The effect of mental training for sensory perceptions of skill performance in some indicators of electrical activity and the special physical abilities of young pole vaulters

El efecto del entrenamiento mental sobre las percepciones sensoriales del rendimiento de las habilidades en algunos indicadores de actividad eléctrica y las habilidades físicas especiales de los saltadores con pértiga jóvenes

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How to cite in APA

Salem Tayeh, H., Sareeh AlFadly, Y., Kareem Al-Zuabidi, R. S., & Muhammad Salman, T. (2025). The effect of mental training for sensory perceptions of skill performance in some indicators of electrical activity and the special physical abilities of young pole vaulters. *Retos, 71*, 884-893. https://doi.org/10.47197/retos.v70.116927

Abstract

Objective: The aim of the research is to prepare skilled mental exercises according to spatial and temporal perceptions and the awareness of the strength of young pole-vaulters, and to recognize the impact of these exercises on improving the indicators of electrical activity of working muscles and some special physical abilities and accomplishing this effectiveness

Research methodology: The researcher used the experimental curriculum (one experimental group), and included the sample of research on (5) two joint jumpers in the Iraqi club championship, all from the center of talent in athletics, the sample is trained on the same curriculum prepared by the coach himself but accompanied by a mental training approach that Prepared by the researcher

Results: The results indicate the development of the muscular capacity of the working groups responsible for the effective lifting of the two men as a corner movement centered on the hips towards achieving attachment and decoration to the technical situation that serves the economy of movement to achieve the greatest range and speed with the stick of adultery and to continue at this speed with the least self-insufficiency of the body to maintain the acquired momentum of the body after attachment and decoration

Conclusions: The mental training associated with skilled training is very effective in the development of the strength of the muscles working by performing pole vaulting, and the importance of both (physical, mahar and mental training) in improving the motor performance of pole vaulting.

Keywords

Mental training; electrical muscle activity; sensory perceptions; stick jumping; special physical abilities.

Resumen

Objetivo: El objetivo de la investigación es preparar ejercicios mentales especializados, según las percepciones espacio-temporales y la conciencia de la fuerza de jóvenes saltadores con pértiga, y reconocer el impacto de estos ejercicios en la mejora de los indicadores de actividad eléctrica de los músculos activos y algunas habilidades físicas especiales, logrando así su efectividad.

Metodología de la investigación: El investigador utilizó un currículo experimental (un grupo experimental) e incluyó una muestra de investigación de cinco saltadores de pértiga en el campeonato de clubes iraquí, todos del Centro de Talentos en Atletismo. La muestra se entrenó con el mismo currículo preparado por el propio entrenador, pero con un enfoque de entrenamiento mental elaborado por el investigador.

Resultados: Los resultados indican el desarrollo de la capacidad muscular de los grupos de trabajo responsables del levantamiento efectivo de los dos hombres como un movimiento de esquina centrado en las caderas para lograr la fijación y la decoración en la situación técnica que favorece la economía de movimiento para lograr el mayor alcance y velocidad con el palo de adulterio y continuar a esta velocidad con la menor autosuficiencia corporal para mantener el impulso adquirido después de la fijación y la decoración.

Conclusiones: El entrenamiento mental asociado con el entrenamiento especializado es muy eficaz en el desarrollo de la fuerza de los músculos que trabajan al realizar el salto con pértiga, y la importancia de ambos (entrenamiento físico, mahar y mental) en la mejora del rendimiento motor del salto con pértiga.

Palabras clave

Entrenamiento mental; actividad muscular eléctrica; percepciones sensoriales; saltos con palo; habilidades físicas especiales.

Introduction

Sports, including athletics, specifically the effectiveness of pole vaulters, adopt basic movements and technical sequences of performance stages as an important base for progress so that teachers and trainers spend most of the time teaching and training the performance of these movements and teaching them and giving them a greater share in educational and training programs' but long time in physical training is not the only way to train basic motor skills there in addition to physical training, mental training comes in accordance with the sensory perceptions of skill complementary and assisted by the speed of improvement of biological neural signals during the application of these movements, which reflects on the possibility of developing the application of movements according to the need for strength, balance, agility and control of the parts of the body in line with the requirements of spatial and temporal perceptions of skill, which depend in some stages on the integration of the nervous system and the mental aspect can contribute to its improvement, as this training works to reduce the burden on the player through the exchange of work between the physical side and the mental aspect within a unified process involving the mental and physical aspects (Radhi, & Obaid, 2020).

Physical training only in the performance of motor skills is not enough to learn and master the basic movements with complex and serial performance of the full effectiveness of pole vaulting, and mental training is not included in the training units used in the training of pole vaulters as well as not to emphasize the role of information on performance through the senses (visual 'audio' and sensory) which are important and effective means of mastering and integrating movements This effectiveness, if combined with mental training, the researcher decided to study this problem by using mental training as a method of correcting skill training with dynamic sensory data related to the stages of performance of this event and to improve the best by achieving this effectiveness as (mental practice as a knowledge strategy is more effective than non-practice and should be used in a way complementary with physical practice to give better results (Davies & Zillmer, 2000 : Behnke et al. 2019).

Several definitions of mental training were received, known as (Ceroni et al., 2010) as a kind of training aimed at reaching its state through the development and development of mental skills 'with increased ability to re-replicate to stabilize governance in performance' and develop the quality of the training system with the ability to relax, re-heal and prepare for competitions and believes (Chamoun & Jamal,1996) that the purpose of using mental training is to aim at Develop and develop the individual to reach the required levels by increasing the quality of the ideal performance state by developing associated mental skills ' and increasing the ability to re-repeat installation, control ideal performance' and control attention and other associated factors.

Many scientists and those interested in the need to think scientifically about the course of movement in accordance with the relationships between muscles and neurotic instruction required (Al Obaidi , 2017), and the integration of kinesiology and electrical planning (EMG) (Davis et al . 2003). This multimedia approach to movement generated a wealth of data that needs to be analysed to include the compliance of the musculoskeletal system (Duncan & Al-Nakeeb, 2005) and the problem of repetition (Ellenbecker & Roetert, 2004: Gioftsidou et al. 2008).

Many models have taken muscle tendon function into account (Gonzalez-Badillo et al. 2010) .Some studies have confirmed the importance of integrating ultrasound data on the musculoskeletal system during movement (Gremion, 2005.) and studying the transmission of force produced by a muscle group working on a particular part of the body with an individual body to the bone through the tendon to the next part of the body that contributes movement this calls for the need to record signs of neuromuscular activity via EMG.

The athlete's mental training performs things that are only aware of him or reflects in his feelings only the things that affect him directly at the same moment (Chamoun, 1980) that control of mental images has become an important skills in the development of performance and that it includes the practice of total experience and all dimensions in the situation with the cooperation of all senses in the practice of performance (Fattah, 1995 : Gracz et al. 2007)

The importance of the research comes from the importance of linking mental training to an experimental reality of the movements that make up the effectiveness of pole vaulting for young jumpers in Iraq

as a psychological aspect and its effect associated with biological neurobiological signals that are associated with sensory perception information and the possibility of their impact on functional integration Electrical activity and the resulting improvement in the special physical abilities of young pole vaulters allowing for simulation of motion performance dynamics. Sending the results of this study to the competent educators to serve as a more solid basis for individual training. An approach to evaluating results, designing improved training programmers and integrating studies designed to better understand the neurological, psychological and physical determinants of the athletic performance of young stick jumpers in Iraq.

Therefore, the aim of the research is to prepare skilled mental exercises according to spatial and temporal perceptions and the awareness of the strength of young pole vaulters , and to recognize the impact of these exercises on improving the indicators of electrical activity of working muscles and some special physical abilities and accomplishing this effectiveness, so the researcher imposed that there are statistical function differences between tribal and remote measurements of indicators of electrical activity and some special physical abilities and the completion of pole vaulting for young people (under 20 years).

Method

Research Methodology

The researcher used the experimental curriculum (one experimental group), and included the sample of research on (5) two joint jumpers in the Iraqi club championship, all from the center of talent in athletics, the sample is trained on the same curriculum prepared by the coach himself but accompanied by a mental training approach that Prepared by the researcher, the researcher achieved the process of homogeneity of the research sample for some variables (height 'weight' age) and achieve homogeneity through the variation factor (P) as shown in table (1).

Table 1. Shows the homogeneity of the research sample (height 'weight' age)

Variables	Q-	on	Variation coefficient
Length	175. 750	4. 325	2. 460881
Weight	62. 833	3. 27	5. 204271
lifetime	19. 853	0. 573	2. 886213

By observing the calculated variation factor values, the sample is homogeneous in terms of (length of 'weight' of age).

The researcher used a video camera to film the stages of performance for the purpose of evaluation, as well as a form to record the performance scores of the members of the research sample. And different measuring tools. Rubbers and ropes The mental training form for search sample personnel, the noraxon (EMG) device, which works with the Wi-Fi signal 8 channels weighing (250g) american industry.

The researcher applied technical performance tests and special physical abilities to my agencies

Technical performance tests: The test of pole vaulters within the rules of the International Athletics Federation and give 3 attempts per start from height (2.50 m) after it was completed according to the level of the sample as the beginning of the competition, and the test was filmed video to satisfy the presentation of the film to the expert gentlemen to give technical calendar grades to it. The researcher was able to prepare a form to evaluate the technical performance of vaulting the pole for the stages of performance and giving the calendar from (10 degrees) according to experts and specialists. (see appendix 1)

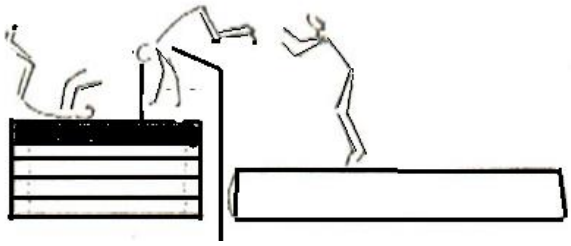
Indicators of electromuscular activity were also measured during the first attempt to jump for recording these indicators for each member of the sample.

Special physical abilities tests: (Al Obaidi , 2017)

Physical tests are determined according to the nature of the main muscle functioning and are associated with stick jumping movements as follows:

- Test the strength of the second muscles and the material for the hip joint, knees and arms according to skill.
- Goal: Measuring the strength of the central constriction of the second muscles and the material for the hips, knees and arms (the stage of coherence, tide and transit of stability).
- Tools: flat, rubber rope, sponge rug.
- Modus operable: The laboratory lies on the terrace at a height of one meter, so that the two men are stretched out on the terrace and the arms are prepared to put the stand on the arms as happens from the rear roll (to stand on the hands in the gymnast) and the player will delight the two men on the way to the joints and pull inside (such as putting the decoration by jumping with the stick) and then the effective tide of the robot and the back With the synchronization of the extension of the arms with it (such as placing the extension by vaulting with the pole) and pushing high to toss the body and cross the rubber rope and get rid of it without touching it (as in crossing the crossbar by vaulting with the pole), and connect the rubber rope to a specific height at the end of the head and at an appropriate dimension so that this dimension gives the player the freedom to do the swing.
- Registration: The highest height the player has passed from 3 attempts. (Note Figure 1)

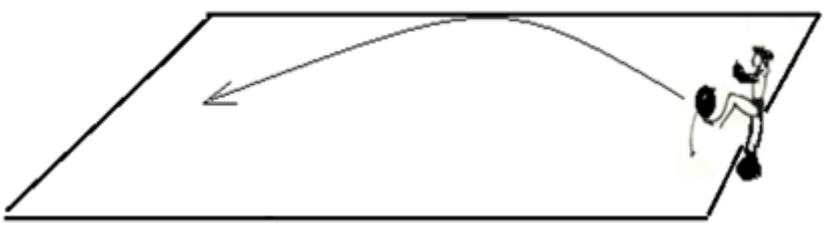
Figure 1. Muscle testing material for hips, knees and shoulders



Test throwing a medical ball with the two men from stability

- Goal: Measuring the strength (central constriction) of the second muscles of the hip joint (upgrading phase and start attachment).
- Tools: measuring bar, medical ball weighing 1 kg.
- Modus operable: The player takes the usual stand position and presses the feet from the inside on a medical ball weighing 1 kg so that the two men are outstretched and the player stands the starting line and prepares to swing the two men in front of high to throw the medical ball as far as possible, giving three attempts calculated the best.
- Registration: Record the largest horizontal distance that the medical ball reaches by meters and its equipment. As show in the Figure 2)

Figure 2. Two-man medical ball throw test



Fist test

- Goal: Measuring the strength of the fixed central contraction of the muscles of the arms (responsible for the implantation phase and the start of attachment and resistance to the pole)
- Tools: Dinometer to measure the strength of the fist
- Modus operable: The laboratory stands and holds the diometer with one hand so that the musk grip in his hand is suitable and contracts with the maximum strength without bending the elbow, and repeats the test to the other arm.
- Registration: The highest strength of the total gram index is recorded and its rate.

The researcher conducted the reconnaissance experiment on a small sample before conducting its research aimed at identifying the obstacles and errors that accompany the research procedures and identifying the time allocated to the training departments, as well as knowing the appropriateness of the stadium in performing the experiment for research.

Tribal tests were carried out over two days, with skill tests conducted on 26 October 2021, while physical abilities tests were conducted on 27 October 2021 at Najaf's Most Honored Olympic Pole Vault Stadium.

Then the implementation of the mental trainings, which lasted for nine weeks from 1/11/2021 until 6 January 2022, and in fact three units per week and simultaneously with the skilled and physical approach . The researcher relied on the physical exercises of the duty of muscles during the stages of performance starting from approaching to the end of planting the column and then attachment and reaching the position of L and decoration and then the tide with the extension of the column and pushing arms and leaving the stick and successful passing and landing, awareness of the senses, and clarity of the motor paths of the parts of the body and correction it should be noted that the mental training curriculum was applied to the research sample, after the completion of the skill training unit, as the sample members move to another place on the field for the purpose of implementing the mental training curriculum and the duration of the unit for mental training (15) minutes.

After the completion of the joint exercises, the remote tests were conducted on 8 January 2022 and in the same procedures as in tribal tests.

After the exercises were completed, the search results were obtained as follows.

Findings

Presentation, analysis of the results

Results are presented and analyzed below:

Table 2. Differences between computational circles, standard error and (t) values of the physical abilities of the search simple

Variables	Unit of measurement	Tribal		Post		so	P	(t) Calculated	Error level	Significance of differences
		Q	±	Q	±					
Explosive force of two men.	meter	5.71	0.34	6.80	0.21	1.09	0.278	3.92	0.021	D
Explosive force arms	meter	0.49	0.06	0.61	0.03	0.12	0.890	3.67	0.003	D
Grip power	Kg	46.4	15.7	58.8	5.5	12.4	3.679	3.37	0.050	D
Performance level	degree	4.56	2.92	8.46	1.23	3.90	1.077	3.62	0.001	D
Achievement	meter	3.13	0.09	3.45	0.14	0.32	0.059	5.40	0.043	D

Freedom score (4) and error level ≤ 0.05:

Table 3. Differences for indicators of electrical activity of the working muscles of the search sample

Variables	test	Q 5	On±	P 5	P	(t) Calculated	level Error	Level of significance
Super waistcoa (top)	southern	294.8	74.64	258.6	91.12	6.305	0.003	D
Mick. Volt)	Go away	553.4	77.92					
Dalia (Top) (Mick.Volt)	southern	722.77	107.37	301.82	115.4	5.84		D

	Go away	1024.6	109.89				0.004	
Two-headed, Top, Mick.	southern	610.34	125.05	339.45	88.69	8.55		
Volt.	Go away	949.8	56.8				0.001	D
Femoral (top)	southern	641.44	208.61	354.75	195.62	4.05		
Mick. Volt)	Go away	996.2	37.34				0.015	D

Freedom score (4) and error level ≤ 0.05.

Discussion

The results were statistically significant below the level of ≤0.05 and the degree of freedom (4) indicating a moral development in the sample results because of the mental training exercises used. The results indicate the development of the muscular capacity of the working groups responsible for the effective lifting of the two men as a corner movement centered on the hips towards achieving attachment and decoration to the technical situation that serves the economy of movement to achieve the greatest range and speed with the stick of adultery and to continue at this speed with the least self-insufficiency of the body to maintain the acquired momentum of the body after attachment and decoration. Exercises used using rubber ropes and jump boxes (gymnasts) and then mental training on them to enhance neural pathways aimed at promoting the increased build-up of muscle fiber to work according to the skill performance in question , which was performed from stability cases to achieve performance integration and overcome the inertia of the body when starting effectively in the development of this strength of the muscles of the second hip legs (central contraction here is the duty of the main muscle) so this achieved this The result is the goal of using these exercises, which is the skill training goal by mastering the technical conditions associated with the contraction of the hip muscles during the stages of attachment and training, as well as achieving the training goal by increasing the strength of these working muscles when overcoming the resistance used.

All these exercises were enough to gain the appropriate acceleration to reach a high speed serving the achievement that is associated with the link of my expulsion to the speed of approach and launch, so this topic is due to the nature of movements and mental perception of what muscle strength should take according to the technical tracks of the body parts associated with the stages of technical performance and trained members of the search sample on which contributed to the realization of The correct link between the end and the beginning of each stage, which reinforced the correct link between the speed of approach and upgrading during the performance of competitive attempts to achieve good achievement in the distance tests, and it is better for the rider to choose for himself the appropriate connection based on his sense and intuition, which may not always be sufficient required according to what should be achieved appropriate mechanical conditions which may be unknown to them as a result of not caring about them or confirming them during training and this is related to the results of the sample members in tribal tests.

The moral differences in the explosive strength of the arms indicate that the members of the sample have developed the work of the muscles working in the shoulders and arms to overcome the total body mass as their level of muscle efficiency in these totals has been consistent with their training levels, thus tending the player to the province exert strength with the arms and shoulders during attachment, decoration and post-anchorage as it will need to be effective momentary thrust with these joints simultaneously with the extension of the stick and the completion of the tide in the joints of the shoulders, elbows and wrists to cross the crossbar Without mistakes and at a sound timing and according to what was achieved in the previous stage (attachment), this means the development of the efficiency of these muscles in overcoming body mass and the development of absolute strength through exercises that used various resistances to maintain the energy requirements necessary for the rider, whether vital or dynamic compared to the mechanical situation taken by the player to enhance his province On the speed gained, this indicates that the sample members suffered from errors, especially in tribal tests with regard to motor performance, especially in the first stage after upgrading (attachment and upgrading) and the last stage (the moment of tide and passing the crossbar) and that the main error was to link what is required to achieve the required speed and the required duration (central contraction of the working muscles) and appropriate over the different stages of performance, which the researcher worked to confirm during the mental training of individuals This is why the results develop in this variable as a

result of the application of the proposed exercises according to the stages of performance and the promotion of motor tracks according to the technical performance, which worked to develop the strength rates of the arms according to the required correct motor path that serves the achievement achieved.

Although this method is limited, a number of studies have produced a consistent result that confirms the possibility of neurocooperation in response to muscle excitation for short work, whether by field training or mental training associated with viewing and other sensory information(Jeffreys , 2002: Jones & Bampouras, 2010:Keays et al.2001).

Functionally, the required adjustment in the rate of strength development occurs more after strength training than after maximum strength is gained by mental stimulation (Reiman & Manske, 2011).

By analysing the data for electrical activity associated with video monitoring of the player's movement, it was found that electrical activity increased almost twice as much in the distance test as in the tribal test. These enhance the rate of strength development at the level of a single motor unit, consistent with the findings of (Greenberger et al.1994).

The coaching trend of the stick jumper is towards the integration of strength in the muscle groups operating according to the motor paths of this event, as well as the trend towards increasing the special speed in the conditions of the competition. This is achieved using the mental perception of what is required to be implemented during the performance stages, which is due to a development in special abilities, and in accordance with the muscular work associated with the muscle properties that work when jogging and jumping to ensure the motor preparation of a good rhythm commensurate with the requirements of achieving achievement in this competition and in accordance with its mechanical conditions associated with the educational and training aspect (Stockbrugger & Haennel , 2001).

Also resort to phased training (different stages of the race) to develop training under the parts of the competition and according to its timings and develop and invest the individual capabilities available all to improve performance (individual appropriate precautions, individual training possibilities) to meet the new requirements (psychological and physical) of the competition including the requirements of competition, the willingness to withstand psychological and physical pressures and achieve a higher quality efficiency of training through accurate and objective understanding of training as well as control of training and the basis of concepts of development individual. It is a key duty when starting to teach skill and continue to train it.

One of the practical results achieved in the overall performance of sample members of the research, which was accompanied by the development of muscle forces in the working groups and the level of technical performance is that the stage of bending (attachment and coiration) is in a state of decrease (i.e. an increase in courration through the reduction of the angle of the hips) which led to an increase in the stage of effective tide (speed of tide), and this was consistent with the increase in momentary strength, which influenced the achievement of speed of these parts, which was consistent with the development of the stage of effective tide (tide speed). Ability, with the result of the achievement achieved and gave its ejection significance in that the greatest strength of the shoulders and hips was applied in a little time and gave greater influence than the same power in the longest time of the tide and passing the crossbar. This is what was confirmed to be implemented during mental training, which was reflected in the development of the level of performance and achievement.

The concentration of attention on the model and images helped the sample members during training in mental training and watching the movement in detail Mental training of the things to be learned and how the reaction in certain situations helps to focus better (Al Wasimi, 1999).

Mental training helps prevent the dispersion of ideas and attention" (Rabet,2000) which means the effectiveness of the mental training curriculum that gave the sample members the ability to know the details of skills by listening accurately to the technical description of the skill as well as observing the model depicted or living and working on its return or performance mentally and identifying the details of the performance try after another and continuing to repeat them mentally made them They can feel the movement through the clarity of the image obtained by the sensory signal that trimmed the image during continuous repetition (when using mental training to develop the speed of skills and increase motor learning will be more effective when training in the reality of sensory or motor feeling that accompanies movements) (Al-Kholi et al. 1998) this is also in addition to containing the mental training

program on special exercises on how to isolate negative ideas that provoke And make him not in control of his ideas and replace them with positive ideas build it and achieve goals the presentation of skill by the model and commenting on it in detail gave an opportunity for the experimental group of attention and focus on the parts of the skill and its knowledge in detail the sense and visual, auditory and intellectual awareness they are of great importance that affect the specificity of the games of al-Raya'i (Hussein , 1990).

Finally, the mental training curriculum gave sample members an opportunity to train through multiple different responses, resulting in images of brain typography and avoiding errors.

Conclusions

- The mental training associated with skilled training is very effective in the development of the strength of the muscles working by performing pole vaulting.
- The importance of both (physical, mahar and mental training) in improving the motor performance of pole vaulting.
- Physical, mahar and mental training has affected the achievement of good by vaulting with a pole.
- The importance of mental training in increasing the electrical activity of the working muscles and enhancing their strength rate.

Recommendations

- Use of mental training with physical and mahar training within the training units for caning
- Conduct research studies similar to other jumping or throwing activities.
- Diversify mental training through the use of audio recording, visual models and motor visualization as an integral and effective part with physical and mahar training.

Acknowledgements

Non.

Financing

Non.

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Appendix

Appendix 1

A model of a training unit for the mental training curriculum proposed by the researcher.

Goal: To clarify the importance of mental training, learn to relax, visualize the skill of planting the stick and attachment.

Detailed explanation of the importance of mental training in learning motor skills and the meaning of relaxation

Players are asked to sit long and arms next to the body, palm of the hand up and the legs are close

Start learning the process of breathing (breathing) deep from the abdomen and at the height of the chest up as much as possible and take the lust from the nose and get (exhalation) from the mouth.

Emphasizing breathing at the behest of the coach to reach a fixed mechanism for breathing while drawing the attention of the players to a specific point inside the hall in front of them and continue the process of breathing.

Start learning to relax, take a deep inspiration followed by a long, slow exhalation , double breathing through thoughts (relax) and let your body relax, repeat it several times in a row and then relax the eyes, ask the players to dip the eyes. and with a suitable opening between them Feeling to retain the strength of the arms and not to round the stick to the body without tension or tension.

Sense of hip flexibility and pulling the legs to the torso to start the proficiency and visualize the complete skill and at normal speed (5-7) times

Students are asked to move their fingers and feet, pull the feet towards the chest and lift the arms up. Open the eyes and then rise , and thus repeat the same procedure for the rest of the performance stages.

Appendix 2

Experts in athletics are:

1. Dr. Frank Abdul Karim: Faculty of Physical Education and Sports Sciences - University of Baghdad - Expert
2. Dr. Mehdi Kazem Ali: Faculty of Prisoners University - Department of Physical Education and Sports Sciences - Expert
3. Dr. Ether Sabri Al-Jumaily: An expert specialized in adultery jumping - Qatar

Appendix 3

Noraxon and 8-channel Wi-Fi (250g)