

# Physical Activity, Exercise and Health of the Mind in Young People 體育運動對青少年心理健康的作用

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## Abstract

The physical health benefits of regular exercise or a physically active lifestyle—better blood profile, protection against heart disease, stroke, type II diabetes and certain forms of cancer—are widely acknowledged and accepted. Less understood is the role that regular physical activity and exercise play in the health of mind in young people. The balance of recent evidence suggests that regular physical activity and exercise contribute positively to a healthy mind.

## 摘要

適量運動和健康的生活模式對人體的益處有莫大裨益。運動的益處包括加強心肺功能，促進血液循環，減低患上糖尿病，心臟病，高血壓，中風和癌症的機會。本文目的是檢閱運動對青少年心理的健康。檢閱結果顯示定期的規律運動對青少年心理健康有良性的促進作用。

## Introduction

Despite the overwhelming evidence which show that leisure-time physical activity and exercise is associated with reduced mortality and extensive health benefits, the majority of the population in Singapore, and in many developed countries it appears, entrenched in sedentary lifestyles. In Singapore, the 1998 National Health Survey reports that only 17% of our population, aged between 18 and 69 years old are engaged in physical activity at a frequency of three times a week, for at least 20 minutes per activity session. Even though, this marks an improvement of 3% over the 1992 figure, the trend remains the same; men are more physically active than women, and more of the young and the elderly exercise than people who are in their economically active years. It appears also that people with disabilities, overweight

and obese people, and people who earn a lower income and have less education are also less physically active, even though these points were not highlighted in the survey. Moreover, it is common that up to 50% of those who initiated activity programmes quit within the first six months, irrespective of the activity chosen. This article presents a summary review of the contributory role that exercise and physical activity can play in the mental health of our young people.

## Physical Activity and Exercise as Therapy

The benefits of a physically active lifestyle are available to all without discrimination, including young people who demonstrate symptoms of mental health imbalance. Acute and chronic depression and anxiety are two examples of mental health imbalance and

are illnesses that can result in physical illness. Both are also lifelong recurrent diseases that generate substantial individual and societal costs. Because of the stigma attached to being a mental patient, many cases of depression and anxiety go undiagnosed and untreated. An exploration of the extant literature revealed that diverse methodologies have shown positive associations between physical activity involvement and improvements in mental health symptoms among various populations (Paluska & Schwenk, 2000). Indeed, mood and creativity are improved even after a single physical activity session (Steinberg, Sykes & Lowery, 1991). Over and above improvements in mental health, augmented physical activity and exercise offer well established improvements in cardiovascular health to a school population that can be less sedentary. It is however encouraging that local data that involved questionnaire responses from just under 500 secondary school pupils, revealed that physical recreation was one of the positive strategies employed by young people in coping with their concerns (D'Rozario & Goh, 1998). Such a result has also been established for Australian adolescents (Frydenberg & Lewis, 1993). However, in the two cited studies, there are gender differences in the manner young people coped with their concerns; males tended to use physical recreation more than females. In contrast, females tended to use strategies that involved social support.

### **Young People's Physical Activity & Mental Health**

Physical education (PE) classes in Singapore across all levels up to pre-university are part of the curriculum, with at least 70 minutes a week devoted to PE. Despite this compulsory arrangement, the daily habitual physical activity patterns, as determined using a heart rate monitoring device, among both primary and secondary pupils are relatively low (Gilbey & Gilbey, 1993; Lim, 1998). The effect of exercise and/or physical activity on mental health and emotional well being in young people has received considerable less research attention than among adult populations. Local data are apparently non-existent and is in need of redress. Nonetheless, in a study that involved 5,061 healthy adolescent boys and girls that employed the use of a malaise inventory and a 12-item general health questionnaire, Steptoe and Butler (1996) reported that physical activity is positively associated with well-being, irrespective of sex, class, health status or hospital use. The authors also noted a significant association between psychological symptoms and illness frequency among adolescents that were physically less active. Others have echoed the view that adolescence is an important and formative period to promote and encourage a more physically active lifestyle so as to improve emotional state and psychological well being of young people. With modern technology such as information and communications technology becoming even more pervasive at all levels of society in Singapore, especially at the school-level,

the call to be more physically active is often a 'voice that is lost in the wind'. Physical education teachers have a special responsibility and duty to encourage and enthuse young people into lifestyles that are more physically active.

### **Psychological Mechanisms**

Many 'mind' and 'body' mechanisms have been proposed to explain the beneficial effects of physical activity and positive mental health, but few hypotheses have been supported by randomised controlled trials. Among the psychological hypotheses suggested is the distraction hypothesis, which suggests that time away from the vicissitudes of daily life offered by acute physical activity, has anti-depressant effects. Another popular explanation that links exercise to positive mental health is the self-efficacy theory. In essence, proponents of this theory argue that self-efficacy significantly predicted the maintenance of moderate activity and the adoption of vigorous physical activity. It is suggested that since exercise poses a challenging task for sedentary people, in successfully adopting regular physical activity may induce improved mood, increased self-confidence and perhaps an enhanced ability to handle events that challenge one's mental health. A third mechanism that is often proposed is the mastery hypothesis which asserts that with the mastery of a challenging pursuit such as exercise, a sense of success and confidence are not uncommon outcomes. It is thought that a sense of mastery over one's body, of being skilled in physical activity, may spill over into daily life where exercisers can be their own supporters and thus utilise their individual resources to continue to improve their mental well-being. Finally, the social interaction hypothesis postulates that the social support provided by other exercisers account to a large extent for the beneficial effects of exercise on mental health. As with all postulations or hypotheses, further research is merited.

### **Physiological Mechanisms**

Physiological changes that occur with physical activity have received considerable attention. A number of chemicals secreted during exercise such as noradrenaline and endorphins have been implicated as contributing to the anti-depressive effects of exercise. For instance, many studies have documented those endorphins, which are produced in several endogenous locations during exercise. Essentially, endorphins, particularly beta-endorphins have been shown to bring about a euphoric state and to reduce pain. However, like the psychological mechanisms proposed, further research is needed to elucidate in clearer terms how proposed physiological mechanisms that arise from exercise and physical activity help to augment positive mental health.

## Physical Activity Can also be Deleterious to Mental Health

Exercise or physical activity is no panacea to the mind's ills or imbalance. Ironically, when exercise is carried to the extreme, both mental and physical health may be threatened. For instance, young people afflicted with anorexia nervosa, a body image disorder, almost always employ excessive exercise to achieve unhealthy body weight loss (Chia, Leong & Quek, 2001). Certain athletic groups such as long distance runners appear to share common traits with anorexics and the association between anorexia nervosa and distance running to be studied more. 'Over-training' is term that has been used to describe the outcome of excessive training. Research on the effects of over-training has suggested a constellation of symptoms ranging from undue fatigue, reduced performance, lethargy and malaise, and depression. Studies on over-training have mainly focused on athletes, mainly swimmers. In a nutshell, the majority of studies on both sexes have reported mood disturbances or increased anxiety and depression when training volume is increased compared to control groups. Interestingly, similar findings are echoed in noncompetitive athletes, indicating that too much physical activity beyond what athletes and non-athletes can cope is deleterious to both mental and physical health. Since the line between what constitutes optimal training and excessive training for each individual is subtle, more information about the determinants and implications of over-training for a primary, secondary and pre-university pupils need to be generated and this remains a fertile area for research attention.

## Implications for Physical Education Teachers, Coaches and Physical Activity Organisers

- ❖ Organise and encourage young people to participate in regular physical activity as this has been shown to alleviate symptoms of depression and anxiety.
- ❖ Emphasise habitual physical activity rather than specific exercise forms such as aerobic or strength training as the way forward, as it is the regularity, more than the mode of the exercise, that is important in improving **mental health** symptoms and mood.
- ❖ Physical activity and exercise are no panacea to the mind's ills and on their own will not prevent the onset of depression. They will however, ameliorate any pre-existing depression. Organise manageable bouts of physical activity and exercise as a form of therapy for the depressed and anxious.
- ❖ Exercise and physical activity adherence rates are similar for depressed as well as normal young people so equal attention should be paid to improving overall compliance.
- ❖ Treat symptoms of staleness e.g. depression, that result from over-training with a prompt reduction in the volume of training and closely monitor the individual's depressive symptoms.

## Conclusions

Even though the relationships between physical activity, exercise and positive mental health has been established, our understanding of the possible psychological and/or physiological mechanisms and how they interact with each other to produce a desirable outcome are still not fully understood. Many more questions remain unanswered: Is there an optimal frequency, intensity, modality and duration of exercise or physical activity that is needed to elicit improvements in mental wellness? How do physical activity recommendations differ across the population of young people to include the different races, people with disabilities, and young people in primary, secondary and pre-university schools? All said and done, physical activity regimens deserve serious consideration as we progress to be a mentally healthier and more physically active society.

## References

- Chia, M., Leong, L. K., & Quek, J. J. (2001). *Healthy, Well and Wise: take personal responsibility in daily habit for a life of wellness*. Singapore: National Institute of Education.
- D' Rozario, V. & Goh, M. (1998). How adolescents cope with their concerns: a review and study of Singapore students. *Review of Educational Research and Advances for Classroom Teachers*, (1), 13-20
- Frydenberg, E. & Lewis, R. (1993). Adolescent coping: the different ways in which boys and girls cope. *Journal of Adolescence*, 14, 119-133.
- Gilbey, H. & Gilbey, M. (1995). The physical activity of Singapore primary school children as estimated by heart rate monitoring. *Pediatric Exercise Science*, 7, 26-35.
- Lim, G. (1996). *Physical Activity patterns of adolescents in a secondary school in Singapore*. Unpublished Master of Science's Thesis.

National Health Survey. (1998). Epidemiology and Disease Control Department. Singapore: Ministry of Health.

Paluska, S., & Schwenk, T. (2000). *Physical Activity and Mental Health. Sports Medicine*, 29 (3),167-180.

Steinberg, H., Sykes, E., & Lowery, S. (1991). Exercise enhances creativity independent of mood. *British Journal of Sports Medicine*, 31, 240-245.

Stephoe, A., & Butler, N. (1996). Sports participation and emotional well-being in adolescents. *Lancet*, 347, 1789-1792.

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