Original research article

Effect of Physiotherapy on Pain Intensity and Disability in Patients with Chronic Low Back Pain: A Call for Patients' Awareness to Focus on Physiotherapy Treatment in Cameroon

Abstract

Background: This study aimed at evaluating the effects of conventional physiotherapy (CPT) treatment on pain and disability among patients with Chronic low back pain (CLBP)

Methods: we conducted a quasi-experimental study in some major physiotherapy units in Cameroon from December 2022 to April 2023, patients following physiotherapy treatment for CLBP were enrolled. A structured questionnaire was used to collect general characteristics of participants; the level of pain was assessed with the VAS (Visual Analog Scale) and the impairment of physical function with the EIFEL scale (Echelle d'Incapacité Fonctionelle du Patient Lombalgique). The data collected were analyzed using SPSS. The paired Student test was used to compare the initial and final VAS and EIFEL scores. The Leverne test was used to compare treatment outcomes between patients who received CPT alone and those who received non-conventional traditional medicine (TM). Statistical significance was calculated at $P< 0.05$.

Results: Were included in this study 158 patients with CLBP with a mean age of 46.3 ±14.3. Female were more represented (106/157, 67%). The patients underwent CPT for a mean duration of 8.9 ±15.8 months at a weekly mean session frequency of 3.8±1. Of the 158 participants, 35 (22.2%) underwent additional TM. Conventional physiotherapy significantly reduced pain (Initial VAS:7.4± 1.3; Final VAS: 3.9± 1; P=0.000) and physical impairment of participants (Initial EIFEL: 15.7± 4.5; Finale EIFEL: 6.8 ± 3.2; P=0.000). The study found no significative difference in pain (P= 0.317) and physical impairment (P=0.302) in patients following exclusively CPT and those following physiotherapy additionally to non-conventional TM.

Conclusion: Physiotherapy treatment reduces pain and improve physical function of patients with chronic low back pain and additional non-conventional TM did not have improve further pain and disability in these patients.

Keywords: chronic low back pain (CLBP), Physiotherapy, Cameroon, Non-conventional Traditional Medicines (TM)

1. Background

Low back pain (LBP) refers to pain felt in the lower back, lumbosacral and sacroiliac regions which may radiate to the lower extremities (1). While multiple etiologies have been characterized as responsible for low back pain, most people do not have a specific cause identified for their symptoms. When LBP persists for longer than 3 months it is defined as chronic low back pain (CLBP) (2). Chronic low back pain is one of the major causes of disability in the world and has an impact on the quality of life and functional independence of patients suffering from it. It has significant economic and social repercussions (3-5). In Africa, low back pain is the most frequent musculoskeletal disease (6). According to the World Health Organization (W.H.O), 619 million people worldwide suffered from low back pain in the year 2020 and it is estimated that there will be 843 million by 2050, largely driven by population growth and aging (7). It is the leading cause of disability worldwide and the condition for which the greatest number of people can benefit from rehabilitation (7). In 2022, a systematic review shows that the pooled incidence estimate of LBP in adolescent athletes was high and increasing with years (8, 9). It also constitute a huge economic burden of over $100 billion spending per year in the United States alone (10). Furthermore, CLBP incurs billions of dollars in medical expenditures each year and this economic burden is of particular concern in poorer nations such as those in Africa, where the already restricted health care funds are directed toward diseases such as HIV/AIDS and malaria (11). CLBP leads to job loss, which is the cause of depression, and many other psychological damages in addition to the restriction of mobility at the biological level (7). Several studies have addressed CLBP in high-income-countries (HICs) compared to low-and-middle-income-countries (LMICs) due to other competing priorities of communicable diseases. The extrapolation of results of studies from HICs for use in LMICs is difficult due to differences in social norms, healthcare systems, and legislations, yet there is urgent need to address this growing burden (12) .

Pharmaceutical and non-pharmaceutical treatments are frequently used to reduce the adverse effects of this condition worldwide. However, because pharmacological treatment is often associated with not negligible side effects, non-pharmacological treatments are preferred in managing CLBP. Among these, physiotherapy is one of the promising and successful (13). The results of studies conducted around the world show that physiotherapy is effective in treating CLBP through its effects on pain and disability (1,13,14). However, considering the specific case of Cameroon, the literature on the effects of physiotherapy on CLBP is extremely poor. The only study dealing with the role of physiotherapy in the management of CLBP focus mainly

on the effects on pain and mobility but did not address disability (15). As pain is a subjective phenomenon, the evaluation of other parameters such as functional capacity would be necessary to better objectivize the impact of physiotherapy on CLBP. From daily observations, a good part of the population of Cameroon are very traditionalists, people almost prefer to follow traditional treatment. Also, most people perceive pain at some point in their lives to be normal, and they only seek for help when the pain worsens and is preventing them from doing their usual activities. Among the few following physiotherapy treatment, many of them follow both physiotherapy and traditional treatment (oral herbal medicines or topical application of herbal medicines).

Therefore, this study was set up to highlight the effect of physiotherapy on pain and disability in patients with chronic low back pain. But also, to change the paradigm of low back pain management in Cameroon and to encourage patients to focus on physiotherapy management of low back pain, which is supervised by the health authorities. The main objective of this study was to evaluate the impact of conventional physiotherapy on pain intensity and functional ability in CLBP patients undergoing physiotherapy in Cameroon and to evaluate the effect of additional non-conventional traditional treatment on these patients.

2. Methods

Design and setting of the study

We conducted a multicentric quasi-experimental study from December 2022 to April 2023 mainly in the cities of Yaoundé, Bafoussam and Mbouda, Cameroon. The study was conducted at the physiotherapy units of the National Rehabilitation Centre for Persons with Disability (CNRPH) of Etoug-Ebe in Yaoundé, which is the main national rehabilitation hospital in Cameroon and the biggest in Central Africa, the Rehabilitation Units of the Regional Hospital of Bafoussam and the District Hospital of Mbouda which are located in the West Region of Cameroon. These centers were chosen for the study because of their reputation in treating patients with CLBP, moreover they are the main centers in the West and Central regions with high frequentation by patients. With their policy in the reduction of the cost of physiotherapy sessions, they receive patients coming from all over the country because of their affordable treatment cost.

Study population and Inclusion criteria

Were included only patients with nonspecific low back pain persisting for longer than 3 months followed up at the physiotherapy units and willing to participate in our study. We excluded patients who did not come regularly for physiotherapy treatment, and those who abandoned physiotherapy for a time before restarting it again. We also excluded patients who received physiotherapy elsewhere before starting physiotherapy in the site of data collection. The informed consent to participate to the study was obtained in written form for every participant before starting the study. The participants were enrolled using and exhaustive sampling in the different collected sites.

Data Collection and collection tools

We used a structured questionnaire to take general information of participants such as: age, sex, profession, Body mass index (BMI), pain, complications of CLBP (sciatica, cruralgia and motor impairment), the duration of physiotherapy treatment, if they are receiving another treatment (traditional treatment such as potions, herbal medicine) at the same time with physiotherapy and the frequency of physiotherapy sessions per week. The second part of the questionnaire was investigating on the intensity of the pain using the Visual Analog Scale (VAS) where patients were assessed of their pain level from the beginning of the treatment and on the day of collection. The VAS is a valid tool used to evaluate pain of patient numbered from 0 equivalent to no pain to 10 equivalent to maximal pain (16). In the third part, we evaluated the functional impairment with the EIFEL (Echelle d'Incapacité Fonctionnelle des Patients Lombalgiques) scale from the beginning of physiotherapy treatment and on the day of collection. The EIFEL is a French questionnaire without any English valid version. It is a reliable and validated tool for disability assessment for chronic low-back pain. The scale quantifies the impact of lumbar spine pain on the patient's activities of daily living: locomotion, domestic activities and comfort. It is rated from 0 (for no functional incapacity) to 24 (for maximum functional incapacity) (17).

Due to the fact that physiotherapists in Cameroon in general do not address functional disability and pain using conventional scales, we were obliged to evaluate the initial state of patients the day of data collection by the interview and the patients were relating their condition on how they were before initiating the treatment and at the time of data collection (after at least 10 sessions of physiotherapy treatment).

Conventional Physiotherapy treatment

Conventional physiotherapy for CLBP consisted in a series of 10 sessions performed every day (from Monday to Friday) for the initial 2 weeks of the treatment, and after this step, it continued at the frequency of at least three sessions a week for the remaining follow-up period. The protocol is settled generally as following: First of all, 15 to 30min of electrical nerves stimulation using Transcutaneous Electric-Neuro Stimulation (TENS). After that, 15 to 20min of infrared radiation, massage session of the back for 5-10 minutes and depending on the occurrence of the irradiation, therapeutic exercises to stretch the low back, hamstring and calf muscles, lumbar traction and mobilization in all cases. This program is performed for the first 10 sessions after which was added muscles strengthening exercises, proprioceptive exercises and walking exercises were done progressively.

Non-conventional traditional treatment

Some patients who were receiving physiotherapy treatment also took both topical and oral traditional medicines (from herbes) without the consent or advise of their physiotherapist. Thus, during data collection, those patients were classified in the group Conventional Physiotherapy with additional traditional treatment.

Statistical analysis

Data collected were entered in an excel spreadsheet (MS Excel 2016). To compare the final and initial VAS and EIFEL scores, we used the student test. And to compare patients undergoing physiotherapy exclusively and patients undergoing physiotherapy with traditional treatment, we used the Leverne test. The confidence interval settled at 95% and the statistical significance at $p<0.05$.

3. Results

General description of population

A total of 208 participants receiving physiotherapy treatment for CLBP were enrolled. We excluded 50 patients who did not come for treatment regularly. Hence, we worked with 158 participants. There were 52 male (33%) and 106 female (66%), the average age was 46.3 ±14.3. The main occupation was represented by Housewife, (21.5%, 34/158). The average BMI was 28.1±5.9. Of the 158 participants, 86 were having complications (54.4%). The main complication encountered was right sciatica (19%, 30/158). About 35 (22.2%) patients were receiving traditional treatment elsewhere while also receiving physiotherapy treatment. The

average duration of physiotherapy follow up was: 8.9 ±15.8 months with a frequency average of 3.8± 1 sessions per week as seen in Table 1.

Table 1: General characteristics of study population

Sex	**Effective**	**Percentage (%)**
Male	52	33
Female	106	67
Total	158	100
Occupation	**Effective**	**Percentage**
House wife	36	22.8
Famer	18	11.4
Driver	8	5.1
Trader	20	12.7
Tailor	12	7.6
Lecturer	22	13.9
Student	8	5.1
Informatician	6	3.8
Retired	12	7.6
Secretary	6	3.8
Others	10	6.3
Total	158	100.0
Complications	**Effective**	**Percentage**
Right cruralgia	10	6.3
Bilateral cruralgia	2	1.3
Left cruralgia	2	1.3
Motor impairement	4	2.5
No complications	72	45.6
Right sciatica	30	19.0
Bilateral sciatica and motor impairment	4	2.6
Bilateral sciatica	18	11.4
Left sciatica	12	7.6
Bilateral sciatica	4	2.5
Total	158	100.0
Undergoing traditional treatment		
Yes	35	22.2
No	123	77.8
Total	158	100

Effects of physiotherapy treatment on patients' pain

A paired-sample Student's t test was performed. Table 2 shows that the initial pain of patients according to VAS at the start of physiotherapy sessions was 7.4 ± 1.3, and at reevaluation at the end of the treatment, it was 3.9 ±1, indicating a statistically significant difference between initial and final pain levels (P= 0.000).

Table 2: Means VAS comparison: students test for paired samples

						T	Ddl	P value
	Means	**S-D**	**Standard error m.**	**Confidence interval 95% of the difference**				
				Inf.	Sup.			
Initial VAS	3.43	1.1	0.95	3.24	3.61	36.	15	**0.000**
final VAS		9				2	7	

VAS: Visual Analog Scale, SD: Standard Deviation, T: student test, ddl: degree of liberty

Effects of physiotherapy in disability level

The initial level of functional impairment with the EIFEL scale was: 15.7 ±4.5 the final EIFEL scale was: 6.8 ±3.2. There was a statistically significant difference between the initial EIFEL and the final EIFEL (p= 0.000) as seen in Table 3,

Table 3: Average mean EIFEL scores before and after treatment

						T	Ddl	P value
	Mean	**S-D**	**Standard error m.**	**95% CI of the difference**				
				Inf.	Sup.			
Initial EIFEL score	8.8	3.2	0.26	8.37	9.40	34.	15	**0.000**

Final EIFEL score	86	79				06	7	

EIFEL: Echelle d'Incapacité Fonctionnelle du Patient Lombalgique, SD : Standard Deviation, T : student test, ddl : degree of liberty

Comparison of patients who received physiotherapy associated to traditional treatment and patient who received exclusively physiotherapy treatment

As presented in Table 4, there was no significant difference between patients following physiotherapy treatment alone and those following physiotherapy and traditional treatment in term of pain (p= 0.317). Similarly, Table 5 shows that there was no significant difference between patients following physiotherapy alone and those following physiotherapy with traditional treatment in term of functional ability (p=0.302).

Table 4: Comparing patients following only physiotherapy and those following physiotherapy and traditional treatment in terms of pain score (VAS)

		Test of Levene on equality of variations		Test-t for equality of means						
		F	P value	T	Ddl	P value	Diff. M	Diff. S-D	95% CI of the difference	
									Inf.	Sup.
	Hypothesis of equal variations	2.365	0.126	1.148	157	0.253	0.236	0.206	-0.171	0.64
	Hypothesis of Unequal variations			1.012	46.9	0.317	0.236	0.23	-0.23	0.70

F: statistic of levene test, t : student test, ddl : degree of liberty

Table 5: Comparing patients following only physiotherapy and those following physiotherapy and traditional treatment in term of physical impairment (EIFEL)

		Test of Levene on equality of variations		Test-t for equality of means						
		F	P value	t	ddl	P value	Diff. M	Diff. S-D	95% CI of the différence	
									Inf.	Sup.
	Hypothesis of equal variations	0.257	0.613	1.08	157	0.281	0.664	0.613	-0.547	1.875
	Hypothesis of inegal variations			1.04	52.1	0.302	0.664	0.636	-0.613	1.940

F: test statistic of levene test, t: student test, ddl: degree of liberty

Discussion

This study aimed to evaluate the effect of physiotherapy on pain and disability among CLBP patients in Cameroon, and to investigate any changes regarding patients undergoing physiotherapy in association to traditional treatment. The study was conducted on 158 patients followed up at various physiotherapy units in the Central and West regions of Cameroon. The mean age of participants was 46.3 ±14.3 years and more most (66%) were female.

Conventional physiotherapy treatment significantly improved the pain levels of patients undergoing physiotherapy (initial mean VAS: 7.4± 1.3, final mean VAS: 3.9± 1). This result corroborates that reported by Atemkeng et al. (15) in Douala Cameroon, who observed a significant improvement in pain and mobility of the low back pain patients after 6 weeks of physiotherapy follow-up. Similarly, studies (18) in India and Iran (19) reported significant improvement in pain and disability after receiving conventional physiotherapy treatment. However, this result is in contrary to that reported by a systematic review on the effects of physical therapy rehabilitation on chronic non-specific low back pain. They concluded that

physiotherapy treatment modalities like exercise therapy, electrotherapy and manipulation had only small improvements on the pain and disability compared to acupuncture and Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) (20). This difference in results could be explained by differences in the physiotherapy treatment strategies and in the study design. Furthermore, our findings also contrast that of Middelkoop et al. (21) in a systematic review where they reported insufficient evidence of physiotherapy modalities like back school, heat and cold therapy, massage, traction and lumbar supports, to draw firm conclusion on its effects on chronic low back pain. This difference could be attributed to differences in study design. Also, participants in our study had longer periods of follow-up which might have contributed in improving pain and function.

Regarding function, our findings indicate a significant improvement in functional capabilities among participants (initial mean EIFEL:15.7 ±4.5, final EIFEL: 6.8 ± 3.2). These results are confirmed by several reports in literature with significant improvements in patients' pain levels and daily life after physiotherapy treatment (22,23). This similarity could be due to the fact that CLBP being one the most common situation in physiotherapy unit, physiotherapists worldwide are used to the pathology and try their best to implement adequate physiotherapy treatment modalities. Furthermore, physiotherapy treatment modalities do not have side effects and therefore could be used for longer periods of follow-up which is not the case with NSAIDs that have considerable adverse effects. Therefore, their prolonged use in patients with CLBP is not advised. Furthermore, most of the treatment modalities used in this study; electrotherapy through Transcutaneous Electric Neuro-stimulation, heat therapy through Infrared light, soft tissue manipulations and therapeutic exercises, have all been reported to mitigate pain. A reduction of pain permit for strengthening and consolidating the treatment gains, which help in ameliorating the functional capabilities of these patients.

Regarding the comparison made between the patients who received physiotherapy treatment alone (123 patients) and those who received physiotherapy treatment and traditional treatment (oral and topical herbal medicine) (35 patients). From our findings, patients who received physiotherapy treatment alone had significant improvements of pain and disability just like those who received physiotherapy and traditional treatment. However, the individual groups all had significant ameliorations in pain and function. Although not statistically significative, these results highlight the fact that patients should focus on following physiotherapy treatment. As of now most take different traditional treatments involving herbes which have not been clinically studied. Further study will emphasize on the reel effects of the traditional treatment compared

to physiotherapy treatment through cohort-prospectives study designs. However, there was no significant difference between the groups. Although we found no studies that report a comparison between physiotherapy treatment and traditional medicines, the Cochrane review by Oltean and al. (24) reveal that oral herbal medicines were effective in reducing pain levels in patients with chronic low back pain than in placebo. The fact that the patients who received additional traditional treatment did not have significant improvements, could be due to the fact that no particular herbal medicine was used. This go in line with the reports by Ahenkorah and al., (25) who concluded that the management practices for CLBP in African countries appear to contradict recommended biopsychosocial management guidelines by developed countries and are not sufficiently documented. Furthermore, the types of herbal medicine used were unknown for most of the patients who usually see diverse herbal practicians who mix several herbes. Thus, this raise questions on the real effects of herbal medicines on CLBP, which herbes specifically and of what dosage? With these unanswered questions, it is much more preferable for patients to focus on non-pharmacotherapeutic and non-surgical means of treatment of CLBP like physiotherapy treatment modalities, while waiting on further studies to evaluate the appropriate effects of herbal medicines on chronic low back pain. However, it is also important to interrogate on why some patients get engaged with traditional medicines. While for some patients, it is just cultural believes, but for many of them, it is because of financial constraints. Herbal medicines are cheaper than physiotherapy sessions and since patients are not able to afford for many physiotherapy sessions, some decide to complement with traditional medicines because they think they may get better faster. Hence, it is important to educate the population about the dangers of using non-conventional treatments and also to conduct more research to understand the active principles and mechanisms of action of these herbal medicines as well as their toxicity.

Strengths and limitations

The major strength of this study is that it is the first study in Cameroon and Central Africa to explore the effect of physiotherapy in chronic low back pain in a large scale. Furthermore, the study considered a longer follow up unlike several others where the duration of physiotherapy treatment is a few weeks. As limitations, the study's unequal gender representation may induce biases because some of the findings may not apply to the whole population. The study groups' respective participant counts were out of balance. Another limitation is that this study did not take into consideration the factors that influence some patients to seek for traditional treatment when receiving physiotherapy treatment. Despite these limitations, the findings of this study

highlight a critical situation on the physiotherapy management of chronic low back pain in Cameroon.

4. Conclusion

This study is the first large scale study to throw insight into the physiotherapy management of chronic low back pain in Cameroon. Physiotherapy reduces pain intensity and improves functional state of patients with CLBP. There was no added improvement in the few patients who received physiotherapy and non-conventional treatment. Physiotherapists in Cameroon are working in a context where some patients may turn to non-conventional practitioners for several reasons including financial constraints and cultural believes. And among those following up physiotherapy there are steel some who undergo non-conventional traditional treatment. Because CLBP is a condition that last for long, some patients may stop physiotherapy because of the time taken for relieve. Others may prefer not to visit physiotherapy services even after being referred by physicians in profit to non-conventional traditional practitioners because of socio-economic and cultural context. The findings of our study demonstrate that adequate physiotherapy treatment significantly improve pain levels and quality of life in patients with chronic low back pain. Therefore, patients should concentrate on their medically advised treatment for CLBP.

Competing interests

The authors declare no conflicts of interest

Consent to participate

The Informed consent to participate in the study was obtained systematically in written form from every participant, after detail presentation of the objective of the study.

Ethics approval

The study received the Research clearance from the Research Review Board of the University Institute of Sciences, Technology and Ethics (IUSTE) of Yaoundé, Cameroon (This review

committee review research protocols before giving the approbation for the research to be conducted).

Disclaimer (Artificial intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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