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ORIGINAL RESEARCH ARTICLE

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Professional practice profile, treatment preferences, and the bases for clinical, educational, and research among Nigerian physiotherapists

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Abstract

Background Physiotherapy education and practice have country-specific peculiarities which may limit globalization in health care. This study aimed to characterize physiotherapy practice and treatment preferences, educational qualifications, and research in Nigeria, with a view of providing vital information for transnational integration and collaboration.

Methods A cross-sectional survey of 104 Nigerian physiotherapists was conducted. The Physical Therapy Practice Questionnaire and a self-developed proforma were used as survey tools.

Results The mean age of respondents was 33.5 ± 9.4 years. About two-fifth of all respondents (39.4%) had an MSc and mostly practice as clinicians (51.0%) in teaching hospitals (34.6%). The respondents were mostly involved in general practice (50.0%), with a caseload of 1–10 patients per day (67.3%). Soft tissue mobilization (83%), proprioceptive neuromuscular facilitation (76%), breathing exercises (77%), and transcutaneous electrical neuromuscular stimulation (83%) were commonly used. Respondents were familiar databases and evidence-based resources (81.2%) and mostly utilize PubMed (73.3%). Regular case conferences with professional colleagues (47.6%) and treatment planning of between 11 and 30 min (40.6%) were common. Educators spend 1–3 h planning educational work (91.8%). Clinical decision-making is mostly based on professional experience, while journals are the primary resource for educational information.

Conclusion Physiotherapy practice in Nigeria is degree based and requires registration board's licensure. Practitioners deal with a high caseload and utilize a wide range of techniques and modalities and have tendencies to utilize personal experience and research in making clinical decisions. The parity in education and practice with advanced climes inadvertently gives physiotherapy practice in Nigeria a global purview.

Keywords Professional practice, Profile, Treatment preferences, Physiotherapist, Nigeria

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Introduction

The scope of physiotherapy practice in optimizing [1] and maximizing function, mobility, and quality of life [2] has varying boundaries across different countries, and it is moderated by country-specific legislation and economic situation among other factors [3]. Thus, difference in practice patterns not only is different between developed and developing countries but also it is somewhat varied among developed nations. In Australia and Canada, physiotherapy has been fully adopted as an autonomous profession with direct access to patients or clients, contrary to Germany where physiotherapists are not authorized to make diagnoses, have first contact access to patients, and neither refer patients to other specialists [4, 5]. On the other hand, in Nigeria, physiotherapy has a semblance of autonomy but still require legislation backing [6]. A variation in entry-level requirements to practice also exist across different countries. For instance, a Doctor of Physical Therapy degree must be earned in the USA to qualify for licensure [7], while a full- or part-time course or a degree apprenticeship is obtainable in the UK [8], and a 3-year diploma [9] qualifies one to be a registered physiotherapist in Germany. In Nigeria, a baccalaureate is the required entry-level qualification to register as a practicing physiotherapist. Thus, a combination of many factors, including access to state-of-the-art facilities and equipment as determined by country-specific economic levels, influence the latitude of the practice of physiotherapy across different countries around the world.

The world is fast becoming a global village, and in order to foster global intellectual and professional exchanges across different climes, country-specific data on education and practice profiles is required. This data is relevant for intra-professional exchange across countries, as well as help to ensure synchrony of global physiotherapy practice. To date, only a few studies have documented country-specific physiotherapy education [10] and practice profiles [11–13]. However, there seems to be a dearth of similar studies in sub-Saharan Africa (SSA).

As the most populous country in Africa, accounting for one in four of sub-Saharan Africa's people, physiotherapy was introduced into Nigeria in 1945, and its training started as a 3-year diploma course under the auspices of the Chartered Society of Physiotherapy, UK. The process of time saw this training develop into a baccalaureate at the University of Ibadan having its pioneer degree holders in 1969 [14]. Over time, the requirement for professional registration to practice in Nigeria is a bachelor's degree and a mandatory 12-month internship at accredited institutions. The most recent milestone achieved in physiotherapy training was the approval of the Doctor of Physiotherapy curriculum by the National Universities

Commission in 2018 [15]. While only a few universities in Nigeria have engaged the new approved curriculum, many others are yet to be ready [15].

Specialization in physiotherapy practice in Nigeria is in four major areas: neurology, orthopedics, cardio-pulmonary, and pediatrics and cutting across different practice settings including hospitals, home-service delivery, private clinics, health, fitness, and wellness centers. Varying practice experience, age, and competency levels are important factors that influence the quality and approach to physiotherapy service delivery [16]. There is an apparent dearth of literature on education, practice, and research profile of Nigerian physiotherapists. This study aimed to characterize physiotherapy practice and treatment preferences, educational qualifications, and research in Nigeria, with a view of providing vital information for transnational integration and collaboration.

Methodology

This cross-sectional study involved purposive board-licensed physiotherapists, who were members of either Association of Clinical and Academic Physiotherapists of Nigeria (ACAPN) or Nigeria Society of Physiotherapy (NSP) and who had practiced for at least 1-year post qualification in Nigeria. The respondents were attendees at the 2019 annual National Conferences of the ACAPN which is held at Port Harcourt, the NSP which is held at Enugu, and Medical Rehabilitation Therapists (Registration) Board of Nigeria (MRTB) which is held at the Federal Capital Territory, Abuja. An online administration of the survey was carried out via WhatsApp platforms of the professional associations, as well as through emails to reach those who did not attend the conferences, as well as conference attendees who did not fill the print survey.

Ethical approval for this study was obtained from the Health Research and Ethics Committee of the Institute of Public Health (HREC), Obafemi Awolowo University, Ile-Ife, Nigeria, (IPHOAU/12/1382). Sample size for this study was estimated based on a standardized formula [17] with a 95% confidence level set at 1.96, the absolute error/precision at 10%, and the expected proportion of professionalism attributes in the population at 79% [14]. Thus, minimum sample of 64 was estimated to power the study.

Respondents gave signed informed consent. The Physical Therapy Profile Questionnaire (PTPQ) developed by Dizon et al. [11] was used in this study. The tool has five unique sections, namely: (a) general information comprising of free full-text questions on biodata and educational background/training, (b) practice profile—comprising of multiple-choice questions describing practice, (c) treatment preferences—consisting of checklists of treatment preferences across various physiotherapy

specializations, (d) bases for clinical work, and (e) bases for educational/research work. Sections D and E consist of multiple-choice questions and ranking in order of decreasing magnitude (one being highest, ten being lowest) of resources that serve the bases for clinical and educational/research work, respectively. In sections D and E, resources requiring ranking were each treated as separate variables and were ranked according to the average of the values respondents attached to them, that is, resources with the lowest average were ranked highest with one (1), and resources with the highest average value were ranked lowest with ten (10). Paper and electronic administration of the PTPQ was used in this study in order to address any sampling effects. A self-developed proforma was used alongside the tool to capture work/practice and socioeconomic characteristics.

Data analysis

Since the roles of clinical and academic physiotherapists differ, we grouped the respondents as clinicians and academics for the analysis. Descriptive statistics of frequencies, means, percentages, and charts were used to summarize sociodemographic, area of practice, work position, and characteristics data. Mean rank was used to summarize data on basis of clinical decision-making, sources, and resources of professional development. Charts were used to present roles of physiotherapy in practice, inter-professional team-work practice, access to library, Internet, databases, and evidence resources. Data was analyzed using SPSS Statistics Version 23.0 (IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY, USA: IBM).

Results

Sociodemographics profile of respondents

Of 162 conference attendees, 104 participated. The mean age of the respondents was 33.5 ± 9.4 years, with a male-to-female ratio of 1.48:1. A larger proportion of the respondents practice in the southwest geopolitical zone (47.1%) of Nigeria. Most respondents earn between N101,000 and N200,000 (37.5%) (at the exchange rate of US \$1 for N365). All the respondents had their baccalaureate in Nigeria, and 39.4% of the respondents had a master's degree and 11.5% a doctoral degree (Table 1).

Roles as clinical practitioners

The respondents were mostly involved in general practice (in the Nigerian context, this refers to clinicians with no additional or specialty training) (50.0%), with over 10 years of experience (31.7%). Only 6.7% of the respondents solely practice as researchers. Based on specialization, respondents were mostly into sports/musculoskeletal physiotherapy (28.8%) (Table 1). From Table 2, 51% of

the respondents were clinicians, who mostly practiced in teaching hospital setting (34.6%) and attends to between 1 and 10 patients per day (67.3%) (Figs. 1 and 2).

Treatment preferences

Treatment preferences for musculoskeletal conditions were mostly soft tissue mobilization (83%), positional technique (69%), and massage (59%), while specialized interventions such as McKenzie's mechanical diagnosis and therapy (4%) and Mulligan's technique (13%) were less preferred (Table 3). Treatment preferences for neurological conditions were mostly proprioceptive neuromuscular facilitation (PNF) (76%). Breathing exercises (77%), activity of daily living training (67%), and lifestyle modification (63%) were mostly preferred for cardiopulmonary rehabilitation. The most preferred treatment modality is transcutaneous electrical nerve stimulation (TENS) (83%). Only very few respondents use LASER (7%).

Interprofessional practices

On daily basis, 41.6% of the clinicians engaged in interactions with 1–5 professional colleagues (95% physiotherapists, 61.4% medical doctors, and 19.8% others). Inter-professional discussions were centered on patients' cases and updates (80.2%) (Fig. 3). A total of 46.6% of respondents spent between 11 and 30 min planning patients' treatment. Regular case meetings included case conferences (46.5%) with colleagues (68.3%) and others (medical doctors (24.8%) and occupational therapist (10.9%)) (Table 4).

Basis of clinical decision-making, professional development, role as educators, basis for educational content, and professional development as educators

Professional experience was ranked highest as a basis for clinical decision-making. When faced with new or unique clinical case scenario, respondents ranked journal articles highest as basis for clinical decision (Table 5). Among respondents, 50.5% always used Internet connectivity available to them for clinical purposes. Although 40.6% of respondents had access to the library, they mostly never used it (37.6%) (Fig. 4). A total of 81.2% of the respondents were familiar with databases and evidence-based resources, and they frequently search PubMed (74%) and Google Scholar (57%). A total of 74.3% of the respondents engaged in looking for clinical guidelines to identify the best approach for clinical cases (Fig. 4). Seminars/trainings and postgraduate education (MSc/PhD) were ranked highest and lowest respectively on the list of trainings/resources/opportunities that will help in the clinical practice (Table 6).

Among the academics, 6.8% practice solely as educators in a school/university. A total of 22.3% of them were

Table 1 Characteristics and work profile of the respondent

Items		n (%)
Age	21–25	11 (10.8%)
	26–30	38 (37.3%)
	31–35	19 (18.6%)
	36–40	11 (10.8%)
	41–45	8 (7.8%)
	46–50	8 (7.8%)
	51–55	6 (5.9%)
	56–60	1 (1%)
Gender	Male	62 (59.6%)
	Female	42 (40.4%)
Religion	Christianity	80 (76.9%)
	Islam	24 (23.1%)
Regional distribution of workplace	Northwest	12 (11.5%)
	North Central	17 (16.3%)
	Northeast	8 (7.7%)
	Southwest	49 (47.1%)
	South-South	11 (10.6%)
	Southeast	7 (6.7%)
Monthly income	< N50,000	11 (10.6%)
	N51,000–N100,000	22 (21.2%)
	N101,000–N200,000	39 (37.5%)
	N201,000–N300,000	19 (18.3%)
	N301,000–N500,000	8 (7.7%)
	> N500,000	5 (4.8%)
Level of education	BSc holders	51 (49.0%)
	MSc holders	41 (39.4%)
	PhD holders	12 (11.5%)
Location of education	BSc	
	Nigeria	104 (100%)
	MSc	
	Nigeria	36 (87.8%)
	Overseas	5 (12.8%)
	PhD	
	Nigeria	9 (75.0%)
	Overseas	3 (25.0%)
Work position	Physiotherapists	66 (63.5%)
	Chief physiotherapist	5 (4.8%)
	Senior physiotherapists	5 (4.8%)
	Principal physiotherapist	5 (4.8%)
	Deputy director	6 (5.8%)
	Assistant director	7 (6.7%)
	HOD/director	4 (3.9%)
	Academics/university	6 (5.7%)
Area of practice	General practice	52 (50.0%)
	Sports/musculoskeletal	30 (28.8%)
	Geriatrics/neurology	21 (20.2%)
	Pediatric therapy	21 (20.2%)
	Cardiopulmonary rehabilitation	10 (9.6%)

Table 1 (continued)

Items		n (%)
	Wellness/health promotion	11 (10.6%)
	Community development	5 (4.8%)
	Research	7 (6.7%)
Duration of practice	> 10 years	33 (31.7%)
	5–10 years	24 (23.1%)
	2–5 years	26 (25.0%)
	< 2 years	21 (20.2%)

involved in clinical practice and research, while 8.7% combined clinical practice, administration, education, and research (Fig. 2). Journal articles/other referencing materials were the primary resource for educational information and to find answers to new/unique questions (Table 6). A total of 67.3% of respondents use Internet always for educational/research work, while 93.9% of them were familiar with databases and evidence-based resources (mostly Google Scholar, 56.4%) (Fig. 4).

Discussion

This study aimed to characterize physiotherapy practice and treatment preferences, educational qualifications, and research in Nigeria. The physiotherapists in this study were mostly young adults. Also, the gender pattern observed in this study is consistent with earlier findings indicating male preponderance in studies involving physiotherapy practice in Nigeria [18–20]. The higher proportions of male participants in physiotherapy-related studies in Nigeria are a reflection of high male dominance in the profession in the country. According to Odebiyi and Adegoke [18], more men than women have graduated in physiotherapy programs in Nigerian universities, and the professional practice is dominated by them. This pattern is at variance with reports from countries like the UK [21]. A recent report by the Chartered Society of Physiotherapy (CSP) revealed a slow change in membership data of practicing and nonpracticing physiotherapists between 2017 and 2020, where the female-male ratio moved two percentage points from 76% vs. 24% to 74% vs. 26% [22]. Similarly, data from the USA indicate that 67% of physical therapists are female, thus making women the more common sex in the profession [23]. Odebiyi and Adegoke [18] adduced that having some male expatriates among the foundation practitioners (British who brought the profession to Nigeria), as well as having higher numbers of males among the first sets of Nigerian trained physiotherapists, might have perpetuated the pattern of male dominance in physiotherapy in

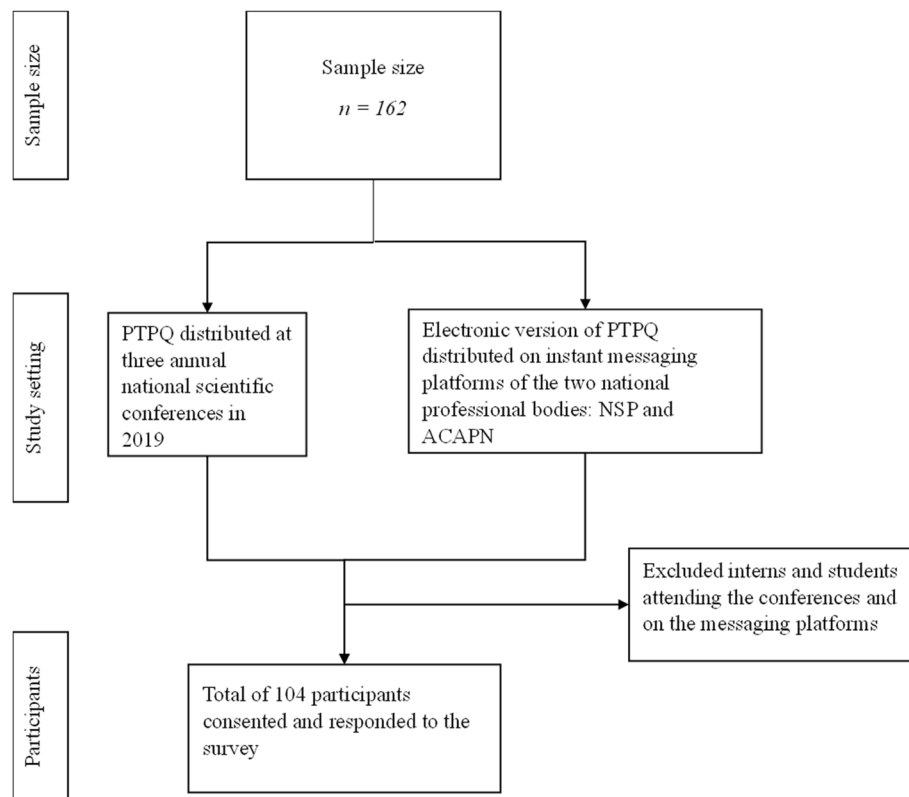
Table 2 Work characteristics of the respondents

Workplace environment	n (%)	Workplace setting							Total n (%)
		Hospital n (%)	Private clinic n (%)	Homecare n (%)	Community n (%)	School/university n (%)	Wellness/sport fitness n (%)	Multidisciplinary setting n (%)	
Academics/university	6 (5.8)	1 (14.3)	0 (0)	0 (0)	0 (0)	6 (85.7)	0 (0)	0 (0)	7 (100)
Federal medical center	13 (12.5)	12 (92.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (7.7)	13 (100)
Primary health center	1 (1.0)	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)	1 (100)
Private hospital	28 (26.9)	9 (20)	15 (33.3)	15 (33.3)	0 (0)	0 (0)	1 (2.2)	5 (11.1)	45 (100)
State general hospital	20 (19.2)	20 (76.9)	1 (3.9)	3 (11.5)	1 (3.9)	1 (3.9)	0 (0)	0 (0)	26 (100)
Teaching hospital	36 (34.6)	28 (71.8)	3 (7.7)	2 (5.1)	1 (2.6)	2 (5.1)	1 (2.6)	2 (5.1)	39 (100)

the country. According to World Physiotherapy (WPT) [24] annual membership census in 2021, globally, 62% of physiotherapists were females, and in the African region, 60% of physiotherapists were females. However, countries like Belgium, Japan, Sri Lanka, and several African have around half of the professional population to be males [25].

Based on geographical spread, there is a great number of physiotherapists in the southwestern region of Nigeria. It is adducible that the high concentration of public physiotherapy training institutions, the cosmopolitan nature, and the socio-economic development of the region may have accounted for high number of physiotherapists

who practice in the zone. Furthermore, all the physiotherapists who took part in this study had a bachelor's degree in physiotherapy and were all trained in Nigeria. The entry-level educational requirement to practice as a physiotherapist in Nigeria is a 5-year Bachelor of Physiotherapy (BPT) or Bachelor of Medical Rehabilitation (PT) degree [26]. Recently, the Doctor of Physical Therapy degree has been adopted as the minimum benchmark for training of physiotherapists in Nigeria [27], and a number of public and private institutions are transitioning into the new program. About a two-fifth and a tenth of the physiotherapists in this study had an MSc and PhD, respectively. Postgraduate training in physiotherapy was

**Fig. 1** Flow chart diagram representing the study

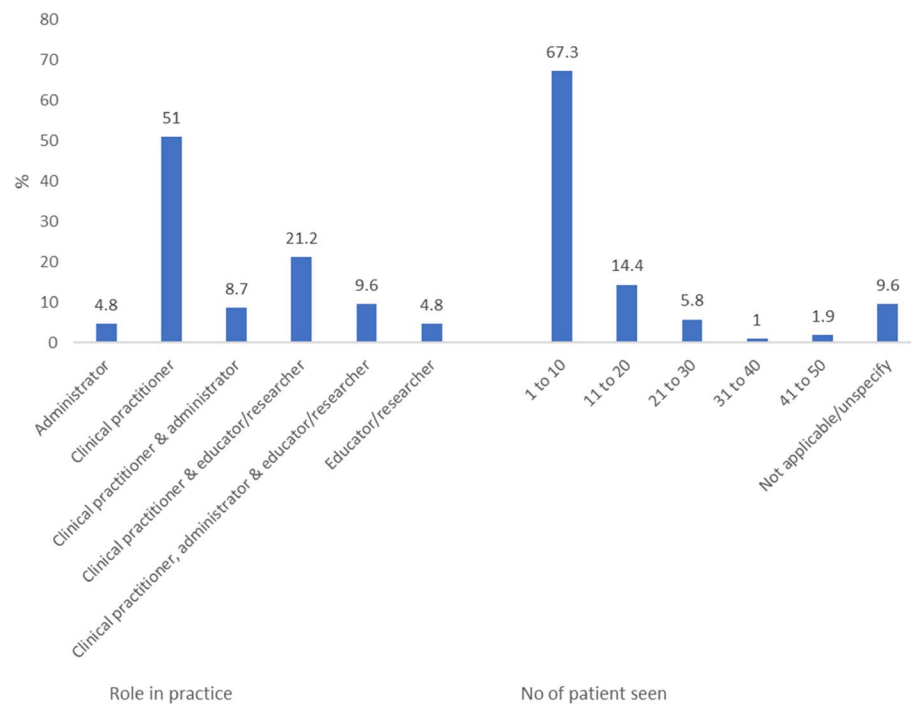


Fig. 2 Roles of physiotherapist in practice and patients seen per day

Table 3 Treatment preferences

Treatment preferences		Percentage (%)
Manual therapy	Soft tissue manipulation	83%
	Muscle energy technique	44%
	Positional technique	69%
	Mulligan	13%
	Massage	59%
	McKenzie's	4%
Neurodevelopmental technique	PNF	76%
	Bobath's	60%
	Brunnstrom approach	25%
	Sensory integration technique	14%
Cardiopulmonary	Breathing exercises	77%
	ADL	67%
	Lifestyle modification	63%
	Postural drainage	49%
Therapeutic exercises	Stabilization exercises	82%
	Strengthening exercises	83%
	Stretching exercises	66%
	Endurance	70%
Electrotherapy	TENS	83%
	Hot/cold packs	78%
	Electrical stimulation	76%
	IRR	74%
	Ultrasound	69%
	Diathermy	31%
	LASER	7%

PNF Proprioceptive neuromuscular facilitation, ADL Activity of daily living, TENS Transcutaneous electrical nerve stimulator

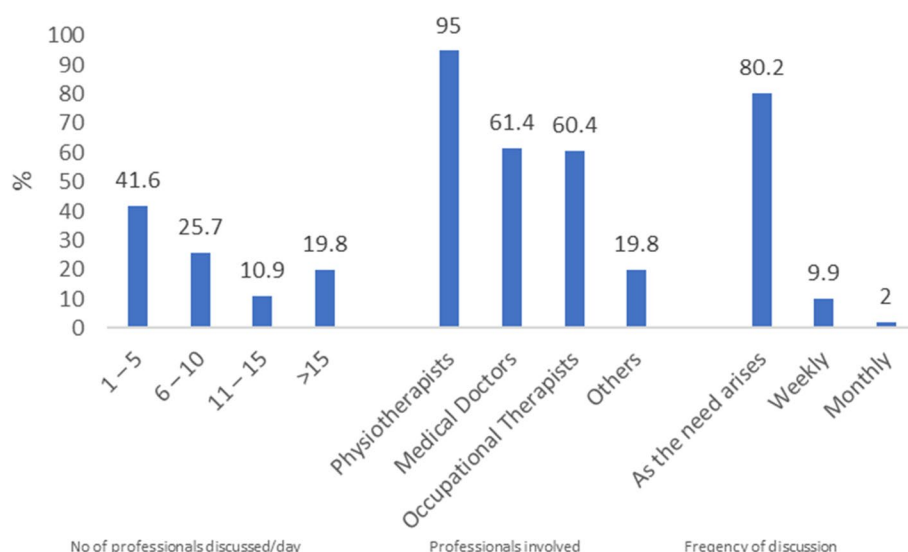


Fig. 3 Inter-professional team-work practices among clinicians

conceived as an advanced learning opportunity to meet the ever-increasing needs of patients, service delivery, the profession, and individuals in the twenty-first century [28]. Leirós-Rodríguez et al. [29] submit that the acquisition of skills and competencies, such as information management skills, problem-solving, and decision making, are not being adequately integrated into the degree course, hence the need for educational institutions and professionals to provide an advanced training platform

that meets the needs of the physiotherapy employment market. In the Nigerian context, having a baccalaureate alone is becoming out of date, and there is a quest by academic and clinical physiotherapists to earn a higher degree. In the light of this, seven out of the nine Federal Government-owned public institutions providing physiotherapy training in Nigeria offer postgraduate education in physiotherapy/medical rehabilitation. It is noteworthy that the University of Ibadan is the pioneer university for

Table 4 Treatment/educational work planning and case discussion among respondents

Clinicians			Academics		
Items		n (%)	Items		n (%)
Planning patient treatment	Yes	90 (100%)	Planning educational/research work	Yes	45 (91.8%)
Time spent planning treatment	1–10 min	25 (28.4%)	Time spent planning educational work	< 30 min	12 (25.5%)
	11–30 min	41 (46.6%)		1–3 h	16 (34.0%)
	31–45 min	15 (17.2%)		Half-day	4 (8.5%)
	46–60 min	6 (6.8%)		One whole day	5 (10.6%)
	Others	1 (1.1%)		Others	10 (21.3%)
Regular meeting	Yes	65 (64.4%)	Regular meeting	Yes	35 (74.5%)
	No	15 (14.9%)		No	6 (12.8%)
Professionals attending meeting	PT	69 (68.3%)	Professionals attending meeting	PT	32 (31.7%)
	OT	11 (10.9%)		OT	4 (4%)
	Med Drs	25 (24.8%)		Med Drs	7 (6.9%)
	Others	5 (5%)		Instructors/professors	5 (5%)
Format of meeting	Case conference	47 (46.5)	Format of meeting	Others	1 (1%)
				Case conference	17 (34.69%)
				Lecture presentation	14 (36.73%)
				Group discussion	18 (28.57%)

PT Physiotherapists, OT Occupational therapists, Med Drs Medical doctors

Table 5 Basis of clinical decision-making among clinical physiotherapists

Basis of clinical decision making	Rank (from highest to lowest)	Mean (SD)	Basis for clinical decision in new or unique clinical cases	Rank (from highest to lowest)	Mean (SD)
Experience	1	3.13 (2.37)	Journal articles/other referencing materials	1	2.74 (2.05)
Textbooks	2	3.47 (2.16)	Textbooks	2	3.06 (2.03)
Seminar/conferences	3	3.57 (2.07)	Experience	3	3.23 (1.99)
Journal articles/other reference materials	4	3.63 (1.96)	Seminars/conferences	4	4.18 (2.44)
Undergraduate education	5	3.84 (2.33)	Recommendation from colleagues	5	4.28 (2.27)
Hospital protocol	6	4.67 (3.03)	Undergraduate education	6	4.87 (2.64)
PG certification courses	7	4.68 (3.23)	Hospital treatment protocol	7	5.23 (2.91)
Recommendation from colleagues	8	5.12 (2.11)	PG cert. courses	8	5.86 (3.19)
Master/PhD education	9	5.39 (3.41)	Master/PhD education	9	6.07 (3.45)
Doctor's prescription	10	7.77 (2.44)	Doctor's prescription	10	7.38 (2.82)

SD Standard deviation

graduate training of physiotherapists, as well as foremost institution for postgraduate education in physiotherapy in Nigeria [30].

In the Nigerian context, physiotherapy is considered to be a high bonus-based job. Most Nigerian physiotherapists earn between N101,000 and N200,000 (at the exchange rate of US \$1 for N365). There is an apparent dearth of studies on income of healthcare workers in Nigeria. However, a junior cadre physiotherapist with

a median income of N180,000 (i.e., US \$493) belongs among the upper-middle class of the society in the Nigerian context. As a low- and middle-income country, the annual income is only US \$995 [31], with the poor population living on less than US \$1.90 a day [31].

Most Nigerian physiotherapists in this study were clinicians and seem to have preferences for teaching hospitals as place of practice. In Nigeria, most teaching hospitals are public facilities owned by the Federal

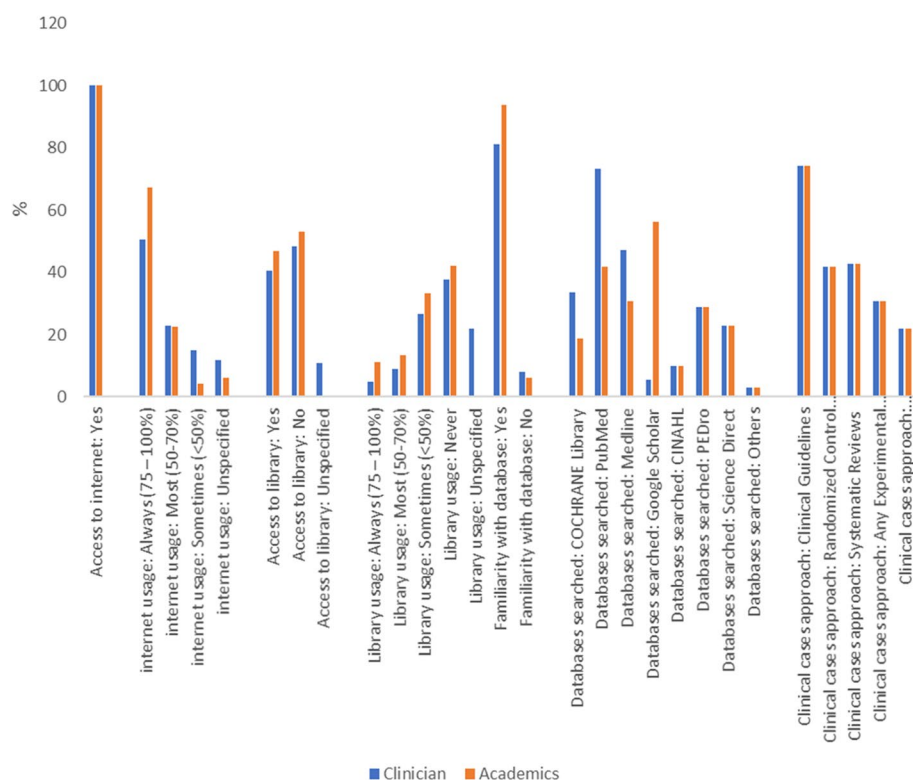
**Fig. 4** Access to library, Internet, databases, and evidence resources

Table 6 Sources and resources of professional development

Source	Clinicians rank (mean \pm SD)	Academics rank (mean \pm SD)	Resource	Resource for educational information rank (mean \pm SD)	Resource when faced with new/unique questions rank (mean \pm SD)
Seminars/trainings	1 (2.25 \pm 1.55)	2 (2.26 \pm 1.66)	Journal articles and other research evidence	1 (2.35 \pm 1.69)	1 (2.20 \pm 2.04)
Exposure to local and international practice	2 (2.32 \pm 1.77)	1 (2.16 \pm 1.64)	Textbooks and other reference materials	4 (3.35 \pm 2.32)	2 (2.65 \pm 1.95)
Updated textbooks and other reference materials	3 (2.45 \pm 1.49)	4 (2.53 \pm 1.58)	Seminars/conferences	3 (3.26 \pm 2.21)	3 (3.37 \pm 1.95)
Time to access literature	4 (2.48 \pm 1.59)	7 (4.00)	Masters/PhD education	2 (3.15 \pm 2.52)	4 (3.58 \pm 2.14)
PG certification course	5 (3.31 \pm 2.20)	3 (2.30 \pm 1.53)	PG certification courses	5 (3.84 \pm 2.36)	5 (4.00 \pm 2.61)
Time to engage in professional association	6 (3.46 \pm 1.86)	6 (3.32 \pm 2.16)	Recommendation from friends	6 (4.74 \pm 2.10)	6 (4.33 \pm 1.68)
Master/PhD education	7 (3.56 \pm 2.32)	5 (2.79 \pm 2.12)	Undergraduate education	7 (4.85 \pm 2.06)	7 (5.31 \pm 2.02)

SD Standard deviation

Government. Anecdotally, preference for teaching hospitals over basic health clinics and general hospitals is premised on job security, better wage package, prestige, and status of these hospitals as centers of medical excellence in training, research, and healthcare service delivery. Nigerian physiotherapists were mainly involved in general practice even after having spent more than 10 years in the profession. It is possible that lack of opportunity for specialization and residency programs in Nigeria may have confined many clinicians into general practice. Currently, specialization as a physiotherapist in Nigeria is attained through postgraduate physiotherapy training. Among Nigerian physiotherapists, soft tissue mobilization is the most widely used manual therapy technique, while a small percentage apply McKenzie and traction techniques. This is in line with global practice pattern among physiotherapists, where soft tissue mobilization is utilized as a manual technique to affect muscles and other soft tissues, so as to promote muscles relaxation, healing, and breakdown of scar tissue. Likewise, PNF was the most preferred neurodevelopmental technique. PNF is a common practice among physiotherapists [32] as a stretching technique aimed to improve muscle elasticity, as well as improve range of motions [32, 33]. Also, the Bobath technique was commonly used. This technique is a neurological rehabilitation approach that is applied in patient assessment and treatment involving stroke survivors [34] or children with cerebral palsy [35]. Cardiopulmonary physiotherapy specialists use all forms of exercises under cardiopulmonary intervention, while therapeutic exercise including stabilization, strengthening, and stretching exercises is almost equally preferred. Meanwhile, TENS was the most widely used electrotherapy modality among the

Nigerian physiotherapists. The relative affordability of TENS above other electrotherapy equipment like ultrasound, electrical muscle stimulation machine, and interferential stimulation may have contributed to its higher preference among Nigerian physiotherapists.

There was a high level of familiarity with research databases and evidence-based resources among Nigerian physiotherapists. The clinicians mostly utilized PubMed, while the educators searched Google Scholar, and both clinicians and academicians employ clinical guidelines as the best approach in clinical or educational decision-making. Fell et al. [36] posits that physiotherapists now utilize evidence-based information sources more frequently, more significant, and intentionally. These clinical databases offer increasing opportunities for research into physical therapy theory and practice [37]. Comprehensive data reflecting the use of clinical databases and the practice of evidence-based rehabilitation (EBR) in Africa seems to be scarce. Available evidence suggests that among Nigerian physiotherapists, there is increasing inclination towards EBR [38]; nevertheless, where other factors limiting the practice of EBR include lack of organizational mandate and access to professional resources [39], over the years, the leading hindering factor remains insufficient time [38, 39].

Experience was ranked highest in what informs routine clinical decisions followed by textbooks and other reference materials, while seminar/conferences come in third place; masters/PhD education and doctor's prescription were last resorts in decisions about treatment choices. Both clinicians and educators consult journal articles when faced with new or unique challenges in the course of work. The clinicians in this study spend up to 30 min to plan patient treatment, and one in every two clinicians may engage in meetings or case conferences with

professional colleagues when faced with difficult cases. Nigerian physiotherapy educators spend up to 3 h to plan educational work and conduct regular meetings in form of lecture presentations to discuss educational work. They depend on exposure to local and international practice, training, availability of resources, or opportunities that will facilitate their work. Majority of the population of Nigerian physiotherapists have access to the Internet and always use it for clinical information purposes, while less than average of this community has access to libraries, and a yet discouragingly minute percentage use the library for clinical information purposes.

In sum, this survey was a novel enquiry into physiotherapy practice in any low- and middle-income countries, specifically in Africa. The findings in this study generally suggests that physiotherapy in Nigeria is a degree-based profession. The socioeconomic characteristics of the professionals place them in the upper-middle class social strata, with all having access to the Internet and libraries. Practitioners are quite conversant with clinical databases, routinely making consultations when making clinical decisions or faced with a unique condition. Nigerian physiotherapists show commitment to continuous professional development and are willing to travel beyond the borders to gain further professional experience even though all had their initial training within the country.

The strength of this study lies in the setting and hybrid approach of data collection. It was carried out at the most widely attended national conferences convening physiotherapists from all over the country into one location.

Limitations of the study

The PTPQ takes between 15 and 20 min to complete leading to several questions left unanswered due to respondents' time constraints. Also, respondents may have mistaken some look-alike questions from the clinical and educational sections, although the written instructions sought to mitigate the occurrence of such. Additionally, licensed physiotherapists who match the inclusion criteria who neither attended any of these conferences or were nonparticipants of the professional social media platforms may have been left out in the survey. Other limitations of this study include participation of relatively small sample of Nigerian physiotherapists which could affect the representativeness and generalizability of the findings to the other similar cultural, educational, and clinical contexts. This study provides an empirical data on educational, practice, and research profile of physiotherapy in Nigeria up to the current time; thus, as a dynamic topic, the profile is subject to change. This could limit the international comparison of data and that transnational integration and

collaboration that could result. Also, considering the cross-sectional and self-report nature of the study, there may be a risk of recall bias or errors in interpretation of the questions. There also may be instrument error resulting from nonavailability of reports on psychometric data on the use of the survey instrument among Nigerian population. Therefore, it is important to consider these limitations when interpreting the results of the study in promoting transnational integration in physiotherapy.

Implications of the study

This study reflected physiotherapy practice in Nigeria, providing a baseline data to drive future routine professional practice profile for easy progress evaluation and comparability with global practice. The findings herein also echo the local utilization of globally recognized, evidence-based techniques in rehabilitating patients and managing clients. By identifying the perceived strengths and weaknesses of physiotherapy practice in Nigeria, the results from this study can provide leverage for policy makers and physiotherapy education curriculum designers to craft policies and training that facilitate global standard in physiotherapy practice in Nigeria.

Conclusion

Physiotherapy practice in Nigeria is degree based and required registration board's licensure. Practitioners deal with a high caseload and utilize a wide range of techniques and modalities, have tendencies to utilize research in making clinical decisions, and show commitment towards continuous professional development. The parity in education and practice with advanced climes inadvertently gives physiotherapy practice in Nigeria a global purview.

Abbreviations

ACAPN	Association of Clinical and Academic Physiotherapists of Nigeria
NSP	Nigeria Society of Physiotherapy
MRTB	Medical Rehabilitation Therapists (Registration) Board of Nigeria
PTPQ	Physical Therapy Profile Questionnaire
CSP	Chartered Society of Physiotherapy
WPT	World Physiotherapy
BPT	Bachelor of Physiotherapy
PNF	Proprioceptive neuromuscular facilitation
EBR	Evidence-based rehabilitation

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Authors' contributions

CEM, OAO, and OTB made substantial contributions to the conception, design of the study, the acquisition, analysis, and interpretation of data and substantively revised the manuscript. OOO, TG, MOE, SK, and FF drafted the manuscript and substantively revised it. The authors read and approved the final manuscript.

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Availability of data and materials

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

Declarations

Ethics approval and consent to participate

Ethical approval was obtained from the Health Research and Ethics Committee of the Institute of Public Health (HREC), Obafemi Awolowo University, Ile-Ife, Nigeria, approval number IPHOU/12/1382. All the participants gave informed consent.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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