

It is time to exercise smart rather than exercise hard. A comparison of high intensity interval training and circuit training to traditional aerobic and anaerobic exercises



Ling, P. M. P. & Woods, D.

Australian College of Applied Psychology, Sydney, Australia

## Background

The literature shows that physical exercise has numerous advantages on bodily health and psychological health including cardiovascular health improvement and alleviation of depression (Bartlett et al., 2011; Jayakody, Gunadasa, & Hosker, 2014; Winters-Stone et al., 2013). While exercise can be generally categorised as aerobic and anaerobic, high intensity interval training (HIIT) or high intensity circuit training (HICT) is introduced as a novel exercise technique which incorporates both aerobic and anaerobic function (Cheema & Gaul, 2006). A wealth of scientific evidence supported that the benefits of HIIT and HICT on bodily health is even beyond traditional aerobic or anaerobic exercise alone (Gremeaux et al., 2011; Rognum et al., 2004; Tjønnå et al., 2008). Furthermore, a few clinical studies established that HIIT and HICT reduces psychological symptoms (Gerber et al., 2014; Laforgia, Withers, & Gore, 2006). Nevertheless, concurrently there is no research that compares the effects of high intensity exercise to aerobic or anaerobic exercise on the psychological health domain. The present study makes an attempt to investigate whether HIIT and HICT is a more efficacious intervention for psychological health improvement in contrast to aerobic or anaerobic exercise.

### AEROBIC



### ANAEROBIC



### HIIT



## Aims and Hypotheses

**Aim:** To measure and compare psychological quality of individuals who are engaged with different types of exercise, including the high intensity training, aerobic and anaerobic.

**Hypothesis:** Participants who are engaged with the HIIT or HICT were predicted to have relatively better psychological health than the aerobic and the anaerobic groups.

## Methods

184 participants were recruited through an online survey platform, Qualtrics. Based on their exercise habits, the participants are classified into four groups:

1. No exercise routine/ Sedentary
2. Aerobic
3. Anaerobic
4. HIIT/HICT

The following questionnaires were used to assess psychological health of the subjects.

1. General Health Questionnaire (GHQ-12)
2. Depression Anxiety Stress Scale (DASS-21)

## Results

An ANOVA test revealed that a significant difference was detected among the four groups in the GHQ scores, although there was no significant difference in other measures. A further contrast test was conducted. Consequently, it is shown that the three groups that are engaged in different exercises reported higher GHQ scores than the sedentary group.

Table 1. Comparison of the DASS-21 and GHQ-12 Scores among Participants engaged in Different Types of Exercises

	Aerobic	Anaerobic	Combined	None	F
Depression	3.87 (3.88)	4.05 (4.20)	4.33 (4.83)	4.67 (3.48)	.50
Anxiety	3.89 (3.63)	3.32 (3.02)	3.10 (3.90)	4.00 (3.31)	.49
Stress	5.60 (4.04)	5.15 (3.88)	5.71 (4.50)	5.31 (3.70)	.13
GHQ_Total	.83 (.46)	.76 (.42)	.93(.57)	1.02 (.37)	.045*

Table 2. GHQ-12 Scores of the Participants Engaged with Different Types of Exercises

Contrast	Mean difference	Standard Error	p
Anaerobic vs Aerobic	-.07	.11	.53
Combined vs Independent (Aerobic + Anaerobic)	.13	.11	.23
None vs Active (Combined + Aerobic+ Anaerobic)	.18	.08	.02*

## Discussion and Conclusion

This study had not been able to demonstrate that high intensity exercise is more beneficial than aerobic or anaerobic exercise in the psychological perspective. Nonetheless, the current results showed that exercise, regardless of which type, generally has a positive effect on overall mental health. It can therefore be advocated that an active lifestyle would contribute to an enhancement of psychological health quality.

## Limitations

1. The recent study only assessed the effect of exercise while leaving other health related factors uncontrolled. Some researches have shown that factors such as diet and social economical status could vary mental health quality.
2. Hospitalised samples were recruited in most investigations whereas the authors of this study collected their sample from the general population. Similarly, a study by Wang et al. (2014) did not find significant difference in maximal oxygen consumption between the group assigned to HIIT and another group assigned to aerobic exercise, indicating that the margin of difference between HIIT and aerobic exercise may be smaller in the general population in comparison to clinical patients.

## Further Research

In conclusion, this study implicates that exercise is beneficial to psychological health and can be incorporated into psychological intervention. However, it is suggested that there may be a few limitations. For example, psychologists must be aware of physical capabilities of their clients while implementing such intervention as they might have other physical co-morbidities. In further research, the authors recommended to implement individualised high intensity exercise intervention on patients with psychological disorders to the actual efficacy of this kind of treatment.

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