

Developing Speed, Flexibility and Endurance of People with Developmental Disabilities Using Zumba

Paolo E. Hilapo¹, Christian Vanessa B. Olea², Alluidin B. Panara-ag³, Nomer A. Felismino⁴
Alexander Justine Valera⁵, Ricardo R. Villas Jr.⁶

¹⁻⁵ *BPE Sports and Wellness Management, College of Education, Arts and Sciences, National University*

⁶ *Associate Professor, College of Education, Arts and Sciences, National University*

**Corresponding Author: rvillas@national-u.edu.ph*

Abstract: The study was conducted to determine the effectiveness of zumba in improving speed, flexibility and endurance of people with developmental disabilities. Specifically, the study aims to determine the level of performance of PWD before and after being exposed to zumba. This quantitative study used quasi-experimental design. Data were gathered using the 20 meter sprint to measure the speed, V-sit reach and shoulder flexibility to measure the flexibility and YMCA 3-minute step test to measure endurance. The data were subjected to statistical analysis using the mean and standard deviation and paired sample t-test. Results revealed that there is a significant improvement in the speed, flexibility and endurance of people with disabilities after being exposed to zumba. This study concludes that zumba is an effective wellness activity that can be used to develop the speed, flexibility and endurance of people with disabilities. Larger scale experimental studies focus on determining the effectiveness of zumba in developing other areas of physical fitness among different disability categories is highly recommended.

Key Words: zumba, speed, flexibility, endurance, developmental disability

1. INTRODUCTION

Physical activities for PWD is primarily intended to reverse deconditioning secondary to impaired mobility, optimize physical functioning, and enhance overall well-being (Durstine, et al., 2000; Murphy & Carbone, 2008). Regular physical fitness activity among people with disabilities is highly encouraged since it helps in disease prevention and promotion of physical and emotional well-being (Rimmer, 2002). In addition, regular physical activity is essential for the maintenance of normal muscle strength, flexibility, and joint structure and function and may slow the functional decline often associated with disabling conditions (Durstine, et al., 2000). However, people with disabilities are less likely to participate in

sustained robust exercise than people with disabilities (Healthy Children, 2010 in Fragala-Pinkham, Haley, Rabin, & Kharasch, 2005). Physical exercise, as one of possible treatments for people with disabilities, 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 disabilities. It is worth recalling the various physical benefits of exercise which may decrease the risk for chronic disease, mental health issues and premature death. According to Warburton, Nicol, and Bredin (2006), for example, have noted improved vascular functioning amongst adults who engage in regular aerobic activity. It even assists in regulating the body's physiological reaction to

stress. 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 developmental disabilities.

In the recent years, there has been a focus on persons with disability (PWD) in the Philippines. According to 2015 census of the National Statistics Office (NSO), 3.805 million or 3.7 percent have disabilities out of the 102.8 million household populations in the country. These are the most prevalent types of disabilities mentioned in the 2015 census: attention deficit/hyperactive disorders, blindness or low vision, brain injuries, deaf/ hard-of-hearing, learning disability, medical disability, physical disability, psychiatric disability, and speech and language disability (NSO, 2015). Most of these PWDs are living in with their families while some are living in charitable institutions, and government and non-government institutions among others. Veluz (2015) stated that some of the clients with disabilities in a charitable institution exhibit poor physical development due to lack of exposure to sports and wellness activities. The problem associated with the movement and body coordination of these individuals hindered them from performing different physical activities. In this context, this study focused on the people with developmental disabilities living in a charitable institution. The study aims to (1) determine the level of performance of people with developmental disabilities in terms of speed, flexibility and endurance before and after the zumba intervention program; and (2) determine the effectiveness of zumba intervention program on the development of speed, flexibility and endurance of people with developmental disabilities. Developmental disabilities in this study only refer to individuals with intellectual disability and autism.

1.1 Review of Related Literature and Studies

Results of several studies revealed that zumba as a movement exercise has positive effects to human body (Ljubojevic, Jakovljevic and Poprzen, 2014; Donath et al., 2014; Fragala, Pinkham, Haley, O'Neil, 2008; Bachman and Sluyter, 1988). In the study of Animesh, Chakravarthy & Swatik (2015), results reveal that aerobic exercise is an effective wellness tool since the participants improved their heart rate and body composition. Zumba as an aerobic exercise also promotes positive development of the physical well-being of individuals using it. Moreover, participants of the study reported that they enjoyed the classes where zumba was implemented. In support to this, the results of the study of Ljubojevic, Jakovljevic and Poprzen (2014) on the effectiveness zumba fitness program on changes of women body composition reveal that zumba was an efficient way to lose weight since participants experienced reduction of the body weight, fat percentage, fat mass, fat-free mass increased, and total body water increased. Meanwhile, Donath, et al (2014) investigated on the effects of zumba training on endurance, trunk strength, balance, flexibility, jumping performance and quality of life of female college students. Results revealed that zumba training can improve well-being, aerobic fitness and neuromuscular function in female college students. On the other hand, zumba, a psychosocial culturally tailored aerobic dancing activity, is effective in increasing the self-esteem of women (Alcantar, 2013).

Participating in a physical activity or movement exercise can improve one's health and physical skills especially to those with disability. Movement exercise like zumba is used as fitness exercise for normal individuals not only to prevent illness and to develop body's physical skills but also to improve self-esteem, burn calories, prevent

inappropriate behaviour and improve the quality of life of a person. In the study of Bachman and Sluyter (1988), two developmentally disabled adults were observed in a day activities center in order to see the effects of aerobic dance exercise on inappropriate behaviour. Results of their study indicated for both subjects have a decrease in each of the inappropriate behaviour as a result of exercise. This study is undertaken to advance knowledge about the effects of zumba in terms of improving speed, flexibility and endurance of people with developmental disabilities.

1.2 Theoretical/Conceptual Framework

This study is anchored to the Bandura (1997) Social Cognitive Learning Theory which states that people learn from one another, via observation, limitation, and behaviour. There are four components of social learning theory, the attention, retention, motor reproduction, and motivation. In attention, the PWD has to watch the zumba instructor's in order to imitate it. In retention, this is where the PWD codes the information into long-term memory so that the information can be retrieved later on. In motor reproduction, the PWD must learn and possess the physical capabilities of the zumba instructor and perform the different zumba steps. In motivation, this is when the PWD expects to receive positive reinforcement from the zumba instructor. The environment delivers a consequence that changes the probability that the behaviour will be performed again. In the context of this study, the present level of performance of people with developmental disabilities can influence their response to the zumba intervention program and vice-versa.

2. METHODOLOGY

This quantitative study employed quasi-experimental design in order to measure the effectiveness of zumba in improving speed, flexibility and endurance of PWD. Specifically, the researchers used the *single group pre-test and post-test design*. This study is undertaken in a charitable institution that caters to PWD. Nine (9) people with developmental disabilities are purposively chosen using the pre-determined inclusion criteria. In order to measure the speed, flexibility, and endurance of the PWD, the researchers used the 50 meter sprint, V-sit reach test and the shoulder flexibility test, and YMCA 3-minute step test, respectively. The researchers gave the informed consent form to the participants and explained to them the nature and scope of the study. Only participants who gave their consent participated in this study. After receiving the signed consent form, the participants were given pre-test to measure their speed, flexibility and endurance prior to the zumba intervention program. The researchers conducted zumba sessions with the participants twice a week for one month. After the zumba sessions, the participants were given post-test to determine the effectiveness of zumba. Mean and standard deviation were used to determine the level of performance of people with disabilities in terms of speed, flexibility and endurance before and after the intervention. One sample t-test ($\alpha \leq .05$) was used to determine the significant difference in the level of performance of people with developmental disabilities in terms of speed, flexibility and endurance before and after the intervention.

3. RESULTS AND DISCUSSION

Results show that there is a decrease in travelling average time from the point of reference to the target distance which means

that there is an improvement in the speed of PWD after being exposed to zumba. On the other hand, the increase in the distance reached in v-sit reach test shows that there is an improvement in the flexibility of PWD. The decrease in the gap of the fingertips when doing shoulder flexibility test on the right arm and left arm also indicates an improvement in the flexibility of the PWD. Meanwhile, the increase in the repetition of the steps on the endurance test shows that there is an improvement in the endurance of PWD after participating in zumba sessions.

Table 1. Speed, Flexibility, and Endurance Performance of the People with Disabilities

		Mean	SD
Speed	Pre-test	6.97s	2.04
	Post-test	5.1s	1.24
Flexibility	Pre-test	47.11cm	5.56
	Post-test	52.56cm	5.50
Right Arm Flexibility	Pre-test	7.22cm	2.59
	Post-test	4.33cm	2.96
Left Arm Flexibility	Pre-test	6.56cm	5.20
	Post-test	4.44cm	4.39
Endurance	Pre-test	59.78reps	16.28
	Post-test	71.89reps	18.34

Moreover, results show that there highly significant mean differences on the speed, flexibility, and endurance of PWD after participating in the zumba intervention program which indicate that zumba is an effective wellness tool in improving the speed, flexibility, and endurance of PWD.

Table 2. Significant Difference in the Speed, Flexibility, and Endurance of the PWD after being Exposed to the Zumba

	p-value
Speed	.005
Flexibility (hamstrings, lower back and gluteal muscles)	.007
Right Arm Flexibility	.000

Left Arm Flexibility	.000
Endurance	.000

The results of the study show the significant improvement of the speed, flexibility, and endurance of PWDs after being exposed to zumba, an aerobic exercise. Findings in this are supported by the study of Donath, et al. (2014) where effects of zumba training on endurance, trunk strength, balance, flexibility, jumping performance and quality of life shows significant difference to the group of persons who were exposed to it. In addition, Ljubojevic et al.'s (2014) advanced that zumba fitness exercise shows significant changes on person's body composition. In support to this, Alberta (2015) posited that physical and movement exercise also improves cardiovascular fitness and endurance, develop and maintain joint flexibility, muscular strength, and balance. Similar observations were advanced by Rimmer (2005) who stated that aerobic exercise for PWD have many benefits including increased in cardiovascular capacity and endurance, lower blood lipid levels and weight management, preservation of bone mass, and overall maintenance of functions.

Health promotion interventions like zumba for people with disabilities have the potential to decrease the incidence and severity of these secondary conditions, but little research has developed models of intervention that specifically addresses the needs of this people (Ravesloot, Seekins and Young, 1998). Moreover, it is vital to be physically active as possible for anyone with disabilities or mobility issues (Alberta, 2015).

4. CONCLUSION

The significant improvement in the speed, flexibility, and endurance means that zumba is an effective movement exercise that can be given to PWD in order to improve

their speed, flexibility and endurance. People with developmental disabilities are highly recommended to join movement exercises such as zumba for them to improve their physical skills. A longitudinal experimental study focused on testing the effectiveness of zumba in improving the different physical skill domains of different groups of PWD is highly recommended. Further studies also are needed to determine whether zumba could be carried out in a community or school setting.

5. ACKNOWLEDGEMENT

The authors would like to acknowledge the support of the administrators of the participating charitable institution, College of Education, Arts and Sciences, and the Department of Sports and Wellness Management.

6. REFERENCES

- Alberta, C. A., (2015). Physical activity for people with mobility issues or disabilities.
- Alcantar, V. (2013, November). Effect of zumba: The psychosocial implications of a culturally tailored physical activity on Latina women's self-esteem. In 141st APHA Annual Meeting (November 2-November 6, 2013). APHA.
- Animesh, H., Chakravarthy, K., & Swatik, M. (2015). Effect of aerobic exercise training on body composition and heart rate recovery in overweight and obese sedentary Indian women. *Journal of Medicine and Pharmaceutical Sciences*, 5(1), 1-6.
- Bachman, J. E., & Sluyter, D. (1988). Reducing inappropriate behaviors of developmentally disabled adults using antecedent aerobic dance exercises. *Research in Developmental Disabilities*, 9, 73-83.
- Bandura, A. (1977). Social cognitive learning theory.
- Donath, L., Roth, R., Hohn, Y., Zahner, L., & Faude, O. (2014). The effects of Zumba training on cardiovascular and neuromuscular function in female college students. *European Journal of Sport Science*, 14(6), 569-577.
- Durstine, J. L., Painter, P., Franklin, B. A., Morgan, D., Pitetti, K. H., & Roberts, S. O. (2000). Physical activity for the chronically ill and disabled. *Sports Medicine*, 30(3), 207-219.
- Fragala-Pinkham, M., Haley, S. M., & O'Neil, M. E. (2008). Group aquatic aerobic exercise for children with disabilities. *Developmental Medicine & Child Neurology*, 50(11), 822-827.
- Fragala-Pinkham, M. A., Haley, S. M., Rabin, J., Kharasch, V.S. (2005). A Fitness Program for Children With Disabilities. *Physical Therapy*, 85,(11), 1182-1200.
- Ljubojević, A., Jakovljević, V., & Popržen, M. Effects of zumba fitness program on body composition of women.
- Murphy, N. A., & Carbone, P. S. (2008). Promoting the participation of children with disabilities in sports, recreation, and physical activities. *Pediatrics*, 121(5), 1057-1061.
- National Statistics Office (2015). Gender quick stat. Retrieved from <https://psa.gov.ph/statistics/gender-statistics/gender-quickstat-index>
- Ravesloot, C., Seekins, T., and young, Q. R. (1998). Health promotion for people with chronic illness and physical disabilities: the connection between health psychology and disability prevention.

- Rimmer J.H. (2002). Health promotion for individuals with disabilities: the need for a transitional model in service delivery. *Disease Management and Health Outcomes*, 10, 337-343.
- Rimmer J. H. (2005). Exercise and physical disability in persons aging with a disability. *Physical Medical Rehabilitation in North America*, 18, 41-56.
- Warburton, D.E., Nicol, C. W., & Bredin, S. S. (2006). Health benefits of physical activity: the evidences. *Canadian Medical Association Journal*, 174(6), 801-809
- Veluz, F. personal communication, September 8, 2015)