

EFFECT OF WARM UP EXERCISES ON PERFORMANCE OF BADMINTON PLAYERS

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Abstract

A descriptive cross-sectional study was conducted in Faisalabad division. 100 badminton players (N=60Male and N=40Female) with age 18-30 years playing badminton with different skill level like club, competitive, recreational and national level were participated. Injured and pregnant players were excluded in this study. Sample size was 100 calculated via

Raosoft. Random non-probability convenient sampling technique was used to collect data. The data was collected through general demographics and physical self-description questionnaire. This study was initiated after approval from advanced study and research committee of Isra institute of rehabilitation sciences, Isra University Islamabad and data collection approval was taken by divisional officer sports, Faisalabad Division and duration of data collection was 3-months after approval.

Objective: objective of this particular study was to find out the effect of warm-up exercises on performance of badminton players.

Study design: Descriptive cross-sectional study

Place and duration of study: Study was carried out in Faisalabad division and duration of the study was 3 months.

Methodology: A descriptive cross-sectional study was conducted in Faisalabad division. 100 badminton players (N=60 Male and N=40 Female) with age 18-30 years playing badminton with different skill level like club, competitive, recreational and national level were participated. Injured and pregnant players were excluded in this study. Sample size was 100 calculated via Raosoft. Random non-probability convenient sampling technique was used to collect data. The data was collected through general demographics and physical self-description questionnaire. This study was initiated after approval from advanced study and research committee of Isra institute of rehabilitation sciences, Isra University Islamabad and data collection approval was taken by divisional officer sports, Faisalabad Division and duration of data collection was 3-months after approval.

Main Findings: 40% (40) were females and 60% (60) were males. The mean age of the male participants was 25.15 ± 2.60 years and female participants were 25.55 ± 3.22 Years. Based on the body mass index (BMI) data, Majority of the participants were found to be normal (83.3% male vs. 87% females). The results of Physical self-description Questionnaire (PSDQ-S, Marsh) in which the overall mean, \pm SD and p-value of coordination, strength, flexibility, endurance, activity and sports of the participants (N=100) were 5.474 ± 1.397 $p < 0.00$, 5.396 ± 1.112 $p < 0.00$, 5.534 ± 1.199 $p < 0.01$, 5.390 ± 1.215 $p < 0.01$, 5.390 ± 1.215 $p < 0.00$, 4.880 ± 1.372 $p < 0.00$, 5.346 ± 1.176 $p < 0.00$ with respectively. All six domains of Physical self-description Questionnaire score shows majority of the participants Male vs. female were in the mostly true and true category which means that warm-up exercises had significant positive effects on performance of participants. Warm-up activities mentally prepare players for competition and enhance confidence level.

Conclusion:

Physical health is essential components of a player's for successful sport performance. Conclusion of the current study elaborates that warm up activities increase Coordination, strength, Flexibility, endurance, activity and sports. The results of the current study suggest that warm up exercise might improve coordination strength, flexibility, endurance and sports activities and warm up exercises to enhance performance of badminton players. Exercise change the player performance level and maintain the quality of life and to avoid the failure in sports career.

Introduction: Badminton is most popular Racket sports over the world, in which two players (singles) or four players (two pairs in doubles) take a position on opposing rectangular court and strike a shuttlecock over a dividing net between them to score a point¹. Badminton is a

racket sport which sport has five events: men's and women's singles, doubles or mixed doubles². Badminton is a physical activity played on a rectangular indoor or outdoor court for recreation and competitive level. Badminton is excellent choice for people of all ages to maintain a fitness level. During the previous 30 years, there has been real growth in female participation in sports³. Badminton is a sporting physical activity characterized by long and high-intensity movements (speed, endurance, strength, and coordination) blended with rest periods. Badminton is rapidly growing in popularity after 100 years of vigorous development. Today, it is one of the most well popular sports in the world⁴. Warm up in sports can be defined as a preparatory period before exercise to enhance performance in competition or training⁵. Preparing the body for physical activity through proper Warm up protocols is a training that has been incorporated into training programs dependent on research proposing WU prior to activity allows the body to gradually prepare for an increase in physical activity⁶. An increase in body heat level, muscle temperature, circulation and heart rate trigger a course of physiological reactions increasing blood flow, and increment the rate at which nerve impulses travel⁷. A good warm up exercise prepare body for more intense activity. Warm up exercise prevents injuries in harmful way during workout and improve blood flow to muscles. Stretching exercise increases the range of motion of joint and maintenance flexibility and enhances player performance or flexibility⁸. Warm up will prevent the occurrence of muscle soreness⁹. Warm up as a means by which player performance may be improved, muscles temperature enhances and chance of injuries redacted¹⁰. Warm up improve range of motion and enhance anaerobic performance, the lack of warm up intensity may be affected or low reliability of ROM for specific joint¹¹. Specific warm up exercise resulted that increased body temperature, heart rate, anaerobic ability and the lack of chance in range of motion at the knee and hip joints, benefits of warm up are closely related to the duration, intensity and warm up mood, in short warm up prior to activity with the intention of enhancing performance and reducing injuries. So, the current study was conducted to find out the effect of warm up exercises on performance of badminton players.

Methodology:

This descriptive cross-sectional study was conducted in Faisalabad Division. 100 badminton players with (N=60 Male and N=40 Female) age 18-30 years playing badminton in the different skill level were participated in the study. Injured and pregnant players were excluded in this study. Duration of the study was 06 months after approval. Sample size for the study was calculated via Rao Soft formula and non-probability convenient sampling technique was used in the study. The data was collected through general demographics questionnaires and physical self-description questionnaire. This study was initiated after approval from advanced study and research committee (ASRC) of Isra institute of rehabilitation sciences, Isra University Islamabad and data collection approval was taken by divisional officer sports (DOS), Faisalabad Division.

Confidence Level	Population Size	Response Distribution	Recommended Sample Size	Margin of Error
95%	134	50%	100	5.00%

transferred to SPSS 21 for analysis. The results obtained after analysis was presented by use of graphs and tables.

Results of the study:

40% (40) were females and 60% (60) were males. The mean age of the male participants was 25.15 ± 2.60 years and female participants were 25.55 ± 3.22 Years. Based on the body mass index (BMI) data, Majority of the participants were found to be normal. Frequency and percentages of participants regarding Body mass index in categories wise shows in Table I

Table-I: Frequency (N) and percentage (%) of Participants Body Mass Index (N=100)

Gender	Categories	Frequency	Percent
Male	Underweight	1	1.7
	Normal	50	83.3
	Overweight	9	15.0
	Obese	0	0
Female	Underweight	5	12.5
	Normal	35	87.5
	Overweight	0	0
	Obese	0	0

Table II shows the frequency of participants regarding skill level

Table-II: Frequency of Participants in study with skill level (N=100)

Skill Level	Gender		
	Male	female	Total
recreational level	23	12	35
club level	20	20	40
competitive level	15	5	20
national level	2	3	5
Total	60	40	100

Table III, To find out the possible effects of warm up exercises on performance of badminton players and shows the results of Physical self-description Questionnaire (PSDQ-S, Marsh) in which N, mean, SD, of the 6 dimensions, Coordination, strength, flexibility, endurance, activity and sports. Result shows significant positive effect on performance of participants.

Table III: N (%), Mean, SD and P value of Physical self-description Questionnaire scale

PSDQ Scale	Male	Female	Overall	

	N	Mean	±S.D	N	mean	±S.D	N	mean	±S.D	P.value
Coordination	60	5.300	1.257	40	5.670	1.551	100	5.474	1.397	0.00
Strength	60	5.700	0.958	40	5.041	1.183	100	5.396	1.112	0.00
Flexibility	60	5.288	1.203	40	5.866	1.161	100	5.534	1.199	0.01
Endurance	60	5.327	1.160	40	5.616	1.144	100	5.390	1.215	0.00
Activity	60	5.166	1.259	40	4.450	1.436	100	4.880	1.372	0.00
Sports	60	5.688	0.934	40	4.833	1.320	100	5.346	1.176	0.00

Table-IV present the frequency and percentage of males and females participants based on findings of participants regarding Coordination, Strength, Flexibility and Endurance on Physical self-description Questionnaire categorizes as false, mostly false, more false than true, more true than false, mostly true and true. The detail distribution of frequency of players according to individual items can be seen in (Table IV).

Table -IV: Frequency and percentage of participants regarding Coordination, Strength, Flexibility and Endurance based on Physical self-description Questionnaire (N=100).

		Coordination (Frequency)	Percent	Strength (Frequency)	Percent	Flexibility (Frequency)	Percent	Endurance (Frequency)	Percent
False	Male	1	1.7	1	1.66	2	3.3	3	5
	Female	3	7.5	2	5	1	2.5	1	2.5
Mostly false	Male	2	3.3	2	3.33	2	3.3	2	3.33
	Female	4	10	3	7.5	1	2.5	4	10
More false than true	Male	5	8.3	5	8.33	3	5	1	1.7
	Female	4	10	4	10	7	17.5	5	12.5
More true than false	Male	8	13.3	6	10	3	5	11	18.3
	Female	5	12.5	7	17.5	7	17.5	13	32.5
Mostly true	Male	14	23.33	8	13.33	15	25	12	20
	Female	10	25	10	25	14	35	14	35
True	Male	30	50	38	63.33	35	58.3	31	51.7
	Female	14	35	14	35	10	25	3	7.5

Regarding activity domain of Physical self-description Questionnaire, Statistical analysis shows Male (N=60) and female (N=40) mean, \pm SD and p-value were 5.16 ± 1.25 $p < 0.00$, 4.45 ± 1.43 $p < 0.00$, with respectively. 46.7% male and 27.5% female were score in true category

regarding activity collective results to warm up exercise improve performance of badminton players. (Figure 1)

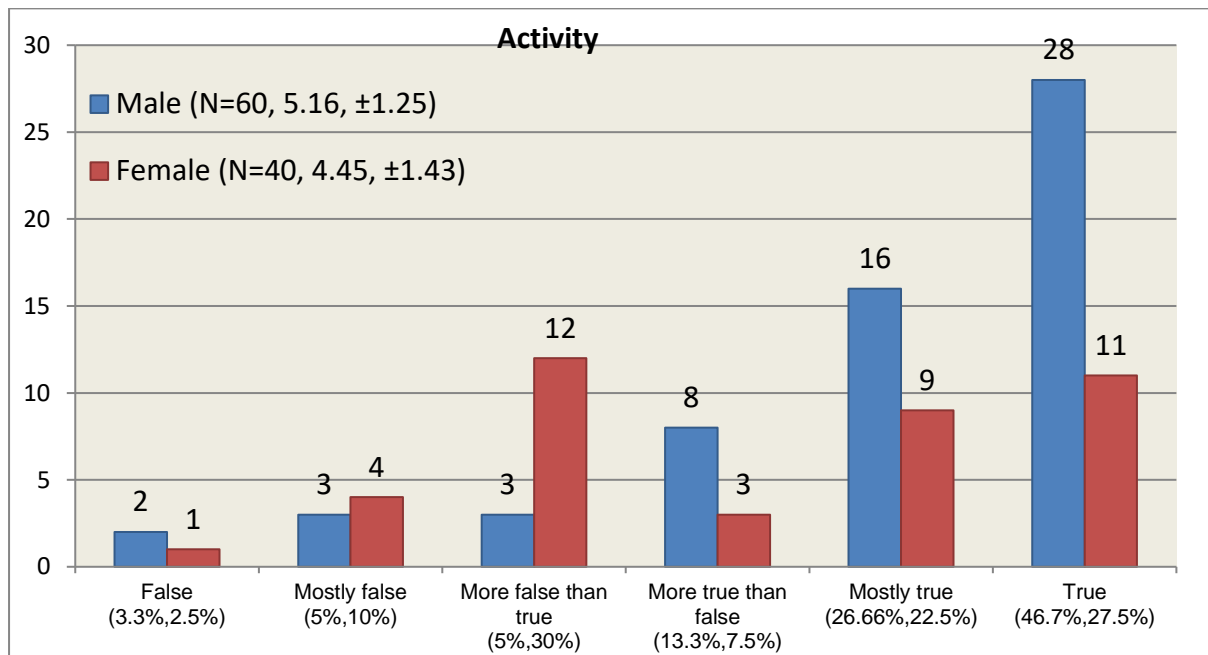


Figure 1: Frequency and percentages of participants regarding activity domain of Physical self-description Questionnaire.

Majority of the participants i.e. 66.66% male and 37.5% female were score is true category regarding sports (Figure II)

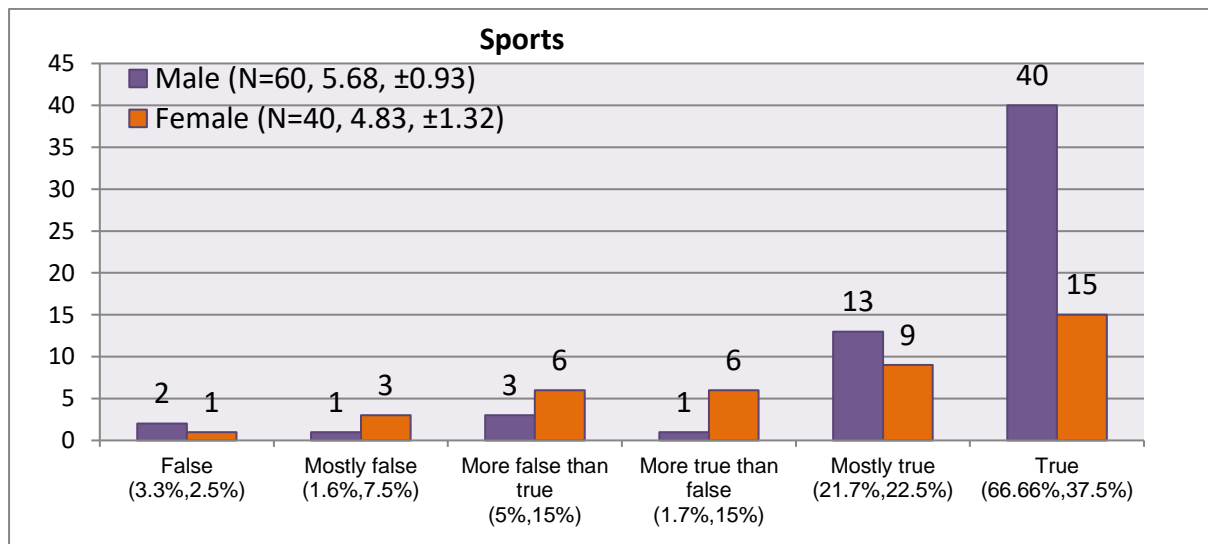


Figure II: Frequency and percentages of participants regarding Sports domain of Physical self-description Questionnaire.

Discussion:

The purpose of current study was to find out the effect of warm up exercises on performance of badminton players, Data was obtained as a sample of N=100 (60 male, 40 female), N=35 (Male23, 12female) recreational level, N=40 (Male20, 20female) club level, N=20 (Male15, 5female) competitive level and N=5 (Male2, 3female) national level ages of 18 to 30 years

badminton players of Division Faisalabad. To fulfill the objective, data was collected through Physical self-description Questionnaire (PSDQ-S, Marsh).

Previous studies analyzed the effect of warm up exercises on performance of players and their results shows that warm up exercises increased body temperature, heart rate, enhances performance and reducing injuries, stretching warm up exercises significantly improves quadriceps strength and hamstring flexibility.^{11,12}

According to previous study conducted by Yoksel et al in 2017 reported that many training programs with different warm up exercise have been developed to improve fitness parameters of badminton players, badminton warm up exercises incorporated strength and endurance activities has been reported to improve endurance and strength of elite and junior level badminton players.¹³ Results of the past studies was consistent with the current study finding which shows that the warm up activities has been reported to improve strength and endurance of badminton players. Out of 100 participants with respectively (strength, endurance) 52,34 had true and 18,26 had mostly true regarding strength and endurance collective results to warm up exercise improve performance of badminton players.

One of comparative study conducted by Jan M, Yaday JS in 2017 analyzed effect of selected exercises on flexibility and coordination of badminton and tennis players, flexibility refers the absolute ROM in joint and length in muscles that cross the joints, coordination is the ability to integrate movement of muscles into an efficient pattern of movement.¹⁰ The results of current study demonstrate warm-up activities increase the coordination & flexibility. Out of 100 participants with respectively (coordination, flexibility) 44,45 had true and 24, 29 had mostly true. Another study done in 2015 shows that warm up exercises and interval training increased endurance (strength, speed).¹⁴ These previous studies findings was consistent with the findings of present study which demonstrate warm up activities significantly increase Flexibility and ROM of the joint.

Wilke J and Royé C in 2020 investigate the effect of aerobic circuit training on health related fitness among 40 senior athletes. Aerobic circuit training significantly improves health related fitness such as muscles strength, endurance and flexibility.¹⁵ which are in favor of current study results showing that the Changing in direction are necessary after most shorts and all movements must be completed quickly with good technique and control. Coordination and flexibility are more usual in all aspects of the game. While physical health and physical ability are essential components of a badminton player's successful sport performance, warm up exercises improve flexibility and endurance.

One of the previous study done in 2012 determines the effect of dynamic and static warm up exercises on performance. Dynamic warm up shows best results on overall performance then static warm up protocol.¹⁶ Previous studies result is in favor of current study results which show warm up exercise with different dynamic activities significantly best effect on performance of badminton players.

One of the study held in 2019, results shows that regular stretching exercise programs enhance the level of self-esteem and decreasing hopelessness level, exercises develop positive change in behavior, increased self-esteem level, decreased body fat ratio, anxiety and body image dissatisfaction.¹⁷ These previous studies result support the current research findings demonstrating warm up exercise significantly enhance the level of self-esteem.

Warm up exercises improve Coordination, strength, flexibility, endurance and it's have a good effects on badminton player performance. With warm up activities players improve

health. Activity and sports mentally prepare of players for competition and enhance confidence.

Conclusion:

Physical health is essential components of a player's for successful sport performance. Conclusion of the current study elaborates that warm up activities increase coordination, strength, flexibility, endurance, activity and sports. The results of the current study suggest that warm up exercise might improve coordination strength, flexibility, endurance and sports activities and warm up exercises to enhance performance of badminton players. Exercise changes the player performance level and maintain the quality of life and to avoid the failure in sports career.

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