

Effects of Exercise on Various Systems of Human Body in Residence of Peshawar, Khyber Pakhtunkhwa, Pakistan

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ABSTRACT

Background: Non Communicable diseases like hypertension, diabetes and heart diseases are on rise due to sedentary life style. Exercise is the most import factor that can improve outcome of major communicable diseases.

Objective: To evaluate the beneficial effects of exercise on human body as perceived by individuals.

Material and Methods: A cross-sectional study was conducted from 1stSeptember 2019 to 28 February 2020 in community of Peshawar Khyber Pakhtunkhwa. A sample size of 300 individuals were selected using non probability convenient sampling technique. Data was collected on a structured questionnaire which was pre validated through pilot study. Data collected was analysed using SPSS version 21 for windows.

Results: Mean age of study participants were 33 ± 5 S.D. Majority of the study participants were male (73%) and remaining were females (27%). 33% reported that they exercise every day, 18% once in a week, 27% 3 times a week and 22% of study participants reported that they do exercise occasionally. Participants were asked about effect of exercise on blood pressure and other parameters. Those who were hypertensive reported an improvement in blood pressure after starting regular exercise. The study subjects were asked about the effect of exercise on GIT function. Majority reported improvement in gastrointestinal function. Reduction in weight and improvement in other systems were also reported as shown significance with a P-value less than 0.05.

Conclusions: Our study concluded that those individuals who started regular exercise have reported significant improvement in their different body functions. Therefore there is significant importance of exercising regularly in maintaining a sound mind and a sound body.

Key words: Exercise, BMI, Hypertension, Diabetes

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INTRODUCTION

Exercise including brisk walk and running at least one hour is important for a healthy body. Exercise have got positive effects on various organ systems of body including musculoskeletal, Gastrointestinal and cardiovascular systems¹. Obesity, Hypertension and diabetes are the leading cause of mortality and morbidity worldwide and exercise has got significant effects on reduction of obesity, lowering hypertension and type 2 diabetes.¹

Regular exercise including brisk walk for at least half an hour is having a positive role in improvement of body functions, decreasing stress level and improves memory. Reduction in body fat is noted after one month of regular exercise. Exercise delays the process of reactive oxygen species that leads to cell injury and damage². Regular exercise have also a role in decreasing cortisol level and improvement in blood glucose levels. Lack of physical activity leads to obesity and consequently hypertension and other cardiovascular diseases³.

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Regular exercise have also a positive role on stress and anxiety. Studies shows that exercise helps in reducing stress levels. Those individuals who started regular exercise have reported reduced anxiety and depression levels and a better sleep pattern^{4,5}.

Cardiovascular diseases are the leading causes of mortality and morbidity in this era due to sedentary life style and increase junk food consumption⁶. Stroke, hypertension and diabetes risks can be significantly reduced by taking regular exercise along with consumption of healthy diet. Exercise helps in reducing bad cholesterol and promotion of healthy cholesterol levels.

Keeping in view of benefits of exercise on body function this study practically demonstrated those effects on individuals who is doing regular exercise. Therefore the purpose of this study was to evaluate the benefits of exercise in those individuals who started regular exercise.

MATERIAL AND METHODS

A cross-sectional study was carried out from 1st September 2019 to 28 February 2020 in Peshawar city. Sample size was calculated using Epi Info software by taking prevalence of 77.2% of physically inactive individuals from a study done in Karachi²⁹ and using 95% confidence interval with 5% margin of error. Calculated sample size was

271 but for more convenient we took 300 samples. Those individuals were selected who used to do walk or exercise for minimum 30 minutes a day and for a duration of 3 months regularly. Convenient sampling technique was used to select individuals. Data was collected using a semi structured questionnaire. The questionnaire was developed. Ethical approval of the study was taken from Ethical committee Khyber Medical College Peshawar (Diary No=.613ADR KMC) dated 8/10/2019. Before conducting actual study, a pilot study was conducted by taking ten individuals and questionnaire was modified in light of it to ensure validity of the questionnaire. Data collected was analysed using Statistical Package for social Sciences Software version 21 for windows. Quantitative variables like age, duration of exercise was analysed by taking mean and standard deviation and qualitative variables like gender and questions related to effects of exercise were analysed as frequency and percentages. Chi square test was used to see any statistical significance between different parameters. P-value less than 0.05 was taken as significant.

In Present study: Effects of exercise means good or bad effects perceived by individuals and assessed through questionnaire. Different system in our study include musculoskeletal, GIT, Nervous system and other metabolic parameters like B.P, Blood Glucose levels.

RESULTS

Mean age of study participants were 33 ± 5 S.D. Majority of the study participants were male 219 (73%) and remaining were females 81(27%).

Table 1 shows effects of exercise on different systems of the body. Participants were asked about effect of exercise on blood pressure. Those who were hypertensive reported an improvement in blood pressure after starting regular exercise. The study subjects were asked about the effect of exercise on GIT function. Majority reported improvement in GIT function. reduction in weight and improvement in other systems were also reported as shown significance with a P-value less than 0.05.

Table 1. Effect of Exercise on Various Body Functions as Perceived by Individuals

Effect of exercise on Musculoskeletal system	Improved	Not improved	Total	P-value
Joint pains	212(70%)	88(30%)	300(100%)	0.033
Body aches	189(63%)	111(37%)	300(100%)	0.024
Fatigue	138(46%)	73(54%)	300(100%)	0.03
Effect of exercise on nervous system				
Depression	188(62%)	112(38%)	300(100%)	0.04
Social interaction	260(86%)	40(14%)	300(100%)	0.001
Insomnia	221(74%)	79(26%)	300(100%)	0.009
Effect of Exercise on Blood Glucose				
Decrease in blood glucose levels	250(83%)	50(17%)	300(100%)	0.01
Effect of Exercise on B.P				
Blood Pressure	260(86%)	40(14%)	300(100%)	0.012
Effect of Exercise on GIT				
Appetite	279(93%)	21(7%)	300(100%)	0.032
Effect of Exercise on Lung Functions				
Dyspnea	235(78%)	65(22%)	300(100%)	0.01
Effect of Exercise on Body weight				
Weight	190(63%)	110(37%)	300(100%)	0.15

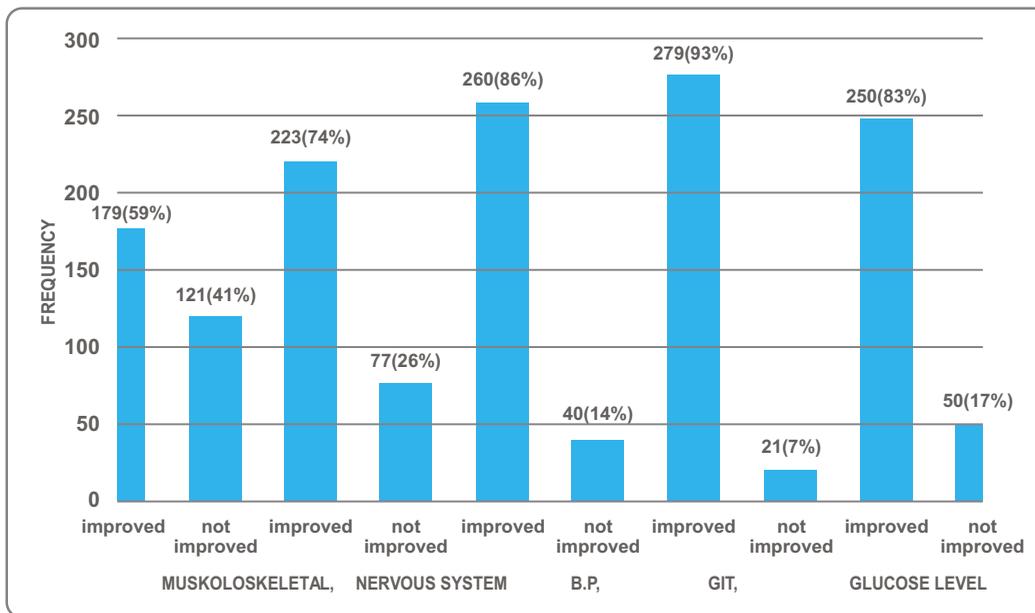


Figure 1. Effects of Exercise on Different Body Systems

DISCUSSION

Our Study reveals that exercise have got significant effect on different body function as perceived by individuals in our study. Our study population included persons above 30 years of age and this is the age where different health related conditions started to be appearing in human body. In present study participants reported a positive effects in their body after starting exercise.

According to latest guidelines published by American Heart association regular exercise of at least half hour per day at least four days a week is very important for a health body along with a reduction in salt and sugar contents⁷. Moderate exercise is really important and helps in regulation of Blood pressure, sugar and dietary lipids levels which in turn helps in reducing risk of strokes and related cardiac events⁸⁻¹⁰.

In our study effects of exercise on different body organs were reported as positive. In our study participants reported improvement in CNS, Respiratory, Musculoskeletal and other body functions which shows significant improvement as reported by participants after starting regular exercise. Different studies done in different parts of the world shows an agreement with our present study.¹¹⁻¹⁷

Franklin et al in his study demonstrated that regular brisk walking and running helps in reducing risk of Type 2 diabetes mellitus and also

reduces blood glucose levels in diabetic patients.¹⁸ In present study there was a statistically significant improvement in blood glucose level was reported by diabetic individuals.

Lee et al conducted a study in which positive effects were demonstrated by individuals on different body mechanisms showing an agreement with our study.²² Another study conducted by North et al. showed that exercise has significant changes in improving sleep patterns and reducing anxiety and depression.²³ In our study we also found that exercise has got a significant role in improvement of depression and other psychological symptoms.

Positive effects of exercise was also noted on sleep patterns. Regular exercise improves sleep duration and quality. Various studies have shown a positive effects in quality and quantity of sleep.¹⁹⁻²¹ Exercise has also positive effects on improving sleep. Different studies showed that regular exercise improves duration and quality of sleep.²⁴⁻²⁷ Our study also showed that majority of people told that exercise improved sleep level.

Obesity is the leading cause of cardiovascular diseases. Reduction of weight is observed in those obese individuals who started taking exercise regularly along with changes in diet patterns week.^{28,29} In our study those who regularly do exercise has profound effect on their body weight.

CONCLUSION

We can conclude that there is significant importance of regular exercise in maintaining a sound mind and a sound body because it is like adding years to our life and quality to those years. Keeping in view the results of our studies, it is affecting positively almost every system of our body regardless of gender and age group issues. There are however certain limitations as we were unable to measure certain parameters like weigh, B.P and BMI. Other study designs like prospective studies should be carried out.

RECOMMENDATIONS

Few effects were observed in present study due to time constraints. Further research is recommended on different physiological and biochemical functions of body.

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AUTHOR'S CONTRIBUTION

The following authors full fill authorship criteria as per ICMJE guidelines;

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| Tahir A, Sikandar A: | Idea conception, drafting the work, final approval, agreed to be accountable for all the work. |
| Hayat S, Azhar S: | Design of the work, data acquisition, critical revision, final approval, agreed to be accountable for all the work. |
| Khalil KUR: | Data analysis, drafting of the work, final approval, agreed to be accountable for all the work. |
| Zahoor S: | Data interpretation, critical revision, final approval, agreed to be accountable for all the work. |