



Original Research

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EVALUATION OF KNOWLEDGE, ATTITUDE, AND PRACTICE OF THE CORE-SKILLS OF PHYSIOTHERAPISTS IN SPORTS SCIENCE AND MEDICINE

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ABSTRACT

Background: With the increasing interest of physiotherapists (PTs) in postgraduate training in sports science and medicine, there may be inter-professional conflict, misconceptions and under-utilization of sports scientists. There is an overlap in core skill practice between PTs and sports scientists, although concepts and approaches differ. This study aimed to understand the inter-professional knowledge, attitude and practice of PTs regarding sports science and medicine specialty.

Methods: A cross-sectional survey of 160 PTs was conducted. A modified KAP Questionnaire assessed knowledge of health/skill-related fitness, exercise prescription, FITT and One-RM principles on a 5-point Likert scale. Attitude was also rated. Descriptive statistics and Chi-square test were used.

Results: Most PTs (83.1%, 76.7% and 78.5%) were familiar with content, technical guidelines and 1-RM use respectively. Between 20%-53.2% rated their knowledge as high/very high, while 38.5% rated curriculum knowledge as medium. Mean knowledge and attitude scores were 3.42 ± 3.16 (very good) and 3.72 ± 0.18 (positive). Work setting was significantly associated with attitude towards employing a sports scientist ($X^2=4.29$, $p=0.04$).

Conclusion: A high proportion of PTs had very good knowledge of sports science core skills with positive attitude, but exhibited poor knowledge of educational curriculum. Most PTs used FITT and One-RM guidelines.

Keywords: Physiotherapists; Sports science; Exercise prescription; FITT principles; One-RM; Inter-professional knowledge; Attitude; Practice

INTRODUCTION

Sports medicine as a discipline emerged in the 1920s and 1930s, with the first college of sports medicine established in Germany in 1924, and the term 'sports medicine' was first recorded in literature in 1928 [1]. However, it was after the 1950s that the growth of the discipline really accelerated as a result of the medicalization of society, which encompassed sport, and the increasingly competitive nature of sport [2]. Sports science and exercise medicine play a crucial role in the prevention, rehabilitation, and management of sports-related injuries [3]. Physiotherapists are also an integral part of the sports medicine team and they play similar roles as other professionals in sports medicine [4,5,6,7]. Specifically, the role of physiotherapists in sports includes the provision of assistance in minimizing and preventing injuries, rehabilitation of injured players, institution of programmes for enhancing performance, and intervention in cases of injuries during sports [7,8,9]. This overlap in duties implies that there may be inter-professional conflicts in the discharge of responsibilities when working in the same sports setting. Hence, the need for Inter-professional education and collaboration among professionals in order to avoid misconceptions and under-utilization [10].

Aweto and colleagues [11] reported that most Nigerian physiotherapists demonstrated good knowledge regarding health promotion but with little or known study on the evaluation of the core skills of physiotherapists in the field of sports science. This suggests a potential gap in the training and education of Nigerian physiotherapists when it comes to sports science and exercise medicine. Furthermore, Aweto et al. [11] found that Nigerian physiotherapists had a positive attitude towards promoting physical activity but despite this, a significant proportion of the physiotherapists did not offer appropriate counseling on lifestyle and physical activity. This discrepancy between knowledge and practice may be attributed to factors such as inadequate consultation time, years of working experience, and the relative physical activity levels of the physiotherapists [3]. Furthermore, knowledge is known through study or experience and it also extends to awareness, attitude and familiarity. Several studies [10, 12, 13, 14] have established the inter-professional knowledge and opinion of Doctors, Pharmacists and nurses on physiotherapy role but there is dearth of empirical data to ascertain the knowledge and attitude of Physiotherapists towards the specialty of Exercise and Sport Science, despite the area of overlap in the practice of both experts. There is therefore a need to investigate the knowledge, attitude and practice of physiotherapists in the field of Exercise and Sport Science, as a specialty. The objectives of this study were to investigate the knowledge, attitude and practice of physiotherapists on exercise prescription and sports science specialty.

Methods

Respondents

Respondents for this study were licensed physiotherapists recruited from 7 University Teaching Hospitals, one military hospital, one private physiotherapy clinic and the physiotherapy department of two universities in 6 geographical locations of Nigeria.

Inclusion and Exclusion Criteria

The eligible respondents were physiotherapists licensed by the Medical Rehabilitation Therapist Board of Nigeria (MRTBN), with minimum of two years as the clinical experience and could be practicing in either public or private health institutions. Physiotherapists with previous working experience in sport settings or who have retired from civil service were excluded.

Instrument

The modified KAP Questionnaire was used to assess the knowledge and attitude of physiotherapists towards sports medicine [15]. It has 3 sections namely: Socio-demographic, Knowledge on Health and skill related fitness and Exercise prescription component; and Attitude of Physiotherapists towards working with Exercise and Sport Scientists. All variables in the questionnaire were scored on 5-point Likert scale. The scores were aggregated for the following components: Health and skill related fitness components, Exercise prescription component, Curriculum of Sports science, Willingness and understanding of the knowledge of sporting activities on body systems. The Likert scale of 1 - 5 was graded as 1-5 points for the purpose of deriving a mean score for knowledge and attitude. The mean knowledge score was categorized as: 0 - 0.98 (Poor), 0.99 - 1.98 (Fair), 1.99 -2.98 (Good), 2.99 - 3.98 (Very Good) and 3.99 - 5 (Excellent). The mean attitude score was also rated as: 0 - 0.98 (Highly negative attitude), 0.99 - 1.98 (Negative attitude), 1.99 -2.98 (Moderately good attitude), 2.99 - 3.98 (Positive attitude) and 3.99 - 5 (Highly positive attitude).

Research design

This research was a Cross-sectional survey.

Sampling technique

The respondents were recruited using a convenience sampling technique while eleven hospitals were purposively selected from different regions of Nigeria. The sample size of 160 was determined using the Slovin's formula.

Procedure

Ethical approval was obtained from the Ethics and Research Committee of the University of Medical Sciences Ondo (NHREC/TR/UNIMED.-HREC.Ondo St/22/06/21). Both male and female physiotherapists who met the inclusion criteria were recruited. Information about the purpose of the study and participant rights were explained to the respondents and they consented to participate by signing a form. Being a knowledge-based questionnaire, all the respondents provided the information in the presence of the investigator to avoid interaction and cheating. Each participant responded to all sections of the questionnaire and this was retrieved immediately.

Data analysis

Descriptive statistics of frequency, percentage, mean, and standard deviation were used to summarize the data. Chi-square test of association was used to determine the association between knowledge, attitude, practice, and sociodemographic characteristics. Statistical analysis was performed using the IBM Statistical Package of Social Sciences (SPSS) (Version 21). The alpha level was set at $p < 0.05$.

Results

One hundred and sixty physiotherapists participated in this study, with the mean age being 36.14 ± 10.52 years. Most (106, 66.3%) of the participants were males while 51 (31.9%) were females. The mean years of experience of the physiotherapists was 7.06 ± 7.31 years. Other sociodemographics characteristics are summarized in Table 1. One hundred and thirty-three physiotherapists (83.1%) were familiar with the scope of practice of Exercise and Sports Science while 23 (16.9%). Also, 122 (76.7%) were familiar with Practical and Technical guidelines for prescribing exercises (Table 2).

The overall knowledge score ranged between 1 and 5 with a mean of 3.42 ± 3.16 while the mean overall attitude score was 3.72 ± 0.18 . Sixty (37.5%) physiotherapists rated their knowledge on body composition as a component of fitness testing as high while 53 (33.1%) rated their knowledge as medium. Knowledge on cardiorespiratory endurance was rated by 72 (46.8%) physiotherapists and 35 (22.7%) physiotherapists as 'high and very high', respectively. Only 34 PTs (21.9%) however, rated their knowledge on flexibility training as 'very high'. Other results on knowledge of sport science are presented in Tables 3 and 4. The attitude of physiotherapists towards sport medicine are presented in Table 5.

Only 43 physiotherapists (28.9%) had the experience of practicing in a Sport medical centre while 91 (60.3%) have never attended any conference or workshop related to Exercise and Sport Science. More than half (83, 55.0%) of the physiotherapists had never been attached to practice in any team or game in the past and most (64.5%) had never involved an Exercise and Sport Scientist in the treatment plan for any client. Furthermore, 79 physiotherapists (49.4%) reported willingness to specialize in Exercise and Sport Science in the future. Attitude scores across all domains are summarized in Table 6.

There was no significant association between the work settings of the physiotherapists, and attitude in the desire to work in the same team ($p = 0.10$) and also teach postgraduate students who are Exercise and sport scientists ($p = 0.24$). However, there was significant association between their work settings and the attitude of employing an Exercise and Sport scientist as an academic/clinical staff to work in the same clinic ($p = 0.04$). There was no significant association between the areas of specialties of the physiotherapists and the desiring attitude to work in the

same team and also teach postgraduate students who are Exercise and sport scientists ($p = 0.36$ and $p = 0.31$ respectively). There was significant Linear association between their work settings and the attitude of willing to employ an Exercise and Sport scientist as an academic/clinical staff to work in the same clinic ($\chi^2 = 4.29$, $p = 0.04$).

Furthermore, there was no significant association between the work settings of the physiotherapists and the number of those who were using the FITT principle in the exercise practical guidelines ($p = 0.98$). However, there was significant linear association between areas of specialties and familiarity with the use of One-RM ($p = 0.04$). There was significant association between years of experience and the use of One=RM as exercise practical guidelines for muscle strengthening programme. Sixty-four physiotherapists (46.7%) who have not been using the practical guidelines of FITT, expressed the likelihood to use it in future exercise management plans. Similarly, 56 (45.2%) physiotherapists had same level of desire to use One-RM principle in muscle strengthening plans in the future.

Table 1: Socio-demographic characteristic of participants

		Mean	SD	f	%
Age	-	36.14	10.52	-	-
Experience	-	7.06	7.31	-	-
Sex	Male	-	-	106	66.3
	Female	-	-	51	31.9
	Nil Response	-	-	3	1.9
Qualifications	First degree	-	-	-	-
	MSc	-	-	82	51.0
	PhD	-	-	37	23.1
	Nil Response	-	-	13	8.1
Work settings	State Hospital	-	-	15.6	17.1
	Federal Medical Centre	-	-	16.3	17.8
	Teaching Hospital	-	-	74	46.3
	Private hospital	-	-	6	3.7
Specialties	Orthopaedic	-	-	27	16.9
	Neurology	-	-	43	26.9
	Paediatrics	-	-	13	8.1
	O & G	-	-	6	3.8
	Geriatrics	-	-	7	4.4
	Cardiopulmonary	-	-	9	5.6
	Sports physiotherapy	-	-	9	5.6
	Other Specialties	-	-	3	1.9
	Nil Response	-	-	43	26.9

Table 2: Familiarity with the Practical and Technical guidelines for prescribing exercises

	Response category	f	%
Content and practice of Exercise and Sports Science	Familiar	133	81.3
	Unfamiliar	23	16.9
	Nil Response	4	2.5
Practical and Technical guidelines for prescribing exercises	Familiar	122	76.3
	Unfamiliar	37	23.2
	Nil Response	1	0.6

Table 3: Self rated Knowledge of physiotherapists on Health and skill related fitness components

Knowledge of	Rating Level of Knowledge				
	None(%)	Low (%)	Medium (%)	High (%)	Very High (%)
Health and skill related fitness components					
Body composition	2 (1.2)	5 (3.1)	53 (33.1)	60 (37.1)	32 (20.0)
Cardiorespiratory endurance (N =154)	-	2 (1.3)	45 (29.2)	72 (46.8)	35 (22.7)
Flexibility (N =155)	1 (0.6)	3 (1.9)	44 (28.4)	73 (45.6)	34 (21.9)
Muscular endurance (N = 157)	1 (0.6)	4 (2.5)	41 (26.1)	75 (47.8)	36 (22.9)
Agility (N = 157)		6 (3.8)	50 (31.8)	65 (41.4)	36 (22.9)
Balance(N = 155)		3 (1.9)	36 (23.2)	73 (47.1)	43 (27.7)
Coordination (N= 157)			36 (22.9)	77 (49.0)	44 (28.0)
Power (N= 156)		1 (0.6)	37 (23.7)	83 (53.2)	35 (22.4)
Reaction Time (N= 158)	2 (1.3)	10 (6.3)	47 (29.7)	65 (41.1)	34 (21.5)
Speed		8 (5.2)	47 (30.3)	61 (39.4)	39 (25.2)
Exercise prescription components in					
Cardiac rehabilitation (N= 153)	1 (0.7)	18(11.8)	64 (41.8)	50 (32.7)	20 (13.1)
Exercise biochemistry (N= 154)	5 (3.2)	43(27.9)	60 (39.0)	35 (22.7)	11 (7.1)
Exercise epidemiology (N= 155)	4 (2.6)	43(27.7)	60 (38.7)	36 (26.2)	12 (7.7)
Pediatric exercise science (N= 153)	5 (3.3)	38(24.8)	51 (33.3)	44 (28.8)	15 (9.8)
Physical Activity and Health(N= 154)		11 (7.1)	44 (28.6)	66 (42.9)	33 (21.4)
Energy Production for Physical Activity (N= 156)	1 (0.6)	10 (6.3)	55 (35.3)	63 (43.4)	27 (17.3)
Principle of overload (155)	3 (1.9)	7 (4.5)	48 (30.6)	65 (41.4)	34 (21.7)
Principle of specificity	3 (1.9)	10 (6.5)	45 (29.0)	55 (38.1)	38 (24.5)
Progression of program	2 (1.3)	11 (7.1)	30 (25.2)	65 (41.9)	38 (24.5)
Energy or caloric balance	5 (3.2)	17(11.0)	55 (35.7)	47 (30.5)	30 (19.5)

Table 4: Self rated Knowledge on the Curriculum of Sports science and the effects of sporting activities on the body systems

	Rating of knowledge Level				
	None (%)	Low (%)	Medium (%)	High (%)	Very High (%)
Understanding the content of the Curriculum of Sports science includes					
Sports injuries and Prevention	3 (1.9)	20 (12.8)	49 (31.4)	51 (32.7)	33 (21.2)
Sports science and Management	2 (1.3)	24 (15.6)	54 (35.1)	46 (29.9)	28 (18.2)
Entrepreneurship sports	6 (3.9)	41 (26.6)	58 (37.7)	33 (21.4)	16 (10.4)
Psychological Theories and Sports	6 (3.8)	46 (29.5)	60 (38.5)	28 (17.9)	16 (10.3)
Ergogenic aids, Nutrition and sports performance	7 (4.6)	39 (25.5)	54 (35.3)	31 (21.3)	22 (14.4)
Advanced Seminar on Evidence Based Practice in Sports science and Medicine	11 (7.1)	33 (21.4)	56 (36.4)	35 (22.7)	19 (12.3)
Genetic determinants of sports	14 (9.0)	42 (26.9)	60 (38.5)	21 (13.5)	19 (12.2)
Basic pharmacology and therapeutics in sports	10 (6.3)	42 (26.9)	59 (37.8)	25 (16.0)	19 (12.2)
Sports injuries, Eemergency and Management	9 (5.7)	29 (18.5)	48 (30.6)	41 (26.1)	30 (19.1)
Rehabilitation and parasports	7 (4.6)	30 (19.6)	50 (32.7)	39 (25.5)	27 (17.6)
knowledge of effects of sporting activities on body systems					
Physiology of Cardiovascular System	1 (0.6)	14 (9.1)	29 (18.8)	61 (39.6)	49 (31.8)
Lymphatic System	1 (0.6)	22 (14.3)	49 (31.8)	45 (29.2)	37 (24.0)
Respiratory Systems	1 (0.6)1	14 (9.0)	35 (22.4)	60 (38.5)	46 (29.5)
Hormones and endocrine systems	1 (0.6)	20 (12.8)	52 (33.3)	46 (29.5)	37 (23.7)
Menstrual cycle and female hormones	5 (3.2)	29 (18.1)	44 (28.2)	39 (25.0)	39 (25.0)

Table 5: Attitude and Willingness of Physiotherapists to work with Exercise and Sport scientists

Attitude and Willingness	None (%)	Low (%)	Medium (%)	High (%)	Very High (%)
To work in a team with Exercise and Sport scientists (N= 151)	16(19.3)	23 (15.2)	23 (15.2)	43 (28.5)	46 (30.5)
Employing an Exercise and Sport scientist as an academic/clinical staff	8 (5.2)	9 (5.8)	44 (28.4)	59 (38.1)	35 (22.6)
Supporting the training of Exercise and Sport scientist at undergraduate level in a Physiotherapy department	3 (1.9)	8 (5.1)	35 (22.4)	57 (36.5)	53 (34.0)
At Postgraduate level, Willing to support the training of Exercise and Sport scientist within Physiotherapy department	1 (0.7)	6 (3.9)	29 (19.1)	56 (36.8)	60 (39.8)
To teach postgraduate students in Exercise and sport science	5 (3.3)	9 (6.9)	40 (26.5)	48 (31.8)	49 (32.5)
To study Exercise and sport science at Postgraduate level	11 (7.2)	12 (7.8)	35 (22.9)	45 (29.4)	50 (32.7)

Table 6: Practicing the role of Exercise and Sport scientists

Practice		f	%
Having work experience in a sports medical centre	Yes	43	28.9
	No	106	71.2
Attendance of workshop related field to sport science	Yes	60	39.7
	No	91	60.3
Previous attachment to any Sport team	Yes	68	45.0
	No	83	55.0
Desire to specialize as an Exercise and Sports scientist	Yes	79	54.1
	No	67	45.9
Preference	Exercise and sport science	63	43.8
	Sport and Exercise	81	56.3
	Medicine		
Previous treatment of sports related injuries	Yes	125	82.2
	No	26	17.1
Familiarity with the use of One-Repetition Maximum	Yes	117	78.5
	No	33	21.5
Involving an Exercise and sports scientist in the exercise management plan	Yes	44	35.5
	No	80	64.5
Usage of the FITT principle in the exercise practical guidelines	Yes	74	66.1
	No	38	33.9

Table 7: Opinion of likelihood of using FITT and One-RM Principles

Practical guidelines	Rating	f	%
Using FITT principles in the future (N = 137)	Very very likely	64	46.7
	Very likely	42	30.7
	Likely	19	13.9
	Possibly	10	7.3
	Unlikely	2	1.5
Using One-Repetition Maximum in strengthening programme (N = 124)	Very very likely	56	45.2
	Very likely	38	30.6
	Likely	16	12.9
	Possibly	11	8.9
	Unlikely	3	2.4

Discussion

The fields of sports science and medicine have been documented to play multifaceted roles in promoting public health, physical fitness; preventing sedentary lifestyles, encouraging social cohesion, and also serving as medium for recreation and leisure [16,17]. Physiotherapists, particularly Sports physiotherapists require in-depth knowledge, skills and competence that are specific to this context and area of practice [18]. Sport physiotherapists are typically at the edge of the sport field, close to the injury being sustained and enhancing performance of athletes, and this requires an increasingly high levels of expertise. Hence, it has become mandatory to seek knowledge of the core skill practices of physiotherapists and investigate their attitude towards other professions with areas of overlap.

The average age of physiotherapists who were respondents in this study was 36 years and they had 7 years work experience in the profession. Also, less than half of the physiotherapists had postgraduate qualifications with almost half of them working in the Teaching hospitals. The overall implication of this is that their responses could be taken to be reliable and a true reflection of their evaluation of knowledge and attitude on the specialty of Sport and Exercise Science. Most of the respondents were familiar with the content and practice of Exercise and Sports Science; and the Practical and Technical guidelines for prescribing exercises. More than half of the physiotherapists rated their knowledge as between ‘medium’ and ‘high’ on component of fitness testing with regards to understanding body composition while the knowledge on Cardiorespiratory endurance was rated as ‘very high’.

Most respondents rated their knowledge as very high in component of fitness testing such as Flexibility, Muscular endurance assessment, Agility, Balance, Coordination, Power, Reaction and Speed Time testings. Similar trend was observed in the ratings of knowledge on all Exercise prescription components evaluated in this study and this included Cardiac rehabilitation and Exercise Biochemistry, Exercise epidemiology, Pediatric exercise science, Physical Activity and Health and the use of overload principle of exercise. These findings corroborated that of Abaraogu et al who found that majority of the physiotherapists surveyed demonstrated good knowledge in the field of physiotherapy.[19]

On the understanding of the content of the training curriculum for Sport and Exercise Science, the findings showed that the physiotherapists highly rated themselves as very high in knowledge in the areas of Sports injuries and Prevention, Sports science, Emergency Management, Rehabilitation and para-sports; Management and Entrepreneurship in sports but rated themselves very low in areas such as Psychological Theories and Sports, Ergogenic aids, Nutrition and sports performance, genetic determinants of sports and Basic pharmacology and therapeutics in sports. It is important for physiotherapists to understand all areas of Sport and Exercise Science because

the role of physiotherapy in sports include prevention of injuries, and rehabilitation of injured players [8,9].

The rating of knowledge was very high on the understanding of effects of sporting activities on body systems such as the cardiovascular system, lymphatic system and the respiratory systems. Generally, the physiotherapists in this study had very good knowledge and positive attitude towards the specialty of exercise and sports science. Aweto et al [11] also reported that most Nigerian physiotherapists had a good level of knowledge regarding health promotion and often incorporated aspects of health promotion into their patients' treatment. Our current findings were further corroborated by Ferrante and Muscat [20] who found that a significant number of physiotherapists had adequate knowledge and positive perception of the role being played in sports medicine. Similarly, Kemp et al [21] emphasized the need for the role of physiotherapy in sports medicine.

Most physiotherapists showed high ratings in the willingness to work in a team and also employ an Exercise and Sport scientist as an academic/clinical staff in the same work-setting. Majority also supported the training of Exercise and Sport scientists at undergraduate level in a Physiotherapy department but majority had poor practice in terms of attending workshop related field to sport science and involving an Exercise and sports scientist in the exercise management plan for treating clients. There are documentations that physiotherapists usually indicate a strong and positive desire to examine and manage various form of sports injuries using multidisciplinary approaches, sport science, and exercise medicine, inclusive [22]. Respondents in the current study also showed willingness to study Sport and Exercise Science at Postgraduate level. This can be attributed to the much-needed relevance of the field in sports science and medicine [4]. Although, there was no significant associations between the work settings of the physiotherapists, the attitude in the desire to work in the same team and also teach postgraduate students who are Sport and Exercise Scientists but there was a significant association between the former and the attitude towards employing an Exercise and Sport scientist as an academic/clinical staff to work in the same clinic. There were no significant associations between the areas of specialties of the physiotherapists and the desiring attitude to work in the same team and also teach postgraduate students who are Sport and Exercise Scientists. Furthermore, there was significant association between areas of specialties and familiarity with the use of One-RM and between years of experience and the use of One-RM as exercise practical guidelines for muscle strengthening programme. It was observed that most physiotherapists who had not been using the practical guidelines of FITT and One-RM principles, expressed the likelihood of using it in future clinical plans. This current finding contradicted the belief that physiotherapists are skilled in exercise prescription, although, it is recognized that it is an area of potential future growth, that needs to be improved [22]. In addition, the current finding that most physiotherapists were using the exercise prescription guidelines contradicted the recent findings of Onigbinde and Kekere who found very poor documentation on the use of FITT and One-RM principles among Nigerian physiotherapists [23]. Although, it might be that they utilized the principles but have poor attitude towards documentation.

Conclusion

A high proportion of the PTs had very good knowledge of the core skills of sports science and medicine with positive attitude but they exhibited poor knowledge of the educational training curriculum. Most physiotherapists were using the practical guidelines of FITT and One-RM principles and about half those who were not, expressed the likelihood of using it in future clinical plans. It was also concluded that there was a significant association between work settings and the attitude of working in a team with Sport and Exercise Scientists.

Conflicts of Interest:

No conflict of interest was declared by any of the authors

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