



ORIGINAL SCIENTIFIC ARTICLE

## EFFECT OF VINYASA TRAINING ON DYNAMIC BODY BALANCE OF MALE NATIONAL LEVEL YOGA PLAYERS

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Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

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Accepted for Publication: January 22, 2022

Published: March 25, 2022

DOI: 10.17309/tmfv.2022.1.06

### Abstract

**Background.** Body balance is among the most important aspects for achieving athletic excellence in competitive sports. Body balance helps in the development of proper body posture control, which supports high performance and skill demonstration across all sports. Body balance is known to be positively correlated to competitive athletic performance. In sports, good balance implies moving more efficiently and with better body control. Yoga is one of the means of improving body balance, and it has also been linked to enhancing athletic performance. Vinyasa yoga is a powerful method that targets the entire body. Navigate challenging poses to improve your strength, flexibility, and balance, especially if you want to target muscle groups that aren't used in your preferred sport.

**The focus of this study.** To analyse the efficacy of a 6-week Vinyasa Yoga Training Programme (VYTP) in improving dynamic body balance of male national level yoga players.

**Materials and methods.** Twenty male national level yoga players (18-25 years) from the Lakshmibai National Institute of Physical Education, Gwalior, India, participated in the study. The participants were then randomly allocated into two groups, one experimental (Vinyasa) and the other control. The Sensbalance machine was used to measure the dynamic body balance.

**Results.** ANCOVA indicates a significant difference in the selected variable of dynamic body balance in the experimental group compared to the control group. When compared to the control group which did not receive any training, the post-test found that the experimental yoga group significantly improved in dynamic body balance.

**Conclusions.** VYTP was found to be helpful in enhancing dynamic body balance. In the current study after six weeks of vinyasa training it was observed that the male national level yoga players had a substantial difference in dynamic body balance compared to the control group.

**Keywords:** yoga, vinyasa, VYTP, dynamic body balance, competitive sports.

### Introduction

Competitive sporting life requires an optimum level of body balance for better athletic performance. Balance (postural control) is the ability to maintain the vertical position of the body's center of gravity while undertaking coordinated and precise neuromuscular activity to execute a task (Hrysomalis, 2011). Athletes concentrate their training mainly on objectives: gaining better control over bodily posture, avoiding injury, and improving performance. In competitions, balance training has been widely required to enhance balance and thereby minimize the possibility of injury, such

as ligamentous sprains, which are highly common in sports (Saraswat, 2015). There are basically two type of balance in sports to look at equilibrium - static and dynamic balance. Static balance (e.g., headstand) is described as the ability to maintain a stable base of support with minimal movement (Bressel et al., 2007). Static balance is a critical component contributes to effective performance, particularly in sports which demands higher bodily postural control (Rogers et al., 2013). Many experts have inferred that static equilibrium is a factor for balance control and suggested for players since it not only improves sports performance but also decreases lower extremity damage (Boccolini et al., 2013).

Dynamic balance is the ability of the body (e.g., somersault in gymnastics) to maintain a body's center of mass while performing the combination of complex movements

(Brown & Weir, 2001). Studies have shown that dynamic balance and postural control are essential for success in all competitive sports (Cote et al., 2005; Erkmen et al., 2007). Improving dynamic balance has been found to greater agility, faster reaction times, and overall performance for athletes and helps to reduce the risk of acute and chronic injuries, and overall coordination of the muscle groups in executing an activity (Brachman et al., 2017).

One of the ways to achieve optimal functioning dynamic body balance in athletic performance is to practice Yoga. Yoga is derived from the Sanskrit word “Yuj” (“युज”), which refers to the unification of individual and universal consciousness (Singh, 2018). Maharshi Patanjali, refers Yoga as «Yogaschitta vrtti nirodhah,» which means Yoga is a state of mind that is in balance without any fluctuations in mind (Saraswati, 2016). Various types of yoga may have different goals in terms of focus, mindfulness, and muscular engagement. While Hatha yoga focuses on focused breathing methods, flexibility, and meditation, Vinyasa yoga focuses on muscular endurance (Sharma, 2018).

Vinyasa yoga is a yoga method that consists on putting postures together so that one can flow from one to the next posture with breath awareness (Ramaswami, 2005). Vinyasa as a philosophy, acknowledges the impermanent nature of things, it originally referred to a series, or sequence of steps, to make something sacred with a stable stance taken up, hold it for a few moments, and then release it (Saal, 2019). Vinyasa yoga is one type of Yoga, that can aid in improving dynamic balance in competitive sports. Many studies has investigated that yoga practice aids in the improvement of various physical and psychological dimensions to be precise. Research revealed that yoga exercises are useful in developing balance and perception (Rayat, 2015). The findings imply that a regular yoga practice can improve male college players' balance and flexibility and so improves athletic performance (Polsgrove et al., 2016). Previous investigations states that vinyasa is a cost-effective and alternative training method, it can improve fitness and boost overall wellness (Tsopanidou et al., 2020). Positive improvement has been found in yoga training programme on balance, flexibility and strength of male soccer players (Kartal & Ergin, 2020). In a study, following six months of vinyasa training, females had changes in maximal muscle torque, as well as alterations in muscle topography (Buško & Rychlik, 2006). Long-term vinyasa yoga-based programmes have shown enhancement in health related fitness condition significantly (Boraczyński et al., 2020). Despite the desirable findings of the studies, however, no previous studies have investigated on the short-term (6 weeks) effects of Vinyasa Yoga Training Programme (VYTP), as well as research on dynamic body balance.

*The focus of the present study* was to examine the effect of a short term six-week VYTP on dynamic body balance of male national level yoga players.

## Materials and methods

### Study participants

Twenty male national level participants (aged 18-25 years) with prior yoga experience (but without previous structured vinyasa training experience) consent for this study from Lakshmibai National Institute of Physical

Education in Gwalior, India. Participants were allocated into experimental (vinyasa training) group and control (daily schedule) group. Ethical approval was obtained prior to the study.

### Study organization

VYTP in this study consisted of 5 different batteries of various bodily yogic postures mainly Surya Namaskar, Standing Vinyasa Series, Plank Vinyasa Series, Proline Vinyasa Series and Supine Vinyasa Series, as displayed in Table 1. On the other hand, Table 2 explaining with a micro-cycle example about Vinyasa Training program 5 Days a Week.

Sensbalance was utilised as the study's tool for data collection purpose. Sensbalance is a completely computerised system machine that is designed for improving balance (static and dynamic), increase body awareness and coordination abilities. The angle of maximum tilt was set at 15o in all directions and time duration was set 30 seconds. During this test, the person moved the platform and gazed at the computer screen to track the reference location produced by

**Table 1.** Six Weeks Vinyasa Programme

S. No.	Test Battery	Postures/Asanas
1	Warmup +Prayer	Active Stretching+ Yogic Prayers
2	Surya Namaskar	12 Postures
3	Standing Vinyasa Series	Awkward chair Goddess pose Awkward chair Goddess pose Awkward chair Standing forward bend Standing high lunge Pyramid Standing stretch (Tadasana) Tree pose Single leg awkward chair
4	Plank Vinyasa Series	Pushup plank Plank Side plank Four limbed staff One leg raise plank Cross side leg plank
5	Proline Vinyasa Series	Sarpasana Upward facing dog(bhujangasna) Single leg salbhasana Both leg salbhasana Reverse boat Single leg bow pose Both leg bow pose
6	Supine Vinyasa Series	Bridge Single leg bridge Side leg bridge Chakrasana Reverse plank
7	Relaxation	Yogic Nidra

Note. Style Adapted from Unpublished thesis LNIPE, Gwalior., by Singh. V, 2019, p. 18.

the movement of the circle on the computer screen. The participants were required to balance over a single leg throughout the test. The test results were produced by the computer when the test time finished.

### Procedure

Two sessions were held prior to the start of the VYTP to familiarise the participants about the data collection, VYTP procedures and test protocol. The training intervention lasted 6 weeks and consisted of 30-minute training sessions (Table 1 & Table 2). One micro-cycle lasted 7 days and included 5 training sessions (Monday-Friday) under the supervision and guidance of the first author. Training data was collected at two specific intervals: week 1 (before training) and weeks 6 (after training).

### Statistical analysis

In this study, IBM SPSS (version 20) software was used to run ANCOVA analyses to examine the data.

## Results

ANCOVA (in Table 3), showing the descriptive statistics information of experimental and control group male national yoga player about dependent variable: dynamic body balance after training. The experimental group had mean and standard deviation of  $75.60 \pm 3.27$ , and the control group had mean and standard deviation of  $70.50 \pm 2.50$  respectively.

**Table 3.** Descriptive Statistics Dependent Variable: Dynamic Body Balance After Training

Group	Mean	Std. Deviation	N
Experimental	75.600	3.272	10
Control	70.500	2.505	10
Total	73.050	3.859	20

The statistical significance level was set at  $p \leq 0.05$ . The p-value linked with the F-statistics for leg strength is 0.004, which is less than 0.05 (Table 4), results from ANCOVA found a significant difference in the selected variable dynamic body balance in the experimental group compared to the control group. When compared to the control group which did not received any training, the post-test found that the experimental yoga group significantly improved in dynamic body balance.

As a result, when the dynamic body balance of male national level yoga players was compared to the dynamic body balance of the control group, the experimental group had a substantial improvement.

## Discussion

The study aimed to evaluate the effect of “six weeks vinyasa training on dynamic body balance of male national level yoga players”. The VYTP included a well-structured battery of combination of five series of vinyasa yoga posture, it was conducted for six weeks, five days a week and a session of 30 min each. The study resulted that the experimen-

**Table 4.** ANCOVA Table Dependent Variable: Dynamic Body Balance After Training

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Pre-test	73.803	1	73.803	15.862	.001
Groups	49.853	1	49.853	10.715	.004
Error	79.097	17	4.653		
Corrected Total	282.950	19			

Note. a. R Squared = .720 (Adjusted R Squared = .688) b. Computed using alpha = .05

tal group showed significantly better improvement in the dynamic body balance, revealing that the VYTP was effective. According to the findings in the current study, VYTP is helpful in generating significantly positive improvements in dynamic body balance. The very study also shows that the five-day-a-week vinyasa yoga practice may have provided enough stimuli to improve dynamic body balance of yoga players. It is worth mentioning that even a 6-week intervention was adequate to improve dynamic body balance.

Furthermore, we know that past studies have found that a yoga intervention improves adolescence balance, flexibility, and strength (Fillmore et al., 2010). The findings imply that a regular yoga practice can improve male college players' balance and flexibility, as well as whole body measurements, and so improve athletic performance (Polsgrove et al., 2016). Previous researches also revealed effectiveness of long-term vinyasa yoga-based programmes helped in improving health-related fitness condition significantly. The use of cumulative target heart rate targets resulted in greater than predicted gains in cardio-respiratory fitness and body composition (Boraczyński et al., 2020). Vinyasa is an alternative training method it can increase overall fitness and boost wellness (Tsopanidou et al., 2020). In a study, following six months of Vinyasa instruction, changes found in maximal muscle torque, as well as alterations in muscle topography (Buško & Rychlik, 2006), regular exercise programmes with resistance training and yoga training, can help people with multiple sclerosis improve their lower limb strength and balance (Hosseini et al., 2018). The analysing of data in another study revealed that yoga exercises are useful in developing balance and perception (Rayat, 2015). It was found that the 6-week yoga programme improved balance, flexibility and strength of male soccer players thus coaches must implement it in the training before the competitive season since they will help soccer players enhance their overall motor skills (Kartal & Ergin, 2020). Evidently, these findings strongly support present study of short term yogic intervention on sports performance enhancement.

One of the potential limitations of the study that may have affected the results could have been its limited sample size, this study was focused at one gender (male), one sport (yoga), and level of players (national-yoga), which may have affect its generalizability. Another study potential limitation was that the subjects' lifestyle, routine, eating habits, and socioeconomic background may have influenced the findings.

Over the due course of time, it is observed that this study performs well as a pilot study, implying the possibility



of a larger investigation. According to the findings, future research is needed to see how well vinyasa yoga meets the needs of other various population subgroups (e.g., eating disordered, overweight/obese, sedentary, and smokers). Future studies should focus on different time intervals, and researchers could use comparable studies to address diverse groups of players from different sports and genders. Other areas of future research should focus on vinyasa effect on physiological aspects such as oxygen consumption changes, metabolic analysis and energy expenditure during different paces of vinyasa and time intervals. Postural practices, meditative forms such as tai-chi, and other types of yoga such as hatha and ashtanga can also be worked up to determine if they enhance other skill and fitness related physical components such as static equilibrium, which is equally vital in sports.

According to the findings of the study, vinyasa yoga could be beneficial for improving balance, reducing the chances of injuries in competitive sports, eventually assisting to enhance the performance. Coaches and teachers could use vinyasa in training programmes since it will contribute in the development of static body balance of the players.

## Conclusion

In competitive sports, dynamic body balance is essential, and vinyasa yoga can help in improving dynamic body balance. According to this study, VTYP was found to be helpful in enhancing dynamic body balance. In the current study after six weeks vinyasa training it was observed that the male national yoga players had a substantial difference in dynamic body balance compared to control group. To conclude, coaches can incorporate the vinyasa training programme as an alternative to their training programme to increase dynamic balance and athlete performance in competitive sports.

## Acknowledgement

All authors would like to acknowledge and pay sincere gratitude to Late Prof. Jayashree Acharya, who guided and motivated the authors to pursue this study. The authors felt the absence of her strong research proficiency throughout the study. All Authors also would like to pay sincere gratitude to Dev Roychowdhury for his continues help in making this paper more valuable with his strong knowledge and experience he shared throughout the making of this manuscript.

## Conflict of interest

Authors have no conflict of interest to disclose.

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## ВПЛИВ ТРЕНУВАННЯ ВІН'ЯСА НА ДИНАМІЧНУ РІВНОВАГУ ТІЛА СПОРТСМЕНІВ-ЧОЛОВІКІВ, ЯКІ ЗАЙМАЮТЬСЯ ЙОГОЮ НА НАЦІОНАЛЬНОМУ РІВНІ

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Авторський вклад: А – дизайн дослідження; В – збір даних; С – статаналіз; D – підготовка рукопису; Е – збір коштів

Реферат. Стаття: 7 с., 4 табл., 21 джерел.

**Проблематика.** Рівновага тіла є одним із найважливіших аспектів для досягнення атлетичної майстерності у змагальних видах спорту. Рівновага тіла допомагає у розвитку правильного контролю постави, що сприяє високим досягненням та демонстрації навичок у всіх видах спорту. Відомо, що рівновага тіла позитивно корелює з конкурентоспроможними спортивними здібностями. У спорті хороша рівновага передбачає більш ефективний рух і кращий контроль над тілом. Йога є одним із засобів для покращення рівноваги тіла та підвищення спортивних результатів. Він'яса-йога — це потужний метод, націлений на розвиток всього тіла. Виконуйте складні пози, щоб покращити свою силу, гнучкість та рівновагу, особливо якщо ви хочете розвинути групи м'язів, які не задіяні у вашому основному виді спорту.

**Мета дослідження** – проаналізувати ефективність 6-тижневої тренувальної програми Він'яса-йоги (ТПВЙ) у покращенні динамічної рівноваги тіла спортсменів-чоловіків, які займаються йогою на національному рівні.

**Матеріали і методи.** Учасниками дослідження були двадцять спортсменів-чоловіків, які займаються йогою

на національному рівні (18-25 років), з Національного інституту фізичного виховання імені Лакшмі Бай, Гваліор, Індія. Учасників випадковим чином було розділено на дві групи: експериментальну (він'яса) і контрольну. Для вимірювання динамічної рівноваги тіла використовувався прилад Sensbalance.

**Результати.** Коваріаційний аналіз вказує на значну різницю у вибраній змінній динамічної рівноваги тіла в експериментальній групі порівняно з контрольною групою. У порівнянні з контрольною групою, яка не проходила жодного тренування, підсумковий тест показав, що експериментальна група з йоги значно покращила динамічну рівновагу тіла.

**Висновки.** Було виявлено, що ТПВЙ допомагає покращити динамічну рівновагу тіла. Дане дослідження показало, що після шести тижнів тренування він'яса спортсмени-чоловіки, які займаються йогою на національному рівні, мали істотну різницю в динамічній рівновазі тіла порівняно з контрольною групою.

**Ключові слова:** йога, він'яса, ТПВЙ, динамічна рівновага тіла, змагальні види спорту.

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**Cite this article as:** Singh, V., Bhutia, T.N., Singh, M.K., & Krishna, N.R. (2022). Effect of Vinyasa Training on Dynamic Body Balance of Male National Level Yoga Players. *Teoriâ ta Metodika Fizičnogo Vihovannâ*, 22(1), 43-47. <https://doi.org/10.17309/tmfv.2022.1.06>

Received: 14.10.2021. Accepted: 22.01.2022. Published: 25.03.2022

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