



EFFECT OF ONLINE VINYASA TRAINING ON HOUSEWIVES' LOWER AND UPPER BODY ENDURANCE: A RANDOMIZED POST-PANDEMIC COVID-19 TRIAL

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Abstract

Study purpose. The COVID-19 pandemic has a considerable impact on social and financial factors in addition to health outcomes. There is, however, still little information available as to how Covid-19 actually impacted housewives. Consequently, this paper aims to provide a new dimension to the study of how vinyasa could support mothers' fitness throughout the pandemic. This study sought to determine whether an online vinyasa programme for 8 weeks during Covid-19 pandemic could significantly influence housewives' upper and lower body muscle endurance.

Materials and methods. 24 housewives (between the ages of 26 and 36) from the NCR region of Delhi participated in the study. The participants were divided at random and put either into the experimental group (vinyasa) or the control group. Both upper and lower body muscular endurance was found to be the health-related variable. The longest-lasting bent knee push-ups were used to gauge upper body muscular endurance, while the longest-lasting bodyweight squat holds over a 90-degree angle were used to gauge lower body muscle endurance.

Results. To analyse the findings, tests were run both prior to and following the training. A substantial difference between the experimental group and control group was found using ANCOVA to compare them to the baseline after 8 weeks.

Conclusions. Thus, it was determined that the online/virtual vinyasa training programme was a successful way for housewives to increase their body muscular endurance (health-related fitness).

Keywords: vinyasa, physical fitness, muscular endurance, bent knee push-ups, squat, health-related fitness.

Introduction

“Muscular endurance” refers to a muscle's capacity to work out for a long period of time. You can maintain general health and fitness by having strong muscles (Sissons, 2021). An organism's capacity to sustain itself and contract a muscle or group of muscles against resistance – such as weights or body weight – for a prolonged length of time while worn out or depleted is known as muscular endurance. Endorphins are released when you increase your endurance, which improves

your mood. People who engage in physical activity are better able to manage their chronic illnesses, including anxiety, melancholy, and stress. Health benefits of complementary and alternative therapies that promote increased physical activity and discourage sedentary behaviour have been demonstrated (Keadle et al., 2017).

Yoga is comes from the Sanskrit root word yuj, which denotes the union of personal and cosmic consciousness. Yoga's original meaning is to understand one's own life's purpose (Singh, 2018). According to Maehle's definition of vinyasa from 2007, it is “sequential movement that connects postures to produce a continuous flow.” Vinyasa is a technique of motion meditation that makes all forms appear transient and warns against clinging to them. One

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should pay close attention to their breathing rhythm while practising vinyasa. Many research have demonstrated that practising yoga improves a number of both psychological and physical aspects (Singh et al., 2022). Vinyasa yoga, a style of Hatha yoga that places an emphasis on systematic practise (Beth et al., 2012) In essence, it is a powerful form built on a fast flow of sun salutations that are timed with breath. The popularity of this type of yoga has increased over the past few decades due to both its effectiveness and its flair. Studies show that the cardiovascular fitness profiles of yogis and runners are comparable, and sun salutations increase heart rate into zones associated with cardiovascular endurance. Yoga has also been employed as a complementary therapy for the treatment of insomnia, anxiety, and depression (Choi et al., 2018). Vinyasa yoga practise on a regular basis can improve general health and aerobic fitness (Tsopanidou, et al., 2020).

According to earlier studies (Fillmore et al., 2010), yoga can improve adolescent girls' balance, flexibility, and strength. It can also raise abdominal strength and improve body composition and cardiorespiratory fitness (Boraczyski et al., 2020). Despite the positive study outcomes, nothing is known about the short-term (8 weeks/6 weeks) impacts of online vinyasa training. Additionally, there is a dearth of evidence on the effectiveness of an online vinyasa training programme (8 weeks) on lower body muscular endurance.

Therefore, the purpose of this study was to determine whether an 8-week vinyasa programme had any impact on housewives' ability to maintain muscle endurance in their upper and lower bodies (health related fitness). In comparison to the control group, the study intends to determine whether an online vinyasa training programme has a significant influence on the upper body and lower body muscle endurance of the experimental group.

Purpose of the study. The current study's objective was to determine the effects of an eight-week online vinyasa training programme on housewives' upper and lower body muscular endurance after Post-Pandemic Covid-19.

Materials and methods

Study participants

In the present study 24 housewives (between the ages of 26 and 36) from Delhi's National Capital Territory participated in the study; none of them had ever received

official training. They readily agreed to engage in training after being informed about the procedure and any risks involved with the intervention/data collection. They also signed a written consent form. Following that, the participants were randomly split into two groups experimental (Vinyasa) and control (daily schedule). The health-related variable selected was muscular endurance. The longest body-weighted squat holding at 90 degrees were used to assess lower-body muscular endurance, whereas the longest bend knee push-up holds were used to assess upper-body endurance. Tests were run both before and after training to evaluate the outcomes. Subjects for this study had to be free of any recent practice that would have affected the training programme or collection of data in order to be eligible for inclusion criteria.

Study organization

To acquaint the participants with test procedures, 3 sessions were held before the intervention began. The subjects learned about the methods for gathering data and conducting training interventions during the familiarisation sessions. 40 training sessions of 30 minutes each made up the 8-week training programme. Each micro-cycle was seen and overseen by the student, and it consisted of five training sessions over the course of seven days (Monday, Tuesday, Wednesday, Thursday, and Friday; Table 1). To avoid interfering with their house's usual Covid-19 programming, the sessions took place in the early morning from 6:15 to 6:45 a.m. and lasted 30 minutes each. The subjects were specifically urged to attend all of scheduled sessions in a special request. Nevertheless, there were a few omissions. Through yogic poses that were intended to be as pleasurable as possible, the training intervention was developed with the aim of strengthening lower body muscular endurance. Two tests were conducted: one before and one after training (0 week apart) (8 weeks). Maximum number of bend knee push-ups were used to measure muscular endurance. A challenging isometric exercise that strengthens lower body is the squat hold. Using a standing body-weighted squat held at 90 degrees for as long as possible, lower body endurance of housewives was measured. The subject's upper body muscular endurance was measured with the ability to perform push-ups with a bent knee. Hands should be placed below shoulders, feet should be crossed, and the person's knees should be on the ground. Keep your back straight and tense your abdominals. As soon as your chest is about

Table 1. The housewives treatment group followed a vinyasa training session during a micro cycle

No.	Test Battery	Rounds	Duration (In Seconds)	Total Time (In Seconds)
1	Surya Namaskar (12 postures)	3	120	360
2	Standing Vinyasa Series (postures 11)	3	110	330
3	Plank Vinyasa Series (postures 5)	3	50	150
4	Prone Vinyasa Series (postures 7)	3	70	210
5	Supine Vinyasa Series (postures 5)	3	50	150

Note: Each subject was allowed to relax in Savasana for 3 minutes after performing every round of all the test batteries. 6 min (360 sec).

Each position: 10 sec.

Asana Practice: 20 min (1200 sec).

Total training program schedule: 26 min (1560 sec).

parallel to the floor, start bending your elbows. Then, after a small break, return to the starting position. A squat hold was used to assess the subject's lower body muscular endurance with the ability to maintain their lower body muscles. The person should stand comfortably with his or her feet shoulder-width apart while slightly turned out. Set the shoulders and tense the midsection. Push your legs out and over your toes as you slowly crouch down while raising your arms forward in front of the chest. Squat until your waist line is well below knee level and keep your arms in front of you to stay balanced and stable. For the next few minutes, maintain this position, making sure your breathing is not difficult. Data was quickly obtained when the researcher did the test and showed it online (side angle view). The longest amount of time was required for subjects to hold a 90-degree squat position.

Training Method – The researcher himself taught Vinyasa and oversaw the practise sessions, with the assistance of an assistant to monitor the online class, which was run using the Zoom app for the training. Each step was discussed and shown ahead of time for the aim of instructing. The remaining instructions were supplied in the intervals between vinyasa training sessions.

The demographic information as follows:

Table 2. Demographic information of experimental and control group housewives

Group	Gender	Activity	No. of Participants	Percentage (%)
Experimental	Female	Housewives	12	50
Control	Female	Housewives	12	50
		Total	24	100

Statistical analysis

The study used IBM SPSS software (version 20.0.0) to analyse the data with an ANCOVA Single Pre-test and Post-test Group Design. The analyses were done using two groups (experimental and control), $p = 0.05$ was chosen as the statistical significance level.

Results

As stated in the study's objectives, Table 3 and Table 4 shows the descriptive features (mean and standard deviation) of both the experimental and control groups for upper body endurance and lower body endurance respectively. Table 5 and Table 6 shows the adjusted mean and standard error for data on upper body and lower body muscular endurance respectively for both experimental and control groups. The advantage of using the ANCOVA is that the differences in the post testing means are compensated for the initial differences in the scores. In other words, it may be said that the effect of covariate is eliminated in comparing the effectiveness of treatments on the criterion variable. Table 7 shows the findings of the ANCOVA analysis for upper body endurance. Table 8 shows the findings of the ANCOVA analysis for lower body endurance. After 6 weeks, ANCOVA demonstrated a significant difference in the targeted variables (upper body and lower body endurance) in the experimental group compared to the control group.

Table 3. Descriptive statistics of upper body endurance after training

Group	Mean	Std. Deviation	N
Experimental	9.75	1.95	12
Control	4.58	1.08	12
Total	7.16	3.05	24

Table 4. Descriptive statistics of lower body endurance after training

Group	Mean	Std. Deviation	N
Experimental	35.08	3.44	12
Control	21.91	4.64	12
Total	28.5	7.82	24

Table 5. Adjusted mean and standard error for the data on lower body endurance in different groups during

Groups	Mean	Std. Error	95% Confidence Interval	
			Lower bound	Upper bound
Control	21.97	0.77	20.36	23.57
Experimental	35.02	0.77	33.42	36.63

- a. Covariates appearing in the model are evaluated at the following values: Pre_Squat = 21.66.
- b. Values have been rounded off

Table 6. Adjusted mean and standard error for the data on lower body endurance in different groups during

Groups	Mean	Std. Error	95% Confidence Interval	
			Lower bound	Upper bound
Control	9.792	.470	8.814	10.769
Experimental	4.542	.470	3.564	5.519

- a. Covariates appearing in the model are evaluated at the following values: Pre Knee Push-up = 4.00.
- b. Values have been rounded off

Table 7. ANCOVA Table of upper body endurance After Training

Source	Type I Sum of Squares	Df	Mean Square	F	Sig.
Pre_Test	3.500	1	3.500	1.353	.258
Groups	157.500	1	157.500	60.874	.000
Error	54.333	21	2.587		
Corrected Total	215.333	23			

- a. R Squared = .748 (Adjusted R Squared = .724)
- b. Computed using alpha = .05

Table 8. ANCOVA Table of lower body endurance After Training

Source	Type I Sum of Squares	Df	Mean Square	F	Sig.
Pre_Test	235.18	1	235.18	32.85	.00
Groups	1022.48	1	1022.48	142.82	.00
Error	150.33	21	7.15		
Corrected Total	1408	23			

- a. R Squared = .893 (Adjusted R Squared = .883)
- b. Computed using alpha = .05

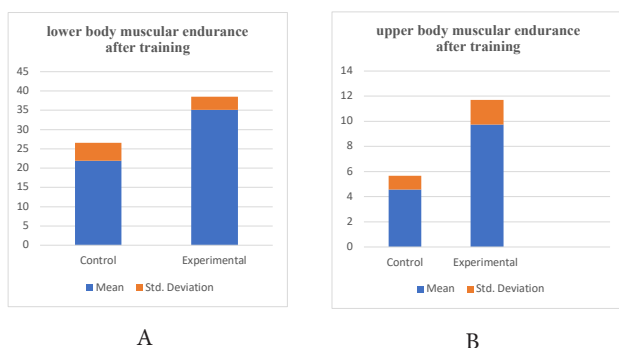


Fig. 1. Graphical representation of mean and standard deviation of (A) lower body muscular endurance among control and experimental group (B) upper body muscular endurance among control and experimental group

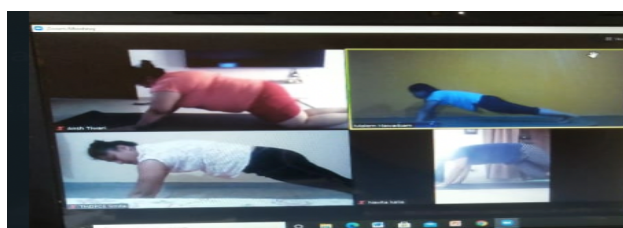


Fig. 2. Participants treatment group following online vinyasa training session during a micro cycle

Discussion

The current study's statistical results showed that an 8-week Vinyasa Training Program is beneficial in boosting housewives' upper body muscular endurance and lower body muscular endurance. The ANCOVA test for dependent variables revealed a significant difference in upper body muscular endurance as well as in lower body muscular endurance between the control and experimental training groups of women in Delhi's NCR region. The findings of our investigation are backed up by the findings of a previous study. Preliminary evidence of increases in strength, balance, aerobic fitness, and self-rated health following yoga practice has been published recently (Singh et al., 2021; Patel et al., 2012). These advantages may be especially important for persons who are unable or unwilling to engage in aerobic or resistance programs and activities. Cardiorespiratory endurance, muscular strength and endurance, and flexibility are all improved in Chinese adults after a 12-week Hatha yoga intervention (Lau et al., 2015). A systematic yoga practice increases upper-limb and abdominal muscular endurance. Muscle endurance is improved through isometric contractions in yoga postures (Shiraishi, 2016).

According to the results of our study, subjects who participated in an online vinyasa programme improved in a both upper body and lower body muscular endurance variable than those who did not. This may be explained in part by the fact that the women in our study were sedentary housewives with no prior experience with structured training. Furthermore, the structured vinyasa training programme may have aided housewives in improving the identified regulation, resulting in an increase in the motivation to put in more effort (Patel et al., 2012). The vinyasa programme,

which took place five days a week, may have provided enough stimulation to boost housewives' overall health capacities. Additionally, it's worth noting that even a short intervention of 8 weeks was enough to improve muscular endurance. In reality, it is well recognised that when a new stimulus is used as a training intervention, the greatest advantage can be obtained.

Previous research has also revealed efficacy of a 6-week Vinyasa Yoga Training Programme (VYTP) in improving dynamic body balance of male national level yoga players and it was observed that the male national yoga players had a substantial difference in dynamic body balance compared to the control group (Singh et al., 2022) and in other study it was found (Singh, et al., 2015) that an 8-week yoga training programme had a substantial impact on female hockey players' physical strength, endurance, flexibility, and agility. According to (Hosseini et al., 2018), prescription regular exercise regimens with controlled intensity and time, particularly resistance training and hatha yoga training, can enhance lower limb strength and balance in multiple sclerosis patients. Handgrip strength (Madanmohan et al., 1992), muscular endurance (Ray et al., 1986), flexibility (Gharote & Ganguly, 1979), and maximal oxygen uptake (VO_2 max) have all been demonstrated to improve with yoga practice (Balasubramanian & Pansare, 1991). As a result, these data may support the argument that inactive people might improve their general physical fitness, cardiovascular health, and psychological well-being by practising Vinyasa yoga (Choi et al., 2018).

Conclusions

The current study is a noteworthy attempt to determine whether an 8-week online vinyasa training programme is useful in enhancing lower body muscular endurance in housewives during Post-Pandemic Covid-19. The results showed that there was a significant difference ($p < 0.05$) between the control and experimental groups after the implementation of the "8 week vinyasa training plan," rejecting the null hypothesis. Following are some recommendations given in light of the findings: The research could be useful in determining the impact of Vinyasa on other factors besides muscular endurance. The study's findings could help people understand Vinyasa yoga in a more authentic way. The research can be done on people of all ages and genders. A comparable study might be conducted by lengthening the training regimen under controlled settings. The findings of the study may be useful to ordinary people as well as athletes, particularly during pandemics like COVID-19 and also recommended to do for general health development, when we are advised to stay at home and stay healthy by practising Vinyasa yoga.

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Conflict of interest

Authors have no conflicts of interest to declare.

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ВПЛИВ ОНЛАЙН-ЗАНЯТЬ ВІНЬЯСА-ЙОГОЮ НА ВИТРИВАЛІСТЬ НИЖНЬОЇ ТА ВЕРХНЬОЇ ЧАСТИНИ ТІЛА ДОМОГОСПОДАРОК: РАНДОМІЗОВАНЕ ДОСЛІДЖЕННЯ В ПЕРІОД ПІСЛЯ ПАНДЕМІЇ COVID-19

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Реферат. Стаття: 6 с., 8 табл., 2 рис., 19 джерел.

Мета дослідження. Пандемія COVID-19 має значний вплив на соціальні та фінансові фактори, окрім наслідків для здоров'я. Однак поки що мало інформації про те, як Covid-19 насправді вплинув на домогосподарок. Отже, метою цієї статті є забезпечення нового виміру дослідженню того, як віньяса-йога могла підтримувати фізичну форму матерів протягом пандемії. Метою цього дослідження було визначити, чи могла онлайн-програма занять віньяса-йоогою протягом 8 тижнів під час COVID-19 суттєво вплинути на витривалість м'язів верхньої та нижньої частини тіла домогосподарок.

Матеріали та методи. У дослідженні взяли участь 24 домогосподарки (віком від 26 до 36 років) з Національного столичного регіону Делі (Індія). Учасниць розподілили випадковим чином до експериментальної групи (віньяса-йоогою) або до контрольної групи. Установлено, що м'язова витривалість як верхньої, так і нижньої частини тіла є змінною, пов'язаною зі здоров'ям. Найтриваліші віджимання на колінах використовували для вимірювання витривалості м'язів верхньої частини тіла, тоді як найтриваліші утримання присіду із власною вагою під кутом 90 градусів використовували для вимірювання витривалості м'язів нижньої частини тіла.

Результати. Для аналізу отриманих результатів були проведені тести до та після тренування. Між експериментальною та контрольною групою було виявлено значну різницю за допомогою коваріаційного аналізу, який використовували для їх порівняння із вихідним рівнем через 8 тижнів.

Висновки. Таким чином, було визначено, що онлайн/віртуальна програма занять віньяса-йоогою є успішним способом для домогосподарок підвищити м'язову витривалість свого тіла (фізичну витривалість).

Ключові слова: віньяса-йоогою, фізична підготовленість, м'язова витривалість, віджимання на колінах, присід, фізична витривалість.

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