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Inference by Electrical Activity to Determine the Active Side of the Brain While Performing Mental Relaxation Skill for Diving Player

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Abstract:

The research aims to infer electrical activity in the brain to determine the active side of the brain during the performance of the skill of mental relaxation, where the researcher used the descriptive method (case study) due to its appropriateness of the nature and objectives of the research, the research sample was selected in the deliberate manner of divers enrolled in the International Diving Organization in Misralam (2021/2022 AD) and the number of (nine) divers, The researcher used electroencephalograph , one of the technological devices used in neuropsychology to study the electrical planning of the brain, and the researcher concluded that the active dominant side of most diving players is the left side, and recommends further scientific research in the field of neuropsychology applications in the field of sports due to the importance of this scientific research in the disciplines of The researcher concluded that the dominant active side of most diving players is the left side

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الاستدلال بالنشاط الكهربي لتحديد الجانب النشط للمخ أثناء أداء مهارة الإسترخاء العقلي للاعبي الغوص

الملخص :

يهدف البحث إلى الاستدلال بالنشاط الكهربي بالمخ لتحديد الجانب النشط للمخ أثناء أداء مهارة الإسترخاء العقلي ، حيث إستخدمت الباحثة المنهج الوصفي (دراسة الحالة) نظراً لمناسبته

لطبيعة و أهداف البحث ، تم إختيار عينة البحث بالطريقة العمدية للغواصين المقيدين بمنظمة الغوص الدولية في مصرلعام (٢٠٢١م /٢٠٢٢م) وعددهم (تسعة) غواصين، وتم إختيارهم من المستوي الأول إلي المستوي الرابع، وأثناء إجراء البحث تم إستبعاد (١) واحد غواص نظراً لظهور أخطاء بالنتائج الخاصة به، وبذلك بلغت عينة البحث (٨) ثمانية غواصين ، إستخدمت الباحثة " جهاز رسام المخ الكهربي "Electroencephalograph" (EEG) وهو أحد الأجهزة التكنولوجية المستخدمة في علم النفس العصبي لدراسة التخطيط الكهربائي للمخ ، وتوصلت الباحثة إلي أن الجانب النشط المسيطر لمعظم لاعبي الغوص هو الجانب الأيسر، وتوصي الباحثة إجراء المزيد من البحوث العلمية في مجال تطبيقات علم النفس العصبي في المجال الرياضي وذلك لأهمية تلك الأبحاث العلمية في تخصصات وتطبيقات علم النفس الرياضي. إستخدام جهاز رسام المخ الكهربي الرقمي (EEG)، كأداة قياس موضوعية للتعرف على الجانب النشط للمخ للرياضيين في مختلف الأنشطة الرياضية.

Inference by Electrical Activity to Determine the Active Side of the Brain While Performing Mental Relaxation Skill for Diving Player

Introduction and research problem

The brain forms the main part of the nervous system, which is the part responsible for collecting, analyzing, storing and retrieving information when needed, and it controls and even directs most of the organs of the human body. Between them, there is a large group of adjacent nerve fibers through the nerve connections, which transmit information from the brain to the various organs and tissues of the body and vice versa. (3 : 283)

There is an asymmetry in the function of the two hemispheres of the brain. In its early days, the principle of specialization was limited to the specialization of the dominant hemisphere of the brain (which is the left hemisphere in the case of the right hand preference), and this specialization was limited to language functions, then the principle of specialization extended to the hemisphere of the non-dominant brain. For the functions of visual perception. (4 : 100)

The electrical activity of the brain is recorded by means of an electrograph. The study of the electrical properties of brain activity dates back to the end of the eighteenth century when Richard Catton made the first recording of the electrical energy of the brain in (1875 AD), and this method

was neglected until he Once again, "Hans Burger" (1929 AD) rediscovered it, and succeeded in recording the electrical energy of the brain from the scalp and called it "electroencephalography". (4 : 239)

Over the past twenty years, recreational diving has been one of the most important types of water sports in Egypt and the world for players who practice diving, due to the multiplicity of forms and types of animal and plant creatures in the Red Sea and its worldwide fame due to its great diversity, where divers enjoy watching Types of beauties that they did not expect to see under the water, and the amazing biodiversity ecosystem is home to about (1000) species of fish, and (150) species of rare coral reefs. (5 : 3)

Relaxation is also of great importance in achieving the best level for players, as the mental relaxation skill for players helps reduce stress (mental and physical), and anxiety, and leads to increased self-confidence, ability to focus and good performance, and the importance of mental relaxation for diving players lies in that it is an indicator A preventive measure to protect the body's organs from excessive stress, especially the organs or systems of the body that are most predisposed to the occurrence of symptoms of stress and the ability to control the level of muscle arousal or emotionality. Memory improves when the player is in a relaxed state, gaining the ability to control biological responses such as heart rate, body temperature, skin surface electrical activity and other vital responses, and helping to reach high levels of psychological well-being, calmness, and disposition It relieves muscle tension, delays the onset of muscle or mental fatigue, and speeds recovery from physical or mental exertion. m in helping to rediscover the joy of sports activity when the athlete is under constant stress. (12: 222)

The researcher considers that the use of modern, advanced scientific methods and devices in measurement and evaluation methods in the sports field has become necessary to measure and develop psychological aspects in general and the level of psychological skills in particular in all different sports activities and in diving in particular, and in light of the previous scientific rooting presented in the introduction The research shows the scientific and applied importance of the research, "as the development of neuropsychology as one of the modern neuropsychological sciences in the field of sports psychology gave appropriate scientific opportunities to use more objective and high-tech scientific tools and methods to measure mental activity in general and psychological skills in particular, in addition to To rely on physiological measurements derived from neuropsychology in understanding, interpreting and evaluating human behavior in a more objective way.

As a result of the researcher having obtained a second level course in diving from the World and International Organization (PADI), the idea of the research came, which is an attempt to "inference by electrical activity to determine the active aspect of the brain during the performance of the skill of mental relaxation for diving players", where it is possible to measure the electrical activity of brain waves during the performance of the skill Mental relaxation by the electroencephalograph, in which the electroencephalogram charts are converted into statistical tables and then into spectral graphs that show the activity of electric waves (α, beta, theta θ, delta Δ) in the cerebral lobes, and then into maps of those waves in the cerebral lobes. The four cerebral lobes (frontal, parietal, temporal, and occipital) on both sides of the brain during mental relaxation skill.

In light of this, the researcher is trying through the (Electrographer) to search for an objective way to infer electrical activity in order to determine the active side of the brain while performing the mental relaxation skill of the diving players, in order to allow the trainers to upgrade the mental skills of the divers to reach the players to high levels in diving.

Research Objective

The research aims to infer the electrical activity in the brain to determine the active side of the brain while performing the mental relaxation skill.

Research Question

What is the active side of the brain while performing the mental relaxation skill for diving players?

Research Methodology

The researcher used the descriptive approach (case study) due to its relevance to the nature and objectives of the research.

Research Community

The research community included diving players classified according to several levels :

Level one: Open Water Diver.

Level Two: Advanced Open Water Diver.

Level Three: Rescue Diver.
Fourth level: diving guide.

The Research Sample

The research sample was chosen by the intentional method for the divers registered with the International Diving Organization in Egypt for the year (2021AD / 2022AD) and their number is (nine) divers, and they were chosen from the first level to the fourth level. Thus, the research sample reached (8) eight divers.

Table (1) Shows the Numerical Distribution of the Research Population and Sample. (attachment 1)

Certification level	No. of dives	age	م
Dive master	900	34	١
Open water diver	35	23	٢
ıdvanced open water diver	40	23	٣
Open water diver	30	25	٤
Rescue diver	50	26	٥
Open water diver	35	23	٦
Open water diver	35	25	٧
ıdvanced open water diver	42	26	٨
Dive master	2100	32	٩

It is clear from the results of Table (1) that the research sample was determined based on the level of the diver and the number of dives.

Measuring Methods and Tests used in the Research

1- The researcher used the "Electroencephalograph" (EEG) device.
2- Computer
3- Stopwatch

Test Used in the Research for Mental Relaxation Skill (Prepared by prof : Tarek Badreddine) (Annex 3)

- Beginning with biorhythm, which is taking a deep breath and exhaling regularly, and its duration is 2 minutes.

- Stop.
- Mental relaxation, in which the player fully relaxes all parts of the body, controls breathing, and isolates all thoughts - a moment of silence .... Get ready - a moment of silence .... calm ..... A moment of silence.... Focusing on the breath for 2 minutes, then stopping.

Steps to Implement the Research plan

First: An electroencephalogram (EEG) device was used by a specialist to operate and activate the device in the presence of the researcher and the research supervisors, at the Faculty of Physical Education for Boys - Helwan University -

Second: The measurement was applied with the electroencephalograph (EEG) on the diving players at the four levels under study.

Third: After completing the measurement, the data was analyzed, and the results of the research sample were obtained.

To Refer to:

Determining the active side of the brain of the diving players by inferring the electrical activity of the brain.

Measurement Instructions

- The player's last breakfast, an hour before the measurement.
- Leaving the mobile away from the player.
- Measure in a well-ventilated and lighted room.
- Isolate any visual or audio distractions during the measurement.
- Taking into account the factors of security, safety and distance between players, taking into account the precautionary instructions to address the Corona virus(COVID 19).

The research procedures were carried out during the time period from ten in the morning until two in the evening at the Faculty of Physical Education for Boys - Helwan University - in the special amphitheater of the Individual Training Department, Swimming Division, diving specialty (Annex 2)

Results View:

Table (2)
The Average Frequency of the Lateral Lobes of the Brain (Frontal, Parietal, Temporal and Occipital) of the First Player During Mental Relaxation Skill

Mean Frequency (HZ) (cycles/second)		cerebral lobe waves	Cerebral lobes
right side	left side		
١٠.٢٥	١٠.٠٠	α	Frontal
١٦.٧٥٠	١٦.١٦٧	β	
١٠.١٢٥	١٠.١٢٥	α	Temporal
١٧.٠٠	١٦.٦٢٥	β	
١٠.٠٠	١٠.٢٥	α	Parietal
١٦.٥٠	١٦.٠٠	β	
١٠.٥٠	١٠.٥٠	α	posterior
١٦.٥٠	١٦.٧٥	β	

It is clear from the results of Table (2) that the following changes occurred:

Alpha Waves:

• The average frequency of the cerebral lobes waves on both sides of the brain "frontal, parietal, temporal, and posterior occipital" ranged between (10.00: 10.50), where the activity of alpha waves is evident in the other lobes of both sides of the brain, followed by the parietal lobe next to the left brain, the frontal lobe next to the brain The right temporal lobe on either side of the brain, the frontal lobe on the side of the left brain, and the parietal lobe on the side of the right brain.

Beta Waves:

• The average frequency of the cerebral lobes of the two sides of the brain "frontal, parietal, temporal and posterior occipital" ranged between (16.00: 17.00), where the activity of beta waves is evident in the temporal lobe next to the right brain, the frontal lobe next to the right brain, the other lobe next to the brain The left, the temporal lobes next to the left brain, the parietal and posterior lobes next to the right brain, and the frontal and parietal lobes next to the left brain.

Which shows that the other side is the right side.

Table (3)
The Average Frequency of the Lobes of the Two Sides of the Brain (Frontal, Parietal, Temporal and Occipital) of the Second Player During Mental Relaxation Skill

Mean Frequency (HZ) (cycles/second)		cerebral lobe waves	Cerebral lobes
left side	left side		
٩.٨٣٣	٩.٨٣٣	α	frontal
١٦.٩١٦	١٧.٠٠	β	
١٠.٣٧٥	١٠.٧٥	α	temporal
١٦.٧٥	١٧.١٢٥	β	
١٠.٠٠	١٠.٢٥	α	parietal
١٦.٧٥	١٧.٠٠	β	
١٠.٢٥	١٠.٢٥	α	posterior
١٧.٠٠	١٧.٠٠	β	

It is clear from the results of Table (3) that the following changes occurred:

Alpha Waves:

• The average frequency of cerebral lobes waves on both sides of the brain "frontal, parietal, temporal, and posterior" ranged between (9.833 : 10.75), where the activity of alpha waves is evident in the temporal lobes on both sides of the brain, followed by the other lobes on both sides of the brain, and the parietal lobes on both sides of the brain. Next is the frontal lobe, both sides of the brain.

Beta Waves:

• The average frequency of the cerebral lobes of the two sides of the brain "frontal, parietal, temporal, and posterior" ranged between (16.916: 17.125), where the activity of beta waves appears in the temporal lobes on the side of the left brain, followed by the frontal and parietal lobes on the side of the left brain, and the other lobes next to me The cerebrum, followed by the frontal, temporal, and parietal lobes, next to the right brain.

This indicates that the dominant side of the second player is the left side.

Table (4)
The Average Frequency of the Lateral Lobes of the Brain (Frontal, Parietal, Temporal, and Occipital) of a Third Player During Mental Relaxation Skill

Mean Frequency (HZ) (cycles/second)		cerebral lobe waves	Cerebral lobes
left side	left side		
٩.٧٥	٩.٧٥	α	Frontal
١٧.٠٠	١٦.٧٥	β	
١٠.٢٥	١٠.١٢٥	α	Temporal
١٧.٠٠	١٧.٠٠	β	
١٠.٢٥	١٠.٢٥	α	Parietal
١٧.٠٠	١٧.٠٠	β	
١٠.٢٥	١٠.٢٥	α	Posterior
١٦.٥٠	١٦.٧٥	β	

It is clear from the results of Table (4) that the following changes occurred:

Alpha Waves:

• The average frequency of cerebral lobes waves on both sides of the brain "frontal, parietal, temporal, and posterior occipital" ranged between (9.75: 10.25), where the activity of alpha waves is evident in the temporal lobe on the right side of the brain, and in the parietal and frontal lobes on both sides of the brain, followed by the temporal lobe on the side of the brain. The left brain, then the frontal lobe on both sides of the brain.

Beta Waves:

• The average frequency of the cerebral lobes of the two sides of the brain "frontal, parietal, temporal and posterior occipital" ranged between (16.50: 17.00), where the activity of beta waves is evident in the frontal lobes of the right brain, the temporal and parietal lobes on both sides of the brain, followed by the frontal and posterior lobes. Next to the left brain, then the occipital lobe next to the right brain.

This indicates that the dominant side of the third player is the left side

Table (5)
The Average Frequency of the Lobes of the Brain (Frontal, Parietal, Temporal, and Posterior) of a Fourth Player During Mental Relaxation Skill

Mean Frequency (HZ) (cycles/second)		cerebral lobe waves	Cerebral lobes
left side	left side		
١١.٠٨٣	١١.٢٥	α	Frontal
١٥.٧٥	١٥.٨٣٣	β	
١٠.٨٧٥	١٠.٧٥	α	Temporal
١٦.٥٠	١٦.١٢٥	β	
١٠.٧٥	١٠.٧٥	α	Parietal
١٦.٥٠	١٦.٢٥	β	
١٠.٧٥	١٠.٧٥	α	Posterior
١٦.٢٥	١٦.٥٠	β	

It is clear from the results of Table (5) that the following changes occurred:

Alpha Waves:

• The average frequency of the cerebral lobes of the two sides of the brain "frontal, parietal, temporal, and posterior" ranged between (10.75: 11.25), where the alpha wave activity is evident in the frontal lobes of both sides of the brain, and the temporal lobe next to the right brain, followed by the temporal lobe next to the brain The right, then the temporal lobe next to the left brain, and the parietal and posterior lobes on both sides of the brain.

Beta Waves:

• The average frequency of the cerebral lobes of both sides of the brain "frontal, parietal, temporal, posterior occipital" ranged between (15.75: 16.50), where the activity of beta waves is evident in the temporal and parietal lobes next to the right brain, and the other lobes next to the left brain, followed by the parietal lobe Next to the left brain, the other lobes next to the right brain, then the temporal lobes next to the left brain, followed by the frontal lobes on both sides of the brain.

Which indicates that the dominant side of the fourth player is the balance between the left and right sides.

Table (6)
The Average Frequency of the Lobes of the Brain (Frontal, Parietal, Temporal, and Posterior) of the Fifth Player During Mental Relaxation Skill

Mean Frequency (HZ) (cycles/second)		cerebral lobe waves	Cerebral lobes
left side	left side		
١١.٢٥	١١.٥٠	α	Frontal
١٦.٦٦٧	١٦.٧٥	β	
١١.٢٥	١١.٢٥	α	Temporal
١٦.٧٥	١٦.٣٧٥	β	
١١.٢٥	١١.٥٠	α	Parietal
١٦.٥٠	١٦.٢٥	β	
١١.٢٥	١١.٥٠	α	Posterior
١٦.٥٠	١٦.٠٠	β	

It is clear from the results of Table (6) that the following changes occurred:

Alpha Waves:

• The average frequency of cerebral lobes waves on both sides of the brain "frontal, parietal, temporal, and occipital" ranged between (11.25: 11.50), where the activity of alpha waves is evident in the frontal, parietal, and posterior lobes of the left brain, followed by the frontal lobe next to the right brain, and the right side of the brain. The temporal, on both sides of the brain, and the parietal and posterior lobes on the side of the right brain.

Beta Waves:

• The average frequency of the cerebral lobes of the two sides of the brain "frontal, parietal, temporal, and posterior" ranged between (16.00: 16.75), where the activity of beta waves is evident in the frontal lobe beside the left brain, and the temporal lobe next to the right brain, followed by the frontal lobe next to The right brain, then the parietal and posterior lobes next to the right brain, followed by the temporal lobes next to the left brain, and the parietal and posterior lobes next to the left brain.

This indicates that the dominant side of the fifth player is the left side.

Table (7)
The Average Frequency of the Cerebral Lobes of the "Frontal, Parietal, Temporal, and Posterior" Sides of the Brain of the Sixth Player During Mental relaxation skill.

Mean Frequency (HZ) (cycles/second)		cerebral lobe waves	Cerebral lobes
left side	left side		
٩.٧٥	٩.٧٥	α	Frontal
١٦.٦٦٧	١٦.٥٨٣	β	
٩.٧٥	٩.٨٧٥	α	Temporal
١٦.٥٠	١٦.٦٢٥	β	
٩.٧٥	١٠.٠٠	α	Parietal
١٦.٥٠	١٦.٧٥	β	
٩.٧٥	١٠.٠٠	α	Posterior
١٦.٥٠	١٦.٥٠	β	

It is clear from the results of Table (7) that the following changes occurred:

Alpha Waves:

• The average frequency of cerebral lobes waves on both sides of the brain "frontal, parietal, temporal, and posterior" ranged between (9.75: 10.00), where the activity of alpha waves appears in the parietal lobe and the other lobe next to the left brain, followed by the temporal lobe next to the left brain, then The frontal lobes are on either side of the brain, and the temporal, parietal and occipital lobes are on the right side of the brain.

Beta Waves:

• The average frequency of the cerebral lobes of both sides of the brain "frontal, parietal, temporal and posterior occipital" ranged between (16.50: 16.75), where the activity of beta waves is evident in the parietal lobe on the side of the left brain, followed by the frontal lobe on the side of the right brain, and the temporal lobe on the side of the brain. The left brain, then the frontal lobes next to the left brain, the temporal and parietal lobes next to the right brain, and the other lobes on both sides of the brain.

This indicates that the dominant side of the sixth player is the left side.

Table (8)
The Average Frequency of the Lobes of the Brain "Frontal, Parietal, Temporal, and Occipital" of the Seventh Player During Mental Relaxation Skill.

Mean Frequency (HZ) (cycles/second)		cerebral lobe waves	Cerebral lobes
left side	left side		
٩.٦٦٧	١٠.٠٠	α	Frontal
١٦.٧٥	١٧.٢٥	β	
٩.٧٥	١٠.١٢٥	α	Temporal
١٦.٧٥	١٧.٢٥	β	
٩.٧٥	١٠.٠٠	α	Parietal
١٦.٥٠	١٧.٢٥	β	
١٠.٠٠	١٠.٠٠	α	Posterior
١٦.٥٠	١٧.٥٠	β	

It is clear from the results of Table (8) that the following changes occurred:

Alpha Waves:

• The average frequency of the cerebral lobes of the two sides of the brain "frontal, parietal, temporal, and posterior" ranged between (9.66: 10.125), where the alpha wave activity is evident in the temporal lobe next to the left brain, followed by the frontal and parietal lobes next to the left brain, and the other lobes Both sides of the brain, then the temporal and parietal lobes next to the right brain, followed by the frontal lobes next to the right brain.

Beta Waves:

• The average frequency of the cerebral lobes waves on both sides of the brain "frontal, parietal, temporal, and posterior" ranged between (16.62: 17.55), where the activity of beta waves appears in the other lobes of the left brain, followed by the frontal, temporal and parietal lobes next to the left brain, followed by The frontal and temporal lobes next to the right brain, then the parietal and occipital lobes next to the right brain.

This indicates that the dominant side of the seventh player is the left side.

Table (9)
The Average Frequency of the Lobes of the Brain (Frontal, Parietal, Temporal, and Posterior) of an Eighth Player During Mental Relaxation Skill.

Mean Frequency (HZ) (cycles/second)		cerebral lobe waves	Cerebral lobes
left side	left side		
١٠.٥٠	١٠.٥٠	α	Frontal
١٦.٨٣٣	١٦.٩١٦	β	
١٠.٥٠	١٠.٥٠	α	Temporal
١٦.٥٠	١٧.٢٥	β	
١٠.٢٥	١٠.٥٠	α	Parietal
١٦.٥٠	١٦.٧٥	β	
١٠.٥٠	١٠.٥٠	α	Posterior
١٦.٥٠	١٧.٠٠	β	

It is clear from the results of Table (9) that the following changes occurred:

Alpha Waves:
• The average frequency of the cerebral lobes of the two sides of the brain "frontal, parietal, temporal and occipital" ranged between (10.25: 10.50), where the activity of alpha waves is evident in the frontal, temporal and posterior lobes of both sides of the brain, and the parietal lobe next to the left brain, followed by the parietal lobe next to the right brain.

Beta Waves:
• The average frequency of the cerebral lobes of both sides of the brain "frontal, parietal, temporal, and posterior" ranged between (16.50: 17.25), where the activity of beta waves is evident in the temporal lobe on the side of the left brain, followed by the other lobe next to the left brain, then the frontal lobe On both sides of the brain, followed by the parietal lobe next to the left brain, then the temporal, parietal and occipital lobes next to the right brain.
Which indicates that the dominant side of the eighth player is the left side.

Result Discussion

By displaying the results of the tables from (2) to (9), it became clear that the dominant side of the diving players in question during the performance of the mental relaxation skill is the left side of the second, third, fifth, sixth, seventh, eighth player, while the dominant side of the first player

is The right side, and the fourth player's dominant side which is the balance between the left and right sides.

This means that the dominant active side of the research sample is the left side.

The researcher believes that the diving player's knowledge of the active aspect that dominates him during his performance of the mental relaxation skill helps him to take the correct measures towards the changing situations under water and help him to develop evacuation and emergency plans during diving. Kamel Ratib (2000 AD) (3), Muhammad Al-Arabi Shamoun (2001 AD) (12), Ahmed Amin Fawzi (2006 AD) (1), and Ahmed Muhammad Al-Shafei (2012 AD) (2), that relaxation is one of the best ways that suits the sports field, as They indicate that when the muscle contracts and the player reaches the maximum possible degree of tension for the muscle group, this is followed by complete relaxation of this group and then diastole occurs so that the muscle reaches a state of relaxation more than it was before the contraction, and thus when the player acquires the skill to identify the state of tension in his body muscles, and he can get rid of this tension, especially during training and competition situations or in critical performance situations, where relaxation has achieved its goal. (3: 212), (12: 222), (1: 285), (2: 157)

The extracted results are in agreement with the results of "Mamdouh Muhammad Saad and Ahmed Muhammad al-Akkad" (2000 AD) (13)), "Abdul Mohsen Zakaria" (2003) (9), "Ahmed Sobhi Salem" (2004 AD) (6), "Ahmed Farouk" Abdul Aziz" (2004 AD) (10), "Gamal Abdel Nasser al-Sayed (2007 AD) (4)," "Ahmed Salah al-Din Khalil, and Walid Ahmed Jabr" (2009 AD) (5), and "Mustafa Amin al-Ashqar" (2011) (15).), that training mental skills positively affects the level of ability to relax and reduce stress and anxiety to reach the optimum degree of relaxation that helps to increase the efficiency of performance during the training process.

Thus, the research question has been answered, which states, "What is the active side of the brain while performing the mental relaxation skill of diving players"?

Search Conclusion

In light of the research objective and its question, and within the limits of the research sample, and the procedures that were followed, and based on the results that were reached, the researcher concluded that the active side that dominates the brain for diving players is the left side..

Research Recommendations

n light of the research objective and its question, within the limits of the research sample, and the procedures that were followed and based on the results that were reached, the researcher recommends the need to:

1. Conducting more scientific research in the field of neuropsychology applications in the field of diving sport.
2. Using the digital electroencephalograph (EEG), as an objective measurement tool to identify the active side of the brain of athletes in diving in particular.

Resources

First: References in Arabic

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