

INFLUENCE OF HEALTH EDUCATION ON PHYSICAL EXERCISE IN ALLEVIATING LOW BACK PAIN AMONG PATIENTS IN RIVERS STATE, NIGERIA

Ime M. Ubom^{1,*}, Richard C. Echem², Anelechi K. Madume³, Golda O. Ekenedo⁴

¹ *Department of Physiotherapy, University of Port-Harcourt teaching hospital, Port-Harcourt, Nigeria.*

² *Orthopaedic, University of Port-Harcourt Teaching Hospital, Port-Harcourt, Nigeria.*

³ *Department of Physiotherapy, Faculty of Basic Medical Sciences, Rivers State University, Nigeria.*

⁴ *Department of Health Education, Faculty of Education, University of Port Harcourt, Port Harcourt, Rivers State, Nigeria.*

Corresponding Author: Ime M. Ubom, Email: dr.ime.ubom@pw.epac.to OR ime_ubom@uniport.edu.ng

Abstract: This study investigated the influence of health education on physical exercise in alleviating low back pain among patients in Rivers State, Nigeria. The study utilized a pretest-posttest quasi-experimental design and involved 170 patients at the University of Port Harcourt Teaching Hospital. Two objectives were set, along with corresponding research questions and hypotheses. The participants were selected using convenience and stratified sampling techniques, resulting in a cohort of 50 individuals consisting of 35 patients from the general outpatient clinic department and 15 patients from the spine physiotherapy unit. The group included 20 male and 30 female participants. Data was collected using a self-structured, self-administered questionnaire titled physical exercise-focused health education in alleviating low back pain, which demonstrated good reliability (0.82). Descriptive and inferential statistics were employed to analyze the data and test the hypotheses. The study findings indicated that health education, with a focus on physical exercise (PEFHE) for low back pain patients, consistently improved mobility by enhancing respiration, reducing abdominal fat, strengthening muscles and increasing flexibility. More so, PEFHE significantly alleviated pain and stiffness among individuals with low back pain. In conclusion, the study recommends the implementation of comprehensive PEFHE programmes, fostering patient participation, conducting further research on long-term effects, and promoting collaboration among healthcare providers, educators, and policymakers to integrate these interventions into the existing healthcare system seamlessly.

Keywords: Physical exercise-focused health education; PEFHE; Low back pain patients

1 BACKGROUND TO THE STUDY

In the contemporary epoch, there persists a prevailing acknowledgment of the paramount significance of physical exercise within society [1]. In Nigeria, this knowledge is accessible to all individuals who possess the opportunity to attend basic school. Physical exercise has been defined as a purposeful and systematic engagement of the body, with the aim of enhancing physical fitness, promoting overall health, and safeguarding against chronic ailments [2]. This perspective accentuates the physiological advantages of exercise, such as enhanced cardiovascular well-being, augmented muscular strength, and improved flexibility. However, it is imperative to acknowledge that physical exercise transcends the realm of physical benefits alone; it also encompasses mental, emotional, and spiritual well-being [3]. This is due to the fact that activities that foster cardiovascular health also entail introspection, stress management, self-care, and spiritual awareness [4-5]. Thus, it can be unanimously agreed upon that physical exercise, within this framework, contributes to a harmonious and gratifying existence for individuals who wholeheartedly embrace it.

Despite the aforementioned positive aspects, there exists a prevailing perception among many individuals that physical exercise is either a mere display of prowess, showmanship or a pursuit solely catering to the privileged, particularly in Nigeria. Among these individuals with inadequate understanding of physical exercise, it is often regarded as a self-evident activity that inadequately addresses debilitating health conditions, such as low back pain[6]. One reason for this perception stems from the prevalent culture of immediate gratification in society. People tend to seek quick remedies and instant relief, leading them to rely on pharmaceutical solutions rather than investing time and effort into physical exercise [7]. The allure of a pill promising pain alleviation or a cure for ailments is frequently more enticing than the commitment required for regular exercise. Another contributing factor to this disconnection is the insufficient emphasis on the guidance and implementation of physical exercise within various health education programmes. These programmes tend to prioritize nutrition, disease prevention, and medication, relegating physical exercise to a secondary consideration. Consequently, there exists a dearth of coherent explanations regarding the long-term positive influence of physical exercise when compared to the ills of quick remedies and instant relief, the appropriate exercises for specific conditions, and how exercise can be methodically employed to achieve desired health outcomes, particularly in relation to low back pain[8]. This undervaluation has resulted in the underestimation of physical exercise as a viable solution.

Furthermore, the sedentary lifestyle that has become increasingly pervasive in contemporary society plays a pivotal role in the detachment between the potential benefits of physical exercise and individuals' attitudes towards engaging in it[9]. Technological advancements, desk-bound occupations, and a lack of physical activity have cultivated a population that is less inclined to partake in exercise. The convenience and comfort afforded by sedentary pursuits have overshadowed the importance of physical movement, thereby engendering a disconnection between individuals and physical exercise. This study therefore sought to investigate the influence of health education on physical exercise in alleviating low back pain among patients in Rivers state, Nigeria.

2 STATEMENT OF THE PROBLEM

It is duly recorded that within Rivers State, Nigeria, both hospital facilities and pharmaceutical centers are observing a notable surge in the number of patients seeking clarification regarding the persistent discomfort they experience throughout their bodies, particularly in the lower region of their backs. These individuals have previously resorted to pain-relief medications prescribed by their respective family physicians, yet they persist in demanding further medical attention in order to address their recurring episodes of low back pain. The situation is compounded by a global report indicating a growing prevalence of insufficient educational opportunities for young individuals in Nigeria, spanning from their formative years to the advanced stages of education. This, in turn, has inadvertently resulted in a significant disparity between the knowledge and comprehension that the populace ought to possess regarding physical exercise as imparted by health education, and the personal beliefs and understanding they harbor concerning the impact of physical exercise. In light of these circumstances, the researchers have astutely observed that the root of the problem lies in the absence of comprehensive health education encompassing the utilization of physical exercise as a means of managing low back pain, thereby leading to recurring or exacerbated conditions among the patient population. This considerable gap has served as the impetus for the present study, which seeks to investigate the influence of health education on physical exercise in mitigating low back pain amongst patients residing in Rivers State, Nigeria.

3 AIM AND OBJECTIVES

This study was aimed at investigating the influence of health education on physical exercise in alleviating low back pain among patients in Rivers State, Nigeria. Specifically, the objectives were to:

- 1) determine the influence of physical exercise-focused health education on enhancing mobility in low back pain patients in Rivers State, Nigeria.
- 2) ascertain the influence of physical exercise-focused health education on pain alleviation in low back pain patients in Rivers State, Nigeria.

3.1 Research Questions

- 1) What is the influence of physical exercise-focused health education on enhancing mobility in low back pain patients in Rivers State, Nigeria?
- 2) What is the influence of physical exercise-focused health education on pain alleviation in low back pain patients in Rivers State, Nigeria?

3.2 Hypotheses

The following two hypotheses were tested at 0.05 alpha level.

- 1) Physical exercise-focused health education has no significant influence on enhancing mobility in low back pain patients in Rivers State, Nigeria.
- 2) Physical exercise-focused health education has no significant influence on pain alleviation in low back pain patients in Rivers State, Nigeria.

3.3 Conceptual Framework

The study's underlying premise revolves around the impact of health education centered on physical exercise on the mitigation of low back pain, thereby fostering enhanced mobility and alleviation of pain and stiffness in patients residing in Rivers State, Nigeria. This framework is visually depicted in Figure 1

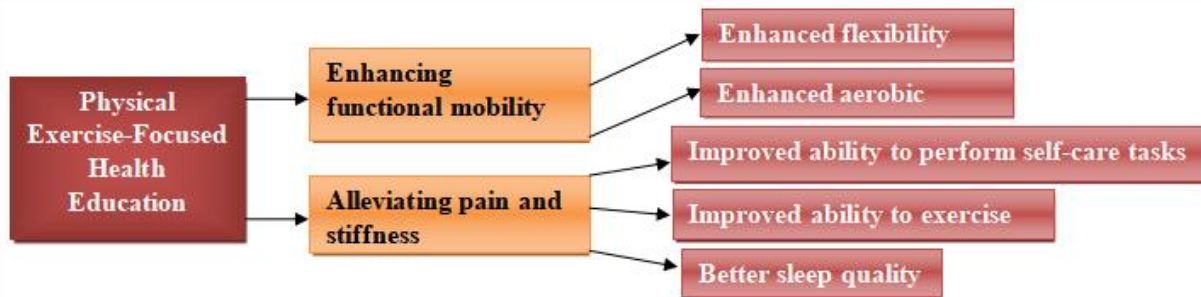


Figure 1 An illustration of the study's conceptual framework.
Source: Researchers' Conceptualization (2024)

4 LITERATURE REVIEW

4.1 Physical Exercise-Focused Health Education

Physical exercise-focused health education (PEFHE) is an essential factor in the full-scale efforts to support people's health and mitigate chronic diseases [10-11]. Quite notably, PEFHE instruction is distinct from all other types in its focus on the importance of regular exercise and support for physical health, unlike diets and resting patterns in general health education [12-13]. While other health education programmes may mention the benefits of physical exercise, PEFHE goes into detail about how different types of exercise can improve cardiovascular health, boost strength and flexibility, and lower the risk of chronic diseases like low back pain, heart disease, diabetes, and obesity. PEFHE also covers topics such as proper form, injury prevention, and how to make physical activity a part of daily life. According to the World Health Organization [14], being physically active can reduce the risk of coronary heart disease, stroke, and diabetes compared to traditional health education methods, focusing on physical exercise offers many advantages. For example, studies have shown that interventions centered on exercise are more effective in improving health outcomes such as weight loss and blood pressure control than education-only interventions [15]. Additionally, incorporating physical exercise into health education can boost motivation and engagement, as individuals are more likely to prioritize their health and well-being [16-17]. However, Vermeesch et al. noted that limited access to exercise facilities or resources, especially in low-income areas, hinders the full potential of PEFHE[18]. This obstacle may prevent individuals from participating in regular physical activity and reaping the benefits of PEFHE. Moreover, cultural and social factors can impact the adoption and adherence to exercise programmes [19], underscoring the importance of culturally sensitive and inclusive approaches to PEFHE.

4.2 Enhancing Functional Mobility through PEFHE in Low Back Pain Patients

Enhancing functional mobility in health education involves promoting physical activities and exercises that enhance an individual's ability to carry out daily tasks and movements smoothly and efficiently. The focus is on improving strength, flexibility, balance, and coordination to support functional independence and prevent mobility limitations [20-21]. In the context of PEFHE, enhancing functional mobility is especially crucial for individuals dealing with low back pain, a common condition that can significantly hinder daily activities and overall quality of life. PEFHE plays a critical role in improving functional mobility and reducing pain in these individuals by offering tailored approaches that consider their specific needs and limitations [22]. PEFHE programmes for low back pain patients may include exercises targeting core muscles like abdominals and back extensors to enhance stability and support the spine, such as pelvic tilts, bridges, and modified planks. Furthermore, incorporating flexibility exercises such as gentle stretching and yoga poses can enhance range of motion and alleviate muscle tightness in the low back region [23-24]. Balance and coordination exercises, like tai chi practice, can also improve postural control and lower the risk of falls for low back pain patients [25-26]. Through PEFHE, individuals with low back pain receive strategies to manage and prevent future episodes, such as maintaining a healthy weight, avoiding prolonged sitting or standing, and integrating regular physical activity into their daily routine. These interventions aim to empower individuals with the knowledge and tools needed to enhance functional mobility, reduce pain, and improve overall quality of life [25, 27-28].

4.3 Alleviating Pain through PEFHE in Low Back Pain Patients

Multiple studies have highlighted the positive impact of PEFHE interventions on reducing pain and enhancing functionality in individuals dealing with low back pain [29-34]. Of particular note, Huang et al. and Seong-Kyong et al.[31, 34] have conducted separate studies that offer valuable insights into the effectiveness of PEFHE. Huang et al. conducted a randomized controlled trial that showcased the significant benefits of PEFHE, illustrating a notable decrease in pain intensity and disability compared to standard care[30]. In contrast, Seong-Kyong et al. delved into the impact of

individualized exercise programmes, revealing that personalized exercise regimens were more effective in reducing pain and improving function among low back pain patients[34]. While Huang et al emphasized the importance of exercise-focused health education specifically highlighted the superiority of individualized exercise programmes over generalized ones, showcasing the importance of tailored interventions to meet patient-specific needs [31, 34].

Moreover, Marris et al. conducted a systematic review underscoring the educational aspect of PEFHE interventions. Their research emphasized that educating patients about the significance of exercise in managing low back pain can empower individuals to actively engage in their recovery process[35]. Louw et al. shed light on the collaborative nature of PEFHE interventions, noting the involvement of diverse healthcare professionals like physiotherapists, exercise specialists, and educators[36]. This multidisciplinary approach, as indicated by Louw et al. in alignment with Lamper et al. and Suman et al.[37-38], has yielded impressive outcomes in terms of pain reduction and functional enhancement. In the realm of long-term benefits, Dibben et al. conducted a systematic review revealing that exercise-based interventions have sustained effects on pain and disability for up to one year post-intervention, underlining the lasting impact of PEFHE interventions in managing low back pain[39]. However, a challenge lies in ensuring patient compliance and adherence to exercise regimens. Saner et al. found that high adherence to home-based exercises was linked to greater reductions in pain intensity and disability[40], a finding corroborated by Essery et al. Similarly[41], Herman et al.[42] and Andronis et al.[43] explored the cost-effectiveness of PEFHE interventions compared to standard care. Their findings indicated that PEFHE was associated with lower healthcare costs and improved quality-adjusted life years (QALYs).

5 THEORETICAL FRAMEWORK

5.1 Cognitive-Behavioral Theory (CBT)

The cognitive-behavioural theory (CBT), developed by Aaron Beck and further expanded upon by Judith S. Beck in 2020, highlights the interconnectedness of our thoughts, feelings, and behaviours [44]. By challenging negative thoughts and beliefs, CBT is tailored to improve health by promoting positive behaviours. When it comes to the influence of health education on physical exercise for alleviating low back pain in Rivers State, Nigeria, CBT plays a crucial role. It addresses cognitive and behavioural factors that contribute to low back pain by reconceptualizing health education to provide information on exercise benefits, correct misconceptions, and foster positive beliefs about exercise as a means of pain management. CBT techniques, like cognitive restructuring, help challenge negative thoughts hindering engagement in physical exercise. By reframing these thoughts, individuals can develop a positive mindset, increasing motivation and adherence to exercise programmes. Additionally, CBT assists patients in recognizing and modifying unhelpful behaviours related to low back pain, such as avoiding physical activity out of fear. Gradually exposing patients to safe exercise routines builds confidence and reduces fear avoidance behaviours.

5.2 Methodology

This study investigated the influence of health education and physical exercise in reducing low back pain in patients in Rivers State, Nigeria by adopting a pretest-posttest design. Convenience and stratified sampling selected a sample of 50 participants from the targeted 175 participants for the study in University of Port Harcourt Teaching Hospital: 35 from the general outpatient clinic and 15 from the spine physiotherapy unit. The sample had 20 males and 30 females, all diagnosed with low back pain, aged 18 to 60 years, and without underlying pathology, infection, or spinal fractures. The researchers collected data using a questionnaire titled "Physical Exercise-Focused Health Education in Alleviating Low Back Pain (PEFHEALBPQ)." The questionnaire's validity and reliability were established through expert review and internal consistency reliability analysis, resulting in a Cronbach's alpha value of 0.82. The data were analyzed using mean, standard deviation, ANCOVA, and simple percentage tests at 0.05 alpha level. The study achieved a high return rate, with all participants completing the questionnaire.

6 RESULTS

6.1 Answer to Research Questions

6.1.1 Research Question 1

What is the influence of physical exercise-focused health education on enhancing mobility in low back pain patients in Rivers State, Nigeria?

Table 1 Mean and standard deviation scores of PEFHE on enhancing mobility in low back pain patients in Rivers State, Nigeria

S/No.	Items	Pre-Test		Post-Test		Mean Gain
		Mean	SD	Mean	SD	

1.	Sustaining sufficient respiration during periods of physical exertion.	1.49	0.21	2.91	0.70	1.42
2.	Achieving optimal reduction of excess abdominal fat.	1.72	0.24	2.68	0.64	0.96
3.	Take pleasure in engaging in regular physical exercise to improve my muscle strength.	1.70	0.23	2.99	0.73	1.29
4.	Regularly engaging in dancing as a convenient form of physical exercise to improve flexibility.	1.91	0.26	3.12	0.77	1.21
5.	Regularly skipping to improve my mobility.	1.11	0.15	2.85	0.69	1.74
Cluster Mean/SD		1.79	0.22	2.91	0.71	1.32

6.1.2 Research Question 2

What is the influence of physical exercise-focused health education on pain alleviation in low back pain patients in Rivers State, Nigeria?

Table 2 Mean and standard deviation scores of PEFHE on pain alleviation in low back pain patients in Rivers State, Nigeria

S/No.	Items	Pre-Test		Post-Test		Mean Gain
		Mean	SD	Mean	SD	
6.	Practicing relaxation techniques such as deep breathing to manage stress.	2.05	0.43	3.27	0.81	1.22
7.	Increased ability to engage in exercise activities such as walking a distance.	1.14	0.07	2.80	0.67	1.66
8.	Greater ease in performing daily activities such as household chores.	1.73	0.32	2.76	0.66	1.03
9.	Enhanced performance of self-care tasks such as dressing.	1.77	0.33	3.10	0.76	1.33
10.	Improved sleep quality with reduced discomfort and pain during sleep.	1.38	0.18	2.64	0.63	1.26
Cluster Mean/SD		1.41	0.27	2.91	0.71	1.30

6.2 Test of Hypotheses

Hypothesis 1: Physical exercise-focused health education has no significant influence on enhancing mobility in low back pain patients in Rivers State, Nigeria.

Table 3 ANCOVA result for pre-test and post-test analysis on the significant influence of PEFHE on enhancing mobility in low back pain patients in Rivers State, Nigeria

Source	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Pre-test	22.47	1	22.47	36.80*	0.062	0.436
Group	83.46	1	83.46	136.89*	0.000	0.742
Error	29.11	48	0.61			
Total	135.04	50				

Note: * indicates statistical significance at $p < .05$

Hypothesis 2: Physical exercise-focused health education has no significant influence on pain and stiffness alleviation in low back pain patients in Rivers State, Nigeria.

Table 4 ANCOVA result for pre-test and post-test analysis on the significant influence of PEFHE on pain alleviation in low back pain patients in Rivers State, Nigeria

Source	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Pre-test	20.95	1	20.95	32.73*	0.335	0.160
Group	79.26	1	79.26	123.84*	0.001	0.605
Error	30.59	48	0.64			
Total	130.80	50				

Note: * indicates statistical significance at $p < .05$

7 ANALYSES OF RESULTS

The study conducted in Rivers State, Nigeria, presents the mean and standard deviation scores of physical exercise-focused health education (PEFHE) on enhancing mobility and pain alleviation in low back pain patients. The mean gains in mobility-related items from the pre-test to the post-test as shown in Table 1 indicate a positive influence of PEFHE on enhancing mobility in low back pain patients, with a cluster mean gain of 1.32. This suggests a consistent improvement across various aspects of mobility, including sustaining respiration, reducing abdominal fat, improving muscle strength, enhancing flexibility, and mobility through activities like skipping. The standard deviations show variability in the mean gains, indicating differing individual responses to the intervention. Similarly, the mean gains in pain and stiffness alleviation items as shown in Table 2 demonstrate the positive influence of PEFHE on these aspects, with a cluster mean gain of 1.30. This indicates an overall improvement in managing stress, engaging in exercise activities, performing daily activities, self-care tasks, and sleep quality. The standard deviations reflect variability in the mean gains, suggesting varying responses to the intervention among the participants.

Moving on to the ANCOVA results, Table 3 shows a significant influence of PEFHE on enhancing mobility in low back pain patients. The F-statistic of 136.89* and a p-value of 0.000 indicate a highly significant impact of the group (PEFHE) on enhancing mobility. The partial eta squared value of 0.742 suggests that 74.2% of the variance in mobility enhancement can be attributed to the group factor, highlighting the substantial influence of PEFHE on enhancing mobility. Likewise, Table 4 demonstrates a significant influence of PEFHE on pain alleviation in low back pain patients. The F-statistic of 123.84* and a p-value of 0.001 indicate a highly significant impact of the group (PEFHE) on pain alleviation. The partial eta squared value of 0.605 suggests that 60.5% of the variance in pain alleviation can be attributed to the group factor, further emphasizing the substantial influence of PEFHE on these aspects.

8 DISCUSSION OF FINDINGS

This study conducted in Rivers State, Nigeria, examining the effects of physical exercise-focused health education (PEFHE) on individuals with low back pain, revealed outcomes that are in agreement with prior research. The findings indicated that PEFHE significantly improved mobility, reduced pain and enhanced overall well-being. This is consistent with the results of previous studies, such as the investigations conducted by Kim et al. in consonance with Pensri and Janwantanakul, which also demonstrated the capacity of PEFHE to enhance mobility and alleviate pain in low back pain patients [29]. Notably, the study in Rivers State highlighted consistent improvements in various aspects of mobility, including sustaining respiration, reducing abdominal fat, improving muscle strength, and enhancing flexibility. These improvements were observed in the participants' ability to perform daily activities, engage in self-care tasks, and experience improved sleep quality [31]. However, it is important to note that the study also identified variability in the mean gains, indicating differing individual responses to the intervention [29, 31]. Furthermore, the study emphasized the substantial influence of PEFHE on enhancing mobility, with 74.2% of the variance in mobility enhancement attributed to the group factor [29]. Similarly, PEFHE had a significant impact on pain and stiffness alleviation, with 60.5% of the variance in pain and stiffness alleviation attributed to the group factor [29]. These findings align with the outcomes of previous studies as in-text cited, affirming the effectiveness of PEFHE in alleviating pain in individuals with low back pain.

9 CONCLUSION AND RECOMMENDATIONS

In conclusion, this study, which was conducted in Rivers State, Nigeria, yielded noteworthy findings. It revealed that providing practical education to individuals regarding the significance of physical exercise led to a substantial enhancement in their mobility, a reduction in pain and an overall improvement in their well-being, particularly for those suffering from low back pain. The study placed great emphasis on the necessity of education that encompasses physical exercise as a means to effectively manage low back pain, particularly in areas where educational resources are limited. Notably, participants consistently experienced heightened mobility, reported more effective stress management, actively engaged in exercise activities, and performed daily tasks with greater ease. These findings align with previous research, which underscores the positive impact of health education centered around physical exercise in enhancing mobility and alleviating pain among individuals with low back pain. The study recommends implementing comprehensive health education programmes, encouraging patients to participate, conducting further research on the long-term effects, and fostering collaboration among healthcare providers, educators, and policymakers to seamlessly integrate these interventions into the existing healthcare system.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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