

# Effects of a labor gym program in mental workload of workers from rectory of UNIOESTE

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**Abstract:** The present work is a quality-quantitative study of cause-effect type. The objective of this study was to investigate the effect of a Labor Gym (LG) program in mental workload of workers from rectory of the Universidade Estadual do Oeste do Paraná (Unioeste) Cascavel. The sample consisted of 35 employees. For data collection, it was used the NASA-TLX questionnaire to evaluate the mental workload of employees. Then, the participants performed sessions of LG, totaling 20 classes. After this period the employees were re-evaluated. To characterize the sample, data were tabulated and a descriptive analysis was performed using the SPSS 15.0. The interpretation of the NASA-TLX questionnaire was based on its own methodology. Before the LG sessions, the total average dimensions analyzed was 79 (sd: 11,05), representing a high rate of mental workload. After the period of LG, the total average of final mental workload decreased, but it remained with a high rate (x:75, sd: 13.42). In relation to the comparative analysis of the initial and final averages of mental workload, by t test (bipolar), there was no significant difference ( $p = 0.071668$ ).

**Key words:** NASA-TLX; Mental Workload; Gym Labor; Labor Physiotherapy

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## 1. Introduction

The industrialized work, mechanized and the application of computer techniques, coupled with an intensive search for productivity and quality, have imposed conditions that are extremely unhealthy for human health as a whole. The sphere of labor have been with characteristic increasingly multidisciplinary and more cognitive content [2,3,5]. This restructuring process has caused risks to the workers' health.

Faced with the problem presented, has the Labor Gym (LG) as a preventive and/or rehabilitation instrument. Nowadays, LG programs are implanted in the companies aiming to promote health, improvement of working conditions, biopsychosocial preparation of participants, to contribute directly or indirectly to the improvement of interpersonal relationships and to reduce rates of occupational accidents and repetitive strain injuries (RSI), thus leading to an increase of productivity and quality of life [3].

According to World Health Organization (WHO), health of any individual includes a complete physical, mental and social welfare. Therefore, to achieve this balance the employee must control the physical and mental overload suffered during their work, in order to maintain their health and be able to perform their work tasks without negative interferences.

So, the objective of this study was to investigate the effect of a Labor Gym (LG) program in mental workload of workers from rectory of the Universidade Estadual do Oeste do Paraná (Unioeste) Cascavel.

## 2. Methodology

The present work is a quality-quantitative study of cause-effect type, realized at *Universidade Estadual do Oeste do Paraná* (UNIOESTE) of Cascavel, with servers from rectory.

The study was approved by the Ethics Committee on Human Research of Universidade Estadual do Oeste do Paraná (Unioeste) of Cascavel.

To development the study, the inclusion criteria were: have as its main function in the workplace computer use and participate in LG. The criteria of non inclusion was not to participate in LG. Exclusion criteria were: be an employee of another sectors than the rectory of the university and/or sectors that require higher manual than cognitive work; servers

with a diagnosis of psychological disorders or to submit two or more answers on questionnaire, or even no response.

Employees who were in accordance with the inclusion and exclusion criteria were informed about the purpose and procedures of the research and signed an informed consent (IC) to participate in it.

The sample consisted of 35 employees. For adequate fulfillment of NASA-TLX instrument, employees participants in the research received information about the definitions of the six sub-scales of the questionnaire and other necessary information. Then the servers performed the sessions of LG in their respective sectors, twice a week, with the time approximately 10 minutes, totaling 20 sessions. The time was held at the beginning of the workday and there was no need for any special outfit to practice the exercises. LG sessions lasted two months, and after that period the employees were re-evaluated through the NASA-TLX questionnaire, in the same period of the initial evaluation by the same evaluator. The data for the characterization of the sample were tabulated and a descriptive analysis was performed using the statistical program SPSS 15.0. The NASA-TLX questionnaire has its own methodology, so, it was interpreted as described in the topic instrument.

## 3. Results

The sample consisted of 35 employees, among them 13 are male and 22 female. The average age was 36,40 years (maximum 58 and minimum 18 years).

In the analysis of results obtained using NASA-TLX, before the LG sessions, the dimensions with the highest level of relevance were: mental demands (x: 25,07; sd: 6,05) and time pressure (x: 19,06; sd: 7,34). And with less relevance were physical demand (x: 1,03; sd:6,05) and level of frustration (x: 1,03; sd:7,37). The others sub-scales, effort and performance, respectively had an average of 17,99 (sd: 7,70) and 13,87 (sd: 7,37). The total average of dimensions analyzed was 79 (SD: 11,05), representing a high rate of mental workload performed by analysis of variance ANOVA two-way.

According to the results obtained by the final application of NASA-TLX questionnaire, after the period of LG sessions, the most relevant dimensions remained the mental demand (x:23; sd: 6,02) and time pressure (x:18,32; sd: 7,22). Less relevant, remains the physical demands (x: 0,9; sd: 2,63) and the level of frustration (x: 2,95; sd: 4,19). The other

sub-scales, effort and performance, respectively had an average of 18,32 (sd: 7,22) and 14,37 (sd: 8,54). The average final of mental workload remained with a high rate (x: 75, sd: 13,42). The dimensions that showed a decrease in weighted rate were: mental demand, physical demand, time pressure and effort. While the dimensions of performance and frustration level showed an increase in the weighted rate.

In relation to the comparative analysis of the initial and final averages of mental workload, by t test (bipolar), there was no significant difference ( $p = 0.071668$ ).

#### 4. Discussion

From the data obtained, it was observed that for this kind of work with low physical demands, using the computer most part of the journey, there is a high rate of mental overload. However, it was also certified that for the sample, LG was not effective in reducing the level of mental overload to these labor characteristics. Although the level of mental workload, before and after LG period, shown a reduction in their average, this decreased was not statistically significant. However, it may have clinical significance, since the cognitive symptoms that come with a high rate of mental workload such as stress and exhaustion, may also have diminished.

Guimarães *et al.* [4] also evaluated the mental workload using NASA-TLX questionnaire, in this study the sample consisted of 45 systems analysts with an average age of 50,26 years and average service time of 204 months. One of the objectives proposed by the study was to evaluate ergonomic conditions, in order to know the factors causing physical and cognitive overload. The results obtained by Guimarães *et al.* [4] were similar to this study, because the sub-scale that had greater relevance was the mental demand (67,95) and the lesser relevance was physical demand (0,66). The author further claims that high mental workload can be found caused by the main characteristic of the work, the computer use. Because, this is a task requiring great concentration, reasoning, making decision and memory. Therefore, very similar characteristics of work to the population studied, as well with the average age and time service.

In the ergonomic evaluation performed by Kipper and Moro [1] with two employees of an office computer, it was used the method of labour macroergonomics analysis, together with RULA and NASA-TLX questionnaires. The item from NASA-

TLX that stood out above others was mental demand, due to the nature of work, according to the author. While the physical demands proved to be irrelevant. Similar results with this article. However, the sample size is smaller and the authors did not evaluate the LG effect on mental workload.

The sub-scales of mental demand, physical demand and time pressure showed a decrease in their respective averages. Indicating, in this way, a decrease in mental and physical requirement and time. The increase in average of performance scale and decrease of the effort scale show that employees achieve a better performance with less effort. However, the frustration level also showed an increase.

The fast pace of work, which corresponds to the time pressure on NASA-TLX questionnaire, is an important stress factor that in some cases, it becomes unbearable or harmful to the individual. In addition, changes in psychosocial factors may originate outside such as dissatisfaction at work, a factor corresponding to the level of frustration from NASA-TLX [4].

#### 5. Conclusion

The mental workload of the rectory of workers from UNIOESTE – Cascavel, did not show statistically significant decrease after the intervention period of LG. In addition, from the results obtained using the NASA-TLX, it was found a relationship between a high rate of mental workload with a high time pressure.

It is then suggested a new research evaluating the mental workload of employees with a longer period of intervention of LG sessions (time and/or total sessions).

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