

Ergonomics As An Impact Variable In Employee Psychology

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ABSTRACT

The present study shows the results of the research aimed at the redesign of a work station carried out by an operator in the production department of the garment firms

Companies are involved in various processes and activities required to make the final product. In particular, the apparel industry aims to produce garments, including all the activities necessary for their production, such as cutting, painting.

These tasks are related to risks related to machine and work equipment safety, good process practices, hygienic conditions (temperature, humidity, noise, vibrations, contact with fibers, etc.), as well as ergonomic and environmental conditions. Working conditions affect not only the employees of this industry on a physical level, but also their mental health. Garment workshops are often located in poorly maintained, poorly ventilated buildings with poor cooling and lighting.

INTRODUCTION

Some authors consider ergonomics as a science, others as a discipline. Regardless of this or the explanation, we must always think of the truth, the first principle that protects ergonomics, that it is the work that must be changed to the person, not the person to the work. However, systems, equipment and workplaces must be adapted to the worker to protect their safety and health and thus increase the productivity of the organization, so we can say that ergonomics has two aspects on the work and the relationship with the organization itself.

According to Cortes (2007) states that ergonomics is a discipline of science or engineering aspects of

different types, aimed at the man-machine system, the objective of adjusting the environment or working conditions of the person in order to achieve the best balance between optimal conditions of comfort and productivity. excellence.

Therefore, as this author says, ergonomics is a method of prevention, aiming to achieve a good balance between workers' work and health in terms of health, safety and satisfaction. Similarly, Cortés (2007) says that ergonomics focuses its activities on the study of work methods and documents, environmental conditions and the conditions of the system in which the work is performed.

The discipline of science is concerned with understanding the interaction between people and other parts of the system, and the profession uses theoretical principles, knowledge, and creative methods to improve the well-being of people and the performance of systems in its field (IEA, n.d., 2000, cited by Saravia, 2006).

Regarding the repetition of the word "management", which we find in the definitions of ergonomics, it should be clarified that this means the contact or interaction of a person with a machine (machines) in the performance of their tasks, where machine (machine) means any tangible object, property or device that operates.

According to Saravia (2006), the fundamental principle of ergonomics is the Ergonomic System (ES), which consists of three parts, namely:

Person, object/machine and physical space. A person should be considered as a related being with all its characteristics of life, culture, behavior, mind, emotions, etc.; the mechanical part includes tools, equipment, tools, equipment, etc. involved in production; and the virtual space is the virtual space where the work is performed, where the other two parts of the human-machine system are found (Sanfeliix et al., 2012).

It is important to clarify that when performing an ergonomic analysis, the systems that include the human machine system are:

Superior or cultural-social system, organizational system, micro-social system, user behavior system and biological system.

Therefore, we can understand that ergonomics has an important impact on the safety and health of the worker, as it directly affects the detection of hazards directed at him and thus avoid dangerous events that harm the health of an employee who wants to be there. harmony at work. . Therefore, we understand that ergonomics is an important discipline in the organization because it carries out the task of analyzing dangerous situations for the worker and giving advice to control such risks through the training of managers and employees. (Maciel et al., 2016; Sánchez Fleitas et al., 2019).

On the other hand, a good ergonomic analysis and a good health system have good results for the organization and are manifested in lower absenteeism due to health reasons, worker productivity and therefore better quality of work. services provided by the company. Therefore, according to Barrau, Gregorio and Mondelo (1994), there are several factors to consider for a perfect career plan (optimal application of a design):

Good health; psychological and social; improve productivity, efficiency and safety; personal relationships; strengthening, transformation and expansion of activities; thermal, acoustic and visual comfort; electrical fields; air quality; serious labor relations; part of the stratosphere; buildings, movements and movements; communication flows; calendar; Teamwork; activities; How to order; corporate culture; brain activity; sex age, experience. In addition, by improving working conditions, it improves the work climate, increases employee commitment and motivation (Albornoz Silva et al., 2017; Gonzales Mendoza et al., 2022; Martinez Reyes et al., 2022).

METHOD

This research is focused on the sewing process work place for the garment companies, it takes into account the type of qualitative research, to answer different questions and concerns that are generated during the research with a descriptive scope since the variables studied will be described to achieve understanding and integrate a proposed solution to the thesis proposed. Through the means or method of observation to determine the shortcomings in the workplace.

ANALYSIS OF THE INFORMATION

What problems does the sewing job cause?

- Postural fatigue due to poor posture during repetitive tasks.
- Vision fatigue due to poor lighting.

Common disorders of sewing operators: These are pain in the head, body and shoulders, back, buttocks, thighs (tingling), knees and legs.



Figure 1. Bad posture.

POSITION TYPE	
Job title	Operative
Code Position	0563
Training	Seamstress
Experience	Knowledge and skills in textile processing and sewing machines, minimum 1 year of experience.
Attitudes	Tolerance to frustration, Leadership, Teamwork.

Activity Flowchart																																																																																																																																	
Description of the production process carried out in the job position	<table border="1"> <thead> <tr> <th colspan="4">FLUJOGRAMA DE ACTIVIDADES</th> </tr> </thead> <tbody> <tr> <td>Área de trabajo:</td> <td>Código de área: 056</td> <td>Elaborado por: Encargado del sistema SST</td> <td>Aprobado por: Jefe de producción.</td> </tr> <tr> <td>Costura</td> <td></td> <td>Analista de seguridad y salud</td> <td>Dirección de seguridad y salud</td> </tr> <tr> <td>Nombre del procedimiento</td> <td colspan="2">Descripción de actividades, inspector de seguridad y salud en el trabajo</td> <td>Fecha: 4/07/2019</td> </tr> <tr> <th>No. Act (Mejoras)</th> <th>Descripción de las actividades</th> <th>▲</th> <th>■</th> <th>➔</th> <th>●</th> <th>▼</th> <th>◊</th> <th>▭</th> <th>▭</th> <th>▭</th> <th>Comentarios</th> </tr> <tr> <td>1</td> <td>Recibe material cortado (Short-Pantalon)</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Inspección del material</td> <td></td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Se coloca en el soporte de costura</td> <td></td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Guiar en la maquina de costura</td> <td></td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Entrega material a proceso de pretina</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Símbolo</th> <th>Tarea Descrita</th> </tr> </thead> <tbody> <tr> <td>○</td> <td>Inicio</td> </tr> <tr> <td>▭</td> <td>Operación , actividad o tarea</td> </tr> <tr> <td>◊</td> <td>Decisión</td> </tr> <tr> <td>◊</td> <td>Revisión</td> </tr> <tr> <td>▭</td> <td>Salida física de copias</td> </tr> <tr> <td>▭</td> <td>Generación de documento (escrito)</td> </tr> <tr> <td>▭</td> <td>Información en Base de Datos</td> </tr> <tr> <td>▼</td> <td>Almacenamiento de documentos físicos</td> </tr> <tr> <td>○</td> <td>Fin</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Símbolo</th> <th>Tarea Descrita</th> </tr> </thead> <tbody> <tr> <td>○</td> <td>Inicio</td> </tr> <tr> <td>▭</td> <td>Operación , actividad o tarea</td> </tr> <tr> <td>◊</td> <td>Decisión</td> </tr> <tr> <td>◊</td> <td>Revisión</td> </tr> <tr> <td>▭</td> <td>Salida física de copias</td> </tr> <tr> <td>▭</td> <td>Generación de documento (escrito)</td> </tr> <tr> <td>▭</td> <td>Información en Base de Datos</td> </tr> <tr> <td>▼</td> <td>Almacenamiento de documentos físicos</td> </tr> <tr> <td>○</td> <td>Fin</td> </tr> </tbody> </table>	FLUJOGRAMA DE ACTIVIDADES				Área de trabajo:	Código de área: 056	Elaborado por: Encargado del sistema SST	Aprobado por: Jefe de producción.	Costura		Analista de seguridad y salud	Dirección de seguridad y salud	Nombre del procedimiento	Descripción de actividades, inspector de seguridad y salud en el trabajo		Fecha: 4/07/2019	No. Act (Mejoras)	Descripción de las actividades	▲	■	➔	●	▼	◊	▭	▭	▭	Comentarios	1	Recibe material cortado (Short-Pantalon)	X										2	Inspección del material				X							3	Se coloca en el soporte de costura		X									4	Guiar en la maquina de costura		X									5	Entrega material a proceso de pretina			X								Símbolo	Tarea Descrita	○	Inicio	▭	Operación , actividad o tarea	◊	Decisión	◊	Revisión	▭	Salida física de copias	▭	Generación de documento (escrito)	▭	Información en Base de Datos	▼	Almacenamiento de documentos físicos	○	Fin	Símbolo	Tarea Descrita	○	Inicio	▭	Operación , actividad o tarea	◊	Decisión	◊	Revisión	▭	Salida física de copias	▭	Generación de documento (escrito)	▭	Información en Base de Datos	▼	Almacenamiento de documentos físicos	○	Fin
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Activities and/or operations performed in this position	Routine: Sewing, material inspection, guiding the process. Non-routine: Machine maintenance, area cleaning.																																																																																																																																
Tools, equipment or methods of use are used.	Sewing Machine, Scissors.																																																																																																																																
Practical requirements	Fastener grips, force to push the fabric to the machine.																																																																																																																																
Competencies	Tolerance to frustration, Leadership, Teamwork.																																																																																																																																
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Working Hours	48 hours per week.																																																																																																																																

Figure 2. Profesiogram

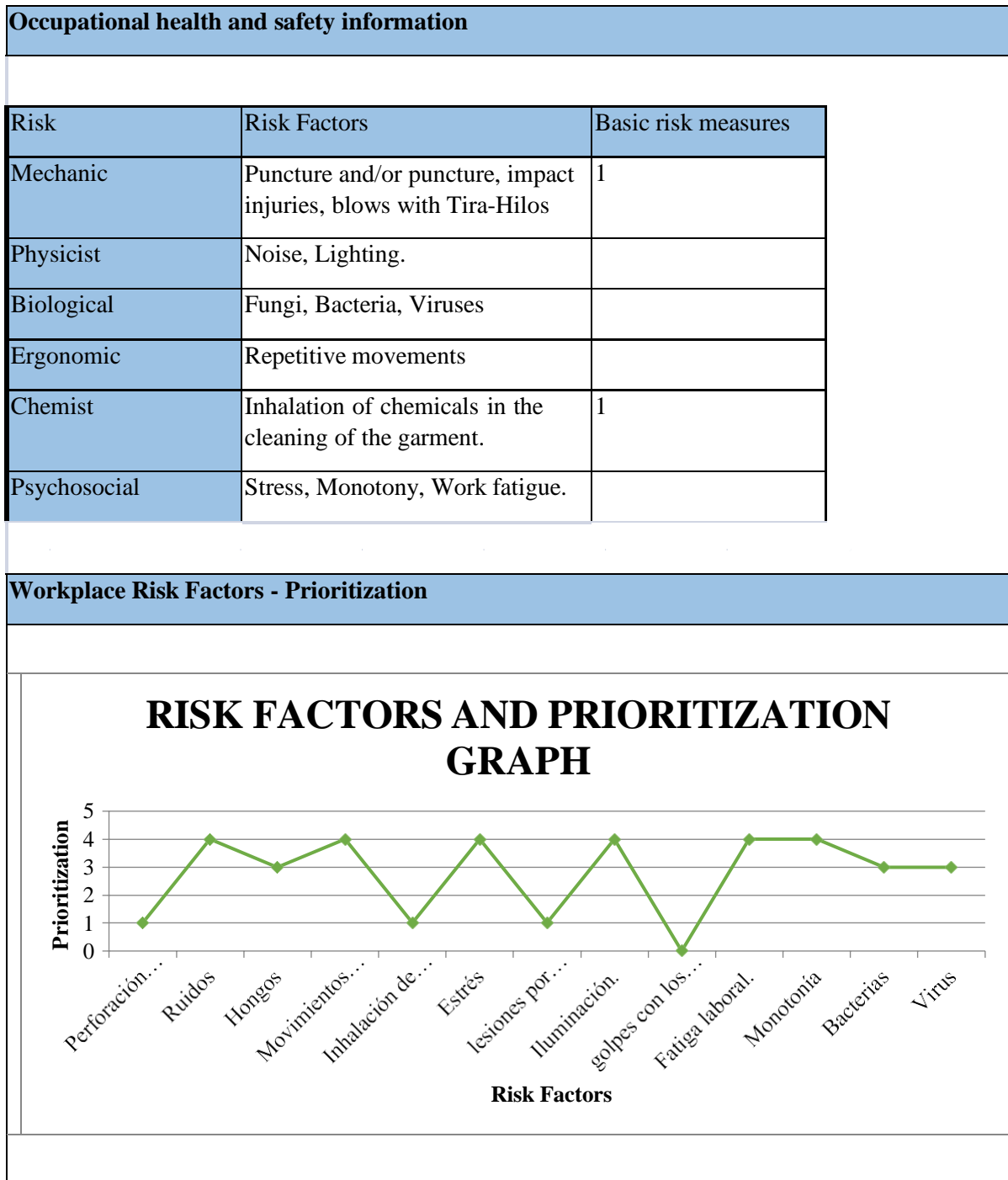


Figure 3. Profesiogram

Personal protective equipment for work.					
	gloves	goggles	boots	endowment	Others
Job title	x	x	x	x	X

Figure 4. Personal protective equipment

Psychophysiological demands of the job.						
Minimum skills required	Very good	Good	Media	Insufficient	Deficit	Remarks
	5				1	
capacity for initiative						
Adaptability						
ability to solve problems						
teamwork						
Creativity						
Occupational medical examination and assessment						
Pre-occupational	Occupational examination (physical, mental and social health of the worker)					
Newspapers	Occupational examination (physical, mental and social health of the worker)					
Reimbursement	Occupational examination (physical, mental and social health of the worker)					
Specials	Spine Rx and visiometry					
Output	Occupational examination (physical, mental and social health of the worker)					

Figure 5. Occupational medical examinations and assessments.

Medical Contraindications	
Absolutes	Hernias, spinal problems, visual problems.
Related	Pregnancy and hypertension

Figure 6. Medical contraindications

Preventive measures of the position

Create a workplace (tables, chairs, counters...) taking into account the characteristics of each person (height, age, capacity, etc.) and its function. Facilitate the work and allow flexibility and breaks.

2. Use chairs that are large enough for each work area that can be adjusted to fit each person's height. The benefits they have to offer are as follows:

be height adjustable - the correct height is the height that allows the hips to be horizontal, the feet on the floor, have a swivel seat that is not made of

hard material, and the adjustable backrest necessary to reach the middle of the spine to avoid bending the spine at the bottom of the spine.

3. Adjust the height of the sewing machine according to the height of the person using it to enjoy leg and back room during work. For example, increasing the table height reduces the amount of neck and back rotation in people who are taller than expected for machine users.

4. To practice physical exercises aimed at stretching and strengthening the muscles of the back, mainly the cervical and lumbar area, the shoulders, and the upper and lower extremities.



Figure 7. Active pause.

Intervention Measures

Table 1. Intervention measures

WORKPLACE PARAMETERS	ACTUAL MEASUREMENTS	CORRECT MEASURES
Table height	m	90-95cm
Right Arm Flexion		50cm
Left Arm Flexion	50°	45°
Table Tilt	0°	30°
Arm Height	95°	90°

Recommended

- Replace this function with other functions that facilitate handling or movements.
- Adjust the length of the stop to the type of force used.
- Distribute the weight of the load, move the legs in position
- Keep your back straight and lean back in the chair.

- The feet should rest comfortably on the floor.

Critical Parts of the Chair

Workers often protect their shoulders, elbows and forearms (as shown) when sewing due to incorrect seat height or position.

Workers have to sit or stand in one place for long periods of time, which causes back and neck and/or hip pain and reduces blood flow to the legs.

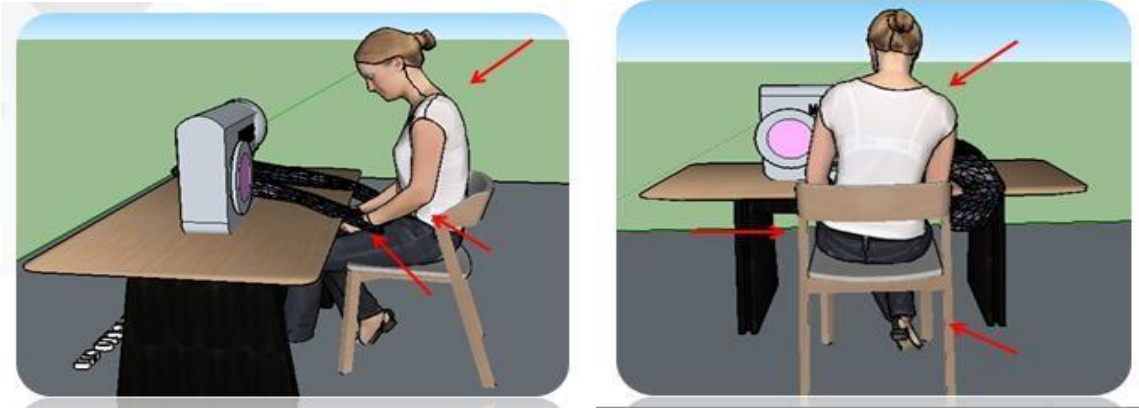


Figure 8. Critical part chair

Proposal development

Use adjustable seats (as shown in Figure 5) to reduce operational discomfort and train workers on how to use them correctly. Seats should have:

Easy height, seat and back adjustment; rounded sides to support the lower back of the work; no wheels or locks. Sliding front edge so the edge of the seat does not press on the back of the legs; and the closed seat distributes the worker's weight so that no part of the body is under pressure.

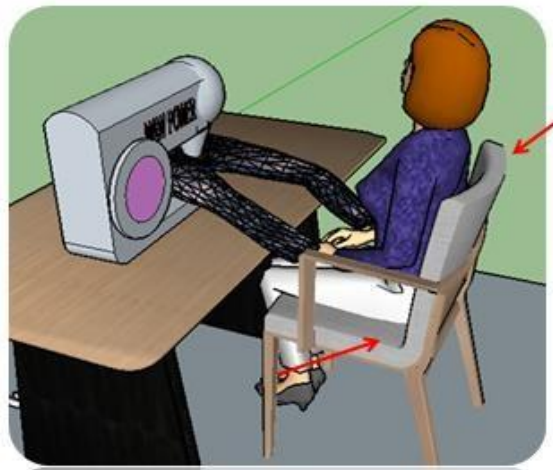


Figure 9. Proposed chair solution

When choosing the right chair, consider the range of motion required to complete the task and the employee's behavior.

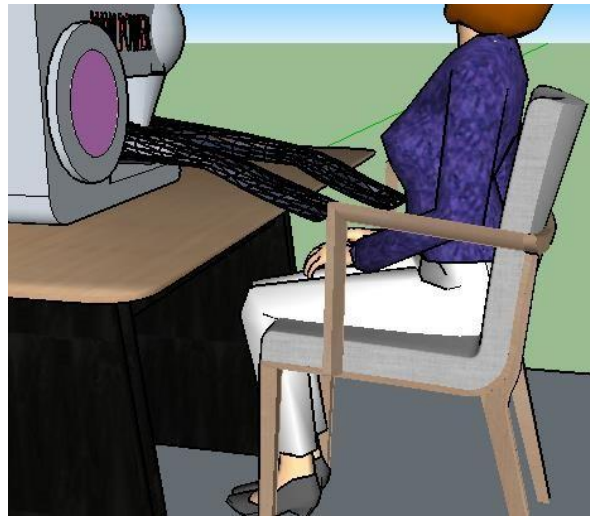


Figure 10. Appropriate Chair

Critical parts table

Workers maintain weak shoulders, elbows and hands while sewing due to the low table height.



Figure 11. Critical part table

If workers put their arm or hands on sharp points, this can lead to a reduction of the nervous system due to poor blood circulation, nerve pressure and injuries to the hands or arms.

Proposed solution

- Provide height and tilt adjustable desks (as shown in Figure 12) that can help workers do their jobs without getting into awkward positions.
- Tables should be adjusted so that work is at elbow height and arms are kept straight.

- If the table is too low, workers will have to bend over, putting pressure on the back, neck and shoulders, so the table must be set at the appropriate height.

- The head of the table should not press against the worker's waist. Workers who pedal need more room than non-pedaling workers to move their legs easily.

- If the table is too high, employees must raise their shoulders to raise their arms high enough to work.

This position damages the muscles of the neck, shoulders and upper back and can cause muscle pain.

- For seated work, the table should also be high enough to allow room for the worker's feet on the floor.

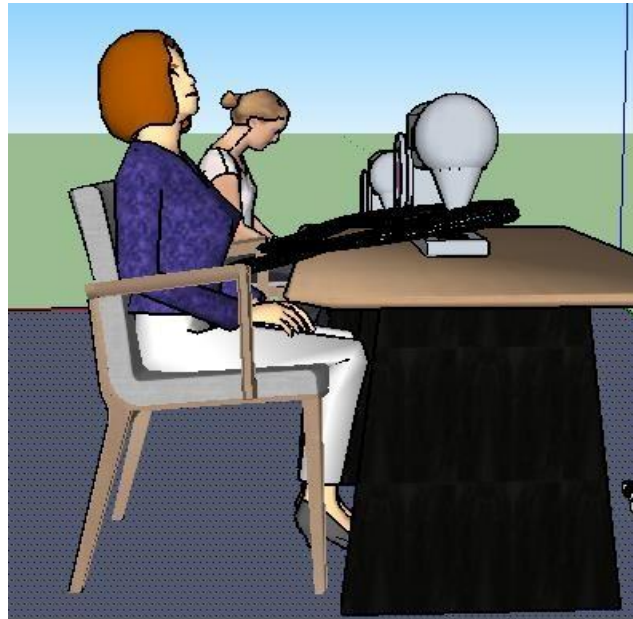


Figure 12. Table solution

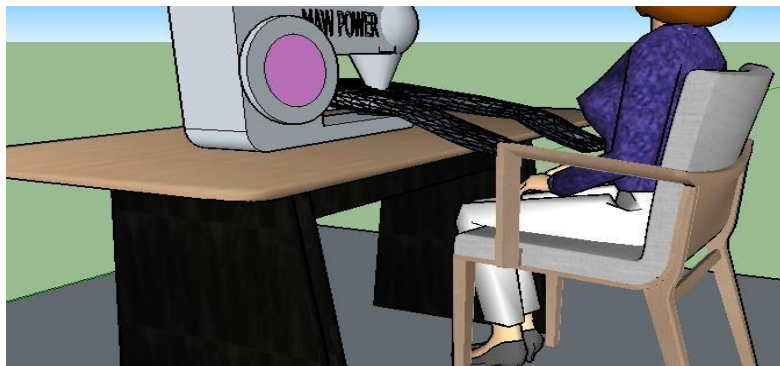


Figure 13. Table solution

DISCUSSION AND CONCLUSIONS

By means of the diagnosis and observation of the activities performed by the operator, different

problems were found when performing the operation.

It was possible to analyze the poor posture of the operator within the company, and it was determined that the process presents a level of musculoskeletal disorders since the operator makes a greater effort when lifting the fabrics and performing the operations.

Through modeling, improvements were applied to the sewing workstation taking into account physical factors to prevent illness or injury and improve comfort for the production process.

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