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Original Article

A Study of the Biopsychosocial Effects of Exercise on Health

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Abstract *— Today's fast pace of life has resulted in physical and psychological disorders, social isolation, and individuals' alienation from exercise, resulting in various health risks. This study was conducted to investigate the biopsychosocial effects of exercise on health.*

A questionnaire consisting of 46 questions was given to participants twice, during the two phases of the study, over a period of one month. The total time needed to complete each questionnaire was 60 minutes. The sample consisted of 120 people enrolled in a sports centre. Statistical analysis was performed using SPSS 25.

The majority of the participants claimed that they had no health problems (72.5%), more than half suffered from musculoskeletal pain (55%), and 52% were smokers. The findings suggest that physical activity has a statistically significant effect ($p<0.05$) on arterial diastolic blood pressure, 10' aerobic ability, BMI, sleep quality, stress management, pleasure, participants' knowledge regarding exercise and sociability.

Sports centres are an everyday casual setting promoting health and well-being, and thus the need to staff these facilities with health professionals with an undergraduate and post-graduate education is more evident than ever.

Keywords — *Exercise, Health, Health professionals.*

I. INTRODUCTION

Today's modern and hectic reality can be overwhelming due to the vast amount of information and events that people are confronted with. Stress dominates most people's lives regarding issues they are required to deal with. Moreover, nowadays it seems that people do not exercise as much as they should. The Retention People (TRP)[1] investigated 10,000 health and fitness members about their exercise habits and membership behaviour and found that 88% usually attend gyms, exercise classes and swimming courses while 58.9% were taking part in two fitness training workout sessions per week.

The significant benefits of exercise on the human body have been documented in the literature. Just 10 minutes of exercise a day is enough to improve mood, memory and learning ability, while 30 minutes of aerobic exercise inhibit the release of neurotransmitters such as endorphins, dopamine, norepinephrine, and serotonin[2]. In addition, research has revealed a short bout of exercise reduced reported adverse reactions after vaccinations for local and systemic adverse reactions[3].

There is no age limit when discussing the need for exercise, and the notion that children during development should not exercise is now outdated and is commonly accepted as a myth. Studies indicate that children attending middle school who exercise regularly for at least 10 minutes a day achieve higher scores on attention assessments during class than students who do not exercise at all[4].

Several studies correlate exercise and mental health. The results of these studies indicate that daily exercise improves self-image, reduces anxiety and is an additional treatment option for depression[5]. Exercise rejuvenates one's emotional world and offers a different perspective in order to tackle everyday problems. In general, exercise effects the individual's personality self-esteem and facilitates better stress management[6]. In addition, exercise acts on the human cells by reducing the signs of ageing[7] and inhibits the release of lipotropin, endorphin and dopamine, which provide a sense of well-being and joy[8]. An important

finding is suggested by the research conducted by Adorn & Straten[9], who linked physical activity with 26 types of cancer and found that exercise reduces the risk of cancer by 7%.

Injuries are a daily occurrence in people of all ages, regardless of activity. Based on a survey conducted at Benenden Hospital in Great Britain[10], the average person suffers 9,672 injuries in their lifetime. Specifically, over the course of a year, a person may experience 124 incidents of illness, 3 choking incidents, 5 cuts, 5 muscle cramps, 6 stomach problems, while almost half of the participants of this study claimed they experienced muscle pain every three days. Based on the same study, participants claimed they had experienced 858 incidents of a headache, 780 incidents of back pain, 234 falls, 156 incidents of earaches and 78 eye infections during their lifetime.

Undoubtedly, muscle pains and injuries directly affect an individual's mental health and daily life[11]. Specifically, when an individual is experiencing intense muscle pain, there is a lack of interest in physical activity, as there is a sense of malaise, resulting in reduced endorphin production[12]. The most common muscle pain is back pain. Over 80% of adults will experience back pain at least once in their life[13]. Over 1,000,000 incidents of back pain caused in the working environment have been recorded, making it the second most common cause of being absent from work compared to the common cold[14].

Injuries can happen at any time, anywhere. Accidents can occur in sports centres. These accidents, which may result in injuries, are often caused by one's overestimation of strength, lack of knowledge, lack of qualified personnel on the premises, inadequate guidance, and negative role models[15].

Today, becoming a personal trainer is easy; it involves completing a personal training course and obtaining a certificate from a private facility by which the individual is able to practice the profession in any sports centre. However, this professional credential does not allow the professional to offer medical advice, first aid in case of an emergency, or a diagnosis.

By law, all sports centres must always have a health professional on the premises at all times. All members of staff occupied in a sports centre must be certified in providing first aid in case of an emergency. According to the National Safety Council[16], if immediate first aid is provided in emergency situations, danger can be avoided in 24% of cases.

The National Qualifications Framework (NQF) accreditation for universities is level 6 [17]. The need to staff sports centres with health professionals is illustrated by the upgrade by the EuroActive[18], European certification of personal trainers from a level 4 qualification to a level 5 qualification. This upgrade is achieved by training individuals to be able to manage people with chronic problems attending sports centres and are competent to design personalized fitness programs based on the client's unique health condition. Individuals with an EQF level 5 certification carry the title Exercise for Health Specialist[19].

Professionals with Advanced Exercise for Health Specialist (EQF level 6) are responsible for the design and implementation of an exercise program, progress assessment and supervision of exercises techniques for the general population for individuals with low to moderate risk levels[20].

There is a lack of research studies in the Greek literature on the effects of exercise on health, while in the international literature, studies mainly focus on the impact of injuries during exercise and on the quality of life of individuals (adults and children). The aim of this study was to investigate the biopsychosocial effects of exercise on health.

II. MATERIALS AND METHODS

A. Research Design

The research is a cross-sectional study conducted during the months of January and February 2019.

B. Sampling Procedure

Convenience sampling was used. The questionnaire was given to a total of 120 participants who were selected purely on the basis of their willingness to participate once they had been fully informed about the forthcoming process. Participants were also informed that the survey was anonymous and only the research team would have access to the completed questionnaires. The individuals who eventually took part in the survey were members of the same sports centre, so to allow a systematic follow-up. The specific sports centre was selected based on the criteria that this setting adhered to factors such as hygiene, reliability of sports equipment, staff expertise and a computer system used to record members' attendance daily.

C. Data Collection

A questionnaire was constructed with a total of 46 questions (4 questions related to the participant's demographic characteristics, 11 closed-ended questions regarding the participant's brief medical history, 16 open-ended questions related to participants' body measurements, 4 open-ended questions related to participant's body composition parameters, 5 closed-ended questions in relation to the participants' general well-being and 6 closed-ended questions regarding motivation were included). A five-point Likert scale: "1=never, 2= rarely, 3= sometimes, 4= often, 5= always" was used to obtain participants' responses to the questions regarding their general well-being and those concerning their motivation.

Two separate appointments, lasting 60 minutes each, were made with each participant at a sports centre within the period of one month. During the first appointment, the completion of the questionnaire was conducted. Participants were then informed about the training program they would have to follow, which included a 10-minute warm-up session followed by a 40-minute training session and a 10-minute post-training recovery program 4 times a week. At the same time, body measurements, flexibility tests, aerobic ability tests, self-assessment questions and body composition parameters were carried out. During the second appointment, a month later, participants completed the questionnaire for a second time and were informed of their results in relation to their previous body measurements, flexibility test, aerobic ability test, self-assessment questions and body composition parameters.

Questions regarding participant's medical history were selected based on diseases or conditions that would interfere with the exercise process and would have been necessary for the research team to be aware of before the survey process began. Questions related to the participant's well-being and motivation were assessed. It is worth mentioning that during the in-person appointment, participants demonstrated medical reports verifying their answers in relation to musculoskeletal problems or illnesses. Responses were given via yes/no, numerical variables and via the five-point scale.

The responses given during the first appointment were recorded and are referred to as phase (A), while the responses given during the second appointment were recorded and referred to as phase (B). Descriptive statistical analysis was used for the sample's demographic characteristics and brief medical history (Table 1 and Table 2). Descriptive statistical analysis of the remaining variables is presented in the form of tables, including the mean value (m) and standard deviation (s) of each variable. Also, a normality test was performed based on the Kolmogorov-Smirnov statistical test ($p>0.05$). Finally, to investigate the biopsychosocial effects of exercise on health, a dependent samples test was performed using appropriate statistical tests of parametric (paired t-test) and non-parametric (related 2 samples Wilcoxon test) analysis. Statistical analysis was performed using SPSS v.25.

D. Ethically

The study received ethical approval from the institutional review board of the University of Patras (Greek registration number: 2649).

III. RESULTS

A. Sample Demographic Characteristics

Table 1. Sample demographic characteristics

		n	(%)
Gender	Male	61	50,8
	Female	59	49,2
Occupation/Professional	Civil servant	4	3,3
	Private employee	19	15,8
	Self-employed	11	9,2
	Student	72	60,0
	Unemployed	14	11,7
Age (years)	18-24	72	60,0
	25-35	21	17,5
	35+	27	22,5
Level of education	Secondary education	10	8,3
	Higher education	95	79,2
	MSc	12	10,0
	PhD	3	2,5

The majority of the respondents were male (50.8%), while 49.2% were female. Most participants were aged 18 to 24 years (60%), 60% were students, while 79.2% reported that they had an undergraduate education level. Recommended font sizes are shown in Table 1.

B. Brief Medical History

Table 2. Participants brief medical history.

		n	(%)
Do you or a family member (1st-degree relative) suffer from a chronic disease?	Yes (heart)	33	27,5
	No	87	72,5
Are you pregnant?	Yes	0	0,0
	No	59	100,0

Have you given birth in the past few weeks?	Yes	0	0,0
	No	59	100,0
Do you have a communicable disease?	Yes	0	0,0
	No	10	100,0
	Do not know/answer	0	0,0
Have you ever experienced or suffered from the following?	High blood pressure	0	0,0
	Heart attack/myocardial infarct	0	0,0
	Atrial fibrillation	0	0,0
	Spastic Colitis	0	0,0
	Stomach Ulcer	0	0,0
	Diabetes	0	0,0
	Epilepsy	0	0,0
	Stroke	0	0,0
	Other	0	0,0
	None of the above	120	100,0
Are you currently on any medication?	Yes	0	0,0
	No	120	100,0
Have you had or are you suffering from any of the following?	Arthritis	2	1,7
	Muscle pain	64	53,3
	Asthma	0	0,0
	None of the above	54	45,0
Do you suffer from musculoskeletal pain?	Yes	66	55,0
	No	54	45,0
Are you suffering from a serious injury?	Yes	0	0,0
	No	120	100,0
Have you been hospitalized recently?	Yes	0	0,0
	No	120	100,0
Do you smoke?	Yes	63	52,5
	No	57	47,5

The majority of the participants (72.5%) do not have a family member that suffers from a chronic disease, none of the women reported being pregnant or having recently given birth, while all the participants claimed that they do not suffer from a communicable disease or a disease of the cardiovascular, digestive, nervous or other system and are not currently on any medication. More than half of the respondents (53.3%) claimed that they suffer from muscle pain, 55% from musculoskeletal pain, while none of the participants had a serious injury or had been hospitalized recently. Finally, 52.5% claimed that they were smokers, while 47.5% were nonsmokers.

C. Body Measurements and Body Composition Parameters

Table 3. Phase (A) and (B) body measurements and body composition parameters (mean and standard deviation)

	Phase (A), (n=120)		**Phase (B), (n=120)**	
	Mean value (m)	**Standard deviation (p)**	**Mean value (m)**	**Standard deviation (p)**
Body measurements				
Resting pulse (bpm)	78,54	10,18	76,14	10,34
Arterial Systolic Blood Pressure (mmHg)	12,28	1,33	12,07	1,49
Arterial Diastolic Blood Pressure (mmHg)	7,26	0,85	6,87	0,99
Height (cm)	171,56	9,36	171,56	9,36
Weight (kg)	70,83	15,75	70,42	15,87

Waist (cm)	88,06	13,48	85,84	11,89
Hips (cm)	102,56	9,90	100,36	8,68
Right Thigh (cm)	56,25	6,49	55,36	5,92
Left thigh (cm)	56,26	6,47	55,36	5,93
Right arm (cm)	30,66	4,42	30,30	4,26
Left arm (cm)	30,36	4,35	30,25	4,22
Flexibility(cm)	-4,95	10,52	0,38	8,39
5'Aerobic ability (bpm/5 min)	121,19	14,40	113,77	12,01
10' Aerobic ability (bpm/10 min)	124,28	14,09	115,75	11,80
15' Aerobic ability (bpm/15 min)	127,14	14,80	117,06	11,84
Body Composition Parameters				
BMI (Body Mass Index)	23,86	4,24	23,72	4,02
BMR (Basal Metabolic Rate) (kcal)	1629,6	415,82	1622,66	395,01
TBW (Total Body Water) (kg)	38,1	6,71	38,90	6,73
FAT (Body Fat Percentage) (%kg)	21,72	5,47	21,11	4,83

There is a reduction in the mean value of almost all variables in-phase (B). Specifically, resting pulse rate (from 78.54 to 76.14), arterial systolic blood pressure (from 12.28 to 12.07), arterial diastolic blood pressure (from 7.26 to 6.87), weight (from 70.83 to 70.42), waist (from 88.06 to 85.84), hips (from 102.56 to 100, 36), thighs (from 56.25 to 55.36), arms (from 30.66 to 30.30), flexibility (from -4.95 to 0.38), 5', 10' and 15' minute aerobic ability, Body Mass Index (from 23.86 to 23.72), Basal Metabolic Rate (BMR (kcal) from 1629.6 to 1622.66) and Body Fat Percentage (FAT (%kg) from 21.72 to 21.11) all demonstrate reduced mean values.

D. Back pain

Table 4. Back pain during phases (A) and (B).

		Phase (A)		**Phase (B)**	
Body measurement		n	(%)	n	(%)
Back Pain	Never	59	49,2	118	98,3
	Rarely	16	13,3	2	1,7
	Sometimes	26	21,7	0	0,0
	Often	13	10,8	0	0,0
	Always	6	5,0	0	0,0

Regarding back pain in-phase (A), 49.2% of participants claimed they never felt back pain, 21.7% stated they sometimes experienced back pain, while 13.3% mentioned they rarely had back pain.

E. Participants General Well-Being

Table 5. Participant's general well-being self-assessment in phases (A) and (B)

		Phase (A)		**Phase (B)**	
General well-being (GWB)		n	(%)	n	(%)
Energy **How often do you feel good in terms of your energy levels throughout the day?**	Never	1	0,8	0	0,0
	Rarely	9	7,5	0	0,0
	Sometimes	49	40,8	13	10,8
	Often	57	47,5	93	77,5
	Always	4	3,3	14	11,7
Sleep **How often is the quality of your sleep good?**	Never	1	0,8	0	0,0
	Rarely	10	8,3	1	0,8
	Sometimes	46	38,3	13	10,8
	Often	53	44,2	82	68,3
	Always	10	8,3	24	20,0
Stress **How often do you manage your stress?**	Never	2	1,7	0	0,0
	Rarely	21	17,5	0	0,0
	Sometimes	46	38,3	22	18,3
	Often	42	35,0	74	61,7
	Always	9	7,5	24	20,0
Body image **How often are you happy with your body image?**	Never	4	3,3	0	0,0
	Rarely	33	27,5	0	0,0
	Sometimes	50	41,7	27	22,5
	Often	30	25,0	81	67,5
	Always	3	2,5	12	10,0
Self-esteem **How often do you feel love and respect for yourself?**	Never	1	0,8	0	0,0
	Rarely	7	5,8	0	0,0
	Sometimes	29	24,2	5	4,2
	Often	64	53,3	61	50,8
	Always	19	15,8	54	45,0

The results demonstrate an improvement regarding the participant's general well-being based on their self-assessment by comparing the date from phase (A) and phase (B), specifically in relation to their energy levels, sleep quality, stress management, body image, self-esteem.

F. Participant's Motivation Assessment

Table 6. Participant's motivation during phases (A) and (B)

		Phase (A)		Phase (B)	
Motivation Assessment (M.A.)		n	(%)	n	(%)
Habit **To what extent do you consider exercise as a habit?**	Never	18	15,0	0	0,0
	Rarely	32	26,7	1	0,8
	Sometimes	37	30,8	17	14,2
	Often	28	23,3	71	59,2
	Always	5	4,2	31	25,8
Pleasure **How often do you experience a feeling of well-being when you exercise?**	Never	1	0,8	0	0,0
	Rarely	8	6,7	0	0,0
	Sometimes	47	39,2	4	3,3
	Often	45	37,5	64	53,3
	Always	19	15,8	52	43,3
Knowledge **To what extent do you feel satisfied with your knowledge about exercise, health, and nutrition?**	Never	10	8,3	0	0,0
	Rarely	31	25,8	1	0,08
	Sometimes	48	40,0	29	24,2
	Often	26	21,7	76	63,3
	Always	5	4,2	14	11,7
Sociability **How often do you believe that exercise provides an opportunity for a positive social experience?**	Never	3	2,5	0	0,0
	Rarely	15	12,5	3	2,5
	Sometimes	39	32,5	9	7,5
	Often	50	41,7	62	51,7
	Always	13	10,8	46	38,3
Trust **To what extent do you believe you could achieve your health goals on your own?**	Never	18	15,0	2	1,6
	Rarely	29	24,2	6	5,0
	Sometimes	47	39,2	38	31,7
	Often	23	19,2	54	45,0
	Always	3	2,5	20	16,7
Motivation **To what extent do you believe your fitness levels motivate you to keep trying?**	Never	0	0,0	0	0,0
	Rarely	7	5,8	0	0,0
	Sometimes	21	17,5	8	6,7
	Often	45	37,5	34	28,3
	Always	47	39,2	78	65,0

The results illustrate an improvement in participant's motivation when comparing phase (A) to phase (B). To test whether the variables follow a normal distribution, Kolmogorov-Smirnov statistical test was used. According to the null hypothesis (H0), the sample follows a normal distribution if p-value > a, where a is the significance level equal to 0.05. Otherwise, the null hypothesis is rejected.

G. Assessing Normality

Table 7. Results based on Kolmogorov-Smirnov statistical test

	Kolmogorov-Smirnov[a]		
	Statistic	df	Sig.
Resting pulse	0,100	120	0,005
Arterial Systolic Blood Pressure	0,051	120	0,200*
Arterial Diastolic Blood Pressure	0,069	120	0,200*
Weight	0,084	120	0,035
Waist	0,112	120	0,001
Thighs	0,154	120	0,000
Right Thigh	0,163	120	0,000
Left Thigh	0,161	120	0,000
Right arm	0,149	120	0,000
Left arm	0,185	120	0,000
Flexibility	0,129	120	0,000
5' Aerobic ability	0,098	120	0,006
10' Aerobic ability	0,075	120	0,096
15' Aerobic ability	0,090	120	0,019
BMI	0,129	120	0,000
BMR	0,120	120	0,000
TBW	0,397	120	0,000
FAT	0,146	120	0,000
SUM_GWB_A	0,117	120	0,000
SUM_GWB_B	0,161	120	0,000
SUM_MA_A	0,124	120	0,000
SUM_MA_B	0,129	120	0,000

Based on the body measurement variables analyzed using parametric statistical analysis, both arterial systolic and diastolic blood pressure follow normal distribution since p-value = 0.200 > a = 0.05. Similarly, 10-minute aerobic ability also follows a normal distribution since p-value = 0.096 > a = 0.05. The remaining body measurement variables, as well as body composition parameters, general well-being and motivation, were analyzed by non-parametric statistical analysis. The distribution of the above factors does not demonstrate normal distribution since p-value <a = 0.05, and therefore the null hypothesis is rejected.

Table 8. Phase (A) and phase (B) parametric paired t-test results for arterial systolic blood pressure, arterial diastolic blood pressure and 10' aerobic ability

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	**Systolic Blood Pressure A (mmHg) - Systolic Blood Pressure B (mmHg)**	**0,20333**	**1,18746**	**0,10840**	**-0,01131**	**0,41798**	**1,876**	**119**	**0,063**
Pair 2	**Diastolic blood pressure A (mmHg) - Diastolic blood pressure B (mmHg)**	**0,39500**	**,92970**	**0,08487**	**0,22695**	**0,56305**	**4,654**	**119**	**0,000**
Pair 3	**Aerobic ability A (BPM/10 min) - Aerobic ability B (BPM/10 min)**	**8,58333**	**10,14151**	**0,92579**	**6,75018**	**10,41649**	**9,271**	**119**	**0,000**

The results demonstrate that exercise has a statistically significant effect on arterial diastolic blood pressure ($t=4.654$, $df=119$, $p<0.05$), as well as on 10' aerobic ability ($t=8.583$, $df=119$, $p<0.05$).

Table 9. Results of the non-parametric comparison test (Wilcoxon) for the remaining body measurement variables as well as body composition parameters, general well-being and motivation.

		Z	Asymp. Sig. (2-tailed)
pair 1	Resting pulse A (BPM) - Resting pulse B (BPM)	-2,633[a]	0,008
pair 2	Weight A (kg) - Weight B (kg)	-1,898[a]	0,058
pair 3	Waist A (cm) - Waist B (cm)	-6,988[a]	0,000
pair 4	Hips A (cm) – Hips B (cm)	-7,957[a]	0,000
pair 5	Right Thigh A (cm) - Right Thigh B (cm)	-5,063[a]	0,000
pair 6	Left Thigh A (cm) - Left Thigh B (cm)	-5,254[a]	0,000
pair 7	Right arm A (cm) - Right arm B (cm)	-3,322[a]	0,001
pair 8	Left arm A (cm) - Left arm B (cm)	-1,061[a]	0,288
pair 9	Back pain A - Back pain B	-6,864[a]	0,000
pair 10	Flexibility B (cm) - Flexibility A (cm)	-9,144[b]	0,000
pair 11	Aerobic capacity A (BPM/5 min) - Aerobic capacity B (BPM/5 min)	-7,025[a]	0,000
pair 12	Aerobic capacity A (BPM/15 min) - Aerobic capacity B (BPM/15 min)	-8,137[a]	0,000
pair 13	BMI A – BMI B	-1,958[a]	0,050
pair 14	BMR A (Kcal) - BMR B (Kcal)	-0,858[a]	0,391
pair 15	TBW B (kg) - TBW A (kg)	-3,359[b]	0,001
pair 16	FAT A (%) - FAT B(%)	-4,953[a]	0,000
pair 17	GWB_ Energy B – GWB_ Energy A	-6,490[b]	0,000
pair 18	GWB_ Sleep B – GWB_ Sleep A	-6,121[b]	0,000
pair 19	GWB_ Stress B – GWB_ Stress A	-7,147[b]	0,000
pair 20	GWB_ Body image B - GWB_ Body image A	-7,779[b]	0,000
pair 21	GWB_ Self-esteem B - GWB_ Self-esteem A	-6,790[b]	0,000
pair 22	MA_ Habit B - MA_ Habit A	-8,487[b]	0,000
pair 23	MA_ Pleasure B - MA_ Pleasure A	-7,826[b]	0,000
pair 24	M.A._ Knowledge B - M.A._ Knowledge A	-7,900[b]	0,000
pair 25	MA_ Socialization B – MA Socialization A	-7,442[b]	0,000
pair 26	MA_ Trust B - MA_ Trust A	-7,218[b]	0,000
pair 27	MA_ Motivation B - MA_ Motivation A	-5,325[b]	0,000
pair 28	SUM_ GWB_ B – SUM _ GWB _ A	-8,918[b]	0,000
pair 29	SUM_ MA _B – SUM _M _ A	-9,446[b]	0,000

a. Based on positive ranks.
b. Based on negative ranks.

In regard to the variables related to body measurements, according to the results, exercise has a statistically significant ($p<0.05$) effect on participants resting pulse rate, waist, hip, thigh and arm measurements, back pain, flexibility, 5' and 15' aerobic ability. Regarding body composition parameters, exercise has a statistically significant ($p<0.05$) effect on BMI, TBW and FAT calculations. Regarding participant's general well-being, physical exercise has a statistically significant ($p<0.05$) effect on energy levels, sleep quality, stress levels, body image and self-esteem. Lastly, in regard to participant's motivation, exercise has a statistically significant effect ($p<0.05$) on habit, pleasure, knowledge related to exercise, health and nutrition, sociability, confidence levels in achieving their goals and motivation.

IV. DISCUSSION

Within one month of systematic exercise, positive physical and mental outcomes are apparent. Thus, sports centres must upgrade their services so as to offer a multidisciplinary approach to training as well as knowledge related to exercise, health and nutrition and introduce individuals who choose to exercise to a new way of life.

The findings of this study suggest that people that started exercising regularly with a specific training program for a period of 30 days improved their health by reducing their weight, fat, body mass index and increasing their aerobic ability. The findings suggest that participants also had an increase in energy levels, felt they could manage their stress levels, had better sleep quality, body image, motivation and self-esteem. Importantly, they now consider exercise as a daily habit improving their sense of pleasure, increasing their knowledge of health - nutrition - exercise and improving their sense of socialization and self-esteem. The available literature reports similar findings[21], [22].

Notably, feelings of motivation towards exercise improved within one month of systematic exercise. Thus, sports centres need to incorporate to each member an additional benefit, including body composition and body measurement tests, per month. In this way, members will be motivated by the results, and as a result, they will not give up their effort[23].

In addition, through regular exercise, the study sample felt more energetic in their daily life after one month of exercise. One of the main problems of modern society is the lack of time and thus the main excuse for someone who has not yet started exercising. Sports centres must have highly qualified staff so that they can plan workout programs according to trainees' available time. It is important to emphasize to trainees that even a 20' personalized workout session is enough to see physical and emotional changes[24].

It is generally accepted that people who feel physical pain or suffer from a medical condition are apprehensive about starting exercise. This is due to the fact that there are no health professionals occupied in sports centres specialized in musculoskeletal problems and chronic diseases. Thus, there is a lack of trust on the part of the trainee towards sports centres. For this reason, sports centres should include in their staff health professionals such as nurses and physiotherapists for such cases. In this way, people who have been avoiding physical activity because of possible health issues can feel confident that sports centres are staffed by health professionals and specially trained personnel. In addition, prompt treatment in the event of an injury can be provided, and unnecessary injuries can be avoided[25].

LIMITATIONS

It is generally accepted that people who feel physical pain or suffer from a medical condition are apprehensive about starting exercise. This is due to the fact that there are no health professionals occupied in sports centres specialized in musculoskeletal problems and chronic diseases.

V. CONCLUSION

Daily exercise increases the feeling of well-being while providing a healthier lifestyle resulting in continuous, physical, biochemical, and psychological changes. In addition, it rejuvenates the individual's emotional world and offers insight as to tackle everyday problems. Exercise has a positive effect on personality self-esteem as well as reducing signs of ageing on a cellular level.

Ideally, health professionals with post-graduate training and qualifications in Personal Training should work in sports centres. In this way, sports centres are legally covered while appropriate well-trained staff can provide a safe, personalized fitness experience while being able to overcome emergency situations if they occur.

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