Analysis of mental toughness of Indian elite long distance athletes

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Abstract
The aim of the present study was to analyze the mental toughness between female and male long distance runners. For the purpose of the study ten female and ten male long distance runners were selected purposively as subjects who fall between the age group of 18 to 35 years. Data were obtained from Sports Authority of India Banglore, Bhosle Athletic academy Nasik and LNIPE Gwalior. Selected psychlogical variable Psychological Performance Inventory was used made up of 42 items that are divided into 7 subscales i.e., self-confidence -2.03, negative energy control -0.28, attention control 1.57, visual/imagery control -0.36, motivational level -2.00, positive energy control -1.31, and attitude control -0.98. Independent T test was used at 0.05level of significance. The calculated t-value self-confidence, negative energy control, attention control, motivational level, attitude control, positive energy control and attitude control which were greater than 0.05level of significance. It concluded that there were no significance differences betweent female and male long distance runners.

Keywords: Psychological performance inventory, long distance runners, female and male

Introduction

"Mental toughness" is the ability to communicate with yourself especially when you are under pressure. Everyone has some degree of mental – toughness. We all have a point at which we falter – when a situation begins to negatively affect our performance. This is the first indicator that mental toughness is being challenged. Anyone can train to improve his or her current level of mental toughness. The most common techniques include visualization, relaxation, energization, self-talk and goal setting [5].

[1] Suggested a mentally tough athlete has "a high sense of self-belief and an unshakable faith that they control their own destiny, these individuals can remain relatively unaffected by competition and adversity". Clough and colleagues proposed that mental toughness (MT) consists of a number of components labelled the 4Cs: (a) control (emotional and life), a tendency to feel and act as if one is influential, (b) commitment, a tendency to involve oneself in rather than experience alienation from an encounter, (c) challenge, belief that life is changeable and to view this as an opportunity rather than a threat and (d) confidence (interpersonal and in abilities), a high sense of self – belief and unshakable faith concerning one's ability to achieve success. To date, researchers have tended to focus on defining and describing MT without exploring the relationship between MT and variables such as achievement level, gender, age, sporting experience, or sport type.

Despite scholars citing MT as a crucial construct in determining athletic success [7], research concerning achievement level and MT is meager. A study by [4] examined MT among a sample of 115 male rugby league players of international, Super League, and Division 1 standard. Small differences in negative energy and attention control were found. However, comparing athletes with greater variability in achievement level may reveal larger differences. In a different study, [8] explored MT between elite and non-elite Korean female athletes. The elite athletes were more mentally tough than their non-elite counterparts, although no differences were found for arousal and attention control. we predicted that higher levels of achievement would be associated with higher levels of MT. Following [3] it was predicted that older and more experienced athletes would exhibit higher levels of MT. We also hypothesized males and team sport athletes would report higher MT scores than females or individual sport athletes. This is because confidence is a key component of MT [2], and males have been reported as being more confident than females and team sport athletes more confident than individual sport athletes [11].

Coaches and athletes alike are searching for competitive advantages. This search has typically led to the development of physical or technical training programs. Many coaches and athletes have become aware of the importance of mental skills in sports and are placing more emphasis on the development of these skills. The development of these mental skills is not only important for those with the desire to win, but for those with a desire to become more consistent performers. Currently, within both scientific and coaching communities, mental toughness is now regarded as one of the most important psychological factors associated with achieving performance excellence in any sport.

In order to be mentally tough on the race, you must have talent and be in peak physical condition. Your technical skills have to be sharp. It is also important to recognize that the physical, emotional and mental side affects each other. MT training allows players to tap into emotional and mental resources that keep play at its prime as often and constantly as

possible.

Materials and methods Selection of the subjects

To serve the purpose of the 10 female and 10 male athletes were purposively selected from long distance running; age ranged 18 to 35 years from Bhosle athletic academy, Nasik, Sports Authority of India, Banglore and LNIPE Gwalior who at least International, National and All India participated.

Selection of the variables

According to the discussion with experts, feasibility, criteria, availability of instruments, equipments and relevance of present study Psychological Performance Inventory was used.

Criterion measure

Mental toughness: Mental toughness is a trained skill that helps you cope with challenging situations. Mental toughness is also a broad term that indicated the strength of your overall mental game [14].Psychological Performance Inventory It is a useful psychometric instrument to measure individual's mental toughness. Mental toughness test is personal awareness version, which focuses on, the score range for seven broad personalities and behavioural factors that are associated with succcess in competitive activity. The idea of mental toughness and the ability to develop mentally tough athletes is a socially popularized concept.This questionnaire was propounded by Loehr, 1982 and made up of 42 items that are divided into 7 subscales i.e.

1. **Self confidence:** Positive cognitions, feelings and images about what one can do and achieve.
2. **Negative energy control:** The ability to control negative emotions such as fear, anger, frustation resentment.
3. **Attention control:** The ability to sustain a continuous focus on the task at hand.
4. **Visual / imagery control:** The ability to think in positive and supportive images and the ability to control the flow of mental images in a positive and constructive direction.
5. **Motivational level:** The willingness to preserve with training schedules and to endure the pain, discomfort and self – sacrifice associated with forward progress.
6. **Positive energy control:** The ability to become energized through fun, joy, determination, positivity and team spirit.
7. **Attitude control:** Control over one's habits of thought reflecting the extent to which one's personal attitudes are consistent with those of successful high-level performances.

Administration of the questionnaire and collection of data The questionnaire was administered to the female and male long distance runners. Before administering the questionnaire, all the necessary information regarding the questionnaire was given to the participants and doubt has cleared by the researcher herself. All the subjects had filled their responses by themselves once only. After the successful completing the test, all the collected data was analyzed to draw a conclusion with regard to the hypothesis.

Statistical Procedure

In order to examine the hypothesis of the study, descriptive statistics such as mean, standard deviation, comparative statistics independent T test was used at 0.05 level of significance with the help of SPSS 18 version.

Analysis of data

Table 1: Descriptive statistics of female and male long distance runners in psychological performance inventory

Variables	Groups	N	Mean	SD	Std. Error
SC	Female	10	13.80	1.62	0.51
	Male	10	16.00	3.02	0.95
	Total	20	29.8	4.64	1.46
NEC	Female	10	18.00	2.71	0.86
	Male	10	18.40	3.63	1.15
	Total	20	36.4	6.34	2.01
AC	Female	10	17.70	2.11	0.67
	Male	10	16.20	2.15	0.68
	Total	20	33.9	4.26	1.35
VC	Female	10	11.00	2.26	0.71
	Male	10	11.60	4.84	1.53
	Total	20	22.6	7.1	2.24
ML	Female	10	9.50	2.59	0.82
	Male	10	11.40	1.51	0.48
	Total	20	20.9	4.1	1.3
PEC	Female	10	10.60	1.65	0.52
	Male	10	11.90	2.69	0.85
	Total	20	22.5	4.34	1.37
ATC	Female	10	11.20	1.48	0.47
	Male	10	12.00	2.11	0.67
	Total	20	23.2	3.59	1.14

Table 1 shows the mean and standard deviation of mental toughness with sub scales i.e., self-confidence, negative energy control, attention control, visual/imagery control, motivational level, positive energy control and attitude control are 29.8±4.64, 36.4±6.34, 33.9±4.26, 22.6±7.1, 20.9±4.1,
22.5±4.34, and 23.2±3.59 respectively among female and male long distance runners.

Table 2: Levene's test for equality of variances among groups

Variables	F-value	P value
SC	7.36	0.01
NEC	1.29	0.27
AC	0.22	0.65
VC	2.13	0.16
ML	3.41	0.08
PEC	4.30	0.05
ATC	0.63	0.44

To test the equality of variances Levene's test was used. In table 2, F- value of NEC, AC, VC, ML, AND ATC are 1.29, 0.22, 2.13, 3.41, and 0.63 which are insignificant as the p
value are .27, 0.65, 0.16, 0.08, and 0.44 which are more than
.05 except SC and PEC was found significant as F-value are
7.36 and 4.30 as p value are 0.01 and 0.05 which is less and equal to 0.05. Thus, the null hypothesis of equality of variances may be accepted in most of variables except SC and PEC. It is concluded that the variances of the most groups are equal except SC and PEC.

Table 3: Independent T test for the data on all sub-scales of mental toughness

Variables	Mean difference	SE of means difference	t-value	P value
SC	-2.20	1.08	-2.03	0.06
NEC	-0.40	1.43	-0.28	0.78
AC	1.50	0.95	1.57	0.13
VC	-0.60	1.69	-0.36	0.73
ML	-1.90	0.95	-2.00	0.06
PEC	-1.30	1.00	-1.31	0.21
ATC	-0.80	0.81	-0.98	0.34

It can be seen from table 3 that the value of t-statistics are - 2.03, -0.28, 1.57, -0.36, -2.00, -1.31, and -0.98. This t value is
insignificant as their p values are 0.06, 0.78, 0.13, 0.73, 0.06, 0.21, and 0.34 which is more than .05. Thus, the null hypothesis of equality of population means of two groups is accepted, and it may be concluded that there is no significant difference in mental toughness in female and male long distance athletes.

Discussion and findings

Long distance races need a specific type of determination ability, pain bearing qualities under uncomfortable situation for prolonged period of time. They sweat profoundly, and lot of minerals is lost during this sweating process resulting mental stress which has to be coping up effectively. So, their psychological traits vary according racial, demographical region and it may also vary on gender basis. Here the researcher wanted to see whether the gender can be a determental factor in psychological traits i.e. self-confidence, negative energy control, attention control, motivational level, visual/imagery control, positive energy control and attitude control. Most of the variables found insignificant on the basis of gender differences in psychological traits of 7 subfactors. Similar results reported by [10].

Mental stress and coping stratigies of an individual runner plays a significant role on their performance [6]. As the athletes is determined to cover the target distances as per the training schedule i.e., high intensity pace or time duration or the distance to be covered in kilometers, lot of patience and will power is required. As many athletes quit the races during hard training that could be due to their mental strength differences. As in the study the researcher investigated twenty Indian female and male athletes who had participated at international level. The researcher was enquisitive to know whether these level of achievement differes on the basis of gender. It was observed that there were no significant

differences in any variables of mental toughness between female and male this is in consonence of study carried out by [12] as the p value in table 3 clearly shows it is more than 0.05 in all the variables. However the mean difference in NEC found higher in male athletes (18.40) than female (18.00) because girls has higher stress level in comparison to the male in india due to social restrictions [13] whereas the another variable that is mean difference (20.9) in the motivational parameter was least influence by gender. These results could be due to the smaller sample size. This study may be further investigated on large sample size and with more psychological variables to assess their psychological traits.

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