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The effect of a psychological counselling approach on cognitive load and mental fatigue among young 110-meter hurdles athletes

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Abstract

The aim of the research was to construct two specialized scales: one for measuring cognitive load and another for mental stress, and to identify their levels among young 110-meter hurdles athletes. Furthermore, the research aimed to design a psychological counselling program to mitigate the levels of cognitive load and mental stress among these athletes. The research hypotheses posited that there are statistically significant differences between the pre-test and post-test results of the experimental group in cognitive load measurement, and that there are statistically significant differences between the pre-test and post-test results of the experimental group in mental stress measurement. The experimental method was adopted, employing a one-group pre-test and post-test design. The sample included 8 young athletes specializing in the 110-meter hurdles, who were deliberately selected following a survey using the two scales, representing 42.105% of the target population. The total population comprised 19 young 110-meter hurdles athletes from the Al-Jaish Sports Club during the 2023/2024 sports season. Additionally, a similar population from other Baghdad sports clubs practicing the same discipline was utilized, comprising 5 athletes for the pilot study and 105 athletes for the scale construction sample. Two specialized scales were developed for this category of athletes, tailored to the specific requirements of the current research, through the adoption of several systematic steps. Subsequently, a psychological counselling program was designed to address and reduce both phenomena under investigation, using diagnostic measurement as a basis. The program was implemented as part of the research experiment, which commenced with the application of the two scales measuring the investigated phenomena during the pre-tests on Sunday, March 3, 2024. This was followed by the implementation of the psychological

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Journal of Physical Education

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counselling program for 110-meter hurdles athletes, conducted weekly on Mondays from March 4, 2024, to April 10, 2024. The experiment concluded with the post-tests on Thursday, April 11, 2024. The data were analysed using the SPSS system, leading to the conclusions and applications that the cognitive load and mental stress scales are suitable for young 110-meter hurdles athletes. These scales demonstrated effectiveness for their intended purpose of measuring these two phenomena and meet the scientific standards and requirements necessary for the acceptance of scales in sports psychology. Furthermore, the practical applications of the psychological counselling program designed to reduce cognitive load and mental stress levels were found to be appropriate for young 110-meter hurdles athletes. It is essential to prioritize diagnostic psychological measurement and its applications for young 100-meter hurdles athletes to monitor their psychological state and address or mitigate psychological issues before they escalate. Moreover, it is crucial to consider the specific characteristics of the training and competitive environment of 100-meter hurdles athletes, as well as the specialized concepts of sports psychology, when designing appropriate psychological counselling programs for this category of youth.

Keywords: Psychological Counselling Program, Cognitive Load, Mental Stress, Young 110-Meter Hurdles Athletes.

Introduction:

Athletics events receive significant attention in sports psychology studies, as breaking records has become a regular occurrence year after year. What was once considered an extraordinary feat has now become a reality. The scientific and technological advancements in various fields, including sports psychology, have played a major role and had a clear impact on achieving progress in this domain. (Othman, 2017).

Mental preparation is one of the most important elements of an athlete's training, enabling them to achieve optimal performance. It teaches the athlete to endure long and demanding training hours without boredom or frustration, and to handle unforeseen circumstances such as bad luck, unexpected injuries, or uncontrollable factors that may impact their athletic performance according to their training program. (Bahi and Jad, 2004).

It is essential to address and avoid many discouraging factors, such as fear of failure and mental fatigue resulting from inadequate support from the coach or management, or a lack of enjoyment in training and competition. The presence of these factors weakens the athlete's determination to continue training with the same intensity and enthusiasm. (Yassin, 2016).

The athlete's engagement in repetitive mental habits leads to responses to stressful situations during coping and adaptation processes under competitive conditions. This involves behavioural and cognitive efforts undertaken in response to the type of stressor encountered.

Journal of Physical Education

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Additionally, certain mental, emotional, biological, and demographic traits influence the interaction with stress factors and may potentially result in mental fatigue. (Mousse & Schaefer, 2013).

The specificity of the 110-meter hurdles event relies on several technical aspects that govern the utilization of physical abilities. This drives coaches to increase their guidance and instructions regarding these technical aspects, aiming to enhance the athlete's control over them and avoid technical errors during high-speed running and the required jumps to clear the hurdles without mistakes. However, the overload of information and knowledge creates psychological pressure on the mind, burdening it with the task of comprehending and interpreting these inputs. Simultaneously, it strains the athlete's mental faculties and weakens their focus during the race.

Many of the psychological pressures experienced by athletes stem from the excessive or accumulated instructions they receive from coaches, which place a burden on their cognitive abilities during competitions. Additionally, threats, punitive measures, ridicule, neglect, and aggressive behaviours encountered in their training environments further contribute to these pressures. (Hyman & Zelikoff, 2009).

Perception, in general and across its various types, refers to an individual's unique method or approach to organizing, receiving, processing, and understanding information as a mental process that occurs within the brain. It relies on the integrity of the senses, as well as the activity and focus of attention. The process of perception is followed by storage and retrieval operations in memory, which subsequently lead to decision-making. (Goetz & Ash, 2006).

It is worth noting that "if an athlete lacks information indicating their progress in performing a task or their perception of self-efficacy, the effort exerted to achieve the goal will be weak. Conversely, athletes are willing to exert effort to reach their goal if they receive appropriate feedback and possess a high level of perception of self-efficacy in performing a given task. (Proven, 2010).

This means that an individual's cognitive map is not a photographic capture of the external world but rather a personal construct through which the individual selects certain subjects to play a significant role, perceiving them in their own unique way." (Al-Tuhami et al., 2018)

Cognitive load of knowledge is defined as the total amount of mental activity in working memory within a specific period of time. It can be measured by the number of cognitive units or elements involved in mental processing during a given time frame. (Faraj, 2008).

John Sweller developed the theory of cognitive load, in which he stated that human knowledge is divided into two types: fundamental knowledge and secondary knowledge.

Journal of Physical Education

Volume 36 – Issue (4) – 2024 Open Access

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https://jcope.uobaghdad.edu.iq

Fundamental knowledge refers to information that has evolved and been passed down from one generation to another, such as speaking a native language, forming social relationships, and employing certain problem-solving strategies. This type of knowledge is acquired effortlessly, without direct learning or effort by the individual. Secondary knowledge, on the other hand, involves intentional learning undertaken by the individual and requires effort to acquire. The theory focuses on this type of knowledge, emphasizing the principles of cognitive organization and information storage. (Sweller, 2003).

Cognitive Load is a term used in psychology and education to describe the mental effort required to process information. This concept focuses on how the quantity and complexity of information influence an individual's ability to perform a specific task. Cognitive load can be categorized into three main types. (Sweller, 2011).

1. **Intrinsic Cognitive Load**: This type relates to the inherent nature of certain topics or tasks that naturally demand greater effort to understand, depending on the interactions and relationships among their elements.
2. **Extraneous Cognitive Load**: This type concerns how information is presented or organized. Poorly designed information sources, such as overly complex explanations or a lack of organization, can significantly increase this load.
3. **Germane Cognitive Load**: This type refers to the mental effort dedicated to processing information and constructing effective cognitive structures. It represents the constructive effort that facilitates deep understanding and meaningful knowledge assimilation.

Continuous mental efforts that require cognitive functions, combined with high levels of psychological and physical stress and negative emotions, play a significant role in generating mental fatigue. Symptoms of mental fatigue include reduced concentration and an increased likelihood of errors during the performance of complex cognitive tasks. In addition to its cognitive effects, mental fatigue also has physiological impacts that arise from engaging in demanding mental activities. (Soto et al., 2011).

Persistent or chronic mental fatigue is considered one of the most prevalent ailments of modern civilization and urbanization in our contemporary era. The constant sense of responsibility and the pressure of commitments have placed many individuals under the burden of chronic fatigue, particularly in training environments. This condition, in numerous cases, extends into the personal lives of athletes and can subtly develop into chronic physical and mental exhaustion. In this context, it is worth noting that mental, nervous, physical, and psychological fatigue inevitably lead to the onset of some of the most feared diseases. (Belmont et al., 2006).

Scientists have approached the concept of stress from numerous perspectives, to the extent that they have highlighted the difficulty of establishing a universally agreed-upon definition.

Journal of Physical Education

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https://jcope.uobaghdad.edu.iq

One of the main challenges in defining stress lies in its nature as an integrated program that depends on the factor causing it, the response to that factor, as well as the state of the individual responding. Stress is considered a major common factor in all of our daily lives; however, the key is learning how to keep it under control. Stress can work either against you or in your favour. The term 'stress' has become widely used in psychology and psychiatry and was borrowed from engineering and physics studies, where it originally referred to (Stress), (Fatigue), and (Load). (Abu Dalu, 2009).

Mental fatigue has significant effects on the central nervous system, particularly on the brain." (Al-Bayati, 2009) Zerwal (2008) indicates that Zblagi and Wallace believe that stress has an internal impact, leading to a state of psychological or physical imbalance within the individual. This results from factors stemming both from the external environment and the individual themselves, emphasizing the role of external stimuli in the occurrence of stress.

It becomes evident that behavioural therapy is essential for reducing the levels of these two phenomena when present in 110-meter hurdles athletes. This necessity arises from the effects of the training environment, the nature of training tasks, competitive responsibilities, and the pressures of coaching instructions, which can narrow the channel of information and knowledge about competitive performance. It is crucial to provide the athlete with the opportunity to independently explore the requirements of tasks, enabling them to identify the necessary capabilities and work on their development to meet these demands. This does not imply dispensing with the coach’s guidance, but rather that such guidance must remain within reasonable limits to avoid placing undue pressure on the athletes. Among the most effective behavioural treatments are psychological counselling programs specifically designed for the sports environment.

Psychological counselling is defined as "a science, an art, and a practice. It is a relatively modern field, initially emerging in connection with the vocational guidance movement in the early 20th century, though it did not flourish until the 1930s. The counselling process aims to assist individuals in understanding themselves, analyzing their personalities, recognizing their experiences, identifying their problems, developing their potentials, achieving their goals, and attaining psychological health and personal, educational, professional, and familial adjustment. (Al-Khaikani et al., 2016).

Psychological counselling is also defined as "a set of planned activities conducted in an atmosphere of respect and appreciation, aimed at helping individuals address their problems, train them to make appropriate decisions, find necessary solutions, develop their abilities and skills, and modify their attitudes. (Abu Asaad & Arabiyat, 2019).

Given the researchers' academic specialization in sports psychology for athletics and their repeated field visits to training sessions in Baghdad clubs, as well as consultations with coaches

Journal of Physical Education

Volume 36 – Issue (4) – 2024 Open Access

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https://jcope.uobaghdad.edu.iq

at Al-Jaish Sports Club - which includes the largest number of young 110-meter hurdles athletes - the researchers identified psychological issues that these athletes were unable to measure. Following inquiries into the preliminary situation, the researchers decided to measure cognitive load and mental fatigue to better understand the problem through assessment. Subsequently, they employed behavioural therapy through psychological sports counselling to benefit both the coaches and the athletes, aiming to help them achieve better performance levels. This approach underscores the importance of the psychological factor, which is no less significant than the physical and technical factors in their training programs. The research aims to develop two specialized scales: one for measuring cognitive load and the other for mental fatigue, and to identify their levels among young 110-meter hurdles athletes. Additionally, it seeks to design a psychological counselling program to reduce cognitive load and mental fatigue levels in this group. The research hypotheses propose that there are statistically significant differences between the pre-test and post-test results of the experimental group in measuring cognitive load, as well as statistically significant differences between the pre-test and post-test results of the experimental group in measuring mental fatigue.

Methodology and Procedures:

The population of this research comprised 19 young 110-meter hurdles athletes from Al-Jaish Sports Club during the 2023/2024 sports season. From this population, a purposive sample of 8 athletes was selected, representing 42.105% of the total population. This selection was made following a field survey in which the study's two scales were applied, choosing athletes who scored above the hypothetical mean on both scales. Additionally, a pilot sample of 5 young 110-meter hurdles athletes was selected from a similar population in other sports clubs across Baghdad. Furthermore, a sample of 105 young 110-meter hurdles athletes were included for scale construction purposes.

Due to the lack of specialized measurement tools for the two phenomena under investigation among 110-meter hurdles athletes, the researchers developed two paper-and-pencil scales based on the principles of psychological measurement and evaluation in physical education sciences. They followed field procedures and statistical treatments that prioritized efficiency and minimized repetitive application to avoid measurement errors. The researchers prepared 20 items for the cognitive load scale and 21 items for the mental fatigue scale, using the theoretical framework of both phenomena to construct the initial version of each scale. Each item was designed with three response options: "Always," "Sometimes," and "Never," with a scoring key of (3, 2, 1), respectively. A higher score indicates a higher level of the phenomenon being measured. The researchers developed a survey to present the two scales to 19 academics specializing in sports psychology, testing and measurement, and athletics. All academics unanimously agreed to retain the items as they were, achieving a 100% approval rate. This granted both scales face and logical validity, as this percentage exceeds the 80% threshold specified by Bloom's criteria for validity acceptance. Subsequently, the two scales

Journal of Physical Education

Volume 36 – Issue (4) – 2024 Open Access

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https://jcope.uobaghdad.edu.iq

were piloted on a sample of five athletes from Al-Shurta Sports Club to identify any potential challenges that might arise during the main study and to ensure the clarity of the items for the sample. The average completion time for each scale was calculated, with both the cognitive load scale and the mental fatigue scale requiring five minutes each. Subsequently, the discriminatory power of the items in each scale was verified by applying them to the construction sample, which consisted of 105 athletes. A proportion of 27% was used to identify the two extreme groups, each comprising 28.35 participants, rounded to 28 for practical purposes. The scores of these two groups were then statistically compared using the t-test for independent samples, as illustrated by the results in Tables (1) and (2).

Table (1) shows the results of the discriminatory power analysis for the items of the cognitive load scale.

Item	Group	Number	Arithmetic Mean	Standard Deviation	(t)	(Sig)	Statistical Difference	Discrimination
1	Upper	28	2.96	0.189	17.859	0.000	Significant	Distinctive
	Lower	28	1.29	0.46				
2	Upper	28	2.68	0.476	9.887	0.000	Significant	Distinctive
	Lower	28	1.39	0.497				
3	Upper	28	2.93	0.262	15.01	0.000	Significant	Distinctive
	Lower	28	1.36	0.488				
4	Upper	28	2.64	0.488	8.855	0.000	Significant	Distinctive
	Lower	28	1.46	0.508				
5	Upper	28	2.89	0.315	13.038	0.000	Significant	Distinctive
	Lower	28	1.43	0.504				
6	Upper	28	2.61	0.497	8.231	0.000	Significant	Distinctive
	Lower	28	1.5	0.509				
7	Upper	28	2.86	0.356	11.023	0.000	Significant	Distinctive
	Lower	28	1.57	0.504				
8	Upper	28	2.57	0.504	6.647	0.000	Significant	Distinctive
	Lower	28	1.71	0.46				
9	Upper	28	2.82	0.39	10.624	0.000	Significant	Distinctive
	Lower	28	1.54	0.508				
10	Upper	28	2.54	0.508	6.708	0.000	Significant	Distinctive
	Lower	28	1.64	0.488				
11	Upper	28	2.79	0.418	9.815	0.000	Significant	Distinctive
	Lower	28	1.57	0.504				
12	Upper	28	2.5	0.509	6.638	0.000	Significant	Distinctive
	Lower	28	1.61	0.497				
13	Upper	28	2.75	0.441	8.742	0.000	Significant	Distinctive
	Lower	28	1.68	0.476				
14	Upper	28	2.46	0.508	5.62	0.000	Significant	Distinctive
	Lower	28	1.75	0.441				
Item	**Group**	**Number**	**Arithmetic Mean**	**Standard Deviation**	**(t)**	**(Sig)**	**Statistical Difference**	**Discrimination**
15	Upper	28	2.71	0.46	8.133	0.000	Significant	Distinctive
	Lower	28	1.71	0.46				
16	Upper	28	2.43	0.504	5.196	0.000	Significant	Distinctive
	Lower	28	1.79	0.418				
17	Upper	28	2.68	0.476	7.314	0.000	Significant	Distinctive

Journal of Physical Education

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https://jcope.uobaghdad.edu.iq

	Lower	28	1.86	0.356				
18	Upper	28	2.39	0.497	4.784	0.000	Significant	Distinctive
	Lower	28	1.82	0.39				
19	Upper	28	2.64	0.488	6.833	0.000	Significant	Distinctive
	Lower	28	1.89	0.315				
20	Upper	28	2.36	0.488	3.973	0.000	Significant	Distinctive
	Lower	28	1.96	0.189				

An item is considered distinctive if (Sig) < (0.05) at a significance level of 0.05 and with a degree of freedom of 54.

Table (2) presents the results of the discriminatory power analysis for the items of the mental fatigue scale.

Item	Group	Number	Arithmetic Mean	Standard Deviation	(t)	(Sig)	Statistical Difference	Discrimination
1	Upper	28	2.89	0.315	16.042	0.000	Significant	Distinctive
	Lower	28	1.25	0.441				
2	Upper	28	2.61	0.497	9.493	0.000	Significant	Distinctive
	Lower	28	1.36	0.488				
3	Upper	28	2.86	0.356	13.674	0.000	Significant	Distinctive
	Lower	28	1.32	0.476				
4	Upper	28	2.57	0.504	8.485	0.000	Significant	Distinctive
	Lower	28	1.43	0.504				
5	Upper	28	2.82	0.39	11.96	0.000	Significant	Distinctive
	Lower	28	1.39	0.497				
6	Upper	28	2.54	0.508	7.894	0.000	Significant	Distinctive
	Lower	28	1.46	0.508				
7	Upper	28	2.79	0.418	10.057	0.000	Significant	Distinctive
	Lower	28	1.54	0.508				
8	Upper	28	2.57	0.504	6.818	0.000	Significant	Distinctive
	Lower	28	1.68	0.476				
9	Upper	28	2.75	0.441	9.82	0.000	Significant	Distinctive
	Lower	28	1.50	0.509				
10	Upper	28	2.46	0.508	6.381	0.000	Significant	Distinctive
	Lower	28	1.61	0.497				
11	Upper	28	2.71	0.46	9.101	0.000	Significant	Distinctive
	Lower	28	1.54	0.508				
12	Upper	28	2.43	0.504	6.364	0.000	Significant	Distinctive
	Lower	28	1.57	0.504				
13	Upper	28	2.68	0.476	8.043	0.000	Significant	Distinctive
	Lower	28	1.64	0.488				
14	Upper	28	2.39	0.497	5.3	0.000	Significant	Distinctive
	Lower	28	1.71	0.46				
15	Upper	28	2.64	0.488	7.488	0.000	Significant	Distinctive
	Lower	28	1.68	0.476				
16	Upper	28	2.36	0.488	4.885	0.000	Significant	Distinctive
	Lower	28	1.75	0.441				
Item	**Group**	**Number**	**Arithmetic Mean**	**Standard Deviation**	**(t)**	**(Sig)**	**Statistical Difference**	**Discrimination**

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17	Upper	28	2.61	0.497	6.578	0.000	Significant	Distinctive
	Lower	28	1.82	0.39				
18	Upper	28	2.32	0.476	4.478	0.000	Significant	Distinctive
	Lower	28	1.79	0.418				
19	Upper	28	2.57	0.504	6.124	0.000	Significant	Distinctive
	Lower	28	1.86	0.356				
20	Upper	28	2.29	0.46	3.569	0.000	Significant	Distinctive
	Lower	28	1.93	0.262				
21	Upper	28	2.89	0.315	14.577	0.000	Significant	Distinctive
	Lower	28	1.32	0.476				

An item is considered distinctive if (Sig) < (0.05) at a significance level of 0.05 and with a degree of freedom of 54.

To further validate the scientific validity of the study's two scales, Pearson's simple correlation coefficients were calculated between each item's score and the total score of the corresponding scale. This was done using the statistical analysis of the scores obtained from the application of the scales to the construction sample, which consisted of 105 athletes specializing in the 110-meter hurdles. The results are presented in Tables (3) and (4).

Table (3) shows the internal consistency of the items' correlation with the total score of the cognitive load scale.

Item	Correlation Coefficient Between the Item and Total Score	(Sig)	Item	Correlation Coefficient Between the Item and Total Score	(Sig)
1	0.391	0.000	11	0.862	0.000
2	0.677	0.000	12	0.616	0.000
3	0.661	0.000	13	0.556	0.000
4	0.505	0.000	14	0.541	0.000
5	0.511	0.000	15	0.733	0.000
6	0.553	0.000	16	0.424	0.000
7	0.769	0.000	17	0.477	0.000
8	0.621	0.000	18	0.601	0.000
9	0.575	0.000	19	0.517	0.000
10	0.815	0.000	20	0.622	0.000

An item is considered consistent if (Sig) > (0.05) at a degree of freedom of 103 and a significance level of 0.05.

Table (4) presents the internal consistency of the items correlated with the total score of the mental fatigue scale.

Item	Correlation Coefficient Between the Item and Total Score	(Sig)	Item	Correlation Coefficient Between the Item and Total Score	(Sig)
1	0.832	0.000	11	0.723	0.000
2	0.681	0.000	12	0.401	0.000
3	0.709	0.000	13	0.533	0.000
4	0.535	0.000	14	0.475	0.000
5	0.964	0.000	15	0.741	0.000
6	0.642	0.000	16	0.762	0.000
7	0.411	0.000	17	0.423	0.000

Journal of Physical Education

Volume 36 – Issue (4) – 2024 Open Access

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https://jcope.uobaghdad.edu.iq

8	0.722	0.000	18	0.727	0.000
9	0.614	0.000	19	0.504	0.000
10	0.654	0.000	20	0.536	0.000

An item is considered consistent if (Sig) > (0.05) at a degree of freedom of n – 2 = 103 and a significance level of 0.05.

The same application scores of the two scales were used for the construction sample, consisting of 105 young 110-meter hurdles athletes, to statistically verify reliability using Cronbach's Alpha coefficient. The reliability coefficient for the cognitive load scale was 0.833, while for the mental fatigue scale, it was 0.885, at a degree of freedom of 103 and a significance level of 0.05. Additionally, the suitability of the two scales for young 110-meter hurdles athletes was confirmed by statistically verifying the normal distribution of the data, as shown in the results of Table (5).

Table (5) presents the final statistical parameters and normal distribution values for the two scales.

Scale Name	Number of Items	Total Score	Number of Athletes in Construction Sample	Arithmetic Mean	Standard Deviation	Skewness Coefficient
Cognitive Load	20	60	105	34.64	1.279	-0.862
Mental Fatigue	21	65	105	36.3	1.936	-0.169

The distribution is considered normal if the skewness value falls within the range of ±1.

Following this procedure, the researchers completed the development of the two scales in their final forms (Appendices 2 and 3). The total score for the cognitive load scale ranged between 20 and 60, with a hypothetical mean of 40, while the total score for the mental fatigue scale ranged between 21 and 65, with a hypothetical mean of 42. To select the participants for the study from the youth category athletes at Al-Jaish Sports Club, a survey was conducted on 19 110-meter hurdles athletes. It was found that 8 of them had scores above 40, indicating values greater than the hypothetical mean for both scales. This suggests the presence of the two undesirable psychological phenomena among these athletes. Furthermore, this measurement process was beneficial in diagnosing weaknesses in the items that contributed to the high levels of both phenomena among these athletes. Subsequently, three items from each scale were included in psychological counselling sessions as part of the program's sessions.

The steps involved in designing a model for the psychological counselling program for 110-meter hurdles athletes included the following:

- Identifying specific needs for reducing cognitive load and mental fatigue.
- Selecting priorities for reducing cognitive load and mental fatigue.
- Defining and documenting the objectives of the psychological counselling program aimed at reducing cognitive load and mental fatigue.

Journal of Physical Education

Volume 36 – Issue (4) – 2024 Open Access

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- Developing strategies and techniques to achieve the planned objectives of the psychological counseling program for reducing cognitive load and mental fatigue, including the use of visual aids and videos to minimize the explanatory burden during counselling sessions.
- Evaluating the outcomes of the psychological counselling program in terms of reducing cognitive load and mental fatigue.
- Implementing the psychological counselling program to reduce cognitive load and mental fatigue.

The implementation of the psychological counselling sessions aimed at reducing cognitive load and mental fatigue was conducted as follows:

1. The young 110-meter hurdles athletes were seated in a comfortable and suitable environment, free from disturbances or distractions. Quiet and calming conditions were ensured, with the elimination of any factors that could negatively impact this psychological counselling setting.
2. Each counselling session lasted 30 minutes.
3. A total of 12 counselling sessions were conducted, with two sessions held each week on Mondays and Wednesdays, aligning with the athletes' regular training schedule and availability.
4. The implementation of the counseling sessions for the program aimed at reducing cognitive load and mental fatigue continued for six weeks.
5. The counseling sessions were conducted alongside the regular training of the young 110-meter hurdles athletes but were scheduled outside of the training times (i.e., before the regular training units). These sessions were carried out without introducing any experimental changes to their established training regimen. The sessions incorporated psychological counseling techniques targeting two key aspects to reduce cognitive load and mental fatigue through various applications, some examples of which are outlined below:

- **Physical and Mental Relaxation:** Utilizing calming strategies, listening to soothing music, and avoiding auditory distractions.
- **Cognitive Flexibility:** Developing the ability to shift between positive thoughts easily and flexibly, without stress, repetition, or monotony.
- **Self-Awareness and Control:** Directing the senses to acquire knowledge that positively contributes to their training and performance.
- **Understanding Responsibility:** Employing strategies for continuous innovation and generation of new ideas by stimulating experiences of sensory and cognitive curiosity.
- **Mental Activation:** Using strategies to foster curiosity, experimentation, and openness to intellectually challenging ideas, integrated with models of cognitive immersion.

The research experiment began with the administration of the scales for the two investigated phenomena during the pre-tests on Sunday, March 3, 2024. This was followed by

Journal of Physical Education

Volume 36 – Issue (4) – 2024 Open Access

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the implementation of the psychological counselling program for 110-meter hurdles athletes, which spanned from March 4, 2024, to April 10, 2024, with sessions conducted every Monday. The experiment concluded with the post-tests on Thursday, April 11, 2024.

The research results were processed using SPSS software to calculate percentages, arithmetic means, standard deviations, skewness coefficients, Pearson's simple correlation coefficients, Cronbach's Alpha coefficients, the paired-samples t-test, and the independent-samples t-test.

Results:

Table (6) presents the results of the pre-tests for the experimental research group.

Phenomena	Group and Number of Athletes		Arithmetic Mean	Standard + Deviation	(Liveen)	(Sig)	Difference
Cognitive Load of 110-Meter Hurdles Athletes	Experimental	8	49.13	4.19	0.401	0.302	Not Significant
Mental Fatigue of 110-Meter Hurdles Athletes	Experimental	8	50.5	4.957	0.227	0.665	Not Significant

Homogeneity of variance for the experimental research group was determined using Levene's test, with significance assumed when Sig > 0.05 at 7 degrees of freedom.

Table (7) presents the results of the pre-tests and post-tests for the experimental research group.

Phenomena	Group and Number of Athletes	Comparison	Arithmetic Mean	+ Standard Deviation	Vari ance	Degrees of Freedom (df)	(t)	(Sig)	Difference
Cognitive Load of 110-Meter Hurdles Athletes	Experimental (8)	Pre-test	49.13	4.19	14.875	5.436	7.739	0.000	Significant
		Post-test	34.25	1.581					
Cognitive Load of 110-Meter Hurdles Athletes	Experimental (8)	Pre-test	50.5	4.957	14	5.732	6.908	0.000	Significant
		Post-test	36.5	2					

The statistical difference is significant when (Sig) ≤ 0.05 at a degree of freedom (7).

Journal of Physical Education

Volume 36 – Issue (4) – 2024 Open Access

P-ISSN: 2073-6452, E-ISSN: 2707-5729
https://jcope.uobaghdad.edu.iq

Discussion:

The results presented in Table (7) indicate that the levels of both cognitive load and mental fatigue decreased among the 110-meter hurdles athletes in the experimental research group during the post-tests. The researchers attribute this improvement to the positive impact of the psychological counselling program, which was implemented alongside the regular training regimen. This program addressed the conditions that had previously exacerbated these two phenomena before the intervention. The counselling program, specifically designed to reduce cognitive load and mental fatigue among young 110-meter hurdles athletes, emphasized logical persuasion to encourage the voluntary participation of athletes in the counselling sessions. Through the program's applications, such as physical and mental relaxation, new perceptions were built, and the knowledge they received was simplified by breaking it down into manageable components. This took place in a calming environment aimed at alleviating psychological tension and dismantling the mental blocks caused by repetitive and tedious cognitive instructions from certain coaches. This approach facilitated the athletes' ability to shift their perceptions from negative beliefs about their training and competition to positive ones that enhanced their performance. As a result, their sensory awareness and self-awareness were enhanced, allowing them to prioritize knowledge based on its importance and relevance. This development fostered a sense of responsibility to recognize and address the most significant knowledge required by young 110-meter hurdles athletes, enabling them to innovate new ideas to achieve their performance goals in this discipline. Additionally, the psychological counselling program played a positive role in stimulating mental activity by employing strategies of curiosity, experimentation, and openness to intellectually challenging ideas that previously caused mental strain before the implementation of this program. At the same time, it helped reduce mental fatigue by adopting mechanisms for disregarding irrelevant knowledge and efficiently processing essential information through logical and reasonable cognitive strategies, thus avoiding unnecessary mental exhaustion caused by excessive interpretations.

"Psychological counselling can help individuals learn techniques for relaxation, meditation, and focus, improve mental organization and positive thinking skills, and develop strategies to manage mental distraction and psychological stress." (Piet and Hougaard, 2011, p. 1335).

Advancing the individual in an era characterized by movement and change is not achieved merely by presenting ideas, but through understanding, comprehension, and the assimilation and application of knowledge. This is reflected in behavioural patterns that enable individuals to keep pace with the evolving dynamics of the modern age. (Lifta, 2000).

The social environment plays a prominent role in satisfying individuals' needs and motivates them to learn behaviours that either bring reinforcement or help them avoid punishment within the social context in which they interact. (Abu Riyash, 2007).

Similarly, psychological counselling plays an important role in stimulating the mind by providing individuals with the skills and strategies necessary to improve awareness, attention, and focus. It also works to enhance awareness of factors that may negatively impact the mind and provides the tools needed to address and improve them. (Rempfer & Wang, 2017).

Journal of Physical Education

Volume 36 – Issue (4) – 2024 Open Access

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https://jcope.uobaghdad.edu.iq

A good psychological state enables an athlete to better transform negative thoughts into positive ones. This allows them to recall pleasant events and emotions experienced during a successful competition, which may positively influence their competitive behaviour. Conversely, a poor psychological state may cause them to remember negative and unsuccessful events and emotions they have encountered, which would then negatively affect their competitive behaviour. (Al-Ghurairi, 2005).

Players can practice meditation techniques and concentration exercises to calm the mind and enhance awareness of the present moment during training. This involves deliberately directing their senses to focus on the sensations of breathing, movement, and visual and auditory perceptions during their sessions, thereby activating their cognitive awareness and promoting interaction with a calm mind to avoid mental fatigue. (Keng et al., 2011).

Similarly, "appropriate cognitive load is generated through the development of a cognitive schema, which requires additional capacity in working memory. (Kadhim et al., 2021) Sensory memory organizes the passage of information from the senses to short-term memory, allowing the transfer of approximately four to five cognitive units at a time. (Kadhim, 2023) A cognitive unit could be a word, letter, image, or sentence. Sensory memory does not perform any cognitive processing of information; instead, processing begins in short-term memory. (Abu Riyash, 2007).

It is observed that the theory of cognitive load has established two main principles for reducing cognitive load and maximizing learning in individuals. The first principle involves designing educational models based on the individual's cognitive structure, while the second emphasizes placing greater focus on the construction method. It is crucial to link an individual's cognitive structure with educational designs, as the unique aspect of human thought lies in the quantitative dimension, represented by the amount of information stored in long-term memory. This capacity is what creates intellectual differences among humans and between humans and other living beings. Therefore, educational designs must be tailored to the individual's cognitive capacity to achieve the highest possible level of learning. (Mayer and Moreno, 2003).

An individual must answer the question, 'What can I do when faced with a stressful situation?' The individual's sense of threat depends on their assessment of the level of danger inherent in the situation. Based on this assessment, the type of response is determined. If the response is positive, coping and resistance mechanisms can be successfully employed. However, if the response is negative, these mechanisms fail to address the stress, leading to a loss of self-esteem and fear. (Kafafi, 2012).

Self-control prevents undesirable responses, resulting in self-reinforcement, which underscores the significance of self-control. (Hashim, 2006).

Moreover, 'an individual's beliefs about their ability to exercise self-control determine the extent to which they can regulate their emotions and their capacity to endure mental stress. The greater their self-control, the stronger their determination to overcome stress-inducing circumstances with willpower and resolve. This enables them to address such challenging situations and problems effectively. Additionally, it underscores the significant impact of the

Journal of Physical Education

Volume 36 – Issue (4) – 2024 Open Access

P-ISSN: 2073-6452, E-ISSN: 2707-5729
https://jcope.uobaghdad.edu.iq

physiological and emotional environment on an individual's ability to exercise self-control. This is achieved through their perception of self-efficacy in managing their emotions and the resulting behaviours. (Al-Masry, 2012).

There are organic defensive mechanisms within the human body that help maintain a state of equilibrium, enabling it to cope with changes and return to balance once the conditions causing those changes subside. However, any external demand that disrupts this equilibrium, if the body fails to manage it, constitutes stress faced by the individual. (Salih et al., 2024) Cannon emphasized the role of the sympathetic nervous system, a division of the autonomic nervous system, for its critical function in preparing the body to confront various stressful situations. The purpose of Cannon's study was to elucidate the physiological role of stress and subsequently measure it under different conditions, ultimately identifying the body's internal balance. The following diagram illustrates this concept. (Malika, 2011).

Research has generally found that intrinsically flowing activities, characterized by engagement with the present moment, result in a sense of vitality in cognitive processes. (Le Bel and Dube, 2017).

Conclusions and Applications:

1. The cognitive load and mental fatigue scales are suitable for young 100-meter hurdles athletes and are appropriate for their intended purpose of measuring these two phenomena. Both scales meet the scientific criteria and standards required for acceptance in the field of sports psychology.
2. The practical applications of the psychological counselling program designed to reduce cognitive load and mental fatigue are well-suited for young 100-meter hurdles athletes.
3. Implementing the psychological counselling program contributes to reducing the level of mental fatigue among young 100-meter hurdles athletes.
4. It is essential to prioritize diagnostic psychological measurement and its applications for young 100-meter hurdles athletes to monitor their psychological state and address or mitigate psychological issues before they escalate.
5. It is necessary to consider the specific characteristics of the training and competitive environment of 100-meter hurdles athletes, as well as the specialized concepts of sports psychology, when designing appropriate psychological counselling programs for this category of youth.

Journal of Physical Education

Volume 36 – Issue (4) – 2024 Open Access

P-ISSN: 2073-6452, E-ISSN: 2707-5729
https://jcope.uobaghdad.edu.iq

Appendix (1) illustrates the cognitive load scale for 110-meter hurdles athletes.

No.	Item Statements	Always	Sometimes	Never
1	I feel incapable of handling embarrassing situations during training and competition.			
2	I tend to isolate myself from athletes who do not integrate into the training environment.			
3	I feel frustrated by the coach's limited reliance on my physical and technical abilities in running.			
4	I feel unlucky regarding the opportunities granted to me during training and competition.			
5	I believe that the training load and tasks in the sessions are not suited to my abilities.			
6	The coach's explanations and instructions annoy me.			
7	I support prioritizing practice and application over extensive explanation and guidance.			
8	I advocate for summarizing only the essential information regarding potential technical errors in competition.			
9	I believe that delving into detailed information about the competition is a waste of time.			
10	Detailed information about the competition disrupts my ability to continue updating my knowledge outside the training session.			
11	Paying attention to the coach's detailed explanations about competition conditions exhausts me.			
12	I find it difficult to distinguish important movement patterns when the coach extends the explanation of detailed information about performance in competition.			
13	I prefer self-directed practical application without the coach.			
14	I trust only my own ability to overcome common technical errors in running during competition.			
15	I believe that extensive diagnostic information for overcoming common running errors in competition requires clarity.			
16	I find explanations of technical error terms in running during competition tiring.			

Journal of Physical Education

Volume 36 – Issue (4) – 2024 Open Access

P-ISSN: 2073-6452, E-ISSN: 2707-5729
https://jcope.uobaghdad.edu.iq

17	Searching for common technical errors in running exhausts me.			
18	I feel apprehensive about the coach's information regarding my training condition.			
19	Repetition of information about how to overcome hurdles at high speed annoys me.			
20	I believe the coach focuses more on informational terminology than on practical applications.			

Appendix (2) illustrates the mental fatigue scale for 110-meter hurdles athletes.

No.	Item Statements	Always	Sometimes	Never
1	I feel that the variety of my training tasks creates psychological pressure during competition.			
2	I find it difficult to keep up with updates to my knowledge about the competition.			
3	I am bothered by the coach adding additional tasks alongside my regular training.			
4	I find it challenging to balance attending training sessions with my other life responsibilities.			
5	I feel that the coach is indifferent to the burden of the requirements imposed on me during regular training.			
6	I am frustrated by the inadequacy of training sessions in preparing me for the specific requirements of the competitions I am expected to participate in.			
7	I feel restricted by the centralized instructions from the coach and the club.			
8	I am drained by some of the illogical instructions issued by the coach and the club.			
9	I feel that the club's management is disconnected from the actual realities and requirements of competition levels.			
10	I believe that the club's management exploits my efforts for its own benefit in competitions.			
11	I feel frustrated by the planning and implementation of training sessions without assessing the development of my physical and technical running abilities.			
12	I feel that adhering to the schedule of training sessions strains my nerves.			
13	I feel that the burden of instructions during training has negatively impacted my social interactions.			
14	I am bothered by the coach’s monitoring of updates to my technical knowledge in running.			
15	I am annoyed by the coach’s unconsidered suggestions for improvement.			

Journal of Physical Education

Volume 36 – Issue (4) – 2024 Open Access

P-ISSN: 2073-6452, E-ISSN: 2707-5729
https://jcope.uobaghdad.edu.iq

16	I am annoyed by discussions among athletes during the time-allocated training session.			
17	I feel dissatisfied when the coach focuses on my knowledge about the competition.			
18	I feel embarrassed when I cannot answer other athletes' inquiries about the competition.			
19	I am bothered by the lack of interaction from the coach and athletes regarding the knowledge I possess about the competition.			
20	I feel that the duration of the training session is insufficient to provide the necessary knowledge about the upcoming competition.			
21	I find it difficult to understand the coach's continuous instructions and guidance.			

Journal of Physical Education

Volume 36 – Issue (4) – 2024 Open Access

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