

## Comparison of Mindfulness among Adult Females Performing Pilates vs Aerobics

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### Abstract

#### Background

Pilates is a form of exercise which mainly focuses on muscle strengthening and it has a significant effect on mindfulness and aerobic exercises are used in weight training and weight loss. Previous research results suggested that Pilates are used as a rehabilitation tool and aerobic exercises used to reduce social anxiety. Some studies concluded that they have a significant but short-term effect on mindfulness.

#### Objective

To compare mindfulness between females performing Pilates vs aerobic exercise

#### Methodology

A comparative cross-sectional study was conducted to evaluate the comparison of mindfulness among 346 females performing Pilates and aerobics. MAAS questionnaire was used to evaluate the comparison. Reliability of MAAS is  $r=0.04$ . SPSS version 21 was used for the analysis of data.

#### Results

According to the result of the study, the group performing Pilates were 54% and aerobics were 46%. Mean age of participation was found 24. Independent sample t-test was used to evaluate the difference of mindfulness among women performing Pilates and aerobics. There was a non-significant difference of average mindfulness score between two groups. Although groups involved in performing Pilates have slightly more average mindfulness score. The p-value is .228.

#### Conclusion

This study concluded that there is a non-significant difference of mindfulness among adult females performing Pilates vs aerobics

**Keywords:** mindfulness; awareness; posture; female; goals

### Introduction

Pilates is a form of exercise which mainly focuses on physical strength, posture and intensify mental awareness by using customized apparatus. Nowadays Pilates not only used as fitness training but also as a rehabilitation tool such as in musculoskeletal disorders, low back pain, multiple sclerosis, osteoporosis and many more. Pilates is not only recommended as a complete rehabilitation process but it can also improve the physical health.[1]

It has both physical and psychological effects. It can be done by customized apparatus or by mats (specially designed for Pilates or yoga purpose). It is a low impact exercise which is effective to tone up the body and build up the lean body mass. People demand for physical fitness because of the treatment cost of some disorders to lower the financial burden. Most of the research proposes that health-related issues and pain reduce by exercise. Pilates is a low-impact anaerobic exercise that aims to strengthen muscles while improving postural alignment and flexibility. Pilates mainly targets the core, although the exercises work other areas of your body as well. You can do Pilates with or without appliances (more on that below), but no matter what, expect the moves to involve slow, precise movements and breathing exercise. "Pilates is



full-body exercise methods that will help you do everything better," Sonja Herbert, a Pilates instructor and founder of Black girl Pilates, tells SELF. "It strengthens and stabilizes your core body, which is your foundation, so that you can move efficiently while improving your posture, flexibility, and mobility." A typical Pilates workout is 45 minutes to an hour long.[2]

Aerobics is energy consumption exercise which needs oxygen to meet its requirements. It is a low to high intensity based exercise including swimming, cycling, running, jogging, walking etc.[3] This exercise needs a long period of time and most of the time in moderate intensity. It really helps to cope up with different diseases such as cancer, heart related disease and longer the life span. Aerobics is a form of physical exercise that combines rhythmic aerobic exercise with stretching and strengthening routines with the goal to boost up all elements of fitness (flexibility, muscular strength, and cardio-vascular fitness). It is usually performed to music and may be practiced in a group setting led by an instructor (fitness professional), although it can be done solo and without musical accompaniment. With the goal of preventing illness and promoting physical fitness, practitioners perform various routines comprising a number of different dance-like exercises. Formal aerobics classes are divided into different levels of intensity and complexity and will have five components: warm-up (5–10 minutes), cardiovascular conditioning (25–30 minutes), muscular strength and conditioning (10–15 minutes), cool-down (5–8 minutes) and stretching and flexibility (5–8 minutes). Aerobics classes may allow participants to select their level of participation according to their fitness level. Many gyms offer a variety of aerobic classes. Each class is designed for a certain level of experience and taught by a certified instructor with a specialty area related to their particular class. It is really helpful for meditation purpose and for stress reduction. It has been observed that people involved in aerobics have very fresh and active minds than those who are not involved in aerobics. It work wonders for obese people because it is really beneficial for quick weight loss. Its 8 week MSRB shows really effective results on sedentary lifestyle. it also prevents the infection of respiration.[4]

Mindfulness is the basic human ability to be fully present, aware of where we are and what we're doing, and not overly reactive or overwhelmed by what's going on around us. Mindfulness is a quality that every human being already dominates, it's not something you have to evoke, and you just have to learn how to access it. Mindfulness is the basic human ability to be fully present, aware of where we are and what we're doing, and not overly reactive or overwhelmed by what's going on around us. Mindfulness is to be focused on something you are saying or listening or seeing, thinking and you are present mentally in a particular situation. You should accept the other person's perspective and be able to define your perspective. You are mentally active every time every single minute every single hour that's mindfulness.[3]

Mindfulness can be increased by meditation. Meditation is something that relaxes the mind and body and can help a person to perform his/her tasks easily in their daily life.

most of the time it can be achieved by yoga because yoga can enhance the effects of mindfulness and in the current century people are really busy in their work so they can't get time for themselves so try to make time for themselves by means of yoga, Pilates, aerobics to relax their mind and body and it is the best way to be stress free.[5]

Everything comes with its pros and cons Pilates and aerobics have uncountable advantages like Pilates improves flexibility, it increase muscle tone and strength specially buttocks, abdominal and lower back muscle, it also balanced muscular strength it improvise the muscle control it improved stabilization of your spine improved posture rehabilitation of injuries related to muscle imbalance it increased lung capacity and circulation through deep breathing it also managed stress and promote relaxation, improved concentration and body awareness. It also helps in improving posture related issues, strengthens the body and works on the endurance of muscle, improves core stability, enhances the mental ability, makes a person physically and mentally active and makes a person more aware of their surroundings. It also improves balance and flexibility. It prevents slouching. You have to take precautions while doing Pilates including people who had recent surgery, pregnant women, people aged 40 or more, people with heart disease and musculoskeletal injury and disorder, anyone who is not involve in exercise for a long time, and people who are very obese. Disadvantaged of Pilates are that it is not that effective for weight loss and will not burn that much calories if we want to achieve instant or quick result it progress slow so people normally frustrate Pilates are not really for rehabilitation like if you have an injury and you join Pilates classes only for rehab purpose than its not effective in any way for injury. You have to follow some guideline to achieve expected results and have to be fully focused which is not an easy task.[6]

On the other hand aerobics increase the efficiency of respiration. It improves blood volume, distribution, and delivery to muscle. It increase cardiovascular efficiency and decrease resting heart rate, strengthen muscle, ligaments, tendons and bones. It improves the efficiency of movement. It improves the stroke volume, increase cardiac output. It helps reduce the risk of developing coronary artery disease, cancer and diabetes. It helps decrease anxiety and stress improves the body's ability to use body fat as energy source. It helps u feel better overall. Aerobics really good for heart related issues it controls the high blood pressure and reduce the risk of diabetes, heart attack by reducing the work on heart and blood vessels. It also enhances our nervous system it improves function of brain cells and tries to make new cells. it improves the quality of sleep if you take a 10 min session of aerobics daily it lower the risk of sleep apnea and you can take a healthy sleep it also comes with cons like overuse injuries because of repetitive, high-impact exercise. It is not effective in building muscle mass. Over training if you are continuously working out for several hours and not taking rest you will be mentally and physically exhausted. Our body also needs time to repair itself from hectic work if we are doing work and work our body will become tired and except of feeling energetic we start feeling low, so we have to take care of the routine and schedule of our daily exercise to be fit and more



healthy.[7]

The prevalence of this study in undergraduate female is 86% and community sample 66%[8].

Previous studies concluded the effects of mindfulness among females performing Pilates and aerobics separately but there that there was no comparative study held before in Pakistan. Pilates and aerobics both have a massive effect on mindfulness as mentioned in all the previous studies. People had no awareness about the effects of Pilates and previous studies proposed that they have short term effects so we want to make accurate declaration regarding this that will be based on our study findings.[9]

## Rationale

The study will help us to determine the effect of Pilates and aerobics on mindfulness and will also provide awareness to the general population about the effects of Pilates. This study will educate people that how to overcome their stresses and prevent their body from various diseases by learning the benefits of Pilates and aerobics. By incorporating the findings of this study exercise plans would be modified.

## Literature Review

**Karen et al** published a research article on 27 December 2014. In this study they want to observe that by taking part in movement based exercises like Pilates or yoga or aerobics the sleep quality, mood, stress reduces or may have effect on mindfulness. It increases or decreases the effect on mindfulness or will help in better sleep. This study concludes that movement based exercise reduce depression, anxiety, eating disorders and stress.[5]

**Hector et al** conducted a study regarding mindfulness and non mindfulness based exercises on depression in Hong Kong. It mainly focuses on how to manage depression by mindfulness and non mindfulness exercises and how it reduces the effect of depression. To prolong the effects of mindfulness different techniques were used as well as for lowering the risk of depression. The result indicates that they are effective for short term only.[9]

**Keira et al** published a research article on 26 March 2017. A study defines Pilates works as a rehabilitation tool because in most of the studies it was used for stretching and breathing control purpose. This study was basically conducted to observe the other benefits of Pilates in different disorders rather than in physical fitness. This study reflects that it is useful to reduce pain and disability.[10]

**Karl et al** published a research article that was approved in the year 2018 on 12 February which was based on mental health outcome. That defines Pilates can improve or have better or unknown effect on depression and anxiety. This study conclude that they have controlled emotions and increases peace of mind through Pilates .[11]

**Hendrick et al** published a research article on 22 February 2014. Study mainly focuses on the men who were suffering from different diseases like cancer, heart problem, chronic pain, depression, personality disorders and the sessions of aerobics were conducted to see the result whether it can prevent or improve their mental and physical health. This study reveals that regular physical activity may enhance body awareness.[12]

**Philippe et al** published a research article in Stanford university which describe how a person imagine himself and the view of a person about his own personality, whether it is in positive sense or in negative and by performing aerobic exercise the perspective about self image changes or not. The result is that this study needs further research to conclude that ,it needs more stress management programs for effective results.[13]

**Jacob et al** published a research article on 31 March 2018. The study was specifically pointed towards 8 week benefits of aerobic training and the stress reduction program. Results concluded that it enhances the physical and mental health of a person by reducing the stress and also prevent our body from various diseases. This study conclude that application of two interventions are more beneficial to got satisfactory result for physical activity.[4]

**Kristin et al** published a research article that was accepted on 20 February 2018. This study was mainly conducted for the fact that we all know that mindfulness changes and improvise the health behavior but they all wanted to know that is there anything they can improve for the betterment of society and well being of a person. The research results concludes that such type of interventions can help to improve the mindfulness and health behavior.[3]

## Operational Definition

### Mindfulness

The “mindfulness attention awareness scale” was used to determine the comparison of aerobics and Pilates on mindfulness among the adult females of Lahore. The questionnaire includes questions about level of consciousness, carelessness, focused image, paying attention, feeling of discomfort, level of alertness, lack of interest, over thinking, polyphagia. The Cronbach’s alpha (0.85).[1] Mindfulness attention awareness scale (MAAS) is a reliable tool to determine the mindfulness level. To score the simply complete mean of 15 items highest score reflect level of dispositional mindfulness.

### Objective

To compare mindfulness between females performing Pilates vs aerobic exercise

## Materials and Methods

### Study Design

A comparative cross sectional study



## Study Population

Females performing Pilates and aerobics

## Setting

- Physiques fitness gym
- Synergy fitness
- Refuel gym
- Physical fitness in castle
- Genesis
- Shape up@ARJ
- Cuts gym
- Fitness factory
- ZS fitness gym
- Fitness time gym
- Right now gym
- Life fitness club

## Study Duration

The study duration was 6 months

## Sample size

Sample size is calculated through following formula and parameters

$$\text{Sample size} = \frac{Z_{1-\alpha/2}^2 P(1-p)}{d^2}$$

Z	1.96
P	0.66
1-p	0.34
D	0.05

Sample size calculated using 66% proportion of the condition is 3

## Sampling Technique

Convenient sampling technique was used.

## Ethical Issues

Data was collected from all the females of Lahore who were involved in Pilates and aerobic exercise after taking their consent. The ethical committee of Azra Naheed Medical Collage has approved the execution of this study in GYM, s of Lahore. It has no affect on female's ethical values.

Researcher has followed all the ethics of medical field.

## Eligibility criteria

### Inclusion criteria

Data was gathered from;

- Adult females of Lahore ranges from 18 to 50 years
- Exercise on regular basis (3 times per week for 50 min)
- Involved in aerobics (cycling, treadmill, swimming)
- Involved in Pilates (mat exercises)

### Exclusion Criteria

Data was not gathered from;

- Recent surgery
- Unstable cardiovascular conditions
- Severe hypertension
- Acute infection
- Pace maker or stunt
- Menopause
- Pregnant women

## Data Collection Procedure

After getting the approval from physiotherapy department of Azra Naheed Medical Collage a comparative cross sectional study was conducted. The participants have fulfilled the inclusion and exclusion criteria. To gather data about the mindfulness level of the females of Lahore MAAS questionnaire was used. By forming two group Group A with females involved in Pilates (mat exercise) and Group B with females involved in aerobics (cycling, running, jogging, tread mill) and they all had followed the routine 3 day per week for 50 min. This has been assessed by MAAS questionnaire it has mean of 15 items and higher value indicates dispositional mindfulness.

## Data Analysis

Data was analyzed by using SPSS version 21 and was calculated through this software. For categorical variables frequency and percentage was used for discrete variables mean and standard deviation was used. Independent t test was used to compare the mindfulness between two groups P-value of 0.05 considered significant.

## Results



**Table 1:** Study Group of the participants

	Frequency	Percent	Valid Percent	Cumulative Percent
PERFORMING PILATES	187	54.0	54.0	54.0
PERFORMING AEROBICS	159	46.0	46.0	100.0

**Table 2:** Mean age of the participants

	N	Minimum	Maximum	Mean	Std. Deviation
age	346	16	42	24.00	4.845

Table 1 showing that Study Group PERFORMING PILATES were 54% and remaining of the participants PERFORMING AEROBICS were 46%S Table 2 showing Mean age of the participants was found 24 years

**Table 3** MASS questions of the participants

		Almost Always	Very Frequently	Somewhat Frequently	Somewhat Infrequently	Very Infrequently	Almost Never
I could be experiencing some emotion and not be conscious of it until some time later	N=346	36	73	92	48	51	46
	%age	10.4	21.1	26.6	13.9	14.7	13.3
I break or spill things because of carelessness, not paying attention, or thinking of something else.	N=346	31	46	68	85	61	55
	%age	9	13.3	19.7	24.6	17.6	15.9
I find it difficult to stay focused on what's happening in the present.	N=346	32	48	54	74	96	42
	%age	9.2	13.9	15.6	21.4	27.7	12.1
I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.	N=346	32	48	44	105	63	54
	%age	9.2	13.9	12.7	30.3	18.2	15.6
I tend not to notice feelings of physical tension or discomfort until they really grab my attention.	N=346	28	49	53	67	71	78
	%age	8.1	14.2	15.3	19.4	20.5	22.5
I forget a person's name almost as soon as I've been told it for the first time.	N=346	24	46	70	73	43	90
	%age	6.9	13.3	20.2	21.1	12.4	26
It seems I am "running on automatic," without much awareness of what I'm doing.	N=346	16	31	67	91	69	72
	%age	4.6	9	19.4	26.3	19.9	20.8
I rush through activities without being really attentive to them.	N=346	25	41	91	82	73	34
	%age	7.2	11.8	26.3	23.7	21.1	9.8
I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.	N=346	26	51	54	67	91	57
	%age	7.5	14.7	15.6	19.4	26.3	16.5
I do jobs or tasks automatically, without being aware of what I'm doing.	N=346	22	24	60	91	57	92
	%age	6.4	6.9	17.3	26.3	16.5	26.6
I find myself listening to someone with one ear, doing something else at the same time.	N=346	22	37	63	67	109	48
	%age	6.4	10.7	18.2	19.4	31.5	13.9
I drive places on 'automatic pilot' and then wonder why I went there.	N=346	11	32	53	74	106	70
	%age	3.2	9.2	15.3	21.4	30.6	20.2
I find myself preoccupied with the future or the past.	N=346	18	21	68	95	89	55
	%age	5.2	6.1	19.7	27.5	25.7	15.9
I find myself doing things without paying attention.	N=346	10	36	68	62	102	68
	%age	2.9	10.4	19.7	17.9	29.5	19.7
I snack without being aware that I'm eating.	N=346	13	48	35	66	95	89
	%age	3.8	13.9	10.1	19.1	27.5	25.7

Table 3 showing MASS questions of the participants



Table 4 Mean total MASS score and average score

	N	Minimum	Maximum	Mean	Std. Deviation
Total Score(sum out of 90)	346	31	81	59.53	10.709
Average score(sum/15) out of 6	346	2.1	5.4	3.968	.7186

Table 4 shows that Mean total MASS score was found 59.5 out of 90 and mean average score was found 3.97 out of 6 which indicates that participants have above average dispositional mindfulness

Table 5 Independent sample t test for study group matching on the basis of age

	Study Group	N	Mean	Std. Deviation	Std. Error Mean
Age	PERFORMING PILATES	187	24.05	4.557	.333
	PERFORMING AEROBICS	159	23.94	5.178	.411

P value .842

Table 5 shows Independent sample t test for study group matching on the basis of age. There was non-significant difference between groups PERFORMING PILATES and aerobics on the basis of age ( $p=.842$ )

Table 6 Independent sample t test to see the difference of mindfulness among women performing Pilates and aerobics

	Study Group	N	Mean	Std. Deviation	Std. Error Mean
Average score(sum/15) out of 6	PERFORMING PILATES	187	4.01	.7010	.0513
	PERFORMING AEROBICS	159	3.91	.7378	.0585

P value .228

Table 6 is showing Independent sample t test to see the difference of mindfulness among women performing Pilates and aerobics. There was found non-significant difference of average mindfulness score between two groups. Although groups involved in PERFORMING PILATES have slightly more average mindfulness score.

## Discussion

A comparative cross sectional study conducted on females performing Pilates and aerobics with population of 346. The prevalence of the study group performing Pilate were 54% and remaining of the participants performing aerobics were

46%. MAAS questionnaire was used to assess the mental awareness, focus and over reactive or overwhelmed responses.

Total 346 females were selected from different gyms to evaluate the mindfulness level. The percentage of females performing Pilates is slightly higher than the females performing aerobics. Mean age of the participants was found 24 years. Mean total MASS score was found 59.5 out of 90 and mean average score was found 3.97 out of 6 which indicates that participants have above average dispositional mindfulness. Independent sample t test was used for study group matching on the basis of age. There was non-significant difference between groups performing Pilates and aerobics on the basis of age ( $p=.842$ )

Independent sample t test used to see the difference of mindfulness among women performing Pilates and aerobics. There was found non-significant difference of average mindfulness score between two groups. Although groups involved in performing Pilates have slightly more average mindfulness score showing p value .228.

A previous study conducted in 2018 by Alison that was a phenomenological study to find out the relation of Pilates to physical and mental awareness. She suggested that Pilates is originally called "contrology" created by Joseph Hubertus Pilates in the 1920s for rehabilitation. Pilates is to achieve full body coordination, mind and spiritually. She wants to find out whether a daily practice of Pilates in my work or resting increase awareness physically and mentally. She researched on LBP and body awareness. Her results showed that LBP reduce significantly by performing Pilates daily. She describe that before performing Pilates when she saw her in the mirror she only found imperfections but now when she saw herself she found to be confident and strong and had positive image about her ideal body. This study results contradict with our study results in a way it doesn't put emphasis on mindfulness with aerobics.[14]

Another study was conducted to assess the effects of mindful and non-mindful exercise among people with depression a randomized study was conducted among the sample was taken people aged 18 or above and the results showed that both mindful and non-mindful exercise were ineffective for short term. This study has limitations so that they recommended that well-controlled studies should be conducted in future to evaluate the short and long term effects of exercise. This study supports our study in a way that aerobics have significant but short term effect on mindfulness[9]

A qualitative study was conducted to evaluate the Pilates and



mindfulness relation. He took the sample from Pilates class women and those who have menopause for more significant with a certified instructor and made 15 to 18 students to results.

participate in this program every three days for 50 minutes.

This study concluded that students were connected way More researches should be conducted in future to evaluate more with each other, body awareness increases, ability to the short and long term effects of Pilates and aerobics.

concentrate and confidence increases and risk of injury

decreases. This study supports our study result that Pilates

has significant effect on mindfulness.[6]

Another study was conducted to determine the comparison of

MBSR vs aerobics. The study was about SAD to examine

which one has more effects to overcome social anxiety. It

was a randomized study with fifty six adult patients. A self-

referential encoding task was used to examine the changes.

The result of this study concluded that MBSR has more

significant effects on SAD patients than aerobics. This study

contradict with present study in a way that aerobics has less

significant results than MBSR.[13]

Another previous study on developing mindfulness among

college students through movement based courses that study

include students of their 2007\_2008 session in 15 week

Pilates classes. They concluded that being involved in

movement based program overall mindfulness score increase

it also improves sleep quality, mood, self-efficacy and stress.

This study support our study directly because mindfulness

increase by performing Pilates.[5]

## Conclusion

This study concluded that Pilates and aerobics both have

significant effects on mindfulness. Age have non-significant

effects on mindfulness in females and there was found non-

significant difference of average mindfulness score between

two groups. Although groups involved in performing Pilates

have slightly more average mindfulness score. The mean age

is 24. This study concluded that there is non-significant

difference of mindfulness adult females performing Pilates

vs aerobics.

## Limitation and Recommendation Limitation

It was difficult to find female participants who were only

engage in Pilates or aerobics most of the them were doing

Pilates and aerobics both is so it was complex to filter them.

Gyms don't allow us to collect data.

Participants were not cooperative due to their busy routines.

## Recommendation

The study should be conducted on national level in Pakistan.

A research should be conducted that includes pregnant

## Declaration

This is our original research work.

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