International Research Journal of Multidisciplinary Scope (IRJMS), 2025; 6(1):1440-1450

Original Article | ISSN (O): 2582-631X DOI: 10.47857/irjms.2025.v06i01.02962

# An Impact of Aerobic Exercises and Yoga Practices on Physical Fitness with Psychosocial Well-Being among College Women: A Statistical Analysis

N Balaji Naik, T Parasuraman*

Department of Physical Education and Sports Science, Hindustan Institute of Technology and Science, Chennai, India. *Corresponding Author's Email: parasuramt@hindustanuniv.ac.in

## Abstract

At present, physical fitness is vital for college women as it aids manage stress and improves academic performance over enhanced energy and concentration levels. Regular exercise raises a sense of community and increases self-esteem, advancing a positive body image. Whereas, Yoga and aerobic exercises are essential for supporting overall mental well-being and physical fitness among college women as well as elder people. They increase flexibility, improve cardiovascular health, and help to strengthen muscles, while also aiding to decrease anxiety and stress. Combining both practices raises a stable routine, which supports emotive resilience and physical energy. This study discovers the impact of aerobic exercises and yoga practices on mental well-being and physical fitness among college women. Using a quantitative technique, we conducted three statistical analyses namely linear regression, logistic regression (LR), and ridge regression (RR) of participants appealing to design aerobic and yoga programs over a semester. Data were composed over pre- and post-intervention measurements, such as physical fitness tests and psychosocial studies evaluating anxiety, stress, and complete health. The findings show that both aerobic exercises and yoga considerably help to improve physical levels of fitness, with advances well-known in cardiovascular survival, strength, and flexibility. A comparative study discovered that both types of exercise deliver extensive benefits, and yoga has shown a more distinct effects on psychosocial health. These outcomes highlight the significance of including dissimilar physical actions in college wellness programs to stimulate both mental and physical health among women.

**Keywords**: Aerobic Exercises, Physical Fitness, Psychosocial Well-Being, Statistical Analysis, Yoga Practices.

## Introduction

Young People are in a dynamic transition period of development and growth that connects childhood to adolescence which can be described by fast, consistent changes of mind, body, and social relations (1). During this phase of psychological, sexual, and physical growth, young people slowly take responsibility for their well-being. Their health-promoting exercises and mental health not only influence their abrupt health condition but also have longer-term health concerns (2). Most young people are involved in a broad variety of unhygienic practices namely inadequate exercise, rest, and nutritional intake, and risk behaviors that result in poor health results. Encouragement of healthy life habits among teenagers is so important (3). Youngsters must be challenged to assume responsibility for their well-being and health. Physical fitness is described as the capacity to implement day-to-day work with energy and vigor and is mostly verified by training and genetics (4). Physical fitness is a significant health indicator in childhood and adulthood, in addition to a predictor of higher-risk features in humans. Aerobic training is an unspecified activity that increases physical and respirational abilities (5). It is easy to perform and contains knee ups, jogging in place, marching, running, short kicks, and so forth. Aerobic training is related to decreases in body fat mass and mental health in young people (6). There are numerous conventional models of aerobic exercise with long-term sessions. Yoga is a philosophical system well-known in India a billion years ago (7). It seeks to improve the spiritual harmony of the individual over the control of body and mind. In the periods of yoga, the postural exercises are performed without repetition and are associated with one another by passages that create links between the exercises in an order that has become named choreographies (8). Data indicates that the regular execution of this choreography offers the medical practitioner increased vitality, muscle strengthening, physical flexibility, reduced psychological stress, and decre-



(Received 25th October 2024; Accepted 28th January 2025; Published 31st January 2025)

ased cardiovascular diseases (9). Yoga is one of the technical and common lifestyle routines measured as the combination of body, soul, and mind. Yoga has proven to be very useful for mental, social, and physical health since ancient times, and it is gaining popularity globally (10).This study discovers the impact of aerobic exercises and yoga practices on mental well-being and physical fitness among college women. Using a quantitative technique, we conducted three statistical analyses namely linear regression, logistic regression (LR), and ridge regression (RR) of participants appealing to designed aerobic and yoga programs over a semester. Data were composed over pre- and post-intervention measurements, such as physical fitness tests and psychosocial studies evaluating anxiety, stress, and complete health. The findings show that both aerobic exercises and yoga considerably help to improve physical levels of fitness, with advances well-known in cardiovascular survival, strength, and flexibility. Besides, participants stated condensed stress and concern levels, besides improved overall physical well-being. A comparative study discovered that both types of exercise deliver extensive benefits, and yoga has shown a more distinct effect on psychosocial health. The following research questions and hypotheses are designed to explore the multifaceted effects of the intervention on both physical and psychological health, providing a comprehensive understanding of its overall impact. Some research Questions arises-(a) what is the impact of the intervention on physical fitness levels among participants? (b) how does the intervention affect psychosocial well-being, including aspects such as mental health and social support? (c) are there any differences in outcomes based on demographic factors such as age, gender, or baseline fitness levels? (d)how do changes in physical fitness correlate with improvements in psychosocial well-being?

## Hypotheses

**Hypothesis 1:** Participants who undergo the intervention will show a significant improvement in physical fitness levels compared to those who do not participate in the intervention.

**Hypothesis 2:** The intervention will lead to a measurable enhancement in psychosocial well-being, with participants reporting lower levels of anxiety and depression post-intervention.

**Hypothesis 3:** There will be significant differences in the effectiveness of the intervention based on demographic factors, with certain groups (e.g., younger participants) experiencing greater benefits.

**Hypothesis 4:** Improvements in physical fitness will be positively correlated with enhancements in psychosocial well-being, indicating that as physical health improves, mental health also benefits.

By addressing these questions, the study aims to contribute valuable insights into the relationship between physical fitness and psychosocial well-being, potentially informing future interventions and health programs. The clarity of these questions and hypotheses is crucial for the study's design and analysis, ensuring that the research objectives are met effectively.

# Methodology

The proposed study taken from the several existing papers as, in a study it was found that investigational models and intricate 28 members nominated by a theoretical sample from Nogosari village, Boyolali regency, Indonesia throughout 12 meetings. Data on BP have been gathered from members with hypertension preceding and following yoga and Aerobic exercises (11). The measurements have been captured on members for 12 sittings in 1 month using a BP monitor. The machine applied in this work was a sphygmomanometer ambulatory BP monitoring (ABPM). From the existing study, authors targeted to create a perception of personal excellence (PE) depending on the Patanjali Yoga Sūtra (PYS) (12). For that exact reason, yoga views, philosophical, psychological, and professional, of WB and PE are analyzed to develop a practical yogic structure for PE. This WB along with spiritual healing concepts of PE are considered. The PYS applies PE as the WB's dynamic level and self-examination till one reaches Dharmamegha Samādhi. Finally, Ashtanga Yoga (AY) has been examined as a general principle, process, and practice for retreating PTs, disappearing YHs, authorizing general WB, developing paranormal potentials, progressing self-examination, and PE.

From the existing method, the authors inspect the harmonious co-existence between sports and yoga, emphasizing their collective prominence on mental focus, physical movement, community building, and stress reduction (13). The use of sports and yoga in the educational process is discovered, underlining their advantages for student well-being and development. Finally, approaches to promote sports and yoga as a healthier nation at countrywide and universal levels are recommended, public health inventiveness, incorporating education, community outreach, professional training, cultural promotion, infrastructure development, inclusive programming, and study estimation. The study involved a sample of 149 participants, with an average age of 14.6 ± 0.5 years. An experimental design was implemented, with measurements taken both before and after the intervention for two groups: an experimental group and a control group (14). The control group underwent a six-session body appearance training module, while the experimental group participated in the same module but began with a warm-up focused on mindfulness and yoga. The calculation tool applied is the reviewed Emotional Awareness Questionnaire (EAQ30).

In the study conducted by a randomized controlled trial was implemented utilizing a pre-screen, follow-up, and post-test design. The research involved a sample of 60 students, divided equally into a control group and an experimental group, each comprising 30 participants. These students were engaged in various educational institutions during the Covid-19 pandemic in Turkey. Data collection was carried out using an individual information feedback form, the Psychologic Wellness Scale, and the Life Satisfaction Scale. The experimental group participated in a Mindfulness-Based Physical Exercise Program, which was conducted weekly over the course of eight sessions (15). The existing research is performed to demonstrate the result of yoga on dealing with fatigue and pain of employed nurses. This was one randomly assigned controller research to regulate the outcome of yoga on fatigue severity, foot or leg pain, and psychological welfare in nurses. This work is a randomized safe experiment. The work has been shown with nurses employed in 25 controller groups and 20 experimental groups. However, gathering data, a Visual Analog Scale, Fatigue Severity Scale, Psychological Well-being Scale, and Individual Identification Form are employed (16).

# Results and Discussion

## Statistical Analysis

In this study, we conducted statistical analysis using three models such as linear regression, LR, and RR. Linear regression is used for predicting a constant dependent variable depending upon one or more independent variables. The LR is employed for dual classification issues, where the outcome variable is categorical. The RR is a kind of linear regression that contains a regularization term.

**Linear Regression:** The linear regression model is an often-applied model to solve problems of estimation (17). According to the concept that samples in a similar class consist of the equal linear subspace and is exemplified by a linear equation. Eq. [1] demonstrates the simpler linear regression approach.

$$y = \beta_0 + \beta_1 X + \varepsilon \qquad [1]$$

In Eq.[1], $y$ is named as a variable of dependent, and $X$ is named independent variable. The point where the line interconnects with the y-axis is $\beta_0$, but $\beta_1$ signifies the coefficient regression. Lastly, $\varepsilon$ denotes the gained estimate errors. Eq. [1] is recognized as simpler linear regression meanwhile it comprises simply the variable of independent $X$. When there are several self-determining variables affecting Eq. [1], it's termed numerous linear regression. The numerous regression method is provided in Eq. [2]. Since Eq. [2], there exist numerous variables independently containing $X_1, X_2, \dots, X_n$.

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n + \varepsilon \qquad [2]$$

Since the problem tackled in this work, but attributes, that is, permissions, signify the variable of independence, $y$ signifies the classes of an application. A linear regression approach has been required since a larger amount of application agreements are utilized as characteristics. Meanwhile, the equations methods are resolved in linear regression, processes are carried out by utilizing one rather than benign and *zero* rather than malicious.

Supposing a dataset contains N applications and $M$ permissions $(p_1, p_2, \dots, p_M)$ gained from this application. An equations system is made if there is a linear relationship between applications and permissions, as exposed in Eq. [3].

$$\{y_1' = \beta_0 + \beta_1 p_{1,1} + \beta_2 p_{1,2} + \cdots + \beta_M p_{1,M}\ y_2' = \beta_0 + \beta_1 p_{2,1} + \beta_2 p_{2,2} + \cdots + \beta_M p_{2,M}\ y_3' = \beta_0 + \beta_1 p_{3,1} + \beta_2 p_{3,2} + \cdots + \beta_M p_{3,M}\ \vdots\ y_N' = \beta_0 + \beta_1 p_{N,1} + \beta_2 p_{N,2} + \cdots + \beta_M p_{N,M} \quad [3]$$

In Eq. [3], $y_1', y_2', \dots, y_N'$ denotes the outcome of linear combinations of permissions $(p_1, p_2, \dots, p_M)$. $\beta_i$ displays the permissions effect on values of $y_1', y_2', \dots, y_N'$. Eq. [3], is intended to discover the proper $\beta_i (1 \leq i \leq M)$ parameters for the linear regression approach. The values of real class $(y_1, y_2, \dots, y_N)$ should be roughly equivalent to values $of\ y_1', y_2', \dots, y_N'$.

The mean square error (MSE) is typically applied to determine the qualities of the linear regression approach. The smaller the MSE, the nearer the linear regression approach will be to the real values. Hence, to gain an excellent quality regression approach, it is essential to generate the MSE of the method small-scale possible. Therefore, quality regression techniques are made by discovering the most suitable $\beta_i$ parameters. Eq. [4] displays how the sum of squares of errors (SSE) has been considered.

$$SSE = \sum_{j=1}^{N} (y_j - y_j')^2 = \sum_{j=1}^{N} (y_j - \beta_0 - \sum_{k=1}^{M} \beta_k p_{j,k})^2 \quad [4]$$

To reduce the function of SSE gained in Eq. [4], the limited derivative of these functions regarding all of its $\beta_i (1 \leq i \leq M)$ unknowns need to be adopted. Meanwhile, it is targeted to reduce the error, the outcome of a partial derivative is equivalent to 0. Eq. [5] illustrations partial derivative.

$$\frac{\partial SSE}{\partial \beta_0} = \frac{\partial \sum_{j=1}^{N} \left(y_j - \beta_0 - \sum_{k=1}^{M} \beta_k p_{j,k}\right)^2}{\partial \beta_0} = 0$$

$$\frac{\partial SSE}{\partial \beta_1} = \frac{\partial \sum_{j=1}^{N} \left(y_j - \beta_0 - \sum_{k=1}^{M} \beta_k p_{j,k}\right)^2}{\partial \beta_1} = 0$$

$$\frac{\partial SSE}{\partial \beta_M} = \frac{\partial \sum_{j=1}^{N} \left(y_j - \beta_0 - \sum_{k=1}^{M} \beta_k p_{j,k}\right)^2}{\partial \beta_M} = 0 \quad [5]$$

**Logistic Regression:**

Logistic regression is an overview of standard linear regression and is part of this family of statistical devices recognized as GLMs (18). It is proper after modeling binary response variables: in our field, the quantities we need to model, $y$, denotes a vector whereas individual elements $y_i$ takes the value one a galaxy is an SR and the value $zero$ when its an FR. Figure 1 represents the structure of logistic regression. Larger sample size generally increases the power of a study, allowing for more reliable conclusions. It helps in capturing a diverse range of participants, which can enhance the generalizability of the findings. A well-calculated sample size ensures that the study can detect meaningful differences or effects if they exist. In studies focusing on specific populations, such as young women in wellness programs, it is essential to have a sample size that reflects the diversity within this group. This includes variations in age, socioeconomic status, and lifestyle factors, which can all influence the outcomes of the intervention.

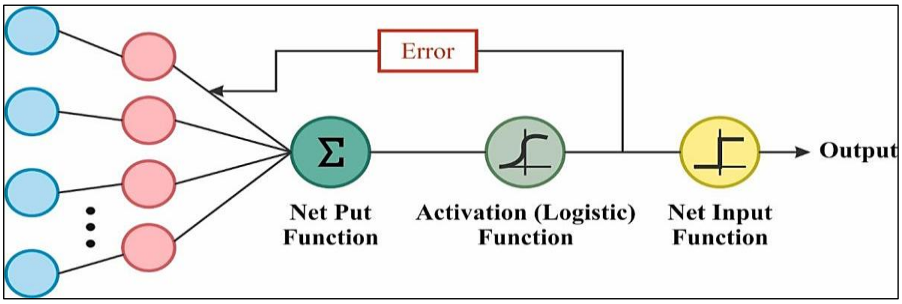


**Figure 1:** Structure of Logistic Regression

Either GLMs or linear regression utilizes a predictor's linear combination typically written $X$ and a model coefficients vector frequently labeled $\beta$ to model the transformation in a variable of response $y$. Compared to linear regression, still, GLMs still need a selection of link functions that map the linear combination $X \cdot \beta$ on a more proper domain for the problem nearby. Regarding logistic regression, we model the probabilities that $y_i = 1$ as demonstrated:

$$Pr(X_i = x_i) = p_i = \sigma(X_i^T)\beta, \quad [6]$$

while $\sigma$ signifies the sigmoid function described as $\sigma(x) = \frac{1}{1 + e^{-x}}$.

These functions map the ranges $(-\infty, \infty)$ to $(0,1)$ as is proper to model probability. Let us now model the experimental y-values as being self-sufficient and distributed identically, every extracted from a Bernoulli distribution, one with the success probabilities specified by Eq. [6]. This provides us the succeeding function of $log$-probability for the $N$ witnessed data points $y_i$, while the subscript $i$ goes in our sample:

$$logL = \sum_{i=1}^{N} y_i \, log \, p_i + (1 - y_i) log \, (1 - p_i) \qquad [7]$$

There are several methods to enhance Eqs. [6] and [7] to gather the top-fitting $\beta$ values. We select to capture a Bayesian technique, employing previously the model parameters and utilizing the probabilistic programming language STAN to approximate the resultant distribution of posterior. Lastly, we conclude this preliminary segment with a message concerning the model coefficient's interpretation. The nonlinearity of the logistic function represents that attention must be given after doing this. Particularly, unlike in linear regression, the predictor variable value at which one needs to assess a modification in the likelihood of being an SR makes it important. For instance, what does decrease or increase within the likelihood of being an SR after growing stellar mass? The solution variations are based on an upsurge from $10^9$ to $10^{10} M_{\odot}$ or $10^{10}$ to $10^{11} M_{\odot}$. The accurate method to compute the changes in probabilities after comparison with predictor vectors $X_1$ and $X_2$ is to compute using Eq. [8]:

$$\triangle p = \sigma(\beta \cdot X_2) - \sigma(\beta \cdot X_1) \qquad [8]$$

**Ridge Regression:** RR main goal is to study a new real-valued function on $R^p$ in $n$ points (19). We function in the overparameterized rule, i.e., $p > n$. Assume the data set contains $n$ i.e. vectors sampled from a few distributions on $R^p$, whose value of the mean is zero. $x$ means an independent attraction from that distribution. $X \in R^{n \times p}$ be the matrix whose rows are transferred. The results are based on the range of the covariance matrix $\Sigma = E[xx^T]$. We schedule an orthonormal basis where $\Sigma$ is diagonal shown below as Eq. [9]:

$$\Sigma = diag(\lambda_1, \lambda_2, \dots, \lambda_p), \qquad [9]$$

Here $\lambda_1 \geq \lambda_2 \geq \cdots \geq \lambda_p$ denotes the non-increasing series of eigenvalues of $\Sigma$.The sub-Gaussianity represents the $Z := X\Sigma^{-1/2}$ (data matrix). $Z$ are isotropic centered i.e. randomly generated vectors. Let the rows of $Z$ be sub-Gaussian with sub-Gaussian norm $\sigma_x$. Sub-Gaussianity is a traditional assumption that delivers an appropriate structure for processing deviances of numerous amounts of interest. Let $y \in R^n$ be the vector whose coordinates are noisy measurements of an indefinite function in the equivalent data points. We pretend that the true function is linear with coefficients $\theta^* \in R^p$, i.e.,

$$y = X\theta^* + \varepsilon,$$

Here $\varepsilon$ denotes a noise vector. Let components of $\varepsilon$ be placed variables at random with variance $v_\varepsilon^2$. RR with regularization parameter $\lambda$ is a traditional learning technique, which measures $\theta^*$ from $X, y$ as per the below mentioned formulation:

$$\hat{\theta}(y) := X^T(XX^T + \lambda I_n)^{-1} y$$

The matrix $\lambda I_n + XX^T$ plays a significant part in this study, so we represent

$$A := \lambda I_n + XX^T$$

In the ridgeless case ($\lambda = 0$), $A$ denotes the Gram matrix. The regularization of the ridge changes each eigenvalue by $\lambda$. The amount of interest is the excess risk that we described below: remember that $x$ denotes a novel data point from a similar distribution as rows of $X$. The error that our analyst experiences on this data point is $x^T(\hat{\theta}(y) - \theta^*)$. We describe excess risk as the average squared error over the population, i.e.,

$$E_x[(x^T(\hat{\theta}(y) - \theta^*))^2] = \|\hat{\theta}(y) - \theta^*\|_\Sigma^2,$$

While we describe $\|x\|_M := \sqrt{x^T M x}$ for any positive semi-definite (PSD) matrix $M$ and any vector $x$ of the equivalent size. Remember that $\hat{\theta}(y)$ is a linear in $y$, which lets us to write

$$\hat{\theta}(y) = \hat{\theta}(X\theta^*) + \hat{\theta}(\varepsilon)$$

$$E_\varepsilon[\|\hat{\theta}(y) - \theta^*\|_\Sigma^2] = \|\hat{\theta}(X\theta^*) - \theta^*\|_\Sigma^2 + E_\varepsilon[\|\hat{\theta}(\varepsilon)\|_\Sigma^2],$$

$$\|\hat{\theta}(y) - \theta^*\|_\Sigma^2 \leq 2(\|\hat{\theta}(X\theta^*) - \theta^*\|_\Sigma^2 + \|\hat{\theta}(\varepsilon)\|_\Sigma^2)$$

The term $\|\hat{\theta}(X\theta^*) - \theta^*\|_\Sigma^2$ represents an error in the noiseless regime; which is produced by rows of $X$ not covering the entire space and by regularization. The term $\|\hat{\theta}(\varepsilon)\|_\Sigma^2$ denotes an error in learning the 0 function from pure noise. The dual terms well decouple from together and can be considered distinctly. Furthermore, observe that $\|\hat{\theta}(\varepsilon)\|_\Sigma^2$ is a quadratic method in $\varepsilon$. Its probability measures linearly with $v_\varepsilon^2$ (variance of the noise):

$$E_\varepsilon[\|\hat{\theta}(\varepsilon)\|_\Sigma^2] = v_\varepsilon^2 tr(A^{-1}X\Sigma X^T A^{-1})$$

If the noise is sub-Gaussian with sub-Gaussian type $\sigma_\varepsilon$, then some complete constant $c$ and any $t > 1$, with likelihood at least $1 - ce^{-n/c}$,

$$\|\hat{\theta}(\varepsilon)\|_\Sigma^2 = \varepsilon^T A^{-1} X\Sigma X^T A^{-1} \varepsilon \leq ct\sigma_{\varepsilon j}^2 tr(A^{-1}X\Sigma X^T A^{-1})$$

So, both deviations and expectations of the term $\|\hat{\theta}(\varepsilon)\|_\Sigma^2$ are measured by the amount $r(A^{-1}X\Sigma X^T A^{-1})$. Therefore, we describe as in Eq. (10):

$$B := \|\hat{\theta}(X\theta^*) - \theta^*\|_\Sigma^2 = \|(X^T A^{-1} X - I_p)\theta^*\|_\Sigma^2 \text{ — } bias,$$

$$V := E_\varepsilon[\|\hat{\theta}(\varepsilon)\|_\Sigma^2 / v_\varepsilon^2]$$

$$= tr(A^{-1}X\Sigma X^T A^{-1}) \text{ — } variance. \qquad [10]$$

These measures are not based on the distribution of the noise. The main intention of this analysis is to deliver sharp non-asymptotic limits for them.

## Performance Analysis

This section studies the performance analysis using the Exercise and fitness metrics dataset (20). Table 1 provides complete details of a dataset. Figure 2 represents sample images.

**Table 1:** Details of Dataset

| No. of Exercise | Exercises | Exercises Type |
|---|---|---|
| Exercise 1 | Yoga | Tadasana |
| Exercise 2 | Yoga | Adho Mukha Svanasana |
| Exercise 3 | Yoga | Vrikshasana |
| Exercise 4 | Yoga | Bhujangasana |
| Exercise 5 | Yoga | Trikonasana |
| Exercise 6 | Aerobic | Zumba |
| Exercise 7 | Aerobic | Jazzercise |
| Exercise 8 | Aerobic | Bokwa |
| Exercise 9 | Aerobic | Hip-Hop Aerobics |
| Exercise 10 | Aerobic | Soca Dance |

**Figure 2:** Sample Images

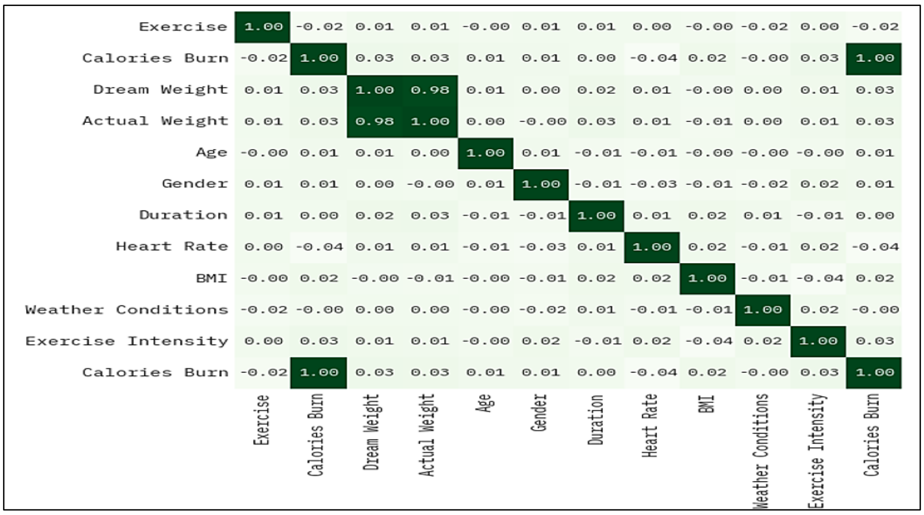


**Figure 3:** Correlation Matrix

Figure 3 establishes the correlation matrix, which shows effective outcomes. The proposed method has efficient detection and classification of all classes. Figure 4 determined the result study of the loss graph for various epoch sizes. The loss values are evaluated over an interlude of 0-50 epochs. It is characterized that the training values demonstrate a decreasing tendency, disclosing the ability to balance an exchange between data fitting and generalization. The repeated fall in loss values also pledges the advanced functioning and tunes the prediction results over time.

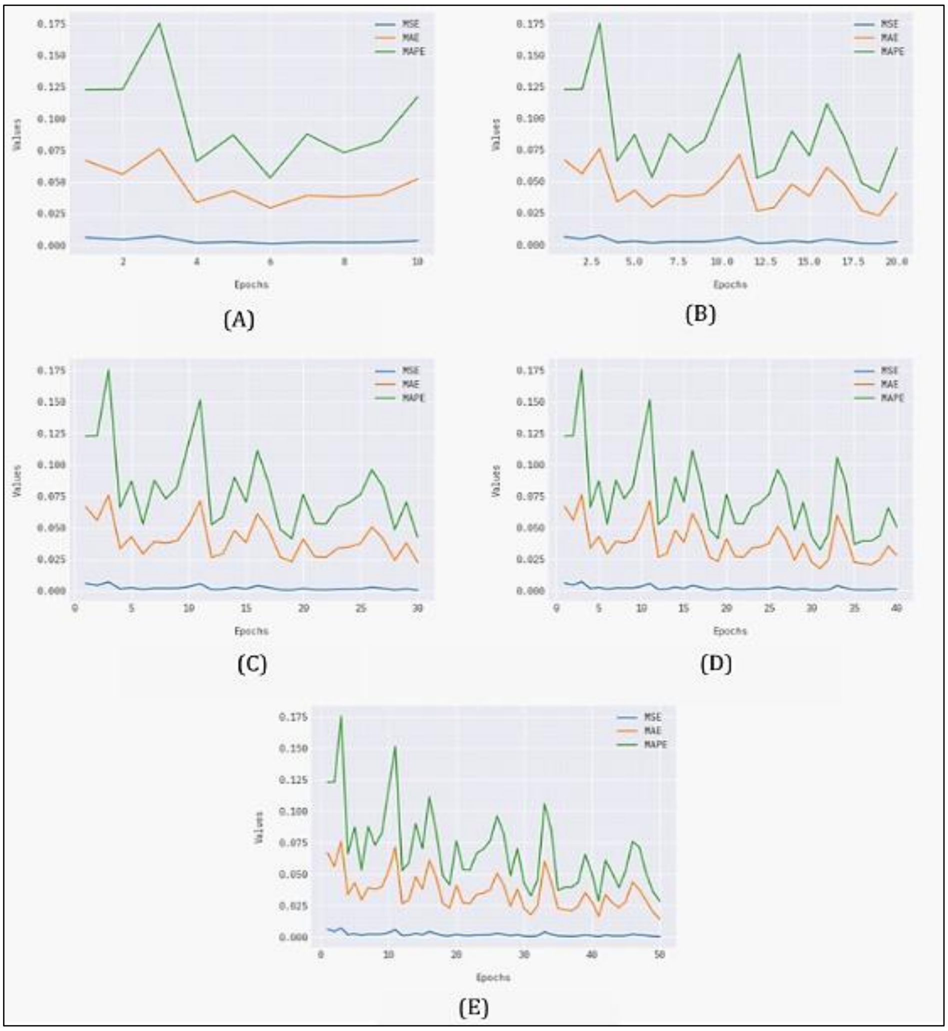


**Figure 4:** Result Analysis of Loss Graph for Different Epoch Size (A) 10, (B) 20, (C) 30, (D) 40 and (E) 50

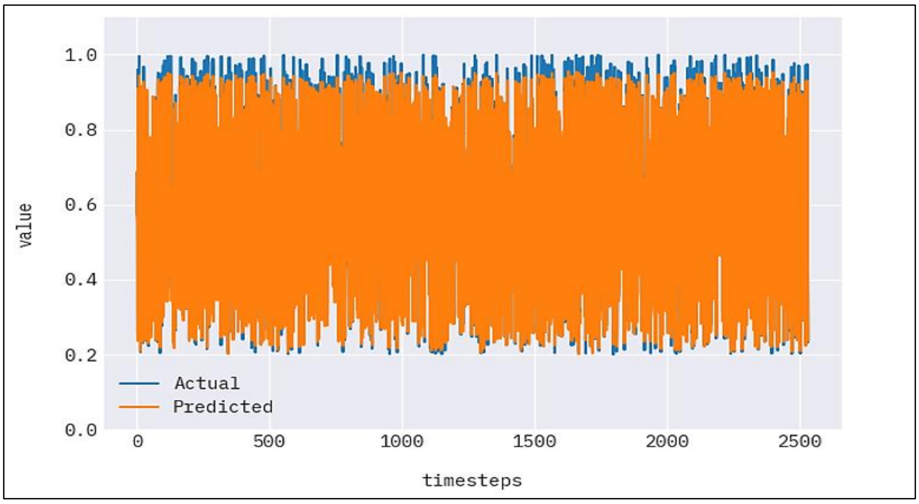


**Figure 5:** Result Analysis for Actual vs Predicted

**Table 2:** Classifier Outcomes with Distinct Metrics

| Metrics | Values |
|---|---|
| MSE | 0.0003 |
| MAE | 0.0145 |
| MAPE | 0.0287 |

Figure 5 displays the result analysis for actual vs predicted. The Figure specifies that the proposed method appropriately predicted the result. It is also observed that the predicted values are nearer to the actual values. Table 2 and Figure 6 characterize the classifier results with distinct metrics such as MSE, MAE, and MAPE. The results inferred that the proposed method has attained MSE of 0.0003, MAE of 0.0145, and MAPE of 0.0287.

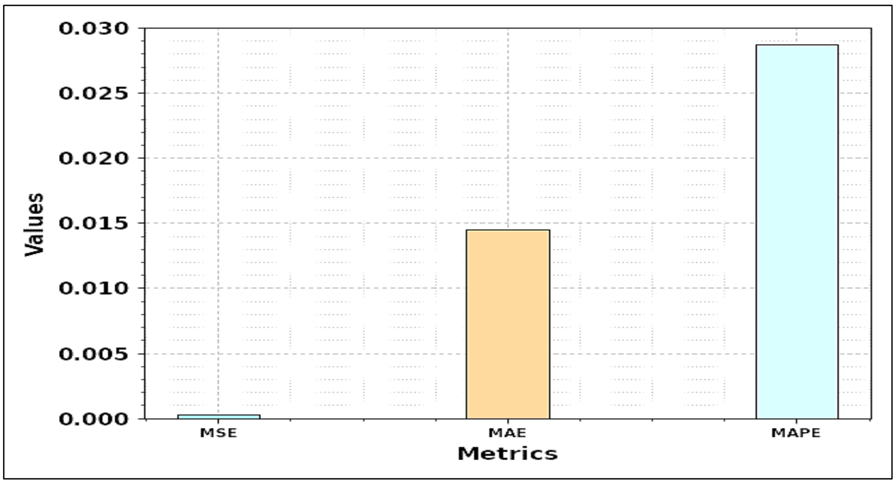


**Figure 6:** Classifier Outcomes with Distinct Metrics

**Table 3:** MSE and MAE Outcome with Existing Methods

| Methods | MSE | MAE |
|---|---|---|
| Linear Regression | 0.0011 | 0.0489 |
| Ridge Regression | 0.0008 | 0.0314 |
| Logistic regression | 0.0003 | 0.0145 |

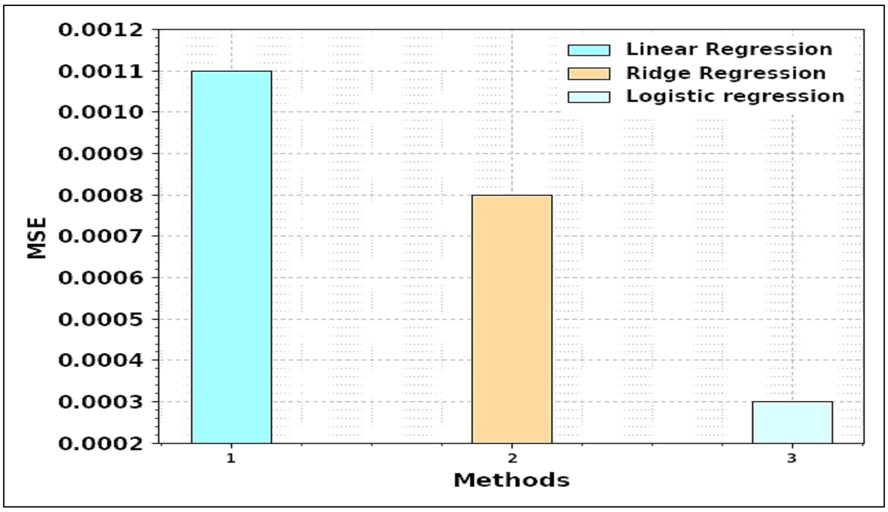


**Figure 7:** MSE Outcome of Existing Methods

To determine the capability of the proposed technique, a comprehensive comparison study is made with current methods such as Linear regression, Ridge regression, and Logistic regression in Table 3 and Figures 7 and 8 (21). The experimental values assumed that the approach has enhanced performances in terms of MSE and MAE.

The Linear regression technique has established MSE of 0.0011 and MAE of 0.0489. At the same time, the Ridge regression technique has obtained MSE of 0.0008 and MAE of 0.0314. Ultimately, the Logistic regression technique got MSE of 0.0003 and MAE of 0.0145.

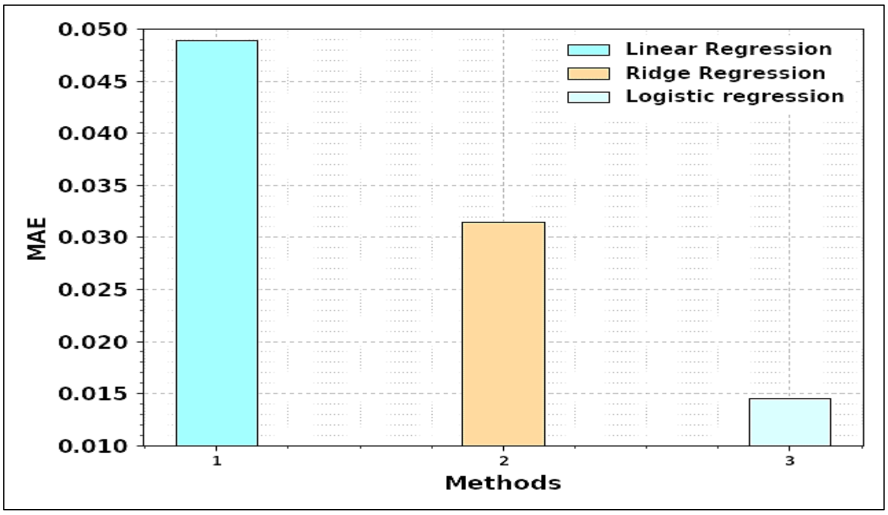


**Figure 8:** MAE Outcome of Existing Methods

**Table 4:** Comparative Outcome under Different Exercises

| Exercise | Improvement on Fitness (%) |
|---|---|
| Yoga | 26 |
| Aerobic | 35 |
| Yoga+Aerobic | 78 |

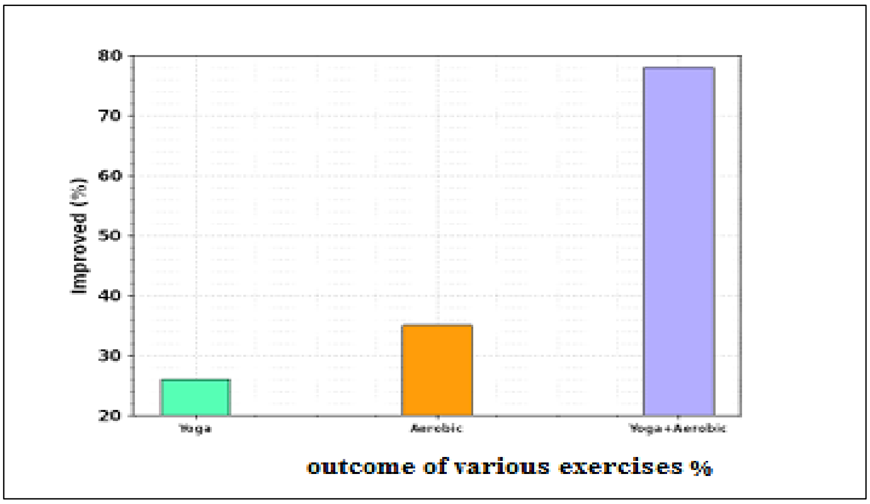


**Figure 9:** Comparative Outcome under Different Exercises

Table 4 and Figure 9 states the comparative outcome of various exercises in terms of improvement in fitness under different exercises. Based on Yoga exercise, the fitness has consequences at 26%. Where, based on aerobic exercise, the fitness has results at 35%. Meanwhile, according to both Yoga+Aerobic exercise, the improvement on fitness has presented effective results at 78%.

## Conclusion

This study discovers the impact of aerobic exercises and yoga practices on mental well-being and physical fitness among college women. Using a quantitative technique, we conducted three statistical analyses namely linear regression, LR, and RR of participants appealing to designed aerobic and yoga programs over a semester. Data were composed over pre- and post-intervention measurements, such as physical fitness tests and psychosocial studies evaluating anxiety, stress, and complete health. The findings show that both aerobic exercises and yoga considerably help to improve physical levels of fitness, with advances well-known in cardiovascular survival, strength, and flexibility. Besides, participants stated condensed stress and concern levels, besides improved overall physical well-being. A comparative study discovered that both types of exercise deliver extensive benefits, and yoga has shown a more distinct effect on psychosocial health.

## Abbreviation

Nil.

## Acknowledgement

Nil.

## Author Contributions

All authors contributed equally.

## Conflict of Interest

The authors of this work state that they have no conflicts of interest about its publication.

## Ethics Approval

This research does not require ethics approval.

## Funding

None.

## References

1. Dunås T, Wåhlin A, Nyberg L, Boraxbekk CJ. Multimodal image analysis of apparent brain age identifies physical fitness as predictor of brain maintenance. Cerebral Cortex. 2021 Jul;31(7):3393-407.
2. Snyder-Beattie AE, Sandberg A, Drexler KE, Bonsall MB. The timing of evolutionary transitions suggests intelligent life is rare. Astrobiology. 2021 Mar 1;21(3):265-78.
3. Ortega FB, Ruiz JR, Castillo MJ, Sjöström M. Physical fitness in childhood and adolescence: a powerful marker of health. International journal of obesity. 2008 Jan;32(1):1-1.
4. Mandsager K, Harb S, Cremer P, Phelan D, Nissen SE, Jaber W. Association of cardiorespiratory fitness with long-term mortality among adults undergoing exercise treadmill testing. JAMA network open. 2018 Oct 5;1(6):e183605-.
5. Kim Y, Wijndaele K, Lee DC, Sharp SJ, Wareham N, Brage S. Independent and joint associations of grip strength and adiposity with all-cause and cardiovascular disease mortality in 403,199 adults: the UK Biobank study. The American journal of clinical nutrition. 2017 Mar 1;106(3):773-82.
6. Buchan DS, Boddy LM, Young JD, Cooper SM, Noakes TD, Mahoney C, Shields JP, Baker JS. Relationships between cardiorespiratory and muscular fitness with cardiometabolic risk in adolescents. Research in Sports Medicine. 2015 Jul 3;23(3):227-39.

7. Juonala M, Magnussen CG, Berenson GS, Venn A, Burns TL, Sabin MA, Srinivasan SR, Daniels SR, Davis PH, Chen W, Sun C. Childhood adiposity, adult adiposity, and cardiovascular risk factors. New England Journal of Medicine. 2011 Nov 17;365(20):1876-85.
8. Jamil F, Kahng HK, Kim S, Kim DH. Towards secure fitness framework based on IoT-enabled blockchain network integrated with machine learning algorithms. Sensors. 2021 Feb 26;21(5):1640.
9. Bittár NH, Falkstedt D, Wallin AS. How intelligence and emotional control are related to suicidal behavior across the life course–A register-based study with 38-year follow-up. Psychological medicine. 2020 Oct;50(13):2265-71.
10. Wu J. An important but overlooked measure for containing the COVID-19 epidemic: Protecting patients with chronic diseases. China CDC Weekly. 2020 Apr 1;2(15):249-50.
11. Dwijayanti K, Hakim AR, Nugroho U, Muryadi AD, Firdaus M, Aliriad H. Effects of Aerobic Exercise and Yoga on Blood Pressure in Women Between the Ages of 30 and 40 Years. International Journal of Disabilities Sports and Health Sciences. 2024;7(4):753-64.
12. Chaudhry N, Bhandari RB, Gaur V. Yoga perspective on personal excellence and well-being. Journal of Ayurveda and Integrative Medicine. 2023 May 1;14(3):100717.
13. Deshmukh L, Janghel U, Sonkuwar A, Thakur R. Exploring the Synergy between Yoga and Mindfulness Sport Practices: Enhancing Mental and Physical Well-Being. Indian Journal of YOGA Exercise & Sport Science and Physical Education. 2024 Jun 21:26-32. https://doi.org/10.58914/ijyesspe.2024-9.1.4
14. Cerdá A, Boned-Gómez S, Baena-Morales S. Exploring the mind-body connection: Yoga, mindfulness, and mental well-being in adolescent physical education. Education Sciences. 2023 Nov 2;13(11):1104.
15. Terzioğlu ZA, Çakır-Çelebi SG, Yıldız M. Effect of online mindfulness-based physical exercise program on psychological well-being and life satisfaction during the Covid-19 pandemic. Current Psychology. 2024 Apr;43(16):15035-45.
16. Güvener YÖ, Erdoğan M. The Effect of Yoga on Foot/Leg Pain, Fatigue and Psychological Well-Being in Nurses The Effect of Yoga on Foot/Leg Pain, Fatigue. Authorea Preprints. 2023 Sep 6. https://www.techrxiv.org/doi/full/10.22541/au.169397282.29381350
17. Şahın DÖ, Akleylek S, Kiliç E. LinRegDroid: Detection of Android malware using multiple linear regression models-based classifiers. IEEE Access. 2022 Jan 27;10:14246-59.
18. Vaughan SP, Van De Sande J, Fraser-Mckelvie A, Croom S, Mcdermid R, Liquet-Weiland B, Barsanti S, Cortese L, Brough S, Sweet S, Bryant JJ. The SAMI galaxy survey: predicting kinematic morphology with logistic regression. Monthly Notices of the Royal Astronomical Society. 2024 Mar;528(4):5852-63.
19. Tsigler A and Bartlett PL. Benign overfitting in ridge regression. Journal of Machine Learning Research. 2023;24(123):1-76.
20. Ganley KJ, Paterno MV, Miles C, Stout J, Brawner L, Girolami G, Warren M. Health-related fitness in children and adolescents. Pediatric Physical Therapy. 2011 Oct 1;23(3):208-20.
21. Mendonça FR, De Faria WF, Da Silva JM, Massuto RB, Dos Santos GC, Correa RC, Dos Santos CF, Sasaki JE, Neto AS. Effects of aerobic exercise combined with resistance training on health-related physical fitness in adolescents: A randomized controlled trial. Journal of Exercise Science & Fitness. 2022 Apr 1;20(2):182-9.