

To Study Relation Between Psychological Disturbances and Mental-Wellbeing Among Gym Goers

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ABSTRACT

Anxiety, stress and depression have become the regular associates of today's modern adult life, thanks to the sedentary lifestyle and competing demands for work, education and family life. Although structured gym based exercise is increasingly being used as a non-pharmacological pathway to psychological relief, there is a lack of research on the association between structured exercise and positive mental well-being in everyday, non-clinical exercisers. This paper describes a 12-week correlational study of 47 adult gym-goers which was conducted at 3 time points using the General Health Questionnaire; the Depression Anxiety and Stress Scale and the Warwick-Edinburgh Mental Well being Scale. Psychological distress decreased consistently and significantly throughout the study, and mental well-being increased over the study, although less so, and by the end of the study the two scales were highly correlated and negatively. The results suggest that structured and moderate gym activity is a suitable add-on to traditional mental health treatments.

Keywords: gym; exercise; anxiety; stress; depression; mental well-being

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INTRODUCTION

An old saying says that an idle mind is the devil's workshop, and the lesser known version is that a tranquil mind is civilisation's workshop¹. There's not much tranquillity in modern life. Many people feel that they have too many balls in the air between Career, Family and Society and a common reaction is to engage in some structured physical exercise, usually in a specially constructed facility that has been around since antiquity and is called the gymnasium¹. It is derived from the Greek gymnasium which is an open, colonnaded area used for running, wrestling, throwing events, etc. that intertwined directly with the ancient Olympic Games¹. Indeed, physical education, philosophy, and civic life were not distinguishable for the Athenians: the gymnasium served as a school of philosophy, and thinkers like Socrates, Plato, and Aristotle did both teach and debate in the very places where citizens exercised their bodies¹. Plato's Academy and Aristotle's Lyceum both combined training in the body and the training of the mind under the belief that a

disciplined body upheld a disciplined mind¹. It was practiced and adapted in Rome and other traditions of deliberate, physical culture, such as yogic exercise to martial training, were found independently in ancient China and India¹.

The modern gymnasium is a product of the nineteenth century European physical-culture movement's reaction to the spread of sedentary living and became an institution for the twentieth century that was widely adopted across cultures. Gym-going gained popularity in India mainly from 1990 onwards when there was the overall exposure of western thoughts of health and body image and many of the gyms in the Indian cities are also quite packed with people. The benefits are not just physical: exercise has been proven to release endorphins and neurotransmitters such as serotonin and dopamine, which help regulate sleep, self-esteem and emotions, and in a country where formal psychological services are still underutilised and stigmatised, the gym is a close secret for many as a form of self-care³.

The ancient Greek belief that mind and body health go hand-in-hand is timeless. Based on evidence from recent years, regular exercise has been shown to be associated with significantly fewer poor mental health days than non-exercisers, regardless of age, income or geographic location⁴. A systematic review of 97 systematic reviews that included over 128,000 participants found that there was meaningful evidence that physical activity is effective in reducing psychological distress, not only as a secondary health care intervention, but as a first-line intervention in the general population, in individuals with diagnosed mental illness and in individuals with a chronic disease⁵.

There are three constructs that appear in this literature. Depression is characterized by a persistent low mood, a decrease in interest in activities that used to be pleasurable, and a decrease in the ability to function normally in daily life, and can happen without one single trauma that is identifiable⁶. Anxiety is a normal reaction to an unknown situation and becomes pathological when it is excessive, longer than usual or difficult to manage and is accompanied by an increase in heart rate, restlessness and a lack of concentration⁷. Stress is a mental and emotional strain caused by challenging situations; small amounts of stress is helpful but when it persists it causes fatigue, irritability, lack of sleep and the effect is as much to do with how the person appraises the situation as with the situation itself⁸. Mental well-being, defined as the presence of positive functioning (emotional balance, life satisfaction and effective social and emotional coping²), co-occurs with these distress states.

All this seems to be connected with diet. Vegetables, fruit, whole grains, lean protein and healthy fats are related to better mental health outcomes, while diets that are heavily processed and higher in sugar are related to increased anxiety, and diets that are lower in nutrients are related to both anxiety disorders and difficulty recovering from them⁹. A review of the nutrition literature similarly suggests that dietary patterns that align with dietary recommendations could potentially play a role in both preventing and treating depression and anxiety, although the mechanisms and additional controlled trials are yet to be elucidated¹⁰.

There is good evidence that gym settings can have a positive effect on mental health in a number of ways, including providing a structured exercise program, a social setting for people to meet, a distraction from daily stressors and, for many who attend the gym, a more conscious approach to diet and lifestyle³. Meta-analyses have shown that physical activity decreases symptoms of anxiety, depression and stress and that a single session of physical activity can have a measurable immediate effect on anxiety in individuals without a diagnosed anxiety disorder¹¹. However most of this evidence has been presented in clinical or randomised-trial populations and the course of

psychological distress and positive well-being in the real-world of an every day self-selected adult joining a commercial gym, over a realistic multi-week training period, remains comparatively under-researched, especially in Indian samples. This study directly aims to fill this gap.

Research question: Is there a significant relationship between the psychological discomfort (anxiety, stress and depression) and mental well-being of gym-goers?

H₁ (Alternative Hypothesis): There is a significant relationship between anxiety levels and mental well-being among gym goers

H₀ (Null Hypothesis): There is no significant relationship between anxiety levels and mental well-being among gym goers.

H₂ (Alternative Hypothesis): There is a significant relationship between stress levels and mental well-being among gym goers.

H₀ (Null Hypothesis): There is no significant relationship between stress levels and mental well-being among gym goers.

H₃ (Alternative Hypothesis): There is a significant relationship between depression levels and mental well-being among gym goers.

H₀ (Null Hypothesis): There is no significant relationship between depression levels and mental well-being among gym goers.

Aim: The aim of the study was to investigate the psychological discomfort and its relationship with mental well-being over a defined 12 week gym programme.

Objectives:

1. To assess the level of psychological disturbances (depression, anxiety, and stress) among

individuals engaging in a structured 12-week gym routine using standardized psychometric

tools (GHQ-12 and DASS-42).

2. To evaluate the level of mental well-being among gym-goers, using Warwick–Edinburgh Mental Well-being Scale (WEMWBS)

3. To examine the relationship between psychological disturbances and mental well-being

among adult gym-goers using correlational analysis.

Review of Literature

Structured exercise is shown to have a real psychological component and at the same time to remind us that different types of modalities have slightly different pathways. Twenty sessions of gym-based fitness training and yoga were compared in healthy Austrian adults and both

exercise groups demonstrated significant improvements in social competence, although the other results differed: The yoga group also reported decreased somatisation and body-related anxiety, while the gym group reported decreased sexual discomfort, indicating that the path of improvement is important, too¹. Exercise has been shown to be an effective treatment for mild to moderate depression and anxiety: In a Danish RCT, 20 weeks of supervised aerobic and resistance exercise increased patient's level of physical activity and their cardiorespiratory fitness, which was also seen to be maintained at 12 weeks follow-up¹². A subsequent review found that exercise is as effective as antidepressant medication in some analyses, an effective first-line treatment for mild to moderate depression, and a valuable, although less effective, adjunct for anxiety disorders¹³.

Meta-analytic studies with specific focus on anxiety have been more of an equivocation, whilst also affirming that the direction of effect is towards a beneficial impact: a systematic review of 12 RCTs reported that the evidence for impact of exercise on anxiety was of a magnitude similar to known effective interventions, but noted that small sample sizes, concurrent interventions and poor adherence monitoring reduced the certainty of the evidence¹⁴. In the depression direction, evidence that is more consistent comes from dose-response cohort evidence; a meta-analysis of prospective cohort studies showed that higher exercise levels were associated with a lower risk of depression in the future, an association that remained after a vast array of covariates were included¹⁵, while randomised evidence supports a moderate to large antidepressant effect of physical activity compared with control groups. Exercise also has been shown to have a moderate-to-large antidepressant effect in adults with major depression in a systematic review with trial sequential analysis¹⁶.

There also seems to be a close relationship between diet and mood, although it is more difficult to determine which causes which. The dose-response meta-analysis of 24 cohort studies showed that the association between diet quality and depressive symptoms was consistent and increased as diet quality improved, though there were weaker associations in studies that used formal diagnosis, suggesting caution in assuming causality¹⁷. In addition, findings from a seven day ecological momentary assessment study showed that stress and negative affect were both associated with lower physical activity several hours later, and that physical activity was followed by lower stress and negative affect and higher positive affect several hours later, suggesting that physical activity is a bidirectional relationship with stress that supports its inclusion in daily stress management, and not just an occasional solution to stress¹⁸. All these pieces of work together suggest that the act of going to the gym can be seen not as one intervention, but as a package of

physiological, psychosocial, and nutritional effects working concurrently with distress and well-being, and this is the premise of the design of the present study.

MATERIALS AND METHODS

Design. This was a correlational, repeated-measures design, rather than a controlled trial, to obtain within-person evidence of change in psychological distress and mental well-being in a structured 12-week gym programme.

Participants and setting. Purposive sampling was used to recruit 47 adult gym-goers between the ages of 25 and 45 years from one gym. Inclusion criteria were willingness to follow a protocol for 12 weeks. People with ongoing psychological or psychotropic medications, and individuals with serious cardiac or respiratory diseases which limit exercise capacity and those who exercised in the gym for over one month were excluded. Data was collected in 2025-2026.

Measures. Three standardised instruments were used at three points in time during the programme: the General Health Questionnaire (GHQ-12), which is a screening tool for non-psychotic psychological disturbance in community populations; the Depression, Anxiety and Stress Scale (DASS-42), which measures negative emotional states; and the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), a validated instrument measuring positive psychological functioning.

Programme structure. This 12-week program consisted of three 4-week blocks: (1) a basic foundation of mobility, exercise technique correction, and establishment of basic diet habits; (2) an increased training volume, while the basic exercise science, nutrition and motivation education continued, and (3) advanced training and refined nutrition for consolidating the gains.

Analysis. All 5 variables were computed for descriptive statistics at each time point. Change over time was tested for each variable using repeated-measures ANOVA with Bonferroni-corrected pairwise comparisons and a Pearson correlation was used to assess the relationship between the distress variables and mental well-being at the last measurement.

RESULTS

The sample was 57.4% male and 42.6% female. Chronic illness, ongoing treatment or current medication use was reported by more than half of all participants (55.3%, 53.2% and 53.2%, respectively), and most (72.3%) used nutritional supplements; steroid use was rare (10.6%) as was smoking (14.9%), while no participant reported psychiatric history or cardiac history or pregnancy.

Each of the five outcome variables varied significantly between the three time points. General distress (GHQ) fell from a mean of 21.19 to 14.34 ($F(2,92) = 57.40, p < .001$,

partial eta squared = .555). Depression fell from 17.23 to 10.96 ($F(2,92) = 64.32$, $p < .001$, partial eta squared = .583), anxiety fell from 16.19 to 10.19 ($F(2,92) = 63.10$, $p < .001$, partial eta squared = .578), and stress fell from 19.68 to 13.09 ($F(2,92) = 56.78$, $p < .001$, partial eta squared = .552). Bonferroni post hoc analyses showed that all the pairwise comparisons for depression, anxiety, and stress were significant, and that, for all three, the improvement was not confined to any one of the three periods, but rather was progressive and cumulative.

Mental well-being increased in the opposite direction, from 34.72 to 41.87 ($F(2,92) = 10.92$, $p < .001$, partial eta squared = .192), but this was a relatively small effect compared to the large effects for distress. Post hoc comparisons revealed that the increase from time 1 to time 2 and time 1 to time 3 was significant but the increase from time 2 to time 3 was not (mean difference = -2.98, $p = .348$), indicating that well-being increased from time 1 to time 2 and 1 to 3 but distress continued to decrease from 2 to 3.

All three distress measures were very strongly negatively correlated with mental well-being at the final assessment, anxiety ($r = -.979$, $p < .001$); stress ($r = -.989$, $p < .001$); and depression ($r = -.987$, $p < .001$). So all three research hypotheses were accepted and the null hypotheses were rejected. There were also very high correlations between the distress variables ($r = .972$ to $.991$) which showed that GHQ, depression, anxiety and stress scores tracked closely during the programme.

DISCUSSION

This large, cumulative, decrease in general distress, depression, anxiety, and stress, combined with less robust increase in mental well-being is entirely consistent with the broader exercise and mental health literature. In the largest cross-sectional study to date with over 1.2 million participants, all types of exercise were associated with a decrease in the number of poor mental health days, and exercise at moderate levels (3-5 sessions per week) was associated with the greatest average reduction⁴. More active participants are less likely than less active participants to suffer from depression over time, in prospective cohort studies; a subsequent meta-analysis of prospective data found the same effect in a wide range of population samples¹⁹. There was a substantial pooled effect in the meta-analysis that focused only on major depressive disorder, with the greatest benefit in the supervised, moderate-intensity programmes²⁰.

The anxiety findings are also uniform. Resistance training specifically has been found to significantly decrease symptoms of anxiety and worry in a randomized trial in young adults with subclinical generalised anxiety and a meta-meta-analysis with non-clinical adult populations similar to those sampled here reports similar, albeit less pronounced anxiety benefits. The physiologic mechanism

behind stress reduction is reasonably attributed to regulation of the Hypothalamus Pituitary Adrenal axis: In a recent network meta-analysis of exercise modalities, yoga, qigong, and multicomponent training were the most cortisol-lowering, while no cortisol lowering was found with HIIT²², suggesting that the HPA axis is recalibrated over time by sustained training.

It is of particular interest that the smaller effect size in the mental well-being domain seems to plateau between the second and third evaluations, as there is a similar asymmetry in this field: increases in positive well-being are less consistent and smaller than reductions in psychological symptoms, following exercise. A possible mechanism is the following. The relief of distress may respond rapidly to the direct physiological effects of exercise, such as increased brain derived neurotrophic factor and acute endorphin release both associated with the anti-depressant effects of exercise, while the development of positive well-being may also require slower psychosocial effects²⁴. Self-efficacy theory suggests that maintenance of the behaviour depends on confidence in the ability to perform the behaviour²⁵. Well-being is believed to be reliant on satisfying needs for autonomy, competence and relatedness, all of which the gym environment can support, but usually only in the context of building social connections and experiences of mastery over time (weeks 26). It is not surprising, therefore, that a plateau is reached after initial improvements, and programmes specifically designed to improve well-being, not just to decrease distress, may find it useful to incorporate group-based or mentorship components after the initial adaptation period.

There are several caveats that qualify these conclusions. The sample was relatively small, and from one gym only, with no comparison group of non-exercisers, so other factors such as regression to the mean or other life changes cannot be ruled out. Social desirability bias may have contributed to the self-report measures used, especially given that participants may know that they were being evaluated on the benefits of their own participation and the quantification of the type, intensity and frequency of the exercise performed between assessment points was not captured, limiting any claim of what aspect of training made the difference. Those who were available for all three assessments might also have been the ones who did the best, which could present a survivorship bias. For the future, a matched or randomised control condition, objective exercise-dose measurement, larger and more heterogeneous samples, and follow-up after three time points would be beneficial.

CONCLUSION

Over the course of a 12-week, structured gym program, adult gym-goers experienced substantial reductions in general distress, depression, anxiety, and stress, with a smaller but significant increases in mental well-being that

plateaued during the last few weeks. By the end of the programme all three distress measures were very strongly and inversely associated with well-being, providing a strong argument for structured, moderate, sustained gym involvement as a practical, non-pharmacological pathway to complement conventional mental health care, plus sufficient nutrition and, when gains on well-being appear to plateau, additional social or motivational programming.

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