



Examining The Effects Of Performing Individual Fitness Exercise In The Form Of Group Fitness Exercises On Some Parameters

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Abstract

This study was conducted to examining the effects of performing individual fitness exercise in the form of group fitness exercises on some parameters. The sample of the study consists of a healthy male individual (N=18) Participants were divided into two equal study groups Group Fitness Group (GFG) (n=9) and Individual Fitness Group (IFG) (n=9). GFG applied for the exercise program as a group fitness activity, while IFG applied for the same program individually 2 days a week for 8 weeks. To determine the muscle strength ratios of the participants; fitness tests were applied. Body fat ratio was determined using a skinfold caliper, and balance ability was determined by a static balance test on the sigma balance platform. Within the scope of the research model, which was designed as a statistical procedure, the Two-Way Repeated Measures ANOVA test was applied to compare the between-group and in-group values of the participants. According to the results of the research, in the evaluation between the groups, it was determined that there was no statistically significant difference in all values ($p>0.05$). According to the results of the study, although it was determined that performing group fitness exercises individually or in a group did not cause different effects on increasing the physical performance of individuals, It was seen that the increase in all pre-and post-test scores of GFG was higher than IFG.

Key Words: Group fitness, Individual fitness, Strength, Balance, Body composition

Grup Fitness Egzersizlerinin Bireysel Olarak Yapılmasının Bazı Parametreler Üzerindeki Etkilerinin İncelenmesi

Özet

Bu çalışma grup fitness egzersizlerinin bireysel olarak yapılmasının bazı parametreler üzerindeki etkilerinin incelenmesi amacıyla yapılmıştır. Araştırmanın örneklemini (N=18) sağlıklı erkek birey oluşturmaktadır. Katılımcılar, Grup Fitness Grubu (GFG) (n=9), Bireysel Fitness Grubu (BFG) (n=9) olarak iki eşit çalışma grubu şeklinde ayrılmıştır. GFG egzersiz programını grup fitness aktivitesi olarak, BFG ise aynı programı bireysel olarak 8 hafta boyunca haftada 2 gün uygulamıştır. Katılımcıların kas kuvveti oranlarını belirlemek için; fitness testleri uygulanmıştır. Vücut yağ oranı skinfold kaliper kullanılarak, denge becerisi ise sigma balance platform üzerinde statik denge testiyle belirlenmiştir. İstatistiki işlem olarak kurgulanan araştırma modeli kapsamında, katılımcıların gruplar arası ve grup içi değerlerinin karşılaştırılması amacıyla Two-Way Repeated Measures ANOVA testi uygulanmıştır. Araştırma sonuçlarına göre katılımcıların gruplar arası değerlendirmede tüm değerlerde istatistiksel olarak anlamlı farklılığın olmadığı tespit edilmiştir ($p>0,05$). Araştırmanın sonuçlarına göre grup fitness egzersizlerinin bireysel veya grup halinde yapılmasının bireylerin fiziksel performansını arttırmada, farklı etkilere neden olmadığı tespit edilmekle birlikte, GFG'ye ait tüm ön ve son test skorlarında BFG'ye göre artışın daha fazla olduğu görülmektedir.

Introduction

The term fitness is derived from English and means health, wellness, efficiency. This term is often used in conjunction with ability. In addition, fitness refers to the ability to quickly return to the initial state/resting state after heavy loads. Concepts such as health are concepts that develop together with the concept of fitness (Röthig & Prohl, 2003). These activities, generally applied as recreational exercise activities, can be healthy and beneficial only if these exercise programs are carried out following the purpose. These exercise protocols applied in fitness centers should be explicitly planned for different age groups and gender (Kurt, Hazar, Ibiş, Altay & Kurt, 2010).

It is thought that it is important to individualize fitness exercises as in all other exercise applications and to do them with different exercise models. Individual fitness exercises, which are one of these models; It is a form of education in healthy individuals, which consists of the application of a program determined by an instructor or individually decided by an individual in a gym or a fitness center (Çolak, 2008). Individual fitness; At the same time, it can be defined as an education that helps individuals to increase their physical fitness levels and/or achieve their health-related goals through one-to-one practices, in a safe environment, and appropriate exercises (Reiff et al., 1996). Fact that these pieces of training and training processes include a series of scientific measurements, the form status of the client can be followed instantly by the trainer, and they have an uninterrupted guidance process distinguish them from traditional and other group training methods. In addition to the fact that individuals feel their health is at risk, their desire to strengthen their self-confidence (Kipp, 2016) and their position in the society (Schmidt, 2015) by making their bodies more aesthetic or desirable can be counted as another reason for them to prefer a personal trainer.

The other exercise model that is the subject of our research is group fitness exercises, a form of exercise training in which the movements performed with the participation of two or more people are accompanied by a trainer. Group exercise training is important in line with the demands of individuals to exercise under supervision and control. In some studies, it has been determined that group exercise training has a positive effect on the quality of life (Yakut, 2006). Performing group exercise training through positive communication and sharing among individuals and active

participation in the presence of a trainer or physiotherapist is important in terms of increasing recovery, improving performance, and providing adaptation and motivation. In group fitness training, individuals will be able to gain the proper form of movements in a short time through visual imagery. This method, which is used during group fitness training, keeps the individual's interest in concentration and exercise alive. The contact of individuals in the group with each other positively affects the feedback received from the exercise (Yakut, 2006; Olney et al., 2006). This study was conducted to examining the effects of performing individual fitness exercise in the form of group fitness exercises on some parameters

Method

Study Group

The sample of the study consists of a healthy male individual (N=18) with an average age of 20 and at least 5 years of regular fitness strength training history. Participants were divided into two equal study groups as Group Fitness Group (GFG) (n=9) and Individual Fitness Group (IFG) (n=9).

Data Collection Tools

Fitness Tests

Push-up: In order to determine the chest, arm and shoulder muscle strength ratios of the participants, the maximum number of push-ups they did in a single push-up position for 30 seconds at the beginning, until the body touched the ground (elbows 90 degrees) and when they came back to the starting position, with the elbows straight and tense, were recorded.

Sit-up: In order to determine the dynamic body strength ratios of the participants, as many sit-ups as possible in a 30-second period were performed and scores were recorded at once, on their backs on the floor and feet in a bent position, hands together on the chest, while the soles were completely on the mat.

Plank: In this test, participants' bodies are in pronation and in a straight line to determine static core strength and endurance. Only the elbows, forearms, and toes touch the ground, and the

legs are shoulder-width apart. The time that the participants could stand in the correct position was recorded at one time.

Wall squat: In order to determine the leg strength and endurance of the participants, the maximum time they could stand at one time, in the head upright position, feet shoulder-width apart, back (upright) and hips touching the wall, after the knees were lowered down to 90 degrees, was recorded.

Anthropometric measurement

Skinfold caliper: In order to determine the subcutaneous fat tissue ratio of the participants, the Jackson/Pollock 4 Caliper Method was used to measure the abdominal, thigh, triceps, and suprailiac regions with a skinfold caliper, and the results were calculated with a mathematical formula. Measurements were applied to the right side of the body and to each region twice.

- J-P(Jackson-Pollock) Methods

For man (total of three body's part) abdominal + thighs + triceps+suprailiac = total of skinfolds

Body Density = $1.10938 - (0.0008267 \times ST) + (0.0000016 \times ST^2) - (0.0002574 \times \text{age}) \%$
Body Fat = $(495 / \text{Body Density}) - 450$ http://www.linear-software.com/online.html#google_vignette.

Balance: Static balance measurements of the participants were made on the SIGMA Balance Platform with the eyes open, on both legs and standing, with a 30-second stabilometric test application. As a result of the measurement, the average deviation rates of the participants from the platform center point to the x-axis are in cm, the average deviation rates towards the x-axis are also in cm/sec, and the frequency and intensity of vibration were calculated also in Hz.

Exercise Design

The exercise program is designed to increase strength and resistance and to balance calorie consumption and body composition. The group fitness exercise program consists of three parts, warm-up exercises for the movements to be performed in first part. In the second part, the main movements were performed using body weight and additional resistance units, and in the last part, the program was completed with static stretching for cool down. Both groups performed the main

part for 45 minutes, using various resistance apparatus, at the set, repetition, tempo, and resting rates indicated in the table. Participants who did group fitness exercises applied for the exercise program as a group with choreography accompanied by music at 130 BPM, and the individual fitness group applied for the same program individually without music, 2 days a week for 8 weeks, with the classical method (AFAA, 2019)

Table 1
Fitness Exercise Program

WARM UP – MOVEMENT PREP	SETS-REPS	TIME	INTENSITY	REST
SMR pre-class				Minimal
Static stretch: hip flexors, chest, lats				Minimal
Planks	3		progressing each time	Minimal
Floor bridges	2x12			Minimal
Floor crunches	1x12			Minimal
Single-leg squat, all planes of motion	1x5-10			Minimal
BODY OF WORKOUT	SETS-REPS	TIME	TEMPO	REST
Squat Curl to Press	16	3	2/2, 3/1, 1/1	No
Lunge to Balance	16	3	2/2, 3/1, 1/1	No
Push-ups	16	3	2/2, 3/1, 1/1	No
Lunge with Rotation	16	3	2/2, 3/1, 1/1	No
Squat to Press	16	3	2/2, 3/1, 1/1	No
Single-leg Squat	16	3	2/2, 3/1, 1/1	No
Single-leg Squat Touchdown	12	3	2/2, 3/1, 1/1	No
Push-up with Rotation	8	3	2/2, 3/1, 1/1	No
TRANSATION				
SMR		3-5 Minutes		
Static Stretch		3-5 Minutes		

Data Analysis

The analysis of the data obtained for the comparison of the pre-test-post-test values of body composition, strength, and balance levels within and between groups was made in the SPSS-25.0 package program. Parametric and non-parametric distribution of the scores were examined by examining the parametric and non-parametric distribution curves, skewness-kurtosis values. As a statistical procedure, Two-Way Repeated Measure ANOVA analysis was used to determine the effect of training groups over time (pre-test and post-test). To represent the magnitude of the

relationship between variables, (for effect size) $r = 0.10$ small, 0.30 medium, and 0.50 large effect values (Cohen, 1988).

Results

Table 2

Pre-Test And Post-Test Values Of Participants' Body Composition Measurements

Parameters	Groups	N	Pre-test	Post-test	F	*p	η^2
			X±Ss	X±Ss			
Weight (kg)	GFG	9	75.24±13.63	75.04±13.17	.300	.592	.018
	IFG	9	71.51±12.64	72.12±12.15			
	Total	18	73.37±12.89	73.58±12.38			
					F: .388, p: .542, η^2 : .024 *F: 1.510, p: .237, η^2 : .086		
Body Mass Indeks (BMI)	GFG	9	23.43±2.84	23.38±2.70	.276	.606	.017
	IFG	9	22.60±3.06	22.79±2.85			
	Total	18	23.02±2.90	23.09±2.71			
					F: .461, p: .507, η^2 : .028 *F: 1.444, p: .247, η^2 : .083		
Body Fat Percentage (%)	GFG	9	15.56±4.99	13.95±5.14	.008	.930	.000
	IFG	9	14.54±5.52	14.54±5.19			
	Total	18	15.05±5.13	14.25±5.02			
					F: 8.636, p: .010, η^2 : .351 *F: 8.732, p: .009, η^2 : .353		

GFG: Group Fitness Group, IFG: Individual Fitness Group, *Comparison between groups (Tests of between-subjects effects), ** In-group comparison (Tests of within-subjects effects, between Pre-test and post-test), *** Interaction (Tests of within-subjects effects, Time*group), $p=0.05$

As a result of the analysis, there was no significant relationship between the participants' in-group body weight (F: .388, p: .542) and the pre-and post-test values of the body mass index ratio (F: .461, p: .507). and body fat percentage (F: 8.636, p: .010) was found to be a significant relationship. There was a significant correlation between the groups in body weight (F: .300, p: .592), body mass index (F: .276, p: .606), and body fat percentage (F: .008, p: .930) between the groups. found not to exist. When the eta square values were examined, it was determined that the effect ratio was in the body weight (.086) and body mass index (.083) values, but it was not statistically significant. In body fat percentage, the effect value (.353) was found to be moderate and significant. Among these adaptive responses, the use of lipids instead of carbohydrates with exercise is directly proportional to the increase in the amount of oxygen carried to the muscle.

Table 3

Pre-Test And Post-Test Values Of The Participants' Static And Dynamic Force Measurements

Parameters	Groups	N	Pre test	Post test	F	*p	η^2
			X±Ss	X±Ss			
Sit-up	GFG	9	21.67±5.14	24.33±6.40	.668	.426	.040

	IFG	9	18.00±9.20	22.44±8.15			
	Total	18	19.83±7.47	23.39±7.18			
			F: 21.141, p: .000, η^2 : .569		*F: 1.321, p: .267, η^2 : .076		
Push-up	GFG	9	26.56±9.00	35.56±8.44	.041	.842	.003
	IFG	9	30.11±9.59	33.67±8.36			
	Total	18	28.33±9.21	34.61±8.21			
			F: 82.116, p: .000, η^2 : .837		*F: 15.441, p: .001, η^2 : .491		
Plank	GFG	9	92.56±34.78	128.78±41.78	.453	.510	.028
	IFG	9	119.78±60.13	137.22±84.84			
	Total	18	106.17±49.67	133.00±65.02			
			F: 11.308, p: .004, η^2 : .414		*F: 1.384, p: .257, η^2 : .080		
Squat	GFG	9	120.33±52.98	176.22±95.07	2.043	.172	.113
	IFG	9	91.22±31.55	112.78±106.82			
	Total	18	105.78±44.87	144.50±103.38			
			F: 5.008, p: .040, η^2 : .238		*F: .984, p: .336, η^2 : .058		

GFG: Group Fitness Group, IFG: Individual Fitness Group, *Comparison between groups (Tests of between-subjects effects), ** In-group comparison (Tests of within-subjects effects, between Pre-test and post-test), *** Interaction (Tests of within-subjects effects, Time*group), $p=0.05$;

As a result of the analysis; participants' in-group sit-up (F: 21.141, p: .000), push-ups (F: 82.116, p: .000), plank (F: 11.308, p: .004) and squat (F: 5.008, p: .040) A significant relationship was found between test scores. In the comparison between groups, sit-up (F: .668, p: .426), push-ups (F: .041, p: .842), plank (F: .453, p: .510) and squat (F: 2.043, p: .172), it was determined that there was no significant relationship between test scores. It was determined that the training effect size (eta square values) was found in the sit-up test scores (.076), plank test scores (.080), and squat test scores (.058), but it was not statistically significant. It was determined that the push-up scores (.491) were mid-level and found to be significant.

Table 4
Pre-test and post-test values of participants' static balance measurements

Parameters	Groups	N	Pre test	Post test	F	*p	η^2
			X±Ss	X±Ss			
Balance Deviation Rate	GFG	9	.10±.08	.03±.10	1.075	.315	.063
	IFG	9	.10±.09	.10±.08			
	Total	18	.10±.09	.06±.09			
			F: 2.106, p: .166, η^2 : .116		*F: 1.486, p: .240, η^2 : .085		
Balance Speed Rate	GFG	9	.49±.11	.41±.09	.612	.446	.037
	IFG	9	.47±.09	.36±.07			
	Total	18	.48±.10	.39±.08			
			F: 51.998, p: .000, η^2 : .765		*F: 1.740, p: .206, η^2 : .098		
Balance Path Width	GFG	9	14.09±3.21	11.94±2.97	.346	.565	.021
	IFG	9	13.53±2.73	10.96±2.46			
	Total	18	13.81±2.91	11.45±2.69			
			F: 46.745, p: .000, η^2 : .745		*F: .383, p: .545, η^2 : .023		
Balance Area	GFG	9	.02±.01	.02±.01	.041	.841	.003
	IFG	9	.02±.01	.02±.01			

Total	18	.02±.01	.02±.01
		F: 5.878, p: .028, η^2 : .269	*F: .163, p: .692, η^2 : .010

*GFG: Group Fitness Group, IFG: Individual Fitness Group, *Comparison between groups (Tests of between-subjects effects), ** In-group comparison (Tests of within-subjects effects, between Pre-test and post-test), *** Interaction (Tests of within-subjects effects, Time*group), p=0.05'*

As a result of the analysis, pre-and post-tests on the participants' in-group balance speed rate (F: 51.998, p: .000), balance path width (F: 46.745, p: .000), and balance area (F: 5.878, p: .028) It was determined that there was a statistically significant relationship between the two and the balance deviation rate (F: 2.106, p: .166) was not statistically significant. In the comparison between groups, balance deviation rate (F: 1.075, p: .315), balance speed rate (F: .612; p: .446), balance path width (F: .346, p: .565) and balance deviation rate (F: 1.075, p: .315) total balance area (F: .041, p: .841), it was determined that there was no statistically significant difference in the development rate of pre-and post-test values. When the eta square values are examined, the balance deviation rate (.085), the balance speed rate (.098), the balance path width (.023), and the balance area value (.010) were determined. According to the results, it is seen that the impact rate is low and there is no statistically significant relationship. Balance is a very complex skill, and in this and similar studies, it is thought that specific programs should be designed to improve the sensory, auditory and visual parameters of balance with different exercise techniques and the results should be evaluated with different measurement techniques.

Discussion and Conclusion

In our study, examining the effects of performing individual fitness exercise in the form of group fitness exercises on development of strength, body composition, and balance were examined. A statistically significant relationship was found in the ratios of body fat percentages of all participants, both within the group and in the exercise effect size evaluations. It was determined that this change was not the same between the groups. In his study, Badat found similar values to the results of our study in the body composition values of individuals who took part in individual and group exercise training (Badat, 2018). It is known that adaptive responses to exercise, which is one of the factors affecting body composition, occur in different ways. Among these adaptive responses, the use of lipids instead of carbohydrates with exercise is directly proportional to the increase in the amount of oxygen carried to the muscle (Gültekin, 2016). In this context, it is thought that regardless of the type and method of exercises that provide strength increase and muscle activation, they will reduce the body fat ratio. A statistically significant relationship was

found in all ratios of the pre-test and post-test values of the participants' in-group static and dynamic strength measurements. It was determined that this change was not similar between the groups. In the evaluation of the exercise effect size, it was determined that the effect ratio on the push-up test scores was moderate. Yakut et al. (2006) also obtained similar results in their study. Again, the results of the studies of Desbiens et al. (2017) show parallelism with the results of our research. When the studies in the literature are examined, it is seen that exercise training done regularly and at certain intervals has a positive effect on the increase in strength, in parallel with the results we obtained in our study. The fact that participating in exercise training individually or as a group did not make a significant difference in strength increase in our study was supported by other literature studies (Santos, et al., 2012; Guy et al., 2001). The fact that physical activity is applied either as a group or individually does not constitute a disadvantage in any case. If individuals prefer individual or group exercise according to their wishes, exercise plays an active role in increasing muscle strength (Desbiens et al., 2017). In our study, a statistically significant relationship was found in the group evaluations of the participants' balance skills in speed, path, and area test score results. No statistically significant relationship was found in the exercise effect size evaluations. It is known that there is more than one system controlling the balance in the organism, and it is thought that in this and similar studies, specific programs should be designed in order to develop all parameters of balance separately with different exercise techniques and the results should be evaluated with different measurement techniques. Barnett et al. (2003) determined that group exercise training had a positive effect on the development of balance skills. In a study conducted by Angin (2008), it was stated in the literature that group exercises performed with a physiotherapist are effective in improving balance. As a result of this study, it was determined that doing group fitness exercises individually did not cause different effects on increasing the physical performance of individuals; however, it was observed that the increase was slightly higher in all pre-and post-test raw scores of GFG compared to IFG. This increase, especially in applications with higher difficulty levels, suggests that the stress that exercise will create on the organism is not only physical but also those different methods that can work in controlling the level of mental stress. It is thought that choreographically performing group fitness exercises with more than one person accompanied by music will be effective in dispersing the boring and monotonous air that may occur in individual exercises, and thus in providing motivation.

Recommendations

To contribute more to similar studies in the future, we will make some suggestions based on the data obtained in this study:

- The number of samples in the study may be larger.
- Similar studies can be conducted on female participant groups.
- Similar studies can be done on athletes.
- By using various questionnaires and scales, the psychosocial effects of the exercise/training programs applied to the participants can be examined.
- Different exercise/training protocols can be applied.
- The development of different motor and technical skills can be examined.

Information about the ethics committee permission: Responsibility for any violations that may arise in the work done belongs to the author.

Ethics approval

Ethical approval of the study was obtained from the ethics committee of İstanbul Gelişim University (Approval No: 2022-11-32, Date: 24/06/2022).

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