



## RESEARCH

## ERGONOMIC EVALUATION OF THE POSITION OF URGENCY IN A MIXED HEALTH IN NATAL/RIO GRANDE DO NORTE

AVALIAÇÃO ERGONÔMICA DO POSTO DE URGÊNCIA EM UMA UNIDADE MISTA DE SAÚDE NA CIDADE DE NATAL/RIO GRANDE DO NORTE

EVALUACIÓN ERGONÓMICA DEL CENTRO DE URGENCIA EN UNA UNIDAD BÁSICA DE SALUD EN NATAL/RIO GRANDE DO NORTE

Elisabeth Elaine de Castilho Marques Silva<sup>1</sup>, Cecília Nogueira Valença<sup>2</sup>, Gleyce Any Freire de Lima<sup>3</sup>, Mayara Dantas de Oliveira<sup>4</sup>, Raimunda Medeiros Germano<sup>5</sup>, Cleci de Lourdes Schmidt Piovesan Rosanelli<sup>6</sup>

## ABSTRACT

**Objective:** to perform an ergonomic analysis of emergency room in a joint health unit in Natal/RN. **Methods:** this investigation is a descriptive and exploratory with qualitative approach. Constituting an ergonomic evaluation of a workplace environment in a emergency post of a joint health unit, located in Natal, where were pointed ergonomic problems and interventions for the solution of them having in prospect the improvement of the workplace conditions of the workers. **Results:** the main problems found were transport, storage sites, hand tools, the design of the work post, lighting, environmental risk, commodity and welfare and personal protective equipment. **Conclusions:** ensuring ergonomically suitable environment extremely important, thus improving the productivity, reducing risks/accidents and absenteeism. **Descriptors:** Ergonomic evaluation, Nursing, Occupational health.

## RESUMO

**Objetivo:** Realizar a análise ergonômica de um posto de urgência em uma unidade mista de saúde na cidade de Natal/RN. **Métodos:** Trata-se de uma investigação do tipo descritivo-exploratório, com abordagem qualitativa. Constituindo-se de uma avaliação ergonômica do ambiente de trabalho em um posto de urgência de uma unidade de saúde mista, situada em Natal/RN, na qual foram apontados problemas ergonômicos e intervenções para solução destes, tendo em vista a melhoria nas condições laborais dos trabalhadores. **Resultados:** Os principais problemas encontrados foram de transporte, locais de armazenamento, ferramentas manuais, no desing do posto de trabalho, iluminação, risco ambiental, comodidade e bem estar e equipamento de proteção individual. **Conclusões:** Garantir ambientes ergonomicamente adequados é de extrema importância, melhorando desta forma a produtividade, reduzindo riscos/acidentes e absenteísmo. **Descritores:** Avaliação ergonômica, Enfermagem, Saúde do trabalhador.

## RESUMEN

**Objetivo:** realizar un análisis ergonómico de un centro de urgencia en una unidad básica de Natal/RN. **Métodos:** se trata de una investigación tipo descriptivo y exploratorio, con enfoque cualitativo. Constituyéndose de una evaluación ergonómica del ambiente de trabajo en un centro de urgencia de una unidad de salud básica, ubicado en Natal/RN, en donde fueron señalados problemas ergonómicos e intervenciones para su solución con el fin de mejorar las condiciones laborales de los trabajadores. **Resultados:** los principales problemas encontrados fueron de transporte, centros de almacenamiento, herramientas de mano en el diseño del puesto de trabajo, la iluminación, los riesgos medioambientales, la comodidad y el bienestar y el equipo de protección personal. **Conclusiones:** garantizar ambientes ergonómicos adecuados es de suma importancia, mejorando así la productividad, la reducción de riesgos/acidentes y absentismo. **Descriptor:** Calificación ergonómico, Enfermería, Salud ocupacional.

<sup>1</sup>Nurse, graduated from Universidade Federal do Rio Grande do Norte / UFRN. Expertise in Occupational Health Nursing. Faculdade Redentor, Itaperuna-RJ, Brazil. Email: elisabeth-marques@hotmail.com. <sup>2</sup>Nurse. Doctoral student of the Program in Nursing Post-graduation of Universidade Federal do Rio Grande do Norte (PGENF-UFRN). Professor of Graduate Nursing at Universidade do Estado do Rio Grande do Norte / UERN. Campus Caicó-RN, Brazil. Email: cecilia\_valenca@yahoo.com.br. <sup>3</sup>Academic of Nursing Graduation course at Universidade do Estado do Rio Grande do Norte / UERN. Campus Caicó. Scholar of PIBIC / CNPq Email: gleyceany\_freire@hotmail.com. Address: Universidade do Estado do Rio Grande do Norte. Campus Caicó. Rua André Sales, 667. Paulo XI. ZIP code: 59300-000. Caicó-RN, Brasil. <sup>4</sup>Academic of Nursing Graduation course at Universidade do Estado do Rio Grande do Norte / UERN. Campus Caicó. PIBIC / CNPq scholar. Email: mayarah\_dantas@hotmail.com. <sup>5</sup>Nurse. Doctor in Nursing from Unicamp. Professor of the courses in Graduate and Postgraduate in Nursing at Universidade Federal do Rio Grande do Norte. Universidade Federal do Rio Grande do Norte / UFRN, Natal, RN, Brazil. Email: rgermano@natal.digi.com.br.

## INTRODUCTION

The word ergonomics comes from the Greek words *ergon* (work) and *nomos* (rules), aims to improve the comfort, health, safety and work efficiency and more broadly the living conditions of the workers, considering their capabilities, physical and psychological limitations. Acting in preventing accidents.<sup>1</sup>

The ergonomics studies some aspects of the person's relationship with working conditions, observing posture, body movements, environmental factors, equipment and office tasks performed.<sup>1</sup>

To provide an environment ergonomically appropriate through the application of ergonomic principles in the development of industrial activities is essential to all workers. This ensures that adequate and comfortable interaction between human beings and objects that handles as well as with the workplace.

The work environment involves the development of productivity, thereby reducing labor costs and risks that arise through absenteeism, conflict and lack of interest in work. Knowing that being respected all these factors there may be safe, healthy, comfortable and efficient places, acting directly or indirectly on the quality of people's life and the results of work<sup>1</sup>.

Health professionals have an important role in this context because of their actions in health surveillance have as activities to verify if working conditions are appropriate to its users, including their own workplace<sup>2</sup>.

The urgency post is in the unit of the type polyclinic in Cidade Satélite neighborhood, delivering services to adults from various localities, it is entered since November 26, 2001 in J. res.: fundam. care. online 2013. jul./set. 5(3):227-34

the national register of health care facilities (CNES), it belongs to the municipal administration, and there are 91 professionals of technical and higher level.

### Objectives:

To establish an ergonomic analysis of post urgency in a mixed health unit in Natal / RN. To identify the main problems of ergonomic work environment of a post of emergency in a mixed health unit.

To describe possible interventions for adapting equipment used in health care, aimed at improving the quality of working life of employees in this sector.

## METHODOLOGY

This research is a descriptive and exploratory, qualitative approach. Exploratory studies define goals and seek more information on a particular subject, they perform accurate descriptions of the situation and the relationship between elements of the situation<sup>3</sup>.

The descriptive study observes, records, analyzes and correlates events or phenomena (variables) without manipulating them. Looking thus uncover accurately how often a phenomenon occurs, its relation and connection with others, its nature and characteristics.<sup>4</sup>

It is an ergonomic evaluation of the work environment of a post of emergency in a mixed health unit, located in Natal / RN, where various health professionals work, especially nurses.

## RESULTS AND DISCUSSION

**Transport routes unmarked**  
Differentiating transport routes and areas for storing materials. Advise workers that there are areas that need to be flagged (transport and storage) and after first awakening to this situation, consult them on how to display them<sup>5</sup>.

When there are brands of transport routes near furniture or stored materials, it is necessary to make a better highlight of these, putting handrails also help in handling and safety of workers.<sup>5</sup> Thus we seek to orient workers so that nothing will be placed on transport routes that have now been demarcated.

The safety depends on the attitude, awareness and collaboration of each one. Signposted transport routes help workers to achieve a better workflow and provide transport (materials and customers in stretchers and wheelchairs). To understand environmental characteristics may hinder or promoting the realization of the activities is very important.

When a physical environment meets the needs of workers, it will certainly have a positive impact on the performance of activities, thus avoiding accidents that often are seen as casual, which is not true; accidents are preventable and predictable.<sup>6</sup>

#### **Shelves on which are stored the sera are extremely low, complicating the transport and materials handling in the work sector**

At first shelves with different heights should be arranged, the excessively high or low should not be used because the work environment should provide minimum requirements for good posture, visualization and operation of its employees.

Harnessing more adequately and effectively the walls near the work area, helping workers to stay in the correct position for handling the sera and utensils needed during the workday.

To provide guidance about posture, movement and transport of materials: keep their back straight, bend their knees instead of bending the spine; assess the burden; provide varying positions and activities, maintain a clearance for access to cargo; obtain safe conditions soil and  
J. res.: fundam. care. online 2013. jul./set. 5(3):227-34

the path to be traveled; position the feet correctly.

Lifting loads from the floor with the back straightened and bent knees; carry the load as close to the body; avoid twisting movements around the vertical axis of the body; to use wherever possible elements involved periodically and auxiliary equipment training programs and stimulation for practicing gymnastics labor since its completion brings improvements in daily work.<sup>7</sup>

Shelves at various heights allow a better use of space and help to keep things organized when it has a limited environment, when they have specific places for each object they are excellent for safe storage of materials and products, reducing the risk of accidents.

As the back pain problems so common among nursing professionals, a fact that has become a topic of great interest in occupational health nationally and internationally.<sup>8</sup>

#### **Hand tools: Stethoscopes and tensiometers do not have maintenance**

To instruct all workers to replace those that are experiencing equipment failures and arrange replacement of damaged equipment. To advise on the hygienic maintenance of stethoscopes, avoiding work-related diseases and ensuring the correct auscultation ourselves.

Establish regular periodic inspections stethoscopes and tensiometers, and ensure that these inspections are carried out well. Stethoscopes and tensiometers that do not work properly increase the downtime resulting drop in worker productivity. Clearing your stethoscope with 70% alcohol often ensures the ultimate in acoustic performance, and the protection against disease in the ear. Shoddy maintenance in tensiometers and stethoscopes can cause accidents and /or worker health problems.

**Improvements of design of the work post:**

Rest of the patients with high beds for improper performance of procedures and support serum and arm to punch height incompatible with the workers' stature.

To talk to workers seeking to know if they have any difficulty in developing their activities due to the height of the materials. Providing beds, serum media and puncture whose height is adjustable. Making sure that the height is always compatible for short and tall workers.<sup>5</sup>

To allocate materials to be in the range of the short workers. Since these materials are also used by tall workers.<sup>5</sup> Using platforms for short workers so that their hands are in a higher position and they can easily reach to the patients at the time of the procedures.<sup>5</sup>

We know that in the same work environment we find anthropometric variations, these differences tend to be bigger, because they are in workers of both sexes. It should be noted carefully that all workers can perform their procedures with ease without that it will bring them health problems.

Beds and serum and puncture support very high tire the short workers and reduce their efficiency; been a danger to them, they should be avoided. As noted, facilities are designed to track the average of the population, what is around 90% of users possible, showing that 95% of the tallest ones and 5% of the shortest ones fall short of these products.

However, in their workplace it is necessary that the shortest and tallest workers feel safe and comfortable with the existing space, their skills and patients' moving should be complemented by the establishment of safe working practices within an ergonomic structure, using, when possible, equipment and auxiliary equipment.<sup>9</sup>

**Worktop where medication is prepared does not fit the physical structure of all employees, not allowing short workers can perform their duties without risk to bring natural posture**

As workers perform their activities on foot, it is important that the hand is slightly below the elbows and they should also be avoided working heights too low, because it can cause back pain and other damage to this region. Workers may use lower surfaces, the wooden platform or a similar flat structure in order to increase the working height of the hands.

We must bear in mind that most of the occupations of modern life develops in relatively small spaces with the worker standing or sitting, performing movements with relatively larger members than with the whole body and where many factors must be considered as: posture, type of manual activity and clothing.<sup>10</sup>

Within the workspace the horizontal surfaces are important because it is on them that most of the work has been done. On the work desk the equipment must be correctly positioned within the range area that roughly corresponds to 35 - 45 cm with arms hanging normally and 55-65 cm with arms extended revolving around the shoulder.<sup>10</sup>

Correct height in regions where hands operate facilitates the work efficiency and reduces fatigue. Much of the work operations are best performed at the level of the elbows.<sup>5</sup> If the work surface is too high, the neck and shoulders stiffen and become sore because their arms have to stay on top. If the work surface is too low, it's easy to come up pain in the lumbar region, because the work is done with the body leaning forward.<sup>5</sup>

It is extremely important that the rule is applied to determine the elbow the correct height of the bench in relation to hand in order to

increase work efficiency and reduce disease in the shoulders, arms, neck and spine.<sup>5</sup>

#### **Lack of interest by improving the structure of the workplace**

Creating concrete opportunities for workers to propose their ideas for improving the workplace. A good way is to establish a day for it. Explain that these ideas will be discussed with the aim of finding the most feasible.

To provide: modifications of tasks and activities, avoid repetitive movements; verify thermal comfort, visual and acoustic workplace; assess workload and distribution of periods of pauses; deploy modifications that guarantee workers more creativity, autonomy and satisfaction and provide number enough workers' shift.<sup>11</sup>

No one knows a job better than the one that performs it every day. So that employee is the best source of information about ways to improve your work environment and consequently productivity. Leaving where workers are involved in the improvement of the working environment and providing the same motivations, we are guaranteed that they cooperated with the changes made.

**Lighting: increasing the use of natural light instead of artificial used in sector, it was only found a window and it cannot be opened because it is obstructed by cabinets, leaving a dark environment**

Orienting cleaning the windows and remove the obstacles that prevent its openness and natural light. The cabinets that are preventing the window opening can be put in another place since the location observe a countertop without large use, which could be used for this purpose, so the worker will have more natural light.

To increase the size of the windows or windows to a greater height in order to get more natural light. Note that these windows have their J. res.: fundam. care. online 2013. jul./set. 5(3):227-34

openings away from direct sunlight or protect them from such radiation. It is important to install independent switches for the various electrical fixtures or for the various rows of lamps, so that part of the lighting can be turned off when there is enough natural light in the workstation next to the windows.

Combine natural light with artificial light to improve the illumination of the workplace and consequently better working environment. The ambient lighting deficit can cause damage to the health of employees, increase the rate of accidents, promote greater fatigue and discourage workers.<sup>12</sup>

Natural light is the best and cheapest source of illumination. Using it, we reduce energy costs and it helps to maintain a pleasant working environment, and we observed that the distribution of light in the work unit can only be improved with the increased use of natural light.

**Environmental Hazards: cable connections from unsafe equipment, with some being joined by adhesive tape.**

To isolate or protect electrical terminals. Ensure that all wiring is appropriate. Ensuring a sufficient number of outlets for electrical connections in order to reduce the contact of workers with wires. If necessary, use some plugs in block. Eliminate irregular wiring. Never use exposed connections.

To train workers on the use of appropriate standard wiring to electrical energy required for machinery, equipment and points of light.

Do not use receptacle with several outlets connected to it especially when these devices have very different resistances, this can cause a short circuit and accidents. Determine a procedure for immediate replacement of cables peeled. Do not use tape instead of electrical tape, botched installation is dangerous.

Periodically check the general condition of the wiring of the institution. Use insulators for securing the wires when necessary. The wiring and connections of light are the biggest cause of accidents due to electricity, especially electrical shock. Particular care should be taken to prevent an electrical installation and irregular damage to connections.<sup>5</sup>

Good maintenance of mains and connections can decrease wasted time and interruptions due to equipment failures. Good maintenance can also reduce electrical accidents.<sup>5</sup>

#### **Convenience and welfare: improving welfare facilities along with workers**

To discover, through interviews, casual conversations or simple questionnaires, what are referred to the needs of workers with respect to welfare facilities and services. We know that the opinion of using this environment it is important to measure the degree of satisfaction but also confirm or help identify problems.<sup>13</sup>

To involve representatives of workers, supervisors and committee members of safety and health or safety representatives.<sup>5</sup> To recommend home improvement plans with low cost and easy to implement solutions. To submit these plans to the direction and workers.

To discuss together with workers or their representatives that steps should be taken to implement the proposed improvements. The evaluation of the improvements obtained consists of a fundamental stage and again it should involve workers or their representatives.<sup>13</sup>

Facilities for welfare are used every day in many ways. Using them can be easy or difficult, comfortable or uncomfortable, a health hazard or a contribution to the hygiene and healthy life. Joint efforts are certainly appreciated far beyond the time and money invested.<sup>5</sup>

J. res.: fundam. care. online 2013. jul./set. 5(3):227-34

The restoration and improvements of facilities and welfare services are often neglected but they are very important. The joint project should include repair and maintenance. We always should to keep in mind that worker's satisfaction is the first factor to be taken to reduce absenteeism.

#### **Personal protective equipment: it was not observed the use of personal protective equipment (PPE)**

To provide to the workers personal protective equipment and sufficient information about the risk factors at work and the potential for equipment protection.<sup>14</sup> To advise them about the importance of using PPE'S.

To providing not only the correct type of personal protective equipment, as well as the type and size for each worker. Too tight or too loose, it does not protect efficiently, it can cause discomfort and discourages the user to make use of it regularly.<sup>5</sup>

To ensure that all workers wear protective equipment designated for each specific situation.<sup>14</sup> Tests of adaptation before regular use of personal protective equipment help to convince workers that the equipment is necessary and acceptable. Take into consideration the preferences of workers in relation to color, shape, material and design of protective equipment.<sup>14</sup>

It is up to the employee about the PPE: use, using it only for its intended purpose; responsibility for the safekeeping and conservation; communicate to the employer any change rendering it unfit for use, and comply with the determinations of the employer on the proper use.

When personal protective equipment is accepted by workers, their use is commonly assured, decreases risk of accidents and injuries, reduces tension and problems in the workplace.

There are strategies for personal protective equipment is well accepted. Take the necessary precautions to make sure that the funds invested are well used.

### CONCLUSION

The rate of work-related diseases has increased in recent decades. Making it clear that the work activity is performed improperly or in an environment that differs from the ideal, may be contributing to or even causing physical, psychological or both.

These problems over the years without proper solution give rise to chronic diseases that often can be revealed only when the worker becomes incapacitated.<sup>15</sup> It is clear that the institution needs a considered ergonomic intervention, highlighting the nursing station room and interventions / procedures.

The ergonomic problems found could be causing work-related diseases. These problems can be mitigated with actions that involve pauses or reduction of working hours, gym work, job rotation, changes in critical points highlighted in this study.

The findings of this study justify the dissemination and application of knowledge in the design of ergonomic design of jobs, expanding the look change of posture of the service and how it works, the problems were scored through a risk map that allowed its expansion and diagnosis of problems so that these can be modified to improve the health of servers.

### REFERENCES

1. Godinho F. Tecnologias de Informação sem Barreiras no Local de Trabalho: manual digital. Vila Real: UTAD; 2004 [acesso em 2011 mar 20]. Disponível em:  
J. res.: fundam. care. online 2013. jul./set. 5(3):227-34

<http://www.acessibilidade.net/trabalho/Manual%20Digital/capitulo5.htm#cinco>

2. Haas GG, Henrique F, Demarzo MMP. Condições ergonômicas em uma unidade básica de saúde recentemente informatizada de Florianópolis - SC. ACM arq catarin med; 2008.37(4):27-31.
3. Polit DF, Beck CT, Hungler BP. Fundamentos de pesquisa em enfermagem: métodos, avaliação e utilização. 5ª ed. Porto Alegre (RS): Artmed; 2004.
4. Cervo AL, Bervian PA. Metodologia científica. 2ª ed. São Paulo-SP: McGraw-Hill do Brasil; 1996.
5. Brasil, Ministério do trabalho e emprego. Pontos de verificação ergonômica. 1ª ed. São Paulo-SP: Fundação Jorge Duprat Figueiredo; 2001.
6. Santos Junior BJ, Silveira CLS, Araújo EC. Condições de trabalho e a ergonomia como fatores de risco à saúde da equipe de enfermagem do serviço de atendimento móvel de urgência SAMU/RECIFE-PE. Rev Enf UFPE on line [periódico na internet]. 2010 jan/mar. 4(1):246-54. [acesso em 2011 mar 20] Disponível em: [http://www.ufpe.br/revistaenfermagem/index.php/revista/article/view/746/pdf\\_317](http://www.ufpe.br/revistaenfermagem/index.php/revista/article/view/746/pdf_317)
7. Alexandre NMC. Aspectos ergonômicos e posturais e o trabalhador da área de saúde. Semina: Ciências Biológicas e da Saúde. 2007;2(28):109-18.
8. Alexandre NMC, Angerami ELS, Filho DCM. Dores nas costas e enfermagem. Rev esc enf USP. 1996 ago;2(30):267-85.
9. Alexandre NMC, Rogante MM. Movimentação e transferência de pacientes: aspectos posturais e ergonômicos. Rev Esc Enferm USP. 2000;2(34):165-73.
10. Rodriguez ACR. A antropometria e sua aplicação na ergonomia. Rev bras cineantropom desempenho hum. 2001;1(30):102-8.
11. Alexandre NMC. Aspectos ergonômicos e posturais e o trabalhador da área de saúde.

Silva EECM, Valença CN, Lima GAF *et al.*

*Ergonomic evaluation of...*

Semina: Ciências Biológicas e da Saúde. 2007;2(28):109-18.

12. Villarouco V, Andreto LFM. Avaliando desempenho de espaços de trabalho sob o enfoque da ergonomia do ambiente construído. *Produção*. 2008;3(18):523-39.

13. Bins Ely VH, Turkiennicz B. Método da grade de atributos: avaliando a relação entre usuário e ambiente. 2005;2(5):77-8.

14. Brasil. Ministério do Trabalho e Emprego (BR). RN 6-Norma regulamentadora de uso de equipamento individual-EPI. Documento ministerial on line [acesso em 2011 mar 12]. Disponível em: [http://carep.mte.gov.br/legislacao/normas\\_regulamentadoras/nr\\_06.pdf](http://carep.mte.gov.br/legislacao/normas_regulamentadoras/nr_06.pdf)

15. Ballardín L, Fontoura C, Fellippa CS, Vogt M. Análise ergonômica dos postos de trabalho de operadores de caixa de supermercado. *R Eletr de Eng de Produção on line* [periódico na internet]. 2005 set; 3(5). [acesso em 2011 mar 12]. Disponível:<http://www.producaoonline.org.br/index.php/rpo/article/view/353/440>

**Received on: 16/05/2012**

**Reviews required: No**

**Approved on: 17/10/2013**

**Published on: 01/07/2013**