International Journal of Experimental Research and Review (IJERR)

ISSN: 2455-4855 (Online) ***Original Article***

Received: 21th July, 2019; **Accepted:** 13th August, 2019; **Published:** 30th August, 2019

DOI: https://doi.org/10.52756/ijerr.2019.v19.006

The Relationship between Core Muscle Stability and Balance in Yoga

Subhra Basak

Assistant Professor, State Institute of Physical Education for Women,
Hastings House, Kolkata, West Bengal, India

Author's E-mail: basaksubhra@yahoo.in

Abstract

Core muscle stability includes the strength and endurance of the flexor and extensor muscles present at deep inside of the trunk region of our body which is considered as an important factor for sports performance. Purpose of the study was to assess the correlation between balance and core muscle stability of the yoga practicing women in college level. Sixteen (16) inter college level yoga women were agreed to take part in the study as subject. Dynamic balance was measured by Modified Bass Test, Static balance was measured by Standing Stork Test and Core muscle stability was measured by four different tests - Side Bridge Test Left (SBTL), Side Bridge Test Right (SBTR), Back Extensor Test (BET) and Flexor Endurance Test (FET).The entire tests considered in this study were standard tests. Mean and standard deviation were computed as descriptive statistics and coefficient of correlation (r) was computed by Pearson Product Moment method. Only 0.05 level has been considered to judge the significance of the study. All statistical calculations were done by using standard statistical software (Excel-2007). Results revealed that dynamic balance has positive correlation with SBT Left (r=0.300), SBT right (r=0.255), BET(r=0.287) and FET (r=0.408). Static balance has also positive correlation with SBT Left (r=0.559), SBT Right (=0.154), BET (r=0.095) and FET (r=0.007). All the computed values of coefficient of correlation (r) in this study found statistically insignificant except SBTL with static balance which is statistically significant. **Conclusion:** It can be concluded that core muscle stability have a little impact on dynamic and static balance among college level women who practice yoga regularly.

Keywords: Core muscle stability, college level women, dynamic balance, static balance, yoga.

Introduction

The core region is the region of the body consisting of muscles and joints of the abdomen, the lower back, the pelvic and the hips. These core muscles have dual roles. The first role is to protecting (stabilizing) the spine from excessive force; the second role is in the

criterion transfer of force in a proximal to distal sequence. Stability of the core muscles have been defined as the ability to control the position and motion of the trunk over the pelvis to allow optimum production, transfer and control of force and motion to the terminal segment in integrated athletic (or kinetic chain) activities.

Individual performance depends upon various factors, which includes physical, psychological, social etc. But in every physical performance core muscles stability is considered as a very important factor. In every athletic events it is important to stable the core muscle because it plays very vital role to maintain balance, to generate force in athletics (Kibler et al., 2006; Willson et al., 2005) to resist and prevent injuries of core organs (Bliss & Teeple, 2005). For this reasons core strengthening and stability exercises have become key components of training programs for athletes of all levels (Stanton et al., 2004; Akuthota & Nadler, 2004) and core strengthening has become a major trend in rehabilitation (Nesser et al., 2008). Present study was designed to find out the relationship between core muscle stability with static and dynamic balance in yoga.

Materials and Methods

Subject

Sixteen (16) women who participated in inter college level yoga competition were agreed to take part in the study as subject.

Criterion Measured

Following variable were measured for this study-

i) Core muscle stability
ii) Dynamic balance
iii) Static balance

Test and Tools Used

Following test and tools were used for this study-

i. Core muscle stability was measured by four different tests: (1) Sorensen Test (2) Flexor Endurance Test, (3) Side Bridge Test Left and Right
ii. Dynamic balance was measured by Modified Bass Test and
iii. Static balance was measured by Stork stand Test

Results and Findings

The mean and standard deviation of the different core muscle stability test scores have presented in Table-1. The coefficient of correlation were calculated between dynamic and static balance with different core muscle stability tests score and have presented in Table-2 which have shown that the coefficient of correlation between dynamic balance with SBT Left (r=0.300), SBT right (r=0.255), BET(r=0.287) and FET (r=0.408). Static balance has also positive correlation with SBT Left (r=0.559), SBT Right (r=0.154), BET (r=0.095) and FET (r=0.007). From table-2 it has been showed that all the calculated coefficient of correlation (r) values were statistically insignificant except static balance with SBTL. Descriptive statistics for all the tests used to measure the core muscle stability have presented in figure 1.

Discussion

Core stability is defined as the ability to control the position and motion of the trunk over the pelvis to allow optimum production, transfer and control of force and motion to the terminal segment in integrated athletic activities.

Table 1. Descriptive statistics of the performance and different tests score of core muscle stability.

Parameters	SBTL(sec)	SBTR(Sec)	BET(Sec)	FET(Sec)
Mean	58.53	61.93	166.62	144.06
SD	21.75	21.05	28.30	26.83

Table 2. Coefficient of correlation (r) values between the performance and different tests score of core muscle stability.

Parameters	SBTL	SBTR	BET	FET
Dynamic balance	0.300	0.255	0.287	0.408
Remarks	Not significant	Not significant	Not significant	Not significant
Static balance	0.559*	0.154	0.095	0.007
Remarks	Significant	Not significant	Not significant	Not significant

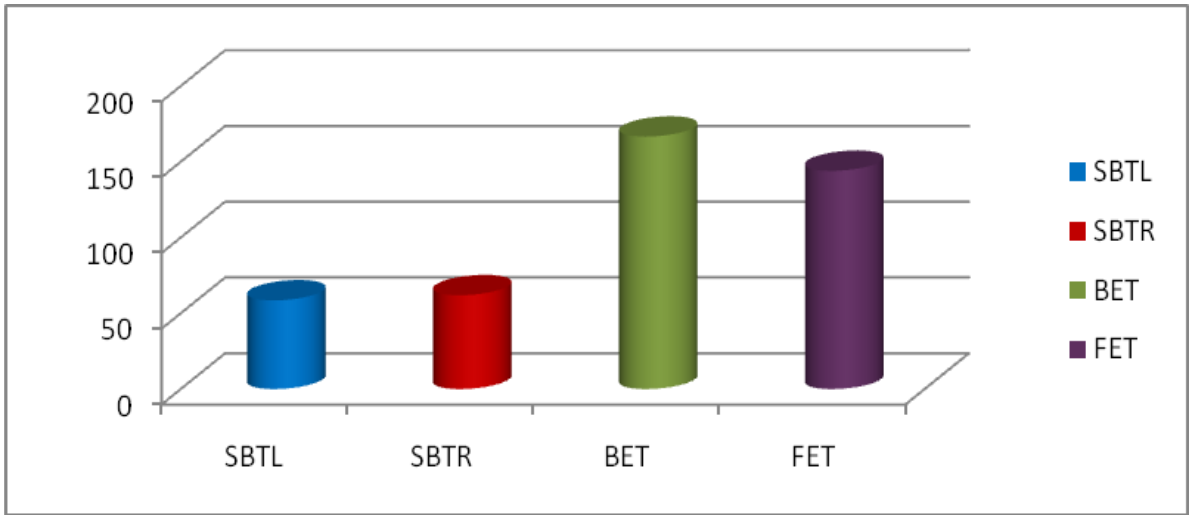

Figure 1. Descriptive statistics of different tests score of core muscle stability.

Core muscle activity is the best understood as the pre-programmed integration of local, single-joint muscles and multi-joint muscles to provide stability and produce motion (Willson et al., 2005). Balance is a very important component in yoga. In this study we used standing bass test for dynamic balance and stork stand test for static balance because these are quick and inexpensive method commonly used by many researchers to identify static and dynamic balance. Present study found positive correlation between core muscle stability with static and dynamic balance but among this only static balance with SBTL is statistically significant. These result of this study was further supported by the study conducted by Okada et al., (2011) where insignificant correlations was reported between core stability and FMS. Among 7 FMS test stepping reaching and leg raise where need some sort of flexibility. Nesser et al. (2008) reported insignificant relationship between core stability and football performance (Nesser et al., 2008). Lacono et al., (2014) reported that static and

dynamic balance of soccer players improved after a four-week core stability test (CST) (Lacono et al., 2014). The star excursion balance test (SEBT) performance for dynamic balance may be affected by kinetic and kinematic factors such as the range of motion of the knee and hip joints, flexibility and strength of the lower extremity muscles (Willson et al., 2005; Bliss & Teeple, 2005; Akuthota & Nadler, 2004). Similar type of effects occur in Modified Bass Test. Gordon et al., (2013) reported that core stability was not associated with SEBT values in female lacrosse players. They used only bent knee lowering test to examine core stability and found a positive but insignificant result.

Conclusion

It was concluded that there was no significant effect of core muscle stability with dynamic and static balance among college level women who practice yoga regularly.

References

Akuthota, V. and Nadler, S. C. (2004). Core strengthening Physical Medicine and Rehabilitation. 85(1): 86–92.

Bliss, L. S. and Teeple, P. (2005). Core stability: The centerpiece of any training program. *Current Sports Medicine Reports*. 4(3): 179–183.

Gordon, A.T., Ambegaonkar, J. P. and Caswell, S. V. (2013). Relationships between core strength, hip external rotator muscle strength, and star excursion balance test performance in female lacrosse players. *International Journal of Sports Physical Therapy*. 8(2): 97.

Kibler, W. B., Press, J. and Sciascia, A. (2006). The Role of Core Stability in Athletic Function. *Sports Med*. 36: 189.

Lacono, A. D., Martone, D., Alfieri, A., Ayalon, M. and Buano, P. (2014). Core stability training effects on static and dynamic balance abilities. *Gazzetta Medica Italy*. 173: 197-206.

Nesser, T. W., Huxel, K. C., Tincher, J. L. and Okado, T. (2008). The relationship between core stability and performance in Division I football players. *J. Strength Cond. Res.* 22(6): 1750-1754.

Okada, T., Nesser, C. K., Tincher, L. J. and Huxel, C. K. (2011). Relationship Between Core Stability Functional Movement Screening and Performance. *Journal of Strength and Conditioning Research*. 25(1): 252-261.

Stanton, R., Reaburn, P. and Humphries, B. (2004). The effect of short-term Swiss ball training on core stability and running economy. *Journal of Strength & Conditioning Research*. 18(3): 522–528.

Willson, J. D., Leetun, T. D., Ireland, L. M., Ballantyne, T. B. and Davis, M. I. (2005). Core Stability Measures as Risk Factors for Lower Extremity Injury in Athletes**.** *Journal of the American Academy of Orthopedic Surgeons.* 13(5): 316-325.