

Mental Toughness in Pakistani Cricketers: A Factor Analytical Approach

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The aim of this study was to develop a culturally relevant scale of mental toughness for Pakistani cricketers with sound psychometric properties. In order to explore the phenomenology of mental toughness 20 national and international male cricketers were interviewed individually and their responses were recorded in verbatim. All the responses were collated, duplicate and vague items were discarded. The remaining items were transformed into a 4-point likert scale to assess the intensity of each item and altogether 48 items comprised the Cricket Mental Toughness Scale (CMTS). Further, 149 male cricketers with the age range of 16-28 years ($M=18.79$, $SD=3.06$) selected through purposive sampling, were given the CMTS final 48 items list, along with the Cricket Mental Toughness Inventory (CMTI, Gucciardi & Gordon, 2009) for concurrent validity. For discriminant validity the Sports Interference Scale (Donohue, Silver, Dickens, Covassin, & Lancer, 2007) and a demographic performance were also included. Exploratory factor analysis yielded 4 factors namely "Resilience", "Preparation", "Emotional Stability" and "Self Belief". The scale was found to have highly internally consistent ($\alpha=.92$), and split half reliability $r=.91$ with moderate levels of concurrent and discriminant validity. Results were further discussed in cross cultural context by highlighting its implication for Pakistani cricketers.

Keywords: mental toughness, cricket, scale development

Sport is an energetic and vibrant field that has ceaselessly captivated the hearts of the people around the globe. Regardless of the fact that the spectators themselves participate in sports or not, over the centuries, sports have become an integral part of every society and culture. Sports help players in expressing and demonstrating their athletic competency in a variety of individual (sport like tennis, squash) and group games (cricket, football, and hockey). , Sports, also manifest its gradual but integral evolution and change along the passage of time. This growth and evolution can be seen in all its aspects, that is, concepts, rules, understanding, as well as the psychology of sports. Over the course of the past century, this dynamic change has given sports an absolutely distinct position in the world cultures (Athan & Sampson, 2013).

Among the plethora of sports, cricket has been pre-eminently dominant for a long time in history of Pakistan. Cricket is known to be a game of constant pressure where the players are

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Contribution of Authors

- 1.Sara Subhan: Collected the data, run analysis and write up the current project
2. Sadia Saleem: Write up and work on the analysis of the project
3. Zahid Mahmood: Conceptualized the project and wrote the discussion

continuously fighting to achieve excellence and consistently maintain their peak performance. Because of this requisite, cricket has developed a tradition of toughness where the players are pushed to the limits of their endurance (Woolmer, Noakes, & Moffett, 2008). The stature of cricketers in the present times has seen a sea change as compared to the times of its onset: having set, and met, the highest standards of physical toughness through rigorous physical training and practice. However, within the last three decades the game has transformed into more a test of psychological power and mental agility than physical strength. This, in turn, has made possible its newfound focus on the connection between body and mind. Learning to keep the mental pressures at bay, no matter how hard the target is to be met, the game itself has reached its fruition (Moran, 2012).

Along the course of studies on cricket and the performance of cricketers, researchers have identified a number of psychosocial issues that hamper and interfere with the cricketer's performance when they were expected to perform up to their maximum potential (Hanton, Fletcher, & Coughlan, 2005). The commonly explored concerns faced by cricketers are handling pressure, grappling with the competitive anxiety (Humara, 1999), maintaining focus (Tedesqui & Glynn, 2013), uncontrollable aggression (Sacks, Petscher, Stanley, & Tenenbaum, 2003), fear of injury, fear of failure (Mellalieu, Hanton, & Fletcher, 2009), fear of not getting financial and social recognition, coping with media, audience and so on. These psychosocial pressures push the cricketers, into a great deal of stress. Therefore, in order to help them tackle these pressures and stresses, sport psychologists, coaches, and players themselves have inferred and deduced that a cricketer must go beyond the physical training and practice alone (Orlick, 2008).

One crucial factor that can salvage them is mental toughness, Gucciardi and Hanton (2016) defined mental toughness as *"a personal capacity to deliver high performance on regular basis despite varying degrees of situational demands"* (p. 442). It can lend them all the potential to control their intense negative emotions, it can enhance their focus on the game, help them get to grips with their anxiety, hold the belief that they can achieve their target, develop a stable relationship with their teammates and coaches, and deal with the opponents constructively (Moran, 2012). Only then the excruciatingly exhaustive physical training can be delivered during the match. In the present day pragmatically competitive world, the positive psychology construct "mental toughness" has turned out to be very important in terms of exploration and evaluation of all sports, and above all, cricket (Hanton, Evans, & Neil, 2003). Gucciardi, Gordon, and Dimmock (2009) also address mental toughness as an umbrella term that comprises multiple positive key components broadly covering the range of values, attitudes, cognitions, emotions and behaviors. The common key characteristics identified were unshakeable belief, self-confidence, resilience, attentional control, personal values, self-motivation, and handling pressure and sports intelligence. All of these characteristics were identified as common across all the sports (Cowden, Meyer-Weitz, & Asante, 2016).

There are a number of theorists and researchers who have attempted to identify the nature, framework and development of mental toughness (e.g. Connaughton & Hanton, 2009; Crust, 2008; Gucciardi et al., 2009). Bull, Shambrook, James, and Brooks, (2005) explored mental toughness in elite cricketers and identified that mental toughness is learned and its foundation and development depend on environmental influences. The most significant is parenting that plays a crucial role in influencing a player and contributes to influence rest of the factors of mental toughness. The parenting put a mark on the adulthood of the player. The strive to earn success, fight and survive during setbacks and develop strong personal characteristics e.g., resilience, confidence, competitiveness all are influenced by the parenting. Further, these characteristic devise a tougher attitude in the player that is operated by the tough character of the player. This attitude is witnessed as self-belief in the player that will make a difference, show courage, have the will to take risks and

work hard. The players believe in quality preparation and is self-determined to face challenges. Bull, Shambrook, James, and Brooks, (2005) also proposed that the tougher thinking, in mentally tough players are those cognition that helps in better decision making and clear thinking. This makes the player capable of overcoming self-doubt and maintains the much-needed focus on the game.

Mental toughness is a developed form of resilience that comprises emotional control, maturity, self-determination, focus, strong belief and positive attitude towards the game (Cowden, Meyer-Weitz, & Asante, 2016). Mental toughness is usually drawn out of reserved energy and it is the goal directed behaviour of the player. Mentally tough players believe in their abilities, manage their attention and focus effectively, persevere through tough times, desire success, expect positive outcomes, effectively manage their emotions, and understand their sport context. It is this constellation of key factors that enables a mentally tough athlete to effectively negotiate the “ups and downs” of everyday life at smaller or larger levels of stress and adversity (Gucciardi, Jackson, Coulter, & Mallett, 2010).

The significance of mental toughness in the world of sports became focus of many researchers and there are number of scales and inventories that are developed to assess this construct in players (Connanghton, Hanton, & Jones, 2010; Gucciardi, & Gordon, 2011). A Psychological Performance Inventory (PPI) was developed by Loehr's (1986) that measured the mental toughness under seven dimensions, i.e., self-confidence; attention control; negative energy; motivation; attitude control; positive energy; and visual and imagery control. PPI was 42 items scale but, this measure is not providing any strong psychometric properties and failed to explain the theoretical framework of its development (Crust, 2008; Gucciardi & Gordon, 2009).

Kobasa (1979) devised a model of 4 Cs based on the conceptualizing of mental toughness as commitment, control, challenge and confidence. Clough, Earle, and Sewell (2002) used this model and developed the Mental Toughness-48 that was extensively used in sport-general context. Gucciardi and Gordon (2009) devised a Cricket Mental Toughness Inventory (CMTI) that was aimed to measure mental toughness in sport-specific situations among International and Australian cricketers. This measure is based on 5 factors, named as, Affective Intelligence, Desire to achieve, Resilience, Attentional Control, and Self-belief. The measure in their culture is a highly reliable and valid tool as it rigorously went through checks with qualitative and quantitative approach.

Research identifies that sports specific mental toughness is also culture specific that is influenced by the environment and individual experiences. The meaning generated from those experiences is generally determined by the individual and social influences (Jones, Hanton, & Connaughton, 2007; Thelwell, Weston, & Greenless, 2005). Cross cultural differences create the need to explore this construct in our culture (Gucciardi, & Gordon, 2009). In Pakistan, cricket has gained marked attention both at national and international level and has also produced legends in cricket. But the last decade witnessed a decline in the cricket performance, there is a constant fluctuation in the performance of the cricketers.

Many coaches, sport psychologists, senior and retired cricketers have reported that there has been a marked decrease in the standards of the sport played in the country (Khan, 2016; Raja, 2015). There has been a steady deterioration in qualities like toughness, persistence due to changes in the nature of the game, its organization, and mode of training. The cricketers of Pakistan are unable to adapt themselves in the changing nature of sports world. They experience difficulty in controlling their emotions and easily lose temper during the game the victims in this case are either their own teammates or opponents. Self-confidence is shattered because of self-doubts, poor decision making, and lack of initiative. All these issues have affected the cricketers' consistency in maintaining the peak

standards (Mahmood, 2010). The stakeholders of this extremely popular game highlight that the solution to these problems is the development of mental toughness that can facilitate them to achieve optimal level of their potential in the game. There is a dearth of comprehensive research conducted on Pakistani cricketers that highlights the manifestation of mental toughness (Waqar, 2015). Therefore, this study will explore the development and manifestation of mental toughness in Pakistani cricketers.

Research Design

The research was carried out into 4 phase that aimed to explore the manifestation and experience of the mental toughness in the Pakistani domestic cricketers as well as devise a standardized measure of mental toughness for Pakistani domestic cricketers.

Phase 1: Item Generation

Participants and procedure. In this phase aim is to explore the associated behavioural expressions of mental toughness that are usually experienced by the under-19 and first class male cricketers of Pakistan. The purposive sampling was used to select 20 participants which were comprised of 7 coaches with minimum 3 years of experience in training the under-19 or first class cricketers, 2 international cricketers experience of both test and one day cricket. Also, 11 under-19 and first class cricketers were selected with minimum 3 years of experience of playing cricket at National level. For the current study the construct mental toughness is operationally defined as *“that reaction of a player that enables him or her to call upon inner abilities, skills and strength to deal with the demands of an adverse situation”*. The phenomenological approach was used and individual interview was carried out with all the participants.

The participants were asked to *“during the game cricketers experience great deal of tough situations what are the attributes that helped a cricketer to raise and maintain their performance regardless of the toughest situation?”* The responses of the participants were collated, after omitting the slangs, vague and repeated items a list of 48 was transform into 4 point Likert scale 0-4 and was given the name of The Cricketer’s Mental Toughness Scale (CMTS) for further validation.

Phase 2: Adaptation of Cricket Mental Toughness Inventory (CMTI) and Sports Interference Scale (SIS)

Participants and procedure. In this phase two scales were adapted that were used to establish the validity of the developed CMTS. The CMTI was used to measure the concurrent validity of CMTS, because the CMTI was developed to measure the mental toughness of the cricketers but validated in the Australians and International cricketers (Gucciardi & Gordon, 2009). The SIS was developed to measure the general sport interference during the game. It was developed for the players who are playing as well as enrolled in the universities (Donohue, Silver, Dickens, Covassin & Lancer, 2007). The two bilingual experts and one clinical psychologist were provided with the translated and adapted version of the CMTI and SIS. The experts suggested that item number 25 from the SIS was not relevant with the sample of this study. The item was measure the player’s educational performance and the participants of the current study were mostly not with strong educational background, so item was omitted. Both scales were approved by experts and ready for the next phase of the study.

Phase 3: Pilot Study

Participants and procedure. A pilot study was carried out and basic purpose of this study was to find out the user friendliness of the scale in terms of its language, layout and instructions. For this purpose the 20 participants were selected because this population is not easily accessible an available therefore, to considering the restricted sample size, we to determine the user friendliness

of the scale on relatively a small sample. The purposive sampling was used in which a homogenous sample of group was choose based on the judgement of the researcher. All the selected participants were male cricketers playing at the under-19 and first class level and playing cricket at the national level. The participants took around 15 minutes to complete the scale and they reported no difficulty while understanding and comprehending the Cricketers Mental Toughness Scale (CMTS).

Phase 4: Main Study

Participants. The homogeneous sample of 149 male cricketers were selected through purposive sampling from the cricket clubs of different regions and districts. The participants were informed about the purpose of the study that was to understand and measure the mental toughness in the Pakistani cricketers playing at national level. The participants of the study were with the age range of 16-28 ($M=18.79$, $SD=3.06$) with years of experience $M=4.29$ ($SD=2.61$). Those participants with less than 2 years of experience in playing cricket were not included in the sample. The 149 cricketers sample was comprised 56 batsmen where 4 were also wicket keepers, 44 bowlers and 49 all-rounder's and were playing at under-19 and first class cricket in two regions of Pakistan.

Measures.

Demographic Performa. This performa included the basic characteristic information of the male under-19 and first class cricketers that was based on age, education, years of experience, region, district, and game position.

The Cricketer's Mental Toughness Scale (CMTS). The indigenously developed CMTS was used to measure the level of Mental Toughness present in the cricketers. CMTS, self-report measure comprising 48 items in which cricketer rated their own level of mental toughness on 4 point Likert scale where 0 is "not at all", 1 is "sometimes", 2 is "to some extent" and 3 is "extremely". The instructions for the CMTS were "*Following statements are some behaviours of players they depict during their match. Read each statement carefully and rate yourself that to what extend that statement applies to you*".

The Cricketers Mental Toughness Inventory (CMTI). (Gucciardi & Gordon, 2009) The adapted version of this scale was used to establish the concurrent validity of the scale. This scale is also measuring the construct of mental toughness on 15 items but in the context of Australians Cricketers with the help of 7 point Likert scale. The cricketers was ask to report that as cricketer how much following attributes reflect them where 0 is strongly disagree and 7 strongly agree. The factors were "Affective Intelligence", "Desire to Achieve", "Resilience", "Attentional Control" and "Self Belief" with high reliability and validity in their country context.

The Sports Interference Scale (SIS). (Donohue, Silver, Dickens, Covassin & Lancer, 2007) This scale was adapted and used to establish the discriminant validity of the developed CMTS. The adapted version was based on 25 items that is measuring the interference a players experience during their game. The cricketers were ask to rate them on 7 point rating scale where 0 is strongly disagree and 7 strongly agree.

Procedure

First, to execute the research project the permission to conduct the research was taken from the Institute Research Board (IRB). Further, the participants were approached after getting the written permission from the directors and coaches of the sports complex from where the data were collected. The administration was in the form of group testing where all the participants filled their protocol in the form of 6 to 8 group members. During the group testing first the researcher gave brief introduction of herself and the research work. The purpose of the study was explained to them

briefly and then the participant's willingness for their participation was asked. Those who did not want to participate were not included in the study and 5% of the participants from the overall sample showed unwillingness to participate. The participant that this information will only take for the research purpose and the assurance of confidentiality was also given to the participants. The instructions regarding the administration were given to the participants in the Urdu language for their convenience. The participants were asked to respond on each item of the scales by selecting one out of the four options, i.e. extremely, sometimes, to some extent and not at all. They were further requested not to leave any statement unmarked. After completing the administration, the researcher expressed her gratitude to the participants and to the directors of the sports complex for their cooperation in the research study. Further, the data was analysed by using the SPSS V21.

Results

Factor Analysis

The mental toughness scale was developed now, to analysis the pattern of the mental toughness construct factor analysis was used and for establishing the psychometric properties of the scale further reliability and validity analyses were used. The exploratory factor analysis was carried out with the help of Principal component analysis by using Varimax rotation on the 48 items of the CMTS; 42 items showed significant item-total correlation. Table 1 presenting the high inter-item correlation where items with loading of .40 or above were retained in their respective factor. To check the adequacy of the factor analysis Kaiser-Meyer-Olkin measure was also used and it was found to .82 with the $p < .001$ Bartlett's test of Sphericity.

Scree Plot

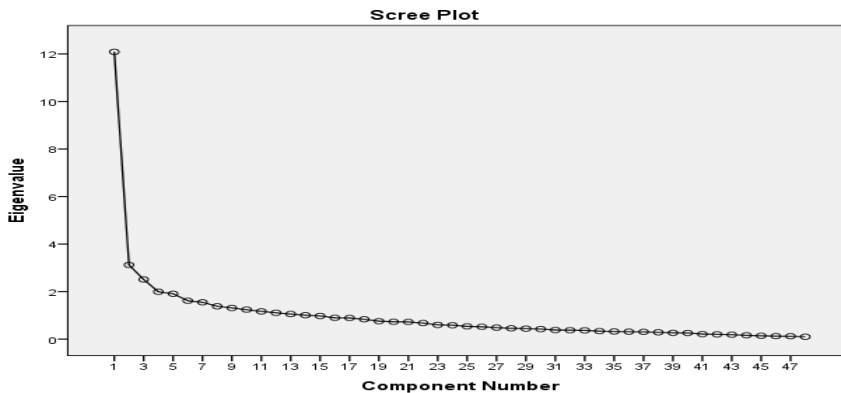


Figure 1. Scree Plot of Cricketers Mental Toughness Scale extracted factors

The Kaiser-Guttman's criterion (Kaiser, 1974) for retaining factors with the greater 1 Eigen value depicted 4 factors to be retained in this item analysis of CMTS.

Table 1

Factor Structure of Cricketers Mental Toughness Scale (CMTS) with Varimax Rotation of 42 Items

Items	Statements	F1	F2	F3	F4
6	Maintain spirit in the match.	.52	.25	.16	.23
8	Show strong will power in the match.	.42	.32	.37	.05
9	Maintain enthusiasm towards game.	.67	-.03	.15	-.03
11	Put efforts to complete the target.	.76	.10	.25	-.06
12	Encourage teammates in tough game.	.43	.25	-.05	.26
15	Maintain focus.	.52	.35	.22	.03
16	Courageously play the match.	.60	.34	.24	.18

17	Compete opponent with determination.	.69	.14	.19	.21
18	Play with thrive.	.59	.31	.20	.05
19	Play confidently.	.63	.43	-.12	.06
23	Clearly explain one's opinion.	.48	.37	.04	.27
31	For winning do hard work.	.80	.23	.06	-.03
34	Believe in one's abilities	.64	.23	.04	.15
35	Enjoy the game.	.48	.16	.16	.24
41	After failure still strive to play.	.49	-.01	-.04	.39
14	Show patience in game.	.27	.54	.30	-.08
20	Able to switch off the attention.	.25	.50	-.12	.06
21	Play with responsibility.	.31	.47	-.15	.16
22	Take care of one's diet.	.07	.43	.09	-.10
26	Know the details of game.	.14	.58	.18	.04
27	Understand quickly opponents plan.	.26	.58	.34	.15
28	Not able to distract easily.	.41	.52	.23	.07
29	Took complete training of the game.	.10	.74	-.12	-.06
30	Aware about opponent's weaknesses.	-.09	.68	.19	-.04
37	Easily adjust in every environment.	.04	.52	.26	.32
43	Able to take decisions.	.17	.55	.15	.35
47	Can control overwhelming emotions.	-.06	.44	.36	.27
48	Transfer coaches training in game.	.18	.55	-.15	.20
1	Maintain interest in game.	.23	.05	.53	.09
2	Control anxiousness.	-.03	.18	.74	.07
3	Control pressure.	.01	-.10	.62	.03
4	Maintain game discipline.	.29	.23	.44	.23
5	Aware about the goal.	.37	.25	.51	.22
33	Constructively use one's anger.	.15	.33	.48	.14
10	Don't accept failure easily.	.15	-.05	.38	.48
32	Control impulsivity.	-.02	.12	.47	.52
38	Believe in one's decisions.	.26	.32	.03	.40
39	Have sense of humour.	.24	-.17	.18	.43
40	Don't overwhelm ones failure.	-.12	.07	.16	.49
42	Not afraid of failure.	.08	.07	-.12	.59
44	Not afraid to take wrong decisions.	-.07	.17	.13	.74
46	Quickly make decisions.	.10	.38	.26	.44
	Eigen Value	6.80	5.72	3.63	3.56
	% of Variance	14.16	11.93	7.56	7.41
	Cumulative %	14.16	26.09	33.65	41.06

Note. Items with factor loadings of .40 and above have been boldfaced

To get the best model 6, 5, and 4 factor solution was observed. Than by using the criterion given by Kline, 1993 those items were retained in a particular factor that is with .40 and above high loading. Items with dubious loading those who have high factor loading on more than one factor were excluded from that factor. The 4 factor solution was considered as the best fit that was representing the clear extracted factors of Cricketers Mental Toughness.

Factor Description

After retaining the 4 factors the content of each factor was observed read in detail and a label was assigned to each factor based on the common theme of the particular factor.

<i>M</i>	39.89	30.21	12.85	16.62	99.58	88.16	72.21
<i>SD</i>	6.17	5.96	3.74	4.61	16.16	11.71	27.52
<i>A</i>	.90	.85	.73	.74	.92	.87	.87

Note. F1=Resilience, F2=Preparation, F3=Emotional Stability, F4=Self Belief, CMTS=Cricketers Mental Toughness Scale, CMTI=Cricketers Mental Toughness Inventory, SIS=Sports Interference Scale, **p*<.05, ** *p*<.01, ****p*<.001

Discussion

In the current study, the phenomenon of mental toughness as experienced by Pakistani cricketers was explored and further transformed into 4-point self-report measure of cricketers mental toughness scale (CMTS) based on 42 items. Exploratory factor analysis yielded four factors named as; “Resilience”, “Preparation”, “Emotional Stability” and “Self-belief”. The factor structure of CMTS is found to be different from the western mental toughness measure (e.g., CMTI; Gucciardi & Gordon, 2009). The common factors between CMTI and CMTS were resilience, emotional stability and self-belief, whereas, CMTS factor “Preparation” seemed to be new in the context of Pakistani cricketers’ mental toughness concept. Also, in CMTS “Resilience” was the first factor and earned higher loading whereas, in CMTI “Affective Intelligence” was the first factor that helped in development of mental toughness. The expression of mental toughness in western society is mostly related to the emotional and cognitive side although it influences the behavioural components of the cricketers too. In CMTS, the expression of mental toughness is related to preparing themselves for the match, ability to transfer training during the match and self-regulation that is followed by emotional and cognitive side of mental toughness.

The first factor CMTS was “Resilience” that means how well a cricketer bounces back from the adverse situation he experiences during the match (Cowden et al., 2016). A Pakistani cricketer needs great deal of passion, will power, devotion, self- determination and hard work to develop and manifest resilience in adversity. During a difficult match, the players need to maintain their concentration toward their goal that helps them to show resilience during the match. Interestingly, the desire to achieve goals as unique factor of mental toughness in CMTI merged in CMTS resilience factor. This showed that resilience develops in our cricketers when they have a desire to achieve their goals regardless of the high level of difficulty they experience because of internal or external pressure factors.

The second factor that is unique in Pakistani cricketer’s mental toughness is “Preparation” of the game. Pakistani cricketers face a great deal of criticism due to their poor discipline and lack of self-regulation and training to be fully equipped before the match. Moreover, they are reproached for lack of ability to generalize and transfer their learning and training during the match. This means that players must engage themselves in constant training and should not take it easy. Jones et al, (2007) defined it as pre-training in the framework of mental toughness development that helps a player to maintain their performance during the game. International players of developed countries get this training at grass root level of cricket. This factor was not found in the CMTI but it was given importance in CMTS. Cricket is played in Pakistan at official level from the age of 16 and above. But seriousness towards the game training is often shadowed by the over confidence of cricketers. They are too sure of their own abilities and this lack of importance to skills training subsequently harms their performance (Orlick, 2008).

The third identified factor is “Emotional Stability” where the players are required to show persistence in regulating their overwhelmed emotions. The players go through a perpetual situation of pressure that adds to their difficulties and makes it hard for them to achieve their goals. Consequently, they get emotionally unstable, lose both their focus and temper. Controlling and

regulating their emotions in this situation is highly important during the game. This may also bring back their focus on their goal of winning. This construct is also present in the western society where it is known as affective intelligence (Gucciardi & Gordon, 2009).

The last factor is “Self-belief”, which leads towards self-confidence among the cricketers. They are able to have faith in themselves and it becomes easier to take risks and difficult decisions and show courage and sportsman’s spirit. The CMTS has high internal consistency and split-half reliability, whereas, moderate level of concurrent and discriminant validity (Miller, McIntire, & Lovler, 2011). Therefore, it can be said that the results show some similarities with the literature. Nevertheless, there is a difference in the “Preparation” factor. This is perhaps because cricketers of Pakistan mostly lack this dimension which is the main reason of losing focus during their game. The constant unnecessary distractions and preoccupations regarding the financial problems, excessive usage of the social media, overthinking on poor performance, etc., also reduce confidence while playing. So, this measure will help the sports psychologist to devise a proper assessment tool for the cricketers.

Conclusion

Mental toughness is considered to be one of the core ingredients of performance in cricket, for it helps the players to attain, as well as, sustain their peak performance. The elements of mental toughness are developed and manifested in accordance to the culture to which the players belong. The current study offers preliminary findings on one of this complex constructs, mental toughness, explored for first time in the context of Pakistani cricketers. The identification of this scale will specify the attributes of mental toughness particularly related to the cricket context that will help in devising the tailor made skills to enhance mental toughness in Pakistani cricketers. Stakeholders of Pakistani cricket, players, coaches, managers and administrative can bring improvement in their training programmes that will certainly enhance mental toughness in cricketers. Also the sport psychology discipline will find platform for future researches in this field. This will give support to future researches in the field of sport.

Future Recommendations

The current study explored the construct of mental toughness and analyse the results through exploratory factor analysis. The results of current study provide preliminary conceptualization for the factor structure and the authenticity of the scale. However, the further advance statistical analyses need to be used to validate the CMTS for the further use of this scale for measuring mental toughness in the Pakistani cricketers. In the future follow-up studies the researcher will conduct confirmatory factor analysis for more rigorous psychometric properties and to also confirm the findings of exploratory factor analysis of Cricketer’s Mental Toughness Scale. This scale can also be used in future as the determinant or consequence of many other factors that played important role in the making the Pakistani cricketers mentally tough during their sport.

References

- Athan, A. N., & Sampson, U. I. (2013). Coping with pre-competitive anxiety in sports competition. *European Journal of Natural and Applied Sciences*, 1(1), 1-9.
- Bull, S. J., Shambrook, C. J., James, W., & Brooks, J. E. (2005). Towards an understanding of mental toughness in elite English cricketers. *Journal of Applied Sport Psychology*, 17, 209-227. Doi:10.1080/10413200591010085
- Connaughton, D., & Hanton, S. (2009). Mental toughness in sport: Conceptual and practical issues. In S. D. Mellalieu & S. Hanton (Eds.), *Advances in applied sport psychology: A review* (pp. 317-346). London: Routledge.

- Connaughton, D., Hanton, S., & Jones, G. (2010). The development and maintenance of mental toughness in the world's best performers. *The Sport Psychologist, 24*, 168-193.
- Cowden, R. G., Meyer-Weitz, A., & Asante, K. N. (2016). Measuring resilience in competitive tennis players: Psychometric properties of the resilience scale for adults. *Frontiers in Psychology, 7*, 1-9. Doi: 10.1177/0081246316644151
- Clough, P. J., Earle, K., & Sewell, D. (2002). Mental toughness: The concept and its measurement. In I. Cockerill (Ed.), *Solutions in Sport Psychology* (pp. 32-43). London: Thomson.
- Crust, L. (2008). A review and conceptual re-examination of mental toughness: Implications for future researchers. *Personality and Individual Differences, 45*, 576-583.
- Donohue, B., Silver, N. C., Dickens, Y., Covassin, T., & Lancer, K. (2007). Development and initial psychometric evaluation of the sport interference checklist. *Behaviour Modification, 31*(6), 937-957. Doi: 10.1177/0145445507303827
- Gucciardi, D.F., & Hanton, S. (2016). Mental toughness: Critical reflections and future considerations (pp. 439-448). In R. Schinke, K. McGannon, & B. Smith (Eds.), *The Routledge International Handbook of Sport Psychology*. New York, NY: Routledge.
- Gucciardi, D.F., & Gordon, S. (2009). Development and preliminary validation of the Cricket Mental Toughness Inventory. *Journal of Sports Sciences, 27*, 1293-1310.
- Gucciardi, D. F., Jackson, B., Coulter, T. J., & Mallett, C. J., (2010). The connor-davidson resilience scale (CD-RISC): Dimensionality and age-related measurement invariance with Australian cricketers. *Psychology of Sport and Exercise, 1*, 1-41. Doi: 10.1016/j.psychsport.2011.02.005
- Gucciardi, D. F., & Gordon, S. (2011). A strength-based approach to coaching mental toughness. *Journal of Sport Psychology in Action, 2*(3), 143-155. Doi: 10.1080/21520704.2011.598222
- Gucciardi, D. F., Gordon, S., & Dimmock, J.A. (2009). Advancing mental toughness research and theory using personal construct psychology. *International Review of Sport & Exercise Psychology, 2*, 54-72.
- Hanton, S., Evans, L., & Neil, R. (2003). Hardiness and the competitive anxiety response. *Anxiety, Stress and Coping: An International Journal, 16*, 167-184.
- Hanton, S., Fletcher, D., and Coughlan, G. (2005). Stress in elite sport performers: A comparative study of competitive and organizational stressors. *Journal of Sports Sciences, 23*(10), 1129-1141. Doi: 10.1080/02640410500131480
- Humara, M. (1999). The relationship between anxiety and performance: A cognitive-behavioral perspective. *Athletic Insight, 1*(2), 1-14.
- Jones, G., Hanton, S., & Connaughton, D. (2007). A framework of mental toughness in the world's best performers. *The Sport Psychologist, 21*, 243-264.
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika, 39*, 31-36.
- Khan, A. (2016, June 3). Anyone representing Pakistan cricket team has to face an unfathomable psychological battle. *The Nation*. Retrieved from <http://nation.com.pk/blogs/03-Jun-2016/anyone-representing-pakistan-cricket-team-has-to-face-an-unfathomable-psychological-battle>
- Kline, P. (1993). *Handbook of psychological testing*. London: Routledge.
- Kobasa, S. C. (1979). Stressful life events, personality, and health: An inquiry into hardiness. *Journal of Personality and Social Psychology, 37*, 1-11.
- Loehr, J. E. (1986). *Mental toughness training for sports: Achieving athletic excellence*. Lexington, MA: Stephen Greene.
- Mahmood, Z. (2010). How can psychology help in sports? *The Clinical Psychologist, 1*(2), 5-6.
- Miller, L.A., McIntire, S.A. & Lovler, R. L. (2011). *Foundations of Psychological Testing* (3rd ed.). Thousand Oaks, CA: Sage Publishing Co.
- Mellalieu, S. D., Hanton, S., & Fletcher, D. (2009). *A Competitive Anxiety Review: Recent Direction in Sport Psychology Research*. New York: Nova Science Publishers.
- Moran, A. (2012). *Sports and Exercise Psychology*. London: Rontledge.

- Orlick, T. (2008). *In Pursuit of Excellence*. Champaign, IL: Human Kinetics.
- Raja, R. (2015, April 26). Pakistan cricket at lowest point in international history. *Dawn Sport*. Retrieved from <http://www.dawn.com/news/1178336>
- Sacks, D. N., Petscher, Y., Stanley, C. T., & Tenenbaum, G. (2003). Aggression and violence in sport: Moving beyond the debate. *International Journal of Sport and Exercise Psychology, 1*, 167-179.
- Tedesqui, R. A. B., & Glynn, B. A. (2013). "Focus on what?": Applying research findings on attentional focus for elite-level soccer coaching. *Journal of Sport Psychology in Action, 4*(2), 122-132. Doi: 10.1080/21520704.2013.785453.
- Thelwell, R., Weston, N., & Greenlees, I. (2005). Defining and understanding mental toughness in soccer. *Journal of Applied Sport Psychology, 17*, 326-332.
- Waqar, Y. (2015, April 20). Pakistan cricket is in trouble. *Dawn Sport*. Retrieved from <http://www.dawn.com/news/1177128>
- Woolmer, R., Noakes, T., & Moffett, H. (2008). *Bob Woolmer's Art and Science of Cricket*. London: New Holland Publishing.

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