

EXPLORING MENTAL TOUGHNESS IN SOCCER PLAYERS OF DIFFERENT LEVELS OF PERFORMANCE

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ASBTRACT: The objective of the present study was to assess mental toughness in two groups of soccer players of different levels of performance. The participants included 242 male soccer players, ranging from 14 to 19 years of age who participated in official competitions for under 16s and under 19s. The Mental Toughness Index (MTI) was used and they were asked three questions related to their perception of their capacity to reach higher levels. Results show significant differences between under 16 players and under 19 players. Some differences were also observed between players of UD Las Palmas and the other teams. Overall, results appear to indicate that from an early age, some differences in regard to mental toughness can be found depending on the level of performance. This study provides data of very young athletes and uses an instrument which had never been used on Spanish soccer players. Further research in this field would be interesting, focusing on younger subjects and other individual and team sports.

KEYWORDS: Mental Toughness, Mental Toughness Index, soccer, Young people, Spanish.

EXPLORANDO LA FORTALEZA MENTAL EN JÓVENES FUTBOLISTAS DE DIFERENTES NIVELES DE RENDIMIENTO

RESUMEN: El objetivo del presente estudio era evaluar la fortaleza mental de dos grupos de futbolistas con diferentes niveles de rendimiento. Los participantes fueron 242 futbolistas masculinos, con edades comprendidas entre los 14 y 19 años y participantes en competición oficial en categorías cadete y juvenil. Se administró el Mental Toughness Index (MTI) y se les planteó tres preguntas relacionadas con su percepción en cuanto a su capacidad de alcanzar niveles más altos. Los resultados muestran diferencias significativas entre jugadores cadetes y juveniles. También se aprecian algunas diferencias entre jugadores de la UD Las Palmas y de los otros equipos. En general, los resultados parecen indicar que ya desde edades tempranas se aprecian ciertas diferencias en la fortaleza mental según el nivel de rendimiento. Este estudio procura datos de deportistas muy jóvenes y la utilización de un instrumento no utilizado en futbolistas españoles. Sería interesante que futuras investigaciones incluyeran sujetos de edades aún más tempranas y que también sean considerados otros deportes tanto colectivos como individuales.

PALABRAS CLAVE: Fortaleza mental, Mental Toughness Index, fútbol, jóvenes, español.

EXPLORANDO A ROBUSTEZ MENTAL EM JOVENS FUTEBOLISTAS DE DIFERENTES NÍVEIS DE RENDIMENTO

RESUMO: O objetivo do presente estudo foi avaliar a robustez mental em dois grupos de futebolistas com diferentes níveis de rendimento. Os participantes foram 242 futebolistas masculinos, com idades compreendidas entre os 14 e os 19 anos, que competiam oficialmente nas categorias cadete e juvenil. Foi administrado o questionário Mental Toughness Index (MTI) e, adicionalmente, foram colocadas três questões relacionadas com a sua perceção relativamente à capacidade para atingirem níveis mais elevados. Os resultados revelaram diferenças significativas entre jogadores cadetes e juvenis. Também se constatou a existência de algumas diferenças significativas entre jogadores de la UD Las Palmas e das restantes equipas. Em geral, os resultados parecem indicar que já desde idades iniciais se observam certas diferenças na robustez mental dependendo do nível de rendimento. Este estudo centrou-se na análise de dados de desportistas muito jovens e na utilização de um instrumento não utilizado em futebolistas espanhóis. Seria interessante que futuras investigações se debruçassem sobre futebolistas ainda mais jovens bem como sobre outros desportos, sejam eles coletivos ou individuais.

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Over the past 15 years, a lot of emphasis has been placed on the concept of mental toughness in the field of Sport and Exercise psychology. Mental toughness has been defined as “a collection of values, attitudes, emotions, and cognitions that influence the way in which an individual approaches, responds to, and appraises demanding events to consistently achieve his or her goals” (Gucciardi, Gordon, & Dimmock, 2009, p. 54). However, Middleton, Marsh, Martin, Richards, and Perry (2004) defined mental toughness as “an unshakeable perseverance and conviction towards some goal despite pressure or adversity”. The many definitions and understandings of mental toughness have caused controversy and a considerable number of reviews on this literature have been written (Connaughton et al., 2008; Cowden, 2017; Crust, 2008; Gucciardi, 2017a; Jones, Hanton & Connaughton, 2002) this has led to independent streams of empirical research (for reviews, see Gucciardi & Gordon, 2011), yet more agreement on common elements of a concept is required before such bodies of knowledge can contribute to its evolution (Suddaby, 2010).

The personal nature of mental toughness is the most striking aspect of the definitions given so far as it is a quality which lies within the individual. The notion of being able to resist or endure challenging or adverse situations is also inherent within these definitions. For instance, Jones et al. (2002) associated mental toughness to “being more consistent and superior to opponents”, whereas Coulter, Mallett & Gucciardi (2010) described it as the presence of some or the entire collection of experientially developed and inherent values, attitudes, emotions, cognitions, and behaviors that influence the way in which an individual approaches, responds to, and appraises both negatively and positively construed pressures, challenges, and adversities to consistently achieve his or her goals.

Likewise, mental toughness is considered to be a multidimensional construct that encompasses a variety of cognitive, emotional, and behavioral dimensions and it is important in sports as it is related to performance (Bull, Shambrook, James & Brooks, 2005; Clough, Earle, & Sewell, 2002; Connaughton, Wadey, Hanton & Jones, 2008; Crust & Clough, 2005; Jones et al., 2007).

Despite the literature acquired, Jones et al. (2002) lament the lack of conceptual clarity which is still present surrounding mental toughness as, although significant progress has been made and some of the key characteristics of this construct have been agreed upon (Crust, 2007), there are still important loopholes.

In any case, this concept should not be mistaken for others which are closely related such as hardiness, coined by Kobasa (1979) given that they are not exactly the same (Clough et al., 2002; Crust, 2007; Gucciardi, 2017a; Madrigal, Hamill & Gill, 2013) or resilience (Coulter et al., 2010; Cowden, 2017; Gucciardi, Hanton, Gordon, Mallett, & Temby, 2015).

The methodology used for the research, whether it is qualitative or quantitative, has consistently shown a series of components, characteristics or attributes that appear such as self-confidence, commitment, self-motivation, advancing in

competence and challenges, conserving psychological control under pressure, optimism resilience, hope, perseverance, focusing and concentration abilities (Crust, 2007; Crust & Swann, 2011; Gould et al., 2002; Gucciardi et al., 2008; Sheard, 2010; Stajkovic, 2006). As shown, this construct includes a wide range of components, characteristics or attributes (Gould, Dieffenbach & Moffett, 2002; Guillén & Laborde, 2014).

Early literature on mental toughness, that goes as far back as the end of last century and the beginning of this century, was initially of qualitative nature (Bull, et al., 2005; Jones, Hanton & Connaughton, 2002; Middleton et al., 2004; Thelwell Weston & Greenlees, 2005), and gradually research became more quantitative (Crust & Clough, 2005; Gucciardi, 2009; Hagag & Ali, 2014; Ponnusamy, Lines, Zhang, & Gucciardi, 2017; Weissensteiner et al., 2012), which mainly used mental toughness questionnaires and in other occasions questionnaires containing some of the multiple characteristics or attributes within the umbrella of mental toughness (Guillén & Laborde, 2014; Laborde, Guillén & Mosley, 2016; Laborde, Guillén, Watson & Allen, 2017).

Qualitative studies attempted to develop a knowledge base in the field of mental toughness, however, in most cases; they resulted in replicates of previous findings. (Anthony, Gucciardi & Gordon, 2016; Fourie & Potgeiter, 2001; Jones et al., 2002). Furthermore, these studies focused excessively on elite performers and assumed that super elite performers (Gold Olympic or world medal holders) are mentally tougher than elite athletes (silver medal holders). In this sense, Jones and Moorhouse (2007) claimed that athletes who were mentally tough were “better” when they have to face challenging circumstances; however, this is problematic given that these researchers failed to compare with athletes who were less successful or mentally tough. Although it seems reasonable to assume that mentally tougher athletes face challenging circumstances better, it is evident that the descriptive nature of most of the literature on mental toughness has not, to date, proved to be satisfactory. This may be questionable if the other multiple factors that determine success are taken into consideration. In any case, the assumption that mental toughness is the key factor to success or the differential factor among the greatest soccer players is still speculation. For this reason, further comparative studies are required in this field although in order to do this, instruments with adequate psychometric properties are necessary. (Crust, 2008; Gucciardi et al., 2008).

The Psychological Performance Inventory (PPI; Loehr, 1986), which consisted of 42 items, was most probably the first instrument to measure mental toughness, however, it was theoretically and conceptually limited. Golby, Sheard, & van Wersch, (2007) highlighted its psychometric limitations to such an extent that the proposal of seven factors received no support. Later, Gucciardi (2012) also expressed his concerns in terms of the conceptual and methodological problems of the PPI and the PPI-A.

After nearly a decade, at the beginning of this century, a new race to develop instruments to measure mental toughness emerged.

One of the first instruments was the Mental Toughness Questionnaire 48 (MTQ 48; Clough, Earle, & Sewell, 2002). This was a 48-item questionnaire that not only offers an overall score but also scores for each of the sub dimensions, commitment, emotional control, life control, challenge, interpersonal confidence and confidence in abilities. However, its factorial structure has been questioned. (Gucciardi, 2017b; Gucciardi, Hanton y Mallett, 2012).

The Mental Toughness Inventory (MTI; Middleton et al., 2004) is an instrument consisting of 67 items that provide information about the overall score and the score of 12 components of mental toughness.

The Mental Toughness Questionnaire (MTQ), by Cherry (2005) is an 18-item questionnaire designed to evaluate an individual's competitive desire, focus, self-confidence, and resiliency.

The Mental, Emotional, and Bodily Toughness Inventory (MeBTough; Mack, & Ragan (2008) is a questionnaire that has not been widely used. It initially consisted of 45 items but was later reduced to 43 items.

Immediately after, the Sports Mental Toughness Questionnaire (SMTQ; Sheard, Golby & van Wersch, 2009) was developed. It consisted of 14 items and three factors (Confidence, Constancy, and Control).

Later, Madrigal, Hamill & Gill (2013) developed the Mental Toughness Scale (MTS), which initially consisted of 54 items but was later reduced to 11 items.

The Mental Toughness Factors in Sport (IMTF-S) by Stonkus & Royal (2015), which was published recently, consists of 40 items and covers four subdimensions (Motivation, Identification, challenge and Determination) each of which contain 10 items.

Simultaneously, the Mental Toughness Index (MTI; Gucciardi et al., 2015) was also published. It is the shortest of the existent questionnaires with only 8 items

Lastly, Vaughan, Hanna & Breslin (2018) developed an abbreviated version of the MTQ48, specifically, Mental Toughness Questionnaire 18 (MTQ18)

Given that the study of mental toughness is relatively recent, only two decades, there is not a lot of literature on this topic, nonetheless, the multiple instruments that have been created to measure it is outstanding. The scarcity of literature and abundance of instruments may possibly be the reason why results are not consistent.

Hence, the need for further research in this area is evident, using the existent instruments and employing adequate psychometric properties.

The purpose of this study was to compare mental toughness in young soccer players from an early age and with different levels of performance. The aim was, on the one hand, to study mental toughness at a very young age on the basis of their level of performance. On the other hand, the aim was to contrast the assessment in young athletes of two different age groups.

METHOD

Participants

The participants were 242 soccer players, 117 played for la Unión Deportiva Las Palmas and 125 were players from other teams on

the island of Gran Canaria, mean age was 16.38 ($DT = 1.38$), ranging from 14 to 19 years of age, they participated in the categories under 16s ($n = 99$) and under 19s ($n = 143$). This sample consisted of men who played soccer at least four times a week for a federated team. The players of UD Las Palmas, within the different categories, under 16s and under 19s held the first position of their category. In the final classification, the players of the other teams who participated were in the second or third position of their corresponding categories.

Instruments

This study was conducted using a sociodemographic questionnaire which provided information on gender, age, category, position played and the team in which they played.

Likewise, the Mental Toughness Index (Gucciardi, Hanton, Gordon, Mallett, & Temby, 2015) was used. An example of one of the 8 items of this questionnaire would be: *"I believe in my ability to achieve my goals"*. Participants respond to each item on a 7-point scale where 1-4 corresponds to "totally false" and 4-7 is "totally true". The score for reliability in the questionnaire presented in this study was .78. It was translated in accordance with the parallel back-translation method proposed by (Brislin, 1986). It was translated from English to Spanish and then translated to English by another expert. They were then compared by psychologists to verify that the items contained the same meaning.

Finally, the players were asked three direct questions which were to be answered on a scale of 1 to 10, do you believe in your ability to play in a superior category? Do you believe in your ability to play for your country? Can you see yourself playing for a team of the First Division?

Procedure

The objectives of the study were explained to the participants who were offered to participate voluntarily. The parents or guardians of the underage participants were asked to sign informed consent and authorization forms. The tests were performed by one of the authors of the present study prior to the training sessions.

Statistical analysis

The data obtained was analyzed using IBM SPSS Statistics 23 for Windows 10.

Normality and homoscedasticity of the variables was verified prior to the analysis.

A descriptive analysis was performed on the construct of mental toughness using the Mental Toughness Index (MTI), as well as three items that cover self-perception of level of capability. The descriptive analysis calculated the typical deviations and mean of the players as a whole. Afterwards, the mean differences of those aspects were calculated according to the category of the participants, according to the team and according to the position they played in. Finally, a correlation study was performed for age, the three questions posed and the MTI.

The effect was calculated following the suggestions of Kline (1998), who advised calculating Cohen's d effect size to obtain the effect-size index for the latent mean differences. The effect size between the score obtained for the overall MTI and the level of

the team is large (0.66), whereas the effect size in the overall MTI and the category are small and below the minimum size effect recommended by Cohen (Cohen, 1988)

RESULTS

As shown in table 1, differences have been found between both categories, under 16s and under 19s, for the scale and the three questions posed. Significant differences can also be observed in

the overall score of MTI although the effect size was small ($d = 0.17$), among the under 16 and under 19 soccer players and also in regard to the question *do you believe in your ability to play in a superior category?* ($p = .000$). No significant differences were observed among the players of UD Las Palmas, however, there were significant differences among the players of the other teams ($t = -2.60$; $p = .010$) among the under 16s ($M = 5.50$; $DT = 0.67$) and the under 19s ($M = 5.83$; $DT = 0.72$).

Table 1
Descriptive analysis and mean differences of MTI and the questions posed, according to categories

	General	UNDER 16s	UNDER 19s	<i>t</i>	<i>p</i>
	<i>N</i> = 242	<i>n</i> = 99	<i>n</i> = 143		
	<i>M</i> (<i>DT</i>)	<i>M</i> (<i>DT</i>)	<i>M</i> (<i>DT</i>)		
MTI	5.90 (.667)	5.78 (.698)	5.98 (.634)	-2.331	.023
To play in a superior category	8.83 (1.52)	8.37 (1.78)	9.14 (1.22)	-3.964	.000
To play for your country	7.29 (2.38)	7.13 (2.52)	7.39 (2.28)	-.835	.404
First Division team	7.48 (2.50)	7.37 (2.58)	7.55 (2.45)	-.546	.566

As shown in Table 2, mean differences are present in both team groups, on the one hand UD Las Palmas and, on the other hand, the other teams on the island of Gran Canaria that play in the same category. Significant differences can be observed for mental toughness using the MTI with a large effect size ($d = 0.66$) and in two of the questions posed, the ability to play for your country ($p = .000$) and seeing yourself playing for a team of the First Division ($p = .000$).

When considered individually, significant differences were found among the under 16 soccer players ($t = 4.49$; $p = .000$) among the players of UD Las Palmas ($M = 6.07$; $DT = 0.60$) and the players of the other teams ($M = 5.50$; $DT = 0.67$). Significant differences were also found among the under 19 soccer players ($t = 3.13$; $p = .002$) among the players of UD Las Palmas ($M = 6.15$; $DT = 0.47$) and the players of the other teams ($M = 5.83$; $DT = 0.72$).

Table 2
Mean differences of MTI and the questions posed, according to the team they belong to

	UD LAS PALMAS	OTHER	<i>t</i>	<i>p</i>
	<i>n</i> = 117	<i>n</i> = 125		
	<i>M</i> (<i>DT</i>)	<i>M</i> (<i>DT</i>)		
MTI	6.12 (.530)	5.70 (.717)	5.183	.000
To play in a superior category	8.97 (1.27)	8.69 (1.71)	1.466	.144
To play for your country	8.18 (1.90)	6.45 (2.48)	6.055	.000
First Division team	8.37 (1.65)	6.65 (2.85)	5.679	.000

As shown in Table 3, correlations of age, MTI and the questions posed were found. Positive correlations were observed between age and MTI, and the ability to play in a superior category. Moreover, positive correlations were also found between MTI and the perception the young players have of their ability to play for their country or a 1st Division team.

possible differences in mental toughness among soccer players of teams of different levels of performance.

Table 3
Correlations of age, MTI and questions posed to the players

	1	2	3	4	5
Age	1	.166**	.240***	.110	.095
MTI		1	.420***	.538***	.524***
Superior Cat.			1	.587***	.626***
Country				1	.812***
1st Division					1

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

DISCUSSION

To date, there is very little literature on mental toughness in young male soccer players, specifically under 19s. Consequently, the purpose of this study was to acknowledge the existence of

For this reason, the participants chosen were, on the one hand, soccer players from lower levels of the Spanish 1st division team, all of which were in the first position of their category in the championship classification, and on the other hand, soccer players in teams belonging to the same category but in a lower position.

We considered that it was especially interesting to study mental toughness in adolescence, and for this reason we chose soccer players in the categories of under and under 16s and under 19s. The reason these categories were chosen was to verify if differences could be observed at this age if you already from these ages were appreciated differences in mental strength.

Furthermore, this study has provided two nouvelles aspects in relation to age. One of which is related to differences in mental toughness according to age and, the other is that the subjects of the study are young. Cowden (2017) mentioned in a recent study that only four studies have been conducted with subjects between 14 and 18 years old.

The results obtained in the study show greater mental toughness in under 19 players than in the under 16 players, although the effect size was small. The results obtained in previous research by Connaughton et al. (2008) appear to confirm this assumption. Nevertheless, and despite scarce literature which considers age, there is sufficient evidence that indicates that older subjects show more mental toughness (Dress & Mack, 2012; Gucciardi, Peeling, Ducker, & Dawson, 2016; Zeiger & Zeiger, 2018), which may be due to experience, given that older athletes have more years of experience in sport or it could also be related to biological changes in individuals.

The manner in which the level of performance has been considered varies, for instance, in some occasions it was considered according to the level of the athletes, international or national, in other occasions depending on whether they were amateurs or professional. In these cases, the contrast is substantial, which favors the detection of differences. However, in this study, we considered that it was more appropriate to consider the team's position in the classification, as well as belonging to an elite team, which implies social recognition. We believe this perspective equals the participants and focuses solely on the position obtained and the recognition that being part of a great team entails.

Given their level of performance and as members of the most representative team of their region, the players of UD Las Palmas showed higher levels of mental toughness than players from the other teams who obtained a lower position, and in turn, less social recognition. This is consistent with the findings by Danielsen, Rodahl, Giske, & Hnigaard (2017) in Norwegian soccer players who responded to the SMTQ. Significantly higher scores in MT were found in 1st division players than in 3rd division players. However, no differences were found between the 1st and 2nd division or between 2nd and 3rd division. However, no differences were found between the 1st and 2nd division players or between 2nd and 3rd division players. These findings also coincide with those obtained in other studies, although other instruments were used (Connaughton & Hanton, 2009; Elemiri & Aly, 2014; Golby & Sheard, 2004; Gucciardi & Gordon, 2011; Mohammadzadeh, Boostani & Boostani, 2009; Shin & Lee, 1994).

Another contribution of the present study is the use of a questionnaire of mental toughness questionnaire such as the Mental Toughness Index (MTI) in soccer, as this questionnaire has been used very little given its recent creation. One of the major problems in the study of mental toughness has been the variety of instruments used (Cowden, 2017), which has possibly led to the inconsistency of the results.

One of the limitations of this study is the size of the sample which, although it was not small, could have preferably been larger. Another obvious limitation is that this study was conducted solely with male athletes. The transversal nature of the study was also another important limitation. Undoubtedly, longitudinal studies could offer enlightening information on the influence of mental toughness.

A lot of research is still needed in the field of mental toughness in sports, whether it is on individual or team sports, risk or combat sports, etc. but it should also be related to multiple variables that may condition mental toughness, favorably or not.

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