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# Musculoskeletal Risk Level among Health Professionals of a Health Entity

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## ABSTRACT

The level of musculoskeletal risk in upper limbs was determined in five areas where health professionals of a health entity in Bogotá-Colombia practice. The essential duties in the Medicine, Bacteriology, Dentistry, Physiotherapy, and Nursing spaces were selected through interviews with employees; the RULA approach was then used to establish the most critical components and the final score. At the level of the neck, shoulders, and wrists, forced postures were the variable that increased the score in areas such as dentistry, Bacteriology, and Physiotherapy. In almost all areas, load handling and movements with high frequency were evidenced. The above findings guide the improvement actions, and the consideration of other factors to be reviewed is recommended.

**Keywords:** Risk, Risk factors, Musculoskeletal pain, Physical ergonomics, Workload

## INTRODUCTION

Musculoskeletal disorders in the upper limbs have represented a health problem in workers and organizations. In the health sector, health professionals are not exempt from this condition based on exposure to a series of risk factors present in working conditions, as well as extra-occupational and individual that the literature has described (Nayak and Patnaik, 2019; Senosy SA, Anwar MM, and Elareed HR, 2020).

A health entity has presented this situation in Bogotá-Colombia of the special regime. From 2016 to 2019, a significant rate of absenteeism was documented in Physiotherapy, Dentistry, Nursing, Bacteriology, and Medicine due to limitations caused by medical diagnoses of Carpal Tunnel Syndrome, Rotator Cuff, Epicondylitis, and Quervain's Tenosynovitis. Furthermore, no significant progress had been made in managing working circumstances to determine potential risk factors present. As a result, the goal of this study was to establish the level of musculoskeletal risk in the parts of the institution that displayed this behavior. To find the essential variables that enhanced the value and prioritize those positions or regions with a higher level of importance.

## METHOD

The study took a quantitative approach and a descriptive scope. In an interview with the physiotherapy, medicine, nursing, bacteriology, and dentistry

staff, we questioned the tasks to be completed and jobs in the earlier sectors to find those with a greater level of physical demand. These tasks were then completed using the RULA (Rapid Assessment of the Upper Limbs) method.

## RESULTS

According to the interview with the professionals in the indicated areas, the following tasks were reported as physically demanding: in Nursing: injecting, in Medicine: Outpatient, Physiotherapy: Mobilization of patients, in Dentistry: Exodontics, and Bacteriology: Sampling. The following is a summary of the results of the RULA methodology applied in these functions:

Tables 1 and 2 consolidate the score obtained after applying the RULA methodology to the tasks analyzed in each of the areas described above.

**Table 1.** Consolidated scoring of the RULA method to the analyzed tasks. Group A.

| ANALYZED AREA | ANALYZED TASK | Hemibody | GROUP A | | | Type of Activity | Load or force |
|---|---|---|---|---|---|---|---|
| | | | Arm score | Forearm score | Wrist score | | |
| NURSE | injectology | Left | 1 | 1 | 2 | 1 | 1 |
| | | Right | 1 | 1 | 2 | 1 | 1 |
| MEDICINE | Outpatient | Left | 2 | 1 | 2 | 1 | 1 |
| | | Right | 2 | 1 | 2 | 1 | 1 |
| PHYSIOTHERAPY | mobilization of patients | Left | 3 | 2 | 2 | 1 | 1 |
| | | Right | 2 | 2 | 5 | 1 | 1 |
| DENTISTRY | exodontia | Left | 4 | 1 | 5 | 1 | 1 |
| | | Right | 4 | 1 | 5 | 1 | 1 |
| BACTERIOLOGY | sampling | Left | 3 | 3 | 4 | 1 | 0 |
| | | Right | 3 | 3 | 4 | 1 | 0 |

Source: authors.

It can be evidenced that the postural component substantially increases the risk level score in the body segments of the arms during the exodontic performed in dentistry and the taking of samples in Bacteriology. There is also evidence of a big postural score at the forearm level in Bacteriology.

A high score was found in the postural component at the wrist joints for Physiotherapy during patient mobilization, Dentistry during exodontics, and Bacteriology during sampling.

Furthermore, unusual postures at the neck level were seen during the movement of Physiotherapy patients, the exodontic conducted by Dentistry, and the sampling performed by Bacteriology.

In almost all the analyzed tasks, the manipulation of weights in the range from 2 to 10 kilograms and the presence of movements or technical actions at least 4 times in a minute are identified.

## DISCUSSION

There is evidence of the presence of forced postures at the level of upper limbs, mainly in segments such as arms and wrists and the neck, during the

**Table 2.** Consolidated scoring of the RULA method to the analyzed tasks. Group B.

| ANALYZED AREA | Group B: ANALYZED TASK | Type of Activity: Hemibody | Load or force: Neck score | Final score: Log score | Level of risk: Legs score | Load or force | Final score | Level of risk |
|---|---|---|---|---|---|---|---|---|
| NURSE | Injectology | Left | 2 | 2 | 1 | 1 | 2 | 2 |
| | | Right | 2 | 2 | 1 | 1 | 2 | 2 |
| MEDICINE | Outpatient | Left | 3 | 3 | 1 | 1 | 3 | 3 |
| | | Right | 3 | 3 | 1 | 1 | 3 | 3 |
| PHYSIOTHERAPY | mobilization of patients | Left | 4 | 2 | 1 | 1 | 6 | 6 |
| | | Right | 4 | 2 | 1 | 1 | 6 | 6 |
| DENTISTRY | exodontia | Left | 3 | 2 | 1 | 1 | 5 | 5 |
| | | Right | 3 | 2 | 1 | 1 | 5 | 5 |
| BACTERIOLOGY | Sampling | Left | 3 | 1 | 1 | 0 | 3 | 3 |
| | | Right | 3 | 1 | 1 | 0 | 3 | 3 |

Source: authors.

execution of tasks performed by health professionals. (Long, Johnston, and Bogossian, 2012) in their systematic review, they found a level of association between posture and discomfort at the neck (OR 1.88 CI: 95% 1.17-3.02) and shoulder (OR 1.87 CI: 95% 1.06-3.30).

(Cárdenas and Montes, 2021) the prevalence of Carpal Tunnel Syndrome and its relationship with physical workload factors was determined through clinical tests and the application of the RULA method in health personnel. Analyzed 29 jobs found a high amount of forced postures and the respective relationship with the severity of the symptomatology (P < 0.01).

Weight manipulation was found in almost all the analyzed tasks of health professionals. (Occhionero, Korpinen and Gobba, 2014) In his literature review on musculoskeletal disorders in higher limbs in health personnel, he describes studies where the association between shoulder pain and situations with manual load handling is found (P < 0.05).

For his part,(Mirmohammadi *et al.*, 2015) evaluated the severity and prevalence of musculoskeletal problems among health personnel and determined risk factors. They used the Quick Exposure Check (QEC) to evaluate the factors. They determined that load management activities such as patient transfer were associated with problems at the neck and lumbar level.

There is movement detection with a certain intensity in the tasks performed by health professionals (Occhionero, Korpinen, and Gobba, 2014). In their literature review, they describe studies where they detect in Nurses the presence of extreme and repetitive movements associated with pain in the neck (OR: 1.59, 95% CI: 1.04–2.43) and shoulder (OR: 2.39, 95% CI: 1.52–3.75). Likewise, there are studies where physiotherapists report the association between the number of hours per week performing manual treatments and the increased risk of discomfort at the wrist joint level (OR: 1.11, 95% CI: 1.05–1.17).

## CONCLUSION

About aspects of the task, a series of critical risk factors have been found in the areas evaluated using the RULA methodology, which, when confronted with the literature, pieces of evidence similar findings. Among these, forced postures increase musculoskeletal risk in health workers. For this reason, surveillance programs should be implemented to carry out the intervention in this aspect. Likewise, situations related to high-frequency movements in upper limbs and load handling were detected in almost all tasks.

Although the scientific literature has demonstrated the association of the physical workload factors, it is essential to consider other factors linked to individual, behavioral and extra-work components (Hernández WA, Cárdenas A, and García D, 2021).

The scientific literature has reported how the RULA methodology has been widely applied to determine musculoskeletal risk in different fields of action or disciplines. Of course, the health sector is no exception. This has made it possible to detect the most critical factors and body

segments to which the respective revision and adjustment of the work station and the combination with complementary methodologies are proposed (Gómez *et al.*, 2020).

*Project implemented within the framework of the research seedbed: Management of working conditions and health.*

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