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COMMENTARY: Exercise as a Treatment in Intellectual and Developmental Disability

Abstract

Physical exercise is often a neglected determinant of good mental and physical health and its role should not be underestimated in health promotion for people with an intellectual and/or developmental disability (IDD). The complex health issues associated with individuals who have IDD increases the risk of suffering from mental health and/or chronic disease issues. Treatment of the myriad of physical and or mental health problems may lead to polypharmacy and may include the use of psychotropic medications. Psychotropic medications for treatment of mental illness can be associated with additional health risks like obesity, metabolic syndrome, diabetes and heart disease. These issues can most simply be countered with, or at least ameliorated by, a carefully-designed, goal-oriented exercise regime based on simple physical activity. Furthermore, if exercise can reduce the use of psychotropics and benefit the health and wellness of the individual, it should be further researched and implemented consistently as a lifestyle intervention.

There is an established correlation between physical activity and optimal health and wellness (Caspersen, Powell, & Christenson, 1985). The World Health Organization (WHO, 2011), for example, recommends 150 minutes of moderate intensity physical activity, such as brisk walking, jogging, cycling or swimming. While exercise, however, is actively encouraged for the general population, it is seldom advocated as an effective medical intervention for those with intellectual and/or developmental disability (IDD). The evidence at hand, though, suggests that regular physical activity is crucial to treatment in IDD.

Physical Benefits of Exercise

It is worth recalling the various physical benefits of exercise which may decrease the risk for chronic disease, mental health issues and premature death. Warburton, Nicol, and Bredin (2006), for example, have noted improved vascular functioning amongst adults who engage in regular aerobic activity. This physical activity was noted to lower the risk for blood clots and to regulate blood pressure; furthermore, aerobic exercise decreased low-density lipoproteins (LDLs, or "bad cholesterol") and increased high-density ones (HDLs, or "good cholesterol") among the study subjects. Regular exercise, they found, decreased chronic inflammation, resulting in improved musculoskeletal and cardiac health (Warburton et al., 2006). There are still more benefits which have been observed. Warburton et al. further found that exercise assisted in stabilizing hormones and insulin levels, the latter by engendering homeo-

stasis to maintain blood sugar control, thus reducing one's likelihood of developing diabetes or becoming obese (Sharma, Madaan & Petty, 2006; Warburton et al., 2006). Since people with IDD experience higher rates of health problems including obesity, hypertension, higher cholesterol, heart disease, diabetes, respiratory infections and osteoporosis as compared with age-matched peers, exercise may be particularly helpful (Potter, n.d.). It is a truism: exercise is good for you. It even assists in regulating the body's physiological reaction to stress (Shama et al., 2006).

Neurological and Circulatory Benefits of Exercise

It is less well-recognized that exercise has neurological benefits as well. Berchtold and Cotman (2002) have observed that physical activity stimulates the production of neurons and is also associated with an increase in brain derived neurotrophic factor (BDNF). This suggests that exercise is capable of improving mental performance and facilitating learning; moreover, the BDNF is also capable of improved resistance following a brain injury (Berchtold & Cotman, 2002). Exercise increases the blood circulation to the brain and stimulates the region of the brain responsible for mood, motivation, and memory formation, as exercise promotes the secretion of neurotransmitters serotonin and endorphins which enhance mood (Callaghan, 2004). Physical activity even assists in regulating the body's physiological reaction to stress (Sharma et al., 2006).

Exercise and IDD: A Proposal

With the physical and neurological benefits of exercise apparent, it remains mystifying that exercise is not often suggested as a medical intervention for those with IDD. Such persons are at greater risk of developing diabetes, heart disease and osteoporosis; they are also at greater risk of becoming obese due to physical inactivity and/or nutritional deficiency (Levy, Lubetkin, Rimmerman, Soghomonian, & Sohler, 2009). For those with IDD, a regulated exercise regimen is a modifiable lifestyle change which should be encouraged and implemented by their care providers to facilitate their overall health and wellbeing.

Mental and Psychiatric Benefits of Exercise

Persons with IDD should benefit greatly from the positive effects of exercise on one's mental health. Exercise is known to improve self-esteem and cognitive functioning whilst ameliorating instances of anxiety, depression and negative mood (Callaghan, 2004). It also helps to regulate sleep, to improve stamina and to increase energy levels (Sharma et al., 2006). It warrants mentioning here that persons with IDD are at much greater risk of developing a psychiatric illness, with some estimates suggesting that they are three to four times more likely to develop a psychiatric illness than the general population (Cooper, Smiley, Morrison, Williamson, & Allen, 2007). Current evidence suggests that, at least among the general population, exercise may decrease one's likelihood of developing dementia or Alzheimer's disease, as well as potentially reducing the risk of cognitive impairment; however, there are only limited studies relative to those with IDD in this regard (Berchtold & Cotman, 2002). For those especially at risk of developing psychiatric illnesses, particularly those with IDD, exercise seems, at least preliminarily, as a relatively innocuous means to improve their mental condition and to reduce their possibility of developing more serious mental and/or psychiatric illnesses.

Exercise and Psychotropic Medications

The medications which are used to treat mental and/or psychiatric illnesses often have dangerous side-effects. It has been estimated that approximately half of all individuals with an intellectual disability have a psychiatric disorder which requires psychotropic medication (Hobden, Leroy, Lindsay, & Samuel, 2013). Pharmaceutical interventions and chemical restraints are used liberally, although they are intrusive methods of treatment which may have unwanted consequences (Webber, McVilly, & Chan, 2011). Antipsychotics are increasingly employed as a first-line pharmacological agent, even though other medications could be more

etiologically-suited (National Coalition of Dual Diagnosis, 2010). Antipsychotic medications are the most commonly-prescribed medication for an individual with IDD, so much so that it far exceeds the prevalence of psychotic disorders in the population (Hobden et al., 2013). There are multiple health risks associated with the use of psychoactive medications, including antidepressants, anti-anxiety agents, anticonvulsants and antipsychotics. Psychotropic medication use is associated with an increased risk of chronic disease. Some medications used for psychiatric conditions, especially antipsychotics, may influence weight gain and food consumption and predisposing individuals to become overweight or obese (Filakovic, Petek, & Radanovic-Grguric, 2012). Since obesity is a determinant of good health, this is extremely significant. There is also a direct correlation of psychotropic drug action to cause dyslipidemia and insulin resistance, contributing to metabolic syndrome; metabolic syndrome causes hypertension as well as type 2 diabetes (Filakovic et al., 2012). Other long-term effects of psychotropic use include psychomotor coordination and performance, daytime drowsiness, confusion, rage, amnesia, emotional irritability, ataxia, falls, as well as the possibility of a physiological dependence to the drug (Center for Substance Abuse Treatment (CSAT, 1998). Many of these effects associated with psychoactive drugs may be improved or neutralized with the implementation of regular physical activity without medication use.

Dangers of Polypharmacy

Similarly, chronic diseases may require constant medication usage – polypharmacy – which increases the likelihood of other adverse developments, such as overmedication, administration error, and interclass drug complications (Hobden et al., 2013). There is relatively little known about the long-term risks of polypharmacy and this should be extremely concerning. Osteoporosis and decreased bone density have also been observed to correspond with the ongoing use of typical neuroleptics (antipsychotics) and mood stabilizing drugs, such as lithium and carbamazepine (Misra, Papacostas, & Kilbanski, 2004). Against these serious pharmaceutical side-effects, exercise should be seen as an obvious and necessary counter-measure.

Exercise as Pharmaceutical Counter-Measure

Physical exercise is associated with a decreased risk of using psychotropic medications in the general population (Sharma et al., 2006). Unfortunately, there have been no direct studies conducted specifically in those with IDD. Regular moderate-to-vigorous activity has, however, been shown to prevent the need for psychotropic medications in individuals who did not have a psychiatric diagnosis (Lahelma, Lahti, Lallukka, & Rahkonen, 2013). In the general population, moderate-intensity physical activity for more than 30 minutes per day was as effective as antidepressant medications or cognitive behavioural therapy in treating mild to moderate depression (Clark, Chambliss, Dunn, Kampert, & Trivedi, 2005). Similarly, persons with schizophrenia who participated in a physical exercise regime were observed to have experienced fewer auditory hallucinations and increased self-confidence, as well as having improvements to their sleep and general behaviour (Callaghan, 2004).

Ashbaugh, Ence, Koegal Lang, Regester, and Smith (2010), in a review of 18 studies, found that individuals with autism spectrum disorder (ASD) benefited from physical exercise. They noted improvements in behaviour, academics and physical fitness, including decreases in elopement and off-task behaviour. Furthermore, instances of aggression and self-injury were found to have lessened with exercise (Ashbaugh et al., 2010). Although further studies need to be done to explore the impact of exercise on problematic behaviours, based on the current results, an increase in quality of life may be expected from implementing regular exercise with individuals with IDD.

Exercise and IDD: Particular Challenges

Although all physical exercise seems to be beneficial, there may be challenges to implementing this as a medical intervention for those with IDD. There is an increased prevalence of sedentary behaviour in this population, which has a negative impact on health and wellness (Bryl, Hoffmann, & Matuszak, 2013). This may be due to a physical disability which limits

activity, ignorance of the benefits of physical exercise, insufficient motivation, or general uncertainty about how to exercise regularly and effectively. For some individuals, obesity may discourage them from exercise because of fatigue or pain-related issues (Bryl et al., 2013). These issues must be addressed deliberately and deftly to ensure that the activity regimen achieves its medical goals.

Strategies for Implementing an Exercise Program

To increase the success of a physical activity program for persons with IDD, a number of factors need to be considered. Once an individual is medically cleared to start an exercise program, service providers need to be trained on safety measures, communication, instructional strategies, activity modification and behavioural reinforcement methods to include others, such as family members, to participate in the regime (Frey & Stanish, 2008). Motivational strategies – such as verbal praise or providing tangible rewards – are necessary, particularly if fitness goals, such as improving speed or endurance, are established and pursued (Frey & Stanish, 2008). The involvement of caregivers or family is essential to ensure participation and adherence to regular physical activity. This involvement also promotes social interaction, inclusion and self-esteem. The activity implemented needs to have some element of interest for the individual and should include participants in the process of activity selection (Frey & Stanish, 2008). The activity should be modified over time to continue to challenge the individual physically as his or her levels of physical endurance increase (Frey & Stanish, 2008).

For front-line caregivers, it is important to remember that the most effective means to implement an exercise regime are often the simplest. A viable exercise intervention could include walking or jogging for 30 minutes: this would be cost-effective and easy to implement. Clients should have specific goals in regards to distance and speed, ideally working toward increasing their speed weekly and promoting physical endurance (Frey & Stanish, 2008). Similarly, riding a stationary bicycle and increasing the resistance at appropriate intervals would likely provide a major health benefit for those with cost or transportation issues. Such activities, augmented by a simple system of goals and rewards, should prove and decrease the health risks associated with sedentary behaviour. The Special Olympics, which is available in a variety of locations nationally, promotes physical activity by offering a variety of sports and recognizes individual abilities and fitness levels (Special Olympics, n.d.). It provides a social atmosphere involving peers in a competitive environment which promotes endurance and has been shown to increase self concept and adaptive factors (Weiss, Diamond, Demark, & Lovald, 2003).

Conclusion

It is essential that physical activity be acknowledged as a necessary daily intervention to increase the quality of life of individuals with IDD. The increased risks of psychiatric illness and behavioural disturbance may be ameliorated by physical activity and prevent the need for psychotropic medications. Psychotropics may increase the chances of polypharmacy and metabolic syndrome which also may contribute to the risk of developing chronic disease and/or obesity. Exercise is a relatively simple, cost-effective medical intervention which requires little more than structured, engaging activity in a supportive, encouraging framework. If it is predicated on moderate, goal-centered activity in a secure environment, the long-term benefits to persons with IDD could prove immeasurable.

Key Messages From This Article

People with disabilities: You have the right to the best possible care, which includes exercise in your daily routine. This will make you feel healthy and happy.

Professionals: Implementing exercise into your clients daily routine to facilitate success including positive reinforcement, a structured daily physical regime with the input of the client will benefit their health and wellness.

Policymakers: Exercise should be considered as a standard in implementing the necessities of life. This will ensure that it is being implemented to promote optimal care.

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