Role of Physical Activity in Learning Disability: A Review

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Abstract

Physical exercise and training are widely considered as promoters of several positive outcomes. Physical activity has consistently been associated with enhanced physiological and psychological functioning. There is sufficient scientific evidence to prove that regular participation in physical activity is vital for healthy growth and development. The positive lifestyle behaviors, such as, participating in daily physical activity is beneficial for children with learning disability. In the long run, daily participation in outdoor games, fitness activities and recreational sports will help to improve the health and well-being of this special group who, otherwise, are prone to various health complications. Thus, the purpose of the present review is to discuss the link between physical activity and learning disability, thus paving an opportunity to reflect on its use as an alternative and supportive element in the intervention programs which aim for the holistic development of children with learning disabilities.

Keywords: Physical activity; Learning disability; Psychological functioning; Intervention programmes; Physical health

Introduction

A meaningful daily physical activity is a key to holistic health of every person. Research has supported the existence of association between physical activity and psychological well-being. Physical exercise showed significant correlation with psychological well-being, positive affect and mood, among both healthy and the clinical populations [1].

A sedentary lifestyle is proved to be a major risk factor for several life style complications and diseases, such as obesity, diabetes, hypertension and cardiovascular disease. One of the major public health concern these days focus on the increasing incidence of overweight and obesity among children and adolescents. Several weights related health problems are being diagnosed earlier in childhood than in the past. In this context, it is important to understand the health status of children with learning disabilities. These children are more likely to have an unhealthy life style and eating habits which can result in obesity when compared to general population [2]. The accumulation of extra body weight can be considered as an indicator of an unhealthy lifestyle, denoting the absence of factors such as diet and physical activity [3,4]. The necessity of people with learning disabilities to engage in physical activity becomes an unavoidable endeavor due to all the above mentioned reasons and therefore the aim of this review is to deliberate on the association between physical activity and learning disability. In addition, it is a known fact that there are significant health related benefits of physical activity among children with learning disabilities but this idea is yet to be translated into practice due to various reasons.

Barriers to physical activity

It has been documented that people with learning difficulties exhibit poorer health compared to the general population and this can be widely avoided [5]. Previous research has indicated that these children do not engage in meaningful physical exercises [6]. Numbers of factors contribute to their failure to engage in physical activities. Some of them include, the general clumsy behavior, poor motor coordination, poor balance of self, inability to handle two or more tasks simultaneously, short attention span, hyperactivity or hyperactivity, poor lifestyle orientations, poor self-esteem and an inability to handle a situation [7].

Yamaki [8] reported that the incidence of obesity is found to be much higher among people with learning disabilities compared to the general population. One of the main reasons attributed include the lack of physical activity. Therefore, intervention studies using physical activity programs and dietary strategies found that learning disabled group's Body Mass Index (BMI) decreased during the follow-up period of 6 years, whereas, an overall increase in body mass index was reported among control group [9]. Apart from physical activity, the amount of time spent also is an important factor for better health among these children. A study conducted by Burton [10] on a group of 78 people with learning disabilities attempted to understand the amount of time these people engaged in physical activities and the factors contributing to their engagement with such activities. The results showed that the levels of engagement were found to be higher for people with mild learning disabilities. Among these people those with higher adaptive behavior skills and less challenging behavior were likely to engage in more activities. The individual's engagement in daily activities was the result of interaction between the individual's characteristics and the group's home environment.

In order to measure the levels of and barriers to physical activity among people with learning disability Hawkins [11] studied 19 learning disabled adults living in community supported accommodation. The findings suggested that the levels of physical
activity were lower among adults with learning disability compared to the general population. The barriers to physical activity identified include the lack of understanding of the benefits of exercise, limited awareness about the variety of options available for physical activity, and the financial issues. In an attempt to establish a seven-day physical activity profiles of Messent [12] interviewed adults with learning disabilities. They reported that participants led exaggerated sedentary lifestyles compared to people from the general populations. The study suggested that the available choices for engaging in physical activity in day and residential care settings are not sufficient enough to empower people with learning disabilities. In a further study conducted by the authors to understand the support provided to the learning disabled in making choices to have a physically active life style, the findings show that these people face a number of barriers due to lack of clarity in policy guidelines, constraints in staffing, transport, income, expenditure, and limitations in physically active community leisure [13].

### Impact of physical activity on learning disability

The results of participating in a physical recreation activity for a learning disabled person include an improvement in lung capacity, reduction in resting heart rates and blood pressure levels, decrease in body fat mass, increase in lean body mass, muscle strength, and structure and function of connective tissues and joints [14]. Various scientifically proven strength-building and weight-bearing activities lead to sustenance of bone mass and reduction in the trauma-induced fracture incidences [15]. Any moderate physical activity is known to reduce the depression and anxiety levels and improve self-image, mental health and social skills [16]. The physical education programs are found highly beneficial for children with learning disabilities. The results of a study conducted to examine the effectiveness of three training programs, namely, psychomotor training, body image training and regular physical education programs on motor skills of learning disabled children (N = 22) supports this view. The findings show that significant improvement in motor skills is seen among those who underwent all the three training programs [17]. According to Northfield [18], physical exercise enhanced internal muscle strength, body balance, and quality of life in children with learning disabilities.

Engagement in exercise and physical activity result in positive outcomes for the children having learning difficulties [19,20]. According to Niemann [21] physical activities have positive influences in learning disabled children in terms of shortening stress, anxiety and depression, and strengthening the overall academic performance. Many researchers have opined that it is beneficial to have the children engage in regular physical activity, thereby making it a habitual daily life activity and a route to maintain good health [22]. There is empirical evidence to support the fact that physical activities may have some beneficial outcomes [23]. It may help the child to improve his academic activity and to reduce the irritability caused by the educational setting [24]. Learning ability and general health of a child may be improved with continuous engagement in physical activity [25]. Each and every physical activity brings positive outcomes such as enhanced feelings of social inclusion, modeling appropriate behaviors for others with similar disabilities, displaying of shared interests and rewarding experiences [26]. Research findings showed that the overall behavioral development and academic proficiency perception of the participants increased at the completion of a physical activity training program for 10 days [27].

The study conducted by Demirci [28] among 40 children with learning difficulties, examined the effect of physical exercise levels on their academic learning abilities. Among these children, 17% were physically inactive, 71% were with lower level of physical activity and 12% had displayed satisfactory physical activity levels. They found that, there was an increase in their learning abilities in accordance with the increase in physical activity levels.

The uses of physical exercise intervention for learning disabilities are few in number. One of those studies conducted by Reynolds [29] aimed at measuring the effectiveness of exercise on reading skills. The dyslexic children showed significant improvements on standardized tests of reading, writing and comprehension following intervention. Improvements were observed in dexterity, postural stability, and for naming fluency, phonological skill and semantic fluency. The experimental group showed significant reduction in cerebellar/vestibular signs following the exercise treatment in comparison to the control group. Reading fluency scores were significantly improved for the study group, along with passage reading for nonsense syllables. The authors concluded that, the intervention showed its effectiveness on eye movement control, dexterity and balance. The paybacks of the exercise are shown in the enhancement of cognitive skills reflecting literacy skills, such as reading process measured by standardized tests. There were criticisms regarding the findings of this study. The reasons cited include the various procedural and statistical issues with this study and the authors concluded that the study failed to provide sufficient evidence to show the efficacy of DDAT on reading difficulties of children [30]. In a longitudinal follow-up study conducted by Reynolds [31] aimed at assessing the main concern whether the learning was sustained for the next 18-month period. The results indicated significant improvement in, working memory, phonology, speech/language fluency, and motor skill. Inattentiveness also was reduced significantly. The significant improvement in reading showed the efficacy of intervention, but failed to indicate the improvement in the speed of reading and spelling. The study indicated that the significant improvements shown are long-lasting. Possible explanations given by the authors suggested that at the neuronal level, cerebellar activity and function are improved, at the cognitive level, attention and learning ability are enhanced, at the affective level, self-esteem, and self-efficacy showed improvement and finally at the social level, familial/parental support is improved.

The efficacy of a 20 week aerobic exercise program on, cardiovascular fitness, motor proficiency, academic achievement and self-concept among 54 boys with learning disabilities, showed a relationship between the exercise and improvement of self-concept. However, no improvement on academic achievement or motor proficiency is reported [32].

### Conclusion

There is sufficient empirical evidence suggesting the contribution of physical inactivity in obesity, cardiovascular diseases and other lifestyle problems of people with learning disabilities. It also suggests that regular physical activity promotes overall well-being and promotes academic performance and learning in these children. Based on this evidence, it is recommended that any lifestyle intervention that is meant for the enhancement of academic performance in children with learning disabilities should include, without fail, physical education programs. Such a promotion of physical activity in learning disabled
populations would result in noteworthy enhancements in health and academic outcomes.

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