

RELATIONSHIP OF BALANCE WITH AGILITY AMONG RECREATIONAL PICKLEBALL PLAYERS –A CORRELATIONAL STUDY

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Background and objective: Pickleball is rapidly growing recreational sport that requires high level of agility and balance. Balance and agility hold equal significance for players, influencing their performance. However, limited data exist on relationship of balance with agility in recreational Pickleball players of Surat city. So, the present study was undertaken. **Methodology:** A cross sectional study was conducted on 60 recreational Pickleball players (43 males, 17 females) aged between 18–28 years. Anthropometric variables (weight, height and body mass index) were measured. Agility was assessed using the pickle ball T-test and balance was evaluated by “Lower quarter y balance test” (YBT-LQ).SPSS 21 was used to analyze the data and descriptive statistics were also done. **Results:** The mean age of participants was 22.18 ± 2.52 years, with a mean body mass index (BMI) of 23.76 ± 4.23 kg/m². BMI classification showed 65% of players were under normal category, 27.61% overweight, 8.33% obese, and 5% underweight. Most players were right-leg dominant (95% males, 88% females). Results of the present study showed moderate negative correlation between Agility (T-Test) and balance (Y- Balance test composite scores) for dominant ($\rho = -0.45$) and nondominant leg ($\rho = -0.54$). In agility, lesser the score more is agility so concluded that balance and agility are positively associated with each other among recreational Pickleball players. **Conclusion:** Among Surat City's recreational pickleball players, a moderate positive correlation was noted between balance and agility, suggesting that balance can be important. Therefore, coaches, physical therapists, and trainers may provide balance training exercises to enhance players' dynamic balance, increase their agility, and improve their overall performance.

Keywords: Balance, Agility, recreational pickle ball players.

Introduction

Pickleball blends elements of tennis, badminton, and table tennis, has rapidly grown in popularity over the past two decades, becoming one of the most widely adopted recreational activities in the United States and beyond. Pickleball is a paddle sport that is gaining popularity in recent years even in India. This rapid growth in popularity has made pickleball a focus of both clinical recommendations and academic research on active aging, health promotion, and injury prevention.^[1] Its movement patterns—walking, lateral shuffling, multi-directional lunging,

and overhead striking—provide cardiovascular and musculoskeletal challenges without the high physical demands of traditional racquet sports.^[1] These findings indicate that pickleball provides a unique blend of physical activity, social interaction, and psychological fulfillment, making it particularly beneficial for aging populations.^[2,3] Together, these studies reinforce that pickleball is not merely a leisure pursuit but a multifaceted tool for promoting holistic well-being in older adults as well.

In addition to the psychosocial benefits of pickleball, both singles and doubles play results in moderate to vigorous intensity exercise,^[3] which can be an enjoyable way for individuals to meet recommended physical activity guidelines. Strength, speed, power, agility, endurance, balance, flexibility, along with coordination are all crucial for pickleball players.

Despite its benefits, pickleball also presents unique physical challenges, particularly in terms of balance.^[4] Balance is critical in sports performance because it underpins stability, coordination, and the ability to safely execute complex movements.^[5] Sports players with better balance not only perform better in sport-specific tasks but are also at reduced risk of lower-limb injuries.

Agility is broadly defined as the capacity to rapidly change body position or direction in response to external stimuli^[6] Majority of team and field sports require agility as well. Agility is a cornerstone of pickleball performance and safety. Within sports science, agility is not limited to physical speed but also includes perceptual and decision-making components, enabling athletes to anticipate and adapt to dynamic situations^[6] In pickleball, agility is critical due to the fast-paced exchanges at the net and the need to respond to shots with lateral, forward, or backward movement.^[1] The sport requires repeated bouts of quick footwork, sudden stops, and changes of direction, underscoring agility as a fundamental determinant of success and safety in gameplay.

Need of the study

Effective performance in the sport relies on the ability to maintain stability (balance) while executing rapid directional changes (agility).^[5] Balance and agility hold equal significance for players, influencing their performance. Understanding the correlation between agility along with dynamic balance in recreational pickleball players may aid in injury prevention, performance enhancement, and rehabilitation. Unfortunately, little is known about the relationship of balance with agility among recreational pickleball players. Till now very few research has been done among Pickleball players in India with emphasis on balance and agility, Hence the present study was undertaken to determine relationship of balance with agility among recreational pickleball players of Surat city.

Methodology

Population and sample

A study was carried out on 60 recreational Pickleball payers (aged between 18 to 28 years) recruited with convenience sampling technique from 3 different pickleball courts of Surat city. After being informed of the study, willing participants provided written consent for balance and agility assessment. Both males and females recreational players were included in the study. Those players having any recent musculoskeletal conditions, currently on medication, engaged in other sports on a regular basis, any visual, neurological or cardiovascular disorders and said yes to any questions of Physical Activity Readiness Questionnaire (PARQ) were excluded from the study.

Demographic details like age, height, weight, Body mass Index (BMI), dominant leg and hand were noted. Details regarding the pickle ball game like frequency/ week, hours/week, falls history, any injury were also noted from players.

Outcome measures

Balance and agility were evaluated with Y-Balance Test for lower quarter (YBT-LQ) and Pickleball T-Test respectively. Before administering the tests, the verbal instructions as well as a visual demonstration for how to perform tests were given. The tests were conducted in the evening time for all the players. Participants performed a 5-minute dynamic warm-up including jogging forward and backward, side shuffling, and lunging followed by any individual stretching/warm-up as desired. Participants who had played pickleball within 15 minutes of testing could choose to omit this dynamic warm-up and rested for 5-10 minutes prior to any testing while paperwork was being completed.

Pickleball T test (seconds)

Agility (change of direction) was assessed with the pickleball T-test, a modified version of the T-test, using pickleball court dimensions. The participants were barefoot to perform the tests. With the participant's feet behind the start line, the recorder gave the commands: "ready, set, go." The participant (1) ran forward to the non-volley line, (2) side shuffled left to the left side line, (3) side shuffled right to the right sideline, (4) side shuffled left to the center line, then (5) ran backward to the end line. Timing stopped when any portion of the participant's body crossed the end line. Test time was recorded to the nearest 1/100th of a second using a stopwatch. If a participant did not complete the test correctly (e.g. started early or failed to reach to, or past, the sideline), the test was repeated after resting a minimum of 90 seconds. Score of the best of three trials were noted. Rest period was determined based on the time required for the phosphagen system to recover.^[7]

Y balance test –Lower quarter (LQ)

The YBT-LQ (cm) was completed by participants in anterior, posterolateral (PL), as well as posteromedial (PM) orientations. Before administering the test, the therapist provided verbal instructions as well as a visual demonstration. Both hands were kept at iliac crest throughout duration of the test. The distal most portion of great toe was placed at intersection of 3 measuring tapes that were taped to floor, and dominant leg served as the stance limb. They had been instructed to keep their single-leg stance while utilizing opposing leg to reach on line in appropriate directions, they touch the ground with distal most portion of their great toe as far away as feasible, then go back to starting position. Following three practice trials, the participants were instructed to take a two-minute break before completing 3 test trials in every direction. At every test trial, arrangement of reaching directions were randomized. Test was dismissed and retaken if a participant was unable to keep stance leg or return reaching foot to initial position. For additional analysis, maximum reach distance in every direction had been employed. Subject's reach distances were utilized to normalize it to exclude limb length's impact. Limb's length was determined by measuring from center of ipsilateral medial malleolus to anterior superior iliac spine.^[8, 9]

Subsequent formula was employed to determine the composite score.

$$\frac{(\text{Anterior} + \text{posteriomedial} + \text{posterolateral})}{(3 \times \text{limb length})} \times 100.$$

Statistical analysis

Participants who completed the balance and agility assessment were assigned a coded number and test results were entered into an Excel sheet. SPSS 21 was used to analyze the data. Level of significance was kept at 5%. After that descriptive statistics were calculated to find the frequency, mean and standard deviation (SD) of different variables. As the data was not normally distributed, spearman’s correlation test was used to find out the relationship of balance with agility among recreational Pickleball players.

Results

A total number of 60 recreational pickleball players (43 Males and 17 Female) were included in the present study. Amongst them, 3 players were underweight, 39 players were normal, 5 players were overweight and 13 players were obese. (Figure 1)

Table 1 represents the characteristics of recreational pickleball players. From data analysis, it exhibited a moderate negative correlation between Agility (T-Test in seconds) and balance (Y- Balance test composite scores in cm) for dominant leg ($\rho = -0.45$) and nondominant leg ($\rho = -0.54$). Since lesser T-test values indicate better dynamic balance this means that a positive correlation is there among balance and agility. (Table 2)

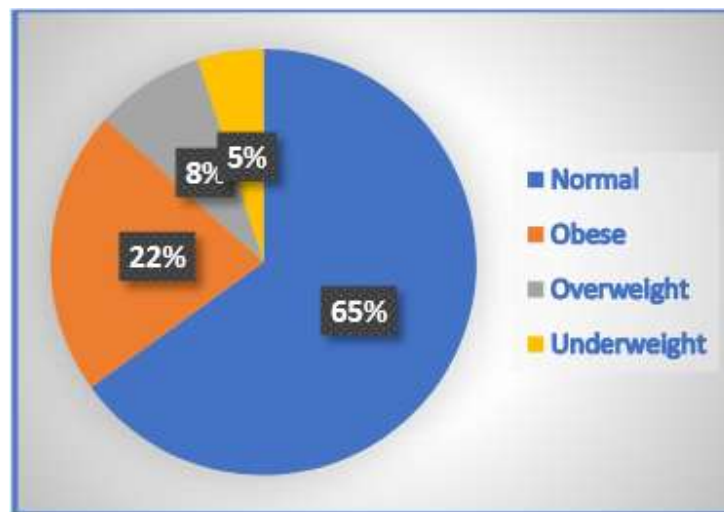


Figure 1: Distribution of pickleball players according to their Body Mass Index (BMI)

Table 1: Characteristics of recreational pickle ball players

Characteristics(n=60)	Mean± SD or N (%)
Age (years)	22.18 (2.52)
Dominant leg	
Right	57 (95.00%)
Left	3 (5.00%)
How often do you play pickleball?	45 (75.00%)
Once/week	11 (18.33%)
Twice/week	4 (6.67%)
Thrice/week	0 (0.00%)
More than thrice/week	0 (0.00%)

Every day	
How many hours do you play pickleball?	
2–3 hours	52 (86.67%)
3–4 hours	7 (11.67%)
More than 4 hours	1 (1.67%)

Table 2: Correlation between balance and agility among recreational Pickleball players

Agility test (T-Test)		
Y- Balance Test (composite score)	rho value	p value
Dominant side	-0.45	<0.05
Non-dominant side	-0.54	<0.05

Discussion

A total of 60 pickleball players were assessed for balance and agility with T test and Y balance test for dominant and nondominant leg. Results of the present study showed moderate negative correlation between Agility (T-Test) and balance (Y- Balance test composite scores) for dominant (rho= -0.45) and nondominant leg (rho= -0.54). In agility, lesser the score more is agility so concluded that agility and balance are positively associated with each other.

In the present study agility and balance are positively connected with each other which is in line with the previous study done by Anusmitha K Vijayan, Harish S Krishna and Sandeep K.^[10] Balance and agility are closely interconnected in Pickleball game which significantly impacting a player's overall performance. In pickleball, players are required to respond swiftly to fast-paced rallies, sudden directional shifts, and short bursts of movement at the net. To do this effectively, they must maintain a strong center of gravity and postural control—key aspects of balance. Improved balance enables smoother transitions between movements, reducing the risk of falling or overextending, which in turn enhances agility. Conversely, enhanced agility supports better balance by training neuromuscular coordination and proprioception, allowing players to recover quickly from unstable positions. This is supported by research conducted by Hrysomallis^[11] in 2011 He noted that balance and agility share neuromuscular foundations and are mutually beneficial in sport-specific movements. In the dynamic and fast-paced environment of pickleball, the synergy between balance and agility is essential for quick footwork, accurate positioning, and injury prevention, all of which contribute to higher performance levels.^[27]

The present study was a cross-sectional survey with small sample size. Other important characteristics of pickleball game (e.g., flexibility, strength, coordination, endurance, and reaction time) were not included in the study. A longitudinal study design is recommended for better evaluation of changes in balance and agility over time. Future studies should include a larger **and more diverse sample population (participants from different age groups and other geographical regions) to improve the generalizability of the findings.**

Conclusion

The present study concluded that balance and agility are correlated with each other in recreational Pickleball players. Therefore, coaches, physical therapists, and trainers may provide balance training exercises to enhance players' dynamic balance, increase their agility, and improve their overall performance.

Conflict of interest: None

Funding: None

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