

Comparative analysis of motor fitness components in women's cricket teams: a study of national and BKSP players in Bangladesh

Análisis comparativo de los componentes de la aptitud motora en equipos de críquet femeninos: un estudio de jugadoras nacionales y BKSP en Bangladesh

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Abstract

Objective. This study aimed to compare the motor fitness components between the Women's National Cricket Team and the Bangladesh Krira Shikkha Protishtan (BKSP) Women's Cricket Team, two pivotal entities in the realm of women's cricket in Bangladesh.

Methods. The subjects for this study were chosen at random from a pool of thirty (30) National level women cricket players from National Camp and thirty (30) women cricketers from BKSP. Various motor fitness components, including speed, agility, abdominal strength, and power of the arm and shoulder, were evaluated using standardized fitness tests. The chosen players were between the ages of 17 and 25. They have 4-13 years of training age at the time of collection data of them used to practices under the supervision of qualified coaches. For statistical analysis, mean, SD, and independent "t" test were measure throw SPSS software. The level of significance was set at 0.05. **Results.** The findings revealed significant disparities in motor fitness components between the two teams. Notably, the Women's National Cricket Team exhibited superior performance in terms of speed, agility, and power of the arm and shoulder compared to the BKSP women's cricket team where calculated t value were significant at 58 df at 0.05 level. However, no significant differences were observed in abdominal strength between the two teams as calculated t value were found to be not-significant at 58 df at 0.05 level. **Conclusion.** The comparative analysis underscores the distinctive strengths and areas for improvement within the Women's National Cricket Team and the BKSP Women's Cricket Team. The outcomes of this study could inform targeted training programs and strategies tailored to optimize the motor fitness components specific to each team, ultimately enhancing their overall performance and competitiveness at the national and international levels.

Key words: Motor fitness, performance, speed, agility, arm and shoulder power.

Resumen

Objetivo. Este estudio tuvo como objetivo comparar los componentes de aptitud motora entre el equipo nacional de críquet femenino y el equipo de críquet femenino Krira Shikkha Protishtan (BKSP) de Bangladesh, dos entidades fundamentales en el ámbito del cricket femenino en Bangladesh. **Métodos.** Los sujetos de este estudio fueron elegidos al azar de un grupo de treinta (30) jugadoras de críquet de nivel nacional del Campamento Nacional y treinta

(30) jugadoras de críquet de BKSP. Se evaluaron varios componentes de la aptitud motora, incluida la velocidad, la agilidad, la fuerza abdominal y la potencia del brazo y el hombro, mediante pruebas de aptitud estandarizadas. Los jugadores elegidos tenían entre 17 y 25 años. Tienen entre 4 y 13 años de edad de entrenamiento al momento de la recopilación de datos y están acostumbrados a prácticas bajo la supervisión de entrenadores calificados. Para el análisis estadístico, la media, la DE y la prueba "t" independiente se midieron mediante el software SPSS. El nivel de significancia se fijó en 0,05. **Resultados.** Los hallazgos revelaron disparidades significativas en los componentes de la aptitud motora entre los dos equipos. En particular, el equipo nacional de críquet femenino exhibió un rendimiento superior en términos de velocidad, agilidad y potencia del brazo y el hombro en comparación con el equipo de críquet femenino BKSP, donde el valor t calculado fue significativo en 58 df a un nivel de 0,05. Sin embargo, no se observaron diferencias significativas en la fuerza abdominal entre los dos equipos, ya que el valor t calculado no fue significativo a 58 gl a un nivel de 0,05. **Conclusión.** El análisis comparativo subraya las fortalezas distintivas y las áreas de mejora dentro del Equipo Nacional de Críquet Femenino y el Equipo de Críquet Femenino BKSP. Los resultados de este estudio podrían informar programas de entrenamiento específicos y estrategias diseñadas para optimizar los componentes de la aptitud motora específicos de cada equipo, mejorando en última instancia su rendimiento general y su competitividad a nivel nacional e internacional.

Palabras claves: actitud motora, rendimiento, velocidad, agilidad, potencia del brazo y hombro.

INTRODUCTION

Motor fitness, also known as physical motor skills or motor abilities, refers to a person's capacity to perform physical tasks that require the coordination of muscular and neurological systems (Boby & Badhan, 2022). This concept is an integral component of overall physical fitness and encompasses a wide range of skills and abilities that relate to movement and physical performance (Majhi et al., 2016). Physical fitness is a crucial component that has a big impact on a cricket player's performance on the pitch (Boby, 2023b). The sport demands a unique combination of skills, including strength, agility, endurance, and speed, which collectively constitute a player's motor fitness components (Lamani & Tiwari, 2018). Athletes' agility, strength, speed, coordination, and endurance are all influenced by their motor fitness components, which are essential to improving their total performance (Bartlett, 2003; Hoff, 2005). Women cricket players need to focus on these motor fitness components through a combination of training programs, drills, and practice sessions to improve their overall performance and stay competitive in the sport (Boby, 2023a). Additionally, individual positions within the team, such as batters, bowlers, and fielders, may require specific emphasis on certain components to excel in their respective roles (Weldon et al., 2021). The importance of these components is magnified at the international level, where teams like the Women's National Cricket Team of Bangladesh and the Bangladesh Kriya Shikkha Protishtan (BKSP) Women's Cricket Team aim to excel and represent their country with distinction (Hossain et al., 2020). Cricket, a game that Bangladeshis love dearly, has experienced incredible growth over the years in terms of both popularity and participation (Mittal RL, 2021). In the field of women's cricket, Bangladesh's Women's National Cricket Team, which represents the country internationally, has achieved considerable advancements ("Cricket and Gendered National Identities," 2015). The Bangladesh Kriya Shikkha Protishtan (BKSP) Women's Cricket squad, in contrast, acts as a development ground for up-and-coming athletes and prospective future members of the national squad. Although these two teams play different roles and have different ambitions, they both strive for cricket excellence.

Understanding and comparing the motor fitness components between Bangladesh's BKSP Women's Cricket Team and the Women's National Cricket Team might provide light on the development and training of female cricketers across the nation. This comparison can aid in identifying areas of strength and growth, making it easier to create specialized training plans and talent development strategies.

As cricket continues to grow in popularity among women and the competitive landscape becomes increasingly intense, understanding the differences and similarities in motor fitness components between these two teams can offer valuable insights for the athletes, coaches, and administrators in the pursuit of success on the international stage. In order to better understand the parallels, differences, and potential consequences for the development of women's cricket in Bangladesh, we examined the motor fitness components of these two cricket teams. By conducting a thorough analysis of various aspects of motor fitness, we seek to offer valuable information that can guide coaches, sports scientists, and stakeholders in the quest to elevate the standards of women's cricket in Bangladesh, and, in turn, contribute to the country's presence on the global cricketing stage.

MATERIAL AND METHODS

Participants

The subjects for this study were chosen at random from a pool of thirty (30) National level women cricket players from National Camp and thirty (30) women cricketers from BKSP. The majority of them participated in the Bangladesh Women's National League. The chosen players were between the ages of 17 and 25. They have 4-13 years of training age at the time of collection data of them used to practices under the supervision of qualified coaches. A consent paper was sign by participant before test.

Criterion and Measure

Motor fitness level was the measuring criteria of present study. Motor fitness was measured by AAHPHERD (The American Alliance for Health, Physical Education, Recreation and Dance) test batteries (50 m dash, shuttle run, and sit-up) and medicine ball throw test. Physical tests are given bellow:

Table 1. Measuring criteria

S1. No	Test	Parameters	Unit
01	50m Dash	Speed	Average time of two trail (Seconds)
02	Shuttle Run (4*10m)	Agility	Average time of two trails (Seconds)
03	Sit-up (Per minute)	Abdominal strength	Average quantity of two trail
04	Medicine Ball Throw	Power of arm and shoulder	Maximum distance covered (Meters)

Materials

The following instruments and tools were used for collecting data in the present study.

- Digital stop watch for measuring time
- Different cones
- Medicine ball (3kg)
- Marker
- Steel tape for measuring distance
- Whistles
- Clapper as standing device

Procedure of collecting data

The participants were gathered in one location. The purpose of the experimental study and its methodology were explained to coaches and their players prior to the investigation. The coaches and all of the investigation's responses gave their collective approval and contest. Initially, the motor fitness was helped by the 50-meter sprint for speed, the medicine ball throw for powerful arm action, the 4x10-meter shuttle run for agility, and the sit-up for abdominal strength. Standard operating procedure was followed throughout the whole testing process. For each subject, three attempts were given, and the best outcome was recorded as the final score.

Statistical analysis

To determine the significant differences of motor fitness components between women national cricket team and BKSP women's cricket team of Bangladesh, unpaired t-test was employed for data analyses. The level of significance was set at 0.05. Mean was calculated for measuring central tendency and standard deviation was calculated as the measure of variability. "t" test was calculated to find out the significant difference between two groups. For analyzing data, mean, SD and t test were calculated through SPSS software version 26.

RESULT

Personal Data

According to table-2, the mean value of Height of National team and BKSP team were 1.5703m and 1.5563m and SD were .05810 and .05308 respectively. The mean value of Weight of National team and BKSP team were 51.3 kg and 49.73 kg and SD was 4.64721 and 3.52267 respectively.

Table 2. Mean and SD of Height and Weight of the two groups

Group	Test	National Team	BKSP Team
Weight (Kg)	Mean	51.3000	49.7333
	SD	±4.64721	±3.52267
Height (m)	Mean	1.5703	1.5563
	SD	±.05810	±.05308

Speed

The descriptive statistics shows the Mean and SD values of National women cricket team and BKSP team on the variable of speed were 7.5197 sec and 7.8787 sec and SD were .35654 and .33521 respectively. To observe the significant difference between two groups "t"

value was calculated and found to be -4.018 which are significant at 58 df at 0.05 level. So it has been observed from the above results that the National women cricket team has demonstrated better on the variable speed than the BKSP women cricket team.

Table 3. Mean, SD, 't' value and 'p' value of speed of two groups

Speed	Group	N	Mean	SD	't' value	'p' value	Remark
Fifty meter(50m) Dash(sec)	National Team	30	7.5197	±.35654	-4.018	.000171	Significant
	BKSP Team	30	7.8787	±.33521			

Agility

A glance at table- 4 shows the Mean and SD values of National women cricket team and BKSP team on the variable of agility were 10.0303 s and 10.7037 s and SD were .27843 and .33067 respectively. To observe the significant difference between two groups "t" value was calculated and found to be -8.532 which are significant at 58 df at 0.05 level. In case of agility lowest time shows better performance. So it has been observed from the above results that the National women cricket team has demonstrated better on the variable agility than the BKSP women cricket team.

Table 1. Mean, SD, 'T' value and 'p' value of agility of two groups

	Group	N	Mean	Std. Deviation	"t" value	P value	Remark
Agility (Shuttle Run in seconds)	National Team	30	10.0303 s	.27843	-8.532	.00001	Significant
	BKSP Team	30	10.7037 s	.33067			

Abdominal strength

The descriptive statistics shows the Mean and SD values of National women cricket team and BKSP team on the variable of abdominal strength were 34.6000 and 34.2667 and SD were 3.96189 and 2.81539 respectively. To observe the significant difference between two groups "t" value was calculated and found to be .376 which are not-significant at 58 df at 0.05 level. So it is seen from the table that National women cricket team and BKSP team were not more or less equal in abdominal strength. In case of abdominal strength highest number of accuracy shows better performance. In sit-up cricket National women cricket team and BKSP team were more or less equal.

Table 2. Mean, SD, 'T' value and 'p' value of abdominal strength of two groups.

	Group	N	Mean	Std. Deviation	"t" value	P value	Remark
Abdominal strength (Sit-up)	National Team	30	34.6000	3.96189	.376	.708289	Not-Significant
	BKSP Team	30	34.2667	2.81539			

Power of arm and shoulder

A glance at table-6 shows the Mean and SD values of National women cricket team and BKSP team on the variable of agility were 6.0343 meter and 5.4980 meter and SD were .48832 and .37626 respectively. To observe the significant difference between two groups "t" value was calculated and found to be 4.765 which are significant at 58 df at 0.05 level. So it has been observed from the analysis that the National women cricket team has demonstrated better on the variable power of arm and shoulder than the BKSP women cricket team.

Table 3. Mean, SD, 'T' value and 'p' value of Power of arm and shoulder of two groups.

	Group	N	Mean	Std. Deviation	"t" value	P value	Remark
Power of arm and shoulder (Medicine Ball Throw)	National Team	30	6.0343 m	.48832	4.765	.000013	Significant
	BKSP Team	30	5.4980 m	.37626			

DISCUSSION

The present study was planned to analyze of motor fitness components among women national cricket team and BKSP women's cricket team of Bangladesh. The findings from the analysis comparing the motor fitness components of the women's national cricket team and the BKSP women's cricket team in Bangladesh shed light on some crucial disparities. These differences, particularly in the variables of speed, agility, and power of the arm and shoulder, reveal intriguing insights into the contrasting performance levels between the two teams.

One of the most noteworthy observations is that the national women's cricket team demonstrated significantly superior performance in terms of speed, agility, and power of the arm and shoulder compared to the BKSP women's cricket team. This finding could be indicative of the national team's access to better resources, advanced training techniques, or perhaps a more intensive and specialized training regimen tailored to enhancing these specific motor fitness components. Any fast-paced sport, including cricket, requires a core set of skills called speed and agility to succeed. A cricket player's overall performance is greatly influenced by their ability to change direction, accelerate, and maintain speed quickly, especially when fielding and running quickly between wickets (Boby, 2023b; Foden et al., 2015). Several studies revealed that speed and agility training greatly improves an athlete's performance by increasing their general mobility and reaction time (Brewer, 2017; Egesoy, 2022; Hoffman, 2002; Westin, 2015). Houghton (2010) highlights the importance of speed and agility in cricket performance, emphasizing how these attributes directly contribute to successful fielding and

running between wickets (Houghton, 2010; Saikia et al., 2019). The superior speed and agility exhibited by the national women's cricket team could be indicative of a more rigorous and effective training regimen, possibly incorporating specialized speed and agility drills tailored to the demands of competitive cricket. In the context of the current analysis, these variables show a positive correlation with the performance disparities between the national team and the BKSP team.

Another significant difference was found in the power of arm and shoulder, where the national women's cricket team outperformed the BKSP team. This is a crucial component for bowlers to generate pace and for fielders to make strong throws (Narvariya & Singh, 2022; Stewart et al., 2005). The results suggest that the national team players may have a better ability to deliver powerful throws or bowl faster deliveries. Additionally, the importance of upper body strength has been thoroughly covered in the literature, particularly in relation to the power of the arm and shoulder. According to Taliep et al. (2010), upper body strength and the capacity to produce power during cricket bowling and batting activities are correlated (Jo-Anne, 2012; Taliep et al., 2010). Research by McDaniel (2009) emphasizes the significance of upper-body power in cricket performance, particularly in bowling and throwing actions (McDaniel, 2009). A higher level of upper-body power can lead to better ball speed and accuracy, making the difference between an average and an exceptional bowler (Sayers & Lorenzetti, 2020). The apparent discrepancy in this specific component, favoring the national team, could be indicative of superior training methodologies, coaching techniques, or even better access to specialized equipment and facilities.

However, no significant differences were observed in abdominal strength between the two teams. Abdominal strength is important for various aspects of cricket, such as stability in batting and fielding (Kernel Networks Inc., 2019; Willardson, 2007). The result suggests that both teams might have similar training programs or emphasis on core strength development. It could also indicate that abdominal strength might not be the primary focus in the training routines for either team, or that both teams have access to similar resources and coaching expertise in this specific area.

These findings highlight the importance of considering various factors beyond mere talent or skill in understanding the performance disparities between different sporting teams. Moreover, the implications of these findings might extend beyond the realm of mere athletic performance. They could potentially underscore the significance of structured training programs, individualized coaching, and access to state-of-the-art facilities in nurturing and honing the physical capabilities of professional athletes. Such a disparity in performance could also reflect the impact of financial investments, coaching expertise, and dedicated support staff available to the national team, which might not be as readily accessible to the BKSP team. Factors such as access to resources, infrastructure, training facilities, and coaching expertise all play a crucial role in shaping the overall athletic prowess and performance of a team. Further research and a comprehensive understanding of these factors could potentially help bridge the gap between different teams and enhance the overall performance of athletes at all levels.

CONCLUSIONS

As a result of the study's findings, it is important to note that some substantial discrepancies were found in a number of particular factors, including speed, agility, and power of the arm and shoulder. Notably, when compared to the BKSP women's cricket team, the national women's cricket team displayed noticeably greater performance in speed, agility, and power of the arm and shoulder. The investigation did not find any appreciable variations in

abdominal strength between the two groups, though. However, the analysis did not reveal any substantial differences concerning abdominal strength between the two groups.

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