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Physiotherapists' perception of physicians' referral of patients for physiotherapy in the Nigerian health system

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Abstract

Background: As the physiotherapy profession gradually evolves into a more autonomous profession, physicians continue to play a major role in the clinical practice of physical therapists globally, particularly as a source of patient referral. Therefore, an evaluation of Nigerian physiotherapists' (NPTs) perception of physician's referral (PR) of patients for physiotherapy may be a critical indicator of the relationship between the two professionals in the Nigerian health sector. The objective of the study was to determine the perception of Nigerian NPTs on the PR of patients for physiotherapy and the influence of demographic characteristics on the perception. The study was an online survey involving one hundred and fifty-four respondents. The instrument for the study was an 11-item self-developed questionnaire with two domains: demographics and perception. The participants were blind respondents reached through different physiotherapists' WhatsApp platforms in Nigeria. The responses were collated electronically after 2 months and analyzed with the Statistical Package for Social Sciences (SPSS) version 23.

Results: The respondents have a negative perception of the 9 out of the 11-questionnaire items that were used to test the physiotherapists' perception of the physicians' referral of patients for physiotherapy in Nigeria health facilities. There was no significant difference ($p > 0.05$) across the respondents' gender, place of employment, areas of specialization, and educational qualifications and the respondents' perception of doctors' referrals of patients for physiotherapy. However, there was a significant difference ($p < 0.05$) in each of the participants' perceptions across the respondents' years of practice, with the participants who had less than 5 years of practice having the least score.

Conclusions: Nigerian physiotherapists have a negative perception of physicians' referral of patients for physiotherapy, and the perception was only influenced by the years of practice of the respondents.

Keywords: Physiotherapists, Physiotherapy, Physicians, Referral, Perception

Background

The evaluation of the physiotherapists' perception of the physicians' referral (PR) of patients for physiotherapy services may be a practical and effective way to study the relationship between physicians and physiotherapists in the Nigerian health sector. As physiotherapy gradually evolves into a more autonomous profession, physicians

continue to play a major role in the clinical practice of physical therapists, particularly as a source of patient referral [1]. In Nigeria, physicians are on top of the health care delivery system, and they work with other health professionals like physiotherapists, pharmacists, radiographers, laboratory scientists, nurses et cetera to deliver health care. The physicians and each of these professionals have distinct roles to play at the level of the tertiary, secondary, and primary health care systems. The multidisciplinary interactions that exist between and

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amongst these professionals should foster a healthy relationship for the benefit of the patients. The current clinical, pedagogical knowledge and skills of physiotherapists cover a wide range of defined specialty areas such as musculoskeletal, neurology, cardiopulmonary, pediatrics, ergonomics, and sports medicine among others. With this extant and broad knowledge in clinical practice and teaching, it is not confounding that studies have shown patients' satisfaction with physiotherapists as first contact practitioners [2, 3]. It has also been shown that early referral of cases for physiotherapy proved efficient in patient's management, while reliance on the physician for referrals may affect early access to physiotherapy [4].

In Nigeria, the extant law regulating the physiotherapy profession shows reservations about physiotherapists treating patients directly without being referred by medical practitioners, even when the condition presented by the patient is an obvious physiotherapy case. This has left a large number of patients who still rely on medical practitioners for a recommendation for physiotherapy services, and referrals for physiotherapy depend on the medical professionals' knowledge and awareness about physiotherapy [5]. The previous study revealed that physiotherapy referrals have been attributed to the wrong attitude and poor knowledge among medical practitioners about the role of physiotherapy in primary and general health care delivery [6]. A study reported that the clinical information on physicians' referral (PR) cards are patient's name and age, diagnosis, a summary of pathology, prescribed modality, referring unit, date of referral, name, and signature of referring physician including the unit/department and the diagnosis of the clinical condition as well as a summary of patients' clinical condition [7]. Also shown was that most of the PR did not contain adequate or complete information based on a standard referral format [8]. Corroborative patients' care, early referrals, and inter-professional understanding are factors that enhance the quality health care delivery system. Physiotherapy referral by medical practitioners should not be based on the wrong attitude and poor knowledge about the role of physiotherapy in primary and general health care delivery [6]. The previous study shows a minimally sustained inter-professional relationships and interaction; hence, physiotherapists are not able to deliver timely and quality services to the patients because physicians use physiotherapy on a "prescription basis" rather than on a "consultation basis" [8]. Moreover, effective referrals could only come from medical practitioners who would rise above professional interest, have a good understanding of physiotherapy, and interact with physiotherapists, and comfortable with the concept of physiotherapy treatments and interventions.

However, the relationship between the Nigerian physicians (NPs) and the physiotherapists despite the later proven competencies in assessment, diagnosis, treatment, and rehabilitation of patients raises probing issues on the physicians' referrals of patients for physiotherapy services. Therefore, an evaluation of Nigerian physiotherapists' perception of such referral issues as the appropriateness of referrals, time of referrals, referral details, frequency of referrals, prescription of treatment, determination of treatment duration, request for feedback by the NPS may be a critical indicator of the relationship between the two professionals in the Nigerian health sector. The apparent dearth of literature on the physiotherapists' perception of PR of patients for physiotherapy services seem to have created a knowledge gap which the authors envisaged the current study would fill by answering the research question "what is the perception of Nigerian physiotherapists (NPTs) to physicians' referral of patients for physiotherapy services?" The outcome will highlight which features generated the highest level of perception, and also if any statistically significant differences exist among demographic subgroups.

Methods

Design

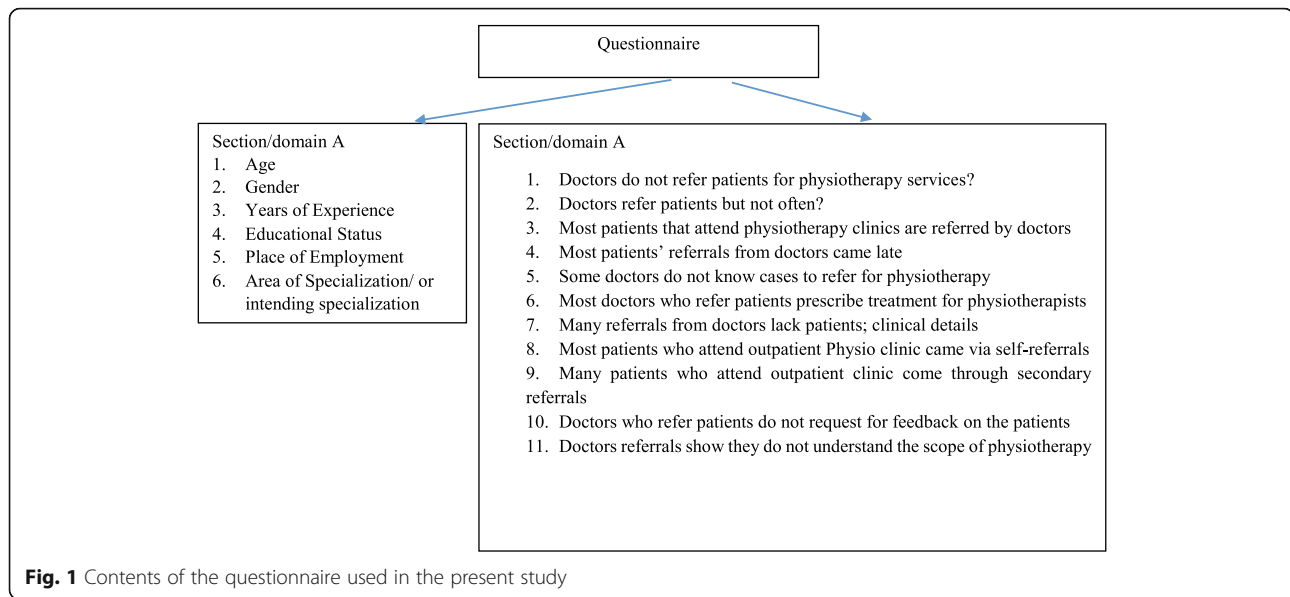
The study was an online cross-sectional survey involving Nigerian physiotherapists in different professional Whatsapp platforms who work in diverse clinical settings in Nigeria.

Sample

One hundred and fifty-four (154) physiotherapists, males = 77 (50%) and females = 77(50%), participated in the study. All participants signed an online consent form before filling the questionnaire.

Instruments

The instrument for the study was a 17-item self-developed questionnaire with two domains: demographics and perception. The first domain had six items and explored participants' gender, age, educational attainment, place of employment, years of practice, and area of specialization. The second domain had 11 items that explored participants' perception on different areas of doctors' referral as shown in Fig. 1. The questionnaire items were designed to evaluate the perception of NPTs about the PR of patients for physiotherapy services in such areas as enumerated in the questionnaire. Before application, the study instrument was checked and certified for content/face validity by three renowned academics. The study instrument was pilot tested at three different times with about fifteen volunteer physiotherapists, and the questions found not to be testing the domain it was meant to test revised or removed. The item



content validity index (CVI) of 100% was given by the scholars.

Procedures

The participants were sensitized to the purpose of the study on the introductory part of the online questionnaire. The participants were blind respondents reached through different physiotherapists' WhatsApp platforms. It took about 7 min to fill the questionnaire. The responses were collated electronically after 2 months and subjected to data analysis. The perception outcome was analyzed with a 5-point Likert scale of "correct," "very correct," "incorrect," "very incorrect," and "undecided." To highlight the main emerging three categories of perception levels, the 5-point Likert scale was collapsed into a 3-point scale and used in result presentation and discussion. The ratings of "correct" and "very correct" ratings were combined to the rating of "correct." Furthermore, the ratings of "incorrect" and "very incorrect" were combined to mean "incorrect." The "undecided" rating in the 5-point scale was retained in the 3-point scale as "undecided." Hence, the perception was interpreted as positive, negative, or undecided depending on how a particular questionnaire item was structured and the respondents' response to any particular questionnaire item. For example, when "correct" dominates respondents' response for a particular questionnaire item, it will be interpreted as a positive perception, while in other instances it could be interpreted as a negative response. The same applied for "incorrect" and "undecided" responses. However, in a bid to calculate the total perception scores of the participants (so that tests of differences could easily be performed), scores were assigned to the Likert scale responses thus: very correct

(3), correct (2), incorrect (1), and very incorrect (0). The scores on the individual items were then summated to get the total perception scores.

Data analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 23. Descriptive statistics of frequencies and percentages were used to summarize the data. Mann-Whitney U test was used to compare the mean ranking of the scores of two independent groups (Males and Females) and the Kruskal-Wallis H test was used to test for significance across the demographic variables. The level of significance was set at 0.05.

Results

Table 1 shows that most respondents were between the age group 20 and 29 years. The male respondents were 77 (50%) and the female 77 (50%). Also, respondents with years of experience between 5 and 10 years were 59 (38.3%) while those with years of experience of more than 15 years were 20 (13%). Most respondents were participants with a basic degree Bachelor of Science in Physiotherapy (B.Sc.PT) or Bachelor of Medical Rehabilitation in Physiotherapy (BMR.PT), while respondents with the Doctor of Physiotherapy (DPT) degree were 3 (6%) in number. Most respondents 33 (22.7%) were from the federal teaching hospitals, while only 1 respondent was from a private University. Respondents with an interest in orthopedic physiotherapy were 57 (37%), while respondents with interest in women's health were 10 (6.5%).

Table 2 shows the responses to questionnaire items:
Response to questionnaire item 1

Table 1 The socio-demographic characteristics of the study participants

Variable	Frequency	Percentage (%)
Age group (years).		
20–29	82	52.9 (%)
30–39	50	32.5 (%)
40–49	23	14.2 (%)
Gender		
Female	77	50 (%)
Male	77	50 (%)
Years of experience		
<5	26	16.9 (%)
5–10	59	38.3 (%)
11–15	49	31.8 (%)
>15	20	13 (%)
Educational status		
B.Sc./BMR (PT)	73	47.4 (%)
DPT	3	1.9 (%)
Masters	53	34 (%)
PhD	25	16.2 (%)
Place of employment		
Federal Medical Center	19	12.3 (%)
Federal University	29	18.8 (%)
Federal Teaching Hospital	35	22.7 (%)
Private Hospital	11	7.1 (%)
Private Physiotherapy Clinics	18	11.7 (%)
State General Hospital	2	1.10 (%)
State Specialist Hospital.	5	3.2 (%)
State Teaching Hospitals	28	18.2 (%)
State University	8	5.2 (%)
Federal Medical Center	19	12.3 (%)
Private University	1	.6 (%)
Area of specialization		
Neurology	29	18.8 (%)
Orthopedics/sports	57	37 (%)
Geriatrics	21	13.8 (%)
Cardiopulmonary	21	13.8 (%)
Women’s health	10	6.5 (%)
Pediatrics	14	9.1 (%)
Total	152	98.7 (%)
Missing	2	1.3 (%)
Total	154	100 (%)

More respondents had positive perception. Verdict—positive perception.
Response to questionnaire item 2

More respondents had a negative perception. Verdict—negative perception.
Response to questionnaire item 3
More respondents had a negative perception. Verdict—positive perception
Response to questionnaire item 4
More respondents had a negative perception. Verdict—negative perception.
Response to questionnaire item 5
More respondents had a negative perception. Verdict—negative perception.
Response to questionnaire item 6
More respondents had a negative perception. Verdict—negative perception.
Response to questionnaire item 7
More respondents had a negative perception. Verdict—negative perception.
Response to questionnaire item 8
More respondents had a negative perception. Verdict—negative perception.
Response to questionnaire item 9
More respondents had a negative perception. Verdict—negative perception.
Response to questionnaire item 10
More respondents had a negative perception. Verdict—negative perception.
Response to questionnaire item 11
More respondents had a negative perception. Verdict—negative perception.
Table 3 shows the Mann-Whitney and Kruskal-Wallis *H* perception test across different demographic variables.
Mann-Whitney test
There was no significant gender difference in any of the participants’ perceptions ($u=2677.50$; $p=0.30$).
Kruskal-Wallis test
There was no significant age difference in any of the participants’ perceptions ($k=5.69$; $p=0.22$).
Kruskal-Wallis test
There was no significant difference ($k=1.26$; $p=0.74$) in participants’ perception across different educational qualifications of the participants.
Kruskal-Wallis test
There was a significant difference ($k=12.51$; $p=0.01$) in each of the participants’ perception across the participants’ years of practice, with the participants who had less than 5 years of practice having the least scores.
Kruskal-Wallis test
There was no significant difference ($k=6.54$; $p=0.26$) in any of the participants’ perceptions across different specialty areas of the participants.
Kruskal-Wallis test
There was no significant difference ($k=2.08$; $p=0.72$) in any of the participants’ perceptions across the different places of employment of the participants.

Table 2 Respondents' responses to questionnaire items on perception of doctors' referral for physiotherapy

Questionnaire item	Frequency (3-point Likert scale)	Percentage
1. Doctors do not refer patients for physiotherapy services.		
a. Correct	19	12.3%
b. Incorrect	134	87.1%
c. Undecided	1	0.6%
2. Doctors refer patients but not often.		
a. Correct	127	82.5%
b. Incorrect	26	16.9%
c. Undecided	1	0.6%
3. Most patients that attend physiotherapy clinics are referred by doctors		
a. Correct	70	45.4%
b. Incorrect	83	53.9%
c. Undecided	1	0.6%
4. Most patients' referrals from doctors came late.		
a. Correct	132	85.6%
b. Incorrect	22	14.4%
c. Undecided	0	0%
5. Some doctors do not know cases to refer for physiotherapy.		
a. Correct	126	81.9%
b. Incorrect	27	17.5%
c. Undecided	1	0.6%
6. Most doctors who refer patients prescribe treatment for physiotherapists.		
a. Correct	116	75.4%
b. Incorrect	38	24.6%
c. Undecided	0	0%
7. Many referrals from doctors lack patients' clinical details.	1	
a. Correct	05	68.3%
b. Incorrect	48	31.1%
c. Undecided	1	0.6%
8. Most patients who attend outpatient physioclinic came via self-referrals.		
a. Correct	89	57.8%
b. Incorrect	64	41.6%
c. Undecided	1	0.6%
9. Many patients who attend outpatient clinic come through secondary referral.		
a. Correct	126	81.9%
b. Incorrect	23	14.6%
c. Undecided	5	3%
10. Doctors who refer patients do not request for feedback on the patients.		
a. Correct	122	79.3%
b. Incorrect	30	19.5%
c. Undecided	2	1.2%
11. Doctors referrals show they do not understand the scope of physiotherapy.		
a. Correct	122	79.3%
b. Incorrect	29	18.8%
c. Undecided	3	1.8%
Total	154	100%

Discussion

The current study evaluates the perception of NPTs to the referral of patients by NPs for physiotherapy services in Nigerian health facilities. One hundred and fifty-four blinded respondents participated in the online study. The demographic characteristics show that respondents cut across different health facilities, areas of specialization, age groups, and years of experience; hence, the outcome seems to reflect the perception of the NPTs on the PR of patients for physiotherapy services.

The NPTs have a positive perception of the Nigerian physicians' referring of patients for physiotherapy though it was not often. This finding agrees with the previous study which stipulates that out of the 1054 respondents (doctors), 678 (56.9%) referred patients for physiotherapy [5]. Also, the study by Talpur et al. shows that 84% of doctors refer their patients for physiotherapy treatment and 16% participants do not refer patients for physiotherapy treatment [9]. This might be attributed to the training background of doctors as it has been shown in previous studies that most referrals come from doctors

who had received lectures in physiotherapy and were trained in the environment where physiotherapists are trained [5]. This has shown that doctors without a basic understanding of physiotherapy rarely or do not refer patients at all [5, 10]. This finding implies that physicians' level of referral of patients for physiotherapy services is directly related to their knowledge of physiotherapy during their training period. This has, therefore, made Talpur et al. 2015 to recommend that medical institutions without a physiotherapy training program should endeavor to introduce it, as this will help physicians have good knowledge of physiotherapy [9]. More participants in the current study show that patients that came through either self-referral or secondary referral dominated those that were referred by the physicians in various physiotherapy outpatient departments. Significantly, late referral of patients for physiotherapy by the NPs characterized most of the respondents' responses. Timely referral of patients for physiotherapy enhances the prognostics outcome and this is one of the findings of the current study which is lacking amongst physicians practicing in the Nigerian system. This

Table 3 Mann-Whitney and Kruskal-Wallis *H* perception test across different demographic variables

Variable	Class	Mean Rank	U/K	P
Gender	Male	73.77	2677.50	0.30
	Female	81.23		
Age (years)	20–29	76.33	5.69	0.75
	30–49	81.65		
	40–49	92.40		
Level of education	BSc	73.91	1.258	.739
	MSc	80.71		
	DPT	66.33		
	PhD	82.52		
Years of practice	<5	53.60	12.510	.006
	5–10	88.64		
	10–15	73.09		
	>15	86.53		
Area of specialization	Neurology	84.36	6.545	.446
	Orthopedic/sports	76.98		
	Geriatrics	85.57		
	Cardiopulmonary	72.19		
	Women's health	47.55		
	pediatrics	71.79		
Place of employment	University/academics	70.56	2.083	.720
	Teaching Hospital/FMC	62.62		
	Private Hospital	64.09		
	Private physiotherapy clinic/itinerant physio	56.96		
	Public specialists	78.90		

finding contradicts the previous studies which have highlighted corroborative patients' care, early referrals, and inter-professional understandings as being factors that enhance quality health care delivery system [4, 6]. Most physicians in Nigeria do not know medical conditions to refer for physiotherapy; this might still be attributed to the training background and poor knowledge of physiotherapy in primary and general health care delivery systems [5, 11–14]. The authors concur with the previous study which suggested a deliberate effort by the physiotherapists to improve communication amongst the physicians through evidence-based demonstration of the efficacy of physiotherapy interventions as this will enable them to understand the scope of physiotherapy practice [15, 16]. This increased communication between the PT and their referral sources should not only be for marketing purposes but also improved patient management [15]. Interestingly, Hendriks et al. [16] had suggested that primary care physicians seek a one-time physical therapy consultation as an appropriate and beneficial component of the primary care patient management process [17]. Nigerian physiotherapists have a negative perception about the attitude of NPs toward the prescription of treatment by NPs for the patients they referred for physiotherapy. Most physicians who refer patients for physiotherapy prescribe treatment for them. This may be an indication of NPs negative perception of the NPTs' competence in assessment, planning, and implementation of managing plans. Previous studies had shown most physicians perceiving PTs as technicians rather than as professional colleagues who lacked the most complex criteria of medical professionalism: examination and evaluation skills and autonomy of judgment; hence, the physicians usually assumed the responsibilities and duties of evaluation, diagnosis, and determination of specific therapeutic interventions and modalities [6, 17–20]. The finding contradicts the current status of physiotherapists as trained professionals with competence in assessment, diagnosis, and treatment of patients' ailment as well as rehabilitation of the patients to restore function. The PTs' clinical and pedagogical knowledge and skills cover a wide range of defined specialty areas such as musculoskeletal, neurology, cardiopulmonary, pediatrics, ergonomics, and sports medicine among others [21]. The belief in the competence of the physiotherapists has to be established with more studies along the lines of Aiken and McColl [22] and Moore et al. [23]. These studies have shown that the diagnostic ability and the agreement between the treatment endorsed by physiotherapists and physicians are quite comparable if not better for the physiotherapists [24]. Most referrals for physiotherapy that stem from the NPs lack patient's necessary clinical details to assist the physiotherapists in the assessment and

arriving at a diagnosis that would assist in proper planning of treatment [8]. Interestingly, most physicians do not request feedback for the patients they referred for physiotherapy in Nigerian health systems. The authors believe that the existence of good inter-professional relationships should be encouraged because it might encourage the physiotherapists to provide feedback to the referring physician whether solicited or not. Aside from that, feedback is critical in patient's management, as it helps in not only tracking the progress of administered physiotherapy intervention, and it also helps the physician determine the efficacy of physiotherapy. Understanding the scope of physiotherapy by the physicians will help boost the referral of patients for physiotherapy services in the Nigerian health system. The current study has revealed that Nigerian physiotherapists have a negative perception about NPs lack of understanding of the scope of physiotherapy and that has contributed to the patient's referral challenges from the medical practitioners. This might be attributed to the physicians' lack of familiarity with physical therapy evaluation and treatment modalities and how they are performed [12] and this can limit the capacity of the physicians to refer patients for physiotherapy services. Also, a previous study had suggested that for a better understanding of physiotherapy, that therapists should take the initiative in developing a good rapport and maintaining a viable relationship with physicians [25]. Al-Eisa et al. had opined that it is the responsibility of physical therapists to raise the perceptions of other healthcare professionals about their profession [15].

There was no gender variation amongst the respondents' level of perception about physicians' referral of patients for physiotherapy services. This implies that the male and the female Nigerian physiotherapists have the same level of perception about the physician's referral of patients for physiotherapy. Additionally, the place of employment, areas of specialization, and educational qualifications did not reflect any difference in the respondents' perception of physicians' referrals of patients for physiotherapy services. Of importance is that the perception of the Nigerian physiotherapists about the referral of patients by the physicians was the same irrespective of where they were working, their area of specialization, and educational qualification. It was deduced from the finding that across the demographic variables that most physicians relate to the physiotherapists the same way in terms of their attitude to patients' referral for physiotherapy, and that has contributed to the uniformity of perception across the respondents. Authors, however, noted that it was only the respondents' years of practice that shows a significant effect on the perception. Those whose years of practice were between 5 and 10 years had the highest perception and those

with less than 5 years of practice had the least perception. The authors attribute the differences in perception across the different years of working experience of the respondents to the fact that those with long years of working experience understand both professional groups better, and the intricacies or rather complexities and politics involved in the Nigerian healthcare system than their younger counterparts.

Conclusion

The study has shown that NPTs have a negative perception of the PR of patients for physiotherapy and that this perception was only influenced by the years of experience of the respondents. It is recommended that to improve the perception, the PTs should open up their profession to the physicians via evidence-based advocacy, as this would enhance the understanding of the physiotherapy profession and improve the referral attitude of physicians. Also, the curriculum of training of physicians should be expanded to include aspects that would help them understand the scope of physiotherapy as this would help change their perception of the profession. The authors suggest more studies in this area of knowledge with more sample size as the outcome will help to enhance the practice of physiotherapy by enhancing mutual professional understanding with the physicians. Also, scale validity index was not determined and therefore constitutes one of the limitations for the study.

Abbreviations

PR: Physician referral; NPTs: Nigerian physiotherapists; NPs: Nigerian physicians; SPSS: Statistical package for social science; B.Sc.PT: Bachelor of science in physiotherapy; BMR.PT: Bachelor of medical rehabilitation in physiotherapy; DPT: Doctor of physiotherapy; K: Kruskal-Wallis *H* test; U: Mann-Whitney *U* test

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Authors' contributions

Authors UPO, EYI, FAM, and JOU designed the study and reviewed and approved the manuscript. UPO and SMM collected the data, analyzed the data, and drafted the manuscript. UPO, ECO, and EOO reviewed the data analysis and interpreted the data. All the authors have 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

The Nnamdi Azikiwe University Teaching Hospital Research Ethics Committee (NAUTHREC) approved this study with the reference number (NAUTH/CS/66/VOL.13/VER III/61/2020/045) on 10 October 2020. The survey was done online, participation was voluntary, and responses were anonymous, so

respondents were not traceable. All the participants sign online consent to participate.

Consent for publication

Not applicable

Competing interests

The authors declare that they have no competing interests.

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References

- Liu H, Fletcher JP. Analysis of physicians' referrals: is further diagnosis needed? 2006 North Am J Sports Phys Ther 1(1):10-15
- Goodwin RW, Hendrick PA. Physiotherapy as a first point of contact in general practice: a solution to a growing problem? 2016 PMID: 27263326. DOI: <https://doi.org/10.1017/S1463423616000189>, 17, 05, 502
- Narh I. First contact physiotherapy practice: opinions and beliefs of physiotherapists working in Ghana. WCPT Africa Region Conference System, 2020. 9th WCPT Africa Region Congress. 2
- Ehrmann-Feldman D, Rossignol M, Abenheim LA, Gobielle D. Physician referral to physical therapy in a cohort of workers compensated for low back pain. Phys Ther. 1996;76(2):150-7. <https://doi.org/10.1093/ptj/76.2.150>.
- Odebiyi, D.O., Amazu, A.R., Akindele, M.O., Igwe, S.E., Olaogun, M.O.B. Evaluation of the mode of referral of patients for physiotherapy by physicians. AJPARS, vol.2, no.1, June 2010, pp.14-20.
- Dunkel BH. Survey of attitudes of Arkansas physicians and physiotherapists, towards the professional capacity of the physiotherapist. Physiotherapy. 2004;25(18):584-7.
- Asem L. Medical referral to physiotherapists, do they tell you enough? Phys Ther. 2004;74:356-60.
- Odebiyi DO, Bakare U, Fapojuwo OA, Owoeye OB, Kareem RO. Qualitative evaluation of the contents of physicians' referral to the physiotherapy department of a teaching hospital in Nigeria. J Clin Sci. 2016. <https://doi.org/10.4103/2468-6859.192282>.
- Talpur M, Khanzada S, Khowaja A. (2015). Assessment of the referral of patients for physiotherapy among medical professionals of Isra University Hospital. IOSR J Dent Med Sci e-ISSN: 2279-0853, p-ISSN: 2279-0861. Volume 14, Issue 5 Ver. VII (May. 2015), PP 73-76. DOI: <https://doi.org/10.9790/0853-14577376www.iosrjournals.org>
- Fertig, A., M. Roland, H. King and T. Moore. 1993. Understanding variations in rates of referral among general practitioners 27 (17): 1467-1470
- Stanton PE, Fox FK, Franfos KM, et al. Assessment of resident physicians' knowledge of physical therapy. Phys Ther. 1985;65(1):27-30. <https://doi.org/10.1093/ptj/65.1.27>.
- English ML, Rudy DL, Castle JM, Mesnard C. Collaborative education in an internal medicine residents' clinic. Proceedings of the American Physical Therapy Association, Combined Sections Meeting, Nashville, TN, 2004.
- Brogan DR. Rehabilitation service needs Physicians' perceptions and referral. Arch Phys Med Rehab. 1981;62:215-9.
- Olsen D. A descriptive survey of management and operations at selected sports medicine centers in the United States. J Orthop Sports Phys Ther. 1996;24(5):315-22. <https://doi.org/10.2519/jospt.1996.24.5.315>.
- Al-Eisa, E. S., Al-Hoqail, H., Al-Rushud, A. S., Al-Harhi, A., Al-Mass, B., Al-Harbi, B. M., Al-Azzaz, S., Alghadir, A. H., & Iqbal, Z. A. (2016). Awareness, perceptions and beliefs about physiotherapy held by physicians working in Saudi Arabia: a cross-sectional study. J Phys Ther Sci, 28(12), 3435-3439. <https://doi.org/https://doi.org/10.1589/jpts.28.3435>
- Hendriks EJ, Kerrensens JJ, Nelson RM, et al. One-time physical therapist consultation in primary health care. Phys Ther. 2003;83(10):918-31. <https://doi.org/10.1093/ptj/83.10.918>.
- Silva DM, Clark SD, Raymond G. California physicians' professional image of physical therapists. Phys Ther. 1981;61(8):1152-7. <https://doi.org/10.1093/ptj/61.8.1152>.
- Ullil RM, Shepard KF, Savinar E. Physician knowledge and utilization of physical therapy procedures. Phys Ther. 1984;64(10):1523-30. <https://doi.org/10.1093/ptj/64.10.1523>.
- James JJ, Stuart RB. Expanded role for the physical therapist. Phys Ther. 1975;55(2):121-31. <https://doi.org/10.1093/ptj/55.2.121>.

20. Shimpachiro O, Katsumi I, Hiroyuki H, The physiotherapist-doctor relationship: an Ishikawa physiotherapists' perspective. *J Phys Ther Sci*. 2005 Volume 17 Issue 2 Pages 87-92. doi: <https://doi.org/https://doi.org/10.1589/jpts.17.87>
21. American Physical Therapy Association Board of Directors Autonomous physical therapist practice: Definition and privileges. In: Professional and Societal Policies, Positions, and Guidelines. Alexandria, VA: American Physical Therapy Association; July 2004
22. Aiken AB, McColl MA. (2008). Diagnostic and treatment concordance between a physiotherapist and an orthopedic surgeon—a pilot study. *J Interprof Care*. 2008;22(3):253–61. <https://doi.org/10.1080/13561820801984134>.
23. Moore JH, Goss DL, Baxter RE, DeBerardino TM, Mansfield LT, Fellows DW, et al. Clinical diagnostic accuracy and magnetic resonance imaging of patients referred by physical therapists, orthopaedic surgeons, and nonorthopaedic providers. *J Orthop Sports Phys Ther*. 2005;35(2):67–71. <https://doi.org/10.2519/jospt.2005.35.2.67>.
24. Alnaqbi A, Shousha T, AlKetbi H, Hegazy FA. Physiotherapists' perspectives on barriers to implementation of direct access of physiotherapy services in the United Arab Emirates: a cross-sectional study. *PLoS One*. 2021;16(6): e0253155. Published 2021 Jun 11. <https://doi.org/10.1371/journal.pone.0253155>.
25. Hulme JB, Bach BW, Lewis JW. Communication between physicians and physical therapists. *Phys Ther*. 1988;68(1):26–31. 3336616. <https://doi.org/10.1093/ptj/68.1.26>.

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