., Root, L. T., Lichtenstein, P., & Bulik, M. (2010). Anorexia Nervosa and Generalized Anxiety Disorder: Further Explorations of the Relation between Anxiety and Body Mass Index. *Journal of Anxiety Disorders*, 25(5), 727–730.
31. Westerterp, R. k. (2018). Changes in physical activity over the lifespan: impact on body composition and sarcopenic obesity. *Obesity Reviews- Physical activity and body composition*, 19, 8-13.