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EFFECTS OF PHYSICAL EXERCISE ON ABILITY MEASURED BY FMS TESTS AND MENTAL HEALTH OF MIDDLE-AGED PERSONS[9]

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Abstract: The aim of the research was to determine the impact of physical exercise on: 1. abi-lities measured by FMS tests, 2. the impact of physical status on the mental health of middle-aged people and 3. body composition. The research used a quasi-experimental design (test-retest). 20 respondents (11 men and 9 women) were included in this paper. The average age of the respondents is 52.3 years, average body height 169.4 cm, average body weight 78.62 kg. All respondents live in the territory of the United Arab Emirates, where they are physically minimally active or completely inactive. Body impedance (InBody120), FMS device and survey questionnaire were used in the research. Descriptive statistics and T-test were used for data processing. The results showed that there is a statistically significant difference in the variables that were measured at the beginning and after the application of the defined exercise program (test-retest), in the variable point score-FMS test ($p = 0.000$) and in the satisfaction questionnaire ($p < 0.05$). However, the exercise program had no effect on body com-position because it focused on trunk mobility and stabilization exercises.

Keywords: FMS tests, questionnaire, body composition

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Introduction

The term fitness has become completely domesticated in our speech, so it is no longer translated. Matić states that the word fit is of English origin and means everything that modern programs and movements of physical culture want a person to be, i.e. suitable, fit, right, good, capable, ready, ready, healthy (Matić, 1998).

FMS is a method created in 1995 and founded by Gray Cook, Lee Burton and Kate Fields, but only in the last few years has it become an indispensable tool in the physical preparation of professional athletes, as well as recreational ones. It is used to identify limitations or asymmetries in seven fundamental movement patterns that are critical to the functional quality of an individual's movement. These forms are designed to assess the ability of the locomotor apparatus, mainly through stability (resisting unwanted forces, as well as the ability to control force and power) and mobility (appropriate movement in a joint), (Functional Movement Screen). Any deviations in relation to the correct performance of the exercise, which is characterized by balance, speed, coordination of movements, followed by the least possible expenditure of energy, are noticed. The basic idea on which FMS is based is the assumption that every muscle and joint system must fulfill its function in order for the body to have a high level of functionality. Through such testing, we can obtain information about asymmetries and limitations, which is of great importance for training programming.

The main goal of the research is to determine the effect of physical exercise on the exerciser's abilities measured by FMS (Functional Movement Screen) tests and the mental health of middle-aged people.

Materials and Methods

The sample of respondents consisted of male and female adults, the number of respondents was 20, aged between 40 and 60 years. There were 11 male and 9 female respondents. The average age of the respondents is 52.3 years. The average body height of the subjects is 169.4 cm, the average body weight of the subjects is 78.63 kg. Before the research, the respondents led a sedentary lifestyle. All respondents were informed about the research before the beginning and voluntarily agreed to participate. The main condition for participation in the research is that the person lives in the United Arab Emirates, that he is physically minimally active or completely inactive.

Study design and research protocol

The research used a quasi-experimental design (pretest-posttest), that is, a design with initial and final measurements, which lasted six weeks. In the mentioned period, a program of activities lasting one hour, three times a week in the gym or at home, was implemented. The task of this program is not the process of losing weight, but rather the correction of postural status, through mobility, flexibility, stability and basic strength exercises that do not require the use of complex props, but only your own body. After the initial test, the respondents received an exercise program the next day. The program was held three times a week, lasting from 45 minutes to 1 hour.

The exercise program was divided into an introductory-preparatory, main and final part. Introductory - preparatory part consisted of two parts: neuromuscular stimulation and stabilization. The main part consisted of mobility exercises and strength exercises. The final part was unloading and rehydration.

In the introductory-preparatory phase, we have two subphases, neuromuscular stimulation and stabilization. Neuro-muscular stimulation had the task of stimulating and activating a specific muscle region, i.e. warming up the muscle apparatus using rollers, stimulating a large group of muscles and tennis balls, which had the task of activating a specific region of the body. Trunk stabilization is the primary function of the trunk muscles. Through isometric exercises, the working temperature increases, and thus the efficiency of the trunk, whose task is to evenly transfer forces from the upper to the lower part of the body and vice versa.

In the main phase of the program, we also have two sub-phases, mobility and strength exercises. Mobility is done immediately after stabilization. 1-2 series are done, depending on the physical condition, and 12 to 15 repetitions in a series. The exercises are dynamic in nature, but the tempo of the exercise is controlled, which means that the subject has complete control over the movements. These exercises fully activate the joint regions of the body, increase the range of motion and prepare the musculoskeletal system. In this phase, exercises have the greatest advantage precisely in that region, which is the most threatened. This phase is followed by the second phase - strength exercises.

Strength exercises are done in two to three sets, with 12 to 15 repetitions each. In this phase, all large muscle groups are worked. Elastic bands and mini bands are used. This phase has the task of triggering the central nervous system for muscular adaptation.

The final phase has the task of gradually relaxing the body and rehydrating. The respondents were tasked with keeping records of how they felt before, during and after training.

They implemented the program at home or in a fitness center.

After six weeks, the final measurement (retest) was performed. All subjects adhered to the basic requirements and had no other form of physical activity. Also, the respondents were physically healthy, i.e. no medical barrier to participation in the exercise program was identified.

Variables

Body composition variables

Bioelectric impedance (BIA) represents one of the most effective, fast, relatively cheap and valid methods of body composition analysis. The reliability of the result depends on the quality of the device, the training of the person performing the analysis, the accurately measured height and weight, the position of the extremities (extremity angle of 30^{o}-45^{o} in relation to the body), that the subject has not taken food a few hours before the analysis, that his bladder is empty, that he did not practice physical activity, depends on the phase of the menstrual cycle. People who have a pacemaker and pregnant women are not recommended to use this measurement method (Đurđević, 2021).

The data processed were:

TBW – *Total Body Water*,
Protein,
Minerals,
BFM – *Body Fat Mass*,
WT – *Weight*,
SMM – *Skeletal Muscle Mass*,
BMI – *Body Mass Index*,
PBF – *Percent Body Fat*,
InBS – *InBody Score*,
WHR – *Waist-Hio Ratio*,
VFL – *Visceral Fat Level*.
Variables of FMS tests
FMS is intended for everyone regardless of gender, age, profession, the test should not last longer than 15 minutes and contains seven tests:
Deep Squat
Hurdle Step
In-line Lumge
Shoulder Mobility

Active Straight Leg Raise
Trunk Stability Push Up
Rotary Stability

Grading is done with grades from 0 to 3.*(FMS Scoring Criteria-1.pdf)*

Score 3 – Test performed without any compensations

Score 2 – Test performed with certain compensations

Score 1 - The test cannot be performed even with compensations

Score 0 – Pain occurs during the performance of any test

With FMS tests, there is no need to use the variables of all 7 tests, for the reason that at the end of the test, the total result is added up, which is a guide towards progression and a positive result. The maximum score is 21.

Tscore – (Total Score Tests 1-7), Total result of FMS testing, expressed in points from 1-21.

There are also so-called Three clearing tests are done after shoulder mobility, push-ups, and rotational stability to make sure there is no pain that didn't show up on those tests.

Survey questionnaire variables

With the survey questionnaire, we have 10 questions that the respondents filled in after the FMS test. They filled out the questionnaire in both the initial and final measurements.

T_P1 – Test question number 1. How would you rate your overall general health?

T_P2 – Test question number 2. How would you rate the performance of the FMS test?

T_P3 - Test question number 3. How would you rate the performance of the overhead squat?

T_P4 – Test question number 4. How would you rate your health in the last four weeks?

T_P5 – Test question number 5. Does your current physical condition limit your activities?

T_P5a - Test question number 5a. Running, lifting heavy objects, participating in intense sports activities,

T_P5b - Test question number 5b. Moderate activities, cycling, housework, gardening, etc.

T_P5c - Test question number 5c. Lifting and carrying bags from the supermarket,

T_P5d - Test question number 5d. Walking, brisk walking, climbing stairs,

T_P5e - Test question number 5e. Bending, kneeling, stooping,

T_P6 – Test question number 6. Does your current physical condition limit your time during activities?

T_P7 – Test question number 7. Have you experienced physical pain in the past 4 weeks?

T_P8 – Test question number 8. How did physical limitations affect you emotionally while doing any activity in the last 4 weeks?

T_P9 – Test question number 9. How much have your social activities been disrupted in the last 4 weeks, due to your health condition and emotional problem? (Such as visiting friends, relatives, etc.)

T_P10 – Test question number 10. Has physical activity changed your physical and emotional state in the last 4 weeks? (Only if you were active)

R_P1 – is the mark for retest questions in the order they were done after the completion of the entire research paper.

Data collection

In the research, the FMS device and FMS paper, portable bioimpedance (INBODY120, n.d.) and a survey questionnaire, which contains ten questions, related to the self-assessment of the quality of life related to the current physical and mental state of the respondents, were used as means of data collection.

Statistical analysis

For statistical data processing, descriptive statistics T-test analysis was used, which is considered to be the most reliable in this type of testing. The test results were first entered from paper into the Microsoft Excel Worksheet program, where they were selected, and then transferred to the statistical package SPSS 20.

Results and discussion

Table 1. shows the descriptive indicators of the physical test and retest variables composition in middle-aged people.

Table 1. Descriptive indicator of body composition variables in middle-aged people.

	Varijable	Mean	Std. Deviation	%cV	Minimum	Maximum
TEST	TBW	39.07	9.665	24.737	24	58
	Protein	10.53	2.634	25.030	7	16
	Minerals	3.71	0.814	21.965	2	5
	BFM	25.31	8.991	35.532	15	49
	WT	78.63	18.716	23.804	50	128
	SMM	29.76	7.965	26.769	18	46
	BMI	27.29	4.992	18.292	21	41
	PBF	32.07	7.008	21.853	18	47
	InBS	69.00	6.657	9.648	54	89
	WHR	0.92	0.049	5.320	0.83	1.01
	VFL	11.25	4.459	39.634	6	20
RETEST	TBW	38.92	9.607	24.687	25	59
	Protein	10.57	2.703	25.575	7	16
	Minerals	3.72	0.821	22.061	2	5
	BFM	25.38	9.310	36.688	14	49
	WT	78.75	18.396	23.362	54	129
	SMM	29.93	7.976	26.652	18	47
	BMI	27.27	4.939	18.111	21	41
	PBF	31.97	7.670	23.995	17	47
	InBS	68.95	7.207	10.453	54	91
	WHR	0.92	0.046	4.933	1	1
	VFL	11.30	4.555	40.309	6	20

TBW – Total Body Water; Protein; Minerals; BFM – Body Fat Mass; WT – Weight; ; SMM – Skeletal Muscle Mass; BMI – Body Mass Index; PBF – Percent Body Fat; InBS – InBody Score; WHR – Waist-Hio Ratio; VFL – Visceral Fat Level

Table 2. shows statistical data on the body composition of middle-aged people.

Table 2. Statistical indicator of the overall result of the body composition T-test.

	Paired Differences							
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
T_TBW - R_TBW	0.155	1.103	0.247	-0.361	0.671	0.629	19	0.537
T_Protein - R_Protein	-0.045	0.300	0.067	-0.185	0.095	-0.671	19	0.510
T_Minerals- R_Minerals	-0.013	0.090	0.020	-0.055	0.029	-0.643	19	0.528
T_BFM - R_BFM	-0.070	1.532	0.343	-0.787	0.647	-0.204	19	0.840
T_WT - R_WT	-0.120	1.706	0.382	-0.919	0.679	-0.315	19	0.757
T_SMM - R_SMM	-0.170	0.753	0.168	-0.523	0.183	-1.009	19	0.326
T_BMI - R_BMI	0.020	0.749	0.167	-0.330	0.370	0.119	19	0.906
T_PBF - R_PBF	0.105	1.992	0.445	-0.827	1.037	0.236	19	0.816
T_InBS - R_InBS	0.050	2.282	0.510	-1.018	1.118	0.098	19	0.923
T_WHR - R_WHR	-0.007	0.036	0.008	-0.024	0.010	-0.877	19	0.392
T_VFL - R_VFL	-0.050	0.945	0.211	-0.492	0.392	-0.237	19	0.815

T_TBW – R_TBW – Test-Retest Total Body Water; T_Protein R_Protein – Test-Retest The amount of protein in the body; T_Minerals- R_Minerals – Test-Retest The amount of minerals in the body; T_BFM - R_BFM – Test-Retest Body Fat Mass; T_WT - R_WT – Test-Retest Weight; T_SMM – R_SMM – Test-Retest Skeletal Muscle Mass; T_BMI – R_BMI – Test-Retest Body Mass Index; T_PBF – R_PBF – Test-Retest Percent Body Fat; T_InBS – R_InBS – Test-Retest InBody Score; T_WHR – R_WHR – Test-Retest Waist-Hio Ratio; T_VFL – R_VFL – Test-Retest Visceral Fat Level

In the table of the 1st and 2nd test and retest of human body composition, the subjects did not show any specific changes in body composition. The research was not moderated in the direction of postural status, but in the direction of physical and mental status. Body composition as a measuring instrument is an integral part of testing, so it is included in the basic measuring instruments.

Konstantin P. Nikolozakes et al. (Nicolozakes, Schneider, Roewer, Borchers, & Hewett, 2017) investigated the effect of body composition on FMS scores in college football players. The results showed that there was a negative correlation between BMI and FMS indicating potential poor movement in athletes and poor test results. With this research, we can compare the negative correlation between the FMS test and body composition. The results obtained after the analysis are not significant statistical changes, which is also indicated by this research among athletes.

In order for the research to gain importance, it is necessary to focus the work on proper nutrition, changing basic life habits, as well as programming a different training program, which in its composition will have the effect of maintaining and progressive training of the cardio-vascular exercise system.

Tables 3 and 4 show the descriptive indicators of the variables and the statistical data of the test and retest in fms testing of middle-aged people.

Table 3. Descriptive indicator of the variables of the overall result in FMS testing.

	Varijable	Mean	Std. Deviation	%cV	Minimum	Maximum
TEST	TScore	13.30	1.720	12.931	11	16
RETEST	TScore	16.90	2.049	12.127	12	20

Tscore – Total fms test result;

Table 4. Statistical indicator of results in FMS testing.

	Paired Differences							
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
T_TScore - R_TScore	-3.600	1.789	0.400	-4.437	-2.763	-9.000	19	0.000

T_TScore – R_TScore – Test-Retest results.

Tables 3 and 4 show the processed results of the FMS test obtained in the conducted tests. Based on the obtained and analyzed results, it can be noted the existence of statistical significance in the tested TScore Test - Retest variables (results are in bold).

In Michael Shavchin's research (Sawczyn, 2020), the effect of strength training on the results of the FMS test in students with a higher risk of injury was investigated. The study showed a positive effect of strength training on the improvement of the total FMS score in students with a score below 14. The experimental group that participated in the functional strength training program significantly changed the total FMS scores after 12 weeks ($p < 0.05$). There were also significant differences in the total FMS score between the groups after the experiment ($p < 0.05$). Comparing the work with this research, we can establish the following results. The results obtained after the test and retest, their processing showed a statistically significant influence of the results T_TScore – R_Tscore ($p < 0{,}000$) on FMS performance. The overall result of the descriptive indicator Test TScore shows that the minimum score on the test was (min 11), and the maximum score on the test was (max 16). The total result Retest TScore shows that the minimum score on the retest was (min 12), and the maximum score on the retest was (max 20). With T_TScore - R_Tscore, the existence of statistical significance is noted in the statistical displays, where the total result of the FMS test - retest shows that there were statistically significant results ($p < 0.000$). What can be noticed is that there is a significant difference between the test and the retest, which indicates that the subjects had significant changes after completing the six-week program and significantly improved their general physical fitness.

In a study by Manuel Trinidad-Fernandez et al (Fernandez, Sanchez, & Vargas, 2019) also investigated whether an FMS score of less than 14 was associated with sports injuries. A systematic review and meta-analysis was conducted. In one of 12 studies, among female athletes, an FMS score < 14 out of 21 points was associated with injury. In other studies, it was 95% less, which indicates that less than 14 points on the test, it is not entirely clear whether it affects the injury.

Comparing with this research, the subjects had significant retest results, but we cannot guarantee and say that they are less susceptible to injuries, almost like this is the difference between athletes and generals.

In the research by Rebecca Schultz and colleagues (Shultz, Anderson, Matheson, Marcello, & Besier, 2013) investigated the test-retest relationship and reliability of the FMS, as well as to compare scoring by a single rater during a live test and the same videotaped test. The results showed a relatively good result of test-retest reliability when it comes to the same rater. However, observations have shown that caution should be used when comparing FMS scores among other raters, as there are experienced and novice raters. With this research, we can confirm the test-retest

correlation when the same evaluator evaluated the respondents, which we confirmed with positive test results. It would be good if another evaluator did the same research, then they would see the test-retest reliability and if they would have approximate statistical results.

Table 5 shows the descriptive indicators of the test and retest variables of the middle-aged persons questionnaire.

Table 5. Descriptive indicator of test and retest variables of the survey questionnaire.

Descriptive Statistics

	Varijable	Mean	Std. Deviation	%cV	Minimum	Maximum
TEST	T_P1	3.00	0.725	24.183	1	4
	T_P2	2.20	1.005	45.693	1	4
	T_P3	2.45	1.234	50.383	1	5
	T_P4	3.05	0.686	22.503	2	5
	T_P5a	1.60	0.681	42.535	1	3
	T_P5b	2.45	0.510	20.833	2	3
	T_P5c	2.70	0.571	21.157	1	3
	T_P5d	2.60	0.503	19.332	2	3
	T_P5e	2.00	0.459	22.942	1	3
	T_P5f	2.95	0.224	7.580	2	3
	T_P6	2.55	0.759	29.771	1	4
	T_P7	2.20	1.056	48.014	1	5
	T_P8	2.90	0.968	33.376	1	5
	T_P9	1.85	0.875	47.302	1	4
	T_P10	2.65	1.348	50.886	1	5
RETEST	R_P1	2.40	0.754	31.414	1	3
	R_P2	1.50	0.761	50.726	1	3
	R_P3	1.50	0.607	40.465	1	3
	R_P4	1.65	0.671	40.656	1	3
	R_P5a	2.10	0.718	34.199	1	3
	R_P5b	2.75	0.444	16.155	2	3
	R_P5c	2.85	0.366	12.854	2	3
	R_P5d	2.85	0.366	12.854	2	3
	R_P5e	2.35	0.489	20.824	2	3
	R_P5f	2.95	0.224	7.580	2	3
	R_P6	1.70	0.801	47.136	1	3
	R_P7	1.50	1.000	66.667	1	5
	R_P8	1.95	0.887	45.489	1	4
	R_P9	1.30	0.657	50.534	1	3
	R_P10	3.55	1.276	35.952	2	5

The questions are listed in the variables on pages 4.

Table 6 shows the statistical indicators of test and retest variables of the survey questionnaire among middle-aged people.

Table 6. Statistical significance of the questionnaire variable in percentages.

	percentage %						percentage %					
Question	**1**	**2**	**3**	**4**	**5**		**Question**	**1**	**2**	**3**	**4**	**5**
T_P1	5.0	10.0	65.0	20.0	0.0		R_P1	15.0	30.0	55.0	0.0	0.0
T_P2	25.0	45.0	15.0	15.0	0.0		R_P2	65.0	20.0	15.0	0.0	0.0
T_P3	25.0	35.0	15.0	20.0	5.0		R_P3	55.0	40.0	5.0	0.0	0.0
T_P4	0.0	15.0	70.0	10.0	5.0		R_P4	45.0	45.0	10.0	0.0	0.0
T_P5a	50.0	50.0	10.0				R_P5a	20.0	50.0	30.0		
T_P5b	0.0	55.0	45.0				R_P5b	0.0	25.0	75.0		
T_P5c	5.0	20.0	75.0				R_P5c	0.0	15.0	85.0		
T_P5d	0.0	40.0	60.0				R_P5d	0.0	15.0	85.0		
T_P5e	10.0	80.0	10.0				R_P5e	0.0	65.0	35.0		
T_P5f	0.0	5.0	95.0				R_P5f	0.0	5.0	95.0		
T_P6	10.0	30.0	55.0	5.0	0.0		R_P6	50.0	30.0	20.0	0.0	0.0
T_P7	30.0	30.0	35.0	0.0	5.0		R_P7	70.0	20.0	5.0	0.0	5.0
T_P8	5.0	30.0	40.0	20.0	5.0		R_P8	35.0	40.0	20.0	5.0	0.0
T_P9	40.0	40.0	15.0	0.0	5.0		R_P9	80.0	10.0	10.0	0.0	0.0
T_P10	25.0	25.0	20.0	20.0	10.0		R_P10	0.0	35.0	5.0	30.0	30.0

T_P1 – T (Test) P (Question) 1 (Ordinal number of questions); R_P1– R *(Retest) P (Question) 1 (Ordinal number of questions).*

Table 7. Statistical indicator of the results of the T-test of the survey questionnaire.

	Paired Differences							
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
T_P1 - R_P1	0.600	0.754	0.169	0.247	0.953	3.559	19	0.002
T_P2 - R_P2	0.700	1.031	0.231	0.217	1.183	3.036	19	0.007
T_P3 - R_P3	0.950	1.234	0.276	0.372	1.528	3.442	19	0.003
T_P4 - R_P4	1.400	0.940	0.210	0.960	1.840	6.658	19	0.000
T_P5a - R_P5a	-0.500	0.688	0.154	-0.822	-0.178	-3.249	19	0.004
T_P5b - R_P5b	-0.300	0.571	0.128	-0.567	-0.033	-2.349	19	0.030
T_P5c - R_P5c	-0.150	0.366	0.082	-0.321	0.021	-1.831	19	0.083
T_P5d - R_P5d	-0.250	0.444	0.099	-0.458	-0.042	-2.517	19	0.021
T_P5e - R_P5e	-0.350	0.587	0.131	-0.625	-0.075	-2.666	19	0.015
T_P6 - R_P6	0.850	0.813	0.182	0.470	1.230	4.677	19	0.000
T_P7 - R_P7	0.700	0.979	0.219	0.242	1.158	3.199	19	0.005
T_P8 - R_P8	0.950	1.191	0.266	0.393	1.507	3.567	19	0.002
T_P9 - R_P9	0.550	0.686	0.153	0.229	0.871	3.584	19	0.002
T_P10 - R_P10	-0.900	1.683	0.376	-1.688	-0.112	-2.392	19	0.027

T_P1 – T (Test) P (Question) 1 (Ordinal number of questions); R_P1– R *(Retest) P (Question) 1 (Ordinal number of questions).*

Table 6 shows the results of the test and retest of the survey questionnaire in percentages. After processing the data, a significant statistical change was shown in the respondents, which indicates a positive effect of the program on their mental satisfaction. The reliability of the obtained results shows a significant statistical impact on the mental health of middle-aged people.

Table 7 shows the significant statistical changes of the respondents in their mental satisfaction of the test - retest.

T_P1 – R_P1 How would you rate your overall general health? has significant statistical changes (p= 0.002), which indicates that their general health has improved and that the number of respondents who had poor health has

completely decreased, and the number of those who felt very good and excellent has increased.

T_P2 – R_P2 How would you rate the performance of the FMS test? has a significant statistical change (p= 0.007), which indicates that the number of respondents who showed satisfaction with the performance of the FMS increased, while the number of those who were dissatisfied decreased completely. The program of activities contributed to improving the technical correctness of the FMS performance.

T_P3 – R_P3 How would you rate the performance of the overhead squat? has a significant statistical change (p= 0.003), which indicates that the number of respondents who showed satisfaction with squatting has increased, while the number of dissatisfied and somewhat dissatisfied has completely decreased. The activity program contributed to improving abilities, eliminating compensatory movements, which resulted in a technically correct deep squat, where the subjects themselves noticed the difference and showed a high degree of satisfaction with it.

T_P4 – R_P4 How would you rate your health in the last four weeks? has a significant statistical change (p= 0.000), which indicates that the number of respondents who feel much better has increased than before the start of the program, but we also see that the percentage of respondents who felt worse has completely disappeared. The program contributed to a 100% change in both physical and mental status, which indicated a high degree of satisfaction among the respondents.

T_P5– R_P5 Да ли ваш тренутни физички статус ограничава ваше активности? has a significant statistical change T_P5a– R_P5a Running, lifting heavy objects, participation in intensive sports activities (p= 0.004), T_P5b– R_P5b Moderate activities, riding bicycles, working in the house, garden, etc. (p= 0.030), T_P5c – R_P5c Lifting and carrying bags from the supermarket (p= 0.083), T_P5d– R_P5d Walking, fast walking, climbing stairs (p= 0.021), T_P5e – R_P5e Bending, kneeling, stooping (p= 0.015), which indicates that the number of respondents who feel much better than before the start of the program has increased and that the activities that caused difficulties have completely disappeared. There is no significant statistical difference in the question T_P5c - R_P5c - (p= 0.083), which indicates that carrying bags did not pose a problem, because as the author of this research, I believe that carrying bags does not represent a problem in the motor sense compared to other activities that are quite more motorically demanding and include in their activity more complex movements and greater muscle activation.

T_P6 – R_P6 Does your current physical condition limit your time during activities? has a significant statistical change (p= 0.000), which indicates that their physical status does not limit their time during the activity compared to the time limited before the program itself. This can also affect mental satisfaction in a positive way. If the respondent does not feel well physically and has certain limitations, it will negatively affect his mental satisfaction as well as the result of the program itself.

T_P7 – R_P7 Have you experienced physical pain in the past 4 weeks? has a significant statistical change (p= 0.005), which indicates that the pain, which was moderate, almost completely disappeared, which indicates a positive result of the program. Anyone who experiences some kind of physical pain is bound to have negative effects on their mental state. With these results, we can say that pain reduction also has a positive effect on the mental state of a middle-aged person.

T_P8 – R_P8 How did physical limitations affect you emotionally while doing any activity in the last 4 weeks? has a significant statistical change (p= 0.002), which indicates that the respondents improved their physical limitations during the program, which positively affected their mental and emotional state.

T_P9 – R_P9 How much have your social activities been disrupted in the last 4 weeks, due to your health condition and emotional problem? (Such as visiting friends, relatives, etc.) has a significant statistical change (p= 0.002), which indicates that the program showed positive results and thus improved the social status, where the respondents no longer had difficulties with social activities.

T_P10 – R_P10 Has physical activity changed your physical and emotional state in the last 4 weeks? (Only if you were active) has a significant statistical change (p= 0.027), and that since the beginning of the program it has had positive effects on the physical and mental health of middle-aged people. The respondents showed significant changes in physical status, which also accompanies mental satisfaction.

In the research conducted by Stanislava Popov and Ivana Jakovljev (Popov & Jakovljev, 2017), they provided an overview of modern scientific research studies that deal with the impact of physical exercise on the improvement of cognitive functions. The results show the benefits of physical exercise on cognitive functions, through physiological mechanisms and structural changes in the brain, and indirectly through the influence on mood and stress reduction. The results show that positive effects depend on the intensity of physical activity, while moderate intensity has a positive effect on cognitive functioning, high intensity shows the opposite effect.

We can connect this research with the satisfaction questionnaire, it was shown that a moderate exercise program still has a positive result and positive statistical changes on the mental health of middle-aged people. Also, a positive result at T_P3 – R_P3 How would you rate the performance of the overhead squat? related to squatting above the head, it is from these studies that we can conclude that it has an impact on cognitive functions. Only knowledge, improvement of certain functions and movements, elaboration of information, improved the movement itself through the program, which is why the statistics showed a positive result.

Research conducted by them (Маврић, Кахровић, Мурић, & Раденковић, 2014) about the effects of regular physical activity on the body and they came to the knowledge, which was done in many other studies, that moderate exercise intensity has a positive result on the body and that it contributes to a better quality of life.

The research they conducted (Nelson, Specian, Tracy, & DeMello, 2006) are related to the effects of moderate physical activity in offenders in a modified maximum security institution, showed that regular moderate physical activity produces positive mental and physical benefits for offenders. Moreover, research suggests that such educational programs can provide positive steps toward a productive, healthy, and crime-free lifestyle.

Conclusion

Physical exercise certainly plays one of the important roles in our life. Timely learning, acquiring habits, will inevitably have a positive result on our physical and mental health. Acquiring good habits, knowledge about proper nutrition, the benefits of physical exercise, even at a younger age, will contribute to making aging easier, i.e. let's slow down aging, be more satisfied both mentally and physically, and thus we will have a better quality of life.

Unfortunately, the modern way of life has reduced the importance of exercise, it has contributed to the fact that a person moves little or minimally, that he spends a large part of his time next to the television, computer, video games and various other things that hinder a person from being physically active. This has led to the fact that we are increasingly obese, that our postural status is disturbed and worsened and that we are emotionally dissatisfied with ourselves, which can later lead to a number of other problems and diseases.

This research showed that it is desirable to use FMS testing in program planning for the general population. It would also be desirable to conduct a survey on a larger number of respondents and apply a standardized satisfaction test in order to have more reference research results.

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