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Knowledge, Awareness and Use of Neurodynamic Mobilization in Athletes Training Among Palestinian Physiotherapists

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Abstract

Background: The use of Neurodynamic mobilizations to improve those qualities had not been enough studies; the aim of this research is to investigate the knowledge, use, and awareness of Palestinian physiotherapists about the Neurodyanimc mobilization (NDM) effect on the above-mentioned variables.

Methods: An online data collection sheet was developed by the researchers and was distributed online, special invitations were sent to physiotherapists on local websites of the Union, and social media.

Results: 58 physiotherapists responded with the average age of participants was 30.24 (± 8.14 years), the average years of experience were 5.58 (± 6.59 years). 60.3% of the participants attended courses in ND, 58.6% attended courses in NDM, postgraduate sport rehabilitation courses were reported by 60.3%. 58.6% reported the application of NDMs after warm-up exercise. 32.7% expressed knowledge in NDM with 39.7% 32.7% reported the knowledge of ND tests. 63.5% of the participants believe that ND is effective in the management of sport injures. Participants believed in positive the effect of the NDM on improving speed (48.3%) <, endurance (60.3%), balance (57%) and athlete performance 72.4%. ND assessment (r 5.31, p =0.00). Males had more knowledge than females in both ND tests and in NDM (p <0.05). Males had twice the chance to attend post-graduate courses.

Conclusion: There was gender variation favorable for males in terms of the chances to attend postgraduate courses, more than half of the participants supported the positive effect of ND on athlete's performance.

Keywords: Neurodynamics; Sport Injuries; Training

Introduction

Competitive sports require an intensive training, that leads to better strength, endurance, balance, and proprioception, especially in a maneuvering game like football, where several trainings are directed to achieve the maximum level of the previously mentioned merits, that distinguishes players from each other, in the elite level of professionals in sports.

High level of performance, and less risk of injury, partially depends on better neuro feedback in terms of proprioception, balance, speed, and endurance. Which in turn depends on neural function in addition to higher level of motor control that allows the players to maneuver and react in more accurate, fast, and dynamic trajectories. since neural mobilization has a positive effect on neural function, the use of NDMs in sports training and assessment was not sufficiently investigated, as there is a lack of studies investigating the effect of NDMs effect on athletes training activities. On the other hand, there is a dearth of information about the use of ND tests in assessment of athletes in Palestine. Results of this study will be useful for physiotherapists, sports trainers, and athletes who are aiming to improve their performance in a competitive level.

The aim of this study is investigating the use, awareness, and knowledge about Neurodynamics in both management and assessment in football players, among Palestinian Physiotherapists in Palestine.

Neurodynamic testing / mobilization is defined as: a method of physical therapy to treat the pain and gliding of the nervous system, and it depends on affecting pain physiology by mechanical treatment of neural tissues and other non-neural structures surrounding the nervous system [1], Throughout the past 30 years ND was discovered after it was suggested that the nerves also move independently just as the joint moves and the muscle contract [2]. Football player need intermittent high intensity performance, and this requires a high strength, power, flexibility, and balance to avoid injury [3], One of the goals of neurodynamic mobilization is to restore haemostasis in and around nervous system, and this can be accomplished through the intervention of

neurodynamics (motion-based intervention) [4]. Neurodynamics mobilization is commonly used by physiotherapist, and the interventions usually used to treat musculoskeletal, nervous system, and muscular diseases, but research on neurodynamics mobilization in athlete's rehabilitation is limited [5].

Football is the most popular sport worldwide. There are about 200 million players in the world, when the numbers of football players increase it will lead in turn to rising frequency of injury with resulting lack of playing time, to avoid injuries injury prevention programs are required [6].

Athletes before training should perform warm up and muscle stretching exercises to avoid strains , players should perform stretching techniques of hamstring muscle to avoid player from injuries and improve performance and static stretching, proprioceptive neuromuscular facilitation use with athletes to increase muscle length, improve flexibility and increase range of motion [7], when the players do stretching and move their joints nerves also move, if the joint is elongated, the joint and never come closer or farther from the joint when they are both placed in contraction [8]. As ND is a popular method of reducing Neural tension, that may affect the Muscle length, then NDMs could also be considered in the methods of stretching and muscle mobility training.

The adverse neural stress can result in nerve pain and limited motion. When the body is facing a problem, it sends nervous signals to make reflexive muscle guarding to protect from the nerve from further irritation [9].

Active, passive, and specific exercises are a different type of warm-up, physical performance improved 79% after the warm-up, Improvement occurs in different types of aerobic and anaerobic exercise [10], those types of training increase muscular endurance to avoid injuries to muscles at the whole body such as the hamstrings, there are many factors that can cause hamstring injuries such as imbalance, muscle strength, insufficient warmup, decrease flexibility [11].

hamstring injuries are the most prevalent sports injuries among athletes that play power sports, endurance training interventions aimed at reducing injury risk typically focus on the development of maximum endurance [12].

Methods

Population and Sampling

The sample was recruited from Palestinian physiotherapists who are involved in training, assessment and management of sport injuries. Through a convenient sampling method, who responded to an online data collection sheet. The population of physiotherapists working in the field of sports rehabilitation is estimated to be around 100 physiotherapists out of more than 1000 registered physiotherapists in Palestine (west Bank) working in other fields of physiotherapy, we were aiming for more than 50% coverage of the total population which is calculated to be 50 participants , we have got 58 responses out (N=58), which is satisfactory to our intended sample size. All physiotherapists who are working in Palestine in the field of Sports rehabilitation and training were included, physiotherapists who are not in the field of sports were excluded, or who are not currently in the field were excluded.

Research Methodology

A cross sectional descriptive design was used, as it is the best and easiest method to answer the research questions. Consent form had be agreed upon and signed electronically before filling the online data collection sheet that investigated personal data (age, gender, experience and other factors), part of the data collection sheet concentrated at the history of postgraduate education, and the last part of the data collection was concerned with the knowledge, attitude and use of ND in both treatment, training and assessment of sports professionals. Descriptive statistics was used to highlight the answers of the 18 questions related to both assessment and management using ND tests and mobilization, and inferential statistics was used to investigate the difference between different age categories and gender. Research ethical codes of conduct in terms anonymity and privacy were guaranteed and declared to participants.

Results

Personal characteristics of the participants

According to results (Table 1), 58 physiotherapists working in athlete's rehabilitation responded, with an average age of (30.2), males composed 55% and females were 45% with average of years' experience (5.58).

Item	Mean	SD
Years of experience in the field of sport rehabilitation	5.58	6.59
Age	30.24	8.14
Gender	N	%
Male %	32	55%
Female %	26	45%

Table 1: Personal chractarestics of the sample

According Figure 1, the sample included 5 universities in west bank, and others that studies in different universities. The majority of participants were from al-Quds University (50%).

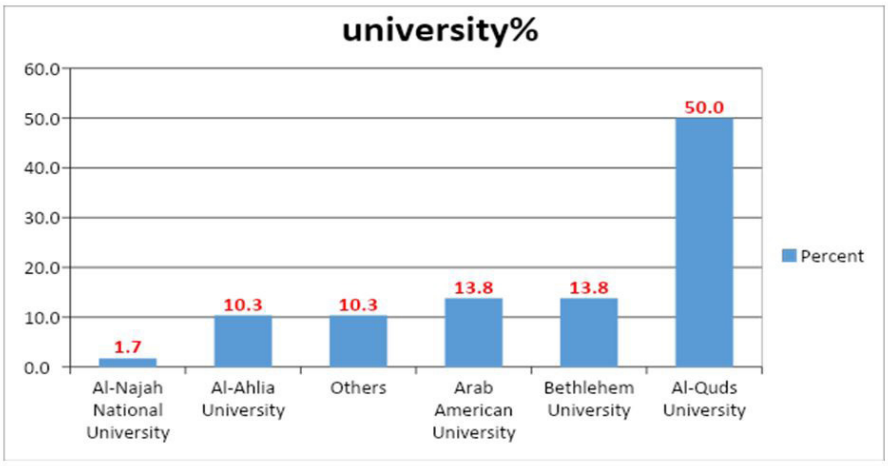

Figure 1: The Participants University

According to Table 2, 39.7% never learned about ND assessment, 60.3% took a course about ND assessment. 41.4% never learned about Neurodyanimc mobilizations (NDMs), compared to 58.6% that took have been subjected at least for one course in NDMs. 39.7% never had chance to attend a sport Rehabilitation course.

Type of course	Yes (%)	No (%)
Course ND assessment	60.3	39.7
Course in NDM	58.6	41.4
Course in sports rehabilitation	60.3	39.7

Table 2: History of courses in NDs and sport rehabilitation

In relation to the timing of using NDMs in relation to the warming up exercises, the therapist responded mainly that they perform NDMs after warm up exercise s (58%) as shown in Figure 2.

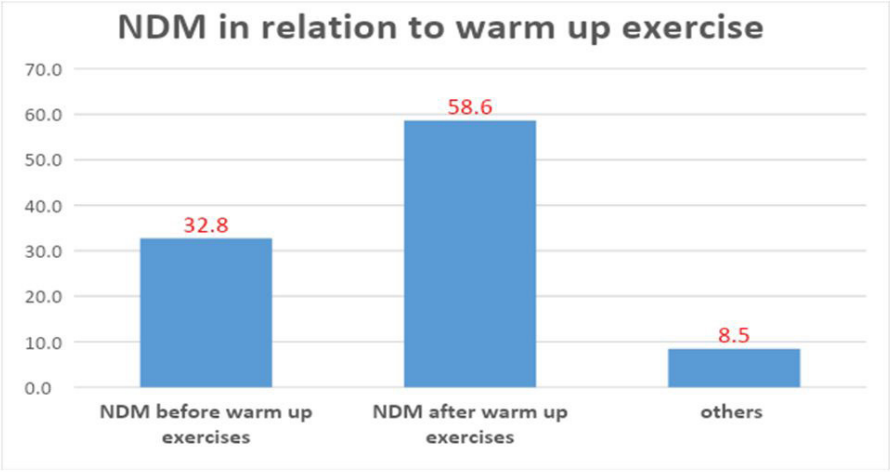

Figure 2: Timing of NDMs in relation to warm up exercises

According to Figure 3 the percentage of therapists responded by agree or strongly agree in terms of knowledge in ND assessment was 39.7% only. While percentage of therapists who responded with agree or strongly agree in terms of knowledge of Neurodyanimc mobilizations (NDM) was 32.7.

In terms of use of NDs in assessment of athletes and sports injuries, only 32.7% of the participants reported by agree or strongly agree reading the use of ND tests with athletes (Figure 4).

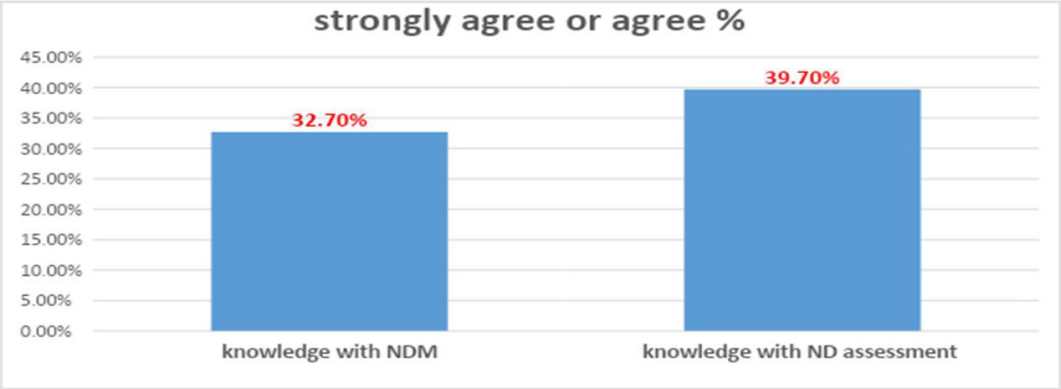

Figure 3: Percentage of therapists who responded with agree or strongly agree regarding their knowledge in NDMs and assessment

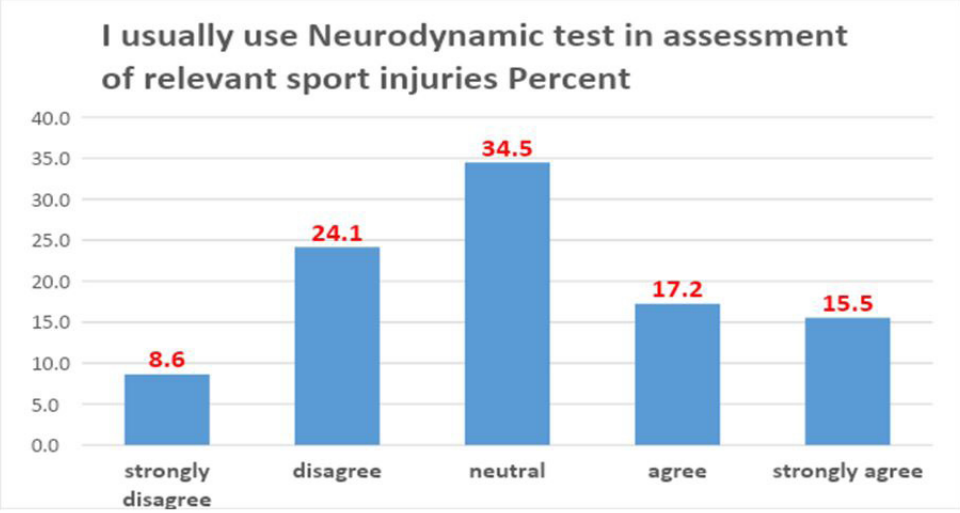

Figure 4: Use of ND tests in assessment of Athletes with sport injuries

Attitude

According the Figure 5, 53.5% of participants believe that the NDMs are effective in management and training of athletes with sport injuries (Figure 5).

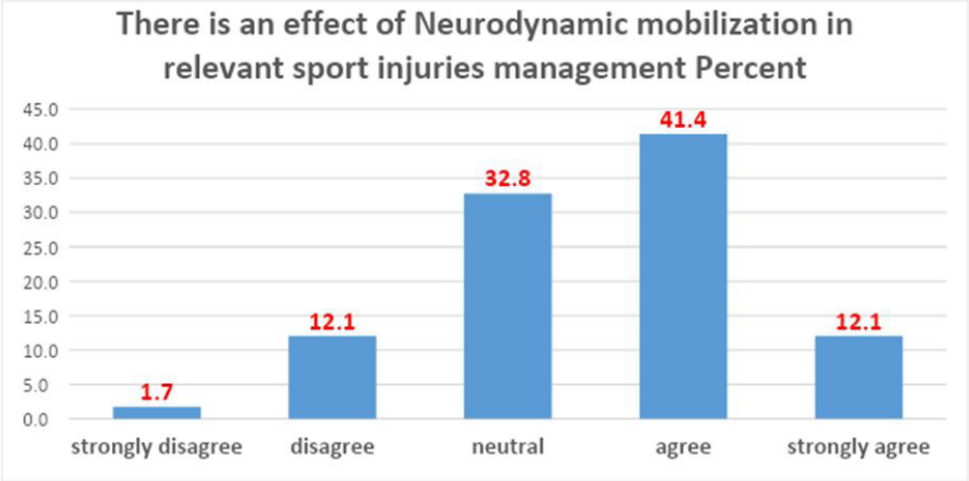

Figure 5: Attitude of therapists regarding the use of NDMs in management of Sport injuries

In relation to the attitude and believe of therapists in terms of the effect of NDMs in the sport training on variables of balance, speed, endurance and performance, more than half of the sample believe it is effective in speed, endurance and balance, and 72.4% believed that it will improve the overall performance of athletes (Figure 6).

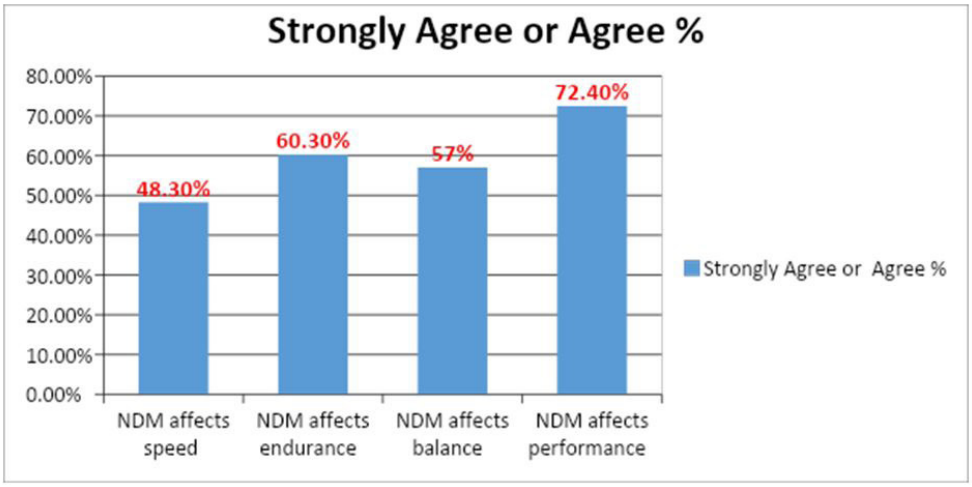

Figure 6: Attitude of participants regarding effect of NDMs on balance, speed, endurance and performance of athlete

The correlation between knowledge in both assessment and management of NDs showed that there is astatically significant correlation between years of experience and the knowledge of ND tests and NDMs ($p<0.05$) using none parametric spearman correlation coefficient (Table 3).

		I have excellent knowledge with NDM	I have excellent knowledge in ND assessment (tests)
Years of experience in the field of sport rehabilitation	Correlation Coefficient	.534**	.531**
	Sig. (2-tailed)	.000	.000
	N	58	58

Table 3: Correlation between years of experience and knowledge in NDs

In terms of gender differences, the males had more knowledge with NDM (3.406) on 1-5 ordinal scale of knowledge, than the females (2.615), also the males had more knowledge with ND assessment with an average of 3.594 an ordinal scale knowledge of 1-5 compared to females (2.808), as shown in Table 4. This difference of knowledge was found to be statistically significant between the two groups (males/females), using Mann Whitney none parametric test ($p<0, 05$).

	Male / Female	Mean (1-5)	Mann Whitney/ P. value
I have excellent knowledge with NDM	male	3.406	0.04
	female	2.615	
I have excellent knowledge in ND (tests)	male	3.594	0.04
	female	2.808	

Table 4: Gender difference in knowledge of NDs

Males in our sample had more chance to participate in postgraduate courses in NDs as shown in Table 5, as 65% responded with yes compared to only 34% among females. the same was found in course for NDM where 70% responded with yes in males as compared to 29.4% in females.

	Courses in ND Assessments	Courses in NDM
Male	65.70%	70.60%
Female	34.30%	29.40%

Table 5: Gender variation in courses in NDs

Discussion

58 physiotherapists responded assuming that these are the therapists involved in sport injuries in Palestine. This percentage represents less than 5% of registered physiotherapists in Palestine that was reported by Palestinian physiotherapists association as around 1200 therapist at the end of 2019. This percentage shows that their less focus in the field of sports among Palestinian physiotherapists associations, which is not clear withier it represents a decrease interests in sport injurers or less chances to work

in this field. At the same time the researchers are not sure if this percentage represents the actual percentage of therapist working in the field of sports or it represents an actual response rate.

*Average age of participants 30 years with average experiences 5 years which implies that we have young generations of physiotherapy working in sport which, at the same time should mean that they should have been subjected modern techniques in PT and updated educational plans. At the same time, it was not expected to find that around 60 percent of participants only had been subjected to post graduate courses in ND tests and ND mobilizations, Despite the fact that this field of both assessment and intervention is one of the well-known techniques in PT [13]. At the same time even though the percentage attended courses 60% only third reported knowledge in ND tests and NDMs, this pauses a question of two things, firstly the depth of knowledge given in those courses and the percentage of practical skills gain of those courses.

**Having such a low percentage of therapists reporting knowledge of ND while they are working in sport injures may affect both the outcome of the rehabilitation and the risk of injures also the incidence and risks of injures, Since we know that neural tension is one of the underline causes is decrease of stretch ability of the muscle which is one of the risks of sports injurers as was supported by Mallac (2019) [8]. One other possibility could be that despite of the knowledge gained of the coursers it may be that therapist are not fully aware of the relevant cases to use those skills knows while 48% - 63% of the participants believed in the positive effects of ND on the most important variables in competitive sport (speed, balance, endurance, and performance), this finding supports conclusions of Faude, Rößler, & Junge, (2013) [6]. Only around quarter of the therapist actually reported knowledge about NDMs in treatment, this could be due to the fact that despite their believe in effectiveness in NDs in management in sport injures, participants are not sure of their professionally qualification and skills in the applications of their skills.

It is expected to find an association between years of experiences and the knowledge of NDs, as years of experiences first of all gives the opportunity to attend post graduate courses and to touch the need of such advance technics in both assessment and treatment in sport injuries assessment and management. This result also shows the importance of investment in the post graduate educations among new graduates. At the same time, it reflects the importance of experience of therapists when they are recruited for athletes training and injuries management

By the initial look at a result it seems that males has a significantly more knowledge than females , but in fact this result would not be considered as a reference for males, it in fact represents a social and cultural disprivilege of females in Palestinian societies, this appears very well when we look at the variation of chances for males in the fields of post graduate courses compared to males, where we see that they have had double the chance to attend such educational privilege, which again stresses the importance of gender equality in courses and fair equal chances of education for females and males to bridge this gap of cultural privilege for males.

Limitations of the Study

The study could have been stronger if it was face to face filled, but due to the corona isolation policy, we had to use online data collection methods.

Conclusion

There was gender variation favorable for males in terms of the chances to attend postgraduate courses that affected knowledge in both assessment and management using ND for the favor of males. There is positive correlation between knowledge of NDs and years of experience, more than half of participants supported the positive effect of ND on athlete's performance, around one thirds of participants only reported knowledge in both ND assessment and mobilization. Further research should be conducted to investigate further knowledge like the barriers to use NDs in both assessment and mobilization. And to conduct a clinical trial that investigates the effect of incorporating Neurodyanimc mobilization in train of athletes, on balance, speed, performance for football players.

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