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Handlers' Musculoskeletal Disorders in an Airline Operating Company in Conakry (Guinea)

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Abstract

Introduction: Musculoskeletal disorders are disorders of the musculoskeletal system related to work. The objective of this study was to musculoskeletal disorders among SOGEAC handlers. Methodology: This was a descriptive and analytic cross-sectional study over 6 months from November 2021 to April 2022. Results: We collected 110 handlers during the study. All of our population had postural constraints and were men. The average age of workers was 39.2 years. 93 handlers or 84.5% did manual handling, and 79% or 71.8% were baggage handlers. Regarding training, 88.2% or 97 handlers were trained, and 89.1% did alternating work. The standing posture was the most adopted with 89.1% followed by the kneeling position with 66.4%. 89.1% carried weights at work. 80 handlers or 73% had developed musculoskeletal disorders and the lumbar seat was found at 70%. The analysis of factors that may influence the occurrence of musculoskeletal disorders did not find any statistically significant relation. Conclusion: Our study shows that musculoskeletal disorders are an occupational health problem and recommends better compliance with occupational safety and health instructions.

Keywords

Musculoskeletal Disorders, Postural Constraints, Airport Handling, Conakry

1. Introduction

Musculoskeletal disorders (MSD) are work-related disorders. They are also known as periarticular affections. According to the INRS, musculoskeletal disorders sum-

marized many affections such as reversible postural fatigue and, other characterised pathologies tendinitis, and tenosynovitis. These disorders can be definitive lesions [1]. The main causes of musculoskeletal disorders are manual handling of loads, stress and body vibrations while driving vehicles [2]. These postural and joint constraints, or "painful postures" are on the one hand situations that result in forced positions of the joints, those with extreme angles of the joints and, on the other hand the maintenance of an identical joint position for a long period which can generate local physical stresses [3]. At airports, the position of passengers in a posture, repetitive gestures and the use of force to lift, lower, push, pull or otherwise move their baggage represent serious ergonomic hazards for workers [4]. Worldwide, baggage handlers are five times more likely to suffer from musculoskeletal disorders [5]. Unfortunately, no statistics have been published on the airport sector in Guinea. This is why we initiated this study to describe the expressions of musculoskeletal disorders and assess their different risk factors.

2. Methods

This was a six-month cross-sectional and analytical study from November 2021 to April 2022. Three hundred and fifty-two workers were counted at SOGEAC during this period. We looked at the workers involved in handling. Only 110 were included in our study. Among all the workers selected, the following elements were studied: age, sex, level of education, residence, marital status, lifestyle, history, type of handling, work position, existence of training, Occupational seniority, work mode, working schedule, postures, use of motor vehicles, load bearing, frequency, intensity and location of pain.

The limitations of this work were the impossibility of evaluating the vibration of the machines due to the multiple types of vehicles, the subjective aspect of some parameters to be evaluated and, the absence of legislation regarding airport handling and musculoskeletal disorders.

3. Results

One hundred and ten workers met our criteria. All the workers were men (100%). The average age was 39.2±8.8 years. One hundred and two workers lived in the main city (Conakry), and only eight lived outside of Conakry. The age groups, education, marital status, lifestyle and personal medical history are described in **Table 1**.

Over 80% of the work was manual and 89% in standing posture. 88.18% of workers got the handler's formation. The professionnal characteristics are described in **Table 2**.

As for the frequency of MSD, the involvement occurred frequently in the neck at 55.6% (5/9), in the back at 46.2% (6/13), in the lumbar level at 42.9% (33/77) and almost always in the wrist. The intensity was moderate in more than half of the cases in all locations except on the wrists where it was strong. These results are in **Table 3** and **Table 4**.

Table 1. Sociodemographics characteristics of the workers.

Sociodemographics characteristics	Effectifs (N = 110)	Frequency (%)
Age groups (years)		
≤30	12	10.9
31 - 40	**65**	**59.1**
41 - 50	17	15.5
>50	16	14.5
Education		
Not Educated	13	11.8
Educated	**97**	**88.2**
Marital Status		
Single	28	25.5
Divorced	1	0.9
Married	**80**	**72.7**
Widower	1	0.9
Lifestyle		
Tabaco	22	20
Alcohol	1	0.9
No vices	87	79.1
Personal medical history		
Aeticular rheumatism	3	2.7
Discal Herniorraphy	2	1.8
Inguinal Herniorraphy	7	6.4
Ombilical Herniorraphy	1	0.9
None	85	77.3

Table 2. Professional characteristics.

	Effectif	Frequency %
Professionnal characteristics		
Manual	93	
Mecanic	17	
Drivers	7	
Warehouse workers	5	
Tractors driver	7	

Continued

Working time (hour)		
8	97	88.2
10	13	11.8
Number of working day per week		
3	12	11
≥4	97	89
Seniority (years)		
≤3	14	12.7
4 - 6	49	44.5
7 - 9	14	12.7
10 - 12	18	16.4
Posture		
Sitting	12	10.9
Sanding	98	89.1
Total duration per day in hour (n = 12)		
5	7	58.3
6	5	41.7
Total duration of exposition per week in hour (n = 12)		
20	1	8.3
>20	11	91.7

Table 3. Site of the musculoskeletal disorders.

Site of the musculoskeletal disorders	Effectif N = 110	Pourcentage
Neck	9	8.2
Back	13	11.8
Lombar	77	70
Right Shoulder	8	7.3
Left Shoulder	15	13.6
Right elbow	2	1.8
Left elbow	1	0.9
Right Wrist	3	2.7
Left Wrist	3	2.7

Table 4. Identification of the risk factors of musculoskeletal disorders.

Factors	Musculoskeletal disorders		RR	IC (95%)	P
	Yes n = 87 (%)	Non n = 21 (%)			
Age					
≤40	57 (78.1)	16 (21.9)	1.16	0.5 - 2.6	0.7
>40	30 (81.1)	7 (18.9)	1		
MBI					
≤24.9	49 (80.3)	12 (19.7)	0.87	0.4 - 1.8	0.7
>24.9	38 (77.6)	11 (22.4)	1		
Sitting posture					
Yes	10 (83.3)	2 (16.7)	1.29	0.3 - 4.8	0.7
No	77 (78.6)	21 (21.4)	1		
Taking **Loads**					
Yes	76 (78.4)	21 (21.6)	0.71	0.2 - 2.69	0.6
No	11 (84.6)	2 (15.4)	1		
Posture debout					
Yes	77 (78.6)	21 (21.4)	0.78	0.2 - 2.9	0.7
No	10 (83.3)	2 (16.7)	1		
Posture à genoux					
Yes	56 (76.7)	17 (23.3)	0.70	0.3 - 1.62	0.4
No	31 (83.8)	6 (16.2)	1		
Posture assise					
Yes	10 (83.3)	2 (16.7)	1.29	0.3 - 4.8	0.7
No	77 (78.6)	21 (21.4)	1		
Port de charge					
Yes	76 (78.4)	21 (21.6)	0.71	0.2 - 2.69	0.6
No	11 (84.6)	2 (15.4)	1		
Posture debout					
Yes	77 (78.6)	21 (21.4)	0.78	0.2 - 2.9	0.7
No	10 (83.3)	2 (16.7)	1		
Posture à genoux					
Yes	56 (76.7)	17 (23.3)	0.70	0.3 - 1.62	0.4
No	31 (83.8)	6 (16.2)	1		

4. Discussion

From 01 November 2021 to 30 April 2022, we registered 352 workers at the Ahmed Sékou Toure International Airport in Conakry, among whom 110 were handlers or a frequency of 31.25%. All these handlers (100%) adopted at least a restrictive posture during their daily work. These results differ from those found in the literature [6]. This frequency demonstrates that MSDs are a real health problem at work. The airport sector is characterized by a high rate of processing information, passengers and their baggage, which often exceeds the recommended standard. This restrictive pace would cause repetitive movements at high rates, thus exposing employees to the occurrence of MSDs.

All handlers (100%) were male. These results differ from those found in the [7] [8]. Conakry airport is not fully mechanized, so most operations are manual. Thus the laborious physical aspect of the handling jobs would mean that this work is much less requested by women. The majority of handlers (88.2%) were educated, compared with 11.2% not. These results are similar to those in the literature [9]

Education could be an important selection criterion in the hiring process in this sector because of the need to be able to at least read and write to understand written instructions, scheduling tables and writing reports. More than two-thirds (92.7%) of the handlers resided in the city of Conakry.

The geographical location of this airport in the capital would make the inhabitants of it the most numerous among the handlers because travel costs are reduced for them. Manual handling dominated with 84.5% against 15.5% of mechanical type. The porter's position was the most represented with 71.8% followed by volunteers (10.9%).

Manual handlers would be the majority because they work most often on the chain to move loads one by one and therefore need a large workforce for loading and unloading operations, Unlike mechanical handling tasks where a single worker can load or unload several containers in relatively short time with the help of a trolley.

More than two-thirds (88.2%) of the workers had received handling training, compared with 11.8% who had not received any training. These results are consistent with the literature [10]. The requirement for handling companies to train workers in occupational safety and health to have the necessary accreditation and the presence of volunteer handlers at airports would justify this result.

The average length of service for cargo handlers was 5.6 years with extremes of 3 (15.5%) and >9 (12.7%). The seniority group in the handling position from 4 to 6 years was dominant with 44.5%. These results diverge from those found in the literature [11]. The accumulation of experience in cargo handling at airports would make this sector an ideal area for the worker.

More than half of the handlers (89.1%) had alternating working hours, compared with 10.9% who worked on morning shifts. The majority (88.2%) of the handlers worked 8 hours/day, compared to 11.8% who worked 10 hours/day with an average of 8.24 hours. These results are similar to those found in the literature

[8].

The fact that this international airport is operational 24/7, hence the need to have at least one team of handlers permanently in service would be the origin of this phenomenon.

In our study, 89.1% of the handlers adopted a standing posture during work, and 66.4% of them were often in a kneeling position. These results are similar to those found in the literature [12] [13].

This result would be explained by the requirement to stand during manual handling of loads, working in restricted spaces and driving mechanical handling vehicles. Although all handlers suffer from postural stress, musculoskeletal disorders were present in 75% of the handlers with a dominant lumbar localization of 70%. These results are similar to those found in the literature [14].

This is because the inevitable working postures of the handlers (leaning position) and the repeated torsion movements of the bust during the passage to the heavy load chain stress the spine, mainly its lumbar portion.

5. Conclusions

Airport handling work is complex and exposes workers to various constraints and demands in the performance of tasks.

MSD reached 73% of the SOGEAC's handlers and postural constraints are dominated by bipedal position with 89.1% for standing posture. The manual charging port is more practised than the mechanical charging port. The conditions of overexertion were mainly located in the spine and shoulders with 70% of TMS lumbar localization. This sector is also characterized by atypical working hours with occupational stress factors. The results of our analysis, which showed no significant link, raise questions about the possible existence of other less visible factors that may influence the occurrence of TMS in SOGEAC's material handlers. These factors will be the subject of additional studies to better understand the phenomenon and extend the practical applications of these results to other sectors of activity to better protect the health of all workers.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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