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Original article

Contribution of physiotherapy in the management of chronic low back pain in the military at the armed forces medical and surgical center of bamako in 2024

Apport de la kinésithérapie dans la prise en charge des lombalgies chroniques chez les militaires au centre médico-chirurgical des armées de bamako en 2024

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Résumé

Introduction : La kinésithérapie est une approche non pharmacologique courante pour la prise en charge de la lombalgie. Notre objectif était d'étudier l'apport de la kinésithérapie dans la prise en charge des lombalgies chroniques chez les militaires au Centre Médico-Chirurgical des Armées de Bamako (CMCA B).

Méthodologie : Il s'agissait d'une étude longitudinale à collecte prospective allant du 1erjanvier au 31 décembre 2024. Elle a concerné l'ensemble des militaires prise en charge à l'unité de kinésithérapie au centre médico-chirurgical des armées de Bamako pour des lombalgies chroniques. L'échantillonnage était exhaustif. Les données ont été saisie et analysées à l'aide du logiciel Excel et SPSS version 25. L'anonymat et la confidentialité des participants ont été respectés.

Résultats : au total nous avons trouvé une fréquence de 28,38% de lombalgie chronique. L'âge moyen était de 37 ans avec des extrêmes de 21 et 69 ans. Le sexe masculin représentait 62% des cas. Ils étaient mariés dans 67% des cas. En termes de grade militaire les sous-officiers étaient les plus représentés avec 67,89% des cas. La majorité des patients avait plus de 10 ans d'expérience avec 54,2%. L'impact positif de la kinésithérapie a été mis en évidence qui a permis de passer de 0% et 28,4% de patient avec une dépendance totale et sévère à 33,94% et 11,93% de dépendance légère et totale respectivement.

Conclusion : la kinésithérapie demeure incontournable dans la prise en charge efficace de lombalgie chronique.

Mots-clés : Kinésithérapie, Prise en charge, Lombalgies chroniques, Militaires, Mali.

Abstract

Introduction: Physiotherapy is a common non-pharmacological approach for the management of low back pain. Our objective was to study the contribution of physiotherapy in the management of chronic low back pain in soldiers at the Armed Forces Medical and Surgical Center of Bamako (CMCA B).

Methodology: This was a prospective longitudinal study from January 1 to December 31, 2024. It concerned all soldiers treated at the physiotherapy unit at the Armed Forces Medical and Surgical Center in Bamako for chronic low back pain. The sampling was exhaustive. Data were captured and analyzed using Excel and SPSS version 25. The anonymity and confidentiality of the participants were respected.

Results: in total we found a frequency of 28.38% of chronic low back pain. The mean age was 37 years with extremes of 21 and 69 years. The male sex accounted for 62% of the cases. They were married in 67% of cases. In terms of military rank, non-commissioned officers were the most represented with 67.89% of cases. The majority of patients had more than 10 years of experience with 54.2%. The positive impact of physiotherapy was highlighted, which made it possible to go from 0% and 28.4% of patients with total and severe dependence to 33.94% and 11.93% of mild and total dependence respectively.

Conclusion: physiotherapy remains essential in the effective management of chronic low back pain.

Keywords: Physiotherapy, Management, Chronic low back pain, Military, Mali.

Introduction

The primary job of military personnel is to serve and protect their community and country [1]. In the performance of their duties, these professionals are required to perform tasks that may require maximum or near-maximum physical effort [1–3]. Given the nature of the threat to them and the need to perform these tasks and duties effectively, military personnel carry and transport a variety of equipment that often equates to more than 45 kg [4,5]. To this end, military personnel are exposed to risk factors for low back pain.

According to the literature, in the U.S. military workforce, the overall incidence rate of low back pain was 40.5 per 1,000 person-years over an 8-year period [6]. In addition, an Australian study reports that low back pain was the most frequently reported disorder, accounting for 40% of all physiotherapy treatments within the organization in the police force [7]. To our knowledge, in Africa very few studies have been conducted on low back pain in the military.

However, the true burden of musculoskeletal disorders and low back pain in this population may actually be higher, as there may be under-reporting of musculoskeletal injuries due to fear of affecting future career opportunities [8]. According to a study carried out in the United States in 2016 [8], 49% or 1,566 military personnel did not report health problems to medical personnel. However, chronic low back pain is one of the most common causes of disability among deployed personnel and therefore of absenteeism [9]. Among U.S. military personnel, a study of 158 soldiers with orthopedic injuries, followed three months before deployment to Iraq, found that, despite compliance with rehabilitation, 62.7 percent were unable to deploy [10]. In addition, soldiers with spinal injuries were more likely to remain non-deployable [10]. Chronic low back pain in military personnel may be more difficult to treat when comorbidities such as post-traumatic stress disorder are present [11,12].

Similarly, while improvements have been made in technology, military equipment, and physical training, Military-specific occupational and training factors that contribute to chronic low back pain are often unavoidable requirements of military service and, as such, are an important and difficult factor to address [5].

For these reasons, different avenues should be considered to improve health outcomes. Physical therapy (also known as physical therapy) is a well-established pathway to provide early treatment for diagnosed or suspected low back pain in the military [13]. Physical therapy (PT) is a common nonpharmacological approach to the management of low back pain and has been recommended by most clinical practice guidelines as a first-line treatment [14–16].

The available physiotherapy treatment strategies and guidelines often involve the use of weight-bearing and non-weight-bearing strength and endurance exercises, joint stabilization exercises, injury and rehabilitation education, and manual therapy techniques [17]. Strengthening exercises of the lumbopelvic-hip region are often recommended as a treatment to reduce low back pain and disability in patients with subacute and chronic non-stabilizing low back pain [18]. Indeed, Rhon et al. [19], demonstrated that a multidimensional intervention, compared to usual care, was effective in reducing low back pain disability (but not pain) in military personnel with low back pain.

While a lot of research has been conducted in the field of the management of musculoskeletal disorders in general and chronic low back pain in particular in military personnel in Western countries, few studies have been carried out in our context. In addition, in view of the importance of physiotherapy in the management of chronic low back pain in the military, we initiated this work in order to study its contribution to physiotherapy care at the Armed Forces Medical and Surgical Center of Bamako (CMCA B).

Methodology

The study took place at the Armed Forces Medical Surgical Center in Bamako in the Physiotherapy Unit. The Medico Surgical Center of the Armed Forces of Bamako is located inside the 34th Military Engineer Regiment in commune IV of the district of Bamako

This was a longitudinal study with prospective data collection. The study was conducted over a 12-month period from January 1 to December 31, 2024.

It concerned all soldiers on active service (in production) treated at the physiotherapy unit at the Armed Forces Medical and Surgical Center in Bamako for chronic low back pain.

In this study, the following were included: Active-duty military personnel who received physiotherapy for chronic low back pain, complete records without abandoning sessions and consenting patients; and the criteria for non-inclusion had concerned: incomplete files, people who have lost follow-up, soldiers in training and veterans, voluntary abandonments, and those who do not consent. Similarly, false low back pain and acute low back pain were excluded from this study

We conducted an exhaustive sampling by taking all data from patients treated for chronic low back pain during the study period.

The variables studied are sociodemographic variables (gender, age, marital status, military rank, year of experience in the army), clinical data (active and passive hip movements in particular (flexion, extension, adduction, abduction, internal and external rotation). The active and passive movements of knee flexion and extension. The movements of flexion and extension of the feet. The movements of inversion and eversion, flexion and extension of the toes.

To evaluate the interest of physiotherapy, we will use the Barthel index before and after physiotherapy treatment. The Barthel Index (BI) measures the extent of independent functioning and mobility in activities of daily living (ADLs). It was developed with a view to being used in rehabilitation with people who have suffered a stroke or who have neuromuscular or skeletal disorders.

Data were collected from patients' medical records. An individual reading grid was used for the collection. The data was entered and processed with Excel software to correct outliers and inconsistent data. The database was analyzed using SPSS version 25 software. Proportions were calculated for qualitative variables and means ± standard deviation were calculated for quantitative variables. The results were presented in the form of tables and figures.

The investigation was preceded by the authorization of the head of the physiotherapy department of the Armed Forces Medical and Surgical Center in Bamako. The confidentiality and anonymity of patients were respected. No data to identify patients were collected. The results of the study were used for scientific purposes only.

Results

During the study period, we collected 109 patients on active military service with low back pain out of 384 patients on active military service admitted to the Armed Forces Medical and Surgical Center of Bamako, i.e. a frequency of 28.38%.

Male sex was the most represented, with a rate of 62%, far exceeding the female sex.

The 20 to 40 age group was the most represented at 66.10%.

- Clinical data before physiotherapy

Active movement (adduction) of the left hip is easy for only 22.94% of patients. Active movements (Abduction, Adduction, External Rotation) of the right hip are easy for only 22.02%; 22.02%; 0.92% of patients respectively. Passive movements (External Rotation, Internal Rotation) of the left hip are easy for only 0.92% and 25.69% of patients respectively. Passive movements (External Rotation, Internal Rotation) of the right hip are easy for only 25.69% and 4.59% of patients respectively.

The different movements (Extension/Flexion) in passive knees are the same and easy for the majority of patients, but the movements (Extension/Flexion) in active knees are different and also easy for the majority of patients.

- Clinical data after physiotherapy

Active movements (internal and external rotation) of the left hip are easy for only 32.11% of patients. Active movements (internal and external rotation) of the right hip are easy for only 33.94% of patients. Passive movement (internal rotation) of the left hip is easy for only 32.11% of patients. Passive movements (internal and external rotation) of the right hip are easy only for 2 33.94% of patients.

Active movements (extension and flexion) of the right knee and left knee are easy for the majority of patients. Passive movements (extension and flexion) of the right knee and left knee are easy for the majority of patients.

- Barthel's index before and after physiotherapy

We have observed a clear improvement in the health status of patients. The positive impact of physiotherapy was highlighted, which made it possible to go from 0% and 28.4% of patients with total and severe dependence to 33.94% and 11.93% of mild and total dependence respectively.

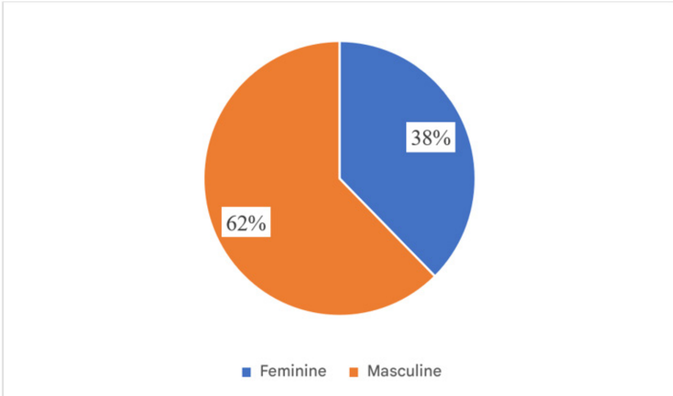

Figure 1. Gender distribution of patients

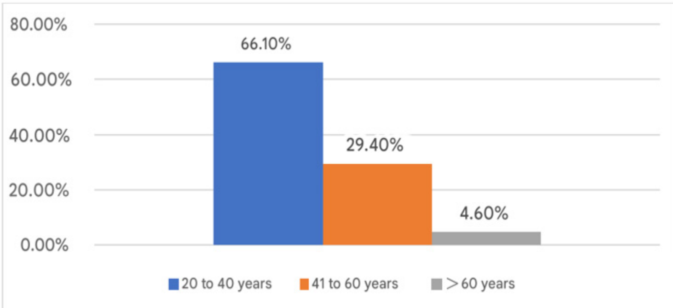

Figure 2: Distribution of patients by age group.

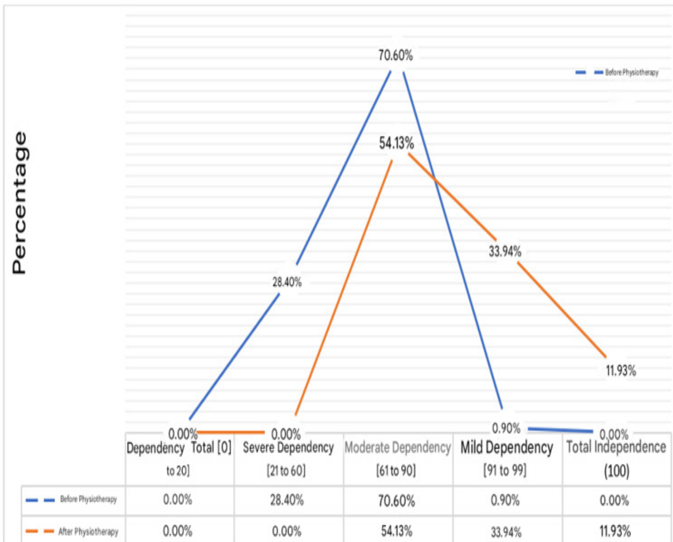

Figure 3. Distribution of patients according to the Barthel index before and after physiotherapy.

Table I : Distribution of patients according to marital status.

Marital status	Staff	Percentage
Bachelor	33	30,3
Divorced	1	0,9
Married	73	67,0
Widow	2	1,8
Total	109	100,0

The majority of patients were married (67%)

Table II : distribution of patients by category and grade

Category	Grades	Actual	Percentage
Non-commissioned member	Second class	6	5,50
	First class	3	2,75
	Corporal	7	6,42
	Master corporal	0	0,00
Non-commissioned officers	Sergeant	49	44,95
	Staff sergeant	1	0,92
	Warrant officer	4	3,67
	Sergeant major	13	11,93
	Chief Warrant Officer Major	7	6,42
Officers	Lieutenant	0	0,00
	Lieutenant	2	1,83
	Captain	9	8,26
	Commander	2	1,83
	Lieutenant colonel	0	0,00
	Colonel	3	2,75
	Colonel Major	1	0,92
	General	2	1,83
Total		109	100

Non-commissioned members: 14.67 Non-commissioned officers: 67.89 Officers: 17.42

Non-commissioned officers were the most affected by low back pain with a rate of 67.89%.

Table III : Distribution of patients according to the number of years of experience (length of service).

Year of experience	Staff	Percentage
< 10 years	50	45,9
10 years	59	54,1
Total	109	100,0

The number of years of experience greater than 10 years is the highest at 54.2%.

Table IV: distribution of patients according to hip movements.

Hip movements	Staff	Percentage
Active left hip movements		
Extension	98	89,91
Inflection	100	91,74
Adduction	25	22,94
Abduction	97	88,99
Active right hip movements		
Extension	107	98,17
Inflection	99	90,83
Adduction	24	22,02
Abduction	24	22,02
External rotation	1	0,92
Passive movements of the left hip		
Extension	108	99,08
Inflection	104	95,41
Adduction	87	79,82
Abduction	87	79,82
External rotation	1	0,92
Internal rotation	28	25,69
Passive movements of the right hip		
Extension	108	99,08
Flexion	103	94,50
Adduction	89	81,65
Abduction	88	80,73
External rotation	28	25,69
Internal rotation	5	4,59

Table V : Distribution of patients according to knee movements.

Knee movements	Staff	Percentage
Active movements of the right knee		
Extension	107	98,16
Inflection	102	93,58
Active left knee movements		
Extension	108	99,08
Inflection	105	96,33
Passive movements of the right knee		
Extension	108	99,08
Inflection	105	96,33
Passive movements of the left knee		
Extension	108	99,08
Inflection	105	96,33

Table VI: Distribution of patients according to hip movements.

Hip movements	Staff	Percentage
Active left hip movements		
Extension	107	98,17
Fl2exion	107	98,17
Adduction	106	97,25
Abduction	106	97,25
Internal rotation	35	32,11
External rotation	35	32,11
Active right hip movements		
Extension	107	98,17
Inflection	107	98,17
Adduction	106	97,25
Abduction	106	97,25
Internal rotation	37	33,94
External rotation	37	33,94
Passive movements of the left hip		
Extension	107	98,17
Inflection	107	98,17
Adduction	106	97,25
Abduction	106	97,25
Internal rotation	35	32,11
External rotation	96	88,07
Passive movements of the right hip		
Extension	107	98,17
Inflection	107	98,17
Adduction	106	97,25
Abduction	106	97,25
Internal rotation	37	33,94
External rotation	37	33,94

Table VII: Distribution of patients according to knee movements.

Knee movements	Staff	Percentage
Active movements of the right knee		
Extension	107	98,17
Inflection	107	98,17
Active left knee movements		
Extension	107	98,17
Inflection	107	98,17
Passive movements of the right knee		
Extension	106	97,25
Inflection	107	98,17
Passive movements of the left knee		
Extension	106	97,25
Inflection	107	98,17

Discussion

We conducted a prospective longitudinal study on the contribution of physiotherapy in the management of chronic low back pain in soldiers at the Armed Forces Medical and Surgical Center in Bamako. We included a total of 109 patients who met our criteria.

During the study period, we collected 109 patients with low back pain out of 384 patients admitted to the physiotherapy unit at the Armed Forces Medical and Surgical Center in Bamako, i.e. a frequency of 28.38%. This result is comparable to that of Hou et al [19] in the study, in which low back pain was reported by 425 of the 1,624 soldiers who participated in the study, a prevalence of 26.2%. On the other hand, in the study by Talbot A et al [20] On home therapies to improve the disability, activity, and quality of life of military personnel with subacute low back pain, the sample included 750 active-duty U.S. service members with chronic low back pain.

During the study, patients in an age range between 20-40 years accounted for 66% of cases with a mean age of 37±12 years and extremes of 21 and 69 years. This result is also comparable to that of Saud K [21] who, in his study conducted in Tunisia on the evaluation of muscle strength in chronic low back pain, found an average age of 42±8.6 years. Back E [55] reports in its 2019 study in France a predominance of patients under 35 years old with 93% of cases. The 25-34 age group accounted for 55.4% with an average age of 31 years in Rodrigo M's study [24]. This age range was 20-25 years in the study by Meyer M [57] with a proportion of 63.8% and an average age of 21.7±2.4 years and extremes of 19 and 30 years. The average age was 42.43 years ±11.25 years, with a predominance of the 25 to 64 age group in the work carried out by Zomalhèto and his collaborators [24] in 2017 in Benin.

Male patients were in the majority in our study with 62% of cases. This proportion is lower than that reported by Rodrigo M [23] which was 90.4% in its study in 2022 on the description of the operational factors of common low back pain among Army Light Aviation personnel in overseas operations. In contrast to our study, the female sex was the most represented with a percentage of 64.4% in the Bengaly A study [25] in Mali on the quality of life of patients followed for chronic low back pain in an outpatient clinic in the neurology department of the Gabriel Touré University Hospital (Bamako/Mali).

This predominance of the male sex could be explained by the fact that the profession of arms is much more solicited by men than by women, linked to our habits and customs in our societies

The proportion of married couples was high with 67% of cases, this same observation was made by Rodrigo M [23], in his study in which the majority of the subjects were in a couple, i.e. in 65% of cases. This proportion was higher in the Bengaly A study. [25] in Mali on the quality of life of patients followed for chronic low back pain in an outpatient clinic in the Neurology Department of the Gabriel Toure University Hospital during which married couples represented 73.9% of cases. According to the literature, married staff had a greater risk of low back pain [26].

In terms of military rank, non-commissioned officers were the most represented in our study with 67.89% of cases. This result is different from that of Rodrigo M [23] who in his study, the subjects included were mostly from the category of non-commissioned officers with 51.9% of cases. In Back E's study [22], first-class soldiers were in the majority with 32% of cases. In the study by Ksibi W et al [27] On the effect of a functional spine restoration program in members with chronic low back pain, patients were divided into 15 officers, 20 non-commissioned officers and 25 non-commissioned members (troop officers). The occurrence of this pathology in soldiers can be due to the fact that they are required to perform sometimes extreme physical performance such as carrying weapons and heavy loads, guards and fighting in the field [27].

In terms of experience, patients under 10 years of age accounted for 45.9%. This is comparable to the study carried out by Zomalhèto and his collaborators [24] in

2017 in Benin with a professional experience of more than 5 years in 93.3% of their patients. As for the Bengaly A study, [27], it was between 6 and 15 years of age in 38.4% of cases. The average number of years of experience in the police force was 14.8 ± 8.3 years in Benyamina D's study [28] on the epidemiology of low back pain and quality of life among Quebec police officers. The occurrence of this pathology in these patients could be explained by a decrease over time in the ability of the intervertebral disc nucleus to adapt and regenerate.

We have seen a clear improvement in the health of our patients. The positive impact of physiotherapy was highlighted, which made it possible to go from 0% and 28.4% of patients with total and severe dependence to 33.94% and 11.93% of mild and total dependence respectively. In our context, the most common treatments in the treatment of chronic low back pain are massage and spinal mobilization which are intended to reduce muscle tension. Stretches that allow you to sheath the back and strengthen weakened muscles. Back strengthening combined with strengthening of the abdominals. Abdominal muscle building stabilizes posture and balance, protects the spine from shocks or trauma and promotes range of motion. Physical reconditioning aims to get the patient out of a sedentary lifestyle. Therapeutic patient education, which aims to help the patient understand his or her pathology and to know the different means to be implemented to relieve his or her pain in a completely autonomous way. In a study evaluating the effectiveness of a home isometric strengthening exercise program, Park et al [29] found a significant positive impact just one month before the start of the intervention. Eccentric strengthening exercises cause tendon strengthening by stimulating the tenocytes' mechanoreceptors to produce collagen, which is the key cellular mechanism that determines recovery from tendon injuries [30,31].

In their study, Cruser et al. [32] found that active-duty military personnel with acute low back pain who were randomly assigned to an osteopathic manipulative treatment plus usual care group reported significantly better scores in two aspects of pain scores (Immediate Pain [p=0.025] and Typical Pain [p=0.020]) at four weeks compared to a usual care control group. Similarly, Rhon et al [33] found that military patients who were randomly assigned to a physiotherapy early intervention group reported significantly better Oswestry Disability Index (ODI) scores at four weeks compared to a standard treatment control group.

According to Zadorina et al [34] In their study, the practice of Physiotherapy for only 20 sessions showed significant clinical results on patients with severe low back pain. Low back pain clinical guidelines routinely recommend the use of exercise for non-specific low back pain [35]. However, in our context, an assessment of psychosocial risk factors (warning signs using prognostic screening tools) is needed to predict worse outcomes [36]. Thus, early treatment will improve clinical outcomes and thus better reintegration into the armed forces.

Conclusion

Low back pain can have a significant impact on quality of life, especially in military members, but physiotherapy offers effective solutions to relieve pain, improve mobility, and provide long-term management. By addressing the underlying causes of low back pain and promoting healing and rehabilitation, physiotherapy empowers individuals to take control of their health and well-being.

Our study revealed the significant impact of physiotherapy in the management of low back pain in military personnel at the Armed Forces Medical-Surgical Center, which made it possible to go from 0% and 28.4% of patients with total and severe dependence to 33.94% and 11.93% of mild and total dependence respectively.

An in-depth study would be needed to assess the impact of physiotherapy in the care of military personnel on a large scale.

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