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Enhancing physiotherapy practice: A quasi-experimental study comparing training alone versus training with support tools among physiotherapists in Ogun State, Nigeria

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Abstract

Objective: This study was designed to determine whether adding a modified pain assessment tool and home-program prescription sheets to a training program improves the knowledge, motivation, behavioural skills and uptake of standardised tools by physiotherapists.

Methods: A quasi-experimental study involving two groups of physiotherapists: experimental group (n=30) and control group (n=30); recruited from four tertiary hospitals in Ogun state, Nigeria. The interventions included lectures, participatory discussions and practical demonstrations for both groups, with modified pain assessment tools and home-program prescription sheets introduced to only the experimental group. A structured questionnaire was used to collect data in three phases: baseline, immediate post-intervention and six-week follow-up. Data were analysed using SPSS version 23. The level of significance was set at p-values less than 0.05.

Results: At baseline, the scores of all measured variables were similar in the two study groups. Immediately post-intervention, the scores in the experimental group were significantly higher than those in the control group across all measured variables ($p < 0.001$). At follow-up, the scores of measured variables were significantly higher in the experimental group compared to the control group for knowledge ($p = 0.005$), motivation ($p < 0.001$), behavioural skills ($p < 0.001$), and utilisation ($p < 0.001$). In the experimental group, the scores of all measured variables significantly increased from baseline values in all the measured variables: knowledge ($p < 0.001$), motivation ($p = 0.047$), behavioural skills ($p < 0.001$), and utilisation ($p < 0.001$).

Conclusion: The addition of support tools to the training program of physiotherapists improved their knowledge, motivation, behavioural skills and use of these tools in their routine practice.

Keywords: Educational intervention, Nigeria, Pain Assessment tool, Physiotherapy, Prescription Sheet

Plain English Summary

This study looked at whether adding a modified tool to a training program could help physiotherapists in Ogun State improve their knowledge, motivation, behavioural skills, and use of standard tools in their practice. Two groups of physiotherapists (experimental and control) with 30 members each were recruited for the study. The two groups received training on the use of home-program prescription sheets and pain assessment tools. The control group received training only, while the experimental group received training

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along with support tools such as a modified pain assessment tool and home-program prescription sheets. A questionnaire was used to collect information at the start, right after training, and six weeks later. At the beginning, both groups were similar in knowledge and practice. After training, both groups improved, but the group that received the extra tools improved much more. Six weeks later, the same group still showed better results, though with a small drop in scores. The conclusion showed that providing access to a support tool during training helps physiotherapists apply what they learn and stick to it over time.

Background

Physiotherapy is a healthcare profession that remediates impairments and promotes mobility, function, and quality of life through examination, diagnosis, and physical interventions (1). Physiotherapy plays a vital role in the management, rehabilitation, and prevention of physical disabilities resulting from injuries, diseases, or other conditions. Effective goal-setting is a crucial component of physiotherapy management as it encourages active patient participation in treatment planning, and this has been shown to enhance adherence, motivation, and satisfaction; ultimately leading to better outcomes (2). Patient-specific instruments are particularly suitable for this purpose, as they actively involve patients in the identification of relevant issues to work on during therapy (3). Some researchers have emphasised the use of tools for assessment and to measure outcomes of interventions; however, their application in routine practice is suboptimal, with limited patient engagement (4). Functional assessment in physiotherapy is a multi-faceted approach aimed at evaluating an individual's physical capabilities so as to develop a personalised rehabilitation plan (5). Understanding the key components and various tests involved is essential for both practitioners and patients. (5). The effectiveness of physiotherapy largely depends on the use of standardised tools, such as patient assessment tools and home-program prescription sheets, which ensure that the care given to patients is consistent, evidence-based and tailored to their specific needs (6). These tools provide a structured framework for physiotherapists to evaluate patients' conditions, monitor progress and adjust treatment plans accordingly, ultimately enhancing patient outcomes and ensuring the highest quality of care (2, 6).

Assessment tools (AT) are instruments used to measure various aspects of a person's health status, such as pain, impairments, activity limitations, participation and quality of life (7). These tools can serve multiple purposes, including diagnosis, outcome measurement of health care interventions, and prognostication. The use of AT is an essential part of evidence-based practice and plays a vital role in supporting the clinical decision-making process (7, 8). Both self-reported and

performance-based ATs have been recommended for rehabilitation professionals in many clinical practice guidelines. In the literature, the term "outcome measure" is often used interchangeably with AT, particularly when determining changes in a patient's abilities before and after an intervention (9). Home-program prescription sheets are used to document prescribed treatment regimens, ensuring accurate tracking of patient progress and ensuring that therapeutic interventions are administered correctly and adhered to. These tools are crucial for the implementation of personalised treatment plans that address the unique health challenges faced by each patient, ultimately enhancing patient outcomes and ensuring the highest possible standard of care (10).

Despite their recognised importance, the use of these tools in routine practice remains inconsistent. This is particularly evident in regions such as Ogun State, Nigeria, where several key barriers hinder their adoption (4, 7). Research has indicated barriers and facilitators such as physiotherapists' competence, knowledge and resistance to change and organisational policies (7). Other barriers include patients' differing expectations, lack of time and resources, lack of familiarity with the tools and ineffective measuring instruments (7). To address these challenges, strategies such as modifying and simplifying tools, developing educational modules and promoting self-analysis have been suggested. These strategies have been shown to improve therapists' knowledge, behaviour, and attitudes towards the use of AT (10, 11).

Educational interventions have been identified as a key strategy for overcoming barriers to the use of AT (12). Targeted training programs can enhance uptake and modification of these tools, thus improving physiotherapists' confidence and competence, ultimately leading to better patient outcomes (10). The Information-Motivation-Behavioural Skills (IMB) model used in this study has previously been shown to be effective in understanding and addressing factors that influence the adoption of behavioural change interventions (10, 13). The IMB model posits the three key components: information, motivation, and behavioural skills, which are critical determinants of health-related behaviours, including the consistent use of standardised tools

in clinical practice (14). By applying the IMB model, this study assessed the knowledge, motivation, and behavioural skills of physiotherapists in Ogun State, Nigeria, and evaluated the impact of an intervention designed to enhance the uptake of home-program prescription sheets and modified pain assessment tools in the region.

Materials and Methods

This study was a quasi-experiment that focused on an education intervention to enhance the uptake of modified pain assessment tools for assessing patients' level of pain, and the use of home-program prescription sheets in place of verbally given home-program among physiotherapists working in selected hospitals in Ogun State. The study adopted a quantitative research method with the study population being physiotherapists recruited from the four largest public tertiary hospitals in Ogun state, Nigeria: Federal Medical Centre Abeokuta (FMCA), Olabisi Onabanjo University Teaching Hospital (OOUTH), Sagamu, State Hospital Ijebu-Ode and State Hospital Ijaiye. The sample size of the study was calculated using normal distribution formula: $N = (Z_{\alpha} + Z_{\beta})^2 \times P_0 (1 - P_0) / (P_1 - P_0)$ where $Z_{\alpha} = 1.96$, $Z_{\beta} = 0.84$, P_0 is prevalence [taken as 52.6% from a previous study (5)], and P_1 is desired level of outcome variable (80%). The calculated sample size was 26. After adding 10% for attrition (2.6), the final sample size was 29, which we rounded to 30 per group. Hence, 30 physiotherapists were recruited for both the experimental and control groups. Two of the four hospitals (OOUTH and State Hospital Ijebu-Ode) were selected randomly by balloting, and these served as sites for the experimental group, while the remaining two hospitals (FMCA and State Hospital Ijaiye, Abeokuta) served as the sites for the control group.

Study intervention

The study intervention involved educational training sessions on the use of home-program prescription sheets and pain assessment tools during physiotherapy consultations. The training modalities included didactic lectures, workshops, seminars, participatory discussions, practical demonstrations and hands-on sessions. The training sessions were held once weekly for a total of six weeks, with each session lasting for two to four hours. Participants in the experimental group were provided with samples of home-program prescription sheets and pain assessment tools for continued use in their practice. Training sessions were conducted by the principal investigator, assisted by four trained research assistants. This

educational intervention study did not allow for blinding, hence the participants and trainers knew who was in which group.

Data collection

Data collection for the study was done in three distinct phases: pre-intervention (baseline), immediate post-intervention, and six-week post-intervention. At baseline, all the participants in both experimental and control groups were required to complete a semi-structured questionnaire specifically designed to assess their baseline knowledge, motivation, and behavioural skills related to the use of assessment tools and home-program prescription sheets. Data collection was similarly done immediately after intervention and finally at six weeks post-intervention to assess the effectiveness of the intervention.

The primary instrument for data collection was a semi-structured questionnaire, developed in accordance with the IMB model. The questionnaire was divided into four sections: Section A captured socio-demographic data of the participants, including age, sex, years of practice, and institution type (state or federal). Section B focused on the participants' knowledge regarding the use of assessment tools and home-program prescription sheets. Section C addressed motivation, encompassing attitudes toward the adoption of these tools, Section D assessed behavioural skills, such as proficiency in using the tools in clinical practice, while Section E assessed the level of utilisation of the tools. The face and content validity of the structured questionnaire were assessed by two senior physiotherapists and a public health researcher. The questionnaire was pre-tested using 10 physiotherapists at State hospital Ishara and General hospital Iperu, and all necessary adjustments were made. Test-retest reliability was evaluated, and the Cronbach's alpha coefficient obtained was 0.76.

Data analysis

The data collected for the study were collated, entered and coded using IBM-SPSS software version 23. Categorical variables were summarised using frequencies and percentages. Continuous variables were summarised using mean and standard deviation. Inferential statistics were performed thus: Chi-square test was used for determining the association between categorical variables; independent sample t-test was used for comparing the experimental and control groups at different study phases; and analysis of variance for comparing different phases of the experimental group. Effect size was assessed using Cohen's d

and classified thus: small effect (0.2-0.4, medium effect (0.5-0.7), large effect (0.8- 1.0) and very large effect (>1.0). Statistical significance was set at $p < 0.05$.

Results

Sixty physiotherapists were recruited for the study, comprising 30 in the experimental group and 30 in the control group. The socio-demographic characteristics of the study participants are depicted in Table 1. Twenty-nine participants

(48.3%) were in the 20-29 age group, while 32(53.3%) were females. The majority, 52(86.7%), had a Bachelor's degree as their highest educational attainment, and 51(85%) were of Yoruba ethnicity. Regarding the work experience of study participants, the majority, 41(65.5%), had practised the profession for a period of less than five years. The experimental and control groups were similar in terms of all these demographic characteristics (p -values > 0.05).

Table 1: Demographic Characteristics of the participants in the study for each group

Variable	Control (N=30) N (%)	Experimental (N=30) N (%)	Total N=60 N (%)	p-value
Age				
20-29	16(36.4)	13(43.3)	29(48.3)	0.489
30-39	3(10.0)	6(20.7)	9(15.0)	
40-49	1(3.3)	4(13.3)	5(8.3)	
50-59	4(13.3)	3(10.0)	7(11.9)	
Gender				
Male	11(36.7)	17(56.7)	28(46.7)	0.121
Female	19(63.3)	13(43.3)	32(53.3)	
Educational attainment				
Diploma	0	0	0	0.766
BSc	26(86.7)	26(86.7)	52(86.7)	
Masters	2(6.7)	3(10.0)	5(8.3)	
PhD	2(6.7)	1(3.3)	3(5.0)	
Others	0	0	0	
Ethnicity				
Yoruba	25(83.3)	26(86.7)	51(85.0)	0.838
Igbo	3(10.0)	3(10.0)	6(10.0)	
Hausa				
Others	2(6.7)	1(3.3)	3(5.0)	
Religion				
Christianity	26(86.7)	28(93.3)	54(90.0)	0.389
Islam	4(13.3)	2(6.7)	6(10.0)	
Traditional	0	0	0	
Others				
Marital Status				
Single	24(80.0)	18(60.0)	42(70.0)	0.091
Married	6(20.0)	12(40.0)	18(30.0)	
Divorced	0	0	0	
Widow/ widower	0	0	0	
Work experience (years)				
Less than 5	23(76.7)	18(62.1)	41(69.5)	0.142
5-10	2(6.7)	6(20.7)	8(13.6)	
11-20	5(16.7)	2(6.9)	7(11.9)	
21-30	0	2(6.9)	2(3.4)	
> 30	0	1(3.4)	1(1.7)	

Table 2 shows the knowledge, motivation, behavioural skills and utilisation of pain assessment tools and home-program prescription sheets at baseline. The mean scores for

knowledge, motivation, behavioural skills and utilisation were 6.6 ± 1.7 , 34.8 ± 3.7 , 17.3 ± 2.8 and 9.7 ± 3.1 , respectively, in the control group and 6.9 ± 1.3 , 34.9 ± 3.9 , 17.4 ± 2.9 and 9.8 ± 3.3 , in the

experimental group. Analysis using the T-test showed that there were no significant differences

across all the measured variables between the experimental and control groups.

Table 2. Knowledge, motivation, behavioural skills and utilisation of pain assessment tools and home-program prescription sheets at baseline

		Baseline				
Variables	Maximum Points on the Scale of Measure	Control Group N=30		Experimental Group N=30		t-test (p-value)
		$\bar{X}$ (SE)	$\pm$ SD	$\bar{X}$ (SE)	$\pm$ SD	
Knowledge	10	6.6(0.3)	1.7	6.9 (0.3)	1.3	0.73(0.469)
Motivation	55	34.8(0.7)	3.7	34.9(0.7)	3.9	0.099(0.921)
Behavioural skills	25	17.3 (0.5)	2.8	17.4 (0.5)	2.9	0.045(0.964)
Utilization	15	9.7 (0.6)	3.1	9.8(0.6)	3.3	0.16(0.873)
$\bar{X}$ - mean		SE- Standard Error	SD- standard deviation	ES- effect size		

The scores for the variables immediately after intervention are depicted in Table 3. Immediately post-intervention, the scores in the experimental group were consistently higher than the control group across all measured variables, and these were statistically significant ($p < 0.001$).

At follow-up, the scores of measured variables were significantly higher in the experimental group compared to the control group for knowledge ($p=0.005$), motivation ($p<0.001$), behavioural skills ($p<0.001$), and utilisation ($p<0.001$). See Table 4.

Table 3: Knowledge, motivation, behavioural skills and utilisation of pain assessment tools and home-program prescription sheets, immediate post-intervention

Variables	Maximum points on the Scale of Measure	Control Group N=30		Experimental Group N=30		ES (95%CI)	t(p-value)
		$\bar{X}$ (SE)	$\pm$ SD	$\bar{X}$ (SE)	$\pm$ SD		
Knowledge	10	6.5 (0.3)	1.7	10.0 (0.1)	0.6	2.0 (1.4 -2.7)	10.91(<0.001)
Motivation	55	35.3 (0.6)	3.41	52.1 (0.5)	2.6	5.6 (4.5-6.7)	21.13(<0.001)
Behavioural skills	25	17.3 (0.6)	2.8	24.8 (0.1)	0.6	3.7 (2.9-4.6)	14.42(<0.001)
Utilization	15	9.8 (0.6)	3.2	15.0 (0.0)	0	1.6 (0.8-2.4)	8.95(<0.001)
$\bar{X}$ - mean SE- Standard Error SD- standard deviation ES- effect size							

Table 4: Knowledge, motivation, behavioural skills and utilisation of pain assessment tools and home-program prescription sheets at 6 weeks follow-up

Variables	Maximum Points on the Scale of Measure	Control Group N=30		Experimental Group N=30		ES (95%CI)	t(p-value)
		$\bar{X}$ (SE)	$\pm$ SD	$\bar{X}$ (SE)	$\pm$ SD		
Knowledge	10	6.5(0.3)	1.7	9.2 (0.2)	0.9	1.97 (1.6-2.3)	7.49 ($p=0.005$)
Motivation	55	34.6 (0.7)	4.0	42.5 (1.2)	6.4	1.52 (0.2-2.9)	5.65 (<0.001)
Behavioural skills	25	17.5 (0.44)	2.4	21.4 (0.5)	2.9	1.46 (0.79-2.13)	5.56 (<0.001)
Utilization	15	10.9 (0.4)	2.2	13.9(0.3)	1.8	1.50 (1.0-2.0)	5.73 (<0.001)
$\bar{X}$ - mean SE- Standard Error SD- standard deviation ES- effect size							

Table 5 shows the mean scores of variables in the experimental group during the three distinct study phases. For knowledge, the mean score immediately post-intervention (9.1 ± 0.6) was higher than baseline (6.9 ± 1.3), with a further increase

after six weeks of follow-up (9.2 ± 0.9). For motivation, behavioural skills and utilisation, the score increased after intervention but reduced slightly after six weeks of follow-up. However, analysis of variance test revealed significantly

increased scores from the baseline values in all the measured variables: knowledge ($p<0.001$),

motivation ($p=0.047$), behavioural skills ($p<0.001$), and utilisation ($p<0.001$).

Table 5: Mean scores of variables in the experimental groups during the three study phases in variables

Variables	Phases evaluation	Mean	SD	F	P value
Knowledge level	Baseline	6.9	1.3	80.2	<0.001
	Post Intervention	9.1	0.6		
	6th week follow-up	9.2	0.9		
Motivation level	Baseline	34.9	3.9	103.2	0.047
	Post Intervention	52.1	2.6		
	6th week follow-up	42.5	6.4		
Behavioural skills	Baseline	17.4	2.9	72.3	<0.001
	Post Intervention	24.8	0.6		
	6th week follow-up	21.4	2.9		
Utilization	Baseline	9.8	3.3	47.8	<0.001
	Post Intervention	15.0	0.0		
	6th week follow-up	13.9	1.8		

Discussion

The post-intervention findings on the utilisation of the assessment tools present an intriguing narrative on the dynamic nature of clinical behaviour change among physiotherapists. Comparing the 3 phases of the quasi-experimental study in terms of utilisation of the modified pain assessment tool and home-program prescription sheets, the mean score rose sharply from 9.8 ± 3.3 at baseline to a mean score of 15.0 ± 0.00 immediately after the intervention, followed by a slight drop to 13.9 ± 1.8 at the sixth week follow-up. This fluctuation of utilisation within the experimental group aligns with existing literature on the implementation of behavioural change models. Studies have shown that introducing new clinical tools often disrupts established routines, especially when practitioners are still in the early stages of assimilating new knowledge and practices (7, 14). The findings from this study reveal a statistically significant improvement in the knowledge scores of the experimental group from baseline (6.9 ± 1.3) to the 6th week follow-up (9.2 ± 0.9) with a very large effect size of 1.97, indicating the intervention was highly effective. Paci et al. (7) reported that physiotherapists often feel unprepared to use assistive technologies due to inadequate training during formal education. Similarly, Odole et al. (4) noted a gradual but insufficient improvement in the familiarity and use of standardised outcome measures over a decade. The findings from this study suggest that well-structured, short-term educational interventions can produce substantial knowledge gains, thus correcting training deficit, which has been identified as a key barrier to the implementation of assistive technologies (12, 15). Furthermore, the results show a significant

improvement in motivation scores among the experimental group from baseline (34.9 ± 3.9) to the 6th week follow-up (42.5 ± 6.4), with a very large effect size of 1.52. A similar trend was also observed in behavioural skills, indicating that the intervention positively influenced physiotherapists' motivation and behavioural skills toward using standardised assessment tools. This finding is consistent with prior research highlighting motivational and attitudinal barriers to adopting outcome measures in Physiotherapy. Okonkwo et al. (5) emphasised that insufficient training and lack of familiarity with standardised tools undermine clinicians' confidence and motivation, while Shamsi and Khan (3) found that time constraints in high-demand clinical settings disincentivise the use of tools that are perceived as time-consuming. It is noteworthy that a slight decline was observed in motivation, behavioural skills and utilisation at the six-week follow-up. This finding is consistent with the widely held notion that behaviour change is an iterative rather than linear process and typically requires ongoing support, feedback and sufficient time (16).

Regarding utilisation, there was also a statistically significant improvement in the experimental group's utilisation of assessment tools (13.9 ± 1.8) compared to the control group (10.9 ± 2.2) with a very large effect size of 1.5. Researchers have reported widespread inconsistencies in the utilisation of support tools by physiotherapists, especially in low- and middle-income countries (LMICs) like Nigeria (4, 17, 18, 19). Variability in practice often arises from therapists relying on personal preferences rather than evidence-based guidelines, which undermines standardization (19). Addressing these challenges requires sustained

institutional support, integration of electronic patient-reported outcome measures, and the development of simplified, contextually relevant tools (20, 21, 22). Ultimately, consistent utilisation depends not only on individual competence but also on systemic facilitators that promote a culture of evidence-based practice.

From a broader lens, this study reinforces findings from prior interventions that demonstrate the importance of ongoing support mechanisms following initial training. Research by Okwen et al (10) underscores singular educational interventions, while effective at improving knowledge, may be insufficient for sustaining behaviour change unless accompanied by accessibility and availability of equipment, mentorship, supervision, and environmental cues that reinforce new practices. Future interventions should therefore consider incorporating iterative support mechanisms such as booster sessions, on-the-job mentorship, and feedback loops to reinforce the use of modified clinical tools and ensure sustained improvements in care delivery. A longer-term follow-up of six months or more is also recommended in a future study to adequately assess the sustainability of the intervention.

Strengths and limitations

The quasi-experimental study design used in this study allowed for the evaluation of the intervention in a real-world setting. The study utilised self-reported data collected through structured questionnaires. While this approach facilitated quick data collection and allowed for the measurement of subjective constructs such as motivation and perceived behavioural skills, it is susceptible to response biases, including social desirability and recall bias. Participants in the experimental group, aware of their involvement in an intervention, may have been inclined to report improvements in knowledge or motivation that do not fully reflect actual changes in practice. Moreover, lack of blinding is a usual limitation in this type of educational intervention since participants and trainers know each other. Another limitation of this study is the relatively short duration of the follow-up period. Although the study assessed outcomes immediately after the intervention and again at six weeks, this timeframe may not be sufficient to capture the long-term sustainability of behaviour change, particularly in terms of continued tool utilisation and integration into routine clinical practice. Despite these limitations, this study has provided evidence of an effective strategy for introducing interventions to routine physiotherapy practice in the Nigerian setting.

Conclusion

This intervention study was conceptualised around four key domains: knowledge acquisition, motivational disposition, behavioural skills, and actual utilisation of support tools by physiotherapists. The findings of the study revealed significant and positive outcomes in all four measured domains. This implies that the intervention not only informed the physiotherapists but also inspired them to embrace the tools as part of their clinical routine.

The pattern observed in the utilisation of the modified tools further reinforced the fact that health workers will adapt to and embrace new technologies with time if fully understood. Hence, structured, context-relevant educational interventions, including the availability and accessibility of necessary devices or tools, are more effective and efficient in promoting the adoption of evidence-based practice among physiotherapists.

List of abbreviations

AT: Assessment Tool

IMB model: Information-Motivation-Behavioural Skill Model

LMICs: Low- and Middle-Income Countries

Declarations

Ethics approval and consent to participate

Ethical approval to conduct this study was obtained from the Babcock University Health Research Ethics Committee (BUHREC 783/24). Permissions were also granted by all the four study sites before commencement of the study. The research was conducted in accordance with Good Clinical Practice (GCP) guidelines and in line with the Helsinki Declaration.

Study participants were given full information on all aspects of the study and a signed informed consent was obtained. It was ensured that confidentiality was not compromised. Moreover, the dataset used did not contain any direct or indirect person identifiers.

Consent for Publication

The authors hereby transfer all copyright ownership exclusively to the journal, if this work is accepted and published by the journal

Availability of Data

Data for this work are available with the authors and may be provided upon reasonable request

Conflicts of Interest

The authors have declared no conflict of interest

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Authors' contributions

AOM conceptualised the study. AOM and LSA designed the study. AOM managed the literature search and gathered data. AOM and AAA analysed the data and wrote the first draft of the manuscript. All authors read and approved the final manuscript.

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