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Effects of Aerobic Dance on Cardiovascular Level and Body Weight among Women

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***Abstract*—**Aerobic dance has becoming a popular mode of exercise especially among women due to its fun nature. With a catchy music background and joyful dance steps, aerobic dancers would be able to have fun while sweating out. Depending on its level of aggressiveness, aerobic may also improve and maintain cardiorespiratory fitness other than being a great tool for weight loss. This study intends to prove that aerobic dance activity can bring the same, if not better impacts on health than other types of cardiovascular exercise such as jogging and cycling. The objective of this study was to evaluate and identify the effect of six weeks aerobic dance on cardiovascular fitness and weight loss among women. This study, which was held in Seremban Fit Challenge, used a quasi-experimental design. The subjects selected include a total of 14 women (n = 14) with age (32.4 years old ± 9.1), weight (65.93 kg ± 11.24) and height (165.36 ± 3.46) who joined the Seremban Fit Challenge Season 13. The subjects were asked to join an aerobic dance class with a duration of one hour for six weeks in a row. As for the outcome, cardiovascular fitness was measured with a 1-mile run test while any changes on weight were measured using the weighing scale. The result showed that there was a significant difference between pre and post-test for cardiovascular fitness when $p = 0.02 < 0.05$ and weight loss when $p = 0.00 < 0.05$. In conclusion, a six-week long aerobic dance program would have a positive effect on cardiovascular fitness and weight. Therefore, aerobic dance may be used as an alternative for people who wish to lead a healthy lifestyle in a fun way.

***Keywords*—**Aerobic dance, cardiovascular fitness, weight loss, 1-mile run test.

I. Introduction

A. Background of the Study

OBESITY has turned into a general well-being emergency in the United States (US) [31]. Broadly, illustrative survey data demonstrate that the prevalence has steadily increased in the pass of three decades although there are huge incongruities between population groups and continuing changes in the related examples. Current evidence recommends that the predominance is liable to stay on the rise and it will not be conceivable to meet the goals set for Healthy People 2010 of diminishing corpulence commonness in grown-ups to 15% and in kids to 5% [31]. Obesity will bring into many consequences including health, social, psychological, and economic for the individuals [31]. From this finding, US generation may have a shorter life than their parents may if this weight pandemic cannot be controlled. Expenditures will keep on rising because of the increments in corpulence commonness and in the expense of related medicinal care. In recent years, there is a marked trend for women are becoming increasingly interested in the potential health benefits of exercise. It is well known that physical fitness is more important than the physical activity level for the accomplishment of health benefits in the public [10]. Reference [25] also stated that, obesity is a well-established risk factor for cardiovascular disease in the general population that lead the cause of mortality and morbidity in developed and developing countries including Malaysia.

According to [3], physical fitness can be defined as a set of attributes that people have or achieve which can be divided into health-related fitness and skill related fitness. Being physically fit has been characterized as the capacity to complete everyday tasks with life and readiness, without undue fatigue and with plentiful vitality to appreciate relaxation time interests and to meet unforeseen crises, while physical activity can be defined as any movement created by skeletal muscles where energy is produced [3]. There are various types of physical activities that human beings can benefit from. It can be categorized into sports, conditioning, occupational, housework, or any other exercise, and also need to be structured, arranged, and organized in such a way that it would well serve the health purpose. There are activities that would rely on environmental setting and weather conditions namely biking, cross-country running and swimming. A rather interesting recreational form that is well-known among females is the aerobic dance, where participants can work out while socializing and having fun. According to [11], in Advanced Fitness Assessment and Exercise Prescription 5th edition, aerobic dance can be defined as a popular mode of exercise for improving and maintaining cardiorespiratory fitness followed by the target intensities. Aerobic dance can also be an effective workout to inhibit falls because of its benefits associated with kinesiology factors and a fairly low rate of injuries. The step and choreography in dance incorporated the sagittal step and straddling step which include balance and agility [28].

Reference [16] expounded that aerobic dance can be helpful to develop cardiovascular endurance because oxygen is delivered around the body through the blood stream and pumped by the heart. The aerobic system can only work when the energy demand is low intensity for the heart to provide the muscles with satisfactory supply of oxygen. In aerobic exercise, the body is operating at a level in which the supply of oxygen is sufficient to the body's requests for oxygen. By doing aerobic dance, body weight also can be reduced [23]. Reference [4] recommend prescribes no less than 150 minutes

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every week of moderate-intensity exercise that causes your heart to beat faster and makes them inhale harder. Aerobic activity should last for a minimum of 10 minutes, but adding more time and increasing intensity will develop cardiovascular health and burn more calories. Aerobic dance activities have normally been created as a vigorous activity to diminish body compositions and also enhance physical wellness and performance [22]. In aerobic dance, plyometric movement included to improve muscle strength of lower extremities [28]. At present, Zumba Fitness is one of the most popular types of aerobic dance around the world that can fix or improve cardiovascular fitness. One of the most desired and desirable physical activities for women are aerobic dance, which can have a positive influence on aerobic power similarly to walking or jogging [14]. In addition, aerobic dance in Thailand is a popular activity and performed by small groups of middle-aged women rather than men [16].

Zumba routines integrate interval training that is recommended for most healthy adults by the Department of Health and Human Services. Aerobic exercise reduces health risks, keeps excess pounds at bay, strengthens your heart, and boosts your mood. If aerobic dance is shown to provide benefits, the type of exercise should be recommended to improve the ability of the heart and also to lose weight, especially for women.

B. Statements of the Problem

Eating disorder, unhealthy eating behavior, and obesity are common and increasingly prevalent health problems among society [6]. For example, the stress of working life and the dietary consumption of the community in Malaysia is reflected through poor eating behavior, exacerbated by easy access to fast food and unhealthy food being relatively cheaper. The double burden of overweight has been identified as a major public health problem in Asian countries, where over nutrition has become increasingly prominent, particularly in adult populations and its continually increase on both rural and urban areas among women factories workers in Peninsular Malaysia [5]. Supporting by [25], obesity recognized as a major determinant of many other non-communicable diseases such as cancers, gallbladder diseases, respiratory problems and musculoskeletal disorders. Furthermore, [6] said that these inadequacies tend to be gender dependent as females tend to choose healthier foods. According to [31], Malaysia was ranked as sixth in Asia with the highest adult obesity rate. Obesity statistics from [19] showed that adults, 18 years and above (based on CPG 2004 Classification), 33.3% (5.4 million) are pre-obese and 27.2% (4.4 million) are obese while for children below 18 years (based on weight for age status), 3.9% (0.3 million) are obese. This demonstrates how the health consciousness among Malaysians is at a worrying level. Excess weight increases risk for stroke, incident cardiovascular disease, cardiovascular mortality, and all-cause mortality among the middle-aged women [30]. Reference [16] stated that aerobic dance can be beneficial on cardiovascular endurance to improve healthy lifestyle, weight control, and it is popular in urban population. Hence, the purpose of this study was to look into the outcome of the training program in enhancing endurance performance and weight control from the previous studies.

C. Objective of the Study

The objectives of this study were:

- To identify the effect of a 6 week aerobic dance class on cardiovascular fitness level.
- To evaluate the effect of a 6 week aerobic dance class on weight loss.

D. Hypothesis

Based on this study, the following hypotheses were formulated:

$H_0$1 : There is no significant difference of 6-week aerobic dance on cardiovascular fitness level.

$H_0$2 : There is no significant difference of 6-week aerobic dance on weight loss.

E. Significance of the Study

Reference [16] mentioned that, aerobic dance is a standout among the most well-known activity rehearses in the world. From this study, it is required to prove that aerobic dance activity is impacting the same or better than other types of exercise such as jogging and cycling in improving the ability of the heart and act as a tool for weight loss. The goal is to give variety to the existing aerobic exercise patterns and to provide more challenging routines for those who are used to it. It is also to see whether aerobic dancing can have significant changes in weight loss. The results of this study will open the eyes of various groups, especially women, are more likely to engage in activities that dancing can avoid diseases such as heart disease, obesity and hypertension [9].

F. Limitations

There are some limitations regarding this study:

- Different intensity level by each person. Some of them will do light or basic movements and some will do vigorous movement. To determine their intensity, the subject will monitor their heart rate every 15 minutes after exercise to identify their intensity level.
- Willingness of participants to get involved and help in conducting this study. In addition, the time and commitment also plays an important role because everyone has their own agenda and there are those who cannot attend every training session.
- Lifestyle of the participants who are smoke or consume unhealthy food will be affected the result.

G. Delimitations

The following are possible delimitations of the study:

- Participants are selected from people who joined the Seremban Fit Challenge program with average aged from 25 to 45 years old.
- Zumba fitness for once a week.
- Duration of exercise is 60 minutes

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H. Definition of Terms

1. Aerobic Dance

A mode of exercise for improving and maintaining cardiovascular fitness can be known as a choreographed routine of movements usually performed to music [13]. This type of training was used by Seremban Fit Challenge program as one of the method to increase cardiovascular fitness level and decrease body weight.

2. Cardiovascular Fitness

Cardiovascular fitness is known as a direct marker of physiologic status. Moreover, it reflects the overall capacity of the cardiovascular and respiratory systems and the ability of the lung to carry out prolonged physical activity/exercise [26]. This study used 1-mile run test as a testing method.

3. Weight Loss

A decrement in body weight or intentionally lost at least 10% of body weights and kept it off at least for one year [33]. This study wants to see whether the weight of subjects is decreased or not after undergo six week of exercise.

4. 1-Mile Run Test

A test had been used to determine participant's cardiovascular level. In addition, it is known as an aerobic fitness to cover a mile (1-mile) distance in the shortest time as fast as possible [27].

II. Literature Review

A. Introduction

Research studies needed to establish the validity of aerobic dance. This study required to prove the effectiveness of aerobic dance especially Zumba to improve or enhance cardiovascular fitness or endurance level and weight reduction within women. This study using qualitative research to measure the pre-exercise and post-exercise within the period by using 1-mile test method to test their fitness level, and weight scale for weight reduction.

B. Past Related Studies

There are many past studies have been done before about the effect of aerobic dance that give results toward their subjects. One of the journals is about the effect of aerobic dance on the body fat distribution and cardiovascular endurance in middle-aged women in Mumbai by [15]. This study involved 120 candidates that are divided into two groups for treatment and control group, and examined by using VO_2max and body fat percentage. The VO_2max was measured using the Queens Step Test while the body fat measured by skin fold measurement. The treatment group engaged with 60 minutes aerobic dance session, three times per week for six months. After post-test, result shows that no significant difference in VO_2max and lower fat percentage, indicating aerobics is highly effective in weight loss, but effects towards cardiovascular endurance are not stated. Increasing the level of existing protocol to achieve increased VO_2max may fasten muscle and tendon injuries. In a nutshell, aerobic dance can be beneficial to assist the effect towards participant's body weight. Reference [23] had conducted a study regarding the effect of an aerobic dance and diet program on cardiovascular fitness, body composition, and weight loss in women by in California. The researchers choose 60 female subjects from the range of 20 to 65 years old over a wide range of body masses and level of fitness. Subjects are divided into two groups which are treatment group or a control group. The treatment group will participated in the exercise and diet program while the control group only participated in the measurement only for seven days per week for 10 days. The researchers use compliance scale for measured diet and exercise scale such as diet, blood pressure, heart rate, body fat, girth, strength and aerobic fitness. The result shows that after 10 days, there was no significance difference in blood pressure, heart rate, girth, or body weight. As a conclusion, the treatment group shows some reduction in weight, girth at the waist, heart rate and blood pressure, but there also have increase of the core muscle strength.

Reference [16] has published a study of aerobic dance exercise improves blood oxidative stress status and increases interleukin-2 in previously sedentary women in six weeks intervention in Thailand. The objective of this study is to evaluate the change in blood oxidative stress, blood interleukin-2, and physical performance in 6 weeks of moderate intensity and duration aerobic dance exercise three times per week in 24 sedentary women. Some of the methods were used such as physical performance (VO_2max and maximal running time until exhaustion), oxidative stress status (protein hydroperoxide [PrOOH], malondialdehyde [MDA], total anti-oxidant capacity [TAC]), and interleukin-2 [IL-2]. The results from post-test shows that VO_2max, TAC and IL-2 were significantly increased while in contrast there were significantly declined for MDA levels [16]. PrOOH shows no significant changes either between baseline measures or after exercise. From this study, it can be concluded that aerobic dance at a moderate intensity and duration, three times per week can improve fitness level, decrease MDA, and increase TAC and IL-2 in previously sedentary women.

C. Summary

This study shows that the adoption of aerobic dances in the daily or weekly routines would positively impact our fitness level and serves as a medium for weight loss. Its ability to reduce risk factors of cardiovascular diseases should be well-acknowledged and put attention to as heart diseases stand among the top killer diseases in Malaysia. Not to mention, aerobic dance is a perfect combination of health and entertainment where workout is carried out in a fun and most enjoyable way.

III. Methodology

A. Introduction

This study was conducted to investigate the effectiveness of six-week aerobic dance to improve cardiovascular fitness and weight loss among women population. In this chapter, the

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topics that has been covered is research design, sampling of subject, tools and instrumentation, research protocol was used, data collection flow chart and data analysis.

B. Research Design

This study utilized a quasi-experimental. Quasi-experimental design is a type of evaluation which aims to determine whether a program or intervention has the intended effect on a study's participants [2]. It also can be defined as lacking key components of a true experiment which include pre-post test design, treatment and control group, and random assignment [2]. This study chooses this design because this study design only looks at one group who receive the intervention was called the treatment group. The results were measured by pre and post intervention.

C. Sampling Procedures

For research purposes, the subjects selection included a total of 14 women (n=14) with average aged from 25 to 51 years old from Seremban 2, Negeri Sembilan who joined the Seremban Fit Challenge program. This study chooses this sample because the participants were women and they are more attracted to aerobic dance rather than men based on the present investigation [23]. For the sampling technique, the researchers have used purposive sampling techniques to focus on particular characteristics of a population that joined the Seremban Fit Challenge Season 13 program.

D. Instrumentation

In this study, 1-mile run test is to be conducted as an assessment to measure fitness performance. The *r*-values can be estimated into absolute and relative VO_2max which was r = 0.87 and 0.94. This test had been used previously in [8]. This test portrays the methodology as utilized in the President's Challenge Fitness Awards and FitnessGram Program. This method is used as it requires only moderate and steady-state exertion [1]. Therefore, the possibility of getting injuries is minimal for inactive or undertrained people, who live a sedentary lifestyle or even older people. Walking was permissible and times were recorded in minutes and seconds [7]. Also, the test is of low intensity, with shorter time duration as compared to other endurance test. Before the test, the researcher need to find and prepare a track, cone for marking the distance, stopwatch, stationary and recording sheet for documentation. All participants are advised to perform their best and aim to achieve the shortest time possible. While for the weight, the weight scales are used before the start of the running test. The pre and post-test was conducted using the same procedure, at the same place. All of the data and information will be recorded on the Data Collection Sheet. Before the test conducted, written, oral instruction and demonstration was given to ensure better understanding and avoid participants' failure to perform the test.

E. Data Collection Procedures

Data collection has been implemented into 3 phases: pre, mid, and post. Screened and qualified participants signed an informed consent form and Physical Activity Readiness Questionnaire (PAR-Q) screening form. After that, they were briefed on the process, scope of study and responsibility expected of them throughout the course of the study. The subject has been chosen among women who participate in Seremban Fit Challenge in D'S2 Mall, Seremban 2. All the training sessions have been supervised by the researcher with the assistance of appointed data collectors from Seremban Fit Challenge organizers. During the pre-test phase, the subject has made the 1-mile run test and recorded to determine their fitness level. After that, the subjects have entered the mid phase which was the six-week intervention. They attended Zumba fitness program for one times per week. At the end of week six, the subject underwent 1-mile run test again for post-test phase.

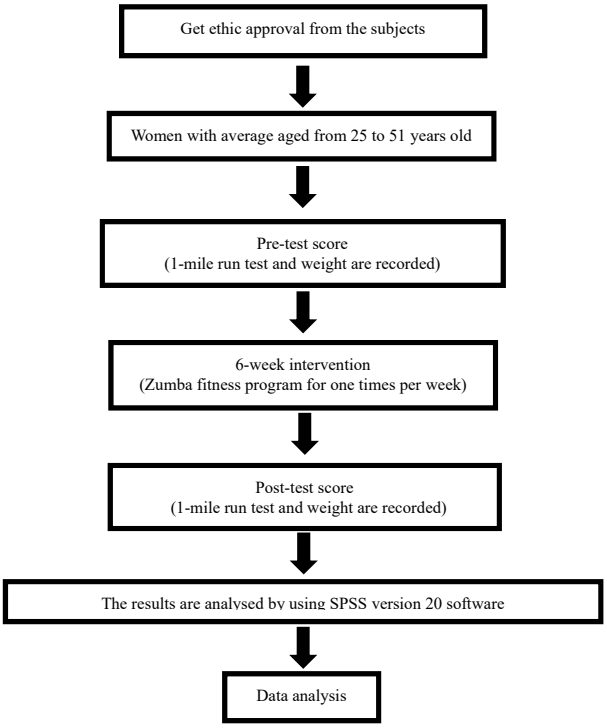


Fig. 1 Data Collection Procedures for Seremban Fit Challenge Group

F. Data Analysis

The subjects of this study were classified into an experimental group and were received the same measurement of pre-test and post-test. The data were analyzed using the Statistical Package for Social Sciences (SPSS) Version 20. Paired Sample T-tests were used to assess any differences and comparisons between pre and post-test of 1-mile run test which is a measure for endurance performance, and weigh reduction for weight loss. All data were represented the mean difference ± standard deviation. Statistical difference between conditions was accepted at $p < 0.05$.

IV. Results

A. Introduction

In this chapter, this study will discuss in detailed regarding

the result from the test conducted for 1-mile run among women who participated in Seremban Fit Challenge Season 13. The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 20. This study are used Paired t-tests were to assess any differences and comparisons between pre and post-test of 1-mile run test which is a measure for endurance performance. All data collected from the testing were converted into correlation statistics.

B. Descriptive Statistics

TABLE I
DEMOGRAPHIC DATA

N = 15	M ± SD	Range
Height (cm)	165.36 ± 3.46	160 - 171
Age	32.36 ± 9.14	25 - 51
Weight (kg)	65.93 ± 11.24	51 - 89

Table I shows the results of demographic data of subjects for. This study used 14 subjects (n = 14) which consist of average aged from 25 to 51 years old from Seremban 2, Negeri Sembilan who joined the Seremban Fit Challenge Season 13 program. Statistical analysis has shown the mean ± SD for weight, height, and age of the subjects. The mean ± SD for weight were 65.93 ± 11.24. The mean ± SD for height were 165.36 ± 3.46. The mean ± SD for age were 32.36 ± 9.14. The minimum weight of the subjects was 51 kg and maximum weight were 89 kg which was 38 kg difference with the heaviest. The minimum height of the subjects was 160 cm while the maximum were 171 cm which were 11 cm difference with the tallest.

C. Normality

1. 1-Mile Run

TABLE II
TEST OF NORMALITY FOR PRE-TEST

	Kolmogorov-Smirnov[a]		
	Statistic	**Df**	**Sig.**
Pre	.119	14	.200*

Table II showed the normality test for 1-mile run result. It represented that Kolmogorov value indicates the significant value is greater than $p > 0.05$ in pre-test. Based on the value, when *p*-value is greater than significant level, the data are normally distributed and there is no violation of the data. The data and value considered as normal because $p = 0.2 > 0.05$.

TABLE III
TEST OF NORMALITY FOR POST-TEST

	Kolmogorov-Smirnov[a]		
	Statistic	**Df**	**Sig.**
Post	.115	14	.200*

Table III showed the normality test for 1-mile run result. It represented that Kolmogorov value indicates the significant value also greater than $p > 0.05$ in post-test. Based on the result, when *p*-value is greater than significant level, the data are normally distributed and there is no violation of the data. The data and value considered as normal because $p = 0.2 > 0.05$.

Table IV showed the descriptive statistic of pre-test in 1-mile run. Based on the result, it showed the mean for statistic was 12.35, median 12.08, SD ± 2.14, minimum 8.43, maximum 16.05, and range 7.62. The assumptions have not been violated with the skewness (0.12) and kurtosis (-0.40) values were considered normal.

TABLE IV
DESCRIPTIVE STATISTIC FOR PRE-TEST

		Statistic	Std. Error (SE)
Pre	Mean	12.35	.57
	Median	12.08	
	Std. Deviation	2.14	
	Minimum	8.43	
	Maximum	16.05	
	Range	7.62	
	Skewness	.12	.60
	Kurtosis	-.40	1.15

TABLE V
DESCRIPTIVE STATISTIC FOR POST-TEST

		Statistic	Std. Error (SE)
Post	Mean	11.51	.53
	Median	11.24	
	Std. Deviation	1.98	
	Minimum	7.43	
	Maximum	14.56	
	Range	7.13	
	Skewness	-.23	.60
	Kurtosis	-.09	1.15

Table V showed the descriptive statistic of post-test in 1-mile run. Based on the result, it showed the mean for statistic is 11.51, median 11.24, SD ± 1.98, minimum 7.43, maximum 14.56, and range 7.13. The assumptions has not been violated with the skewness (-0.23) and kurtosis (-0.09) values are considered normal.

2. Weight Loss

TABLE VI
TEST OF NORMALITY FOR PRE-TEST

	Kolmogorov-Smirnov[a]		
	Statistic	**Df**	**Sig.**
Pre W	.247	14	.020

Table VI showed the normality test for weight loss result. It represented that Kolmogorov value indicates the significant value is greater than $p > 0.05$ in pre-test. Based on the value, when *p*-value is greater than significant level, the data are normally distributed and there is no violation of the data. The data and value considered as normal because $p = 0.20 > 0.05$.

TABLE VII
TEST OF NORMALITY FOR PRE-TEST

	Kolmogorov-Smirnov[a]		
	Statistic	**Df**	**Sig.**
Post W	.234	14	.036

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Table VII showed the normality test for weight loss result. It represented that Kolmogorov value indicates the significant value also greater than $p > 0.05$ in post-test. Based on the result, when *p*-value is greater than significant level, the data are normally distributed and there is no violation of the data. The data and value considered as normal because $p = 0.36 > 0.05$.

TABLE VII
DESCRIPTIVE STATISTIC FOR POST-TEST

		Statistic	Std. Error (SE)
Post W	Mean	65.93	3.00
	Median	62.50	
	Std. Deviation	11.24	
	Minimum	51.00	
	Maximum	89.00	
	Range	38.00	
	Skewness	1.02	.60
	Kurtosis	.21	1.15

Table VIII showed the descriptive statistic of pre-test in weight loss. Based on the result, it showed the mean for statistic is 65.93, median 62.50, SD ± 11.24, minimum 51, maximum 89, and range 38. The assumptions have not been violated with the skewness (1.02) and kurtosis (0.21) values are considered normal.

TABLE IX
DESCRIPTIVE STATISTIC FOR POST-TEST

		Statistic	Std. Error (SE)
Post W	Mean	64.57	3.02
	Median	61.50	
	Std. Deviation	11.30	
	Minimum	49.00	
	Maximum	87.00	
	Range	38.00	
	Skewness	.91	.60
	Kurtosis	-.06	1.15

Table IX showed the descriptive statistic of post-test in weight loss. Based on the result, it showed the mean for statistic is 64.57, median 61.50, SD ± 11.30, minimum 49, maximum 87, and range 38. The assumptions have not been violated with the skewness (0.91) and kurtosis (-0.06) values are considered normal.

D. Summary of Normality

TABLE X
NORMALITY RESULT

	Kolmogorov		Conclusion
	Pre	Post	
Cardiovascular Fitness	$p = 0.2 > 0.05$	$p = 0.2 > 0.05$	Normal
Weight Loss	$p = 0.2 > 0.05$	$p = 0.36 > 0.05$	Normal

From the results of the normality for the pre-test, it can be assumed as normal because the result showed that majority of all graphs for each variables of the normality test is a normal reading. The majority of the result showed a normal reading so the data can be assumed as normal and well distributed. From the results of the normality test for the post-test, it also can be assumed as normal because the result showed that majority of all graphs for each variables of the normality test is a normal reading. The majority of the result showed a normal reading so the data can be assume as normal and well distributed. Therefore, the results of this study towards the normality test for pre-test and post-test are normal and have no violation in results.

E. Paired Sample T-test

1. Hypothesis 1

TABLE XI
PAIRED SAMPLE TEST OF 1-MILE RUN

		Mean	Std. Deviation (SD)	t	Df	Sig. (2-tailed)
Pair 1	Pre - Post	.84	.80	3.93	13	.00

Table XI showed that there was a significant difference between pre and post test for 1-mile run when $p = 0.00 < 0.05$. Based on this finding, this study reject null hypothesis 1. This showed that there is a difference in cardiovascular fitness during pre and post test.

2. Hypothesis 2

TABLE XII
PAIRED SAMPLE TEST OF WEIGHT LOSS

		Mean	Std. Deviation (SD)	t	df	Sig. (2-tailed)
Pair 2	Pre - Post	1.36	.93	5.47	13	.00

Table XII showed that there was a significant difference between pre and post test for weight loss when $p = 0.00 < 0.05$. Based on this finding, this study reject null hypothesis 2. This showed that there is a difference in cardiovascular fitness during pre and post test.

F. Summary for Paired Sample T-test

TABLE XIII
HYPOTHESIS RESULT

Hypothesis	Value	Results
$H_0 1$	$p = 0.00 < 0.05$	Reject null hypothesis
$H_0 2$	$p = 0.00 < 0.05$	Reject null hypothesis

This study used Paired Sample T-test to analyze the data. It suits the study as Paired Sample T-test is appropriate to analyze the data of which involves the pre and post-test. Hypothesis testing was concluded by using the Paired Sample T-test. All the results show that the significant value towards the study.

V. DISCUSSION, CONCLUSION AND RECOMMENDATIONS

A. Introduction

According to [32], physical activity can be defined as any bodily movement formed by skeletal muscles that require energy expenditure. Physical activity during leisure time is a broad descriptor of the activities one participates throughout free time, based on personal interests and wants. Aerobic exercise will increases in heart rate and energy expenditure. Regular involvement results in improvements in the cardiovascular system and the skeletal muscles function,

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furthermore prompting an increment in endurance performance [15]. As a result of this study, it shows that there was an improvement in cardiovascular performance and weight reduction among women who joined the Seremban Fit Challenge program.

B. Discussion

1. Hypothesis 1

In general, the fundamental finding of this study was six-week of aerobic dance program intervention that prompted to significant improvement in 1-mile run test among Seremban Fit Challenge subjects. The outcome definitely shows endurance performances of the subjects were improved because of the impact of six week of aerobic dance program. Furthermore, this study also found that there is a significant difference of improvement in cardiovascular system and give better effect towards fitness level after followed the training program. Previous study had reported the finding of this study by [10] that even small changes in cardiovascular fitness may cause a largely lower fatality in adults. It is also reported that every 3.5 ml.kg-1.min-1 increase in peak volume of oxygen consumption (VO_2) were related with a 12 % improvement in overall survival and every 1 ml.kg-1min-1 increase in peak VO_2 were related with a 15 % decrease in risk of fatality. They also found that current exercise guideline suggested to retain cardiorespiratory fitness is more than five times per week in moderate intensity in order to get better health status. From this study, it can be assumed that it easier to recruit people with aerobic dance session because it is more attractive and fun among women population. Another study by [23] states that, after seven days of aerobic dance, the average heart rate of a person will reduced by 10.0 ± 13.4 beats per minute, means a significant reduction form rest. Among 20% of the subjects, their heart rate was deducted to 29.8 ± 11.4 beats per minute. If we they do this exercise in 10 days, the heart rate will reduced by 13.6 ± 14.3 beats per minute. It means a significant reduction from rest. Furthermore, the is a little improvement values of VO_2max in the aerobic dancers due to decreased peripheral resistance, increased cross sectional diameter of the coronary arteries, and enhanced tone of the ventilatory musculature [12]. According to [8], if we only used moderate intensity exercise, the intention to treat analysis may unsuccessful to find that the physical training enhanced cardiovascular fitness. Cardiovascular fitness was significantly linked with time spent in physical activity but not with moderate exercise only. This is consistent with the research finding that the high intensity exercise, but not the moderate intensity exercise that created significant changes in cardiovascular fitness. That is why Zumba fitness is a suitable dance program because it represented moderate to high intensity exercise or known as interval training. Reference [18] stated that, the effects of dance exercise have been investigated in many non-randomized trials which suggest improvements in aerobic capacity, walking ability, muscular strength and psychological parameters. Previous study by [14] found that, changes in body weight were accompanied by a statically significant increase in aerobic fitness expressed by the use of VO_2max, namely almost about 3.5 ml.kg–1.min–1, that is by about 1 MET. Reference [34] had mentioned that dance performance caused a significantly greater mean heart rate and oxygen consumption than reported for dance class and rehearsal. Reference [17] found that aerobic exercise program was effective in improving the abdominal muscle strength and endurance of employees of a high-tech company.

2. Hypothesis 2

Other factor of the subject were also analyzed which are body weight. Reference [24] states that exercise training can improve body composition. From the result, comparison means between pre and post-test explained statistically significance decrease in skinfold thickness, body fat percentage, body mass index (BMI) and body weight after get involved in a 12-week training program [24]. This study concluded that high intensity exercise is more effective than moderate intensity exercise in improving body composition in overweight people. Compared with this study, there are also significant changes in weight loss when attempt aerobic dance exercise although only in six-week. It happens because the duration of the program is not same which six weeks training program is while the previous one is 12 weeks of training program. Therefore, the results will be dissimilar due to duration of body responds to the exercise. Based on the statistic by [19], the subjects showed some improvement in BMI after involved in 12-week aerobic classes but did not achieved a statistically significant level in the current study. This is happen because the body composition is not only affected by exercise, but also by other factors such as food intake although subjects were told not to change their dietary habits. Further study is required to determine how nutrition and aerobic exercise training may cooperate to affect the body composition. In addition, exercise appeared to result in moderate losses in total body mass, moderate-to-large losses in fat mass and small-to-moderate increase in free fat mass (FFM). Result from [29] stated that aerobic dance exercise depends on the style and intensity of the exercise. The found that obese and overweight people should use low impact and low intensity exercise. There will be significant decrease in body mass and fat percentage if they attend the program in three months. It is not only affected their weight, but also showed significant increase in VO_2max (18%) as well. Supported by [21], aerobic exercise training (aerobic dance and step bench) in conjunction to a controlled diet can have positive effects on reducing both total and abdominal fat under a strictly supervised weight loss program, and for both obesity phenotype. Specific dance intervention significantly decreased body fat and BMI in sedentary African American women from baseline to 8 weeks and was maintained at 18 weeks when compared to the participants who did not receive the intervention [20].

C. Conclusion

Based on the finding of this study, aerobic dance exercise program is recognized to be an effective way in promoting cardiovascular fitness and weight loss. There are also other

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alternatives in enhancing endurance performances and losing fat. Aerobic dance program can be one of the ideal types of exercise especially for those people who are beginner and want to develop fitness level gradually and safe. This exercise is safer and less risk of injury because requires only moderate and steady state exertion [1]. Therefore, the possibility of getting injuries is smaller for inactive or untrained people, as well suited to those who have sedentary lifestyle and older people. This test also has low intensity and less duration compared to others. Hence, the hypothesis in this study is about significant improvement in cardiovascular system and weight reduction after followed six-week Zumba fitness program among women who joined Seremban Fit Challenge Season 13 were strongly accepted. As a conclusion, aerobic dance exercise is an appropriate training protocol to bring out desirable changes over cardiovascular and body weight. It acts as a useful and effective exercise to be practiced among youth and older people. It is beneficial to people that in searched for healthy lifestyle. Academician can also contribute to the information from this study with the students or athletes. Besides walking, jogging and cycling, this study were proved that aerobic dancing can be add as another type of cardiovascular training to improve cardiovascular fitness and reduce body weight.

D. Recommendations

This study already proves that aerobic dance program can affected cardiovascular fitness and weight loss, but the training was applied only to one gender. As already mention, this study was limited to only 14 women who joined Seremban Fit Challenge. The following are the possibilities for future research based on the findings of this study:

i. Apply to both genders to see whether which one give better results.
ii. Add more subject to make data more precise.
iii. Perform in longer period, so that we can see the effectiveness of the training, for example 8 – 12 weeks of interventions.
iv. More research should be performs in the future, in order to search for new answer and to prove the effectiveness of this training.

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