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Impact of Zumba Training on Body Composition and Physical Finesses Parameter of Obese Adolescents

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ABSTRACT: Background and Aim: Despite its widespread appeal, there is a notable absence of research focusing on body composition and physical fitness metrics among obese young individuals. Accordingly, the primary objective of this study was to assess the alterations in body composition and physical fitness parameters in adolescents with a body mass index (BMI) exceeding 24.9, both prior to and following an eight-week Zumba exercise regimen.
Methods: The study employed an experimental design featuring a pretest-posttest control group framework. The participant sample comprised 40 obese adolescent volunteers, aged between 12 and 18 years, with a body mass index (BMI) ranging from 24.9 to 30 kg/m²; participants were randomly assignment to either the control group or the Zumba exercise group. Standard tests were used to collect data. Zumba training was hold in eight weeks. Independent and dependent t tests were used for data analysis.
Results: The findings indicate that engagement in Zumba training has led to a significant reduction in skeletal muscle mass (SMM) and body fat mass (MBF) among obese adolescents. Furthermore, notable improvements were observed in the shuttle run 4*9 and stork balance stand tests following participation in the Zumba training ($P<0.05$). These changes were not evident in the control group ($P>0.05$).
Conclusion: It is anticipated that such repetitive training programs will yield positive outcomes by enhancing speed and balance, as well as contributing to improvements in BMI. Furthermore, Zumba exercises may serve as an effective means to motivate individuals with sedentary lifestyles to engage in physical activity, thereby supporting long-term weight management and body composition improvement.

Keywords: Zumba, Obesity, Adolescents, Fitness, BMI

INTRODUCTION

Obesity in children, adolescents, and adults has become one of the most pressing public health issues of the 21st century. Over the last three decades, the global incidence of childhood obesity has risen dramatically. This condition is multifactorial and is often characterized as a phenotype associated with various pathologies (Adebanjo, 2024). This review aims to examine the existing medical literature on overweight and obesity within the pediatric population, emphasizing clinically relevant practical considerations. Key aspects such as the definition, prevalence, epidemiology, and comorbidities of pediatric obesity will be explored. Additionally, the review will address clinical and laboratory assessments, as well as treatment challenges. Due to the comprehensive nature of the subject, readers will be directed to recent publications on specific topics for a more thorough understanding (Baniasadi et al. 2022; Ramazani et al., 2023; Salehian, and Hosseinzadeh, 2023; Hosseinzadeh and Salehian, 2024).

Obesity is defined as an accumulation of excess body fat, commonly referred to as adiposity. The most prevalent method for assessing obesity is the body mass index (BMI), which is a calculation that relates weight to height. Specifically, BMI is determined by dividing an individual's weight in kilograms by the square of their height in meters (kg/m^2). This index demonstrates a strong correlation with body fat levels and is also indicative of excess weight trends within populations. However, it is crucial to recognize that BMI may not always provide an accurate representation of total body fat (Delextrat et al. 2024). This is due to its inability to differentiate between fat and muscle mass, as well as its failure to predict the distribution of body fat. Consequently, BMI may overestimate body fat in individuals with higher muscle mass, such as athletes, while underestimating it in those with lower muscle mass, like sedentary individuals. Nevertheless, on a broader population scale, BMI effectively reflects trends in adiposity rather than muscularity, allowing for a clear distinction between individuals with significant muscle mass and those with higher levels of body fat (Chaharbaghi et al. 2022).

The World Health Organization (WHO) defines adults with a Body Mass Index (BMI) ranging from 25 to 30 as overweight. Obesity is further classified into stages or grades: Grade 1 encompasses a BMI of 30.0 to 34.9, Grade 2 includes a BMI of 35.0 to 39.9, and Grade 3 is designated for a BMI of 40.0 or higher (Delextrat et al. 2016). The term "morbid obesity" was previously used to describe Grade 3 obesity; however, this terminology has been revised due to the understanding that morbidity can occur at BMI levels below 40 as well (Ghorbani et al. 2020). In pediatric populations, the assessment of overweight and obesity is based on gender-specific BMI-for-age percentile curves. Specifically, children and adolescents whose BMI falls between the 85th and 95th percentiles for their age and gender are classified as overweight, while those exceeding the 95th percentile are categorized as obese (Abdoshahi & Ghorbani, 2022). Furthermore, a BMI above the 99th percentile indicates severe obesity. The International Obesity Task Force has established an international standard growth chart to facilitate global comparisons of prevalence. Nevertheless, numerous countries continue to utilize their own specific growth charts. In the United States, the gender-specific CDC Growth Charts, introduced in May 2000, are employed to assess BMI in children aged 2 to 20 years (Hashemi, 2024).

In children and adolescents, the prevalence of overweight is typically attributed to insufficient physical activity, poor dietary habits leading to excessive caloric intake, or a combination of both factors resulting in an energy surplus. The cornerstone of addressing childhood obesity lies in lifestyle modifications that encompass both nutritional changes and increased physical activity, which are considered non-pharmacological interventions. Engaging the family or caregivers in this process is essential (Parial, 2023). Initiating the journey towards a healthy weight can be effectively supported by offering straightforward strategies for dietary adjustments, enhancing physical activity, and implementing parenting techniques that reinforce these objectives. Behavioral modification strategies aimed at weight reduction may involve encouraging reduced screen time, fostering increased physical activity, psychological training to facilitate changes in eating habits or exercise routines, family counseling to bolster weight loss efforts, and institutional changes within schools to encourage healthy eating and physical activity. Therefore, it can be concluded that interventions focused on physical activity are fundamental to the treatment of obesity (Parial et al. 2021).

Numerous countries globally are actively seeking strategies to combat issues related to overweight, obesity, and insufficient physical activity. Engaging in regular physical activities, such as walking, Pilates, and Zumba, has emerged as one of the most effective and widely embraced approaches for preventing obesity, facilitating weight loss, and enhancing body toning among women, particularly when combined with proper nutrition (Puspodari & Prasetiyo, 2022). One significant barrier to the consistent practice of physical activities is the long-term monotony often associated with exercise programs. Despite the incorporation of music and dynamic movements, participants frequently do not perceive Zumba as a traditional workout. Consequently, these activities serve as effective means to counteract a sedentary lifestyle, creating an enjoyable exercise environment that promotes fitness while addressing the challenges of overweight and obesity (Ismaeel, 2024).

Zumba is a widely accessible exercise program suitable for individuals aged four and older, guided by qualified instructors. This engaging Latin dance fitness regimen has garnered participation from 14 million individuals across 150 countries, ranking among the top ten sports trends globally. A significant factor

contributing to its widespread appeal is the absence of a strict right or wrong approach to Zumba practices (Choudhary & Dubey, 2024; Kasim et al. 2020). The program's motto, "put aside the training and join the party," encourages participants to engage in physical activity in a fun and enjoyable manner, fostering a desire to repeat the exercises. Zumba not only enhances strength, balance, coordination, and overall fitness but also promotes fat reduction in women, serving as an effective means to positively transform body composition (Arol, 2020; Octaviana et al. 2020).

Despite its widespread appeal, there is a notable absence of research focusing on body composition and physical fitness metrics among obese young individuals. Accordingly, the primary objective of this study was to assess the alterations in body composition and physical fitness parameters in adolescents with a body mass index (BMI) exceeding 24.9, both prior to and following an eight-week Zumba exercise regimen.

METHODS

The study employed an experimental design featuring a pretest-posttest control group framework. The participant sample comprised 40 adolescent volunteers, aged between 12 and 18 years. The determination of the sample size was conducted using G-Power analysis (Baniasadi et al. 2022). Ethical compliance was confirmed through evaluation by the Non-Interventional Research Ethics Board. Inclusion criteria specified participants aged 12 to 18 years, with a body mass index (BMI) ranging from 24.9 to 30 kg/m²; participants were required to provide consent for study involvement, be free from chronic illnesses such as diabetes, hypertension, cancer, and diseases affecting the cardiovascular, liver, kidney, or thyroid systems; they should not be on a special diet, nor taking antidepressants or hormones; participants needed to demonstrate the capability to engage in physical activities and must not have participated in sports for at least six months prior to the study's initiation. Exclusion criteria encompassed failure to adhere to the training regimen, absence from the sports club for two consecutive sessions, and withdrawal from the study. Consequently, a total of forty participants were included in the research, which involved random assignment to either the control group or the Zumba group.

Measurements

In this research, body composition (BC) was assessed utilizing the Body Composition X-Scan Plus II, manufactured in Gyeonggi-do, South Korea. Initially, the height of the child participants was recorded with a standard measuring device that has an accuracy of 0.1 cm. Subsequently, each participant was positioned on the apparatus to obtain their weight. The device employs eight electrodes to transmit electrical impulses through various tissues, allowing for the measurement of BC parameters such as body mass index (BMI), skeletal muscle mass (SM), and fat mass (MBF) based on the velocity of the electrical signals (Baniasadi, 2024).

Fitness assessment was conducted through two specific tests: the "Shuttle Run 4*9 test" and the "Stork Balance Stand test." The Shuttle Run 4*9 test is designed to evaluate agility in children. In this assessment, participants navigate a track measuring 9.15 meters, completing four laps while transporting sticks or legs to the opposite side of the track and placing them on the ground. The test commences with the participant positioned behind the starting line, and upon the signal "go," they begin to run. Upon reaching the end of the track, the participant retrieves one stick, returns to the starting line, and places it behind the line. This procedure is repeated for a second lap, although there is no requirement to place the stick on the ground during this round, and the individual maintains a consistent pace while crossing the line. Additionally, the Stork Balance Stand test is employed to assess static balance in children. This widely utilized field test measures static balance by having the participant stand on a foam surface with their eyes open, lifting one leg and positioning the sole of the foot beneath the knee of the opposite leg. The test continues until the participant places the sole of the foot on the ground, with the duration recorded using a stopwatch. This assessment gauges the stability of posture in a standing position by measuring the time, in seconds, that the individual can sustain the one-legged stance (Baniasadi et al. 2022).

Zumba Training

A total of 24 Zumba exercise sessions were conducted over an eight-week period, with sessions held three times a week. These sessions were led by a certified Zumba instructor and lasted for 60 minutes, taking place from 16:00 to 17:00 hours. The choreography was specifically designed to minimize strain on the skeletal muscle system, deliberately avoiding high-intensity jumping movements to accommodate the overweight participants in the study. The warm-up segment of the Zumba program lasted 8 to 10 minutes and included basic dance steps that did not involve jumping or bouncing, accompanied by music with a gradually increasing tempo (120-140 bpm). This phase aimed to elevate body temperature, enhance muscle blood flow, facilitate joint mobilization, and prepare participants psychologically for the workout. The main exercise phase featured approximately 10 Zumba songs with tempos ranging from 140 to 160 bpm, interspersed with rest periods of 20 to 30 seconds between songs. Throughout the study, a Polar M430 Heart Rate Monitor was utilized on the

participant with the highest BMI to monitor potential risks, with maximum heart rate calculated using the formula (208 - (0.7 x Age)). The final cooling phase involved a gradual deceleration of the music, concluding with a song at a tempo of 120 bpm (Choudhary & Dubey, 2024).

Data Analysis

Statistical analysis was performed utilizing SPSS 27 software. Initially, the normality of the data distribution was evaluated through the Kolmogorov-Smirnov test. Based on the characteristics of the distribution, either independent or paired t-tests were employed. A significance level of $p < 0.05$ was set for the analysis.

RESULTS

This research involved a cohort of 40 obese adolescents, who were allocated into Zumba and control groups. The two groups exhibited comparable characteristics regarding age, height, weight, and body mass index (BMI), as detailed in Table 1.

Table 1. Demographic data of the participants

	Zumba	Control	Groups differences
Age (years)	15.33±0.53	15.30±0.49	t=0.010 P=0.998
Height (m)	1.68 ± 0.04	1.67 ± 0.04	t=0.001 P=0.999
Weight (kg)	65.61 ± 3.28	65.59 ± 3.30	t=0.013 P=0.994
BMI	28.24 ± 0.74	28.28 ± 0.70	t=0.014 P=0.995

Table 2 presents the findings related to normal distribution. The outcomes of the Kolmogorov-Smirnov tests indicated that all variables exhibited a normal distribution, with all P-values exceeding 0.05.

Table 2. Results of normal distribution

	SMM	MBF	Shuttle Run 4*9	Stork Balance Stand
Statistics	0.990	0.875	0.917	0.922
P-value	0.200	0.200	0.200	0.200

Descriptive statistics are displayed in Table 3. At the baseline assessment, independent t-tests indicated that there were no statistically significant differences between the Zumba and control groups regarding skeletal muscle mass (SMM), muscle body fat (MBF), performance in the shuttle run 4*9, and stork balance stand ($P>0.05$).

Table 3. Baseline scores of the Zumba and control groups

	Zumba	Control	Groups differences
SMM	23.70±3.50	23.60±3.39	t=0.039 P=0.840
MBF	9.58±1.33	9.56±1.41	t=0.024 P=0.890
Shuttle Run 4*9	12.70±1.30	12.68±1.30	t=0.018 P=0.971
Stork Balance Stand	26.30±2.42	26.28±2.40	t=0.034 P=0.852

The difference score (D) between the pretest and posttest measurements of the research variables is illustrated in Table 4. The findings indicate that engagement in Zumba training has led to a significant reduction in skeletal muscle mass (SMM) and body fat mass (MBF) among obese adolescents. Furthermore, notable improvements were observed in the shuttle run 4*9 and stork balance stand tests following participation in the Zumba training ($P<0.05$). These changes were not evident in the control group ($P>0.05$).

Table 4. Results of the posttest in the Pilates and control groups

	Zumba	Control	Groups differences
SMM	- 6.48	0.14	t=7.415 P<0.001
MBF	- 2.48	0.12	t=- 6.418 P<0.001
Shuttle Run 4*9	- 3.59	0.10	t=- 15.418 P<0.001
Stork Balance Stand	7.48	0.35	t=6.318 P<0.001

DISCUSSION

Despite its widespread appeal, there is a notable absence of research focusing on body composition and physical fitness metrics among obese young individuals. Accordingly, the primary objective of this study was to assess the alterations in body composition and physical fitness parameters in adolescents with a body mass index (BMI) exceeding 24.9, both prior to and following an eight-week Zumba exercise regimen. The findings indicate that engagement in Zumba training has led to a significant reduction in skeletal muscle mass (SMM) and body fat mass (MBF) among obese adolescents. Furthermore, notable improvements were observed in the shuttle run 4*9 and stork balance stand tests following participation in the Zumba training. These changes were not evident in the control group.

Group fitness activities, including Zumba, serve as an effective means for weight reduction, contribute favorably to body mass index (BMI) metrics, and enhance overall body composition. Furthermore, these exercises yield beneficial outcomes in women's body composition and demonstrate improvements in both motor skills and functional capabilities (Khosravi et al. 2023; Seyedi Asl et al. 2016, 2020). The elevated fitness levels observed can be linked to consistent participation in Zumba workouts, which facilitate enhanced joint mobility, muscle development, and flexibility of ligaments and tendons. Additionally, Zumba exercises contribute to advancements in the body's respiratory function. These enhancements are marked by the strengthening of respiratory muscles, improved compliance of the thoracic cavity, increased endurance of the upper respiratory system, and greater elasticity of the respiratory structures (Stonnington et al. 2020; Taghva et al. 2020).

Zumba exercise represents an effective option for individuals seeking to rapidly reduce body fat and achieve weight loss, primarily due to its significant caloric expenditure during sessions. For instance, engaging in just 15 minutes of Zumba can result in the burning of approximately 150 calories. The choreography, paired with upbeat music, enhances the fat-burning potential inherent in this form of exercise (Parial et al. 2022, 2023). Zumba uniquely integrates dance and strength training movements, which may include exercises such as squats and wall presses, making it a distinctive workout experience. Participants can expect to burn over 1000 calories in a single session, facilitating swift weight loss. Furthermore, Zumba can contribute to physical fitness even in the absence of a structured diet. The movements characteristic of Zumba differs from traditional exercise routines, as they are intricately linked to dance. This activity not only alleviates stress but also promotes improved mobility and increased flexibility (Waer et al. 2024).

Engaging in physical exercise offers numerous advantages, one of which is the ability to facilitate calorie expenditure (Najafzadeh et al. 2024). For individuals primarily focused on fat loss and weight reduction, Zumba emerges as an optimal choice among various sports. While activities such as volleyball, futsal, basketball, and skating contribute to overall fitness, Zumba is particularly effective for fat burning (Omidvar et al. 2018; Shafaei et al. 2024). This form of exercise is beneficial for cardiovascular and pulmonary health, allowing participants to burn approximately 450 calories per hour. With consistent daily practice, individuals can potentially achieve a caloric burn of up to 1000 calories, thereby sculpting their desired physique (Najafzadeh et al. 2024). Zumba is recognized as one of the most vigorous and dynamic forms of exercise, incorporating elements from diverse Latin dance styles and set to uplifting music. To effectively lose weight, it is essential to create a caloric deficit by expending more calories than are consumed. This can be accomplished by lowering daily caloric intake while simultaneously enhancing physical activity levels. According to credible sources, a moderate-intensity Zumba session can result in a caloric burn ranging from 300 to 900 calories per hour (Shafaei et al. 2024; Shams, 2024).

CONCLUSION

The findings of the research indicate that an eight-week Zumba training regimen, consisting of three sessions per week lasting 60 minutes each, has led to notable enhancements in body composition metrics, and fitness capabilities among adolescent students aged 12 to 18 with elevated body mass indices. Consequently,

Zumba can be recommended as a beneficial group exercise for this demographic. Given the advantages associated with consistent physical activity, it is crucial to highlight the significance of engaging in fitness activities like Zumba for overall health. It is anticipated that such repetitive training programs will yield positive outcomes by enhancing speed and balance, as well as contributing to improvements in BMI. Furthermore, Zumba exercises may serve as an effective means to motivate individuals with sedentary lifestyles to engage in physical activity, thereby supporting long-term weight management and body composition improvement.

REFERENCES

Abdoshahi, M., & Ghorbani, S. (2022). Effects of Playground Availability on Participation of Children in Physical Activity: The Role of Socioeconomic Status. *International Journal of School Health*, *9*(3), 186-191. [Google Scholar] [Publisher] https://doi.org/10.30476/intjsh.2022.96051.1245

Adebanjo, E. (2024). Effects of a Pilates Training Intervention on Mental Health, Adiposity and Self-Perceived Body-Image of Obese Children. *Physical Activity in Children*, *1*(2), 5-11. [Google Scholar] [Publisher] https://doi.org/10.61186/PACH.2024.473810.1025

Arol, P. (2020). The effect of Zumba exercises on body composition, dynamic balance and functional fitness parameters in 15-17 years old women with high body mass index. *Pedagogy of physical culture and sports*, *24*(3), 118-124. [Google Scholar] [Publisher] https://doi.org/10.15561/26649837.2020.0303

Baniasadi, T. (2024). The Relationship between Self-reported and Device-measured Physical Activity among Children with ADHD. *Physical Activity in Children*, *1*(1), 1-5. [Google Scholar] [Publisher] https://doi.org/10.61186/pach.195747

Baniasadi, T., Ranjbari, S., Abedini, A., Dana, A., & Ghorbani, S. (2022). Investigation the Association of Internet Addiction with Mental Health and Physical Activity in Teenage Girls: The Mediating Role of Parental Attitude. *Women's Health Bulletin*, *9*(4), 243-250. [Google Scholar] [Publisher] https://doi.org/10.30476/whb.2022.96915.1197

Baniasadi, T., Ranjbari, S., Khajehaflaton, S., Neshati, A., & Dana, A. (2022). Effects of physical activity on adiposity in children: mediating role of self-esteem and body-image. *International Journal of Pediatrics*, *10*(12), 17172-17181. [Google Scholar] [Publisher] https://doi.org/10.22038/ijp.2022.67562.5043

Baniasadi, T., Ranjbari, S., Mofrad, S. K., & Dana, A. (2022). Associations between device-measured physical activity and balance performance in children: Mediating role of motor self-efficacy. *Biomedical Human Kinetics*, *14*(1), 252-258. [Google Scholar] [Publisher] https://doi.org/10.2139/ssrn.4915492

Chaharbaghi, Z., Baniasadi, T., & Ghorbani, S. (2022). Effects of Teacher's Teaching Style in Physical Education on Moderate-to-Vigorous Physical Activity of High-School Students: an Accelerometer-based Study. *International Journal of School Health*, *9*(3), 143-150. [Google Scholar] [Publisher] https://doi.org/10.30476/intjsh.2022.95204.1224

Choudhary, P. K., & Dubey, S. (2024). Evaluating the Effects of an 8-Week Zumba Exercise Program on Physical Fitness in Sedentary Women: A Randomized Controlled Trial. *Physical Education Theory and Methodology*, *24*(5), 784-792. [Google Scholar] [Publisher] https://doi.org/10.17309/tmfv.2024.5.14

Choudhary, P. K., & Dubey, S. (2024). Physiological Effects of Zumba Exercise on Male College Students: An Intervention Study. *Physical Education Theory and Methodology*, *24*(3), 404-410. [Google Scholar] [Publisher] https://doi.org/10.17309/tmfv.2024.3.08

Delextrat, A., Bateman, J., Esser, P., Targen, N., & Dawes, H. (2016). The potential benefits of Zumba Gold® in people with mild-to-moderate Parkinson's: Feasibility and effects of dance styles and number of sessions. *Complementary therapies in medicine*, *27*, 68-73. [Google Scholar] [Publisher] https://doi.org/10.1016/j.ctim.2016.05.009

Delextrat, A., Shaw, C. D., & Solera-Sanchez, A. (2024). Heart Rate Responses of Post-Menopausal Women to Zumba Gold® Classes. *Biology*, *13*(7), 462. [Google Scholar] [Publisher] https://doi.org/10.3390/biology13070462

Ghorbani, S., Rezaeeshirazi, R., Shakki, M., Noohpisheh, S., & Farzanegi, P. (2020). The role of BMI, physical activity and the use of electronic device in the status of trunk abnormalities in male adolescents. *Journal of Gorgan University of Medical Sciences*, *22*(3), 129-136. [Google Scholar] [Publisher]

Hashemi, S. (2024). The Effects of Twelve-Weeks of Aerobic Exercise on Body Composition, Physical Fitness and Happiness among Obese Adolescents. *Physical Activity in Children*, *1*(1), 81-88. [Google Scholar] [Publisher] https://doi.org/10.61186/pach.2024.472521.1024

Hosseinzadeh Peyghan, R., Salehian, M.H. (2024), The effect of brain gymnastics training on the body image, excitement and anxiety of elementary school girls Educational Administration: *Theory and Practice*, 30(6), 587-595. [Google Scholar] [Publisher] https://doi.org/10.53555/kuey.v30i6.5269

Ismaeel, S. A. (2024). Comparing the Anthropometric Characteristics and Physical Fitness of the School-Students with High and Low Levels of Physical Activity. *Physical Activity in Children*, *1*(1), 52-57. [Google Scholar] [Publisher] https://doi.org/10.61186/pach.2024.465559.1014

Kasim, N. F., Aldred, S., & Van Zanten, J. V. (2020). Tai Chi and Zumba Gold®: An alternative to motivate elderly in doing physical activity. *Jurnal Sains Sukan & Pendidikan Jasmani*, *9*(1), 62-69. [Google Scholar] [Publisher] https://doi.org/10.37134/jsspj.vol9.1.7.2020

Khosravi, M., Asl, S. T. S., Anamag, A. N., Langaroudi, M. S., Moharami, J., Ahmadi, S., ... & Kasaeiyan, R. (2023). Parenting styles, maladaptive coping styles, and disturbed eating attitudes and behaviors: a multiple mediation analysis in patients with feeding and eating disorders. *PeerJ*, *11*, e14880. [Google Scholar] [Publisher] https://doi.org/10.7717/peerj.14880

Najafzadeh, F., Ranjbari, S., Shafaei, H., & Ghorbani, S. (2024). Correlation between Participation in Physical Activity and Psychological Well-being among Elderly Women: The Mediating Role of Resilience. *Women's Health Bulletin*, *11*(3), 188-194. [Google Scholar] [Publisher] https://doi.org/10.30476/whb.2024.102534.1291

Najafzadeh, F., Shafaei, H., Alizadeh, S., & Dana, A. (2024). Correlations between Physical Activity Participation and Anthropometric Features with Gross and Fine Motor Skills in School Children with Attention Deficit Hyperactivity Disorder. *International Journal of School Health*, *11*(3), 209-215. [Google Scholar] [Publisher] https://doi.org/10.30476/INTJSH.2024.102533.1408.

Octaviana, R., Hidayatullah, M. F., & Kristiyanto, A. (2020). Effect of low-impact aerobic dance and zumba exercises on body fat percentage in obese women. *Malaysian Journal of Public Health Medicine*, *20*(1), 160-166. [Google Scholar] [Publisher] https://doi.org/10.37268/mjphm/vol.20/no.1/art.499

Omidvar, A., Dana, A., Hamzeh Sabzi, A., & Pourpanahi Koltapeh, M. (2018). The effect of education based on developmental physical education on working memory of elementary school students. *Journal of School Psychology*, *7*(1), 83-101. [Google Scholar] [Publisher]

Parial, L. L. B. (2023). Effects of dual-task Zumba gold (DTZ) on the cognition of community-dwelling people with mild cognitive impairment: a pilot randomized controlled trial. Gerontologist. 63(7), 1248-1261. [Google Scholar] [Publisher]

Parial, L. L., Kor, P. P. K., Sumile, E. F., & Leung, A. Y. M. (2023). Dual-task zumba gold for improving the cognition of people with mild cognitive impairment: a pilot randomized controlled trial. *The Gerontologist*, *63*(7), 1248-1261. [Google Scholar] [Publisher] https://doi.org/10.1093/geront/gnac081

Parial, L. L., Lam, S. C., Sumile, E. F., & Leung, A. Y. M. (2022). Mix-and-Match or Mismatch? Exploring the Perspectives of Older Adults About Zumba Dance and Its Potential Utilization for Dual-Task Training. *Journal of aging and physical activity*, *30*(5), 893-905. [Google Scholar] [Publisher] https://doi.org/10.1123/japa.2021-0293

Parial, L. L., Leung, A. Y. M., Sumile, E. F., & Lam, S. C. (2021). Pilot testing of Dual-task Zumba Gold (DTZ) for community-dwelling people with mild cognitive impairment: A mixed-methods study. *Geriatric Nursing*, *42*(6), 1397-1407. [Google Scholar] [Publisher] https://doi.org/10.1016/j.gerinurse.2021.09.013

Puspodari, P., & Prasetiyo, R. (2022). Effectiveness of Zumba Exercise on Maximum Oxygen Volume, Agility, and Muscle Power in Female Students. *Physical Education Theory and Methodology*. [Google Scholar] [Publisher] https://doi.org/10.17309/tmfv.2022.4.04

Ramazani Baghmisheh, L., Salehian, M.H., Hosseinzadeh Peyghan, R. (2023). The Effectiveness of Paaryaad and Braitonic Training on Executive Functions of Children with Learning Disabilities. Med & Health Dec 2023; 18(2): 465-479. *Med & Health*, 18(2): 465-479. [Google Scholar] [Publisher] https://doi.org/10.17576/MH.2023.1802.11

Salehian, M. H., Hosseinzadeh Peyghan, R. (2023). Effects of Teaching Style on Prosocial and Antisocial Behaviors among Children. *Journal of Modern Psychology*, 3(1), 28-37. [Google Scholar] [Publisher] https://doi.org/10.22034/jmp.2023.406019.1062

Seyedi Asl, S. T., Rahnejat, A. M., Elikaee, M. M., Khademi, M., Shahed-HaghGhadam, H., & Taghva, A. (2020). The role of resilience, positive/negative emotions, and character strengths in predicting burnout of military personnel. *EBNESINA*, *22*(4), 4-13. [Google Scholar] [Publisher]

Seyedi Asl, S. T., Sadeghi, K., Bakhtiari, M., Ahmadi, S. M., Anamagh, A. N., & Khayatan, T. (2016). Effect of group positive psychotherapy on improvement of life satisfaction and the quality of life in infertile woman. *International journal of fertility & sterility*, *10*(1), 105. [Google Scholar] [Publisher] https://doi.org/10.22074/ijfs.2016.4775

Shafaei, H., Najafzadeh, F., Shakki, M., & Ghorbani, S. (2024). Associations between Physical Activity and Quality of Life, Happiness, and Depression among Elderly Women. *Women's Health Bulletin*, *11*(2), 104-111. [Google Scholar] [Publisher] https://doi.org/10.30476/whb.2024.101984.1276

Shafaei, H., Rezaei, N., Mohammadi, S., & Ghorbani, S. (2024). Correlations between Physical Activity and Social Health, Moral Development and Physical Fitness among Middle School Students. *International*

Journal of School Health, *11*(2), 97-104. [Google Scholar] [Publisher] https://doi.org/10.30476/intjsh.2024.101704.1388

Shams, A. (2024). The Effect of a Group-Based Play Therapy on Executive Function, Working Memory and Self-Efficacy in Children with ADHD. *Physical Activity in Children*, *1*(1), 45-51. [Google Scholar] [Publisher] https://doi.org/10.61186/pach.2024.463981.1012

Stonnington, C. M., Krell-Roesch, J., Locke, D. E., Hentz, J. G., Dueck, A. C., Geda, Y. E., ... & Caselli, R. J. (2020). Impact of Zumba on cognition and quality of life is independent of APOE4 carrier status in cognitively unimpaired older women: A 6-month randomized controlled pilot study. *American Journal of Alzheimer's Disease & Other Dementias®*, *35*, 1533317519868370. [Google Scholar] [Publisher] https://doi.org/10.1177/1533317519868370

Taghva, A., Seyedi Asl, S. T., Rahnejat, A. M., & Elikaee, M. M. (2020). Resilience, emotions, and character strengths as predictors of job stress in military personnel. *Iranian journal of psychiatry and behavioral sciences*, *14*(2). [Google Scholar] [Publisher] https://doi.org/10.5812/ijpbs.86477

Waer, F. B., Chaari, F., Fendri, T., Laatar, R., Rebai, H., & Sahli, S. (2024). The relationship between postural control and cognitive functioning following Zumba dancing in middle-aged women: A randomized clinical trial. *Journal of Women & Aging*, *36*(4), 273-285. [Google Scholar] [Publisher] https://doi.org/10.1080/08952841.2024.2325195