

Physiotherapy Management of Rheumatic Diseases

Aly Badra Kamissoko^{1*}, Abdoulaye Barry¹, Mamadou Lamine Diallo^{1,2}, Boutros Cosme Nato¹, Abdel Amide Gbadamassi¹, Marie Traore¹, Abèni Faouzyath Yaya¹, Facely Traore¹, Paul Eloundou³, Sory Diane¹, Matènè Komara¹, Halimatou Barry¹, Moriba Toure¹, Kaba Conde¹, Owonayo Oniankitan²

¹Department of Rheumatology, Ignace Deen University Hospital, Conakry, Guinea

²Department of Rheumatology, Sylvanus Olympio University Hospital, Lome, Togo

³Faculty of Medicine and Pharmaceutical Sciences, University of Douala, Douala, Cameroon

Email: *drkamissoko@gmail.com

How to cite this paper: Kamissoko, A.B., Barry, A., Diallo, M.L., Nato, B.C., Gbadamassi, A.A., Traore, M., Yaya, A.F., Traore, F., Eloundou, P., Diane, S., Komara, M., Barry, H., Toure, M., Conde, K. and Oniankitan, O. (2024) Physiotherapy Management of Rheumatic Diseases. *Open Journal of Rheumatology and Autoimmune Diseases*, 14, 37-47.

<https://doi.org/10.4236/ojra.2024.141005>

Received: October 31, 2023

Accepted: February 26, 2024

Published: February 29, 2024

Copyright © 2024 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Introduction: Physiotherapy is an integral part of the non-drug treatment strategy for rheumatological conditions. The evidence for its effects is not formal. The objective was to evaluate the impact of physiotherapy in the management of rheumatological disorders. **Methods:** 6-month case-control study (December 15, 2021 to June 20, 2022) at Ignace Deen University Hospital (Conakry). Patients with rheumatological disease who received drug therapy and physiotherapy were included in the case group. Age- and sex-matched controls had rheumatological conditions, treated without physiotherapy. The evaluation questionnaires were used: WOMAC (osteoarthritis), EIFEL (low back pain), NDI (neck pain), SPADI (shoulder). Patients with heart failure, respiratory failure and/or skin infection were not included. **Results:** We collected 773 patients (389 cases and 384 controls) with a mean age of 53.8 years \pm 12.2 with female predominance (56.8%). Patients were mainly followed for osteoarthritis (65.2%). Rheumatological conditions managed were knee-based (119; 30.6%), lumbar spine (220; 56.6%), shoulders (27; 6.9%) and cervical spine (23; 5.9%). For an average duration of 53.4 \pm 12.2 minutes per session, patients had benefited from a median of 19 physiotherapy sessions. After 3 months, the baseline mean VAS of 6/10 improved to 2.2 \pm 1.6 for cases and 5.7 \pm 1.2 for controls. Functional capacity was improved (WOMAC: 41.8 \pm 22.7 vs. 18.3 \pm 7.3). The satisfaction of patients treated with physiotherapy was 20 times higher than in controls. **Conclusion:** Physiotherapy performed in the management of rheumatological conditions significantly reduced pain and improved functional capacity.

Keywords

Rheumatological Disease, Physiotherapy, WOMAC, Guinea

1. Introduction

Physiotherapy is an integral part of the non-drug management of rheumatological conditions. She uses a variety of techniques designed to preserve joint function and maintain muscle strength through adaptive physical activity [1]. Studies have reported its effectiveness [2] [3] [4] [5] [6] as well as its ineffectiveness [7]. The objective was to evaluate the impact of physiotherapy in the management of rheumatological disorders.

2. Patients and Methods

This was a 6-month analytical case-control study from 15/12/2021 to 20/05/2022. We included patients with rheumatological conditions who received drug therapy and physiotherapy sessions in the case group. Age, sex and diagnosis-matched controls were patients with rheumatological conditions who received only drug therapy. We did not include patients with heart failure, respiratory failure or skin infection. Consent was required after explaining the procedure and purpose of the study. The following variables were collected: age, sex, occupation, level of education, origin, duration of illness, body mass index, diagnosis, duration of physiotherapy. The physiotherapy techniques used were physiotherapy, electrotherapy, massage therapy, passive and active joint mobilizations, posture work, axial traction, muscle strengthening, learning self-rehabilitation.

The Visual Analogue Scale (VAS) assessed the patient's pain intensity on a scale from 0 to 10 at the start of physiotherapy and three (03) months after treatment. She described pain as absent pain for VAS = 0, mild pain for VAS = 1 to 3, moderate pain for VAS = 4 to 6, severe pain for VAS = 7 to 9, and extremely severe pain for VAS = 10. VAS was assessed before treatment (VAS1) and three months after treatment (VAS2). The following questionnaires and indices were used: WOMAC (Western Ontario McMaster) to assess osteoarthritis of the lower limbs [8], EIFEL (Functional Disability Scale for the Assessment of Low Back Pain) to assess the functional disability of low back pain patients [9], NDI (Neck Disability Index) to assess the functional impact of neck pain [10], SPADI (Shoulder pain and disability index) to assess the functional impact of shoulder pain [11]. Satisfaction was sought in patients through self-reporting.

2.1. Data Analysis

Data collection was manual using a pre-set survey sheet embedded in the Kobo-collect application.

Qualitative variables were expressed by frequency and percentage. Quantita-

tive variables were expressed as the mean with their standard deviations. For the correlation between the dependent variable and the different independent variables, we used the Chi² test (or Fisher's exact test). The materiality threshold has been set at 5%.

2.2. Ethical Considerations

The protocol had been submitted and approved by a medical college of the CHU Ignace Deen. The information has been collected and treated confidentially with strict compliance with ethics.

3. Results

Three hundred and eighty-nine patients (56.8% women) had received physiotherapy. The mean age was 53.8 years \pm 12.2 years (Ranges: 20 years and 89 years).

Gonarthrosis was found in 119 (30.6%). Cervical pathology (6.9%) was dominated by cervicarthrosis (2.5%). Shoulder pain was mainly related to omarthrosis and tendinopathies (6.7%). For low back pain, low back arthrosis was the leading cause (162; 41.7) followed by herniated discs (19; 4.9%). (**Table 1**)

Pre-treatment, pain intensity was similar in cases and controls (For patients with knee osteoarthritis, VAS1 = 6.2 \pm 1.3 VS VAS2 = 6.1 \pm 1.5. In cervical pathology, VAS1 = 6.2 \pm 1.8 VS VAS2 = 6.1 \pm 1.6. Shoulder pathology, VAS1 = 6.4 \pm 1.1 VS VAS2 = 6.1 \pm 1.2. Low back pain VAS1 = 7.4 \pm 1.6 VS VAS2 = 7.6 \pm 1.1).

After 3 months, pain was significantly reduced and abilities improved better in patients who received physiotherapy.

For patients with knee osteoarthritis treated with physiotherapy, the pain was significantly reduced VAS1 = 6.2 \pm 1.3 VS VAS2 = 2.2 \pm 1.6.

For neck pain, the intensity was reduced: VAS1 = 6.2 \pm 1.8 VS. VAS2 = 1.7 \pm 0.9.

For shoulder pain, the intensity was reduced: VAS1 = 6.4 \pm 1.1 VS. VAS2 = 2.8 \pm 1.3.

For low back pain, VAS1 = 7.4 \pm 1.6 VS VAS2 = 2.9 \pm 1.6. (**Tables 2-5**)

The WOMAC assessment of function found a significant improvement in the components of pain, stiffness and physical function (WOMAC 1 = 18.3 \pm 7.3 VS WOMAC2 = 31.6 \pm 9.7 (p = 0.03). (**Table 6**)

For neck pain, VAS1 = 1.7 \pm 0.9 VS VAS2 = 4.4 \pm 1.02, function was improved (NDI1 = 7.3 \pm 4.1 VS NDI2 = 11.3 \pm 6.4, p = 0.02) (**Table 7**)

For shoulders, pain was slightly reduced VAS 1 = 2.8 \pm 1.3 VS VAS 2 = 3.6 \pm 2.3, improved function SPADI 1 = 15.4 \pm 7.3 VS SPADI 2 = 21.3 \pm 9.7. (**Table 8, Table 9**)

Physiotherapy was significantly associated with patient satisfaction (p = 0.0004). Patients who received physiotherapy were 3 times more likely to be satisfied than controls (**Table 10**).

4. Discussion

We conducted a case-control study to investigate the effectiveness of physiotherapy

Table 1. Distribution of 389 cases and 384 controls by diagnosis.

	Cases <i>n</i> (%)	Controls <i>n</i> (%)
Knee pathology		
Knee osteoarthritis	119 (30.6)	126 (32.8)
Cervical pathology		
Common neck pain	7 (1.8)	8 (2.1)
Cervicarthrosis	10 (2.5)	10 (2.6)
Cervicobrachial neuralgia	06 (1.5)	07 (1.8)
Shoulder pathology		
Rotator cuff tendinopathy	24 (6.2)	16 (4.2)
Osteoarthritis	4 (1)	3 (0.8)
Lumbar pathology		
Lumbar disc herniation	19 (4.9)	13 (3.4)
Narrow lumbar canal	11 (2.8)	08 (2.1)
Low back arthrosis	162 (41.7)	157 (40.9)
Osteoporosis	21 (5.4)	23 (6)
Ankylosing spondylitis	2 (0.5)	1 (0.3)
Tuberculous spondylodiscitis	5 (1.3)	2 (0.5)
Total	389 (100)	384 (100)

Patients received a median of 19 physiotherapy sessions. The average duration of the physiotherapy session was 53.4 ± 12.2 minutes.

Table 2. Distribution of 119 cases and 126 controls diagnosed with knee osteoarthritis according to VAS before and 03 months after drug treatment plus physiotherapy.

	Cases <i>n</i> (%)	Controls <i>n</i> (%)	
VAS before treatment	4 - 6	82 (68.9)	75 (59.5)
	7 - 9	37 (31.1)	51 (40.4)
	Total	119 (100)	126 (100)
VAS after 3 months	1 - 3	92 (77.3)	47 (37.3)
	4 - 6	24 (20.2)	79 (62.7)
	Total	119 (100)	126 (100)

Mean VAS for cases: 6.2 ± 1.3 ; Mean VAS for cases: 2.2 ± 1.6 ; Mean VAS for controls: 6.1 ± 1.5 ; Mean VAS for controls: 5.7 ± 1.2 .

Table 3. Distribution of 23 cases and 25 controls diagnosed with cervical pathologies according to VAS before and 3 months after drug treatment plus physiotherapy.

	Cases <i>n</i> (%)	Controls <i>n</i> (%)	
VAS before treatment	4 - 6	18 (78.2)	16 (64)
	7 - 9	5 (21.7)	9 (36)
	Total	23 (100)	25 (100)
VAS after 3 months	1 - 3	19 (82.7)	6 (24)
	4 - 6	4 (17.3)	19 (76)
	Total	23 (100)	25 (100)

Mean VAS for cases: 6.2 ± 1.8 ; Mean VAS for cases: 1.7 ± 0.9 ; Mean VAS for controls: 6.1 ± 1.6 ; Mean VAS for controls: 4.4 ± 1.02 .

Table 4. Distribution of 27 cases and 29 controls diagnosed with shoulder pathologies according to VAS before and 03 months after drug treatment plus physiotherapy.

		Cases n (%)	Controls n (%)	
VAS before treatment	4 - 6	21 (77.8)	18 (62.1)	
	7 - 9	6 (22.3)	11 (37.9)	
	Total	27 (100)	29 (100)	P-value = 0.01
VAS after 3 months	1 - 3	23 (85.1)	21 (72.4)	
	4 - 6	4 (14.8)	8 (27.6)	
	Total	27 (100)	29 (100)	

Mean VAS for cases: 6.4 ± 1.1 ; Mean VAS for cases: 2.8 ± 1.3 ; Mean VAS for controls: 6.1 ± 1.2 ; Mean VAS for controls: 3.6 ± 2.3 .

Table 5. Distribution of 220 cases and 204 controls diagnosed with lumbar pathology according to VAS before and 03 months after drug treatment plus physiotherapy.

		Cases n (%)	Controls n (%)	
VAS before treatment	4 - 6	49 (22.2)	35 (17.1)	
	7 - 9	134 (60.9)	163 (79.9)	
	10	37 (16.8)	6 (2.9)	
	Total	220 (100)	204 (100)	P-value = 0.04
VAS after 3 months	1 - 3	188 (87.1)	101 (50.6)	
	4 - 6	28 (12.9)	90 (45)	
	Total	216 (100)	200 (100)	

Mean VAS for cases: 7.4 ± 1.6 ; Mean VAS for cases: 2.9 ± 1.6 ; Mean VAS for controls: 7.6 ± 1.1 ; Mean VAS for controls: 3.1 ± 1.01 .

Table 6. Distribution of 119 cases and 126 controls diagnosed with knee osteoarthritis according to WOMAC before and 03 months after drug treatment plus physiotherapy.

		Cases	Controls	
		Mean	Mean	
VAS before treatment	Pain	13.4 ± 7.1	14.1 ± 7.5	
	Stiffness	4.7 ± 1.8	4.2 ± 2.1	
	Physical Function	22.9 ± 12.4	21.2 ± 12.6	
	WOMAC Total	41.8 ± 22.7	42.4 ± 23.1	P-value = 0.03
VAS after 3 months	Pain	5.8 ± 2.1	12.3 ± 7.5	
	Stiffness	1.04 ± 0.6	3.7 ± 1.4	
	Physical Function	9.7 ± 3.7	20.8 ± 7.1	
	WOMAC Total	18.3 ± 7.3	31.6 ± 9.7	

Table 7. Distribution of the 23 cases and 25 controls diagnosed with cervical pathologies according to NDI (Neck disability index) before and 03 months after drug treatment plus physiotherapy.

		Cases n (%)	Controls n (%)	
NDI before treatment	10 - 29	12 (52.1)	16 (64)	
	30 - 50	11 (47.9)	9 (36)	
	Total	23 (100)	25 (100)	P-value = 0.02
NDI after 3 months	0 - 9	16 (69.6)	7 (28)	
	10 - 29	7 (30.4)	18 (72)	
	Total	23 (100)	25 (100)	

Average NDI for cases: 25.9 ± 12.3 Average NDI for cases: 7.3 ± 4.1 ; Mean NDI for cases: 25.1 ± 11.8 Mean NDI for controls: 11.3 ± 6.4 .

Table 8. Distribution of the 27 cases and 29 controls diagnosed with shoulder pathologies according to SPADI (shoulder pain and disability index) before and 03 months after drug treatment plus physiotherapy.

		Cases	Controls	
		Mean	Mean	
SPADI before treatment	Pain	37.8 ± 13.3	38.3 ± 13.5	
	Shoulder disability	41.7 ± 17.8	39.2 ± 14.3	
	Total	58.3 ± 23.9	55.6 ± 20.8	P-value = 0.01
SPADI after 3 months	Pain	9.2 ± 4.7	12.8 ± 8.3	
	Shoulder disability	11.7 ± 6.1	22.6 ± 7.6	
	Total	15.4 ± 7.3	21.3 ± 9.7	

Function was improved; EIFEL 1 = 6.9 ± 2.8 VS EIFEL 2 = 11.2 ± 4.1 .

Table 9. Distribution of 216 cases and 200 controls diagnosed with lumbar pathology according to EIFEL (Functional Disability Scale for the Assessment of Low Back Pain) before and 03 months after drug treatment plus physiotherapy.

		Cases n (%)	Controls n (%)	
EIFEL before treatment	0 - 14	93 (43.1)	91 (45.5)	
	15 - 24	123 (56.9)	109 (54.5)	
	Total	216 (100)	200 (100)	P-value = 0.03
EIFEL after 3 months	0 - 14	173 (80.1)	112 (56)	
	15 - 23	43 (19.9)	88 (44)	
	Total	216 (100)	200 (100)	

Mean EIFEL for cases: 19.2 ± 9.7 ; Mean EIFEL for cases: 6.9 ± 2.8 ; Mean EIFEL for controls: 17.8 ± 9.1 ; Mean EIFEL for controls: 11.2 ± 4.1 .

Table 10. Correlation between physiotherapy and patient satisfaction after treatment.

		Physiotherapy		OR (95%)	p-value
		Yes	No		
Satisfaction	Yes	321 (82.5%)	171 (44.6%)	03.1 (13.9 - 28.9)	0.0004
	No	68 (17.5%)	213 (55.4%)		
	Total	389 (100%)	384 (100%)		

in the management of rheumatic diseases. The study was carried out in the rheumatology department alone. The relatively high cost of physiotherapy sessions and the non-compliance of some patients with follow-up appointments were the main difficulties in data collection. However, the results we have achieved have made it possible to assess the impact of physiotherapy in the management of rheumatological conditions.

Of the 773 patients, 389 benefited from physiotherapy sessions in addition to drug treatment. The female predominance of rheumatological conditions was similar to Togolese and Congolese data [12] [13]. Similarly, the mean age (53.8 years \pm 12.2 years) was consistent with Ivorian data [14]. Osteoarthritis was the most commonly diagnosed rheumatic disease in our patients with a frequency of 65.2%. This supports data from the literature that reports that osteoarthritis is the leading rheumatological condition in the general population [15].

The site of the rheumatological disease was in (55.1%) of cases of the lumbar spine followed by the knee in (31.7%) of all patients. This found frequency has been reported in several African series by Ouédraogo and al. [16] in Burkina Faso and Rakotomalala and al. [17] in Madagascar. This could be related to the arduousness of daily life and being overweight, which is perceived as a sign of well-being. Parameters assessing functional impact (WOMAC, SPADI, NDI, and EIFEL) and pain intensity (VAS) were similar in both groups before treatment. For example, diagnosed cases of osteoarthritis of the knee had a mean difference of 13.3 points on the WOMAC index and 3.5 points on the VAS scale three months after treatment compared to controls. These results corroborate those of Gail and al. [18] in the United States and Deniz and al. [19] in Turkey, who reported a mean difference of 18.8 points on the WOMAC scale and 3.3 points on the VAS scale, respectively.

This difference in score could be explained by the techniques used in the physiotherapy management of knee osteoarthritis which contribute to muscle strengthening, to the increase of muscle mass, thus reducing pain and disability and then leading to an increase in functional capacity [20].

In patients diagnosed with cervical pathology, there was a significant improvement in pain (cases 2.1 \pm 0.9 Vs controls 4.4 \pm 1.02) and functional disability (cases 7.3 \pm 4.1 Vs controls 11.3 \pm 6.4) in cases compared to controls with a mean difference of 2.3 points for the VAS scale and 4 points for the NDI functional disability score. This result can be superimposed on that of Sherman KJ [21] in the United States, who reported a significant improvement in functional

disability with a mean difference of 2.3 points, 10 weeks after physiotherapy sessions. This could be related to the mobilization and use of a cervical neck brace that allowed our patients to regain the range of motion of the cervical spine. However, this result differs from that of KL Brennan and al [22] who showed a total reduction in pain and functional disability in patients. This discrepancy could be explained by the fact that the latter in their study combined electrotherapy with acupuncture. Our results are consistent with those of the literature that reported a benefit of physical exercise combined with massage therapy for chronic neck pain [23].

Patients diagnosed with shoulder pathology showed a mean difference of 6.3 points compared to controls. Littlewood C [24] and Mueller MJ [25] in their studies had reported higher mean scores of the SPADI index of 12.4 and 13 points, respectively. Such a difference could be explained by contextual factors, such as the patient population, the treating physiotherapist and the content of the overall sessions. Mohamed AA *et al.* [26]. The decrease in assessment scores observed in cases could be attributed to the decrease in stiffness of the musculotendinous complex and the adhesions formed as a result of prolonged immobilization between the scapula and the thorax as improvement progresses.

In patients with low back pain, there was a significant reduction in pain in both groups and a mean difference of 4.3 points in the EIFEL index. Facci and al. [27] reported a significant decrease in disability scores after electrotherapy sessions. Similarly, Hahn *et al.* [28] showed that the rate of pain reduction in an exercise group combined with electrotherapy was significantly higher than in the electrotherapy group alone. In our study, the addition of electrotherapy to exercise warranted further improvement in cases. This would explain why physical exercise has fundamental and structural effects on the body. Also, electrotherapy would cause the activation of inhibitory interneurons in the dorsal horn of the spinal cord, which would prevent nociceptive impulses from passing to the central nervous system.

5. Conclusion

Physiotherapy for rheumatological conditions significantly reduced pain and improved functional capacity. Satisfaction was noted in 82.5% of patients and was significantly associated with physiotherapy.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

- [1] Escalas, C., Dalichampt, M., Dougados, M. and Poiraudeau, S. (2016) Évaluation de l'effet de la kinésithérapie dans une cohorte de patients atteints de spondyloarthrite axiale débutante. Données de la cohorte DESIR. *Revue du Rhumatisme*, **83**, 352-357. <https://doi.org/10.1016/j.rhum.2016.05.004>
- [2] Fritz, J.M., Magel, J.S., *et al.* (2015) Early Physical Therapy vs Usual Care in Patients

- with Recent-Onset Low Back Pain: A Randomized Clinical Trial. *JAMA*, **314**, 1459-1467. <https://doi.org/10.1001/jama.2015.11648>
- [3] Skou, S.T. and Roos, E.M. (2019) Physical Therapy for Patients with Knee and Hip Osteoarthritis: Supervised, Active Treatment Is Current Best Practice. *Clinical and Experimental Rheumatology*, **37**, 112-117.
- [4] Tunwattanapong, P., Kongkasuwan, R. and Kuptniratsaikul, V. (2016) The Effectiveness of a Neck and Shoulder Stretching Exercise Program among Office Workers with Neck Pain: A Randomized Controlled Trial. *Clinical Rehabilitation*, **30**, 64-72. <https://doi.org/10.1177/0269215515575747>
- [5] Kharrat, O., Lebib, S., Miri, I., Aloulou, I., Othmani, I., Ben Souilah, R., et al. (2013) Prise en charge de la polyarthrite rhumatoïde en médecine physique réadaptation: Expérience en Tunisie. *Journal de Réadaptation Médicale. Pratique et Formation en Médecine Physique et de Réadaptation*, **33**, 54-64. <https://doi.org/10.1016/j.jrm.2013.02.001>
- [6] Muzembo Ndundu, J. and Makekita Kiadakulu, S. (2012) Évaluation fonctionnelle d'une population des lombalgiques de Kinshasa par l'échelle d'EIFEL *Journal de Réadaptation Médicale. Pratique et Formation en Médecine Physique et de Réadaptation*, **32**, 103-107. <https://doi.org/10.1016/j.jrm.2012.09.002>
- [7] Bennell, K.L., Egerton, T., Martin, J., Abbott, J.H., Metcalf, B., McManus, F., et al. (2014) Effect of Physical Therapy on Pain and Function in Patients with Hip Osteoarthritis: A Randomized Clinical Trial. *JAMA*, **311**, 1987-1997. <https://doi.org/10.1001/jama.2014.4591>
- [8] Bellamy, N., Buchanan, W.W., Goldsmith, C.H., Campbell, J. and Stitt, L.W.J. (1995) Validation of WOMAC: A Health Status Instrument for Measuring Clinically Important Patient Relevant Outcomes to Antirheumatic Drug Therapy in Patients with Osteoarthritis of the Hip or Knee. *Journal of Rheumatology*, **15**, 1833-1840.
- [9] Coste, J., Le Parc, J.M., Berge, E., et al. (1993) French Validation of a Disability Rating Scale for the Evaluation of Low Back Pain (EIFEL Questionnaire). *Revue Du Rhumatisme (Ed. Francaise: 1993)*, **60**, 335-341.
- [10] Vernon, H. (2008) The Neck Disability Index: State-of-the-Art, 1991-2008. *Journal of Manipulative and Physiological Therapeutics*, **31**, 491-502. <https://doi.org/10.1016/j.jmpt.2008.08.006>
- [11] Angst, F., Schwyzer, H.-K., Aeschlimann, A., Simmen, B.R. and Goldhahn, J. (2011) Measures of Adult Shoulder Function: Disabilities of the Arm, Shoulder, and Hand Questionnaire (DASH) and Its Short Version (QuickDASH), Shoulder Pain and Disability Index (SPADI), American Shoulder and Elbow Surgeons (ASES) Society Standardized Shoulder. *Arthritis Care and Research*, **63**, S174-S188. <https://doi.org/10.1002/acr.20630>
- [12] Houzou, P., Oniankitan, O., Kakpovi, K., Tagbor, K.C., Fianyo, E., Mijiyawa, M., et al. (2013) Profil des affections rhumatismales chez 13517 patients ouest-africains. *La Tunisie Médicale*, **91**, 16-20.
- [13] Nzambi, J.D., Malemba, J.J., Lebughe, L.P., Mpembele, E., Mulenga, C., Lukusa, A., et al. (2017) The Epidemiology of Rheumatic Disorders in a Rural Area of the Democratic Republic of Congo (DRC): A COPCORD Study. *African Journal of Rheumatology*, **5**, 64-69.
- [14] Kouakou N'Zue, M., Akissi, L.N., Eti, E., Daboiko, J., Gabla, A., Odi, R., Traoté, A. and Azttia, Y. (1989) La rhumatologie en milieu hospitalier ivoirien: Données épidémiologiques à propos de 2294 cas. Abidjan, 20 p.
- [15] Leaver, A.M., Refshauge, K.M., Maher, C.G., et al. (2010) Conservative Interven-

- tions Provide Short-Term Relief for Non-Specific Neck Pain: A Systematic Review. *Journal of Physiotherapy*, **56**, 73-85. [https://doi.org/10.1016/S1836-9553\(10\)70037-0](https://doi.org/10.1016/S1836-9553(10)70037-0)
- [16] Ouédraogo, D.-D., Ntsiba, H., Tiendrébéogo Zabsonré, J., Tiéno, H., Bokossa, L.I., Kaboré, F., Drabo, J., *et al.* (2014) Clinical Spectrum of Rheumatologic Diseases in a Department of Rheumatology in Ouagadougou (Burkina Faso). *Clinical Rheumatology*, **33**, 385-389. <https://doi.org/10.1007/s10067-013-2455-4>
- [17] Rakotomalala, H.N., Razanaparany, M.O., *et al.* (2016) Cinq ans de Rhumatologie à Madagascar: Dures réalités et quelles perspectives? *Revue Marocaine de Rhumatologie*, **37**, 33-38.
- [18] Deyle, G.D., Allen, C.S., Allison, S.C., Gill, N.W., Hando, B.R., Petersen, E.J. Dusenberry, D.I. and Rhon, D.I. (2020) Physical Therapy versus Glucocorticoid Injection for Osteoarthritis of the Knee. *The New England Journal of Medicine*, **382**, 1420-1429. <https://doi.org/10.1056/NEJMoa1905877>
- [19] Evcik, D. and Sonel, B. (2002) Effectiveness of a Home-Based Exercise Therapy and Walking Program on Osteoarthritis of the Knee. *Rheumatology International*, **22**, 103-106. <https://doi.org/10.1007/s00296-002-0198-7>
- [20] O'Reilly, S.C., Muir, K.R. and Doherty, M. (1999) Effectiveness of Home Exercise on Pain and Disability from Osteoarthritis of the Knee: A Randomised Controlled Trial. *Annals of the Rheumatic Diseases*, **58**, 15-19. <https://doi.org/10.1136/ard.58.1.15>
- [21] Sherman, K.J., Cherkin, D.C., Hawkes, R.J., Miglioretti, D.L. and Deyo, R.A. (2009) Randomized Trial of Therapeutic Massage for Chronic Neck Pain. *The Clinical Journal of Pain*, **25**, 233-238. <https://doi.org/10.1097/AJP.0b013e31818b7912>
- [22] Brennan, K., Elifritz, K.M., Comire, M.M. and Jupiter, D.C. (2021) Rate and Maintenance of Improvement of Myofascial Pain with Dry Needling alone vs. Dry Needling with Intramuscular Electrical Stimulation: A Randomized Controlled Trial. *Journal of Manual and Manipulative Therapy*, **29**, 216-226. <https://doi.org/10.1080/10669817.2020.1824469>
- [23] Evans, R., Bronfort, G., Schulz, C., Maiers, M., Bracha, Y., Svendsen, K., *et al.* (2012) Supervised Exercise with and without Spinal Manipulation Performs Similarly and Better Than Home Exercise for Chronic Neck Pain: A Randomized Controlled Trial. *Spine*, **37**, 903-914. <https://doi.org/10.1097/BRS.0b013e31823b3bdf>
- [24] Littlewood, C., Bateman, M., Brown, K., Bury, J., Mawson, S., May, S., *et al.* (2016) A Self-Managed Single Exercise Programme versus Usual Physiotherapy Treatment for Rotator Cuff Tendinopathy: A Randomised Controlled Trial (The SELF Study). *Clinical Rehabilitation*, **30**, 686-696. <https://doi.org/10.1177/0269215515593784>
- [25] Mueller, M.J., Sorensen, C.J., McGill, J.B., Clark, B.R., Lang, C.E., Chen, L., *et al.* (2018) Effect of a Shoulder Movement Intervention on Joint Mobility, Pain, and Disability in People With Diabetes: A Randomized Controlled Trial. *Physical Therapy*, **98**, 745-753. <https://doi.org/10.1093/ptj/pzy070>
- [26] Mohamed, A.A., Jan, Y.K., El Sayed, W.H., Wanis, M.E.A. and Yamany, A.A. (2020) Dynamic Scapular Recognition Exercise Improves Scapular upward Rotation and Shoulder Pain and Disability in Patients with Adhesive Capsulitis: A Randomized Controlled Trial. *Journal of Manual and Manipulative Therapy*, **28**, 146-158. <https://doi.org/10.1080/10669817.2019.1622896>
- [27] Facci, L.M., Nowotny, J.P., Tormem, F. and Trevisani, V.F. (2011) Effects of Transcutaneous Electrical Nerve Stimulation (TENS) and Interferential Currents (IFC) in Patients with Nonspecific Chronic Low Back Pain: Randomized Clinical Trial. *São Paulo Medical Journal*, **129**, 206-216.

<https://doi.org/10.1590/S1516-31802011000400003>

- [28] Hahn, S.-W. (2002) The Effects of Exercise Therapy and Transcutaneous Electrical Nerve Stimulation for the Alleviation of Low Back Pain after Coronary Angiography. *Korean Society of Adult Nursing*, **14**, 222-232.