JOURNAL OF BASHIR INSTITUTE OF HEALTH SCIENCES

RESEARCH ARTICLE

Effect of Physical Activity on Depression among Young Population

[a] Muhammad Taimoor ul Hassan Javed, [b]Amir Naveed, [c]Laraib Masood

[a] Department of Rehabilitation Sciences, Bashir Institute of Health Sciences, Bhara Kahu, Islamabad, Pakistan
[b] Bashir Institute of Health Sciences, Postgraduate Psychiatry Trainee, Psychiatry Department Pakistan Institute of Medical Sciences Islamabad, Pakistan
[c] Healthcare Management Sciences, Riphah International University Islamabad Pakistan

*CORRESPONDENCE
Amir Naveed
Bashir Institute of Health Sciences, Postgraduate Psychiatry Trainee, Psychiatry Department Pakistan Institute of Medical Sciences Islamabad, Pakistan
E-mail:
info.bashir.ihs@gmail.com
Phone:+92-344 5893775

ABSTRACT

Background: Depression is a disorder that has characteristics of decreased sleep, decreased appetite, and feelings of guilt, negative mood, less interest for pleasure, decreased energy and poor brain concentration [1, 2]. Above mentioned feelings can either be for short duration or long duration, resulting in a decreased interest for life and this can result in extreme action such as suicide [2]. This study was intended to find out the effects of physical activity on depression. **Methods:** The participants were diagnosed as Moderate, Severe and Extreme depressive by using the Beck Depression Inventory scale. After diagnosis Treatment session of fifty five minutes was given for eight weeks and three days per week. Scoring was done before treatment, after 2nd, 3rd, 4th, 6th and 8th week of treatment session to evaluate the effects. Changes were computed and compared in and among groups through descriptive statistics and repeated measure ANOVA. **Results:** A significant drop in depression level of patients was observed in eight weeks intervention period. The mean and standard deviation of patient's BDI level at week 0 before intervention was 31.78(4.556) with (p=0.00), shows that all the patients are in different levels of depression. After 8 weeks of intervention the value dropped to 15.30(12.40) with (p=0.00) shows that majority of the patients are in Normal status. **Conclusions:** It was concluded that the physical activity is helpful in alleviating the Depression.

Keywords: Depression; Physical Activity; Beck Depression Inventory; Weight Training

INTRODUCTION

WHO defines depression as a disorder or an illness that has characteristics of decreased sleep, decreased appetite, and feelings of guilt, negative mood, less interest for pleasure, decreased energy and poor brain concentration [1,2]. Above mentioned feelings can either be for short duration or long duration, resulting in a decreased interest for life and this can result in extreme action such as suicide [2]. This fact is vastly studied and described in the literature that regular physical activity is beneficial for human health [3]. Another theory called 'Self-Significance Theory' tells us that participation of an individual in physical activity is taken by the society as a good gesture. Therefore, exercise gives competence, control and self-discipline to an individual. While participating in a physical activity an individual gains the experience of achieving goals and overtaking obstacles. Through this experience an individual gets a sense of self-significance [3].

Exercise is as helpful as an effective tranquilizer. A study conducted in adults showed that aerobic exercise for thirty minutes can decrease muscular tension by the same amount as does a dose of meprobamate of 400mg [4]. Muscle relaxation produced by exercise remained for a duration of four to six hours in adults. Not just the physical activity but its type and intensity are equally important in reducing muscular tension. There are some studies which show that tension reduction can only be achieved through sustained and vigorous exercises. While other studies recommend that moderate physical activities or exercises can be beneficial only when done for longer duration and on a daily basis. Anaerobic exercises are equally helpful in reducing psychosocial stress as do the aerobic exercises [5]. There are a few studies which tell that regular physical activity is not only beneficial in reducing depression but it is also helpful in treating panic attacks and different types of phobias [6].

There is major significance of mental disorders in public health. It is observed in some studies that vigorous physical activity positively affects mental health in both clinical and non-clinical populations. However, this fact is proved with strongest evidence that regular physical activity and exercise relieve some symptoms of depression and anxiety. Evidence also proves that physical activity and exercise are beneficial addition to alcoholism and substance abuse program. These also enhance self-esteem, social behavior and cognitive functions; decrease anxiety related symptoms. It is not well known that physical activity and exercise have any effect on mental disorders like schizophrenia. Some studies also report negative psychological effects from exercise. It is recommended further research should be made on effects of physical activity and exercise on mental health [7]. Some researchers observed that aerobic exercises on a regular basis can lead to tension reduction, mood stabilization and sleep improvement. These anti-anxiety effects can be produced by five minutes of aerobic exercise.

Physical activity prevents the decline of functional capacity in an efficient and cost-effective way. Physical activity provides independence in self-care activities, higher self-esteem, better quality of life, higher life expectancy, and decreased mortality [8]. Sedentary lifestyle is also said to be one of the causes of mental health disorders. There are some epidemiological and clinical studies (both cross sectional and prospective longitudinal studies) which showed the relationship of depression effects and physical activity [9].

MATERIALS AND METHODS

The Quasi Experimental study was conducted at different gyms of Islamabad, Pakistan and duration of study was 6 months. Non-probability convenience sampling technique was used to collect the data for those 40 participants who were diagnosed as depressive with the help of Beck depression inventory scale. Sample size was selected with the help of EPI Tool. In the beck depression inventory scale, there are a total twenty one questions with zero to three options which means each question carries minimum zero and maximum three marks. Evaluation of depression through BDI is given as: scores 1-10 show normal ups and downs, scores 11-16 show mild mood disturbances, scores 17-20 show borderline clinical depression, scores 21-30 show moderate depression, scores 31-40 show severe depression, scores above 40 show extreme depression level. During the 8-week trial, participants underwent a progressive aerobic and resistance exercise training program. The program consisted of 24 sessions, taking place three days a week for 55 minutes each session. The training protocol included a warm-up activity for 5 minutes, 30 minutes of aerobic exercise on a treadmill, 15 minutes of weight training targeting major muscles, and a 5-minute cool-down with stretching exercises. Weight training exercises included chest pressing, front pull down, leg pressing, reverse lungs, lateral raises, calf raises, biceps curl, and triceps pressing. Gradual weight increase was applied when the participant was able to perform two sets of fifteen repetitions of a particular exercise. The selection criteria for this study includes individuals with depressive symptoms between the ages of 20 and 35, of both genders, residing only in Islamabad, and excludes those with neurological deficits, intellectual disability, and other comorbidities outside of the scope of the study.

Data collection procedure:

Data was taken from participants of Islamabad, inclusion and exclusion criteria was recruited in the study. Self-structured Performa was used. Data was collected after taking consent from the concerned people.

Statistical analysis:

The result of study was presented as frequency, percentages, mean SD and p-value. The intervention period for each patient was 8 weeks. At 1st day before intervention the Beck Depression Inventory scale was used to diagnose the depression and after intervention period again Beck Depression Inventory scale used to check the effects of physical activity. Descriptive statistics was used to find out frequency and percentage of Demographic data, height and weight of patients. Repeated measure ANOVA used to find out relationship between variables. For analysis of data SPSS version 21 is used.

RESULTS

The study included 40 participants with 67.5% of them aged between 20-27 years and 32.5% aged between 28-35 years. Among the participants, 55% were male and 45% were female. In terms of occupation, 60% were jobless and 40% had a private job. Table 2 shows the mean height of participants was 5.57 inches, with a median of 5.5 inches, and the mode being 6 inches. For weight, the mean was 64.73 Kg, with a median of 63.50 Kg. The mode for weight was 55 Kg.

Table 1. Demographic Data of Patients

	Demographic variables	Frequency	Percentages
Age	20 to 27 years	27	67.5%
	28 to 35 years	13	32.5%
Gender	Male	22	55%
	Female	18	45%
Occupation	Job less	24	60%
	Private job	16	40%

Table 2. Height and weight of Patients

Demographic variables	Mean	Median	Mode
Height (inch)	5.57	5.5	6
Weight (Kg)	64.73	63.50	55
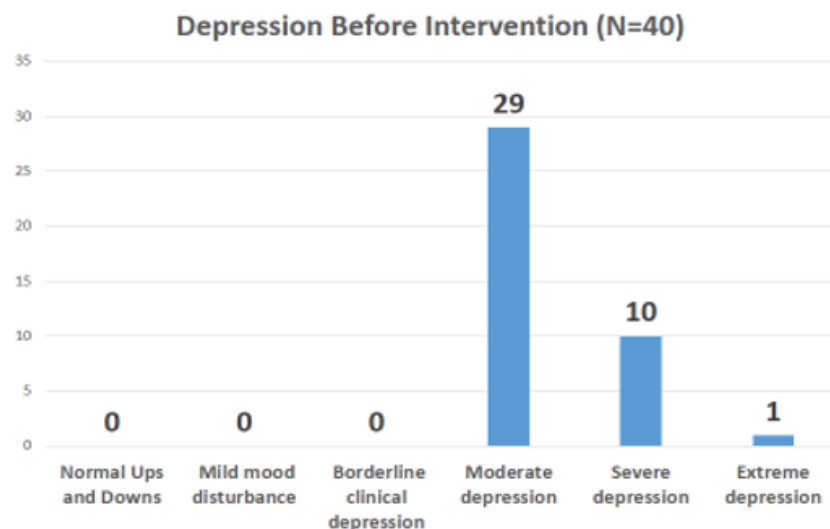
Figure 1. Frequency of patients according to Beck's Depression Inventory Scale before Treatment (N=40).

According to the Beck Scale, the baseline values of the selected participants can be categorized as follows: 72.5% of participants (29 individuals) were in the moderate depression category, while 25% (10 individuals) were classified as having severe depression. Only one participant (2.5%) fell into the category of extreme depression.
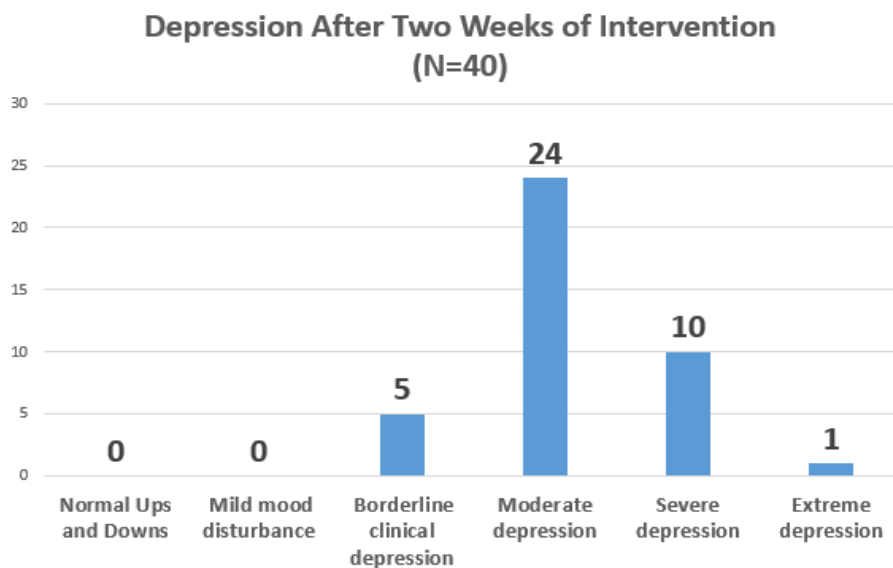

Figure 2. Frequency of patients according to Beck's Depression Inventory Scale after two weeks of Treatment (N=40).

After two weeks of treatment session again BDI scoring was done and results showed that there was no effect of treatment on extreme level depressive patient, patients in severe depression were also not getting significant effect of treatment after two weeks but patients from moderate depression level, 5 patients were recovered to borderline clinical depression.
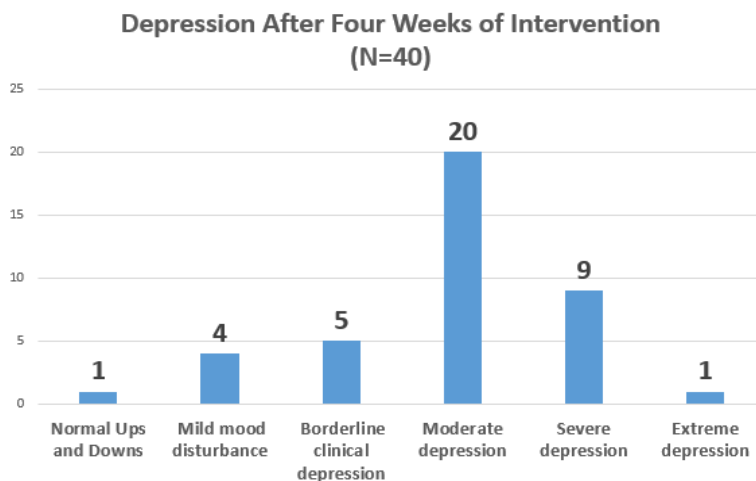

Figure 3. Frequency of patients according to Beck's Depression Inventory Scale after four weeks of Treatment (N=40).

After 4 weeks of treatment, patient in extreme depression level was again not getting any effect of physical exercise, but the number of patients in moderate and severe depression level was reducing gradually with the treatment sessions. Now in severe depression level 9 patients were left (previously 10), in moderate depression level 20 patients were left (previously 29).
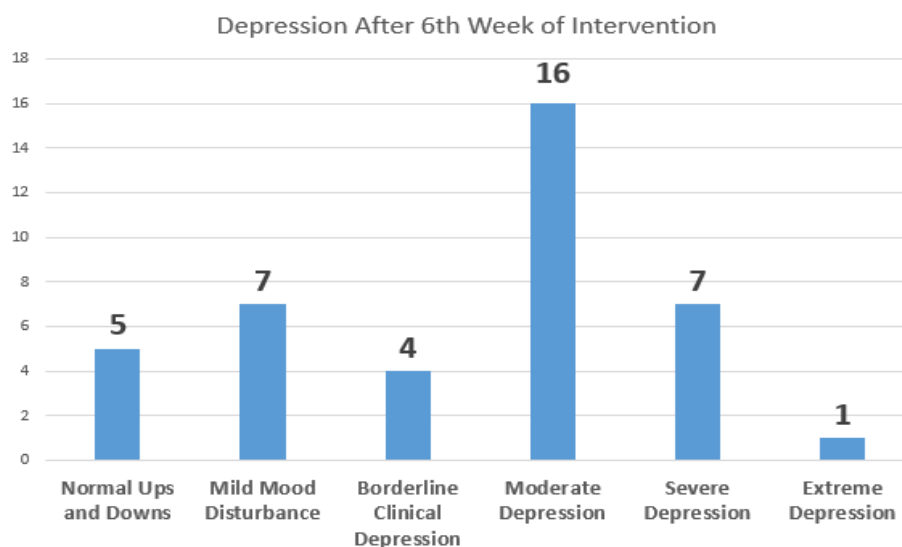
Figure 4. Frequency of patients according to Beck's Depression Inventory Scale after six weeks of Treatment (N=40).

After completion of six weeks of treatment session the distribution of the patients in different levels of depression was as follows; 1 patient in extreme depression level as previously, 7 patients in severe depression level (previously 9), 16 patients in moderate depression level (previously 20). After the end of our 8 weeks of treatment session the final distribution of the patients in different levels of depression was as follows; 1 patient in extreme depression level as previously, 5 patients in severe depression level (previously 7), 11 patients in moderate depression level (previously 16). Therefore, after the end of our 8 weeks of treatment session it was found that out of 40 depressive patients we were able to recover 23 patients out of depression that is about 57.5% of the total number.
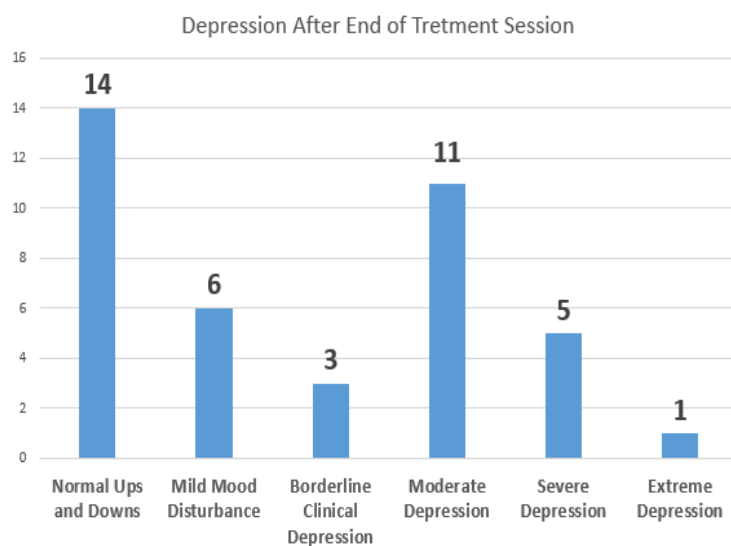

Figure 5. Frequency of patients according to Beck's Depression Inventory Scale after 8 weeks of Treatment session (N=40).

Table 3. Gradual improvement in health of patients in 8 week treatment session (Calculated from Repeated measure ANOVA).

	Depression	
Intervention's interval	Mean ± SD	P-value
W0	31.78(4.566)	
W2	28.75(6.033)	0.00
W2	28.75(6.033)	
W4	25.24(7.820)	0.00
W4	25.24(7.820)	
W6	21.30(9.957)	0.00
W6	21.30(9.957)	
W8	15.30(12.40)	0.00
W8	15.30(12.40)	
W0	31.78(4.566)	0.00

Table 8 reflects the average depression level of patients measured through Repeated Measure ANOVA by using Beck Depression Inventry (BDI) scale. Depression have been scored in BDI scale as: extreme depression obve 40, severe depressio 31-40, moderate depression 21 to 30, borderline depression 17 to 20, mild mood disturbance 11 to 16, normal ups and downs 1 to 10. Repeated Measure ANOVA have measured the mean of depression level of all patients from base line values to week eight W8 (last week after treatment of depression). The presented data shows that the average of depression on BDI scale at W0 to W8 gradually decreased from 31.78(4.566) and 15.30(12.40) respectively. It means that majority of patients which were having severe depression at W0 gradually and intermittently decreased their depression level to normal ups and downs till W8 after treatment sessions.

DISCUSSION

A research was published in the official journal of association of medicine and psychiatry which concluded that if someone is involved in structured exercise on regular basis, symptoms of clinical depression will lessen. As our study also showed that exercise sessions reduced the depression level [10]. Another study was performed in which a sample of 30 moderately depressed men and women were selected and were included in an exercise intervention group. The exercise intervention was including 20 to 40 minutes of walking, three times a week and for the duration of six weeks. This study concluded that this level of physical activity was significantly beneficial in reducing the overall symptoms of depression [11]. This study shows same result as our study shown but treatment protocol is different as in the study mentioned above has waking as treatment protocol.

Another study was performed in which participants were asked to exercise on a cycle ergometer for 30 minutes, four times in a week and for the duration of six weeks. This treatment protocol was compared with a placebo group in which participants were asked to listen to the audio of white noise. This protocol was named as subliminal assertiveness training. The results of this study showed that group of participants doing aerobic exercise have a prominent reduction in the level of depression as compared to the control group. Furthermore this reduction in the depression level was maintained for 3 months after intervention. Physical activities can help to reduce the depression by releasing various chemicals in the body like endorphins and natural cannabis like substances that elevate mood and enhance the sense of well-being. Other than this regular physical activity can also to gain confidence and get more social interaction which indirectly leads to reduction in depression.

Another study showed that walking on treadmill for 30 minutes a day for just ten consecutive days was enough to reduce the level of depression both clinically and statistically [12].

There are a number of studies which show that exercise can treat mild to moderate depression as effectively as antidepressant drugs but with no side effects obviously. To give an example, a study was recently done at Harvard T.H Chan School of public health which concluded that risk of major depression can be reduced by 26 by running for 15 minutes a day or walking for 60 minutes a day. Study also showed that if exercise schedule is maintained the relapse of depression can be prevented [13]. Hence, above all discussion shows the acceptability of research hypothesis –there is significant effect of physical activity on depression among young population- and rejects the null hypothesis, "there is no significant effect of physical activity on depression among

young population" The data was collected on a limited scale from society, specifically only from the capital city of Islamabad, due to access problems. However, the small sample size compared to other studies limits its generalizability.

Conclusions

The statistical analysis of current research study is significant evident to conclude that physical activity is inversely linked with depression in young population. The depression in society can be reduced by minimal regular exercise. It could alter the anti-depressive drugs dependency among depressive masses.

CONFLICT OF INTEREST

None to declare

AUTHOR CONTRIBUTION

MTJ conceptualized the whole study and drafted the manuscript, AN helped in collecting data, study design and critically reviewed the manuscript, LM helped in data analysis and results interpretation, She also helped in editing the final version of the manuscript and improved the English grammar and removed the type errors.

Acknowledgement:

FINDING SOURCE

REFERENCES

1. Murray CJL, Lopez AD (1996) The global burden of disease:a comprehensive assessment of mortality and disability from diseases,injuries and risk factors in 1990 and projected to 2020.Harvard University Press, Cambridge, MA.
2. Kruijshaar ME, Hoeymans N, Spijker J, Stouthard ME, Essink-Bot ML (2005) Has the burden of depression been overestimated? Bull World Health Org 83(6):443–448. Caspersen CJ, Powell KE, Christenson GM. Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. Public health reports. 1985 Mar;100(2):126
3. Rowland TW. Exercise and Children's Health. Champaign: Human Kinetics; 1990. [Google Scholar]
4. Dishman RK. Mental health. In: Seefeldt VS, editor. Physical Activity and Well-being. Reston: American Alliance for Health, Physical Education, Recreation and Dance; 1986. pp. 303–41. [Google Scholar]

5. Crews DJ, Landers DM, O'Connor JS, Clark JS. Psychosocial stress response following training Med Sci Sport Exercise 198820Suppl 1S85[Abst] [Google Scholar]
6. Morgan WP. Psychologic benefits of physical activity. In: Nagle FJ, Montoye HJ, editors. Exercise in Health and Disease. Springfield: Charles C Thomas; 1981. pp. 299–314. [Google Scholar]
7. Morgan WP. Affective beneficence of vigorous physical activity. Med Sci Sports Exerc. 1985;17:94–100. [PubMed] [Google Scholar]
8. Rape RN. Running and depression. Percept Mot Skills. 1987;64:1303–
9. Sharp MW, Reilley RR. The relationship of aerobic physical fitness to selected personality traits. J Clin Psychol. 1975;31:428–32. [PubMed] [Google Scholar]
10. Taylor CB, Sallis JF, Needle R. The relation of physical activity and exercise to mental health. Public Health Rep. 1985;100:195–202. [PMC free article] [PubMed] [Google Scholar]
11. Morgan WP. Psychologic benefits of physical activity. In: Nagle FJ, Montoye HJ, editors. Exercise in Health and Disease. Springfield: Charles C Thomas; 1981. pp. 299–314.

12. Morgan WP. Affective beneficence of vigorous physical activity. Med Sci Sports Exerc. 1985;17:94–100.
13. Rape RN. Running and depression. Percept Mot Skills. 1987;64:1303–10.
14. Sharp MW, Reilley RR. The relationship of aerobic physical fitness to selected personality traits. J Clin Psychol. 1975;31:428–32.
15. Taylor CB, Sallis JF, Needle R. The relation of physical activity and exercise to mental health. Public Health Rep. 1985;100:195–202.