

Physically Fit is Better Than Cognitively Fit: Why Not Set Up a Physical Fitness Unit in Hong Kong Primary School Curriculum

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Great academic pressure has destroyed the ingredients of primary curriculum in Hong Kong. Pupils' attention has been diverted from enjoying childhood learning experiences through discovery and play to learning new knowledge through spoon-feeding and testing. The keen constraints among primary subjects in scheduling lead to the limited provision of Physical Education periods. Thus, the purposes of this paper are to investigate the factors influencing the development of physical fitness programs in Hong Kong and to recommend offering a Physical Fitness Unit with emphasis on health-related fitness components in the primary curriculum. The full details of the unit including aim and objectives, contents, methods and assessment will be discussed. Finally, strategies on implementation are set forth in the paper.

身體強健總較認知出眾為佳—為何不在香港小學課程加設「體適能」單元呢？

沉重的學習壓力已經破壞了香港小學課程的內容。學生的注意力也從透過發現和遊戲去學習新知識及經驗轉移至填鴨式學習測驗和考試。現在小學的時間表上各學科佔用的節數已編排得非常緊密，因而引致體育課的節數不足。此文章旨在探研影響「體適能」單元發展的因素和建議如何在小學課程中加入「健康相關體適能」單元。文中也詳細介紹該單元之目標與目的。內容、方法評估。最後此文亦闡述推行該單元的策略。

I. Introduction

Physical Education (P.E.) defined as “the art and science of human movement” (Seidal & Besick, 1974) is designed as a responsible, educational programme (subject) and yet more than a subject in a school curriculum. Being an important part of school's instructional program, P.E. is the only area of curriculum that presents motor skills and the study of human movement and provides the opportunity to facilitate their development (Nichols, 1994). All areas of the school curriculum, including P.E., strive to enhance the development of positive feelings towards life long learning. Physical Education is that integral part of total education (Seaton et. al. 1969; Daver, 1970) which contributes to the fullest development of the individual in accordance with his or her capacities (Daver, 1970; Wetton, 1988) through the natural medium of directed, carefully planned and conducted motor activities (Nichols, 1994). The movement experiences are designed to develop skilful, fit, and knowledgeable movers so as to enhance and harmonize the physical, intellectual, social and emotional aspects of an individual's personality (Seaton et. al., 1969; Wetton, 1988).

Bookwalter (1962), defines P.E. as “the optimum development of the physically, mentally and socially integrated and adjusted individual through guided instruction and participation in selected total body sports and rhythmic and gymnastic activities conducted according to social and hygienic standards.” The overarching aim of Physical Education is, therefore, to set aside daily a portion of the school day devoted to large muscle activities that encourage and develop learning to move and learning through movement (Gallahue, 1993).

According to Gallahue (1993), the learning-to-move aim of P.E. is based on acquiring movement skills and enhancing fitness. The learning-through-movement aim of P.E. is based on the fact that effective P.E. can positively affect both the cognitive and affective (social - emotional) development of children. The ultimate aims focus on the becoming of a physically educated person (NASPE, 1992). As far as the objectives of P.E. are concerned, many physical educators (Burcher et. al. 1961; Barrow, 1971; Arnheim & Pestolesi, 1973; Annarino et al., 1980; Dauer & Pangrazi, 1989; Morris & Stiehl, 1985 and Gallahue, 1987), have expressed similar objectives:

1. Physical Domain (Organic Development)

- the enhancement of children's physical fitness and well-being ; and their own level of physical growth and development.

2. Psychomotor Domain (Neuro-muscular Development)

- the acquisition of fundamental motor skills and sports skills; and the development of effective body

management and useful physical skills.

3. Cognitive Domain (Intellectual Development)

- the acquisition of intellectual skills, concepts and knowledge associated with effective, efficient exercise and movement.

4. Affective Domain (Social-Personal-Emotion Development)

- the development of children's positive self-image, personal attitudes and beliefs, social behaviours essential to as well as emotional and successful participation.

The World Health Organization (WHO) defines FITNESS as "the ability to perform muscular work satisfactorily." (Bouchard, Shephard, Stevens, Sutton & McPherson, 1990, P.6). Physical Fitness as one aspect of total fitness which includes psychological and social fitness (Hebbelink, 1984), is "the ability to carry out physical activities satisfactorily" (Gutin, Manos & Strong, 1992). The definition of physical fitness has undergone dramatic change during the last decades. The President's Council on Physical Fitness and Sports (Clark, 1971) defines physical fitness as "the ability to carry out daily tasks with vigour and alertness, without undue fatigue, with ample energy to enjoy leisure time pursuits and to meet unforeseen emergencies."

Physical fitness may be viewed as possessing the elements of both health-related-fitness and performance-related fitness. Muscular strength and endurance, cardiovascular endurance, joint flexibility, body composition and stress management are universally considered to be health-related fitness components. Balance, coordination, agility, speed of movement, and power are among the most frequently cited components of performance-related fitness. Being physically fit has also been associated with a positive state of wellness which is highly influenced by participation in regular physical activity, proper diet, stress control, good social relationships with others and high values and ethics, and genetics. The aim of the health-related physical fitness program is to enable an individual to live a contributing, rewarding and self-fulfilling life (Frost, 1975). Wellness has been defined as "a way of life which you design to enjoy the highest level of health and well-being possible during the years you have in this life" (Ardell, 1985). Physical Education plays an important role in wellness through the development of health-related physical fitness in addition to its cognitive, motor, and social objectives in the total development of children in elementary school programs.

In Hong Kong as a part of primary school curriculum, Physical Education has contributed uniquely to foster the overall development of children - cognitive, physical and social. It encompasses a variety of individual and group movement experiences such as fundamental movement at lower primary level and sports activities like athletics, gymnastics, dance, racket games, ball games, swimming and physical fitness at upper primary level. In practice, at least two periods per week (a total of about 80 minutes) have been allocated to P.E. It is recommended that the subject should be taught in units which have been clearly stated and compiled in the syllabus for Physical Education (CDC, 1995). This means that one particular area is taught in a number of periods before commencing another area.

In 1988, a health-related physical fitness school-based curriculum was introduced to some secondary schools. It has led to teachers' awareness of the importance of physical fitness in regular secondary P.E. programs. A 'Physical Fitness Award Scheme' for primary schools jointly presented by the Education Department and the Hong Kong Childhealth Foundation was successfully launched in 1992. Gradually, more physical educators, particularly at the primary level, have understood the value of physical fitness. However, by analysing the current situation strong evidence shows that there are five major constraints which have hindered the development of physical fitness program in primary schools at present. These constraints consist of : the over-emphasis on children's academic performance; the uneven allocation of periods among subjects in time-table; the lack of sufficient standardized test equipment / apparatus in primary schools; the lack of health-related physical fitness unit in the Primary Physical Education Syllabus; and parents' negligence on the educational values of physical fitness to children's whole development. Actually, what are the factors influencing the development of physical fitness in the existing primary curriculum? What are the full details of the proposed physical fitness unit? How can the unit be implemented effectively in the primary curriculum? Therefore, the ultimate purpose of this paper is to explore the most appropriate answers to these three questions.

II. Factors Influencing the Development of Physical Fitness Program in Hong Kong Primary Schools

The goal of physical education in primary schools is to assist each child to develop attitudes, skills, and knowledge of human movement that will result in a lifetime of participation in physical activity. Physical activity has important implications for health. Regular and appropriate physical activity including physical education in schools reduces the risk of all-cause mortality by more than 25 % (Paffenbarger, Hyde & Wing, 1983) and to increase life expectancy by more than 2 years over the population average (Pekkanen & Others, 1987) as well as help to prevent and manage diseases such as osteoporosis and diabetes (Siscovick, LaPorte & Newman, 1985) and reduce the rates of stroke (Salonen, Puska & Tuomilento, 1982).

In spite of the evidence, physical activity of Hong Kong school children has shown little if any increase in recent years. Some research studies have shown that children have seldom participated in regular physical activities. According to Hong Kong Council of Early Childhood Education & Services (HKCECES) (1994)'s findings on the Eating Habits of Children Survey only 28% of 1010 primary pupils liked sports and games activities, while 70% (707) of children spent more than two hours watching television. Most primary school children (75.6%) preferred less physical active pastime; only 15% preferred active play. Other research has shown that preschool children played not more than five minutes continuously in three popular outdoor play areas in Hong Kong (Hong Kong Playground Association, 1995).

Physical education classes can be considered an appropriate mode for developing and maintaining physical fitness in terms of intensity (moderate-to-vigorous activities) and duration (20 minutes) during P.E. lessons. Recent studies have indicated that Hong Kong primary school children only spent 17.3% (3.8 minutes per class period) of their P.E. class time within the recommended intensity (60-90% of Heart Rate Reserve) (Wong & Macfarlane, 1996). Obviously, it has demonstrated that Hong Kong primary school children do not obtain enough exercise to achieve recommended physical fitness objectives according to the exercise guidelines of the American College of Sports Medicine (1988).

Regarding the children's eating habits, the basic diet of the children as a whole is good when compared with the rest of Asia and the world. However, primary school children had a diet with more of the high-fat, low-nutrient snacks and less milk (HKCECES, 1994). Recent research among primary school children in Hong Kong shows that the overnutrition problems of obesity and high cholesterol levels was the second highest children's cholesterol levels in the world (Leung, 1993). Strong evidence indicates that obesity in Hong Kong children appears at about the age of six (Leung, 1993). Severe obesity is associated with a higher incidence of major complications of obesity eg. diabetes, hypertension, heart disease and sleep apnoea (Simopoulos & van Itallie, 1984; Van Itallie, 1979).

The results of the above-mentioned research programs lead to the conclusion that primary school students' habitually physical inactive life-style, traditionally poor eating habits and the insufficient exercise level duration during P.E. lessons may be contributing to the children's' physical fitness problems in Hong Kong.

At present, physical education lessons can be allocated only two periods per week in primary schools, about 35 to 40 minutes a period as recommended by the Education Department. There are around 60 periods of P.E. lessons annually for each level from primary one to six. Since the suggested syllabus of the primary P.E. curriculum covers a wide range of physical activities including individual sports and team sports, P.E. teachers have encountered difficulties in the selection of appropriate and various teaching activities for pupils and in fulfilling individual's needs. As far as the syllabus is concerned, being a skill-oriented P.E. curriculum. It is lack of recommended guidelines and syllabus in Physical Fitness at primary level. Therefore, P.E. teachers have not acquired adequate official guidelines on implementing the physical fitness unit in normal curriculum and extra-curricular activities.

Finally, the situation has been exacerbated by the environmental factors such as the lack of outdoor playgrounds and facilities, insufficient P.E. apparatus and equipment particularly for physical fitness measurement; and human factors for examples: most parents discouraging their children's participation on physical activities and extra-curricular activities in sports in this examination-oriented education system with emphasis solely on pupils' cognitive development.

In summary, although many primary P.E. teachers are aware of the value of physical fitness to the development of pupils' wellness, strong evidence from numerous studies have shown that children's health-related physical fitness level are found to be unsatisfactory due to children's habitually sedentary life style, the inadequate intensity and duration for P.E. activities in primary schools; the children's poor eating habits; the physical constraints in P.E. facilities and equipment; the scarcity of Physical Fitness syllabus in primary curriculum; as well as parents' negative attitudes towards physical activities in Hong Kong. Hence, there is a pressing need to incorporate a health-related physical fitness unit in the existing P.E. curriculum and the informal curriculum such as extra-curricular activities in primary schools.

III. Physical Fitness Unit

In order to remedy the current constraints on the development of a physical fitness unit in the existing primary P.E. curriculum in Hong Kong, a recommended Physical Fitness Unit is introduced at primary level. It is a new unit with a close relationship to the subjects of P.E. and general education. It can be incorporated into the P.E. curriculum as a core element to one extent and can be treated as an extra-curricular activity organized Saturdays alternatively in bisessional schools and after school weekly for one term in whole-day school. P.E. teachers are responsible to design, teach, implement and to evaluate the unit. Listed below are the full details of the units.

A. **Aim** : It aims to enable an individual (pupil) to live in a contributing, rewarding, self-fulfilling, sound and healthy life in a state of wellness.

B. **Objectives** : After the completion of the unit, pupils should:

1. acquire a basic and well-balanced knowledge on health-related physical fitness;
2. understand their own level of physical fitness level;
3. demonstrate how to perform the physical fitness test items correctly;
4. demonstrate hoe to perform keep-fit exercises related to resistance training properly;
5. recognize the need for understanding their own level of physical fitness and the values of health-related physical fitness;
6. accept oneself and tolerate others at various level of physical fitness and performance;
7. attain and foster the positive attitudes towards physical fitness; and
8. develop self interest in keep-fit exercises and engage in life-long recreational activities.

C. **Contents** : The content in the unit is characterized by well-organized and good sequential order. First, the sequence of the contents is mainly dictated by the 'Structural Logic' of the subject matter. Secondly, the 'Spiral Sequence' has also been adopted to arrange the contents in the unit. The suggested contents comprise of the theoretical and practical areas as follows:

Theoretical Aspect

Topic Area I : Health-Related Physical Fitness

- Definitions of health-related physical fitness
- Importance and values of health-related physical fitness
- Components of health-related physical fitness
- Measurement of health-related physical fitness

Topic Area II : The Body and their Care

- Functions of the bones, joints and muscles
- Care of the bones, joints and muscles
- Structure of the bones, joints and muscles
- Understanding the respiratory system and its care
- Understanding the circulatory system and its care

Topic Area III : Personal Hygiene and Posture

- Keeping the body clean
- Keeping the sports clothes clean and tidy
- Keeping the sports equipment clean and tidy
- Keeping good posture

Topic Area IV : Diet and Nutrition

- Healthy diet and good eating habit
- Nutritional needs and caloric needs
- Obesity and starvation
- The pre-game and post-game diet
- Effect of diet on sports performance

Topic Area V : Exercises and Rest

- Importance of exercises
- Importance of rest and sleep
- Right attitudes towards exercises
- Different types of exercises
- Exercises prescriptions - isotonic, isometric and stretching exercises

Topic Area VI : Sports Injuries and First Aid

- The cause of sports injuries
- The nature of sports injuries
- The treatment of sports injuries
- The prevention of sports injuries
- Simple first aid treatment

Topic Area VII : Stress Management

- The cause of stress
- The nature of stress
- The stress management techniques

Practical Aspect

The adoption of the following physical fitness scheme :

1. The School Physical Fitness Award Scheme for Primary Schools (Hong Kong Childhealth Foundation)
2. The International Council for Health, Physical Education, Recreation, Sports and Dance Physical Fitness Scheme.

Remarks: including anthropometric measurement (physique fitness)
measurement of blood pressure and resting heart rate (organic fitness)

The practice of the following muscle toning and aerobic exercises:

1. Muscle toning exercises : Arms and shoulder exercises, trunk and abdominal exercises, upper back and lower back exercises, leg and buttock exercises etc.
2. Aerobic exercises : jogging, running & walking, rope jumping, aerobic dance, obstacle training and circuit training etc.

D. Methods :

The variety of learning activities in the unit is abundant. They may include lecturing, discussing, experimenting, exploring, examining and participating. Understanding the different teaching approaches will affect the learning of different activities in this unit, hence five common approaches of fundamental teaching strategy have been employed : the directive, questioning, discovery, experimental and discussion approach. Therefore, the learning experiences offered throughout the unit have been selected for this influence on the learners' total development in physical fitness both in theoretical and practical aspects leading to the carry-over value in their life.

E. Evaluation :

Evaluation helps to clarify aims and objectives, assess contents and learning experience, refine teaching strategies, and supply information about pupils' abilities and level of attainment; so as to assist pupils to achieve the goals of physical education. Since it is a newly established unit for primary pupils, a formal test or examination on what they have learned in theoretical sessions would discourage their interests in physical fitness. Therefore, no formal cognitive evaluation such as tests, examinations or assignments have been prepared for them. To achieve the ultimate aim in evaluation for different situations, three important methods of evaluation may be adopted in the unit: 'formative' (in course), 'illuminative' (during course) and 'summative' (post course) evaluation. The incorporation of these three methods could fit the criteria of fairness, validity, reliability, subjective and objective judgement, understanding and comprehension.

IV. Implementation

Implementation is the process of putting a change into practice and it is critically important because it refers to the means of accomplishing desired educational objectives (Fullan, 1981). It can be seen that the amount and quality of change which occurs or fails to occur at implementation will significantly effect what outcomes are achieved in any given change effort. In discussing the implementation strategy on health-related physical fitness unit in Hong Kong primary schools, the following matters may be considered:

1. Approaches of Implementation
2. Components of Implementation
3. Factors affecting Implementation
4. Implementation Evaluation

1. Approaches of Implementation

Hong Kong has employed highly centralized and power-coercive strategies of curriculum development at initiation stage, whilst the implementation stage is characterized by a "self-help" or open adaptation strategy. In fact, in dealing with the implementation on health-related physical fitness unit, the 'problem-solving' strategy (system-centred change model) can be adopted rather than 'power-coercive' strategy (product-focused change model).

The problem-solving strategy attempts to make the system better by 'improving' the individuals who collectively comprise it and by teaching the institution as a whole how to improve itself. This model stresses non-hierarchical, personal interaction and maximum communication. Examples include the normative-re-educative approach (Chiu & Benne, 1969), problem solving approach (Havelock, 1971, 1973) and organizational development (Hord, 1987).

An adaptive approach should be adopted as the implementation strategy. The approach assumes that the exact nature of implementation cannot and/or should not be pre-specified, but rather should evolve as different groups of users decide what is best and most appropriate for their situation (Fullan, 1991). It is based on relatively unstructured, more open-ended premises (Fullan, 1981). Adaptive changes have the advantage of allowing for more individual choice, and development suited to a variety of situations. Such approaches may stimulate all implementors and users to participate in the innovation actively with the exchange of opinions. In that case, minor

in-service training courses should also focus on implementation issues. Practice-oriented workshops may be run frequently to polish teachers' practical skills.

In fact, it is necessary that special workshops on curriculum implementation strategy should be organized for staff in P.E. Section. Advisory Inspectorate of ED because they actually need such kind of training to provide adequate and constructive advice and assistance to teachers during implementation process.

Finally, the launch of local and international conferences and seminars will be helpful in updating teachers knowledge and providing chances in sharing teaching experience among teachers, scholars and experts.

It is critical that the CDC and Advisory Inspectorate of ED should establish a strong communication-information systems among all different parties related to the curriculum innovation because the assessment of need, active leadership, principal & teacher-teacher interaction, staff development all serve to increase the communication between administrators and teachers (Fullan, 1982).

EXTERNAL FACTORS can be seen as facilitating or inhibiting curriculum implementation. Three factors illustrating this dilemma are policy change, financial or material resources and technical assistance. It is hoped that the CDC may keep the policy on the innovation as consistent as they can. External funding and financial resources from the Hong Kong Sports Development Board (SDB) and the Hong Kong Childhealth Foundation will help the schools to purchase and replenish sports and fitness equipment for adopting the award schemes. However, the CDC should add such fitness equipment into the List of PE Standard Equipment and provide additional funding for purchasing purpose.

Substantial resources should be provided to support the implementation of curriculum innovation. This support takes a variety of forms which include : the provision of supporting agencies such as adequate regional teachers' centres, the provision of learning resources, and of personnel to advise and assist teachers. Therefore, special funding should be allocated to re-equip the teachers' centres by purchasing references and teaching materials such as video tapes, slides, films and models.

The provision of resources should be strengthened by including curriculum guides, statements of aims and objectives and lists of relevant readings and recommended textbooks. The CDC may invite scholars and experts to write teaching materials for the health-related physical fitness curriculum.

Forms of external assistance can also be more or less helpful. In Hong Kong, external assistance may include the 'expertise' from Universities, Hong Kong Sports Institute, Hong Kong sports & Medicine and Sports Science Association and Hong Kong Physical Fitness Association. Experts from these parties may play the role on consultancy to give advice and assistance to advisory inspectors and teachers.

4. Implementation Evaluation

Implementation evaluation may assist in making accountability and management decisions as well as serving research and development functions. According to Leithwood (1991), implementation evaluation may be designed :

to help specify the practices implied by the innovation; identify those conditions under which implementation is likely to succeed, including problems likely to be encountered under those conditions and strategies available for their resolution; determine the feasibility of innovation implementation, including the capabilities required of the implementors, and whether policy changes are warranted in the light of unintended effects, and decide when the innovation had been sufficiently well-implemented to warrant an assessment of its effects on student learning. Implementation evaluation providing information about these issues assist with management decisions. (p.445)

It is suggested that both formative and summative evaluation should be adopted during the process of

implementation. A variety of tools including questionnaire, interview, and observation may provide adequate information and opinions to the implementations for evaluation. Therefore, the CDC & Advisory Inspectorate may invite P.E. teachers and principals to opinion-sharing meetings before, during and after the academic year both for the implementation of the health-related physical fitness curriculum. The test result on the award schemes should be analyzed to draw recommendations.

To summarize, implementation is the most critical process / stage for the curriculum innovation. There needs to be strong cooperation and collaboration among the advisors and associations, as well as inspectors from P.E. section. Advisory Inspectorate, Education Department at the System Level; the experts and scholars from the universities and institutes at the Institute Level; and the principals and P.E. teachers from primary schools at School Level. In practice it is advised that P.E. teachers may allocate at least ONE to TWO period(s) monthly for teaching the health-related physical fitness to pupils. Since the duration for a period is only 35 to 40 minutes, P.E. teachers may emphasize either the theoretical or practical aspect in one lesson. They may follow the sequence of the suggested contents as depicted in the previous chapter. However, if P.E. teachers encounter difficulties in allocating P.E. lessons for the physical fitness unit, they may organize an extra-curricular activity in health-related physical fitness for pupils. In such cases, they should encourage pupils to participate during weekends for bisessional schools, and during weekdays (once per week) for whole-day schools in each term. The duration may last for 1 hour and 1-1/2 hours for lower primary (P.1 - P.3) and upper primary (P.4 - P.6) respectively. Then, teachers can share the knowledge of health-related physical fitness with pupils first and followed by practical work in one session.

V. Conclusion

The curriculum innovation in the health-related physical fitness unit has been viewed as an international issue. Obviously the contribution of this curriculum to the total development of school children have been confirmed. It is important throughout life to develop and maintain a functional capability to meet the demands of living and to promote optimal health (ACSM, 1988). Therefore, physical fitness is recognized as a major objective in primary P.E. (Kirchner, 1992; Pangrazi & Daver, 1992). Physical fitness should be considered as one crucial element (common-core) in the primary P.E. syllabus in order to enhance pupils' HEALTH "a state of complete physical, mental and social well-being and of merely the absence of diseases and infirmity" (World Health Organization, 1947); and WELLNESS "a way of life which you design to enjoy the highest level of health and well-being possible during the years you have in this life" (Ardell, 1985).

The establishment and maintenance of physical fitness is a legitimate and ultimate objective of physical education. It is clear that Hong Kong primary school children do not attain optimal level of physical fitness due to some inevitable human, curriculum, and environment factors. In order to increase the possibility of the successful implementation, the problem-solving strategy in an adaptive approach has been suggested to P.E. teachers. It aims at reducing the severe limitations on the extent of participation in decision-making, and the range of provision of resources and linkages. Considerations should be cautiously made on those factors affecting implementation including the characteristics of changes, local conditions, local strategies and external factors. Finally, implementations evaluation should be carried out through the process to obtain valuable information. If the health-related physical fitness curriculum changes in Hong Kong are attempting to have an effect on classroom processes, according to Morris (1990), a coherent policy must be identified with regard to the three dimensions :

Resources will have to be provided which aid implementation, linkages will need to be provided which serve to re-educate teachers, and lastly, subordinate groups will need to be meaningfully involved in the decision-making process if they are to be committed to, rather than just compliant with curriculum changes. (p.70-71)

It is hoped that government should take an active role on promoting health-related physical fitness in Hong Kong and should create an atmosphere in the society in attracting people to participate in recreational activities enthusiastically. Should we emphasize a total education in primary education, children will come first, and a well-being in body, mind, spirit should come first too.

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The Round Hill School, a private school established in 1823 in Northampton, Massachusetts, was the first to include physical education as an integral part of the curriculum. In 1824 Catherine Beecher, founder of the Hartford Female Seminary, included calisthenics in her school's curriculum and "was the first American to design a program of exercise for American children" (Lumpkin, p. 202). She also advocated the inclusion of daily physical education in public schools. This position supported the thesis that physical education contributed to the physical well-being of children, as well as to their social, emotional, and intellectual development. [45] Aerobic exercise increases physical fitness and lowers neuroendocrine (i.e., HPA axis) reactivity and therefore reduces the biological response to psychological stress in humans (e.g., reduced cortisol release and attenuated heart rate response).[13][41][88] Exercise also reverses stress-induced decreases in BDNF expression and signaling in the brain, thereby acting as a buffer against. In their study, the hypothesis was that lower-fit children would perform poorly in Mice that had access to running wheels and other such exercise equipment had better neuronal