

Knowledge of Pain Neurophysiology Among Physiotherapists Practising in Saudi Arabia

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Research note

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Abstract

Objectives Healthcare practitioners' understanding of pain neuroscience is important in effective management of patient pain. A major barrier to adequate pain management is patients' limited access to clinicians who are knowledgeable about pain. The study aims to examine the level of knowledge of pain neurophysiology among currently practising physiotherapists in Saudi Arabia using the 12-item Revised Neurophysiology of Pain Questionnaire.

Results One hundred eleven physiotherapists (58.6% male) from different regions and educational backgrounds participated in the study. Out of a maximum Revised Neurophysiology of Pain Questionnaire score of 12, the mean \pm standard deviation (SD) was 6.7 ± 2.2 ; 90% of physiotherapists scored 9 (75%) or less. None of the examined characteristics of participants had an impact on knowledge.

Introduction

Pain is a symptomatic feeling that can accompany different illnesses. Regrettably, recent advances in pain neurophysiology may not be well understood by healthcare workers. Improper management of chronic pain may lead to persistent pain and disability in specific individuals (Hartvigsen et al., 2018). Therefore, it is highly relevant to recognise healthcare workers' understanding of pain neurophysiology.

One approach to management of chronic pain is pain neurophysiology education, i.e. to clarify patients' own understanding of neurophysiological concepts of pain, for example, that pain and tissue damage are not equivalent. (Moseley et al 2004; Louw, 2011; Moayedid and Davis, 2013; Moseley and Butler, 2015). Like cognitive behavioural therapy, this technique aims to change patients' inappropriate beliefs and consequent behaviours (King, 2018). However, to properly guide patients in pain management, health professionals must themselves have a basic knowledge of pain neuroscience (Louw et al., 2011; Nijs et al., 2013; Adillón et al., 2015; Alodaibi et al., 2018).

Numerous publications have suggested that pain science education has not been updated in different countries (Strong et al., 1999; Singh and Wyant, 2003; Watt-Watson et al., 2004; Watt-Watson et al., 2009; Briggs et al., 2011; Bement and Sluka, 2015). For instance, Alodaibi et al. (2018) reported that although final-year physical therapy students in Saudi Arabia demonstrated higher levels of knowledge in pain science compared to those who were at the commencement stage of their undergraduate curriculum, the effect size was small and probably not clinically meaningful. This finding suggests that physiotherapy (PT) education in Saudi Arabia does not adequately incorporate modern pain science.

Short-term educational courses on pain neuroscience can improve PTs' understanding of pain concepts. Greater knowledge about pain is associated with positive attitudes and change in beliefs towards patients suffering from long-lasting pain (Latimer et al., 2004; Colleary et al., 2017; Cox et al., 2017).

The prevalence of chronic pain was 46.4% in a sample of 26,372 Saudi participants residing in a different region of Saudi Arabia (Al-Maliki et al. 2019). In another study looking at the prevalence of chronic pain in a small city at the centre of Saudi Arabia (El-Metwally et al.2019), it was reported that the prevalence of chronic pain was 19%. In both studies, back pain was the most prevalent form of pain reported. Because chronic pain disorders are highly prevalent in Saudi Arabia, it is worth investigating current physical therapists' knowledge of pain neurophysiology. Therefore, our aim in this study was to describe the knowledge level of pain science among PTs practising in Saudi Arabia and to identify any factors that may affect therapists' levels of knowledge.

Method

A cross-sectional survey design was used to examine the pain neuroscience knowledge among PTs practising in Saudi Arabia. The Institutional Review Board of the ministry of health approved this study.

Using different social media websites and by direct invitation through PT email addresses, male and female PTs who were practising in Saudi Arabia were invited to participate in this study. The questionnaire ran from May 8, 2019, to Aug 20, 2019.

Consenting PTs were included in the study, and their demographic data (i.e. age and gender), years of professional experience, and qualifications were gathered.

Pain Neurophysiology Questionnaire

The questionnaire consists of 12 statements about the neurophysiology of pain. These statements assess the understanding of pain biology and physiology based in current pain science (Moseley, 2004; Catley, 2013). Each statement answers include 'true', 'false', or 'undecided'. For each correctly answered item, 1 point is given; the total score therefore ranges from 0 (worst knowledge) to 12 (best knowledge). The psychometric properties of the instrument have been found to be acceptable as an assessment for the individual understanding of pain mechanisms (Catley, 2013). We used the English-language version of the questionnaire because the primary language used in physiotherapy, clinically and academically, is English.

Analysis

Statistical Package for the Social Sciences software (version 24) was used to analyse the data. Descriptive analysis consisted of means with standard deviations (SD), frequencies, and percentages. One-way analysis of variance (ANOVA) and t-tests (independent samples) were used to analyse significant differences of scores between different PT characteristics (i.e. professional experience, gender, education level, country of highest educational level, region of practice). We also compared the score of those who got their highest degree from Saudi Arabia versus other countries.

Results

Demographics

A total of 111 PT participants practising in Saudi Arabia were included in the study (of whom 58.6% were male) out of 5000 registered physical therapists in Saudi Arabia. Just over half (58.6%) were employed as PT 1 (PT with a Bachelor's degree in the current Saudi healthcare system grading), while the remainder were PT 2 (practising PT with a Master degree) (29.7%) and consultants (practising PT with a Doctoral degree) (11.7%). Of those questioned, 82.8% were working in government-run or private hospitals and clinics, and only 17.8% were working in an academic/university environment. Most participants were aged between 26 and 40 years (74.8%), and they had between 0 and 15 years' experience (89.2%) in this area of practice. Just over half (51.4%) of the participants were practising in the Riyadh area (Table 1).

Table 1
Personal and professional characteristics of physical therapists

		n	%
Gender	Male	65	58.6
	Female	46	41.4
Age	20–25	16	14.4
	26–30	35	31.5
	31–35	25	22.5
	36–40	23	20.7
	41–45	4	3.6
	46–50	7	6.3
	Above 50	1	0.9
Job title	Physical therapist I	65	58.6
	Physical therapist II	33	29.7
	Consultant	13	11.7
Level of education	BSc	57	52.3
	MSc	34	29.7
	PhD	16	14.4
	DPT	4	3.6
Country from which the highest degree acquired	Saudi Arabia	68	62.2
	US	14	12.6
	UK	19	16.2
	Australia	2	1.8
	Other	8	7.2
Workplace	Governmental hospital/clinic	65	55.1
	Academia/University	21	17.8
	Private hospital/clinic	32	27.1
Years of experience	Less than 2 years	27	24.3
	2–5	28	25.2

		n	%
	6–10	18	16.2
	11–15	26	23.4
	16–20	4	3.6
	More than 20 years	8	7.2
Province/Region of practice	Central region (Riyadh)	57	51.4
	Central region (out of Riyadh)	11	9.9
	Northern region	3	2.7
	Western region	19	17.1
	Eastern region	10	9.0
	Southern region	11	9.9

Pain neurophysiology knowledge scores

In this study, the mean \pm SD score on the Revised Neurophysiology of Pain Questionnaire (RNPQ) based on the entire sample was 6.7 ± 2.2 . The scores ranged from 2 to 12; 10% of participants scored 10 or more. The items least often answered correctly ($< 50\%$ correct answers) were Item 1, 'It is possible to have pain and not know about it'; Item 2, 'When part of your body is injured, special pain receptors convey the pain message to your brain'; and Item 9, 'Descending neurons are always inhibitory'. By contrast, Item 3, 'Pain only occurs when you are injured or at risk of being injured', and Item 5, 'Special nerves in your spinal cord convey "danger" messages to your brain', attained the highest correct scores, both with 74.8% correct answers (Fig. 1).

Pain neurophysiology knowledge scores based on the PTs' personal and professional characteristics

No significant difference in the RNPQ score was found between the two genders ($p = 0.61$): 6.8 ± 2.3 for men and 6.6 ± 2.1 for women (Table 2). Likewise, no significant differences were found between groups based on the other characteristics examined, such as level of education ($p = 0.43$), the country where participants had acquired their highest degree ($p = 0.16$), and level of experience ($p = 0.93$) (Table 2). The score of the PTs who got their highest educational degree from Saudi Arabia (6.4 ± 2.1) was not significantly different ($p = 0.09$) from that of those who got their highest education from other countries (7.2 ± 2.3).

Table 2

Scores on the Revised Neurophysiology of Pain Questionnaire, by participants' personal and professional characteristics

		n	Mean \pm SD	<i>p</i> *
Gender	Male	65	6.8 \pm 2.3	0.61
	Female	46	6.6 \pm 2.1	
Level of education	BSc	58	6.4 \pm 2.1	0.43
	MSc	33	7.1 \pm 2.0	
	PhD	16	7.1 \pm 2.8	
	DPT	4	6.3 \pm 2.2	
Country from which highest degree acquired	Saudi Arabia	69	6.5 \pm 2.1	0.16
	US	14	7.6 \pm 2.0	
	UK	18	6.6 \pm 2.6	
	Australia	2	9.5 \pm 0.7	
	Other	8	7.0 \pm 2.0	
Province/Region of practice	Central region (Riyadh)	57	7.2 \pm 2.4	0.05
	Central region (out of Riyadh)	11	6.0 \pm 1.8	
	Northern region	3	7.3 \pm 1.2	
	Western region	19	5.8 \pm 1.9	
	Eastern region	10	7.5 \pm 1.8	
	Southern region	11	5.6 \pm 1.4	

Discussion

This study aimed to assess the knowledge of pain neurophysiology among PTs in Saudi Arabia and to examine factors that might explain differences in their understanding. On average, PTs practising in Saudi Arabia exhibited a limited level of knowledge about the neurophysiology of pain. The understanding of the neurophysiology of pain for the PTs practising in Saudi Arabia was similar across different settings and various professional and demographic characteristics including gender.

Our results showed a fair level of knowledge among PTs in Saudi Arabia, evidence by the result of the average score of 6.7 (55.8% correct answer). This level of knowledge was comparable to that in other studies using the RPNQ. For example, our score was similar to a previous study among Saudi PT

students with a mean score of 6.2 in the same questionnaire (51.6%) (Alodaibi et al. 2018) and similar to the score of South African PT students in their final year (58%) (Mukoka et al. 2019). Further, our score was comparable to the 55% score reported for untrained healthcare professionals (PT, occupational therapists, psychologists, and rehabilitation counsellors) in Australia (Moseley 2004). However, our score was lower than that of Portuguese and Spanish PT students in their final year, who reported 62.5% (Marques et al. 2016) and 68.92% (Adillón et al. 2015), respectively.

Additionally, our sample of PTs did not perform as well as PTs who were trained on the neurophysiology of pain, who scored 78% (Moseley 2003). As such, this finding highlights the importance of educational approaches that are aiming to educate healthcare providers about pain neuroscience and have shown to be helpful in the management of chronic pain conditions (Buchbinder et al 2001, Burton et al 2009). Reportedly, PTs score on the RNPQ can improve significantly after 2 days of training (Pitance et al 2016, Latimer et al., 2004; Colleary et al., 2017; Cox et al., 2017).

The results of this study also revealed that a higher percentage of PTs gave correct responses to most of the RNPQ questions except on three questions. In particular, Items 1, 2, and 9 had a small percentage of correct answers (32.4%, 9.9%, and 48.6% respectively). These questions concern the mechanism of nociception and pain modulation, respectively (Ferreira et al 2019). As such, the results of this study highlight the need to integrate pain neuroscience as a part of PTs educational and training programs that could be beneficial (Pitance et al 2019, Latimer et al., 2004; Colleary et al., 2017; Cox et al., 2017). It has been reported that accurate knowledge about pain neurophysiology among healthcare professionals is essential and can reduce unhelpful pain-related beliefs and attitudes (Lee et al 2016). For example, improvement in knowledge about pain biology was associated with reductions in pain, pain-catastrophizing, and fear-avoidance behaviours; and also, with an improvement in function among patients with chronic pain (Lee et al 2016, Fletcher et al 2016). Appropriate pain neurophysiology knowledge is essential and may positively influence patients' beliefs about the cause and consequences of chronic pain and help in the management of chronic pain conditions (Louw et al 2011, Meeus et al 2010, Lee et al 2016).

Different PTs characteristics such as gender, professional experience, and educational level had no impact on pain neurophysiology knowledge in our study. However, longitudinal analyses to examine the influence of different educational levels and other demographic and clinical characteristics, and their impact on pain knowledge is worthy of further investigation among the healthcare providers. Further, the influence of training and educational programs about pain neurophysiology among PTs and how this might influence patients' beliefs such as movement-related fear and pain catastrophizing (Fletcher et al 2016) has not yet been explored in the Saudi Arabian context. As such, it would be sensible to explore whether training or educational classes would improve PTs' knowledge and would influence the beliefs and attitude of their patients with chronic pain.

Limitation

The results of this study should be acknowledged with the consideration of some limitations. There is no determined cut-off value of what the sufficient knowledge score is; therefore, we compare our score and percentage with previous data. Further, the low number of participants and selection bias can limit the generalizability of the results. One of the main goals of healthcare practitioners' learning about pain science is to change patient behaviours by lessening the fear and avoidance that arise through patients' association of pain with movement. However, we did not measure fear or other related factors, so we recommend that future studies consider these.

Declarations

Abbreviations

PT Physical therapist

RNPQ Revised Neurophysiology of Pain Questionnaire

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Declarations

Ethics approval and consent to participate

Ethical approval was obtained from Ministry of Health, Saudi Arabia (IRB: 2019-0060E). Additionally, all participants have signed participation consent before recruitment.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

All authors have contributed equally in writing the study protocol and obtaining ethical approval. A.A and FA were involved in the data collection. All authors have contributed equally in the data analysis and interpretation. All authors read and approved the final manuscript

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Figures

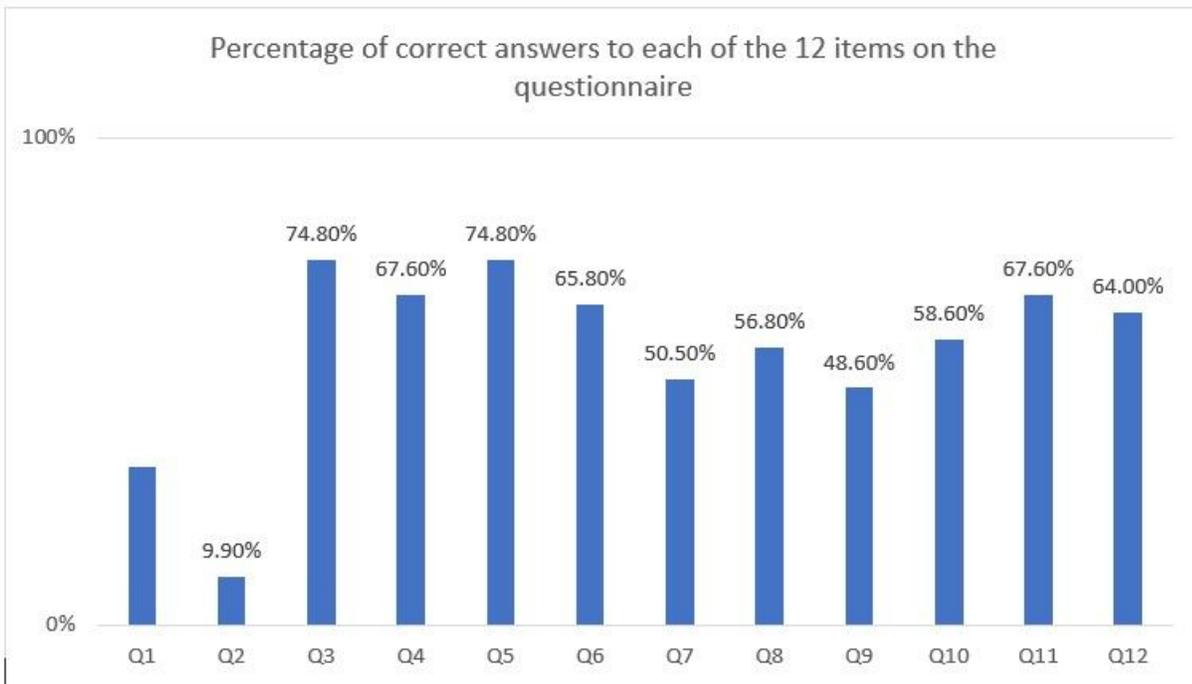


Figure 1

Figure 1

Neurophysiology of Pain Questionnaire