

A Comparative analysis of the Mental Toughness among Players of Various Games and Sports

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Abstract: *The aim of this study was to measure the difference in mental toughness among players of Various Games and Sports (i.e. Individual Sports, Team Sports and E-Sports). For this study, 100 male subjects (individual sports=44, team sports=36 and e-sports=20) volunteered participate in the study were chosen. Their age ranged between 18 to 25 years. Subjects ready to participate in the study were selected from colleges affiliated to Punjabi University, Patiala. To measure the mental toughness of selected subjects for the present study, the Mental Toughness Questionnaire constructed by Goldberg (1990) was administered. To find out the differences in mean of all selected group of players for chosen variable, One-way Analysis of Variance (ANOVA) was applied. For more analysis Scheffe's Post-Hoc test was applied. To test the hypotheses, level of significance was set at 0.05. . Found results were significant on the variable mental toughness and sub-variable reboundability among selected groups of players. But insignificant differences were found with regard to sub variable, Ability to Handle Pressure, Concentration, Confidence, and Motivation.*

Keywords: *Mental Toughness, Individual Sports, Team Sports, E-Sports, Players.*

Introduction

Sport Psychology has significantly changed the lives of many athletes, coaches, and other sport and exercise professionals working in the field with whom we have worked and trained over the many years. Sport Psychology is the area of performance improvement and has much of the practical value to offer sports performers. The concept of mental toughness originated from the literature on hardiness (Maddi, 2002) [7]. Coaches and practitioners are now recognizing the importance of psychological, as well as physical health (e.g., Mahoney et al., 2014) and despite psychological well-being being identified as important by practitioners from the Institute of Sport, pragmatic interventions to protect and promote psychological well-being are rarely documented; recently, they urged fellow practitioners "to evolve to meet this demand" (Marshall & Harrison, 2015)[8]. An "unshakeable belief in ones abilities" is a pertinent feature of mental toughness and widely supported to be key to athletic success (Lane, 2014) [6]. Mental toughness is an accumulation of qualities, states of mind, practices and feelings, which empower a person to drive forward and defeat any hindrance, difficulty or weight experienced, additionally to keep up fixation and inspiration when things are going great, to reliably deliver elevated amounts of performance. Gucciardi et al. (2008) [3] Concluded that mental toughness can explain how physically fit and talented athletes become great athletes. Mental Toughness is seemingly a standout amongst the most essential attributes for accomplishment in athletic execution (Jones et al., 2002)[5]. Gould et al. (2002)[2] analyze the mental attributes of Olympic champions recognized that mental Toughness as a critical patron to games performance improvement. Subsequently, sport psychologists and mentors have endeavored to mold training projects to create mental toughness. Bull et al. (2005) [1] observed on the basis of research that there is also the potential for difference in mental toughness for every individual, sport and situation, from one sports to the other. It is further illustrated that mental aspects affect the athlete's performance in competition Mental toughness has been described as one of the mainly used but least understood terms in applied sport psychology (*Jones et al., 2002*). Numerous research articles investigating successful players have cited mental toughness as a vital factor. Definitions and characteristics of mental toughness have been proposed by so many authors, leading to a diverse range of positive psychological characteristics being associated with mental toughness.

Subjects:

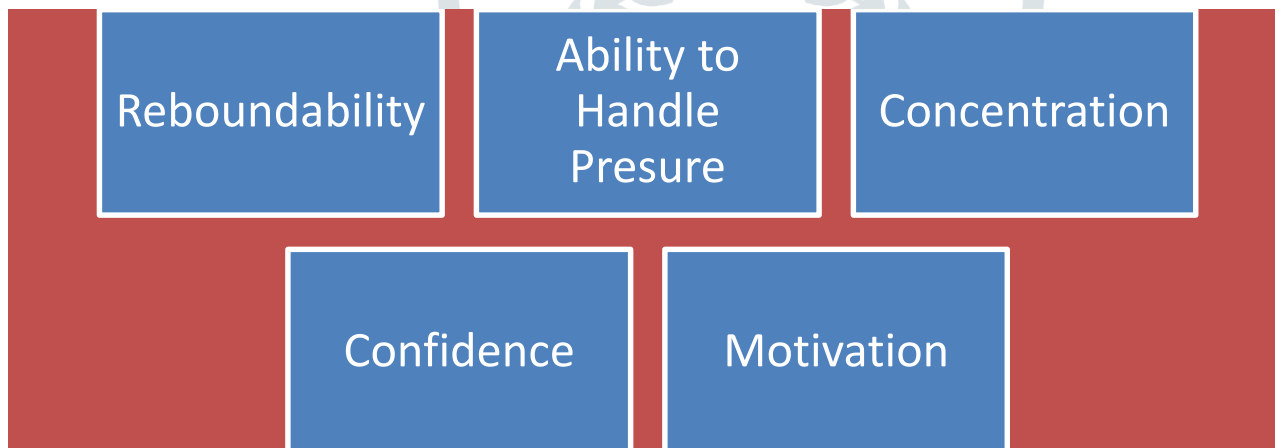
One Hundred male players interested voluntarily to participate in the study were selected for this study with age ranged between eighteen to twenty five years. These players were selected purposively, from the colleges affiliated to Punjabi University, Patiala.

Table-1
Detail of selected subject's (Individual Sport, Team Sport and E-Sports) of Punjabi University, Patiala. (N=100).

Punjabi University, Patiala, Punjab (N=100)					
Individual Sports(N ₁ =44)	Athletics (12)	Archery (12)	Gymnastics (06)	Badminton (7)	Chess (7)
Team Sports (N ₂ =36)	Volleyball (12)		Kabaddi(N.S) (12)		Handball (12)
E-Sports (N ₃ =20)	E-Sports (20)				

Variables:

To find out the differences in Mental Toughness of selected subjects for the present study, the Mental Toughness **questionnaire** developed by Goldberg (1990) was administered. This tool consists of sub-variables namely:

**Statistical techniques employed:**

The following parametric statistical techniques were used:-

- ANOVA (Analysis of Variance).
- Scheffe's Post-Hoc test.
- The level of significance was set at 0.05.
- Statistical Package for the Social Science (SPSS) version 14.0 was used for all analysis.

RESULTS AND FINDINGS

MENTAL TOUGHNESS

Table-2 Results of Analysis of variance (ANOVA) with regard to the variable Mental Toughness among Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d.f.	Mean Square	F-value	p-value
Between Groups	29.033	2	14.516	9.112	.000
Within Groups	154.527	97	1.593		
Total	183.560	99			

Found p-value is .000. Significant at $p < 0.05$.

- According to **Table-2** results of Analysis of Variance (ANOVA) with regard to the variable **Mental Toughness** among Individual Sports, Team Sports and E-Sports players were found statistically significant ($P < 0.05$). As the obtained F-value was found significant, therefore, post-hoc test was employed to study the direction and significance of differences between paired means. The consequences of post-hoc test have been introduced in **Table-3**.

Table-3 Results of post-hoc test with regard to variable Mental Toughness among Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Group (A)	Group (B)	Mean Difference	Sig.
Individual Sports (18.477)	Team Sports	-.35606	.458
	E-Sports	1.12727*	.006
Team Sports (18.833)	Individual Sports	.35606	.458
	E-Sports	1.48333*	.000
E-Sports (17.350)	Individual Sports	-1.12727*	.006
	Team Sports	-1.48333*	.000

- According to **Table-3** the mean value of Individual Sports group was recorded 18.477 whereas Team Sports had mean value as 18.833 and the mean difference among both the groups was found .35606. This result shows that the Team Sports group had performed significantly better on the variable **Mental Toughness** than players of Individual Sports group.
- The mean value of Individual Sports group was recorded 18.477 whereas E-Sports had mean value as 17.350 and the mean difference among both the groups was found 1.12727. This result shows that the Individual Sports group had performed significantly better on the variable **Mental Toughness** than players of E-Sports group.
- The mean value of Team Sports group was recorded 18.833 whereas E-Sports had mean value as 17.350 and the mean difference among both the groups was found 1.12727. This result shows that the Team Sports group had performed significantly better on the variable **Mental Toughness** than players of E-Sports group.

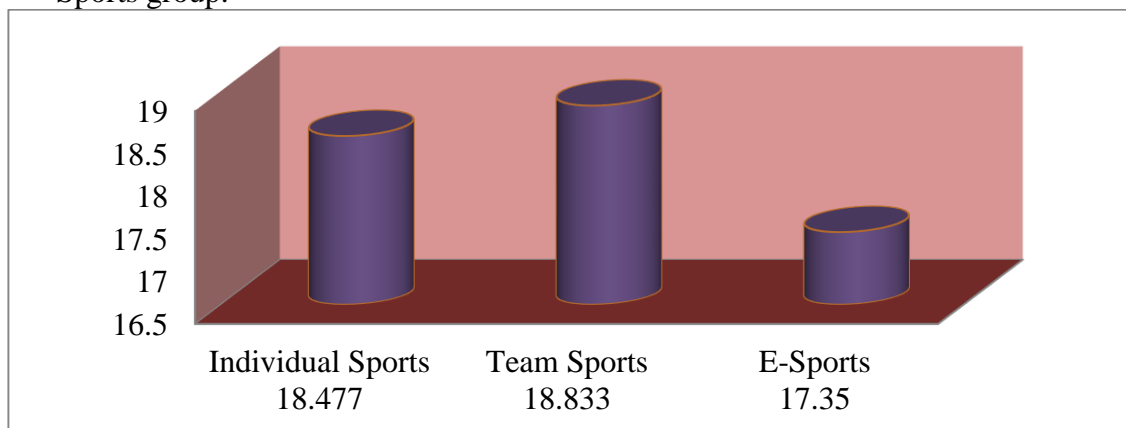


Figure-1 Graphical representation of mean scores with regards to variable Mental Toughness among players of Individual Sports, Team Sports and E-Sports.

Table-4 Results of Analysis of variance (ANOVA) with regards to sub-variable Rebound ability among Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d.f.	Mean Square	F-value	p-value
Between Groups	5.629	2	2.815	3.451	.036
Within Groups	79.121	97	.816		
Total	84.750	99			

Found p-value is .036. Significant at $p < 0.05$.

- It is clear from **Table-4** that results of Analysis of Variance (ANOVA) with regard to sub-variable **Rebound ability** among Individual Sports, Team Sports and E-Sports players were found statistically significant ($P < 0.05$). The obtained F-value was found significant; therefore, post-hoc test was used to study the direction and significance of differences between paired means. The consequences of post-hoc test have been introduced in **Table-5**.

Table-5: Analysis of post-hoc test with regard to sub-variable Rebound ability among Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Group (A)	Group (B)	Mean Difference	Sig.
Individual Sports (3.886)	Team Sports	-.16919	.707
	E-Sports	.48636	.142
Team Sports (4.055)	Individual Sports	.16919	.707
	E-Sports	.65556*	.038
E-Sports (3.400)	Individual Sports	-.48636	.142
	Team Sports	-.65556*	.038

- According to **Table-5** the mean value of Individual Sports group was recorded as 3.886 whereas Team Sports had mean value as 4.055 and the mean difference between both the groups was found .16919. This result shows that the Team Sports group had performed significantly better on sub-variable **Rebound ability** than players of individual Sports group.
- The mean value of Individual Sports group was 3.886 whereas E-Sports had mean value as 3.400 and the mean difference between both the groups was found .48636. This result shows that the Individual Sports group had performed significantly better on sub-variable **Rebound ability** than players of E-Sports group.
- The mean value of Team Sports group was recorded 4.055 whereas E-Sports had mean value as 3.400 and the mean difference between both the groups was found .48636. This result shows that the Team Sports group had performed significantly better on sub-variable **Rebound ability** than players of E-Sports group.

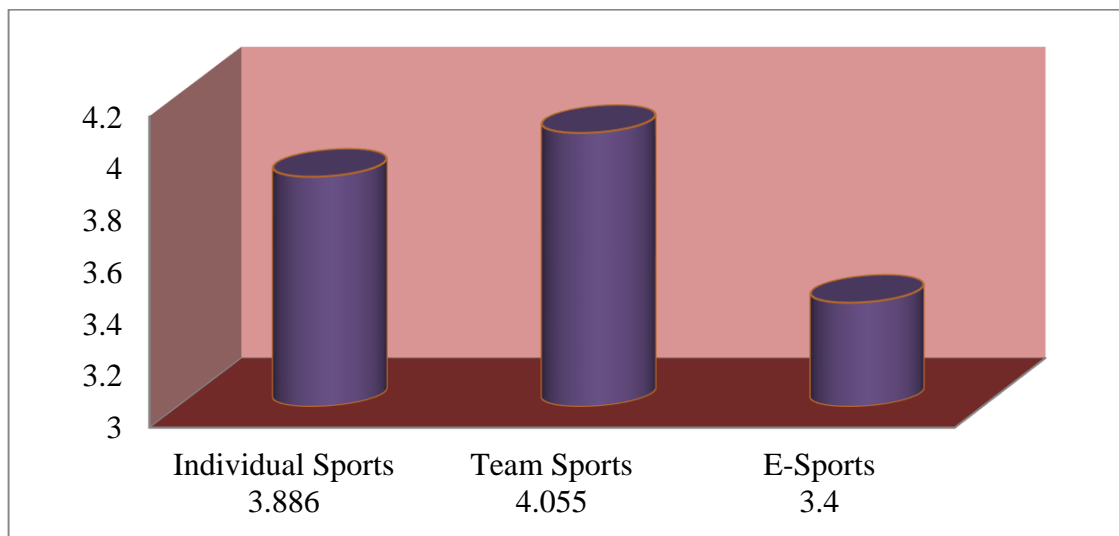


Figure-2: Graphical representation of mean scores with regard to sub-variable Reboundability among players of Individual Sports, Team Sports and E-Sports.

Table-6: Results of Analysis of variance (ANOVA) with regard to sub-variable Ability to Handle Pressure among Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d.f.	Mean Square	F-value	p-value
Between Groups	1.815	2	.907	.638	.531
Within Groups	137.975	97	1.422		
Total	139.790	99			

Found p-value is .531. Not significant at $p > 0.05$.

- According to **Table-6** results of Analysis of Variance (ANOVA) with regard to sub-variable, **Ability to Handle Pressure** among Individual Sports, Team Sports and E-Sports players were found statistically insignificant ($P > 0.05$).

Table-7: Results of Analysis of variance (ANOVA) with regard to sub-variable Concentration among Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d.f.	Mean Square	F-value	p-value
Between Groups	.015	2	.007	.007	.993
Within Groups	97.745	97	1.008		
Total	97.760	99			

Found p-value is .993. Not significant at $p > .05$.

- It is apparent from **Table-7** that results of Analysis of Variance (ANOVA) with regard to sub-variable **Concentration** among Individual Sports, Team Sports and E-Sports players were found statistically insignificant ($P > .05$).

Table-8: Results of Analysis of variance (ANOVA) with regard to sub-variable Confidence among Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d.f.	Mean Square	F-value	p-value
Between Groups	1.018	2	.509	.649	.525
Within Groups	76.022	97	.784		
Total	77.040	99			

Found p-value is .525. Not significant at $p > 0.05$.

- It is apparent from **Table-8** that results of Analysis of Variance (ANOVA) with regard to sub-variable **Confidence** among Individual Sports, Team Sports and E-Sports players were found statistically insignificant ($P > 0.05$).

Table-9: Results of Analysis of variance (ANOVA) with regard to sub-variable Motivation among Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d.f.	Mean Square	F-value	p-value
Between Groups	5.595	2	2.797	1.830	.166
Within Groups	148.245	97	1.528		
Total	153.840	99			

Found p-value is .166. Not significant at $p > 0.05$.

- According to **Table-9** results of Analysis of Variance (ANOVA) with regard to sub-variable **Motivation** among Individual Sports, Team Sports and E-Sports players of were found statistically insignificant ($P > 0.05$).

Conclusion

It has been concluded that, there were significant differences with regard to Overall Mental Toughness and sub variable Rebound ability among players of Individual Sports, Team Sports and E-Sports. But insignificant differences were found with regard to sub variable, Ability to Handle Pressure, Concentration, Confidence, and Motivation. Results of our present study, therefore, supported the state (Harmison, R.J., 2011) [3] rather than trait (Clough, P.J. et al., 2002) view of mental toughness. These all differences were recognized, in spite of the potential ceiling effects probably caused by top athletes reporting high scores on mental toughness inventories (Zeiger, J.S., at al., 2018)[9].

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