Chapter 31

Factors associated with cervical disability

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ABSTRACT

The study aimed to identify the prevalence and factors associated with cervical disability in military police officers. This is a cross-sectional study conducted at the 55th Independent Company of the Military Police, in the city of Ipiaú, Bahia - Bahia. To collect the information, a specific form was used, composed of four blocks of questions: sociodemographic characteristics; work conditions; health conditions (including cervical symptomatology); and cervical disability index (Neck Disability Index). The sample consisted of 45 military policemen of both sexes, aged between 20 and 49 years, regardless of whether or not they had clinical diagnosis of cervicalgia. The results showed that there is a significant prevalence of minimal cervical disability in military police, being higher among women, and that it may be related to working conditions and health conditions of these workers.

Keywords: Cervicalgia, Military Police, Pain.

1 INTRODUCTION

Neck pain was evaluated as the fourth largest physical complaint of global dimensions, declared in 2012 by the Global Burden of Disease Study, having an annual incidence ranging from 10.4% to 21.3%. It is frequently associated with morbidity and disability and can affect about 30% of the population, mainly women[1] .

The pathology, on the part of patients, is reported as responsible for a reduction in quality of life, which affects the economically active population, forcing a change in lifestyle, dependence on medication, depression, social isolation, in addition to time off work. Thus, cervicalgia cannot be seen only as a medical problem, but also as a socioeconomic problem[2] .

Because it is multifactorial, it is difficult to identify the main cause of cervical pain. Among the main labor risk factors, one can mention: incorrect postural movements, resulting or not from inadequacies of the work environment, equipment operation and organization of work execution[3] . The adequacy and organization of the work environment related to ergonomics is fundamental for the prevention of injuries to the worker's health, because the adoption of an inadequate posture in the work environment can lead to injuries and damage to various parts of the body, generating, among other problems, musculoskeletal problems[4] .

Added to this, the lack of physical conditioning, overloading of the posterior cervical muscles (in the attempt of postural correction of anteriorization of the head over the spine), weight gain, obesity, the

height and bad posture are conditions that can culminate with the onset and progression of pain, thus compromising the psychosocial well-being[5] .

In the military police activity, the individual is exposed to a series of factors that can negatively interfere in his/her health. Studies indicate that the activity has a natural propensity to develop musculoskeletal pains due to the posture and load borne during police work, culminating in health problems for the individual. Overt policing, for example, requires that the military remain standing for a long period of time, with inadequate posture and using equipment that overloads the spine[6] .

The investigation of this theme may bring an important contribution in the sense of generating knowledge to the group studied, to the professionals interested, and to the population about the possible risk factors related to sociodemographic characteristics, work conditions, and health conditions that may culminate in the appearance of cervical pain. Thus, we sought to identify the prevalence and factors associated with neck disability in military police officers.

2 METHODOLOGY

This is a cross-sectional study, carried out at the 55th Independent Military Police Company, in the city of Ipiau, Bahia, Brazil.

The sample was composed of 45 military policemen of both sexes, aged between 20 and 49 years, who were working in the operational or administrative sector and who complained of cervical pain, regardless of whether or not they had a clinical diagnosis of neck pain.

To collect the information, we used a form composed of four blocks of questions: sociodemographic characteristics; working conditions; health conditions (including cervical symptomatology); and cervical disability index. Independent variables were defined as those related to sociodemographic characteristics, such as gender (female and male), age group (20-29 years; 30-39 years; and 40-49 years), skin color (black, brown, and white), education (complete high school; incomplete college; and complete college) and marital status (single; married; and divorced); working conditions, composed of length of service (<1 year; 1 to 5 years; 6 to 10 years; and >10 years), position in the Military Police (Car Commander (CMT);Car patrolman (PTR); Car Driver (MOT); and Administrative (ADM), use of Personal Protective Equipment (PPE) (vest; weapons; swim; and all PPE), transportation for policing (on foot; motorcycle; and 4 wheel drive vehicle (VTR)), hours standing (2 hours; 4 hours; and 6 hours), hours sitting (2 hours; 4 hours; 6 hours; 8 hours; and 10 hours); health conditions and cervical symptomatology, with information about physical activity practice (soccer; weightlifting; swimming; crossfit; street running; martial arts; and nothing), knowledge about stretching (don't know; know and do; and know but don't do), frequency of neck pain (yes, daily; yes, 2 times a week; sim, 4 vezes por semana; sim, várias vezes), horário/duração da dor cervical (não; sim, noite, 1 hora; sim, 3 horas; sim, manhã, 1 hora; sim, tempo todo), período da dor cervical (não sinto; < 2 meses; de 2 a 4 meses; > 4 months), absence from work due to neck pain (no; yes, 1 time; yes, 2 times),

treatment of neck pain (no; yes, medication; yes, physical therapy), physical therapy for neck pain (never did; 2 times a week; 1 month; > 1 month), improvement after treatment (no; temporary), influence of posture (yes; no), and precautions for neck pain (don't know; avoid heavy equipment; do physical activity; maintain correct posture; and do not stay in the same posture for long periods).

The neck disability index was defined as the dependent variable of the study, and was obtained through the Neck Disability Index (NDI) questionnaire[7] . It is composed of 10 questions referring to general activities and pain, containing information about pain intensity, personal care, lifting things, reading, headache, paying attention, work, driving cars, sleeping, and having fun.

Scoring is done using a percentage of maximum pain and functional disability[8] . The NDI score consists of the sum of points, from 0 to 5, for each of the 10 questions, totaling a maximum of 50 points. The final result is obtained through the following formula: [total score ÷ (number of questions answered x 5)] x 100, with the final values presented as a percentage. The results are interpreted as follows: no disability, when the value is below 10% (less than 5 points); minimal disability, from 10-28%; moderate disability, from 30-48%; severe disability, from 50-68%; and complete disability, above 72% . [9]

The data were collected by a single examiner, in this case, the researcher, and the information was recorded on individual sheets, without identification. The data analysis had the following steps: Pre-analysis, exploration of the material, treatment of the results and interpretation. For the descriptive analysis of the population characteristics, the absolute and relative frequencies were calculated. The prevalence of military police officers with cervical disability was also calculated. The associations between cervical disability and the independent variables of the study were verified by crude and adjusted analyses using Poisson regression, with robust calculation of prevalence ratios (PR) and 95% confidence interval (95%CI), considering a significance level of 5%.

All analyses were performed using StatisticalPackage for Social Sciences for Windows (SPSS 21.0, 2013, SPSS, Inc, Chicago, IL).

This research was submitted and approved by the ethics and research committee of the Universidade Estadual do Sudoeste da Bahia. CAAE number: 812538817.6.0000.0055.

3 RESULTS

A total of 45 military police officers participated in the study, 86.7% being male, with the majority in the 30-39 age group (66.7%). The sociodemographic characteristics of the population are presented in table 1, while table 2 presents the descriptive characteristics of the working conditions variables.

Table 1. Descriptive characteristics of the study population, according to sociodemographic variables. Ipiau, BA, 2022.

Variables	% response	N	%
Sex	100,0		
Female		6	13,3
Male		39	86,7
Age group (years)	100,0		
20-29		7	15,6
30-39		30	66,7
40-49		8	17,8
Skin Color	100,0		
Black		7	15,6
Brown		36	80,0
White		2	4,4
Education	100,0		
2nd degree complete		8	17,8
College degree incomplete		11	24,4
College degree complete		26	57,8
Marital status	100,0		
Single		12	26,7
Married		29	64,4
Divorced		4	8,9

Table 2. Descriptive characteristics of the study population, according to working conditions variables. Ipiau, BA, 2022.

Variables	% response	N	%
Length of service in the Military Police	100,0		
< 1 year		2	4,4
1 to 5 years		9	20,0
6 to 10 years		13	28,9
> 10 years		21	46,7
Role in PM	100,0		
CMT		8	17,8
PTR		20	44,4
MOT		5	11,1
ADM		12	26,7
Use of PPE's	100,0		
Vest		2	4,4
Weapons		5	11,1
Nothing		6	13,3
All PPE		32	71,1
Transportation for policing	73,3		
On foot		1	3,0
Motorcycle		9	27,3
VTR 4 wheels		23	69,7
Hours Standing	100,0		
2h		17	64,5
4h		19	22,4
6h		9	13,2
Sitting Hours	97,8		
2h		1	2,3
4h		3	6,8
6h		12	27,3
8h		15	34,1
10h		13	29,5

PM: Military Police; **CMT:** Car Commander; **PTR: Car** patrolman; **MOT: Car** driver; **ADM:** Administrative; **PPE's:** Personal Protective Equipment; **VTR: Vehicle**.

The variables of health conditions and cervical symptomatology, as well as the results of the cervical disability index are described on table 3. A higher prevalence of minimal cervical disability was observed in women in this study, 66.6%, compared to 46.2% in men.

Table 3. Descriptive characteristics of the study population, according to variables of health conditions, including cervical symptomatology. Ipiau, BA, 2022.

Variables	% response	N	%
Physical activity	100,0		
Soccer		6	13,3
Bodybuilding		10	22,2
Swimming		1	2,2
Crossfit		5	11,1
Street Race		9	20,0
Martial Arts		3	6,7
Nothing		11	24,4
Stretches	100,0		
Don't know		9	20,0
I know and do		11	24,4
I know, but I don't do		25	55,6
Neck pain (Frequency)	88,9		
Yes, daily		12	30,0
Yes, 2x a week		7	17,5
Yes, 4x a week		3	7,5
Yes, rarely		18	45,0
Neck pain (Period)	95,6		
I don't feel		8	18,6
< 2 months		5	11,6
From 2 to 4 months		7	16,3
> 4 months		23	53,5
Neck pain (absence from work)	100,0		
No		42	93,3
Yes, 1x		2	4,4
Yes, 2x		1	2,2
Neck pain (Irradiation)	100,0		
I have no pain		8	17,8
Localized pain		26	57,8
Radiated pain		2	4,4
Don't know		9	20,0
Cervical pain (physical therapy)	100,0		
I have never done		39	86,7
2x per week		2	4,4
1 month		2	4,4
> 1 month		2	4,4
Neck pain (Improves after treatment)	71,1		
No		3	23,1
Temporary		10	76,9
Neck pain (Influence of posture)	100,0		
Yes		17	37,8
No		28	62,2
Neck pain (Precaution)	100,0		
I don't know		15	33,3
Avoid heavy equipment		4	8,9
Do physical activity		11	24,4
Maintaining the correct posture		13	28,9
Do not stay in the same posture		2	4,4
Cervical Disability Index	100,0		
No Disability		21	46,7
Minimal disability		22	48,9
Moderate disability		2	4,4

PM: Military Police; **CMT:** Car Commander; **PTR: Car** Patrolman; **MOT: Car** Driver; **ADM:** Administrative; **VTR: Car**.

The level of cervical disability with the highest prevalence in the police officers studied was "minimum disability", 48.9%, representing almost half of the population, and there were no interviewees with severe disability or complete disability. The minimum cervical disability was significantly associated with skin color (brown and white), education (high school degree), transport for policing (motorcycle and 4 wheeled RTV), sitting hours (10h), frequency of cervical pain (yes, daily and yes, 2x a week), time/duration of neck pain (yes, 3h; and yes, all the time), period of neck pain (2 to 4 months), irradiation of neck pain (localized pain and radiated pain), treatment of neck pain (yes, medication), and physical therapy in neck pain (never did), as shown in table 4.

Table 4. Prevalence of minimum cervical disability in policemen and its relation with the independent variables of the study. Ipiau, BA, 2022.

Variables	N	RPbruta	95%CI	p-value
Sex				
Female	4	0,85	0,44-1,63	0,617
Male	18	1		
Age group (years)				
20-29	3	1		
30-39	18	0,67	0,19-2,46	0,563
40-49	1	0,96	0,36-2,59	0,936
Skin Color				
Black	2	1		
Brown	18	0,29	0,09-0,92	0,036
White	2	0,61	0,45-0,84	0,002
Education				
2nd degree complete	9	2,07	1,03-4,17	0,042
College degree incomplete	8	1,72	0,92-3,23	0,092
College degree complete	5	1		
Marital status				
Single	6	1		
Married	13	0,67	0,30-1,49	0,321
Divorced	3	0,78	0,40-1,55	0,480
Length of service in the Military Police				
< 1 year	1	1		
1 to 5 years	6	1,05	0,23-4,75	0,949
6 to 10 years	9	1,40	0,66-2,98	0,382
> 10 years	6	1,45	0,72-2,92	0,293
Role in PM				
CMT	3	0,64	0,22-1,91	0,426
PTR	13	1,29	0,64-2,58	0,479
MOT	1	0,34	0,05-2,20	0,259
ADM	5	1		
PPE's				
Vest	2	0,56	1,73-1,82	0,336
Weapons	2	1,35	0,56-3,25	0,507
Nothing	1	1		
All PPE	17	0,84	0,20-3,49	0,813
Transportation for policing				
On foot	1	1		
Motorcycle	7	2,57	1,54-4,26	0,000
VTR 4 wheels	9	2,57	1,41-4,64	0,002
Hours Standing				
2h	7	1		
4h	12	1,59	0,54-4,64	0,398
6h	3	2,21	0,83-5,90	0,114
Sitting Hours				

4h	2	1		
6h	3	2,89	0,81-10,34	0,103
8h	13	1,81	0,48-6,75	0,380
10h	3	4,33	1,58-11,90	0,004
Physical activity				
Soccer	1	1		
Bodybuilding	7	0,20	0,03-1,28	0,090
Swimming	1	0,86	0,48-1,53	0,598
Crossfit	1	1,22	0,81-1,85	0,344
Street Race	3	0,73	0,21-2,54	0,624
Martial Arts	2	0,41	0,15-1,12	0,082
Nothing	7	0,82	0,33-2,01	0,656
Stretches				
Don't know	7	1,22	0,72-2,04	0,461
I know and do	3	1		
I know, but I don't do	12	0,43	0,15-1,20	0,107
Neck pain (Frequency)				
Yes, daily	10	4,20	1,95-9,04	0,000
Yes, 2x a week	5	2,57	1,07-6,20	0,035
Yes, 4x a week	2	2,40	0,80-7,16	0,117
Yes, rarely	5	1		
Neck pain (Period)				
I don't feel	1	1		
From 2 to 4 months	5	1,44	0,02-0,92	0,040
> 4 months	16	0,82	0,48-1,40	0,470
Neck pain (absence from work)				
No	21	1		
Yes, 2x	1	1,00	0,25-4,00	1,000
Neck pain (Irradiation)				
I have no pain	1	1		
Localized pain	17	3,64	1,04-12,69	0,043
Radiated pain	2	4,50	1,33-15,28	0,016
Don't know	2	0,56	0,06-5,09	0,609
Cervical pain (physical therapy)				
I have never done	17	0,49	0,34-0,69	0,000
2x per week	1	1,50	0,95-2,39	0,085
1 month	2	0,58	0,31-1,08	0,089
> 1 month	2	1		
Neck pain (Improves after treatment)				
No	2	1		
Temporary	8	0,67	0,29-1,55	0,348
Neck pain (Influence of posture)				
Yes	17	1		
No	5	0,61	0,29-1,29	0,193

PM: Military Police; **CMT:** Car Commander; **PTR: Car** patrolman; **MOT: Car** driver; **ADM:** Administrative; **PPE's:** Personal Protective Equipment; **VTR: Vehicle**.

4 DISCUSSION

A greater predominance of male policemen and in the age bracket of 27 to 47 years is observed (average of 36.34 years), corroborating other studies carried out with military policemen in other Brazilian regions[10,4] . In the sample of the current study, for example, information was collected from 100% of the female police officers who work in the operational sector of the unit, only 6, showing the discrepancy between the number of women and men in this profession.

Of the population studied, 48.9% of the interviewees were classified as having minimal neck disability, placing this group in a situation of risk for related pathologies. We observed a prevalence of neck pain in the working population, with about 60% to 80% of them reporting recurrent neck pain. On the other

hand, it was observed that minimum neck disability was more frequent among women. Corroborating with the study of Bier and collaborators (2018) who estimated that 12% of women and 9% of men have chronic cervicalgia . [1]

The study also showed a significantly positive association with the means of transport used for policing and with the time spent in the sitting position, showing that policemen who use motorcycles and 4-wheeled RTVs are about 2 times more likely to present minimum cervical disability than those who perform policing on foot, and that those who remain seated for 10 hours are about 4 times more likely when compared to those who remain seated for 4 hours. The policemen who exercise their work activity in these means of transportation use all the individual protection equipment (ballistic vests, short guns, long guns, magazines, and helmets), making it impossible to execute correct movements and leading the individual to a forced posture for several hours in a row. As a consequence, muscular imbalances, fatigue and pain occur throughout the working day[11,12,13] . It is recognized that in police work, when static work is added to the load of individual protection equipment, the propensity and faster induction to fatigue and injuries of the structures of the musculoskeletal system is potentiated[12,13, 14] .

A significantly positive association was also observed for the frequency, period and irradiation of neck pain, where the policemen who reported feeling pain daily, for 2 to 4 months and having localized and irradiated pain were more likely to present minimum neck disability than those who did not feel neck pain or felt it rarely. The reduction of functional capacity can be evidenced in individuals complaining of chronic pain, since the performance of daily occupational and recreational tasks requires a range of motion free of pain and restrictions. People with cervicalgia have a lack of flexibility that results in a deficit in their physical capacity, causing difficulty in performing daily activities, reflecting negatively on their quality of life[15, 5] .

Finally, a negative association was found between the cervical disability index and the performance of physical therapy treatment. That is, those who had never received physiotherapeutic treatment were more likely to have minimum cervical disability. Physiotherapy is an important resource for the improvement of cervical incapacity, bringing good results to patients who seek in physiotherapy the solution for algias related to the posterior neck region; studies report that stretching exercises significantly improve joint range of motion in patients with chronic neck pain. They observed that the practice of stretching exercises associated with manual therapy for four weeks can reduce neck pain and joint limitation in 52%[16,17] .

The number of people who have spinal diseases is quite large. Among the most frequent are those related to posture and inadequate body movements, which are related to various musculoskeletal factors such as reduced strength of the flexor and extensor muscles of the cervical region, limited range of motion, hyperactivity, and increased muscle fatigue, as exemplified by the working conditions[5, 13,18] .

5 CONCLUSION

The present study indicates that there is a significant prevalence of minimum neck disability in military policemen, being higher among women, and that it may be associated with sociodemographic characteristics (skin color and education), working conditions (transportation for policing, sitting hours), and health conditions (frequency, period, irradiation, and treatment of neck pain) of these workers.

It is of great importance that health professionals know the results and develop future research to expand the knowledge about neck pain in military police officers, since the results demonstrated the importance and the need for prevention programs for musculoskeletal pains and improvements in the working conditions of police officers.

The results found can guide actions aimed at improving the health and ergonomic conditions of military police officers in the ostensive exercise of their function, since musculoskeletal neck pain plays an important role in quality of life and professional performance.

REFERENCES

1. Bier, JD, et al. Clinical Practice Guideline for Physical Therapy Assessment and Treatment in Patients With Nonspecific Neck Pain. Physical therapy. 2018; 98(3):162–171.

2. Carvalho BM , Borges SC, Silva AGJ , Castellano LRC , Cardoso FAG. Avaliação da qualidade de vida e do tratamento fisioterapêutico em pacientes com cervicalgia crônica. Fisioterapia em Movimento. 2013 ; 26(4).

3. Bevilaqua GD, chaves TC ; oliveira, AI. Cervical spine signs and symptoms: perpetuating rather than predisposing factors for temporomandibular disorders in women. Journal of Applied Oral Science. 2007; 15(4): 259-264.

4. Silva R, et al. Aspetos relacionados à qualidade de vida e atividade física de policiais militares de Santa Catarina-Brasil. 2012. Motricidade 8(3).

5. Soares JC, Weber P, Trevisan ME, Trevisan CM, Rossi, AG. Correlação entre postura da cabeça, intensidade da dor e índice de incapacidade cervical em mulheres com queixa de dor cervical. Fisioterapia e Pesquisa. 2012; 19(1):68-72.

6. Neto AT, Faleiro TB, Moreira, FD, Jambeiro JS, Schulz RDS. Lombalgia na atividade policial militar: análise da prevalência, repercussões laborativas e custo indireto. Revista Baiana de Saúde Pública. 2014; 37(2): 365.

7. Gronblad M, Jarvinen E, Hurri H, Hupli M, Karaharju EO. Relationship of the Pain Disability Index (PDI) and the Oswestry Disability Questionnaire (ODQ) with three dynamic physical tests in a group of patients with chronic low-back and leg pain. Clin J Pain. 1994; 10(3): 197-203.

8. Cook C, Richardson JK, Braga L, Menezes A, Soler X, Kume P, et al. Cross-cultural adaptation and validation of the Brazilian Portuguese version of the Neck Disability Index and Neck Pain and Disability Scale. Spine (Phila Pa 1976). 2006; 31(14):1621-7.

9. Vernon H, Mior S. The Neck Disability Index: a study of reability and validity. J Manipulative PhysiolTher. 1991; 14(7): 409-15.

10. Oliveira LCN, Quemelo PRV. Qualidade de vida de policiais militares. 2014.

11. Moreira RFC et al. Efetividade do exercício físico em ambiente ocupacional para controle da dor cervical, lombar e do ombro: uma revisão sistemática. 2010.

12. Dias TM, Hentschke VS, Miguel FM. Análise postural em policiais militares da cidade de cachoeira do sul-rs. Revista de Iniciação Científica da ULBRA. 2017; 1(15).

13. Pessoa DR, Dionísio GA, Lima LDV, Soares RMNG, Silva MJ .incidência de distúrbios musculoesqueléticos em policiais militares pelo impacto do uso de colete balístico. Revista Univap. 2017; 22(40): 269.

14. Silva AG, Punt TD, Sharples P, Vilas-Boas JP, Johnson MI. Head posture and neck pain of chronic nontraumatic origin: a comparison between patients and pain-free persons. Arch Phys Med Rehabil. 2009; 90(4):669-74.

15. Sobral MKM, Silva PG, Vieira RAG, Siqueira GR. A efetividade da terapia de liberação posicional (TLP) em pacientes com cervicalgia. Fisioterapia em Movimento. 2017; 23(4).

16. Cheng CH, Su HT, Yen LW, Liu WY, Cheng HYK. Long-term effects of therapeutic exercise on nonspecific chronic neck pain: a literature review. Journal of physical therapy science. 2015; 27(4):1271-1276.

17. Andersen LL, Kjaer M, Andersen CH, Hansen PB, Zebis MK, Hansen K, et al. Muscle activation during selected strength exercises in women with chronic neck muscle pain. Phys Ther. 2008; 88(6):703-11.

18. Gross AR, Paquin JP, Dupont G, Blanchette S, Lalonde P , Cristie T, Goldsmith CH. Exercises for mechanical neck disorders: a Cochrane review update. Manual therapy. 2016; 24: 25-45.