



Constructing and Standardizing a Mental Stress Scale During Competition for Iraqi Professional Basketball League Players

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Abstract

The current research aims to constructing and standardizing a scale for mental stress during competition for Iraqi Professional Basketball League Players, season 2024-2025. Mental stress is considered one of the most prominent psychological challenges related to cognitive processes such as perception, attention, and memory. High levels of stress lead to decreased concentration and reduced ability to make quick decisions, negatively impacting competitive performance. Given the lack of specialized scales in this field within the local arena, the need arose to design a scientific instrument with accurate psychometric properties that would serve as a reliable reference for assessing mental stress levels. The research population consisted of 120 players representing league clubs (Air Defense, Dijlah University, Police, Zakho, Popular Mobilization Forces, Al-Karkh, North Gas, Hilla, Electricity, Trade, and Darbandikhan). They were divided into pilot and standardization samples. The research resulted in the successful constructing and standardizing of the scale, revealing a clear variation in mental stress levels among the players. The study concluded that the scale could be used by the Iraqi Basketball Federation as an accurate diagnostic tool to measure mental stress and differentiate between its levels (low, medium, and very high), which would contribute to designing psychological programs and preparing training plans that respond to the individual needs of players and enhance their competitive performance.

Keywords: Mental Stress, Competition, Basketball Players, Scale Standardization

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Introduction

Mental fatigue is one of the most prominent manifestations of cognitive processes, as it is linked to perception, attention, and memory, and affects them in an interconnected way that can lead to poor concentration, reduced decision-making ability, incorrect responses, or disruptions in cognitive processing. In the sports field, mental fatigue is considered one of the most complex psychological phenomena. It arises from the multitude of thoughts during competition, the pressures of matches, and impaired recall of past skills, which affects the player's ability to execute tasks and perform as required. Its symptoms can also extend to the physical aspect due to pressures and surrounding environmental conditions.

Basketball competitions are an environment full of physical and psychological challenges, where players face high levels of mental fatigue due to the pressure of high expectations from coaches and management, the pressure of the audience, and the rapid decisions required in game situations. These factors make mental fatigue a key factor that can limit players' ability to concentrate and lead to a decline in their competitive performance, negatively impacting the level of basketball locally.

Despite the importance of this variable, the literature in the Iraqi environment shows a clear lack of scientific measures specialized in studying mental stress during competition in basketball, as most of the available measures were either designed for different environments or for other sports fields, which reduces their accuracy in diagnosing stress levels among Iraqi professional league players who have special cultural and environmental characteristics. Hence, the research problem emerged in the need to build a local and standardized measure to measure mental stress during competition among Iraqi professional basketball league players, which includes accurate psychological dimensions that are appropriate to the nature of the Iraqi player, and has scientific psychometric properties that make it an approved and reliable tool in assessing mental stress levels and developing training and psychological programs aimed at improving competitive performance.

Methodology and Tools

The methodology chosen by the researcher is assumed to be suitable for solving the research problem. Therefore, the researcher chose the descriptive survey method using correlational analysis, as it is appropriate to the nature of the research problem.

The current research population was defined as the players of the Iraqi Professional Basketball League clubs for the 2024-2025 season, distributed as (12) players per club. The clubs were: Air Defense, Dijlah University, Police, Zakho, Popular Mobilization Forces, Karkh, North Gas, Hilla, Electricity, Trade, and Darbandikhan. The total number of players was (120), after excluding professional players, leaving a final number of (98) players. The researcher used 100% of the current research population and divided the sample into (3) samples (exploratory, constructive, and standardization):

The first exploratory sample included (3) players, randomly selected by lottery, representing (2.5%) of the total research sample. The researcher conducted a preliminary pilot test on this sample.



The sample used to develop the scale (the Mental Stress During Competition Scale) consisted of 75 players, representing 62.5% of the total research sample. The researcher developed the scale.

Scale Construction Procedures

These are a set of basic steps that can be followed when constructing a test or scale, and how to link the scale's units to measure the overall aspects of a skill, trait, characteristic, or ability. The scale is considered one of the most important tools used in research that relies on measuring psychometric properties, as it provides data and information that help the researcher address and evaluate the existing problem (Awais, 2003, p. 151).

1- Defining the Concept of the Mental Stress Scale

To define the phenomenon to be measured, it must be clear, precise, and measurable. Based on this, the researcher defined his scale as the Mental Stress Scale during Competition for Players of Iraqi Professional Basketball League Clubs. Given the lack of previous scales for this variable, the researcher constructed and standardized the scale according to scientific principles, relying on a theoretical and an operational definition (Ahmed, 2006, p. 28). After reviewing previous studies and conducting personal interviews, the researcher finalized the scale.

2- Defining the Objective of the Mental Stress Scale During Competition

The objective of the mental stress scale should be... Clear, understandable, and consistent with the nature and characteristics of the scale, which vary according to the objectives it is designed to achieve. The objective is the cornerstone and the first building block in the process of constructing scales. This objective should be linked to the importance of the phenomenon under study, the motivations for studying it, and the researcher's inclinations and interests. The objective must be precisely defined and measurable (Ali et al., 2015, p. 26).

3- Defining the theoretical framework of the phenomenon to be measured

By reviewing sources, references, and studies related to the topic of mental stress, the researcher becomes familiar with the nature, importance, dimensions, and domains of this phenomenon. This helps in preparing the theoretical content of the scale. This aspect is a fundamental step in constructing scales, as the measured phenomenon must be based on a clear theoretical framework that is used to accurately define and interpret the subdomains (Ahmed, 2006, p. 50).

4- Defining the domains of the mental stress scale

Based on the theoretical definition of the concept of mental stress during competition, and after reviewing relevant literature and studies, it was proposed The researcher identified seven main areas and prepared an open-ended questionnaire, which was presented to a group of experts in sports psychology, measurement and testing, and basketball. The aim was to



determine the most important areas contributing to the development of the scale and its reference framework. The following core areas were adopted: sense of responsibility, competitive environment, sense of the importance of competition time, inability to cope with competitive problems, feeling fatigued, self-confidence, and feeling tense. These areas represent states of mental strain during competition and facilitate application and discussion. Twenty-one experts participated in the evaluation, assessing the validity of the areas and their operational definitions. They provided feedback on additions, mergers, deletions, or modifications as needed. Using percentages as a statistical measure to gauge the level of agreement among the experts, five areas were adopted: sense of responsibility, competitive environment, sense of the importance of competition time, feeling fatigued and tense, and self-confidence. These five areas achieved a very high percentage, exceeding 75%. Two areas, inability to cope with competitive problems and feeling tense, were excluded because their percentages were unacceptable, falling below 75%. For any field to be accepted, the percentage of agreement on it must exceed (75%), as indicated by (Zoukan et al., 2004), and as shown in Table(1).

Table 1. shows the percentages of expert agreement on the areas of the mental stress scale during competition

No.	The nominated areas	Number of experts agreeing	Number of experts disagreeing	Percentage of agreement	Type of indication
1	Sense of responsibility	21	0	%100	acceptable
2	Competitive environment	20	1	%95	acceptable
3	Sense of the importance of competition time	19	2	%90	acceptable
4	. Inability to cope with competitive problems	14	7	%66	unacceptable
5	Feeling mentally tired and stressed	19	2	%90	acceptable
6	Self-confidence	18	3	%85	acceptable
7	Feeling stressed	15	6	%71	unacceptable

Preparing the Initial Formulations of the Mental Stress During Competition Scale Items

The scale items must have a specific and clear meaning, represent the domains under investigation, be related to the study objectives, and be formulated in correct and understandable language, using short, unambiguous, and neutral statements. Based on these conditions, the researcher followed the scientific method in formulating the initial statements in a manner appropriate to the specificities of the sample. Each item accurately reflects the

content of its respective domain, based on the theoretical definition of each domain. The items were then distributed across the domains, and suitable answer choices were determined.

The initial wording of the items was presented to a group of experts and specialists in sports psychology, measurement and evaluation, and basketball to determine its suitability for measuring the phenomenon and its appropriateness to the designated domain, in addition to evaluating the proposed answer choices. Based on their opinions and the established criteria, the items that received their approval were retained for inclusion in the initial version of the scale before conducting the statistical analysis, as shown in Table (2).

Table 2. Show the answer choices according to the Likert scale

Alternatives	Always	Sometimes	Rarely	Often	Absolutely
Score	5	4	3	2	1

The scale was scored by assigning a score to each player's response and to each item. These scores were then totaled to calculate the total score for each item. To determine the score obtained by the sample for each of the 44 items on the scale, the highest possible score for each item was 5, and the lowest was 1. The highest possible score for the scale was 220, the lowest was 44, and the hypothetical mean was 132.

The scale was scored in the highest possible way by assigning a score to each item. Main Experiment for Developing a Mental Stress Scale During Competition:

The purpose of this experiment was to apply the preliminary version of the Mental Stress Scale During Competition. The objective was to statistically analyze the items, determine their discriminatory power, and identify the discriminating and non-discriminating items. To achieve this, the main experiment (construction sample) was conducted from Thursday, April 3, 2025, to Friday, April 11, 2025. This involved administering the scale to a construction sample of 75 players from Iraqi professional basketball clubs for the 2024-2025 season. After completing the final distribution of questionnaires and collecting responses from the sample, which took nine days due to the clubs being located in several governorates, requiring additional time to reach them and obtain accurate data, the researcher obtained 75 questionnaires. The items were arranged sequentially without specifying the scale's domains (see Appendix 1). The Mental Stress During Competition Scale consisted of (51) items distributed across five main domains: sense of responsibility, competitive environment, sense of the importance of competition time, sense of mental fatigue and tension, and self-confidence. The items were arranged sequentially without indicating their domains to avoid influencing the participants' responses.

Following the completion of the main experiment, the researcher sorted and corrected the response forms for the research sample (the construct sample). The data were then compiled in preparation for statistical analysis with the assistance of the research team.

Statistical Analysis of the Items of the Mental Stress During Competition Scale:

One of the most important steps in constructing scales and tests is conducting statistical analysis of their items after presenting the questionnaire to a group of individuals, then correcting and statistically analyzing it. Furthermore, this improves the quality of the scale by identifying weaknesses in the items and then working to either reformulate or discard them if they are not valid (Alian & Ghoneim, 2000, p. 44).



Table 3. Shows the descriptive characteristics of the construct sample for the Mental Stress During Competition Scale

Characteristics	Mean	Meaning	S.D	S.E	Seq.	Lowest Score	Highest Score
Mental stress	168.68	1670.00	8.33	.277	.739	154.00	196.00

First: (Discriminatory Ability) The two extreme groups

"Discriminatory ability refers to the ability to differentiate between individuals who score highly and those who score low" (Al-Kubaisi, 2010, p. 276). Based on this, the researcher followed these steps:

- The total scores were arranged in descending order. Then, the highest and lowest 27% of the total scores were selected. The upper group represented 27% of the highest scores on the statements obtained from the players, and the lower group represented 27% of the lowest scores on the statements obtained from the players. The total number of players was (75) from the clubs.

- The scores were statistically analyzed using the SPSS statistical package, and the distinctive items were extracted using a t-test to examine the significance of the differences between the means of two independent (uncorrelated) samples from the upper and lower groups. The researcher used items whose significance value was less than the established significance level (0.05).

Second: Internal Consistency Coefficient

The researcher used the internal consistency coefficient to measure the extent to which an item belongs to the scale or domain. This was done by calculating the correlation coefficient between each item and the total score for the scale and domain, as well as the correlation coefficient between the domain and the scale as a whole. Using the internal consistency method adds the following advantages to the scale (Al-Samarrai & Al-Baldawi, 1987, p. 90):

- 1) It highlights the correlation between the items.
- 2) It is considered a construct validity aspect.
- 3) It establishes the reliability of the items.
- 4) It makes the scale consistent in its scope, as each item measures the same behavioral dimension that the entire scale measures. The researcher employed three types of internal consistency to achieve this:

a) The relationship between item score and total scale score

This procedure involves establishing a correlation between each item and the total scale score for all participants in the sample. The aim is to verify whether the responses to the items are appropriately consistent with the behavioral or personality traits reflected in the scores. A correlation between an item score and the total scale score indicates that the item represents the concept or trait targeted for measurement. This correlation serves as evidence that the item actually measures the behavioral dimension the scale seeks to assess. To ensure



the consistency of the scale items in measuring the phenomenon, Pearson's correlation coefficient was used between the score of each item and the total scale score for all participants in the sample. The results showed that 46 items were statistically significant and 5 were not.

b) Relationship between item score and total domain score

The researcher determined the correlation between item score and total score for each of the five domains using Pearson's Law.

c) Relationship between total domain score and total scale score

The researcher determined the correlation between total domain score and total scale score using Pearson's Law, as shown in Table (4).

Table 4. *The correlation coefficient between the domain and the overall scale score is shown*

No.	Dominance	Pearson	Significance Value	Type of Significance
1	Sense of responsibility	0.849**	00.000	Sig.
2	Competitive environment	0.621**	00.000	Sig.
3	Sense of the importance of competition time	0.710**	00.000	Sig.
4	Feeling mentally tired and stressed	0.649**	00.000	Sig.
5	Self-confidence	0.462**	0.002	Sig.

Presentation and analysis of the determination of standard levels for the mental stress scale during competition.

To achieve the second objective of standardizing the (standards and levels) of the mental stress scale during competition among players in Iraqi professional basketball league clubs, and after determining that the sample is normally distributed via the skewness coefficient, in addition to obtaining the standardized scores, it was necessary to use Gauss's normal distribution method. This is one of the most common distributions in the field of physical education because many of the qualities and characteristics measured in this direction are almost normally distributed. The normal distribution curve is a bell-shaped normal curve, dividing the curve into two equal parts, to the right and left of this line. Furthermore, the characteristics of the normal distribution represent (99.73%) of the population (the research sample), as there are three standard deviations to the right of the arithmetic mean and three to the left of it. This mean that there are six standard scores corresponding to six standardized levels, meaning that each standard score corresponds to ten adjusted (t) standard scores, which certainly correspond to one standardized level. In other

words, the upper limit of the standard scores represents the arithmetic mean. Added to it are three deviations to the right. The minimum is represented by the arithmetic mean plus three standard deviations to the left, as (68.26%) of the sample are spread over two standard deviations distributed between (+C1 and -C2). In light of this, the percentage will be determined in the two levels (average and acceptable). As for the level (good and weak), the percentage is spread over (27.18%), and it is certainly distributed equally between the two levels, meaning that the percentage of each of them is (13.59%). As for the range between the two standard deviations ($\pm C3$), as we mentioned earlier, it is (99.73) if we subtract from it the deviations between ($\pm C2$), which amount to (95.44%), and it corresponds to the levels (high, average, acceptable, moderate). The remaining percentage is (4.28%), and it is distributed equally between the two levels (very high and low), and each of them has a percentage of (2.14%). (Saloum, 2016).

Therefore, each pair of adjacent deviations represents a stage of psychological stress during competition that the player reaches. For example:

The levels (low and acceptable) represent the stage of high motivation and initial stress. The player is in a state of excessive physical and mental readiness. This stage is characterized by a significant increase in focus and attention, rapid decision-making, and the beginning of the load on cognitive processes (Wilson, 2007).

The levels (moderate and average) represent the stage of escalating mental stress, characterized by an increasing cumulative mental load and a decrease in mental efficiency, especially in reading the game, evaluating options, and reaction speed (Badin, 2016).

Meanwhile, the levels (high and very high) represent acute stress, mental exhaustion, and collapse. This is characterized by a loss of mental organization (forgetting tactics), slow perception of spaces and areas, and constant distraction (Fardal, 2020), as explained. Table (5)

Table 5. Levels and their corresponding percentages in the normal distribution, raw and standardized scores (Z and T), number of practices, and percentage of the standardization sample for the mental stress scale during competition

Normal distribution proportion	Crude score	Standard score z	Standard score T	Sample	percentage
Very High %2.14	193 and above	2.03707and above	70.37and above	5	%5.263
High%13.59	192-182	1.53267-1.11233 -	65.33 -61.12	7	%7.368
Moderate %34.13	169-181	0.86013-0.01947 -	58.60-50.19	30	%31.578
Moderate %34.13	157-168	0.06460-0.98933 -	49.35-40.11	45	%47.368
Acceptable%13.59	164-156	1.07340-1.91406 -	39.27-30.86	7	%7.368
Low 2.14 %	and below 145	3.76353-	12.36	1	%1.052
	TOTAL			95	%99.99 (%100)

From the above, we observe that the sample results fell within the following levels: very good, good, average, acceptable, weak, and very weak. The table above shows the number of participants in the sample according to their scores and standard levels, and the percentages of the research sample distributed across these levels in terms of mental stress during competition. The percentage was 5.263% in the first level (very good), 7.368% in the second level (good), which is lower than the normal distribution, 31.578% in the third level (average), 47.368% in the fourth level (acceptable), which is higher than the normal distribution, 7.368% in the fifth level (weak), and finally, 1.052% in the sixth level (very weak).



Thus, we achieve the second objective of the research by standardizing the (standards and levels) of the mental stress scale during competition for Iraqi professional basketball players.

Presentation and discussion of the results of the mental stress scale during competition

Table 6. Shows the arithmetic mean, standard deviation, hypothetical mean, t-value, significance level, and type of statistical significance for the mental stress scale during competition

Scale	A.M.	S.D.	T-value	Sig. Level	Sig. Type
Mental Stress During Competition	173.4667	31.4674	11.412	0.000	Sig.
Hypothetical Mean			132		

Table (6) presents the results of the mental stress scale during competition. The scale as a whole achieved a mean of (173.4667), a standard deviation of (31.4674), and a calculated t-value of (11.412). Comparing the mean to the hypothetical mean of (132), we find that the difference was statistically significant, favoring the mean, which is higher than the hypothetical mean.

The research evidence indicates that mental stress in basketball is not caused by a single factor, but rather by the accumulation of several cognitive, psychological, and tactical pressures interacting with a fast-paced, competitive sporting environment where the outcome is decided in mere seconds, as will be explained in the discussion of the scale's components.

Conclusions

1. The constructing and standardizing of the mental stress scale during competition for players in Iraqi professional basketball league clubs was successful.
2. By applying the mental stress scale during competition to the sample group, it was found that its items were clear, indicating its potential use by coaches and researchers to measure this variable.
3. Reliance on a normal distribution reflects the quality of the scale's psychometric construction. It indicates that the scale avoids bias towards any particular group and offers high reliability for future use.



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