



International Journal of Physical Education, Sports and Health

P-ISSN: 2394-1685

E-ISSN: 2394-1693

Impact Factor (RJIIF): 5.38

IJPESH 2022; 9(6): 257-261

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www.kheljournal.com

Received: 22-08-2022

Accepted: 29-09-2022

Dr. Shrikant

Assistant Professor, Lakshmibai
National Institute of Physical
Education (NERC), Guwahati,
Assam, India

Dr. Rahul Kanojiya

Assistant Professor, Lakshmibai
National Institute of Physical
Education, Gwalior, Madhya
Pradesh, India

Dr. Shankar Jyoti Basumatary

Associate Professor, Lakshmibai
National Institute of Physical
Education (NERC), Guwahati,
Assam, India

A cross-sectional study on the mental toughness of female basketball players of different age groups

Dr. Shrikant, Dr. Rahul Kanojiya and Dr. Shankar Jyoti Basumatary

DOI: <https://doi.org/10.22271/kheljournal.2022.v9.i6d.2712>

Abstract

Introduction: Mental toughness is one of the abilities that is known to be important components of athlete performance. In light of this information, the aim of this study was to investigate mental toughness among basketball players of age range of 18-20 years and 21-23 years groups.

Aim of Study: The focus of the present study was to conduct a cross-sectional study on the mental toughness among female basketball players of age range of 18-20 years and 21-23 years groups.

Material and Methods: For this study the researcher selects thirty (30) female basketball players. In which 15 female Basketball players of 18 to 20 years and 15 Basketball players of under 21 to 23 years were randomly selected from LNIPE, Gwalior (M.P.) and LNIPE (NERC), Guwahati (Assam).

Results: The results obtained from age range of 18-20 years and 21-23 years female basketball players groups revealed that Reboundability, Handling Pressure, Concentration, Confidence and Motivation were found higher in the age range of 21-23 years female basketball players. And total mental toughness that consist all the categories like Reboundability, Handling Pressure, Concentration, Confidence and Motivation also was found higher in the age range of 21-23 years female basketball players. At last significant difference was found between both the age range of 18-20 years and 21-23 years on total mental toughness of female basketball players at 0.05 level of significance.

Conclusions: On the basis of finding concluded that 21-23 years players had exhibited higher mental toughness score might be because they could manage the competition stress in a better manner and were more capable of handling the challenges and pressure more efficiently than 18-20 years group.

Keywords: Mental toughness, basketball player

Introduction

Basketball is a popular sport that is enjoyed by the vast majority of the world's population, with participation from practically every society and age range. Because the game is played at a high speed with constant and quick changes between movement patterns such as leaping, sudden runs, and sudden flips of direction, the majority of the game takes place in an anaerobic (oxygen-free metabolism) environment (Hoffman and Maresh, 2000; Crisafulli *et al.*, 2002) [9, 4]. In order to perform movements that require quick acceleration and deceleration, direction changes, sideways shifts, leaps (rebounds, blocks, and shoots), and quick runs (sprints) either with or without the ball in an area that is 28 m long and 15 m wide for 40 minutes, it is imperative that the player have good anaerobic toughness, rapidity, and a high level of agility (Delextrat and Cohen, 2009) [6]. Basketball players' capacity to move and make decisions is fleeting, therefore they must always be prepared and engaged in receiving and delivering passes, shooting, dribbling, and rebounding (Muratlı, Toraman and Çetin, 2000) [18]. According to research, professional basketball players have varying anatomical and biomotor abilities depending on their position in the game. Similar findings have been reported in studies on player structural differences. Pivot players are taller and heavier than forward and guard players, according to research (Ostojic, Mazic and Dikic, 2006; Latin, Berk and Baechle, 1994) [20, 13]. Cox (2012) [3] has identified the psychological traits of top athletes based on this research. They can be enumerated as follows, albeit they may change based on the sporting branch: suitable personality traits, a manageable inner focus for success and failure, a high level of self-confidence and faith in the ultimate success, intrinsic motivation, a strong goal-

Corresponding Author:

Dr. Shrikant

Assistant Professor, Lakshmibai
National Institute of Physical
Education (NERC), Guwahati,
Assam, India

oriented dominance for athletic success, a full concentration on an existing task, the ability to control emotion and excitement, strong coping skills to cope with difficulties faced, the ability to set difficult goals and formulate plans to achieve them, the ability to concentrate on a task entirely. The ability to focus mentally on the most critical aspect of any scenario is referred to as concentration (Moran, 2004) ^[17]. Focusing on pertinent environmental cues is a skill that comes with concentration (Weinberg and Gould, 2015) ^[23]. A highly focused athlete strives to perform as well as possible, learns new abilities more quickly, builds his confidence, uses experience to manage stress and anxiety, and concentrates on elements that are under his control. Unpleasant emotions such as anxieties, worry, grief, and negative thoughts might interfere with attention. Umpire decisions, spectators, rival athletes, weather conditions, and the media are examples of external influences. Mental toughness is defined by concepts such as effectively coping with pressure and difficulties, recovery after failures, challenge, being insistent and not giving up, competition with himself and others, being unaffected or flexible in adverse situations, having a firm belief in taking control of his future, improving under pressure, and possessing superior mental skills (Clough, Earle and Sewell, 2002; Middleton *et al.*, 2004; Jones, Hanton and Connaughton, 2002; Bull *et al.*, 2005; Golby, Sheard and Lavalley, 2003; Thelwell, Weston and Greenlees, 2005; Luthans, 2002) ^[2, 15, 10, 8, 22, 14]. Rebound Ability is the capacity of the mind to recover from difficulties, setbacks, and challenges experienced both before and during a performance. It ranks among the most crucial psychological abilities that elite athletes have. Handling Pressure is the capacity of the mind to handle various internal and external factors that could cause pressure. Some dispositional characteristics, such as personality traits, ego strengths, personal beliefs, self-confidence, and prior experience, can serve as representations of internal components. The confidence sub-dimension is the ability to sustain self-belief despite failures and not to quail before opponents. In sports, motivation is a very important topic. It can be characterised as the focus and level of effort. The amount of effort is referred to as intensity, and the direction is what draws a person. The evidence demonstrates that increased motivation fosters, among other things, learning, performance, enjoyment, and perseverance in sports. Motivation is a crucial psychological quality required for success in basketball. Mentally-tough athletes have the tendency to be individuals who are highly competitive; determined; self-motivated; able to maintain concentration in situations that cause pressure and can cope effectively with such situations; resist increasing difficulties; and can maintain a high level of self-belief even after failures (Crust and Clough, 2011) ^[5]. Mental toughness is one of the abilities that is known to be important components of athlete performance. In light of this information, the aim of this study was to investigate mental toughness among basketball players of age range of 18-20 years and 21-23 years groups.

Methods

Study participants

To measure the mental toughness through the mental toughness questionnaire. For this study the researcher selects thirty (30) female basketball players. Those who were participated in State, National and University level competitions. In which 15 female Basketball players of 18 to 20 years and 15 Basketball players of under 21 to 23 years were randomly selected from LNIPE, Gwalior (M.P.) and

LNIPE (NERC), Guwahati (Assam). A Stratified Random Sampling method was done to draw the sample of the study. The requirements of the study and its nature were explained to each participant verbally and in writing. Additionally, they were told that even after giving their written consent, they may take their name out of the study at any moment.

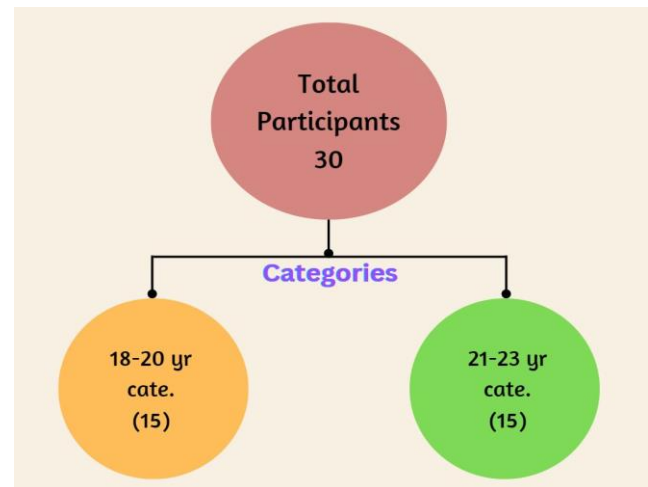


Fig 1: Sampling Chart

Tool

To measure the status of mental toughness through Reboundability, Handling Pressure, Concentration, Confidence and Motivation these are 5 categories of mental toughness questionnaire. Mental Toughness prepared by Alan Goldberg (2012) ^[24] has 30 items, which has 5 categories namely: Reboundability (06 items), Handling Pressure (06 items), Concentration (06 items), Confidence (06 items) and Motivation (06 items).

Administration of Questionnaire

The questionnaire on Mental Toughness prepared by Alan Goldberg (2012) ^[24] has 30 items, which has 5 categories namely: Reboundability, Handling Pressure, Concentration, Confidence and Motivation. A sample statement under Confidence category read "I have trouble dealing with negative self-talk (thoughts)". The subjects were instructed to respond to each item according to how mentally tough they are. Every statement has two possible responses i.e., True or False. There was no time limit for the completion of the questionnaire but the subjects were instructed not to ponder too long over any statement and respond to all the statements in the questionnaire independently.

Statistical Techniques

To find out the significant difference of mental toughness among female basketball players of different age groups. The Independent 't' test was used to compared the effect of anxiety level of the groups. The level of significance was set at 0.05.

Results

After labelling all numerical data, scores regarding psychological variable mental toughness is presented in a table form with the help of mean, median, S.D., skewness, and kurtosis. The distribution of data in a symmetric manner and the normality of the curve or normal distribution of data have been observed through skewness and kurtosis, statistical technique Independent 't' test were employed and presented in following tables and figure.

Table 1. Descriptive statistics for Reboundability, Handling Pressure, Concentration, Confidence, Motivation and total

mental toughness of age range of 18-20 years and 21-23 years female basketball players groups.

Table 1: Show the number of participants along with that, it provides the mean, median, standard deviation, kurtosis and skewness of Reboundability, Handling Pressure, Concentration, Confidence, Motivation and total mental toughness of age range of 18-20 years and 21-23 years female basketball players groups.

	<i>Age Cate.</i>	<i>N</i>	<i>Mean</i>	<i>Median</i>	<i>SD</i>	<i>Kurtosis</i>	<i>Skewness</i>
<i>Reboundability</i>	18-20 years	15	2.40	2	0.98	-0.810	0.06
	21-23 years	15	3.40	3	0.82	-0.224	-0.07
<i>Handling Pressure</i>	18-20 years	15	3.73	4	1.48	-0.21	-0.67
	21-23 years	15	3.86	4	0.91	0.51	0.93
<i>Concentration</i>	18-20 years	15	2.26	2	0.88	-0.48	0.11
	21-23 years	15	3.93	4	1.16	1.95	-1.42
<i>Confidence</i>	18-20 years	15	4.20	4	1.01	1.14	0.01
	21-23 years	15	4.26	4	1.22	2.90	-1.12
<i>Motivation</i>	18-20 years	15	4.33	4	0.73	0.42	-0.39
	21-23 years	15	4.60	5	0.89	2.67	-0.78
<i>Total Mental Toughness</i>	18-20 years	15	17.20	17	2.62	0.33	-0.44
	21-23 years	15	19.80	19	2.59	-0.92	0.70

A closer look at the statistical properties of the reboundability in age range of 18-20 years and 21-23 years female basketball players depicted in table 1 reveals the following – Mean 2.40 for 18-20 years and 3.40 for 21-23 years, median 2 for 18-20 years and 3 for 21-23 years, S.D. 0.98 for 18-20 years and 0.82 for 21-23 years, Skewness 0.06 for 18-20 years and -0.07 for 21-23 years, kurtosis -0.81 for 18-20 years and -0.22 for 21-23 years.

Statistical properties of the ability to handle pressure in age range of 18-20 years and 21-23 years female basketball players depicted in table 1 reveals the following – Mean 3.73 for 18-20 years and 3.86 for 21-23 years, median 4 for 18-20 years and 4 for 21-23 years, S.D. 1.48 for 18-20 years and 0.91 for 21-23 years, Skewness -0.67 for 18-20 years and 0.93 for 21-23 years, kurtosis -0.21 for 18-20 years and 0.51 for 21-23 years.

Statistical properties of the concentration in age range of 18-20 years and 21-23 years female basketball players depicted in table 1 reveals the following – Mean 2.26 for 18-20 years and 3.93 for 21-23 years, median 2 for 18-20 years and 4 for 21-23 years, S.D. 0.88 for 18-20 years and 1.16 for 21-23 years, Skewness 0.11 for 18-20 years and -1.42 for 21-23 years, kurtosis -0.48 for 18-20 years and 1.95 for 21-23 years.

Statistical properties of the confidence in age range of 18-20 years and 21-23 years female basketball players depicted in table 1 reveals the following – Mean 4.20 for 18-20 years and 4.26 for 21-23 years, median 4 for 18-20 years and 4 for 21-23 years, S.D. 1.01 for 18-20 years and 1.22 for 21-23 years, Skewness 0.01 for 18-20 years and -1.12 for 21-23 years, kurtosis 1.14 for 18-20 years and 2.90 for 21-23 years.

Statistical properties of the motivation in age range of 18-20 and 21-23 female basketball players depicted in table 1 reveals the following – Mean 4.60 for 18-20 years and 4.33 for 21-23 years, median 5 for 18-20 years and 4 for 21-23 years, S.D. 0.73 for 18-20 and 0.89 for 21-23 years, Skewness -0.39 for 18-20 years and -0.78 for 21-23 years, kurtosis 0.42 for 18-20 years and 2.67 for 21-23 years.

Statistical properties of the total mental toughness in Age range of 18-20 years and 21-23 years female basketball players depicted in table 1 reveals the following – Mean 17.20 for 18-20 years and 19.80 for 21-23 years, median 17.00 for 18-20 years and 19.00 for 21-23 years, S.D. 2.62 for 18-20 years and 2.59 for 21-23 years, Skewness -0.44 for 18-20 and 0.70 for 21-23 years, kurtosis 0.33 for 18-20 and -0.92 for 21-23 years.

Table 2: T-test statistics of Total Mental Toughness for the age range of 18-20 years and 21-23 years female basketball players groups.

	<i>Age Categories</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>SD Error</i>		<i>Sig.(p-value)</i>
					<i>Mean</i>	<i>t-value</i>	
<i>Total Mental Toughness</i>	18-20 years	15	17.20	2.62	0.67		
	21-23 years	15	19.80	2.59	0.67	-2.728	0.01*

Table 2 reveals that Independent ‘t’ test was applied and was found significant difference in total mental toughness among 18-20 and 21-23 female basketball players groups. The following table were indicating the Mean, Standard Deviation, SD Error Mean, t-value and p-value.

Discussion

Mental toughness is an ability to consistently sustain one's optimum performance state during adversities of the game. Performance consistency is the almost important factor for successful performance even during adverse conditions. However, there is no ready-made formula for achieving

consistency in performance. Achieving the mastery over the skill is not the ultimate but learning proper mental control to execute the skills at changing situations is the most important factor in achieving the goal. So, performing with the maximum potential is the core of the mental toughness. The first aspect known as reboundability or the player's skills at mentally bouncing back from setbacks and mistakes. Mental toughness depends on the player's ability to quickly leave the mistakes and failures behind them. The age range of 21 – 23 years female players showed superior reboundability might be because of the following reasons. The age range of 21-23 years players had longer played career compared to age range of 18-20 years. Moreover, they had better exposure and might have come across such difficult situations during their playing career. Rathore *et al.* (2009) ^[21], also found similar results in their study on mental toughness of team and individual game players. The second aspect is the ability to handle pressure. Without the ability to stay calm and focused on the task, no player can perform at her best. Nervousness during the match will hamper the concentration and attention and finally losing the calmness of the mind. The finding of the study pertaining to the ability to handle pressure revealed that the 21-23 years players were much superior compared to those 18-20 years players. The reasons for this may be the senior players have experienced highly at the state level in facing many difficult game situations and tougher opponents. In addition to this, longer training age, nature of training, experience and exposure might have contributed to better ability to handle pressure by the 21-23 years players. Similar outcome was also found by Kuan and Roy (2007) ^[11], in their study to examine the association between group profiles and mental toughness on performance outcomes. The third aspect is the concentration ability. Basketball game requires a high level of concentration ability as the ball moves very fast during the game. During the game the players face intense, violent oppositions and confrontation from the opponents, in such situations the players have to be stable, and fully focused on achieving the target without losing their temperament and concentration. The player has to always concentrate on the movements of the ball as well as the movement of the opponents and own teammates. The results of the study revealed that the 21-23 years players outsmart the 18-20 years players in the concentration ability. Quit similar outcome was also found by Kumar (2016) ^[12], the study was comparison of mental toughness between male and female Volleyball players. The subject for this study were 12th South Asian Games 2016, which was organized by India in Guwahati (Assam). The fourth aspect deals with the level of confidence and the factors that affect confidence. Under the pressure of competition, low confidence will neutralize natural ability, hard work and talent. Similarly high confidence will enhance the sporting potential into superior performance by overcoming the difficulties without wavering and losing the temperament. Level of confidence of the players will definitely increase this aspiration to win the match. The findings of the study had shown the 21-23 years female basketball players had higher level of confidence while compared to that of 18-20 years female basketball players. Nearly Similar results were also found by Mohamad *et al.* (2009) ^[16], in their study on the relationship between the players' category, status, and achievement with the seven dimensions of mental toughness Self-confident, Negative energy control, Attention control, Visual imagery control, Motivational, Positive energy control, and Attitude Control was evaluated. The fifth aspect deals with motivation. It is

well understood that optimum level of arousal and motivation are the key to successful performance and the accomplishment of the goals. Motivation is a personality characteristic related to the general state of arousals and subsequent level of attention paid to a problem or task faced by an individual. The players have to stay motivated throughout the competition to explore their full potential. In the game of basketball, all the players should co-ordinate their efforts interdependently. The results of the findings revealed that the 21-23 years female basketball players had higher motivation level while compared to that of 18-20 years female basketball players. Fourie and Potgieter (2001) ^[7] also found similar results in their study on mental toughness of expert coaches and elite athletes. The total mental toughness score indicates the strength of overall mental toughness. The result of the findings showed that the 21-23 years female basketball players were having higher total scores of mental toughness compared to the 18-20 years. Mentally tough players generally accept responsibilities for their own performances. Mentally tough players are more capable of handling the challenges and effectively manage the competition stresses. Nicholls *et al.* (2009) ^[19] also found similar results revealed a significant relationship between mental toughness and gender, age, and sporting experience.

Conclusion

It is well established that to realize the full potential of a player it is very essential to train the mind as well. Most performance problems of the basketball players were confronted and they were not a result of poor fitness or lack of physical skills or tactical efficiency, to a great extent it is the mental factors such as anxiety, poor concentration, and lack of confidence, poor team cohesion and inadequate mental toughness. Mental toughness describes the capacity of an individual to deal effectively with stressors, pressures and challenges and perform to the best of their ability irrespective of circumstances in which they find themselves. Mentally tough players generally accept responsibilities for their own performances. Mentally tough players are more capable of handling the challenges and effectively manage the competition stresses. 21-23 years players had exhibited higher mental toughness score might be because they could manage the competition stress in a better manner and were more capable of handling the challenges and pressure more efficiently than the other group. In a nut shell, it is the prime duty of the coach to develop the mental toughness of the basketball players by developing certain mental skills. The players should be taught how to stay relaxed under pressure, how to focus on what is important for them, quickly rebounding from mistakes and failures, controlling negative thoughts, staying motivated by setting realistic goals and also developing a positive attitude and self-confidence.

Conflict of Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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