# EFFECT OF 6 WEEKS OF AQUATIC TRAINING ON THE PAIN STATE OF ACTIVE MILITARY POLICE OFFICERS IN THE METROPOLITAN CITY OF JOÃO PESSOA – PB

# EFEITO DE 6 SEMANAS DE TREINAMENTO AQUÁTICO NO ESTADO DE DOR DE POLICIAIS MILITARES ATIVOS DA CIDADE METROPOLITANA DE JOÃO PESSOA – PB

# EFECTO DE 6 SEMANAS DE ENTRENAMIENTO ACUÁTICO SOBRE EL ESTADO DE DOLOR DE POLICÍAS MILITARES EN ACTIVO EN LA CIUDAD METROPOLITANA DE JOÃO PESSOA – PB

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## ABSTRACT

The need for effective physical fitness in the daily lives of military police officers plays an important role not only in their professional performance but also in their individual quality of life.

**Objective:** To assess the effect of 6 weeks of aquatic training on the pain status of active-duty military police officers in the metropolitan region of João Pessoa, Paraíba.

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**Methodology:** This is a descriptive, quasi-experimental, and quantitative study. The sample consisted of 35 military police officers of both sexes, with a mean age of 41.67 years and a standard deviation of ± 8.729. The data collection instrument was a questionnaire to assess musculoskeletal pain in exercisers. Data collection occurred before and after 6 weeks of intervention. The intervention consisted of aquatic training using a combination of continuous and interval training methods, performed three days a week, with each class lasting 60 minutes, at moderate to vigorous intensity, and monitored by the subjective perception of exertion scale. For data analysis, Excel was used to tabulate the data, and descriptive analysis was performed using SPSS version 21.

**Results:** 50% of participants experienced pain in some area of the body pre- and post-intervention at rest, but there was a 20% reduction during exercise. The areas most affected by pain during exercise were the knees, lower back, and shoulder, with post-intervention reductions of 25%, 20%, and 10%, respectively. There were also reductions in all functional aspects and psychosocial factors, with a notable reduction in pain during exercise.

**Conclusion:** Six weeks of aquatic training reduced musculoskeletal pain in military police officers, improving their quality of life and contributing to their professional performance.

**Keywords:** Painful Symptoms. Aquatic Activity. Musculoskeletal Pain.

**RESUMO**

A necessidade de efetiva aptidão física no cotidiano do policial militar assume importante papel não só no seu desempenho profissional, mas também na qualidade de vida como indivíduo.

**Objetivo:** Verificar o efeito de 6 semanas de treinamento aquático no estado de dores de policiais militares, na ativa, da região metropolitana de João Pessoa–PB.

**Metodologia:** A pesquisa é do tipo descritiva, quase experimental e quantitativa. A amostra foi composta por 35 policiais militares de ambos os sexos, com idade média de 41,67, e desvio padrão ± 8,729. O instrumento utilizado para coletar os dados foi o questionário para avaliação da dor musculoesquelética em praticantes de exercício físico. A coleta se deu antes e após 06 semanas de intervenção. A intervenção foi realizada através de treinamento em ambiente aquático utilizando a combinação dos métodos treinamento contínuo e intervalado, executadas durante 3 dias da semana, com duração de 60 minutos cada aula, com intensidade moderada a vigorosa, monitorada pela escala percepção subjetiva de esforço. Para análise dos dados, foi utilizado o programa Excel para tabular os dados e realizado a análise descritiva através do pacote informático SPSS versão 21.

**Resultado:** 50% dos participantes apresentaram dor em algum local do corpo pré e pós-intervenção em repouso, porém durante o exercício houve uma redução de 20% pós-intervenção. Os locais mais acometidos por dor durante exercício foram, joelhos, lombar e ombro, havendo redução pós-intervenção de 25%, 20% e 10% respectivamente. Também houve redução em todas as variantes de aspectos funcionais e fatores psicossociais, com destaque na redução de dores durante o exercício.

**Conclusão:** 06 semanas de treinamento aquático reduziu as dores musculoesqueléticas em policiais militares, melhorando sua qualidade de vida, contribuindo no desempenho de suas atividades profissionais.

**Palavras-chave:** Sintomatologia Dolorosa. Atividade Aquática. Dor Musculoesquelética.

**RESUMEN**

La necesidad de una aptitud física efectiva en la vida diaria de los oficiales de policía militar juega un papel importante no sólo en su desempeño profesional, sino también en su calidad de vida como individuos.

**Objetivo:** Verificar el efecto de 6 semanas de entrenamiento acuático sobre el estado de dolor de policías militares en activo de la región metropolitana de João Pessoa – PB.

**Metodología:** La investigación es descriptiva, cuasiexperimental y cuantitativa. La muestra estuvo constituida por 35 policías militares de ambos sexos, con una edad media de 41,67 años y una desviación estándar de ± 8,729. El instrumento utilizado para la recolección de datos fue el cuestionario para evaluar el dolor musculoesquelético en practicantes de ejercicio físico. La recolección se realizó antes y después de 6 semanas de la intervención. La intervención se llevó a cabo mediante entrenamiento en medio acuático utilizando una combinación de métodos de entrenamiento continuo e interválico, realizado tres días a la semana, con una duración de 60 minutos cada clase, con intensidad moderada a vigorosa, monitorizada mediante la escala de percepción subjetiva del esfuerzo. Para el análisis de los datos se utilizó el programa Excel para tabular los datos y el análisis descriptivo se realizó mediante el paquete informático SPSS versión 21.

**Resultado:** El 50% de los participantes experimentaron dolor en alguna parte del cuerpo antes y después de la intervención en reposo, sin embargo durante el ejercicio hubo una reducción del 20% después de la intervención. Las zonas más afectadas por el dolor durante el ejercicio fueron las rodillas, la espalda baja y el hombro, con una reducción postintervención del 25%, 20% y 10% respectivamente. También se observó una reducción en todas las variantes de aspectos funcionales y factores psicosociales, con énfasis en la reducción del dolor durante el ejercicio.

**Conclusión:** 6 semanas de entrenamiento acuático redujeron el dolor musculoesquelético en policías militares, mejorando su calidad de vida y contribuyendo al desempeño de sus actividades profesionales.

**Palabras clave:** Síntomas Dolorosos. Actividad Acuática. Dolor Musculoesquelético.

## 1 INTRODUCTION

The military police profession needs relevant physical and mental aptitude, in view of the loads determined by the exercises of the military environment, which is attributed to policing activities standing for long periods, extensive walks and explosions in intense races even with heavy equipment and weapons (RODRIGUES, 2003). In this sense, the area of activity of these individuals demonstrates the need to maintain a balanced physical-mental health and thus ensure the effective performance of their functions (BOLDORI; SILVEIRA, 2000).

The military police segment has a proven historical need to present a routine of physical activity, for the execution of its constitutional daily determinations, knowing that even if the daily service litigates an active physical position, it is not enough to meet its ideal needs related to its physical conditioning and a favorable quality of life (ARAÚJO, 2000). From this perspective, the performance of military police activity corroborates a habitual propensity for pain, due to aspects and professional characteristics indispensable to the execution of their functions (NETO, A.T. *et al.,* 2013).

Pain is a circumstance that every individual seeks to avoid, and can be defined as a personal and subjective experience, resulting from characteristics of the tissues involved in its genesis, as well as physical, emotional and cultural motivations (OLIVEIRA, *et al.,* 2014). Thus, many individuals are victims of chronic diseases, rigidity, postural complications and pain throughout the body, as well as these can be the result of the effects of the misuse of medications and inadequate immobilization (ROUTI, *et al.,* 2000). In this sense, the daily maintenance of a life of constant physical activity is pointed out as a determinant in positive health factors, as they contribute to the prevention and control of cardiovascular diseases, diabetes, osteoporosis, obesity and mental disorders (HASKELL *et al*., 2007).

In this context, a concordant degree of physical exercises aimed at physical fitness has been taken as important motivations in the protection against various physical diseases and also as agents in a better quality of life (ROCHA; FRENCH; CORMELATO; 2008). Nowadays, the use of aquatic environments for various and common physical activities, in addition to swimming, such as water aerobics, walking and interval training (BUTTS; TUCKER; GREENING, 1991; KRUEL, 2000; FLORENTINO, 2012). Aquatic activities have been directed due to their benefits in the body composition, metabolism and muscle strength of their followers (TAUNTON JE et al., 1996; ALVES RV et al., 2004; BETA et al., 2016).

Therefore, the objective of this study was to verify the effects of 6 weeks of aquatic training on the musculoskeletal pain status of active military police officers in the metropolitan region of João Pessoa.

## 2 METHODOLOGY

The research was descriptive, almost experimental and quantitative, following the teachings of Thomas,NelsonandSilverman (2012). The sample initially had 60 police officers, however the COVID-19 pandemic in 2020/2021 limited the number of students to ensure distance inside the pool, making it necessary to reduce the number of participants by half, quantifying the final number of 30 volunteers. Of this final number of volunteers, 6 individuals did not meet the minimum attendance in class and 4 individuals did not participate in the post-intervention evaluation and had the sample discarded, leaving a total of 20 able military police officers, of both sexes, 16 men and 4 women, with a mean age of 41.67 standard deviation ± 8,729, all active in the profession, located in the metropolitan region of João Pessoa-PB.

As an inclusion criterion, active volunteer police officers of both sexes, aged between 24 and 58 years, who worked directly on the street and who agreed to participate in 3 of the 5 weekly classes with at least 75% of active attendance in water aerobics classes performed in the multi-sports pool of the University Center of João Pessoa - UNIPÊ, following the Ethical Standards and Conducts of Research with Human Beings of Norm 466/12 of the National Health Council, approved by the CEP with the number CAAE37007820.6.0000.5176.

Data collection from the volunteers took place in two moments, one before the intervention and the other after the intervention. In this context, all military police officers were submitted to the "Questionnaire for the Assessment of Musculoskeletal Pain in Exercise Practitioners (Q-ADOM)" by Lima *et al.* (2016), this developed in Google Forms through a link generated and forwarded to volunteers, avoiding contact between participants before and after the 6 weeks of intervention.

The Questionnaire for the Assessment of Musculoskeletal Pain in Exercise Practitioners (Q-ADOM) was developed and evaluated by Lima *et al.* (2016). This questionnaire is self-reported and has, as well as open questions to describe the history of falls, injuries or musculoskeletal diseases and pain medications, as well as bipartite questions about the presence of pain at rest and during exercise. In this context, events related to pain sites, their intensities, and functional aspects caused by their existence are variables pointed out in our study.

The water aerobics intervention was carried out in a separate 25m pool with ten lanes in the width of the pool to ensure distancing, respecting the anti-COVID health safety guidelines. The classes took place in 6 weeks, from 7:00 am to 8 am, with 5 days of classes being made available per week, in which volunteers should participate in at least 3 of the 5 days available. Each class lasted 60 minutes, structured in 15 minutes of warm-up, 35

minutes for the main part and 10 minutes of relaxation, using continuous and interval methods, with moderate to vigorous intensity, monitored by the scale of subjective perception of effort (BORG, 2000).

For data analysis, the Excel 2010 program was used both to tabulate the data and also to calculate the percentage of sample responses, and the descriptive analysis of the data was performed through the SPSS version 21 computer package.

## 3 RESULTS

The research presented a sample of 20 military police officers, of both sexes, 16 men, 80% and 4 women, 20%, with an average age of 41.67 and standard deviation± 8.729, active, assigned to the metropolitan region of João Pessoa-PB.

Table 1 shows variables such as the presence of pain status at rest and during exercise, which showed a 20% decrease in responses after intervention in the resting variant and an attenuating response of 20% in the pain state during exercise.

**Table 1**

*Representation of the responses in relation to the Q-ADOM variables of the pain status of Military Police officers in the state of Paraíba before and after the intervention.*

| VARIABLES | REST | | EXERCISE | |
|---|---|---|---|---|
| PAIN | PRE Nº (%) | POST NO. (%) | PRE Nº (%) | POST NO. (%) |
| Yes | 10 (0,5) | 10 (0,5) | 12 (0,6) | 8 (0,4) |
| No | 10 (0,5) | 10 (0,5) | 8 (0,4) | 12 (0,6) |

Source: 2021 survey data.

Table 2 also shows that the regions most affected in the state of pain indicated by the volunteers were the most affected, with the lumbar and knee being the most expressive. The answers to table 2 of the questions presented in the questionnaire (Q-ADOM) by the participants showed a decrease of 44.4% for knee pain during exercise and 62.5% for knee pain at rest after the intervention, which was the most expressive.

**Table 2**

*Representation of the responses in relation to the Q-ADOM variables of the pain places of Military Police officers in the state of Paraíba before and after the intervention.*

| VARIABLES | REST | | EXERCISE | |
|---|---|---|---|---|
| SITES OF PAIN | Pre No. (%) | Post No. (%) | Pre No. (%) | Post No. (%) |
| Arm | 3 (0,15) | 1 (0,05) | 3 (0,15) | 1 ((0,05) |

| | | | | |
|---|---|---|---|---|
| Back | 2 (0,1) | 2 (0,1) | 2 (0,1) | 1 (0,05) |
| Fingers | 1 (0,05) | 1 (0,05) | 1 (0,05) | 0 (0,0) |
| **Knee** | **8 (0,4)** | **5 (0,25)** | **9 (0,45)** | **4 (0,2)** |
| Lumbar | 6 (0,3) | 5 (0,25) | 6 (0,3) | 4 (0,2) |
| Shoulder | 5 (0,25) | 2 (0,1) | 5 (0,25) | 1 (0,05) |
| Neck | 4 (0,2) | 1 (0,05) | 3 (0,15) | 2 (0,1) |
| Feet | 0 (0,0) | 1 (0,05) | 0 (0,0) | 1 (0,05) |
| Thorax | 1 (0,05) | 2 (0,1) | 1 (0,05) | 1 (0,05) |

Source: 2021 survey data.

Regarding pain intensity, the disappearance of severe pain at rest was the most important result presented in Table 3, which compared to its analysis in exercise, there were no changes related to pain status. As well as the responses to pain intensity, the variant descriptors of pain did not present different responses cited by the participants of the research, which obtained a greater predominance: uncomfortable, painful and persistent, with its percentage being the same as that presented before the intervention.

**Table 3**

*Representation of responses in relation to the Q-ADOM variables of pain intensity and description of pain of Military Police officers in the state of Paraíba before and after intervention.*

| **VARIABLES** | **REST** | | **EXERCISE** | |
|---|---|---|---|---|
| **PAIN INTENSITY** | **PRE Nº (%)** | **POST NO. (%)** | **Pre No. (%)** | **Post No. (%)** |
| Lightweight | 2 (0,1) | 7 (0,35) | 4 (0,2) | 3 (0,15) |
| Moderate | 7 (0,35) | 6 (0,3) | 7 (0,35) | 7 (0,35) |
| Intense | 1 (0,05) | 0 (0,0) | 1 (0,05) | 1 (0,05) |

| **PAIN DESCRIPTORS** | **PRE Nº (%)** | **POST NO. (%)** |
|---|---|---|
| Uncomfortable | 16 (0,8) | 16 (0,8) |
| Persistent | 3 (0,15) | 3 (0,15) |
| Painful | 1 (0,5) | 1 (0,5) |

Source: 2021 survey data.

Table 3 shows the variants related to functional aspects and psychosocial factors of the military police, which demonstrate areas such as leisure, work and self-control. The answers to the questions show an improvement in all the means of variants such as pain when performing daily activities that went from 2.05 to 0.8 after the intervention, resulting in a decrease between the averages of 1.25 for the state of pain. As well as responses that

affirm a decrease of 1.2 between the averages after the intervention in financial expenses with medicines and medical care.

**Table 4**

*Representation of the degree of interference of musculoskeletal pain in the functional aspects of Military Police Officers in the state of Paraíba before and after intervention.*

| VARIABLES | PRE | | POST | |
|---|---|---|---|---|
| FUNCTIONAL ASPECTS | AVERAGE | Detour pattern | AVERAGE | Detour pattern |
| **Daily activities** | 2,05 | 2,85 | 0,8 | 1,82 |
| Leisure | 1,45 | 2,21 | 0,75 | 1,51 |
| Work/domestic services | 2,1 | 2,4 | 1 | 1,89 |
| Sexual Activity | 1,05 | 1,82 | 0,65 | 1,49 |
| Exercises | 2,85 | 2,88 | 1,15 | 1,78 |
| Sleep | 0,9 | 1,8 | 0,85 | 1,42 |
| **Psychosocial Factors** | | | | |
| Financial expenses | 1,7 | 2,27 | 0,5 | 1,05 |
| Self-control | 1,2 | 1,85 | 0,35 | 0,81 |
| Depression | 1 | 1,68 | 0,4 | 1,09 |
| Irritability and moodiness | 1,45 | 1,82 | 0,5 | 1,57 |

Source: 2021 survey data.

## 4 DISCUSSION

This study aimed to verify the effect of 6 weeks of aquatic training on the state of musculoskeletal pain of active military police officers in the metropolitan region of João Pessoa-PB. From this perspective, the activity in an aquatic environment stood out in contributing considerably to the reduction of the state of pain of the military police, reaffirming the importance of the use of physical means procedures, in addition to the use of distraction and relaxation methods of water aerobics in the help of individuals (FLORENTINO M. *et al.*, 2012).

Regarding the identification of the participants' pain status, the Lima Musculoskeletal Pain Questionnaire for Physical Activity Practitioners (Q-ADOM) was used *et al.* (2016), in which 60% of the sample, exactly 12 police officers, shown in Table 1, presented some type of complaint of pain in specific places of the body during the practice of exercises, confirming that many individuals are victims of chronic diseases, rigidity, postural complications and pain throughout the body, as well as these can be the result of the effects of misuse of medications and inadequate immobilization (ROUTI, *et al.,* 2000). However, the results of the post-intervention of aquatic training showed in Table 1 that there was a 20% reduction in the

responses that declared pain during exercise, a fact that confirms Whitre (1998) who stated that the principle of pain elimination consists of improving the practice of physical activity and also moving actively, thus confirming that the importance of the action of the physical education professional in the prescription of physical activity contributes directly in aspects related to the quality of life of individuals **(**MILES, 2007**).**

The performance of military police activity favors the level of pain in specific places such as: *knee*, due to the enormous need to board and disembark vehicles, *lumbar,* due to the excessive weight of vests and *shoulder,* due to the use of heavy weapons such as rifles. In this context, Table 2 showed that the practice of targeted physical exercise significantly reduced the number of individuals who answered yes to pain sites at rest, going from 40% to 25% of yes answers for knee pain and from 25% to 10% of yes answers for shoulder pain. In the same sense, for pain sites during exercise, Table 2 also shows a reduction in yes responses for arm pain from 15% to 5%, knee from 45% to 20% and fingers that presented 5% before the intervention and was not included in the post-intervention evaluation, resulting in the disappearance of the pain response, this confirms the view of Simões *et al.* (2009) on the need to apply physical activity in a supervised manner by a physical education professional, in the gain of physical aspects and also benefits to quality of life.

In this way, the gains pointed out by the research complement statements brought by both Tribess and Virtuoso (2005) when they discuss the impact of staying physically active, which contributes to the improvement of functional fitness and reduction of the manifestation of various diseases related to this process, as well as Huard (2018) who considers that chronic diseases are incurable, however, there is the possibility of being controlled, and the neglect of treatment prolongs the patient's situation over time, and that choices can help to treat the disease as a change in lifestyle habits, with the practice of physical activities.

Oliveira (2014) in his study, Impact of Exercise on Chronic Pain, confirms evolution in patients with low back pain, with an average reduction of 2.66 points on the visual analog scale (VAS), compared to patients with gonarthrosis, with only 0.88 points of average reduction, agreeing with the data pointed out in this research in the reduction of pain in places of the body, such as the lumbar (10%) and knee (25%).

Exercising has an objective role in the area of personal health, contributing to quality of life, the incidence rate of chronic diseases, socialization, and the reduction of stress and mental illness (MALTA, 2015). From this perspective, the results regarding the answers focused on pain in functional and psychosocial aspects presented in Table 4 demonstrate the importance of the intervention of physical activity in reducing the means (M) answered for pain in actions such as: daily activities that went from 2.05 (M) to 0.8 (M) resulting in a

difference of 1.25 (M), services and exercises that had a decrease in the comparison of the answered means of 1.1 (M) and 1.7 (M) respectively. In this same context, the comparison of the means of the responses of psychosocial factors before and after the intervention show a reduction of 1.2 (M) between the variants of financial expenditure and 0.95 (M) in the variants of bad mood, demonstrating the contribution to physical and mental health, already reported by Guedes *et al.* (2012) when they point out and suggest that the practice of physical activity is beneficial to health.

## 5 CONCLUSION

It is concluded that 06 weeks of systematized aquatic training contributes directly to the reduction of the state of musculoskeletal pain of military police officers, acting on the pain of specific places at rest and during exercise, such as the knee and lumbar, which substantially reflect on the mobility necessary for police activity, as well as favors functional aspects and psychosocial factors, which are linked to the self-control of the military, All of this resulting in a better quality of life and better performance of the professional activities of these individuals.

However, due to the pandemic period of intervention in the midst of the COVID-19 scenario, it limited the sample size and adherence to longer intervention time. In addition, other factors, such as the functional need of military police officers on the streets, also contributed to the reduction in the sample. Thus, the application of new studies with longer intervention time can contribute to the analysis of the interference of physical activity in aspects related to the health of these individuals, as well as the relationship between the state of musculoskeletal pain and aspects of their health and performance of the profession of military police officers in João Pessoa.

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