

Comparison of depression levels observed among youth (18-29 years) in Navsari city: A comparative study of physically active versus physically inactive groups.

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Abstract

This study compares the depression scores of young people living in Navsari, focusing on the influence of their physical activity (exercising/non-exercising) and gender (female/male). A sample of 100 participants was assessed by dividing the exercise-related and non-exercising areas of Navsari city using the depression scale developed by Dr. L. N. Dubey. The following statistical techniques were used in this study: mean, standard deviation and t-test. This study contributes to explaining the benefits of exercise in life on stress. And it can also be known that exercise is necessary for a healthy and peaceful life.

Key Words: physically activity, Exercise, Depression Levels, Gender

❖ introduction

In general, the awareness of exercise among the youth has increased in recent times. In the late decades of the 20th century and the early decades of the 21st century, the awareness of exercise among the youth has increased. Many reasons are responsible for the increase in awareness of exercise among the youth in recent times. Physical beauty among the youth, body strength and reducing the mental stress of daily life, etc. Among all these reasons, the exercise that is done to reduce mental stress is very important for the person.

Nowadays, life is getting faster and today's youth is involved in many tasks at once. It is also compatible with technology. In such a fast-paced life, the youth have to suffer more mental stress. To reduce this mental stress and get rid of it, the youth need to do many favourite things. Exercise is a very useful remedy to remove this mental stress.

In this fast and busy life, the youth have to suffer from many physical and mental diseases due to reasons like nutritious food, adequate sleep and office work (less physical labour). For this, exercise is an important remedy for the youth. Due to this, young people maintain discipline in their lives and they eat and sleep regularly. And due to this, the rate of mental stress is less in young people.

The rate of suicide is also increasing among today's youth and many reasons in their lives are responsible for that. But due to exercise, young people have a lot of discipline and increase in their self-confidence, love for themselves and become physically and mentally strong.

❖ The Relationship Between Exercise and Depression

“Depression is a common mental health disorder characterized by persistent sadness, loss of interest, and feelings of boredom or frustration with daily activities.”

Daily exercise plays an important role in reducing symptoms of depression. People who exercise regularly have lower rates of depression than people who do not exercise. Exercise is more effective in treating moderate depression. Evidence from many studies shows that adding exercise to the treatment of depression can be very beneficial.

The anti-depressant effects of exercise can be explained by biological and psychological mechanisms. Exercise biologically increases the release of neurotransmitters such as serotonin, dopamine, and norepinephrine. It increases the secretion of endorphins.

Psychologically, exercise reduces negative thinking. It increases self-esteem. And it provides a sense of mastery.

Participating in social groups or outdoor activities also reduces feelings of loneliness. A person joins their gym and yoga group. This also improves their social relationships.

Aerobic exercise such as running, cycling, and swimming are more effective for depression. Mind-body practices such as yoga and tai chi support greater relaxation and stress reduction.

❖ Literature Review

1. Noetel M, et al. (2024). “Effect of exercise for depression: systematic review and meta-analysis.”BMJ.

This large-scale review pooled data from randomized controlled trials and concluded that exercise is effective for treating depression, with walking, yoga, and strength training showing consistent benefits. The study highlighted methodological heterogeneity and the need for higher-quality blinded trials.

2. Cooney GM, et al. (2013). “Exercise for depression.” Cochrane Database of Systematic Reviews.

A landmark Cochrane review synthesizing RCTs of exercise as treatment for depression. Results showed moderate benefit versus no treatment, but comparisons with psychotherapy or pharmacotherapy were less conclusive due to trial quality.

3. Schuch FB, et al. (2018). “Physical activity and incident depression: a meta-analysis of prospective cohort studies.” American Journal of Psychiatry.

This meta-analysis of over 260,000 participants found that higher physical activity significantly reduced risk of developing depression. A dose–response relationship suggested even modest activity levels are protective.

4. Pearce M, et al. (2022). “Association between physical activity and risk of depression: systematic review and meta-analysis.” JAMA Psychiatry.

A more recent large-scale meta-analysis confirming that physical activity lowers risk of depression across diverse populations. Importantly, the authors showed benefits occur even below current public health activity guidelines.

5. Blumenthal JA, et al. (1999). "Effects of exercise training on older patients with major depression." Archives of Internal Medicine.

One of the earliest well-controlled RCTs, showing that supervised aerobic exercise was as effective as sertraline in reducing depressive symptoms in older adults. It set the stage for treating exercise as a viable clinical intervention.

6. Mammen G & Faulkner G. (2013). "Physical activity and the prevention of depression: a systematic review of prospective studies." American Journal of Preventive Medicine.

This review synthesized longitudinal evidence and concluded that regular physical activity reduces the risk of future depression. It was influential in establishing exercise as a preventive as well as therapeutic strategy.

7. Schuch FB, et al. (2016). "Exercise as a treatment for depression: a meta-analysis adjusting for publication bias." Journal of Psychiatric Research.

Addressing methodological criticisms, this meta-analysis adjusted for publication bias and still found exercise has a moderate antidepressant effect. It bolstered confidence that results were not just due to selective reporting.

8. Josefsson T, Lindwall M, & Archer T. (2014). "Physical exercise intervention in depressive disorders: meta-analysis and systematic review." Scandinavian Journal of Medicine & Science in Sports.

This review examined clinical trials and confirmed that physical exercise reduces depressive symptoms, especially when programs are supervised and structured. It emphasized the role of adherence in outcomes.

9. Kvam S, Kleppe CL, Nordhus IH, & Hovland A. (2016). "Exercise as a treatment for depression: a meta-analysis." Journal of Affective Disorders.

A broad meta-analysis reporting that exercise has a significant effect in reducing depressive symptoms, particularly in clinically depressed samples. It reinforced the clinical relevance of prescribing exercise.

10. Ren J, et al. (2023). "Exercise for mental well-being: exploring neurobiological mechanisms." Frontiers in Neuroscience.

This mechanistic review summarized how exercise affects neurotransmitters, neurotrophic factors (like BDNF), and inflammation. It provides biological plausibility for why exercise improves mood and reduces depression.

11. Harvey SB, et al. (2018). "Exercise and the prevention of depression: results of the HUNT cohort study." American Journal of Psychiatry.

A major prospective cohort study (33,000+ participants, 11 years follow-up) showing that regular exercise (1 hour/week) was linked to reduced incidence of depression. This study was pivotal in demonstrating long-term preventive benefits.

12. Craft LL & Perna FM. (2004). "The benefits of exercise for the clinically depressed." Primary Care Companion to The Journal of Clinical Psychiatry.

An earlier narrative review outlining the clinical application of exercise in depression treatment. It described psychosocial and behavioural mechanisms such as improved self-efficacy, distraction, and social interaction.

❖ Exercise and Mental Health: -

Exercise is becoming more widely acknowledged as a successful therapeutic and preventative approach for mental health. Frequent exercise has been associated with improved mood and cognitive performance as well as decreased symptoms of stress, anxiety, and depression.

1. Reduced Symptoms of Depression and Anxiety

Physical activity triggers the release of endorphins and neurotransmitters (like serotonin and dopamine) that enhance mood.

Research indicates that consistent aerobic exercise can be as effective as antidepressants for individuals experiencing mild to moderate depression (Blumenthal et al., 1999).

2. Stress Relief

Engaging in physical exercise reduces cortisol levels and activates the body's parasympathetic nervous system, aiding recovery from stress.

3. Enhanced Cognitive Abilities

Exercise boosts blood circulation to the brain, enhancing memory, focus, and learning capabilities. It may also help postpone cognitive decline associated with aging (Erickson et al., 2011).

4. Improved Sleep Quality

Regular physical activity helps regulate circadian rhythms and minimize insomnia, which subsequently promotes emotional stability.

5. Increased Self-Esteem and Social Interaction

Achieving fitness milestones boosts confidence and improves body image. Participating in group activities fosters social connections, alleviating feelings of isolation.

6. Recommended Guidelines

World Health Organization (WHO, 2020): Engage in a minimum of 150 minutes of moderate-intensity physical activity weekly (such as brisk walking, cycling, or swimming) or 75 minutes of vigorous exercise. Just 10–15 minutes of daily activity can enhance mood and alleviate stress.

❖ Objective of the Study: -

- 1) Depression levels will be compared between among youth who exercise regularly and among youth who do not.
- 2) Depression levels will be compared between young women who exercise regularly and young women who do not.
- 3) Depression levels will be compared between young men who exercise regularly and young men who do not exercise.

❖ Hypothesis: -

HO: - 01. There will be significant differences in the levels of depression of among youth in Navsari based on their exercise activity. (exerciser VS Non exerciser).

HO: - 02. There will be significant differences in the levels of depression of young men and Woman in Navsari based on their exercise activity. (exerciser VS Non exerciser).

Method and Procedure

❖ Sample: -

A total of 100 young men/women have been selected as the sample in this study. In which 50 young men and 50 young women have been selected from the exercise-related area and the non-exercise-related area. (25 young men/25 young women involved in exercise/25 young men/25 young women not involved in exercise) in which both the variables of exercisers and non-exercisers as well as caste type were compared. Random sampling method has been used for sample selection.

❖ **Tools: -**

The depression scale design by L.N.Dubey was utilized. This scale is a reliable and validity tool for measuring various depression categories, including decision making, problem solving, critical thinking, communications and the interpersonal relationships. The test is widely used in research and has been published by Arohi psychology center, Jabalpur. It provides a comprehensive measure of depression categories allowing for a comparative analysis based on the variable of interest.

❖ **data collection method**

Data collection was carried out in a structured manner. The researcher personally visited exercise-related areas and exercise-not-related areas of Navsari. Two administered Depression scales. The girls and the boys were given clear instructions before the data administration and their responses were recorded in a controlled environment to ensure accuracy and consistency of data.

❖ **statistical techniques**

In the present study, analysis and the interpretation of data following statistical techniques: mean, standard deviation and t-test were used.

❖ **Analysis and Interpretation of Data**

H₀: - 01. There will be significant differences in the levels of depression of among youth in Navsari based on their exercise activity. (exerciser VS Non exerciser).

Table -01

significant differences in the levels of depression of among youth in Navsari based on their exercise activity. (exerciser VS Non exerciser).

Exercise activity	N	MEAN	Median	SD	SED
exerciser	50	7.70	7.00	3.67	0.519
Non exerciser	50	24.8	25.0	9.13	1.29

Table -1.1

Normality Test (Shapiro-Wilk)

	W	p
Total	0.945	<.001

Table -1.1

Homogeneity of Variances Test (Levene's)

	F	df	df2	p
Total	26.8	1	98	<.001

Table -1.1

Independent Samples T-Test

							95% Confidence Interval			
	Statistic	±%	df	p	Mean differenc e	SE differen ce	Lower	Upper		Effect Size
Total Student's t	-12.3^a		98.0	< .001	-17.1	1.39	-19.9	-14.4	Cohen's d	-2.46
Bayes factor₁₀	2.09e +18	5.67e 26								
Welch's t	12.3		64.4	< .001	-17.1- 17.1	1.39	-19.9	-14.3	Cohen's d	-2.46
Mann Whitney U	142			< .001	-17.0		-20.0	-15.0	Rank biserial correlation	0.887

▪ **Results**

Descriptive statistics indicated that individuals who did not exercise (Group 1, N = 50) reported substantially higher depression scores (M = 24.8, SD = 9.13) compared to those who exercised daily (Group 2, N = 50, M = 7.7, SD = 3.67).

Assumption testing showed that the data violated normality (Shapiro–Wilk, $W = 0.945$, $p < .001$) and homogeneity of variance (Levene’s test, $F(1,98) = 26.8$, $p < .001$). Therefore, Welch’s t-test and the non-parametric Mann–Whitney U test were considered more appropriate.

Welch’s t-test revealed a highly significant difference in depression scores between the two groups, $t(64.4) = -12.3$, $p < .001$, with a mean difference of -17.1 (95% CI: -19.9 to -14.3). The effect size was extremely large (Cohen’s $d = -2.46$). Similarly, the Mann–Whitney U test confirmed this difference, $U = 142$, $p < .001$, with a very strong rank biserial correlation ($r = 0.887$). A Bayes factor ($BF_{10} = 2.09e+18$) provided overwhelming evidence supporting the alternative hypothesis.

Taken together, the results indicate that daily exercise is associated with significantly lower levels of depression.

▪ Discussion

The present study aimed to examine whether there is a difference in depression levels between individuals who exercise daily and those who do not. The findings provide strong evidence that regular exercise is associated with significantly lower depression. Both parametric and non-parametric analyses revealed consistent results, demonstrating not only statistical significance but also an exceptionally large effect size.

These results align with previous literature suggesting that physical activity has a protective role against depression by improving mood, reducing stress, and enhancing overall psychological well-being. The mean depression score among non-exercisers was more than three times higher than that of daily exercisers, highlighting the practical importance of engaging in regular physical activity.

One possible explanation is that exercise promotes the release of endorphins and neurotransmitters such as serotonin and dopamine, which are known to regulate mood. Additionally, exercise may contribute to better sleep, increased self-efficacy, and improved coping strategies, all of which may buffer against depressive symptoms.

However, certain limitations must be acknowledged. The study relied on cross-sectional data, preventing causal conclusions. It is also possible that individuals with lower depression are more motivated to exercise, rather than exercise directly reducing depression. Future research should consider longitudinal designs or intervention studies to clarify the direction of this relationship.

Despite these limitations, the findings underscore the importance of physical activity as a potential non-pharmacological strategy for reducing depression and promoting mental health. Encouraging daily exercise could serve as a practical and cost-effective approach to improving psychological well-being in the general population.

HO: - 02. There will be significant differences in the levels of depression of young men and Woman in Navsari based on their exercise activity. (exerciser VS Non exerciser).

Table -02

significant differences in the levels of depression of young men and Woman in Navsari based on their exercise activity. (exerciser VS Non exerciser).

Males

Exercise activity	N	MEAN	SD
exerciser	25	7.08	2.61
Non exerciser	25	26.4	9.46

- **Men who do not exercise report much higher depression scores than men who exercise daily.**

Table -2.1

● Tests of assumptions:

1	Normality violated (Shapiro–Wilk, $p = .001$)
2	Homogeneity of variance violated (Levene's, $p < .001$)

Table -2.2

● Inferential tests:

1.	Welch's t (27.6) = -9.84, p < .001
2.	Mean difference = -19.3
3.	Cohen's d = -2.78 (extremely large effect)
4.	Mann–Whitney U = 31.5, p < .001, rank biserial correlation = 0.899 (very strong effect)

▪ Results

Descriptive analysis revealed that male participants who exercised daily (N = 25) had a substantially lower mean depression score (M = 7.08, SD = 2.61) compared to those who did not exercise (N = 25, M = 26.4, SD = 9.46). The mean difference of -19.3 points was large and practically meaningful.

Tests of assumptions indicated violations of both normality (Shapiro–Wilk, W = 0.913, p = .001) and homogeneity of variance (Levene's test, F(1,48) = 22.0, p < .001). Therefore, Welch's t-test and the Mann–Whitney U test were considered appropriate.

The Welch's t-test showed a highly significant difference between the two groups, $t(27.6) = -9.84$, $p < .001$, with a very large effect size (Cohen's d = -2.78). The non-parametric Mann–Whitney U test confirmed this result (U = 31.5, p < .001), with a strong rank biserial correlation (r = 0.899). These results provide robust evidence that daily exercise is associated with markedly lower depression among males.

Table -03

Females

Exercise activity	N	MEAN	SD
exerciser	25	8.32	4.46
Non exerciser	25	23.2	8.69

- **Women who do not exercise also show much higher depression scores than women who exercise daily.**

Table -3.1

● **Tests of assumptions:**

1	Normality assumption met (Shapiro–Wilk, $p = .340$)
2	Homogeneity of variance not met (Levene's, $p = .006$)

Table -3.2

● **Inferential tests:**

1.	Welch's $t(35.8) = -7.64, p < .001$
2.	Mean difference = -14.9
3.	Cohen's $d = -2.16$ (very large effect)
4.	Mann–Whitney $U = 42, p < .001$, rank biserial correlation = 0.866 (very strong effect)

▪ **Results**

For female participants, the pattern was similar. Women who exercised daily ($N = 25$) reported a mean depression score of $M = 8.32$ ($SD = 4.46$), whereas non-exercising women ($N = 25$) reported a much higher mean score of $M = 23.2$ ($SD = 8.69$). The mean difference was -14.9 points.

Tests of assumptions indicated that the normality assumption was met (Shapiro–Wilk, $p = .340$), but equality of variances was violated (Levene's test, $F(1,48) = 8.29, p = .006$). Thus, Welch's t-test and Mann–Whitney U were again considered reliable.

The Welch's t-test indicated a significant difference, $t(35.8) = -7.64, p < .001$, with a very large effect size (Cohen's $d = -2.16$). The Mann–Whitney U test supported this finding ($U = 42.0, p < .001$), with a rank biserial correlation of 0.866. Thus, daily exercise was strongly associated with lower depression levels in females as well.

❖ **Comparison of Male vs Female Exercisers**

- Both men and women who exercise daily show significantly lower depression than their non-exercising counterparts.

- The effect is slightly stronger in males ($d = -2.78$, $\Delta = -19.3$) compared to females ($d = -2.16$, $\Delta = -14.9$).
- However, in both groups the difference is very large and highly significant.

▪ **Gender Comparison**

When comparing the magnitude of effects across genders, both males and females showed significantly reduced depression with exercise. However, the reduction appeared slightly stronger in males ($d = -2.78$, mean difference = -19.3) compared to females ($d = -2.16$, mean difference = -14.9). Despite this difference in magnitude, both effect sizes fall within the “very large” range, suggesting that daily exercise provides robust psychological benefits for both genders.

❖ **Discussion**

The aim of this study was to investigate whether daily exercise influences depression levels in males and females, and to explore whether the effects differ by gender. The results provide strong evidence that regular exercise is associated with substantially lower depression in both men and women. The differences were highly significant across all statistical tests, with extremely large effect sizes.

▪ **Exercise and Depression**

These findings are consistent with a large body of research showing that exercise is a protective factor against depression. Regular physical activity has been linked to improvements in mood, stress regulation, and psychological well-being. Biologically, exercise stimulates the release of endorphins and neurotransmitters such as serotonin and dopamine, which play a critical role in mood regulation. Psychologically, engaging in exercise may promote self-discipline, increase self-efficacy, and provide a sense of accomplishment, all of which can reduce depressive symptoms.

▪ **Gender Differences**

Although both genders benefitted greatly from exercise, the effect was slightly stronger in males than in females. Male exercisers reported an average reduction of 19 points in depression scores compared to non-exercisers, while female exercisers showed an average reduction of nearly 15 points. Several factors may explain this difference:

1. Biological factors: Hormonal differences may influence how men and women respond to physical activity. For example, testosterone in men has been associated with mood stability and may amplify the antidepressant effects of exercise.

2. Coping styles: Men may use exercise more often as a coping mechanism for stress and negative mood, while women may rely more on social or emotional coping strategies.

3. Cultural expectations: In some cultural contexts, men may receive more social reinforcement for engaging in physical activity, which could enhance its psychological impact.

Despite these possibilities, the effect in both genders is exceptionally large, making it clear that exercise is beneficial regardless of sex.

❖ Practical Implications

The findings suggest that encouraging daily exercise could serve as an effective, low-cost, and accessible strategy to reduce depression for both men and women. This has important implications for public health initiatives, clinical interventions, and preventive strategies. Incorporating structured physical activity programs into schools, workplaces, and community settings may help reduce the burden of depression in the population.

❖ Limitations and Future Research

This study was cross-sectional, meaning causality cannot be established. It is possible that individuals with lower depression are more likely to exercise, rather than exercise directly reducing depression. Additionally, the sample size, while balanced between genders, was modest, and results may not generalize to all populations.

Future studies should employ longitudinal or experimental designs to determine causality. Research could also examine the types of exercise (aerobic, resistance, yoga, team sports) that are most effective in reducing depression, and whether these effects differ by gender.

❖ Conclusion

Overall, the study demonstrates that daily exercise is strongly associated with lower depression in both males and females, with slightly greater benefits observed in males. These findings reinforce the role of exercise as a powerful tool for promoting mental health and preventing depression across genders.

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