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Research Article

Knowledge, Attitude and Practice among Physical Therapists in Saudi Arabia towards the Use of Dry Needling on Spasticity in Patients with Stroke

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Abstract: Introduction: Studies that describe spasticity and development of contractures are scarce; however, a permanent loss of joint range of motion was observed to be reported 3–6 weeks after the occurrence of stroke. The prevalence of spasticity in paretic patients has been reported to be 27% at 1 month, 28% at 3 months, 23% and 43% at 6 months, and 34% at 18 months. Various approaches, such as exercises, splinting, and medication have been used to treat spasticity with moderate improvements in the long-term range. **Aim:** To assess the knowledge, attitude, and practice among physical therapists in Saudi Arabia toward the effectiveness of dry needling on spasticity in patients with stroke. **Method:** A cross-sectional study was conducted using a close-ended questionnaire that was distributed among physical therapists in Saudi Arabia to convey the main objective of the study. The questionnaire was distributed on different media platforms. **Results:** The study showed that there was no significant difference found between groups when compared regarding knowledge. No correlation was found between the participants' total knowledge score and gender, experience, work setting, workplace, specialty, and academic degree scores. The participants showed a positive attitude toward the usefulness of dry needling in neurological cases. The majority of our participants used the modified Ashworth scale in their common practice to assess the spasticity in patients with stroke more than other scales, such as MTS and tone assessment scale, and preferred stretching over other interventions to treat spasticity. **Conclusion:** There was no significant difference in the total knowledge scores with regard to the gender, certified and non-certified dry needling participants, and participants who have and never have used dry needling as an intervention for spasticity in patients with stroke.

Keywords: Dry needling, knowledge, attitude, practice, stroke, spasticity.

Introduction

Studies that describe of spasticity and development of contractures are scarce; however, the loss of joint range of motion was reported 3–6 weeks after stroke occurrence. The prevalence of spasticity in paretic patients has been reported to be 27% at 1 month, 28% at 3 months, 23% and 43% at 6 months, and 34% at 18 months[1,2]. The onset of spasticity is highly variable during the post-stroke period, and can still increase over time even after the 3-month peak of the neural components of spasticity; the muscular components of spasticity contribute to an increasing incidence of spasticity 6 months post-stroke. Various approaches, such as exercises, splinting, and medications have been used to treat spasticity with moderate improvements in the long term[3,4,5]. A study conducted by Pollock et al. concluded that no rehabilitation intervention, including Bobath therapy, strength

training, repetitive task training, muscle stretching, and positioning, is more effective than the other in favor of regaining mobility and recovery of function after a stroke[6]. A systematic review and meta-analysis on the effect of transcutaneous electrical nerve stimulation (TENS) showed significant improvement in the walking capacity and reduction of spasticity in stroke survivors when treated with high-frequency TENS. However, the effect that was reported after analyzing and reviewing 11 studies with 439 participants was significant in acute and sub-acute cases, but not certain in chronic stroke survivors[7].

The studies that have been conducted on the effect of dry needling are very limited yet very promising. The majority of the studies have shown a significant effect of dry needling on the muscle spasticity and motor function in patients with neurological conditions. Five clinical trials were conducted between 2014 and 2020[8-10]. Of the five clinical trials, three trials were for the upper limbs and two trials were for the lower limbs. In a crossover study by Gomez et al. on the rotator cuff muscles of the shoulder, the subjects were randomly assigned to receive rehabilitation alone or rehabilitation combined with dry needling. Each subject received underwent the same intervention programs; both interventions were separated by a period of at least 15 days once per week over a 3-week period, focusing on reducing the muscle spasticity by passive positioning of the shoulder girdle and repetitive task training exercises along with dry needling. Both groups showed a significant decrease in the spasticity, pain pressure sensitivity, shoulder abduction, and external rotation. However, the study concluded that the inclusion of dry needling did not generate a higher decrease in the spasticity level for both groups[10]. Crossover studies are often longer than parallel studies. Subjects who complete the first phase of evaluation contribute little to the analysis, and there is the potential of unbinding when the effects of one intervention are more obvious to the participant and there is a carry-over effect between the evaluation phases.

Moreno[11] applied dry needling on 34 patients who previously had a stroke. The patients were randomly assigned to an experimental group that received one session of dry needling over the gastrocnemius muscle and the tibialis anterior muscle, and a control group that received no intervention. Patients who received dry needling exhibited a decrease in spasticity and mean pressure, bilateral increase of pain threshold and support surface in the forefoot, and unilateral increase in the support surface in the rearfoot of the affected side. Since the control group in the study did not receive any intervention, it is difficult to link the significant difference that was shown on spasticity to dry needling. Most studies of dry needling have only administered a single session of dry needling to the subjects[9]; another study did not include an outcome measure to assess the motor function[11]. These same studies recommended that a larger sample size, additional sessions, and a longer follow-up period are now needed in future studies.

To assess the knowledge, attitude and practice among physical therapists in Saudi Arabia towards the effectiveness of DN on spasticity in patients with stroke. To describe physical therapists in Saudi Arabia's knowledge, attitude, and practice towards the effectiveness of dry needling on spasticity in patients with stroke. To assess the relationship between participants knowledge regarding stroke, spasticity and dry needling.

Methodology

Study design

A cross-sectional study was conducted using a close-ended questionnaire that was distributed among physical therapists in Saudi Arabia to convey the main objective of the study. The questionnaire contained two main sections, namely the demographic characteristics and questions assessing the knowledge, attitude, and practice.

Participants

The targeted participants were physical therapists in Saudi Arabia. The participants were recruited using the snowball sampling method and were included if they met the following criteria: (1)

specialized in physical therapy, (2) had at least finished the physical therapy internship year program, and (3) registered as a physical therapist at the Saudi commission for health specialties (SCHS). The participants were excluded if (1) they had no clinical experience and (2) were not familiar with the dry needling intervention. The questionnaire was distributed on different media platforms.

Sampling method and procedure

The number of registered physiotherapists was obtained by contacting the SCHS. Once the targeted population was determined, a sample size calculation was performed. The sampling method used in this study was the snowball sampling method.

Power Analysis (Sample Size Calculation)

We contacted the Saudi Committee for Health Specialties (SCFHS) via email to provide us with the number of physical therapists registered at their database. The total number of physical therapists registered in the SCFHS was 11,716. The number of participants was estimated using an online sample size calculator with a P value < 0.05 and power of 80%, which was 162 participants.

Data Analysis

The questionnaire was developed in a manner that, questions regarding knowledge were drafted specifically to test the participants. Each correct answer was given a score. The scores for each participant were subsequently calculated. The questions regarding attitude and practice consisted of yes/no and multiple-choice questions with no score for participants choices. We performed a normality test to determine if the data showed a normal distribution or non-normal distribution or not. The test showed that our data was not normally distributed; therefore, we used nonparametric measures to analyze the data.

Statistical analysis

Normality of demographics, knowledge, attitude, and practice were assessed using Shapiro-Wilk test. The demographic characteristics were analyzed using descriptive statistics method by reporting the median, interquartile range, minimum and maximum scores. We used a one-way ANOVA test to measure the statistical differences in means of categories and independent t test to measure the statistical difference between two categories. Chai-square test was used to compare between groups in yes and/or no and multiple-choice questions. Correlations between demographics, knowledge, experience and degree were measured using Spearman's rank-order correlation.

Results

Participants

We recruited a total of 379 participants (54.88% men and 45.12% women). 79.80% of the male participants and 66.66% of the female participants were working in governmental hospitals. Notably, 18.75% of male participants and 28.65% of female participants were working in private hospitals, 5.76% of male participants and 12.28% of female participants were working in private clinics/centers, and 3.36% of male participants and 3.50% of female participants were working in home visits.

The specialties of the participants were represented as neurological (50.48% male participants and 28.07% female participants), musculoskeletal/sport (37.98% of male participants and 29.23% of female participants), pediatrics (5.28% of male participants and 23.39% of female participants), cardiac rehabilitation (3.36% of male participants and 3.5% of female participants), women's health (0.48% of male participants and 11.11% of female participants), and general physical therapy (2.40% of male participants and 8.18% of female participants).

The majority of male and female participants were working in out-patient settings, representing 53.36% of the male participants and 46.15% of the female participants. Overall, 18.75% of the male participants and 23.39% of the female participants were working in in-patient settings, 24.51% of the

male participants and 17.54% of the female participants were working in rehabilitation wards, and 3.36% of the male participants and 2.92% of the female participants were working in academic/university settings. The educational qualifications of the participants were as follows: 55.76% of male participants and 42.10% of female participants held a bachelor's degree; 24.03% of male participants and 22.22% of female participants held a master's degree; 5.76% of male participants and 21.05% of female participants held a DPT degree; 10.57% of male participants and 11.11% of female participants held diplomas, and 3.84% of male participants and 3.50% of female participants (6 participants) had a Ph.D. The mean experience was 8.16 years (SD = 4.51) in men and 8.06 years (SD = 5.27) in women (Table 2 and Table 3).

Among all participants, 251 participants were certified dry needling practitioners, representing 66.22% of the total participants, and 128 participants were non-certified dry needling practitioners, representing 33.7% of the total participants. Most of the certified dry needling practitioners were working in a governmental hospital, representing 69.72% of the participants, 28.68% were working in private hospitals, 9.16% working in private clinics, and 3.98% worked with home visits. The majority of the 128 non-certified practitioners were working in governmental hospitals as well with 82.03%, 12.5% in private hospitals, 7.8% in private clinics/centers, and 2.3% in home visits. From the certified dry needling practitioners, the majority of participants (37%) were specialized in neuro-related cases, 35% of the participants were specialized in musculoskeletal/sport, 13.94% were specialized in pediatrics, 7.5% were specialized in women's health, 3.9% were specialized in cardio-rehabilitation, and 1.9% of the participants were specialized in general physical therapy. The majority of the non-certified dry needling practitioners were specialized in neuro-related medicine as well, representing 46.09%, 32.03% were specialized in musculoskeletal/sport, 12.5% were specialized in pediatrics (16 participants), 6.25% were specialized in general physical therapy, 2.34% were specialized in cardiac rehabilitation, and 0.78% were specialized in women's health.

With respect to the work setting of the certified participants, 55.37% of the certified participants were working in out-patient settings, 21.91% were working in rehabilitation wards, 19.92% were working in in-patient settings, and 2.7% of the participants were working in academic and university settings. The majority of non-certified participants were working in out-patient settings, representing 53.12% of the participants, 22.65% of the participants were working in in-patient settings, 20.31% were working in rehabilitation wards, and 3.9% were working in academic and university settings.

The majority of certified dry needling practitioners were holding a bachelor's degree, representing 46.61% of certified practitioners, 20.71% held a master's degree, DPT holders represented 15.93%, 12.74% of the participants held diplomas, and 3.98% of the participants were Ph.D. holders. For the non-certified dry needling practitioners, the majority of the participants were bachelor degree holders as well, representing 55.46% of the participants, master's degree holders represented 28.12% of the participants, 7.031% of the participants held diplomas, 6.25% of the participants held DPT, and 3.13% held a Ph.D. degree (Table 4 and Table 5). There were 105 participants who reported that they have used dry needling intervention for spasticity in patients with stroke, representing 27% of the total participants (68.5% men and 31.4% women). Notably, 76.20% of the participants were certified dry needling practitioners, and 23.80% of the participants were non-certified dry needling practitioners. Among them, 78.09% of the participants were working in governmental hospitals, 20% were working in private hospitals, 7.6% of the participants were working in private clinics/centers, and 3.8% were working in home visits.

The majority of the participants that have used dry needling for spasticity in patients with stroke are specialized in neuro-related medicine, representing 56.1% of the participants, 26.6% specialized in musculoskeletal/sports, 9.5% in pediatrics, 3.8% in cardiac rehabilitation, 2.8% in women's health, and 0.9% in general physical therapy. Participants who were working in outpatient settings represented 45.7%, 30.4% in rehabilitation wards, 21.9% in inpatient settings, and 1.9% of the participants were working in academic/university settings.

The majority of participants held a bachelor's degree, representing 57.1% of the participants, 23.8% of the participants held a master's degree, 8.5% of the participants held diplomas, 7.6% of the participants held a DPT degree, and 2.8% of the participants were Ph.D. holders. The majority of participants who never have used dry needling for spasticity in patients with stroke are specialized in musculoskeletal/sports medicine, representing 36.86% of the participants. Notably, 34.30% of the participants specialized in neuro-related medicine, 14.96% specialized in pediatrics, 6.20% specialized in women's health, 4.37% specialized in general physical therapy, and 3.28% specialized in cardiac rehabilitation.

Participants who work in outpatient settings represented 58.03%, 20.43% of the participants worked in inpatient settings, 17.88% of the participants worked in rehabilitation wards, and 3.65% of the participants worked in academic/university settings. The majority of participants held a bachelor's degree, representing 46.72% of the participants, 22.99% of the participants held a master's degree, 14.59% held DPT, 11.68% held diplomas, and 4.01% of the participants were Ph.D. holders. The participants who were certified dry needling practitioners represented 62.40%, and non-certified dry needling practitioners represented 37.60% of the participants. 72.26% of the participants worked in governmental hospitals, 24.45% worked in private hospitals, 9.12% worked in private clinics/centers, and 3.28% worked in home visits (Table 6 and Table 7).

Table 1. Demographic data of participants

Characteristics				
Work place	Governmental hospital	Private hospital	Private clinic/center	Home visits
	280 (73.9%)	88 (23.2%)	33 (8.7%)	13 (3.4%)
Experience (years)	Minimum	Maximum	Median	IQ range
	1	35	7	5
Gender	Male	Female		
	208 (55%)	171 (45%)		
Certification in DN	Certified	Non certified		
	251 (66%)	128 (34%)		
Practicing DN	Practicing DN	Non-practicing DN		
	105 (27%)	274 (73%)		
DN: dry needling; IQ range: interquartile range				

Table 2. Demographic data of male participants

Gender	**Male**											
Total number/ percentage	**208**				**54.88%**							
Degree	**Diploma**		**Bachelor**		**DPT**		**Masters**		**Ph.D.**			
Total number/ percentage	22	10.57%	116	55.76%	12	5.76%	50	24.03%	8		3.84%	
Specialty	Cardiac rehabilitation		Musculoskeletal / Sports		Neuro		Pediatrics		Women's health		General physical therapy	
Total number/ percentage	7	3.36%	79	37.98%	105	50.48%	11	5.28%	1	0.48%	5	2.40%
Work setting	Outpatient		Inpatient		Rehabilitation ward		Academic/ university					
Total number/ percentage	111	53.36%	39	18.75%	51	24.51%	7	3.36%				
Work place	Governmental hospital		Private hospital		Private clinic		Home visits					
Total number/ percentage	166	79.80%	39	18.75%	12	5.76%	7	3.36%				

Table 3. Demographic data of female participants

Gender	**Female**											
Total number/ percentage	**171**				**45.12%**							
Degree	**Diploma**		**Bachelor**		**DPT**		**Masters**		**Ph.D.**			
Total number/ percentage	19	11.11%	72	42.10%	36	21.05%	38	22.22%	6		3.50%	
Specialty	Cardiac rehabilitation		Musculoskeletal / Sports		Neuro		Pediatrics		Women's health		General physical therapy	
Total number/ percentage	6	3.5%	50	29.23%	48	28.07%	40	23.39%	19	11.11%	14	8.18%
Work setting	Outpatient		Inpatient		Rehabilitation ward		Academic/ university					
Total number/ percentage	96	46.15%	40	23.39%	30	17.54%	5	2.92%				
Work place	Governmental hospital		Private hospital		Private clinic		Home visits					
Total number/ percentage	114	66.66%	49	28.65%	21	12.28%	6	3.50%				

Table 4. Demographic data of certified DN participants

Gender	**Male**				**Female**							
Total number/ percentage	125		32.98		126				33.24			
Degree	**Diploma**		**Bachelor**		**DPT**		**Masters**		**Ph.D.**			
Total number/ percentage	32	12.74%	117	46.61%	40	15.93%	52	20.71%	10		3.98%	
Specialty	Cardiac rehabilitation		Musculoskeletal / Sports		Neuro		Pediatrics		Women's health		General physical therapy	
Total number/ percentage	10	3.9%	88	35%	94	37%	35	13.94%	19	7.5%	5	1.9%
Work setting	Outpatient		Inpatient		Rehabilitation ward		Academic/ university					
Total number/ percentage	139	55.37%	50	19.92%			7	2.7%				
Work place	Governmental hospital		Private hospital		Private clinic		Home visits					
Total number/ percentage	175	69.72%	72	28.68%			10	3.98%				

Table 5. Demographic data of non-certified DN participants

Gender	**Male**				**Female**							
Total number/ percentage	83		64.84%		45		35.15%					
Degree	**Diploma**		**Bachelor**		**DPT**		**Masters**		**Ph.D.**			
Total number/ percentage	9	7.03%	71	55.46%	8	6.25%	36	28.12%	4	3.13%		
Specialty	Cardiac rehabilitation		Musculoskeletal / Sports		Neuro		Pediatrics		Women's health		General physical therapy	
Total number/ percentage	3	2.34%	41	32.03%	59	46.09%	16	12.5%	1	0.78%	8	6.25%
Work setting	Outpatient		Inpatient		Rehabilitation ward		Academic/ university					
Total number/ percentage	68	53.12%	29	22.65%								
Work place	Governmental hospital		Private hospital		Private clinic		Home visits					
Total number/ percentage	105	82.03%	16	12.5%								

Table 6. Demographic data of DN practicing participants

Gender	**Male**				**Female**							
Total number/ percentage	72		68.5%		33		31.4%					
Degree	**Diploma**		**Bachelor**		**DPT**		**Masters**		**Ph.D.**			
Total number/ percentage	9	8.5%	60	57.1%	8	7.6%	25	23.8%	3	2.8%		
Specialty	Cardiac rehabilitation		Musculoskeletal / Sports		Neuro		Pediatrics		Women's health		General physical therapy	
Total number/ percentage	4	3.8%	28	26.6%	59	56.1%	10	9.5%	3	2.8%	1	0.9%
Work setting	Outpatient		Inpatient		Rehabilitation ward		Academic/ university					
Total number/ percentage	48	45.7%	23	21.9%	32	30.4%	2	1.9%				
Work place	Governmental hospital		Private hospital		Private clinic		Home visits					
Total number/ percentage	82	78.09%	21	20%	8	7.6%	4	3.8%				
Certificate	Certified				Non-certified							
Total number/ percentage	80		76.20%		25		23.80%					

Table 7. Demographic data of DN non-practicing participants

Gender	**Male**								**Female**							
Total number/ percentage	136		49.63%						138		50.37%					
Degree	**Diploma**		**Bachelor**		**DPT**		**Masters**		**Ph.D.**							
Total number/ percentage	32	11.67%	128	46.71%	40	14.60%	63	22.99%	11	4.01%						
Specialty	Cardiac rehabilitation		Musculoskeletal / Sports		Neuro		Pediatrics		Women's health		General physical therapy					
Total number/ percentage	9	3.28%	101	36.86%	94	34.30%	41	14.96%	17	6.20%	12%	4.38%				
Work setting	Outpatient		Inpatient		Rehabilitation ward		Academic/ university									
Total number/ percentage	159	58.02%	56	20.43%	49	17.88%	10	3.65%								
Work place	Governmental hospital		Private hospital		Private clinic		Home visits									
Total number/ percentage	198	72.26%	67	24.45%	25	9.12%	9	3.28%								
Certificate	Certified								Non-certified							
Total number/ percentage	171		62.41%						103		37.59%					

The chi-square test showed associations between the demographic data of gender, degree, certified and non-certified, dry needling participants and dry needling practicing, and non-practicing participants ($P > 0.05$).

Furthermore, no association was found between the work setting and the demographic data of the three groups ($P < 0.05$). Only one association was found between the work setting and dry needling participants and dry needling practicing and non-practicing participants ($P > 0.05$) (Table 8).

Table 8. Chai squared test for demographic data of the participants

Characteristics	**Male/Female**			**Certified DN participants/ Non-certified DN participants**			**DN practicing participants/ DN non-practicing participants**		
	Value	**Df**	**Asymptotic significance**	**Value**	**Df**	**Asymptotic significance**	**Value**	**Df**	**Asymptotic significance**
Gender				7.747[a]	1	0.005	10.993[a]	1	0.001
Degree	21.028[a]	4	0.000	12.355[a]	4	0.015	5.558[a]	4	0.235
Specialty	60.890[a]	8	0.000	17.504[a]	8	0.025	17.380[a]	8	0.026
Work setting	3.297[a]	3	0.348	.819[a]	3	0.845	8.549[a]	3	0.036
DN: dry needling; df: degree of freedom									

Table 9. Knowledge and experience of participants

Characteristics	**Median**	**IQ range**	**Minimum score**	**Maximum score**
Stroke Knowledge	6	1	1	6
DN Knowledge	6	2	2	6
Spasticity Knowledge	6	1	0	6
Total Knowledge	16	3	7	18
DN: dry needling; IQ range: interquartile range				

Knowledge

The majority of the participants (66.22%) were certified dry needling practitioners. However, an independent samples t-test showed no significant difference in the total knowledge scores between certified dry needling participants and non-certified dry needling participants (m = 16.19, SD = 1.9) (m = 15.57, SD = 2.0). Furthermore, stroke knowledge for certified participants (m= 5.32) and for non-certified participants (m = 5.0), dry needling knowledge (m = 5.4 - SD = 0.99) for certified participants, m = 4.9 and SD = 1.2 for non-certified participants) or spasticity knowledge for certified participants (m = 5.4 and SD = 1.0) and non-certified (m = 5.5 and SD = 0.83). Additionally, there were significant differences found between the two groups regarding experience (m = 8.2 - SD = 4.9) for certified participants and (m = 7.9 - SD = 4.6) for non-certified participants or patients treated with dry needling by the two groups (m = 1.8 SD = 4.3) for certified participants and (m = 1.6 SD = 7.2) for non-certified dry needling participants. There was no significant difference found between both genders when compared within the same aspects of knowledge for men (m = 15.95 – SD = 2.0) and women (m = 16.02 – SD = 1.90). No significant difference in the knowledge score was found between dry needling practicing and non-practicing participants (m = 16.352 – SD = 1.921) and (m = 15.843 – SD = 1.965).

Table 10. Shapiro-Wilk's test of normality for participants

Characteristics	Static	df	Significance
Experience	0.902	379	0.000
Number of Pt treated with DN	0.348	379	0.000
Stroke knowledge	0.720	379	0.000
DN knowledge	0.638	379	0.000
Spasticity knowledge	0.597	379	0.000
Total knowledge	0.865	379	0.000
DN: dry needling; df: degree of freedom			

The normality of distribution was examined using Shapiro-Wilk's test and showed a non-normal distribution of experience (Table 10). Number of patients treated with DN for spasticity, stroke knowledge, DN knowledge, spasticity knowledge and total knowledge scores (Table 11).

We calculated the knowledge scores between the categories as well according to the specialty, the minimum score of participants, who were specialized in cardiac rehabilitation was 11 (m = 15.6 – SD 2.2). The minimum score of participants who were specialized in general physical therapy was 11 (m = 15.23 – SD 1.7), the minimum score for participants specialized in musculoskeletal/sports was 7 (m = 15.44 – SD = 2.2), and the minimum score of participants who were specialized in neuro-related medicine was 10 (m = 16.3 – SD = 1.6), the minimum score of participants specialized in pediatrics was 8 (m = 16.45 – SD = 1.7), and the minimum score of participants who were specialized in women's health was 12 (m = 16.25 – SD = 1.7); however, the maximum score of all groups was 18 (m = 15.98 – SD = 1.69), and no significant difference was found between the specialties (Table 12 and Table 13).

We used Spearman's rank correlation coefficient test to measure the correlation between experience and the total knowledge. The test showed that there was a negative correlation between experience and total knowledge and dry needling knowledge (Total knowledge= -0.005), dry needling knowledge (-0.098). However, there was no significant correlation found between experience and stroke knowledge and spasticity knowledge (stroke knowledge 0.061), and spasticity knowledge (0.002) between the participants.

The academic degree had a positive correlation with experience (correlation coefficient = 0.453). A negative correlation was found between the degree and stroke knowledge (-0.056), dry needling knowledge (-0.015), and total knowledge (-0.043). However, there was a significant positive correlation between the degree and spasticity knowledge (0.007) (Table 14).

Table 11. Shapiro-Wilk's test of normality across categories

Characteristics	Male			Female			Certified DN participants			Non-certified DN participants			DN practicing participants			DN non-practicing participants		
	Static	df	p	Static	df	p	Static	df	p	Static	df	p	Static	df	p	Static	df	p
Stroke patients treated with DN for spasticity	0.548	208	0.00	0.246	171	0.00	0.471	251	0.00	0.241	128	0.00	0.547	105	0.00		272	0.00
Stroke knowledge	0.747	208	0.00	0.683	171	0.00	0.662	251	0.00	0.780	128	0.00	0.696	105	0.00	0.730	272	0.00
DN knowledge	0.628	208	0.00	0.649	171	0.00	0.568	251	0.00	0.729	128	0.00	0.611	105	0.00	0.647	272	0.00
Spasticity knowledge	0.574	208	0.00	0.623	171	0.00	0.618	251	0.00	0.543	128	0.00	0.442	105	0.00	0.646	272	0.00
Total knowledge	0.865	208	0.00	0.864	171	0.00	0.834	251	0.00	0.900	128	0.00	0.818	105	0.00	0.872	272	0.00
Experience	0.935	208	0.00	0.865	171	0.00	0.880	251	0.00	0.935	128	0.00	0.923	105	0.00	0.894	272	0.00
DN: dry needling; df: degree of freedom																		

Table 12. One-way between categories (repeated measures) ANOVA of specialties

	Sum of squares	df	F	P value
Stroke patients treated with DN for spasticity	327.599	5	2.186	0.055
Stroke knowledge	35.293	5	7.368	0.000
DN knowledge	11.805	5	1.918	0.091
Spasticity knowledge	25.825	5	5.861	0.000
Total knowledge	77.894	5	4.211	0.001
Experience	543.472	5	4.823	0.000
DN: dry needling; df: degree of freedom				

Table 13. One-way between categories (repeated measures) ANOVA of work setting

	Sum of squares	df	F	P value
Stroke patients treated with DN for spasticity	275.592	3	3.068	0.028
Stroke knowledge	2.840	3	0.911	0.436
DN knowledge	9.758	3	2.644	0.049
Spasticity knowledge	7.049	3	2.536	0.056
Total knowledge	14.159	3	1.226	0.300
Experience	205.835	3	2.942	0.033
DN: dry needling; df: degree of freedom				

Table 14. One-way between categories (repeated measures) ANOVA of academic degree

	Sum of squares	df	F	P value
Stroke patients treated with DN for spasticity	347.076	4	2.908	0.022
Stroke knowledge	9.701	4	2.369	0.052
DN knowledge	6.517	4	1.312	0.265
Spasticity knowledge	5.339	4	1.430	0.224
Total knowledge	14.342	4	3.585	0.447
Experience	3697.813	4	65.824	0.000
DN: dry needling; df: degree of freedom				

Table 15. Correlations between knowledge, experience and degree across categories

Characteristics	Stroke patients treated with DN for spasticity		Stroke knowledge		DN knowledge		Spasticity knowledge		Total knowledge		Experience		Degree	
	CC	P	CC	P	CC	P	CC	P	CC	P	CC	P	CC	P
Stroke patients treated with DN for spasticity	1.000		0.075	0.147	0.096	0.063	.192**	0.000	.202**	0.000	0.016	0.749	0.026	0.617
Stroke knowledge	0.075	0.147	1.000		-0.027	0.605	.284	0.000	.606	0.000	0.061	0.239	-0.056	0.273
DN knowledge	0.096	0.063	-0.027	0.605	1.000		0.017	0.742	.623	0.000	-0.098	0.058	-0.015	0.773
Spasticity knowledge	.192	0.000	.284	0.000	0.017	0.742	1.000		.542	0.000	0.022	0.664	0.007	0.899
Total knowledge	.202	0.000	.606	0.000	.623	0.000	.542	0.000	1.000		-0.005	0.918	-0.043	0.406
Experience	0.016	0.749	0.061	0.239	-0.098	0.058	0.022	0.664	-0.005	0.918	1.000		.453	0.000
Degree	0.026	0.617	-0.056	0.273	-0.015	0.773	0.007	0.899	-0.043	0.406	.453	0.00	1.000	
CC: correlation coefficient; DN: dry needling														

Attitude

The data show a positive attitude toward applying dry needling for spasticity in stroke patients. Notably, 77.40% of the male participants answered with yes when asked if dry needling will be beneficial for neuro-related cases. Additionally, 78.95% of female participants had the same response. Furthermore, only 22.59% of male and 21.05% of female participants responded that they believe that dry needling will not be beneficial for neuro-related cases.

Participants were asked if dry needling should be included as an intervention to manage spasticity. Notably, 76.92% of male and 78.95% of female participants responded with yes. Male and female participants who responded with no represented 23.07% and 21.05% (36 participants), respectively. The majority of the participants responded with yes when asked if spasticity should be treated with conventional methods representing 52.88% of male and 58.47% of female participants. The data show that 47.11% of male and 41.52 of female participants believe that spasticity should not be treated with conventional methods.

The majority of male and female participants believe that physical therapy should be more involved in the management of spasticity. Notably, 97.11% of male and 95.91% of female participants responded with yes, and only 2.88% of male and 4.09% of female participants responded with no. The majority of certified and non-certified dry needling participants responded with yes when asked if dry needling will be beneficial for neuro-related cases representing 82.47%; furthermore, 17.53% of certified and 30.47% of non-certified dry needling participants believe dry needling will not be beneficial for neuro cases, respectively.

The participants were asked if dry needling should be included as an intervention to manage spasticity. Notably, 82.87% of certified and 67.97% of non-certified participants responded with yes. The certified and non-certified dry needling participants who responded with no represented 17.13% and 32.03%, respectively. The majority of participants responded with yes when asked if spasticity should be treated with conventional methods representing 50.59% of certified and 33.07% of non-certified participants. The study shows that 49.40% of certified and 35.16% of non-certified dry needling participants believed that spasticity should not be treated with conventional methods.

The majority of the participants believe that physical therapy should be more involved in the management of spasticity. Notably, 97.21% of certified and 95.31% of non-certified participants responded with yes and only 2.79% of certified and 4.69% of non-certified dry needling participants responded with no. For participants who reported using dry needling as an intervention for spasticity in patients with stroke, 89.52% believe that dry needling can be beneficial for neuro-related cases; however, 10.48% of the participants in the same group do not believe that neuro-related cases can benefit from dry needling intervention. Only 26.28% of participants who have never applied dry needling intervention for neuro-related cases responded with no. Further, the majority of participants of the same group believed that dry needling can benefit patients with neurological cases representing 73.72% of the total group of participants.

For including the dry needling intervention in the management of spasticity, 94.28% of participants who have used dry needling to treat spasticity responded that dry needling should be included as an intervention for spasticity and only 5.72% believe that dry needling should not be included as part of spasticity management. The majority (71.53%) of participants who have never used dry needling as an intervention for spasticity represent responded yes when asked about including the dry needling intervention in the management of spasticity, and 28.46% answered no. When participants were asked if spasticity should be treated with conventional methods, only 45.71% of participants responded with no; however, the majority of participants representing 54.28% answered with yes. Notably, 44.16% of the participants who never used dry needling intervention for spasticity believe that spasticity should not be treated with conventional methods, while 55.83% of the same group responded with yes.

The participants were asked if physical therapy should be more involved in the management of spasticity. The majority of participants who have never used the dry needling intervention for spasticity responded with yes representing 96.35%, and only 3.65% of the same group responded with no. The majority (97.14%) of participants who used dry needling as an intervention to manage spasticity believed that physical therapy should be more involved with spasticity management, and only 2.86% of the same group disagreed.

Practice

The participants were asked to whether they evaluate spasticity in patients with stroke. 76.4% male participants reported that they always evaluate spasticity in patients with stroke (159 participants) of the male participants, while 23.1% of male participants reported that they often evaluate spasticity in patients with stroke (48 participants), and 0.5% reported never evaluating spasticity in patients with stroke (1 participant). From the female participant's side, the majority reported that they always evaluate spasticity in patients with stroke, representing 76% of the female participants (130 participants). Furthermore, 22.8% of the female participants answered "often" (39 participants), and 1.2% answered "never" (2 participants); however, there was no significant difference found between the two groups (0.753). The majority of the certified practitioners (187 participants) reported they always evaluate spasticity representing 74.5% of certified practitioners. Furthermore, 25.1% reported they often evaluate spasticity; however, only 0.4% reported they never evaluate spasticity (1 participant).

Participants who have used dry needling for spasticity on patients with stroke represent 27.7% (105 participants). Participants who reported they always evaluate spasticity represented 86.7% (91 participants), 12.4% reported they often evaluate spasticity (13 participants), and 1.0% reported they never evaluate spasticity (1 participant). Moreover, 274 participants reported never using dry needling intervention for spasticity in patients with stroke, representing 72.30% of the total participants; however, 72.3% of this group reported they always evaluate spasticity in patients with stroke (198 participants), 27.0% answered "often" (74 participants), and 0.7% answered "never" (2 participants). The participants were asked if they consider the patient's position during spasticity assessment. Overall, 61.1% of male participants reported they always consider the patient's position (127 participants), while 34.6% answered "often" (72 participants), and 4.3% answered "never" (9 participants). Furthermore, 55.5% of female participants stated they always consider the patient's position (100 participants), 37.4% answered "often" (64 participants), and 4.1% reported never taking the patient's position into consideration (7 participants). Among certified and non-certified dry needling practitioners, 55.8% of the certified practitioners always consider the patient's position during spasticity assessment (140 participants), 39.8% often consider the patient's position (100 participants), and 4.4% never consider the patient's position (11) participants.

The majority of non-certified participants always consider the correct position of the patient during spasticity assessment representing 68% (87 participants), 28.1% reported they often consider the patient's position (36 participants), and 3.9% answered they never consider the patient's position (5 participants). The results shows that 57.7% of the participants who have never used dry needling for spasticity patients with stroke always consider the position of the patient while assessing the spasticity (158 participants). The participants who often consider the patient's position represented 37.2% (102 participants); additionally, 5.1% reported never considering the patient's position (14 participants). For participants who have used dry needling for spasticity in patients with stroke, 65.7% reported that they always consider the patient's position during spasticity assessment (105 participants). Notably, 32.4% of the participants answered that they often consider the patient's position (34 participants), and 1.9% reported they never consider the patient's position (2 participants).

In following dry needling practice guidelines 92.4% of male participants reported they always follow guidelines (145 participants). Notably, 7.6% of male participants reported that they often follow dry

needling practice guidelines, and no male participants reported never following the guidelines for dry needling. Female participants who reported always following dry needling practice guidelines represented 88.7% (126 participants), 9.9% (14 participants) reported they often follow guidelines, and 1.4% answered they never follow dry needling practice guidelines (2 participants). Certified dry needling participants who always follow dry needling practice guidelines represented 93.1% (229 participants). Overall, 6.1% of certified participants often follow guidelines (15 participants), and 0.8% reported never following dry needling practice guidelines (2 participants). Among non-certified dry needling participants 79.2% always follow dry needling practice guidelines (42 participants).

Notably, 20.8% often follow guidelines (11 participants), and no participants reported that they never follow practice guidelines. The percentage of participants who have never used dry needling on spasticity in patients with stroke and always follow practice guidelines was 90.3% (177 participants). It was observed that 8.7% of the participants often follow guidelines (17 participants), and only 1.0% reported never following dry needling practice guidelines (2 participants). Our results show that 91.3% of participants who used dry needling intervention for spasticity in patients with stroke always followed dry needling practice guidelines (94 participants). Notably, 8.7% often followed dry needling guidelines (9 participants), and no participants reported never following dry needling practice guidelines. The majority of certified dry needling participants answered with yes when asked if their institution allowed dry needling intervention representing 70.9% (178 participants).

Notably, 21.9% of the participants reported that their institution does not allow dry needling practice (55 participants), and 7.2% were not sure if dry needling was allowed in their institution (18 participants). The majority of non-certified dry needling participants reported that they were not sure if their institutions allowed dry needling practice, who represent 41.4% (53 participants) of the total non-certified dry needling participants, 33.6% of the participants reported that dry needling was allowed as an intervention in their institutions (43 participants), and 25% of the participants answered that dry needling was not allowed. For participants who have never used the dry needling intervention on spasticity in patients with stroke, 59.9% of the participants reported that dry needling is allowed in their institutions (164 participants). Notably, 17.9% reported that dry needling was not allowed (49 participants), and 22.3% reported that they were not sure if dry needling was allowed in their institution (61 participants). In participants who used dry needling on spasticity on patients with stroke, 54.3% of the participants mentioned that dry needling was allowed in their institutions (57 participants). 36.2% reported that dry needling was not allowed as an intervention (38 participants), and 9.5% of the participants were not as sure if dry needling was allowed or not (10 participants).

Discussion

Our study aimed to assess the knowledge, attitude, and practice among physical therapists in Saudi Arabia toward the effectiveness of dry needling. Our results showed that participants had good knowledge regarding stroke, spasticity and DN. Participants who had good stroke knowledge scores had good spasticity knowledge scores as well. Most of participants had good DN knowledge score. In regards to gender, certified and non-certified dry needling participants, and dry needling practicing and non-practicing participants. The study showed that there was no significant difference found between the three categories when compared in knowledge, and no correlation found between participants total knowledge score and gender, experience, work setting, workplace, specialty and academic degree; however, participants who scored higher in stroke knowledge had the highest spasticity knowledge scores.

Our assumption was that there was no significant difference found in our study due to the fact that our participants had at least 1 year of experience. In a cross-sectional study that aimed to assess the community knowledge and attitudes on stroke and stroke risk factors found that community members have a very limited knowledge of stroke and stroke risk factors and, are not aware that stroke is a disease that affects the brain, and are not aware of the common early warning signs and symptoms of stroke[12]. Another community-based study conducted in Saudi Arabia was compatible

with the previous study results, this study concluded that there is an extremely low level of knowledge about the definition of stroke, management, risk factors, and early symptoms of stroke[13]. This study was performed on participants from rural and urban areas of Uganda, the authors of the study claimed that the reason for the results in his study was due to the poor level of information among the rural community compared to the urban community; the findings of this study are in line with the findings reported in another study conducted in Ugandan setting that described the knowledge of stroke in Uganda as "poor"[14].

We aimed to describe the attitude of physical therapists in Saudi Arabia toward using dry needling for spasticity in patients with stroke. Our results showed a positive attitude toward the usefulness of dry needling on neurological cases regardless of the participant's gender, certification, and whether they were practicing dry needling or not; nevertheless, studies on dry needling applied on different CNS conditions are scarce. However, the positive effects of dry needling on spasticity in patients with stroke have been reported in other CNS conditions[15].

Our results showed that our participants believed that dry needling should be included as part of spasticity management and that physical therapy should be more involved in treating spasticity in patients with stroke. The reason for our results could be due to the large number of certified dry needling practitioners in our study due to the sampling method we used; nevertheless, our results showed that the inclusion of dry needling in treating spasticity does not mean excluding conventional methods used in the management of spasticity, which is in line with the recent literature review that found that dry needling alone or within multimodal treatment program is effective of decreasing the spasticity and increasing the range of motion in patients with stroke[8].

The aim of our study is to describe the common practice of physical therapists when managing spasticity in patients with stroke. Our results showed that the majority of our participants use MAS to assess the spasticity in patients with stroke more than other scales, such as MTS and TAS. Our results match the results of a previous systematic review in which they concluded that despite the debatable issue of validity and reliability of spasticity clinical measures, MAS is the most commonly used scale in clinical settings to assess spasticity in different CNS conditions[16].

In the management of spasticity, our results showed that the participants rely on stretching mainly when designing a spasticity treatment program over other interventions, such as splinting, PNF, and Bobath. Each intervention was found effective in reducing the spasticity and increasing the range of motion; however, the lack of studies that directly compare multiple physical therapy intervention on spasticity or when combined makes it difficult to favor one intervention over the other.

We asked the participants if they have used dry needling intervention for spasticity in patients with stroke. The results showed that less than half of participants have used dry needling on spasticity in stroke patients. We assume that our results were due to the lack of sufficient evidence that measures the effect of dry needling as an intervention for spasticity in patients with stroke.

The lack of studies that measure and describe the knowledge, attitude, and practice among physical therapists toward dry needling interventions on spasticity in patients with stroke have increased the difficulty of our results to be compared with results from other studies. Thus, we assumed that the reason for our findings might be due to the sampling method used in this study or the sample size, which was not sufficient to find a difference.

Conclusion

Our study showed that DN is being practiced by physical therapists in Saudi Arabia for spasticity in patients with stroke despite. Participants showed good knowledge in stroke, spasticity, and DN. There was no significant difference in the total knowledge scores with regard to the gender, certified and non-certified dry needling participants, and participants who have and have never used dry

needling as an intervention on the spasticity in patients with stroke. The participants showed a positive attitude toward the usefulness of dry needling on neurological cases, and believe that physical therapy should be more involved in spasticity management as well as including dry needling as an intervention for spasticity in patients with stroke. Most of our participants reported that they follow dry needling practice guidelines when applying dry needling in their practice. The majority of our participants reported always assessing spasticity by taking the correct position of the patients into consideration during the assessment. The common scale used among participants was the MAS to assess spasticity in patients with stroke more than other scales, such as MTS and TAS. The majority of participants prefer stretching over other conventional interventions, such as splinting, Bobath, and PNF to treat spasticity in patients with stroke.

Limitations of the study

The questionnaire was developed within our study with no reliability or validity test applied to the questionnaire.

Future suggestions

There were no studies found in the literature to assess the knowledge, attitude, and practice of physical therapists toward the use of dry needling on spasticity. We suggest that future studies use a more reliable and valid questionnaire.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Opheim A, Danielsson A, Murphy MA, Persson HC, Sunnerhagen KS. Upper-limb spasticity during the first year after stroke: stroke arm longitudinal study at the University of Gothenburg. Am J Phys Med Rehabil. 2014;93(10):884-96.
2. Wissel J, Manack A, Brainin M. Toward an epidemiology of poststroke spasticity. Neurol. 2013;80(3 Supplement 2):S13-9.
3. Deshmukh MK, Kumar C, Goyal M. Application of transcutaneous electrical stimulation on lower limb acupoints as an important adjunctive tool in stroke rehabilitation program & its effects on spasticity and functional ability. Int J Physiother Res. 2013;3:63-9.
4. Park J, Seo D, Choi W, Lee S. The effects of exercise with TENS on spasticity, balance, and gait in patients with chronic stroke: a randomized controlled trial. Int Med J Exper Clin Res. 2014;20:1890-96.
5. Shamsi S, Al-Shehri A, Aldaihan MM, Abdelkader SM, Khan S, Al Torairi NS, Al-Habib FK. Efficacy of Dry Needling with Exercise in Cervicogenic Headache-A Randomized Clinical Trail. J Posit School Psychol. 2022;6(3):6474-82.
6. Pollock A, Baer G, Campbell P, Choo PL, Forster A, Morris J, Pomeroy VM, Langhorne P. Physical rehabilitation approaches for the recovery of function and mobility following stroke. Coch Data Syst Rev. 2014;4).
7. Kwong PW, Ng GY, Chung RC, Ng SS. Transcutaneous electrical nerve stimulation improves walking capacity and reduces spasticity in stroke survivors: a systematic review and meta-analysis. Clin Rehabil. 2018;32(9):1203-19.
8. Núñez-Cortés R, Cruz-Montecinos C, Latorre-García R, Pérez-Alenda S, Torres-Castro R. Effectiveness of dry needling in the management of spasticity in patients post stroke. J Stroke Cerebrovas Dis. 2020;29(11):105236.
9. Fakhari Z, Ansari NN, Naghdi S, Mansouri K, Radinmehr H. A single group, pretest-posttest clinical trial for the effects of dry needling on wrist flexors spasticity after stroke. Neuro Rehabil. 2017;40(3):325-36.

10. Mendigutia-Gómez A, Martín-Hernández C, Salom-Moreno J, Fernández-de-Las-Peñas C. Effect of dry needling on spasticity, shoulder range of motion, and pressure pain sensitivity in patients with stroke: a crossover study. J Manip Physiol Therapeut. 2016;39(5):348-58.

11. Salom-Moreno J, Sánchez-Mila Z, Ortega-Santiago R, Palacios-Ceña M, Truyol-Domínguez S, Fernández-de-las-Peñas C. Changes in spasticity, widespread pressure pain sensitivity, and baropodometry after the application of dry needling in patients who have had a stroke: A randomized controlled trial. J Manip Physiol Therapeut. 2014;37(8):569-79.

12. Kaddumukasa M, Kayima J, Kaddumukasa MN, Ddumba E, Mugenyi L, Pundik S, Furlan AJ, Sajatovic M, Katabira E. Knowledge, attitudes and perceptions of stroke: a cross-sectional survey in rural and urban Uganda. BMC Res Notes. 2015;8(1):1-7.

13. Alreshidi FM, Alrashidi AS, Alshammari FN, Qadi AB, Alrashidi AG, Alghaythi SM, Alshammari FT, Aleisa SM. Knowledge, attitude and practicetowards stroke risk factors and warning symptoms in Saudi Arabia, 2017. Egypt J Hospital Med. 2017;69(3):2082-7.

14. Nakibuuka J, Sajatovic M, Katabira E, Ddumba E, Byakika-Tusiime J, Furlan AJ. Knowledge and perception of stroke: a population-based survey in Uganda. Int Schol Res Not. 2014;2014.

15. Valencia-Chulian R, Heredia-Rizo AM, Moral-Munoz JA, Lucena-Anton D, Luque-Moreno C. Dry needling for the management of spasticity, pain, and range of movement in adults after stroke: A systematic review. Comp Ther Med. 2020;52:102515.

16. Aloraini SM, Gäverth J, Yeung E, MacKay-Lyons M. Assessment of spasticity after stroke using clinical measures: a systematic review. Disabil Rehabil. 2015;37(25):2313-23.

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