


Level of knowledge of sports coaches and physical education teachers in physical therapy

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ABSTRACT

The topic of physical therapy has concerned widely among the developed scholarly works but little in the developing context, thus this study pursues to explore the role of level of knowledge of both sports and physical education teachers in the area of physical therapy in context of Jeddah, Saudi Arabia. The study was a descriptive in its nature and through using the questionnaire, the data collected from Jeddah City in Saudi Arabia for further perceptions in this topic. A total of 98 participants involved in this study, and the results showed the majority of the participants had adequate knowledge about the important role and potential benefits of the physical therapy in their workplaces. The implications provided of this study indicate the need to integrate the training sessions of the physical therapy into sports events and activities to avoid injuries and improve rehabilitation and treatment of these injuries once occurred. For further exploration of this issue a larger with different sample is needed to fulfill the research gaps in this field.

Keywords: physical therapy, sports coaches, physical education teachers, Saudi Arabia

INTRODUCTION

The topic of physical therapy considers one of the most important healthcare concerns among the sports professionals who handle with the injuries cause during sport practices. And also, mainly provide the assistance to treat and mitigate the potential disabilities and damage for athletes. Moreover, the physical therapy helps to restore the main body functions and cure the injury [1]. It has a vital significant role to prevent as well rehabilitate these injuries happened during sports. In general, some inevitable injuries considered common for sports players and athletes, thus the physical therapist in these cases intervene to provide a medical necessary service that significantly could rehabilitate the injury and provide procedures to maintain personal fitness [2]. Based on the different types of the injuries, the physical therapists structure rehabilitation procedures, which include various ways to stretch, strengthen, and prevent further damage or injury for athletes. Even though, the sports injuries need professional knowledge and experience among the physical therapists, which enable them to handle and manage the situations once occur [3], this knowledge is essential due to the critical results could see once quickly control and cure these injuries effectively and rapidly. The sports injuries further are harmful for athletes' health and physical fitness, which this result permanent disability or end the athletes career.

The literature stated that the injuries consequences may also strain the overall healthcare system, since the injuries treatments are more expensive and time-consuming [4]. Little care with these injuries might lead to increasing of progressive

damages. The professional and experienced physical therapists through the rehabilitation process restore the sports injuries. On other hand, the physical therapy services in the sports field still at lower concern of the recent studies, although the growing focus the role of physical therapist in mitigating, controlling and preventing series of injuries for athletes [5]. The findings of the literature showed that the sport coaches as well as the physical education teachers didn't recognize the important services of the physical therapists at ground. Even though, the lack of professional expertise to manage injuries with poor rehabilitation training, which lead to deficiency among the athletes' performance [6].

There are many different injuries mostly managed by the physical therapist, but the most common sports related injuries are muscles, ligament strains and rupture, and bones fracture. The literature stated about 55% of the individuals had an experience with some forms of sports injuries [7]. The critical issue in this stream is the little knowledge of the sports coaches and physical education teachers about the appropriate methods and ways of the physical therapy and its role in the sports field. The literature that discussed this point revealed that both of sports coaches and teachers also had a lack of adequate knowledge about the physical therapy in sports injuries and rehabilitation [8]. However, the current study has aroused a research question to examine the role of the physical therapy knowledge of the sports coaches and physical education teachers to support the sports events. There are little empirical studies that addressed the awareness of coaches and physical education teachers with this role [9]; hence, exploring this awareness is highly recommended for further understanding this area and enhance the body of

literature with new implications and insights with more focus on the Saudi Arabia setting and how this issue influence and improve the perceptions about the significance of having greater applications and knowledge of physical therapy practices. In Saudi Arabia, limited studies were conducted to cover the gaps in this research area, so this study would contribute to fulfill this gap and add more grasp and new insights. Therefore, the study would answer the following research question: to which extent the knowledge of physical therapy among sports coaches and physical education teachers in Jeddah, Saudi Arabia can develop their role?

A critical review through the available conducted studies of the physical therapy level of knowledge and perceptions indicated a competence associated with the findings and their ability to highlight emerging issues to enrich the literature. The attempts of the current research to the professions are mainly focused to decrease the uncertainty about research knowledge has been done in the traditional studies among different sample e.g., therapists, thus the study is motivated to do a cross sectional approach study in order to investigate how levels of knowledge about the physical therapy over time can contribute and determine the level of support the present setting for the physical therapy knowledge that developed by studies. Moreover, the purpose of this study was to examine the perceptions of physical therapy knowledge of sports coaches and physical education teachers in Jeddah, Saudi Arabia, and the perceptions of therapists through their actual practices.

LITERATURE REVIEW

Although the physical therapy now appear to discuss the necessary of conducting results research for documentation the effectiveness of commonly used intervention, the discussions have been considerable ongoing of number of studies. The prominent figures in the physical therapy stated that the debates are not enough to address the outcomes and discussions in the physical therapy [10]. The literature further demonstrated that the physical therapy practices and standards should be created the based on research evidence of the effective physical therapy methods used [11]. Over the decades, the practitioners in the physical therapy have stated that research works are important to validate the services of physical therapy and provide further essential information on the effectiveness of treatments ways, which could develop the individuals' care by making good medical applications and decisions based on the research results [12]; therefore, this would provide answers to therapists' inquires. An emphasis of the importance of studies over numerous publications was referred by the American Physical Therapy Association (APTA), which also conducted sets of professional seminars and standards practices.

Today's healthcare literature is filled with the discussions and arguments about the importance of research findings and evidence-based practices of physical therapy. Therefore, it is critically to present a belief with the investigation of the current used and new procedures in the physical therapy to the new practitioners such as physical education teachers in order to practice and educate the future researcher [13]. In addition, the APTA objectives include trigger the empirical studies for further and better understand of the physical therapy science and to influence the emerging health care issues and trends, which contribute to improve this profession [14]. The results of

studies stated this issue to drive the physical therapy profession to establish an environment for evidence-based practices to best serve the growing needs of the athletes. The issue of physical therapy practices knowledge was seen a need for further outcomes and understand the critical role of this knowledge to achieve the changes in the healthcare sports system [15]. This may be come through increasing the enrollment of the healthcare training to expand the interests in the health promotion and injuries prevention. Because of the growing sports healthcare costs and competition among the healthcare services, some experts call for justify the needs and contributions they made to possible outcomes, as well to the cost-effectiveness [16]. The physical therapy profession assumes the intentions to conduct a research necessary in terms of identifying whether the knowledge about physical therapy practices and interventions is essentially improve the performance of sport coaches and interested parties e.g., physical education teachers.

The therapists through the accreditation standards and APTA models of professional education have addressed the necessity of educating the sports coaches with physical therapy knowledge and experiences with basic principle and standards to avoid advanced injury for their athletes [17]. The expectations that coaches can evaluate their level of knowledge of physical therapy support the related studies in the physical therapy practices and education. A critical evaluation of the information related to physical therapy established ways and methods, training and policies to develop an environment related to physical therapy knowledge [18]. The works involving in this topic according to the literature participate in numerous scholarly works to contribute to the existing body of physical therapy knowledge, which they clearly outlined the evaluation criteria for the accreditation education programs to prepare the coaches [19]. In-depth discussions and explanations of the research findings and expectations for the knowledge about the physical therapy are presented in the model of professional training and education for physical therapists, the findings were jointly developed by both of practitioners and academicians through a series of investigations and interventions [20]. The normative model stated some examples of the results of proper knowledge and educating in the physical therapy, which include use effective studies to create healthcare protocols, applications and standards of clinical delivery of healthcare with assessment of the studies outcomes for adequate adherence to the protocols.

A review of the relevant literature indicated concerns amongst the educators and coaches about the effective methods to produce and possess solid knowledge about the related physical therapy knowledge with an appreciation for the importance of treatment methods [21]. In Saudi Arabia, a variety of debates have been addressed on the manner, which issue of knowledge about the physical therapy among the sports practitioners for best and professional physical therapy practices [22]. The perceptions were ranged from having findings critique of the studies to launching new research proposals with actual performing research projects to adopt and assist the scholars and research project to actual complete future independent research projects [23]. The physical therapy models also proposed that the education and training programs should discontinue the practices of requiring more insights and applications for the role of knowledge and professional standards with based assumptions that confine

the professional education, thus the coaches and physical education teachers can generally understand the differences of the nuances practices and the need for proper knowledge to develop practical bases, as well comprehend the practices issues for further credible and scientific different contextual studies and implications.

The problems should be considered in the midst of addressing this topic is the lack of knowledge and familiarity with research approach methods in the physical therapy training and education. In this setting, the practitioners like physical education teachers can become more knowledgeable in the common methods, terms as well research statistical analysis of the studies so that they can become competent with critical review of the relevant literature [24]. Having this knowledge is a critical tie in the process to incorporate the findings, so the empirical scientific research into the clinical practices showed equal and important for physical therapy professionals to develop the positive perceptions and attitudes toward the importance of physical therapy research to grow up the body of knowledge in the physical therapy [25]. Physical therapy literature has also realized the needs to incorporate the research results in practice and accept the personal responsibilities and encourage or involve in such this research.

Over the last few years, the sports at schools for the youth have organized and become competitive worldwide. In Saudi Arabia, a number of outstanding and growing sporting events organized at different national levels to characterize the school sports events at the school calendar. The most common sporting events conducted in these schools include various sports such as football competitions and basketball to break the academic rhythm and charge the energy and motivations of the schools towards their schools. In Saudi Arabia, the link with the usual inter-scholastic sports events and competitions in these different events represent the testaments to the popularity of school sports events and support the educational systems to include the sports in the school curricula [26]. The structure sports are essential in development of many different aspects of students which includes physical, psychological and emotional health. However, the high risks of having injuries with low participation in the sports among the students often increase the downside of this participation in the sport events which motivate the scholarly research works to launch like these studies. A major concern particularly if no medical staff like physiotherapists working generally with the school sports teams looks to cooperate with the sporting coaches. This indicates coaches need to expand their extensive knowledge not only in coaching and training of athletes but also broaden the understanding in the measures of injury prevention and treatment to recognize the role of the numerous medical staff who can help school athletes in all respects [27].

METHOD

A cross-sectional study approach was conducted to achieve the current study objectives. The study targeted and collected data from both of sports coaches and physical education teachers in Jeddah, Saudi Arabia. The sample involved in this study was recruited from Jeddah, Saudi Arabia, so this study used the cluster sampling approach to ensure well and appropriate coverage of different participants characteristics and this would provide more insights and perceptions about the study topic. The study also used sets of

Table 1. Demographics profile

Demographics	Frequency	Percentage (%)
Gender		
Male	85	86.7
Female	13	13.3
Age		
20-25	9	9.2
26-30	5	5.1
31-35	8	8.2
36-40	7	7.1
41-45	21	21.4
46-50	34	34.7
Above 50	14	14.3
Education level		
Diploma	10	10.6
Bachelor	77	78.2
Master	11	11.2
Workplace		
Government hospitals	23	23.5
Private hospitals/clinics	32	32.7
Sporting activities	43	43.9

selection criteria that established before selecting the participants, which include only experienced coaches with some years of experience and physical education teachers at both of private and sector schools in Saudi Arabia at different age groups and willingness to participate in the study and can understand English. An online- questionnaires were distributed to the target sample by using Google forms. The instrument measurements were adapted from different previous relevant studies (e.g., [18]), which consist of several parts related to the sample demographics such as gender, education level, experience and so on. Prior start to conduct this study, approval was taken from Faculty of Medical Rehabilitation Sciences Ethical Committee in King Abdulaziz University in (FMRS-EC2022-031). A consent form was also attached with the questionnaire, and only who gave consent to use the data were involved in the analysis. A total of 120 questionnaires were distributed and only 98 were received back with a response rate 81.6%. Eighty nine questionnaires were received and filled up, so the study excluded the incomplete submission, missing information, not filling appropriate data or double-answer questions. The study has used the descriptive statistics to achieve its stated objectives and answer the research question.

RESULTS

The results were presented by using the descriptive statistics with SPSS 21. **Table 1** presents the demographics profile of the participants. The results showed that the majority of the study participants were male about 86.7% of the overall study participants, meanwhile the female participants were 13.3%. it could infer from this result the preference among males to be sports coach and physical education teachers due to physical body reasons and the opportunity may be given of these jobs compared to females. The aging groups of the participants revealed the most age group were ranged 46-50 years old followed by those aged 41-45 years old. This result may trace back into the experienced individuals in this setting. On other hand, the study analyzed both of the education level of the participants and their workplace, the findings showed the majority of them were bachelor holder about 78.2% and work at sports activities around 43.9% respectively.

Table 2. Coaching training & specialty

	Frequency	Percentage (%)
Having a sports coaching training certificate		
Yes	63	64.3
No	35	35.7
Number of years coaching		
1-5	33	33.7
6-10	18	18.4
11-15	8	8.2
16-20	8	8.2
21-25	17	17.3
Above 25	14	14.3
Having a sports physiotherapist at the school		
Yes	14	14.3
No	84	85.7
Your specialty as a sports coach		
Athletics	28	28.6
Football	32	32.7
Basketball	16	16.3
Volleyball	8	8.2
Handball	7	7.1
Swimming	7	7.1
Typical gender of physiotherapist		
Male	34	34.7
Female	0	0.0
Both	64	65.3

The study further concerns with addressing some issues related to physical therapy coaching and the participants were asked about essential statements to know their perceptions towards different factors contribute to better understand this subject. **Table 2** presents the participants' specialty in the sports. The results in **Table 2** showed 64.3% had sport coaching training certificate compared to 35.7% state had no such this certificate, this explains the interest of the coaches and physical education teachers to involve with professional training in the physical therapy. In addition, the numbers of coaching years were varied among the participants, the majority of them had one-five coaching years with a percentage of 33.7% of the overall sample participate in this study followed by those with six-10 coaching years about 18.4%. On other hand, only 14.3% of the participant stated they have a sports physiotherapist at the schools, this may refer to the cost of hire this position in the schools, which can't afford financially this job position. The coaches were varied based on their specialties, the majority were football coach 32.7% and the second specialty was athletics about 21.4%. The typical gender of physiotherapist according to the participants were both of male and female about 65.3%, which indicate great capabilities of physiotherapist for both genders.

Table 3 presents the knowledge about the physical therapy from the coaches and physical education teachers in Jeddah, Saudi Arabia. The current study divided the coaches and physical education teachers' knowledge about the physical therapy and the results demonstrated about 77.6% of the sample thought the physical therapy is a treatment and rehabilitation of the injuries, meanwhile others see it for movements efficiency and health maximization about 10.2% and 8.2%, respectively and only 4.1% see it to identify and manage the acute injuries. However, the potential benefits of the physiotherapy has been divided into two aspects namely personal and therapeutic benefits, the results showed all sample believed with the therapeutic benefit about 100% and 90.8% believed with the personal benefits, which this support the beliefs towards these benefits. Muscle pain and ligament

Table 3. Knowledge levels on physical therapy

	Frequency	Percentage (%)
Physiotherapy is about		
Treatment	76	77.6
Movement efficiency	10	10.2
Health maximization	8	8.2
Acute injuries management	4	4.1
Does physiotherapy have therapeutic benefits?		
Yes	98	100.0
No	0	0.0
Having personally benefited from physiotherapy		
Yes	89	90.8
No	9	9.2
The factors to be attended by physiotherapist		
Ligament injury	34	34.7
Muscle pain	43	43.9
Joint pain	11	11.2
Broken bones	7	7.1
Back pain	3	3.1
The areas sports physiotherapist attends		
First aid treatment	40	40.8
Injury prevention	9	9.2
Injury treatment	45	45.9
Surgery an injured athlete	4	4.1
Equipment used		
Electrical machine	23	23.5
Ice	22	22.4
Exercise machine	50	51.0
Bandages	3	3.1
Warming up to reduce injury risks		
Yes	98	100.0
No	0	0.0
Cool down to reduce injury risks		
Yes	90	91.8
No	8	8.2
Strapping to reduce injury risks		
Yes	82	83.7
No	16	16.3
Does returning too early to play after the injury lead to re-injury?		
Yes	92	93.9
No	6	6.1
Does playing with injury lead to disability?		
Yes	64	65.3
No	34	34.7
Conducting training sessions		
Yes	93	94.9
No	5	5.1
Physiotherapy treatment includes		
Education	7	7.1
Exercises	66	67.3
Massage	25	25.5
Physical therapists provide services		
During training & game	86	87.8
During game matches only	4	4.1
During training matches only	8	8.2

injury were the most factors that encourage the physiotherapists to attend physical therapy training with a percentage of 43.9% and 34.7% accordingly and only 3.1% was interested to attend for back pain. The most equipment used in the physiotherapy events and activities was exercise machine about 51%. And the most area that the sports physiotherapist attends was injury treatment about 45.9% and 40.8% of the participant attend for first aid treatment. To reduce injury risks, the sample was asked different statements to know their knowledge about the activities meet this situation and the results showed 100% thought the warming up can reduce the

injury risk meanwhile about 91.8% thought the cool down can reduce the injury risks, and 83.7% thought the strapping can reduce the injury risk and 65.3% thought the playing with injury can lead to disability. And about 94.9% conduct training sessions. However, the results revealed around 67.3% of the sample stated the physiotherapy treatment includes exercise and 25.5% include massage and 87.8% stated the therapists provide their services during training and game.

DISCUSSION

The current study pursued to identify and address the level of knowledge on the topic of physical therapy among both of sports coaches and the physical education teachers in Jeddah, Saudi Arabia in order to examine and evaluate this knowledge and the role to develop the importance of having physical therapy experience and activities on their workplace. However, this study shed lights the growing concern of the effect and role of physical therapy in the athletics events and sports events. Since the relevant studies conducted in the Jeddah city context is limited compared to the previous studies conducted in other different setting to assess this topic, this study attempts to identify the different inputs. The results of this study found that 85.7% have no physiotherapist at the schools and some of the physical educators have no coaching training certificate, which resulting little better understand about the physical therapy. This is essential field for people those work in the physical education field and coaching to advise and employ the physical therapy services whether a full or part time based on the available resources. However, little examinations have evaluated the applications and practices of the physical therapy amongst the physical education teachers and sports coaches despite the empirical research the confirm and support the results of this study (e.g., [28, 29]).

This study is motivating that about 100% of the participants have a belief about the therapeutic benefits of the physical therapy, which reflects a good knowledge of therapeutic approaches. And the personal benefits also support this belief even with lower result. This result also confirmed the important of having awareness of the therapist role in the management, treatment and rehabilitation the injuries happened because of the sports events. The findings further have proposed that the physical education teachers should be more aware with the physical therapy services which this stand with the study [30]. Although the sports coaches and physical education teachers have adequate both practical and conceptual knowledge about the important role of the physical therapists, the therapeutic services they have are infancy level and insufficient, therefore, this study showed that only 4.1% of the physical therapist provide their services during the game matches only, whereas 8.2% provide their services during the training matches only. However, the recruitment reduction of the physical therapists might be due to the financial costs and constraints associated with the administrative complexity that linked to less management sponsorship. Thus, there is a large need for the sports coaches and therapist who can teach to prevent, manage as well rehabilitate the injured athletes. This study also is confirmed that the participants are good aware about the equipment used and the techniques used by the physical therapists to prevent and treat the injuries.

The results are in line with previous studies findings which also confirmed the role of physical therapy knowledge of the

team managers to prevent and treat sports related injuries. For example, the study [31] addressed this issue and identified the important role of having good knowledge of physical therapy. The study supported that both of sports coaches and physical education teachers should insist their management to appoint a physical therapist among their workplaces at schools or training centers, for example in order to manage, prevent and treat or rehabilitate the sports injuries. However, lower numbers of the professionals in the physical therapy among the organizations like schools would make them expensive due to the potential injuries may occur and failure to prevent and treat them, which in turn lead to loss trained and experienced team sports members. Moreover, the physical therapist knowledge increases the notion that associated with the essential role of this factor in damage rehabilitation, and it also enable the opportunity to work with the professional teams, which this also manage the difficulties while using the services. Thus, it is often important for the physical education teachers to understand well the critical physical therapy services. Based on the study results, it could infer that there was growing concern with the better knowledge on the physical therapy for physical education teachers in Saudi Arabia especially Jeddah. The significance of the physical therapists is ultimately focused on preventing and treating the injuries and play a role in the procedures of injuries rehabilitation, which this also consistent with the findings of other works (e.g., [32]).

Furthermore, the findings of the present study found that the study participants knew about the conditions that commonly treated by the physiotherapists like muscle, ligament and muscle pain or injury. It was provided similar findings in the context of teams managers in South African with a relatively small sample size, and it revealed that more than half of the patients who refer themselves to the professional physiotherapists and presented with different pains of back and muscle indicated that the sample knew about the physiotherapists treatments techniques and conditions involve with back and joint pain [33]. The current research results moreover suggest that the physical education teachers and sports coaches in both government and private administered agencies are aware about the needed conditions of the physiotherapy. This is essential for sports coaches also in the school sports to better grasp and early identification the appropriate injuries treatment and management. Few of sport coaches who thought that the physiotherapists directly help with back pain (3.1%) and broken bones (7.1%) in their workplace. This would have been traced to the observations of the important adopted role of the physiotherapists in the field games of helping the athletes who may be need a medical assistance. A surprising that the majority of the participants knew that the physical therapists' services can be provided only during the game matches. Therefore, the study participants were not aware that the physiotherapists can be involved also in the training. This establishes a need to raise up the respective awareness among the school coaches' sports coaches with the role that may play by the physiotherapist in the game and training matches.

CONCLUSION

The study limitations are linked with the limited numbers of the empirical studies that supported the difficulties to make a comparison with the results of the previous ones. The current study didn't conduct analysis on the effects of other few factors

like educational levels or work experience. The sample was voluntarily involved in this study and some of them didn't give a concern, and the survey questionnaire was not return back. This study also gathered only physical therapy related basic services and information. The knowledge about these services was not well known. The study also used open-ended statements with yes and no types, and other study factors are need for more qualitative analyses. Future studies are also needed to compare some different sports coaches with each other and sports athletes, which could help to identify further perceptions and views on this subject with larger sample size.

Being aware of the study limitations, the research revealed that the majority of the participants were knowledgeable about the physiotherapy scope with regards to the key practices, equipment used, and treatment approaches used by the physiotherapists. There is no discussion about the sources and their reliability to get their knowledge and information about physiotherapy, which this triggers the future research to explore this point. The significance of the level of knowledge related to the coaching years encourage the study to involve with a variety individuals characteristic like sports teams managers, which may enhance the attitudes and perceptions about the factors influencing this knowledge. The developing contextual studies also reflect lower interest with this topic compared to the developed settings, this may because of lower scholarly interests with the factors enhance the development of coaching at schools and the current knowledge of the physical education teachers was a motive in the future to expand a such this study over similar characteristics context with large and different sample for further understanding and implications. A need to focus on the role of integration related circular with practical training sessions for sports coaches by regular training workshops as a mean to educate the interested individuals for the potential benefits of the physiotherapy and the relevance in the sport coaching contexts with regards the injury prevention and treatment. The study findings have implications to impact inclusion concepts like evidence-based practices in the school curricula of physiotherapy in Jeddah. These findings, though significant, do not completely capture the general spectrums of the physical education teachers' knowledge and skills towards integration evidence-based practices. The findings would assist redesign the curriculum and professional training and interventions that needed to facilitate these practices in Saudi Arabia.

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REFERENCES

- Allah Gaowgzeh R, Sundaram Subramanian S, Falah Maayah M, Alfawaz SS, Neamatallah Z, Ahmad Altaim T. Level of knowledge of sports coaches and physical education teachers in physical therapy in Jordan. *J Pharm Res Int.* 2021;33(56A):105-12. <https://doi.org/10.9734/jpri/2021/v33i56A33891>
- Hoover DL, VanWye WR, Judge LW. Periodization and physical therapy: Bridging the gap between training and rehabilitation. *Phys Ther Sport.* 2016;18:1-20. <https://doi.org/10.1016/j.ptsp.2015.08.003> PMID:26679784
- Rethorn ZD, Bezner JR, Pettitt CD. From expert to coach: health coaching to support behavior change within physical therapist practice. *Physiother Theory Pract.* 2022;38(13):2352-67. <https://doi.org/10.1080/09593985.2021.1987601> PMID:34620046
- Orr B, Brown C, Hemsing J, et al. Female soccer knee injury: Observed knowledge gaps in injury prevention among players/parents/coaches and current evidence (the KNOW study). *Scand J Med sci Sports.* 2013;23(3):271-80. <https://doi.org/10.1111/j.1600-0838.2011.01381.x> PMID:22093055
- Fisher RWH, Kollar T, Simmons R. Building and learning from a contextual knowledge base for a personalized physical therapy coach. Available at: <https://www.yumpu.com/> (Accessed: 15 November 2022).
- Zidarov D, Thomas A, Poissant L. Knowledge translation in physical therapy: From theory to practice. *Disabil Rehabil.* 2013;35(18):1571-7. <https://doi.org/10.3109/09638288.2012.748841> PMID:23339718
- Mujalli MF, Zakarneh M, Abu Alooun AK. Common sports injuries among physical activities practitioners at the physical fitness centers in Jordan (comparative study). *Asian Soc Sci.* 2016;12(5):24-32. <https://doi.org/10.5539/ass.v12n5p24>
- Maaouia GB, Chikha AB, Hawani A. Level of knowledge in physical therapy of Tunisian physical education teachers. *J Pharm Res Int.* 2021;33(55A):160-6. <https://doi.org/10.9734/jpri/2021/v33i55A33818>
- Al-Eisa ES, Al-Hoqail H, Al-Rushud AS, et al. Awareness, perceptions and beliefs about physiotherapy held by physicians working in Saudi Arabia: A cross-sectional study. *J Phys Ther Sci.* 2016;28(12):3435-9. <https://doi.org/10.1589/jpts.28.3435> PMID:28174468 PMCid:PMC5276777
- Magnusson DM, Eisenhart M, Gorman I, Kennedy VK, Davenport TE. Adopting population health frameworks in physical therapist practice, research, and education: The urgency of now. *Phys Ther.* 2019;99(8):1039-47. <https://doi.org/10.1093/ptj/pzz048> PMID:31220323
- Arnadottir SA, Gudjonsdottir B. Icelandic physical therapists' attitudes toward adoption of new knowledge and evidence-based practice: Cross-sectional web-based survey. *Phys Ther.* 2016;96(11):1724-33. <https://doi.org/10.2522/ptj.20150428> PMID:27197827
- Owoeye OBA, Rauvola RS, Brownson RC. Dissemination and implementation research in sports and exercise medicine and sports physical therapy: Translating evidence to practice and policy. *BMJ Open Sport Exerc Med.* 2020;6(1):e000974. <https://doi.org/10.1136/bmjsem-2020-000974> PMID:33304607 PMCid:PMC7704287
- Scholten-Peeters GGM, Beekman-Evers MS, van Boxel ACJW, et al. Attitude, knowledge and behaviour towards evidence-based medicine of physical therapists, students, teachers and supervisors in the Netherlands: A survey. *J Eval Clin Pract.* 2013;19(4):598-606. <https://doi.org/10.1111/j.1365-2753.2011.01811.x> PMID:22128867
- Al Maghraby MA, Alshami AM. Learning style and teaching method preferences of Saudi students of physical therapy. *J Family Community Med.* 2013;20(3):192-7. <https://doi.org/10.4103/2230-8229.122017> PMID:24672278 PMCid:PMC3957174

15. Yorke AM, Littleton S, Alsalaheen BA. Concussion attitudes and beliefs, knowledge, and clinical practice: Survey of physical therapists. *Phys Ther.* 2016;96(7):1018-28. <https://doi.org/10.2522/ptj.20140598> PMID:26637654
16. Ziebart C, MacDermid JC. Reflective practice in physical therapy: A scoping review. *Phys Ther.* 2019;99(8):1056-68. <https://doi.org/10.1093/ptj/pzz049> PMID:30921467 PMCid:PMC6665949
17. Darrah J, Loomis J, Manns P, Norton B, May L. Role of conceptual models in a physical therapy curriculum: Application of an integrated model of theory, research, and clinical practice. *Physiother Theory Pract.* 2006;22(5):239-50. <https://doi.org/10.1080/09593980600927765> PMID:17118892
18. Chiwaridzo M, Msiska M. Level of knowledge of physiotherapy among high school sports coaches in Harare, Zimbabwe. *Int J Sci Res Pub.* 2015;5(10):1-11.
19. Mohandas U, Chandan GD. Knowledge, attitude and practice in emergency management of dental injury among physical education teachers: A survey in Bangalore urban schools. *J Indian Soc Pedod Prev Dent.* 2009;27(4):242-8. <https://doi.org/10.4103/0970-4388.57660> PMID:19915276
20. Sukarmin Y, Ndayisenga J. Evaluation of Burundi physical education teachers, coaches, and athletes' sport nutrition, massage, and physiotherapeutic exercises knowledge. *Int J Hum Mov Sports Sci.* 2020;8(4):154-9. <https://doi.org/10.13189/saj.2020.080408>
21. Akhbari Ziegler S, Dirks T, Hadders-Algra M. Coaching in early physical therapy intervention: The COPCA program as an example of translation of theory into practice. *Disabil Rehabil.* 2019;41(15):1846-54. <https://doi.org/10.1080/09638288.2018.1448468> PMID:29544356
22. Alshahrani A, Gautam AP, Asiri F, et al. Knowledge, attitude, and practice among physical therapists toward COVID-19 in the Kingdom of Saudi Arabia—A cross-sectional study. *Healthcare (Basel).* 2022;10(1):105. <https://doi.org/10.3390/healthcare10010105> PMID:35052269 PMCid:PMC8775622
23. Aloyuni S, Alharbi R, Kashoo F, et al. Knowledge, attitude, and barriers to telerehabilitation-based physical therapy practice in Saudi Arabia. *Healthcare (Basel).* 2020;8(4):460. <https://doi.org/10.3390/healthcare8040460> PMID:33158298 PMCid:PMC7711516
24. Kume J, Tandell R, Indelicato J. Application of the evidence-based practice model by physical therapy clinical practitioners. *J Allied Health.* 2019;48(3):e79-85.
25. Fishleder S, Petrescu-Prahova M, Harris JR, et al. Bridging the gap after physical therapy: Clinical-community linkages with older adult physical activity programs. *Innov Aging.* 2018;2(1):igy006. <https://doi.org/10.1093/geron/igy006> PMID:30480131 PMCid:PMC6177034
26. Alodaibi F, Alhowimel A, Alsobayel H. Pain neurophysiology knowledge among physical therapy students in Saudi Arabia: A cross-sectional study. *BMC Med Educ.* 2018;18(1):228. <https://doi.org/10.1186/s12909-018-1329-5> PMID:30285804 PMCid:PMC6171286
27. Bindawas SM. Physical therapy entry-level education and post-professional training in Saudi Arabia: A comparison of perceptions of physical therapists from five regions. *J Phys Ther Sci.* 2014;26(9):1377-82. <https://doi.org/10.1589/jpts.26.1377> PMID:25276019 PMCid:PMC4175240
28. Holdsworth LK, Webster VS, McFadyen AK, The Scottish Physiotherapy Self referral Study Group. Are patients who refer themselves to physiotherapy different from those referred by GPs: Results of a national trial. *Physiother.* 2006;92(1):26-33. <https://doi.org/10.1016/j.physio.2005.11.002>
29. Dissanayaka TD, Banneheka S. Awareness in physiotherapy among high school students. *Int J Sci Res Pub.* 2014;4(7):1-5.
30. Hogan KA, Gross RH. Overuse injuries in paediatric athletes. *Orthop Clin North Am.* 2003;34(3):405-15. [https://doi.org/10.1016/S0030-5898\(03\)00006-3](https://doi.org/10.1016/S0030-5898(03)00006-3) PMID:12974490
31. Gbadamosi ZO, Mohammed J, Sumaila FG. Knowledge of physiotherapy in the prevention and treatment of soccer injuries among managers of amateur soccer teams. *Afr J Physiother Rehab Sci.* 2015;7(1-2):19-24. <https://doi.org/10.4314/ajpr.v7i1-2.4>
32. Andersen JC. Stretching before and after exercise: effect on muscle soreness and injury risk. *J Athl Train.* 2005;40(3):218-20.
33. Motha SG. Team manager's knowledge of the role of physiotherapy South Africa soccer teams in the Premier Soccer League [dissertation]. Polokwane, Limpopo Province: University of Limpopo; 2009.