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Evaluation of the Suitability and Sustainability of the Ergonomics Program, at Gildan Activewear, San Miguel Plant and Rio Nance Hosiery Plant #3, Honduras

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Executive Summary.

The present report has the objective of evaluating the suitability and sustainability of Gildan Activewear's Ergonomics Program in Honduras at the San Miguel and Rio Nance #3 Plants. Throughout the information gathering process, observations at the above mentioned plants were conducted, surveys were conducted of workers, semi-structured surveys of plant management, of representatives of the Department of Labor and of the Honduras Social Security Institute (IHSS), as well as of representatives of the Honduras Women's Collective (CODEMUH).

Both factories have a robust and well-structured Ergonomics program, which is led under the guidance of North Carolina State University. This program, based on the maturity of the ergonomics processes, was designed to achieve higher levels of quality in the application of principles of Ergonomics to reduce the frequency and severity of musculoskeletal injuries of workers at said plants. The activities performed at each level include training, dissemination , a plant Health Care System, workstation evaluations and the application of improvements to them. In addition, they have an Ergonomics Committee, made up of managers from different departments within the plants, although workers do not participate, giving them a good organizational platform.

Training has been provided primarily to the members of the Ergonomics Committee and to very few workers. For the latter, emphasis has been made on dissemination as a means of informing the causes of lesions, techniques for avoiding injury, and knowledge about access to medical services, etc. The strategies for dissemination are various and range from pamphlets and murals to the organization of fairs. Unfortunately, the information has not reached workers in production and there is no active worker participation.

The primary musculoskeletal pains mentioned by workers and which coincide with the diagnoses of the Honduras Social Security Institute and the Facility's Health Care Service are in the back, shoulders and hands; shoulder pain, lower back pain (lumbago), back pain (dorsalgia) and tendinitis.

Workers who perform their jobs in a seated or standing position adopt uncomfortable postures and do not use the chair adequately; the work they perform is repetitive, monotonous and requires repetitive movements of the upper extremities. The ergonomic evaluations are not systematic and only use two instruments for evaluation.

In conclusion, both factories have a robust and well-structured ergonomics program; however, it presents some limitations that will be remedied as its implementation progresses.

Introduction

This report responds to the contract between Fair Labor Association (FLA) and the Consultant, Dr. Lylliam López Narváez, to evaluate the suitability and sustainability of the Ergonomics Program at GILDAN Activewear in Honduras, specifically at the San Miguel and Rio Nance #3 plants. This evaluation is performed in response to a complaint presented by the Honduras Women's Collective (CODEMUH), an organization that groups women working in Maquilas in Honduras. The complaint alleges that at GILDAN Activewear's plants, worker health and safety is not being dealt with adequately; especially those risk factors that result in musculoskeletal injuries.

As background information, GILDAN Activewear is a vertically integrated company based in Canada that manufactures and markets basic apparel. It has manufacturing plants around the world, among them are the San Miguel and Rio Nance #3 Plants, both located in the Municipality of Choloma, Cortes, Honduras. The first has 4,500 workers distributed in 4 x 4 structured shifts (4 work shifts, each with 11 hours per day and 4 days off). The production is basic t-shirts, long sleeve t-shirts and polo style shirts. The Rio Nance #3 Plant is dedicated to the production of socks and has 1,653 workers in the 4 x 4 model arrangement.

In response to the complaint presented by CODEMUH, FLA has requested the present evaluation from the Consultant. The Reference Terms in the contract state that the Consultant must:

1) Review and evaluate GILDAN Activewear's policies, procedures, training, dissemination activities, and worker involvement in its Ergonomics Program, taking into account that the company follows a 4 x 4 structured work schedule.
2) Review the organizational structure as it pertains to the manner in which the Ergonomics Program adapts to the management structure in place, the hierarchical relationships, industrial relations and worker complaint processes.
3) Review Ergonomics skills development, including its content and number of sessions involving management and workers, frequency of skills development and its effectiveness, etc.

4) Review the level of resources assigned by GILDAN to ergonomics in the evaluated plants, including number and team work positions, equipment and cost in dollar amounts of ergonomics expenditures.
5) Review and evaluate the scope, content and on-site activities of the Consultancy Project by North Carolina State University (NCSU). Specifically to: (1) evaluate if the NCSU project scope and activities are appropriate; (2) evaluate if its recommendations and corrective actions are or will be effective in the reduction of worker risk and injury; and (3) evaluate if there exists any occupational health problem or concern that has not been addressed adequately by the NCSU project.
6) Review and evaluate the ergonomic studies conducted in the plants by third parties, including the allegations by CODEMUH.
7) Observe work stations, processes, product flow and plant organization, evaluate if any implementation gaps exist and identify other ergonomic aspects that have not been addressed.
8) Interview key managers, production line supervisors, and production plant workers regarding ergonomic risks, controls and reporting mechanisms within the plants. Workers should be interviewed based on a random sample. In order to obtain reliable information, and if the consultant deems it necessary; interviews may be conducted with workers outside of the workplace.
9) Prepare an action plan prior to starting the evaluation to inform GILDAN of the time that will be spent at the plants to ensure the availability of the pertinent personnel.

Methodology

For the collection of the required information and in order to comply with the primary objective of this consultancy, there was interaction with the main actors: GILDAN representatives, representatives of the Ergonomics Center of North Carolina State University, CODEMUH representatives, workers at the San Miguel and Rio Nance Hosiery #3 Plants, representatives from the State (Department of Labor and the Honduras Social Security Institute). The methodology included document revision and plant visits (observation), semi-structured interviews (see annexed guides) and surveys.

This process was achieved with the complete cooperation of different company representatives (Occupational Health Regional Manager, Maintenance Department Head, Operations Department Head, Human Resources Manager, Environment Health and Safety Coordinator, Corporate Citizenship Manager and Regional Health and Safety Manager, among others), who gave total access to facilities, documents and available information in addition to providing the necessary conditions for the collection of data during the different phases in the process.

Document Review.

The objective of the document revision was to acquire knowledge about the context of Occupational Health and Safety in textile Maquilas, the Ergonomics Program implemented in the plants of interest and previous evaluations, as well as its impact on the improvement of working conditions in the plants. During the review Reference Terms 1 through 5 were kept in mind. The following documents were reviewed at both plants:

1. Ergonomics Program (policies and components, objectives and goals, activities and responsibilities, achievements and limitations).
2. Ergonomic evaluations of workstations.
3. Change control report.
4. Presentations employed for management and worker training.
5. Report of completed training.
6. Report of Ergonomics dissemination activities.

7. Record of main causes of consults for musculoskeletal disorders.
8. Reports of resources assigned to the Ergonomics Program.
9. Results of the Investigation conducted by CODEMUH: “Complementary health and safety procedures, response to the third party complaint”; and “Work and Health. Situation of female workers in Honduras maquilas”.

Observation of the work process.

The visit sought to identify the risks of musculoskeletal injury present in each workstation, improvement actions performed and other activities that make evident the execution of the Ergonomics Program, and implementation gaps in its application (Reference Terms 1-3, 5, 7). For this purpose, a tour was conducted through the different stages in the process, from raw material reception through the packaging of the finished product for export. The tour was conducted in the company of representatives from GILDAN Activewear (management), who described the processes and implemented improvements; the different initiatives taken for workers to learn about Ergonomics and they responded to questions posed by the evaluating team. In addition, a visit was made to the Clinic and the Back School. The visit had a duration of 4 hours at each plant.

Interviews.

Semi-structured interviews were conducted (see annexed guides) with the different social actors, in order to understand the context of occupational health and safety in textile apparel maquilas in the region and the knowledge that administrative personnel and other social actors have about the Ergonomics Program at GILDAN Activewear. Among the actors interviewed are the Department of Labor, the Honduras Social Security Institute (IHSS) and the Honduran Women’s Collective (CODEMUH). In addition, interviews were conducted with medical personnel from the plant’s clinics (the doctor that heads the Occupational Health Regional Management, 2 doctors from the San Miguel Plant and 2 doctors from Rio Nance #3 Plant) according to Reference Terms 6 and 8.

At the Department of Labor, a Hygiene Inspector and the Chief of Occupational Health Services were interviewed. At the Honduras Social Security Institute, the Doctor responsible for the Occupational Risks Commission was interviewed. CODEMUH was visited on two occasions. During the first visit, an interview was conducted with the General Coordinator and the legal representative in the presence of 3 workers (two women, one man); during the second visit only the General Coordinator from CODEMUH was interviewed.

Ergonomics Center, North Carolina State University Interview.

This interview was conducted via e-mail. The questions were sent by electronic means (see annexed guides). This activity corresponds to Reference Terms 1-5 and 8.

Surveys of active workers.

A survey was conducted with a total of 98 workers at both factories (Reference Term 8): 58 workers from the San Miguel Plant and 40 workers from Hosiery Rio Nance #3 Plant. At the San Miguel Plant, the selection was done in a systematic manner, selecting two workers from the same team separated by 3 workstations between them: one of the investigators toured the plant and randomly selected one worker from the first team and then the second worker was selected by moving three workstations clockwise; in the second team, three positions were advanced, always clockwise, to select the next worker, and so on until 58 workers were selected at the San Miguel Plant. At the Rio Nance #3, a systematic selection was also utilized, alternating every 3 workers, insuring that a minimum of 20% of the workers in each department were included.

For the collection of information a questionnaire was utilized (see annex) containing questions regarding general data, employment data, regarding aspects relating to musculoskeletal pain or discomfort, location of pain, interference with the job and activities outside work, regarding entertainment and issues in ergonomics.

The process of filling in the questionnaire was performed in a meeting room within the plant. Between 10 and 12 workers were sent to the meeting room where one of the consultants explained what the questionnaire consisted of and the importance of filling it in conscientiously. The questions were read out loud and the type of information sought was explained. It was also explained that participation was voluntary and if they did not wish to participate, they were thanked for coming to the meeting room and told they could leave. Nobody refused to participate. Once all questions were explained, the workers proceeded to answer the questionnaire. One of the consultants remained in the room to clear up any doubts that arose during the response. Access to the room was not permitted to administrative personnel, so workers would not feel coerced.

Results.

The results are presented corresponding to the methodology utilized, with emphasis on the Reference Terms. When the results differ among plants, as in the case of worker surveys, activities performed, etc., separate sections are presented or the appropriate clarifications are presented.

In Honduras the institution responsible for the monitoring and follow-up of accidents and Occupational Disease is the Department of Labor and Social Welfare, in addition it is responsible for the inspection of work centers, and for regulating and coordinating activities for prevention of occupational risks with the Department of Health and IHSS.

Among the few activities organized by this secretariat, one has been the Apparel and Textile Industry Integrated Training Program for Competitiveness (PROCINCO). This training program includes topics about: Management and personnel supervision, stress and productivity, safety in environmental hygiene, major risks in the textile sector, occupational safety plan, mobbing, sexual harassment, and safe handling of chemicals, among others. Only 40% of companies have made use of this program. The subject of ergonomics is not considered a priority since it is not even mentioned as a specific topic for training. This is consistent with what the Hygiene Inspector from the Department of Labor mentions, stating that training on the subject of ergonomics has only been received on one occasion. And according to the person responsible for occupation risks from the IHSS and the doctor from the Department of Labor, Gildan is ahead of other manufacturers, because it is the only one that has made an effort to implement the Ergonomics Program in the company.

The Ergonomics Program

This program was developed in 2009 with the support of the Ergonomics Center of North Carolina State University and is based on the Ergonomic Culture Maturity Model. The program consists of five maturity levels, which must be reached gradually; it is expected to achieve the maximum level in about 3 more years (2014). The levels of maturity are: Fire-fighting (I), Reactive (II), Compliance (III), Preventive (IV) and World-class (V). It is organized into 3 components (components 1, 2 and 3) and 8 elements.

The first component is that of “Processes” and consists of 3 elements: Injury Management, Education and Training and Program Compliance and Audit.

The second component is that of “Behavior”, also made up of 3 elements: Management Leadership, Employee Involvement and Responsibility and Plant Ergonomics Team.

Finally, the third component is “Technical” and consists of 2 elements: Prioritization and Analysis; and Risk Assessment and Hazard Control.

Each element has defined goals, on which activity planning is based. The number of goals for each element is defined by the maturity level or stage in the program.

The first stage “Fire-fighting” is reached when “some employees have general knowledge about principles and tools; the implementation (of the program) has commenced. Action is taken after events have occurred.” In both plants this level has been surpassed in each of the elements of the components, which could be verified during document review and during the observation of activities. One weakness in the planning of this level is that in the element of Employee Involvement and Responsibility (from the Behavior component) did not consider as a goal the involvement of production workers. Likewise, the element of Plant Ergonomics Team, did not consider the creation of this team as necessary in the goals of the first level. Nonetheless, the latter is considered for the second stage.

The second level “Reactive” is when “some employees have basic knowledge of principles and how to apply the tools; implementation has advanced and its execution is inconsistent; action is taken as events occur.” Although it is considered that this level has been reached, there remain gaps to be filled. The components Processes and Technical (I y III, respectively) have the most progress, primarily the creation of the ergonomics program and the Ergonomics Committee. The latter consists of 13 people from the administrative team in each plant, including the Human Resources Manager, Regional Manager for Occupational Health, a Doctor from the plant, heads of different production lines, Maintenance Manager, Production Manager, Environment, Health and Safety Manager, etc. Unfortunately, to date, it does not include worker representatives.

However, there remain goals to achieve. For example, in the Process component, the creation of an electronic system to register injuries and the monthly review of costs of medical leave (Injury Management) have not been completed, although work is being done on the first; general training for all employees has not been performed (Education); the Ergonomics Program has not been formally communicated to employees (Program Compliance and Audits). The lack of communication about the program, just as in employee training, weaken their understanding and involvement; not having the system nor the monthly review of medical leave costs disallows the definition of priorities based on the main issues (reactive level). Furthermore, in the Technical component, the majority of the goals have been achieved, lacking only the Process inventory and the analysis of 25% of these.

In the Behavior component (also in the second level), the following activities were not performed: establishment of annual severity indicators of musculoskeletal injury and the percentage of program implementation with cost of medical leave (Management Leadership). In addition, the ergonomic guides and disciplinary procedures for violations to these guides and the corresponding personnel training (management and employees) were not established. Nonetheless, the Ergonomics Committee was created, although it does not include the involvement of production workers.

The function of the Ergonomics Committee is to organize and conduct training of the committee itself and of the workers in general, to perform risk analysis of the various processes and develop proposals for changes; conduct discussions about cases of workers with musculoskeletal problems (evaluate the workstations and assess worker reassignment). The Committee proposes to meet monthly and when the need arises to review cases of musculoskeletal injuries. However, the meetings are not occurring with the periodicity indicated.

On the other hand, the company's organizational structure at its different levels is an excellent platform for the implementation of the components and elements of the Ergonomics Program, given that it allows its development in a cascading approach. This

structure facilitates a better link, coordination and diffusion of information to the different labor levels until reaching workers, who are the main actors for the adequate development of the Ergonomics Program and the achievement of quality production with improved working conditions and a reduction in musculoskeletal injuries.

An important factor is that the company has an open door policy. Workers can make suggestions or present their grievances directly approaching any member of the administrative team from the Line Supervisor up to the Corporate Manager, or through the suggestion box. They also conduct round table meetings, where the production team presents problems and solutions. Another option for presenting suggestions is the Integrity Hotline, via telephone, where workers can express different problems that arise during the daily work routine.

In conclusion, at both plants the Program is reaching the final stages of the second level. That is, actions are still being taken reactively to emerging problems, although the necessary basis are being created to advance to the Compliance level, where employees understand the principles and how to apply the tools, and the implementation is continuous and consistent. In fact, some activities can already be observed such as the financial support, and the establishment and training of the Ergonomics Committee.

Training

Ergonomics training has been given to different levels since 2008. In the case of the Ergonomics Committee, the training includes topics about tools for the analysis of

workstations (RULA and NIOSH), workstation design, communication of job risks, materials handling, protection of spinal column, etc. This training was provided through an intensive 3 day course (8 hours daily), given by a specialist from North Carolina State University. This training has been given on two occasions, once per year.

In the case of the coordinators, midlevel management and supervisors, the topics taught were basic and covered the following: What is Ergonomics, Benefits of Ergonomics, Ergonomic Risk Factors in the Workstation (forces and materials handling), Stretching Exercises, How to collaborate with the Ergonomics Program and How to report ergonomic suggestions.

Among the training activities directed at workers, the supervisors gather their teams and lead talks about posture and movements and about the best work methods. It also provides for them to receive an orientation talk regarding how to receive medical attention at the Facility's Health Care System Clinic. The talk includes subjects regarding health rights, prevention programs (vaccination campaigns, vitamin campaigns) available at the plant, health counseling and periodical medical evaluations. In addition, it provides for a yearly orientation presentation regarding risks on the job, preventive exercises, how to cooperate with the accident report, etc.

Although an ergonomics training program exists that is directed at production workers, it has been difficult to reach all workers. The majority of those surveyed expressed having knowledge of an Ergonomics Program in the Company, but being unaware of what it consists of, what the main ergonomic risks are and are also unaware if improvements have been made to the workstation. One possible cause is the deficient production worker involvement in the development of the program. It is necessary to define a strategy for the training and communication of information that is simple and easy to understand for the base which is the production workers.

Dissemination

The Ergonomics Program included different activities for the dissemination of information regarding ergonomics. The activities include talks, murals, dramatizations,

public announcement system messages, posters, leaflets, health fair, celebration of Ergonomics Day, health fair stands y reproduction of videos in the plant and cafeteria. There has also been dissemination activities regarding the introduction of the Back School, newsletters and leaflets were distributed regarding this matter and announcements over the speaker system were made. The content is defined by the Ergonomics Committee. On Ergonomics Day, contests were organized in which workers had to answer questions about Ergonomics in the workstations, demonstrations of exercises are performed, implemented improvements are identified were demonstrated, etc.

At the Rio Nance #3 Hosiery Plant, the FOCAM program is in place, which promotes employee participation in the proposal of changes and improvements to workstations, awarding and implementing the best proposals. These proposals can be for the improvement of quality, production or safety and ergonomics. A total of 200 ideas were presented, 44 corresponded to safety and ergonomics. Of these, 19 were preapproved by the evaluating committee and 4 received awards. The implementation of the winning ideas is done gradually giving priority based on its feasibility and impact. To date, the placement of a ladder for the positioning of thread cones and the use of a rake to reach socks in the bleaching area have been implemented.

Implementation of engineering changes to workstations

San Miguel Plant

During the tour of this plant the following limitations were observed:

1. Workers do not use the chairs in terms of adjustment.
2. The correct seating position is not adopted.
3. An uncomfortable position was observed of workers in a standing position.
4. Chairs in disrepair were observed.
5. The work performed is monotonous and repetitive.

At this plant, during the past two years, the following changes have been made to workstations:

a) A box sealer with table was introduced in order to prevent the worker from bending.
b) An attachment was that allows to hold the roll of tape at the tape operator workstation was installed.
c) A ramp to one turn over table was added so it would slide the 12 piece rolls and a hole was drilled in this table to hold the tying straps.
d) A table was installed to hold bundles at one sub-assembly station of garments.
e) The inspection table was extended in order for workers to place inspected pieces without accumulation, which forced the work to be performed with arms raised above the shoulders.
f) Rounding of machine edges to allow the entrance of thighs and the adjustment of worker's position.
g) The closed sleeve collection tray was moved forward preventing the worker from striking the knee against the tray.
h) Delimitation of the stain cleaning area with barriers to restrict access by other workers.
i) The rolls of packing bags were located at the worker's waist level in order to avoid picking them up off the floor.
j) A spare machine was introduced every two teams and a "wildcard" was introduced (a worker that complements the team requiring more support) to alleviate the work load of the teams.
k) One table with adjustable height was designed (as prototype) for one garment assembly operation.

Río Nance #3 Hosiery Plant

During the tour of this plant's facilities the following limitations were observed:

Knitting area:

1. Workers in the knitting area walk great distances.
2. They are exposed to high levels of noise.
3. The videos with Ergonomics information are not viewed by the workers.

Ironing Area:

1. Task is monotonous and repetitive.
2. Work overload.
3. The workers perform repetitive movements of the shoulder without rest while placing the socks in the mold for ironing.
4. Work with a static foot position and flexed neck.
5. The ramp with the foot rest to adjust the work surface it not used by workers and when available they do not use the foot rest.

Packaging Area:

1. Workers that handle the boxes to not have an adequate technique for lifting the load.
2. Boxes are stacked above the level of the worker's head.

In this plant, during the last two years, the following changes to workstations have been implemented:

a) Ramp with foot rest for low statured workers that place socks in the pressing molds, in order to improve reach.
b) Inclination of the work plane of the packaging table.
c) A rake was adapted to the dryer conveyor belt.
d) Changes in sticker placement.
e) Ladder used for changing thread cones.

Resources

The company GILDAN has made expenditures to cover the activities performed as part of the Ergonomics Program. These expenses include 4 ergonomic evaluations in the plants, performed by the Ergonomics Center of North Carolina State University ($36,726.26 USD); payment for the Membership with the aforementioned center, since 2009, in order to receive Ergonomics Consulting ($10,000.00 USD); training of Ergonomics Committee at the plants ($13,495.60 USD).

In addition, expenditures have been made for the changes to workstations, dissemination of activities, Ergonomics Day, the stand at the health fair, prizes, etc., which have not been reported to us. The total amount of these expenditures was not obtained due to its unavailability. However, we are aware that the realization of these activities has a cost. Indeed, all these activities are documented in the company's files and murals are found throughout the plants.

Survey of workers at the San Miguel Plant

A total of 58 workers were surveyed, of which 31 were female, with an average age of 29 (between 20 and 48 years old). The majority of those surveyed (53) stated having worked at the plant for more than 3 years. Workers from all activities were included in different proportions. Table 1 presents the distribution of activities performed by the surveyed workers. Some stated that they were operators without indicating the specific activity performed.

Table 1. Distribution of the frequency of activities performed by surveyed workers. N=58

Activity performed	Frequency
Operator	15
Set sleeve	10
Inspector	5
Hem Sleeve	5
Sew tape	4
Set collar	4
Garment cleaning	2
Turn hem	2
Close sleeve	2
Other activities	4
Data unavailable	5

Two out of every three workers (32) surveyed stated having muscular pain or discomfort. Of these, 24 considered the pain to be caused by the work activity and the remaining 8 that the pain worsened due to the current work. A little less than half of them experience the pain during the workday and the rest at the end of the workday. Nonetheless, one third also report feeling pain when activities are done at home. With respect to the onset of pain, two thirds stated a period longer than 6 months.

The causes of the pain according to the perception of the workers are described in Table 2. These causes are related to the workstation, the activity or the rate of performance, posture and work load.

Causes of pain	**Frequency**
When working quickly	1
Being in only one job position	1
Lifting a load	2
Bad position	1
Repetitive movement	2
Too much work	2
Caused by the operation performed	4
Caused by the chair	2
Work in standing position	1
Leaning forward	1
Lifting right shoulder more	1
Too many work hours	1

Throwing bundles forward	2	

Table 2. Causes of muscular pain reported by surveyed workers from San Miguel Plant. N=21.

Figures 1 and 2 present the anatomical locations of the pain experienced during the last 7 days or for more than 7 days respectively. The locations indicated most frequently are shoulders, hands, neck and back.

Figure 1. Number of workers at the San Miguel Plant that report pain during the last 7 days in terms of anatomical location.

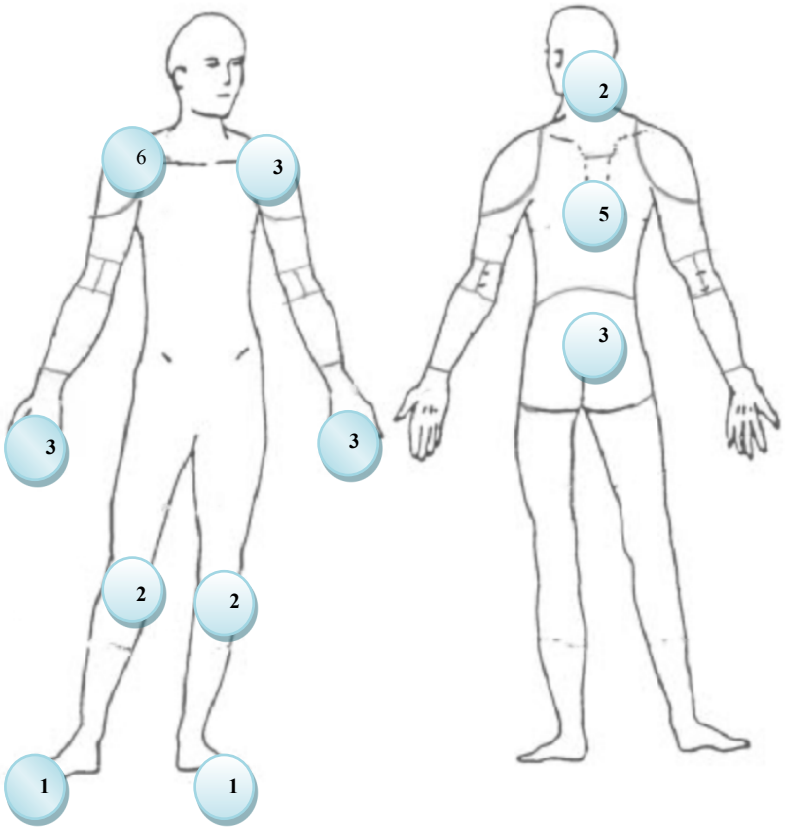
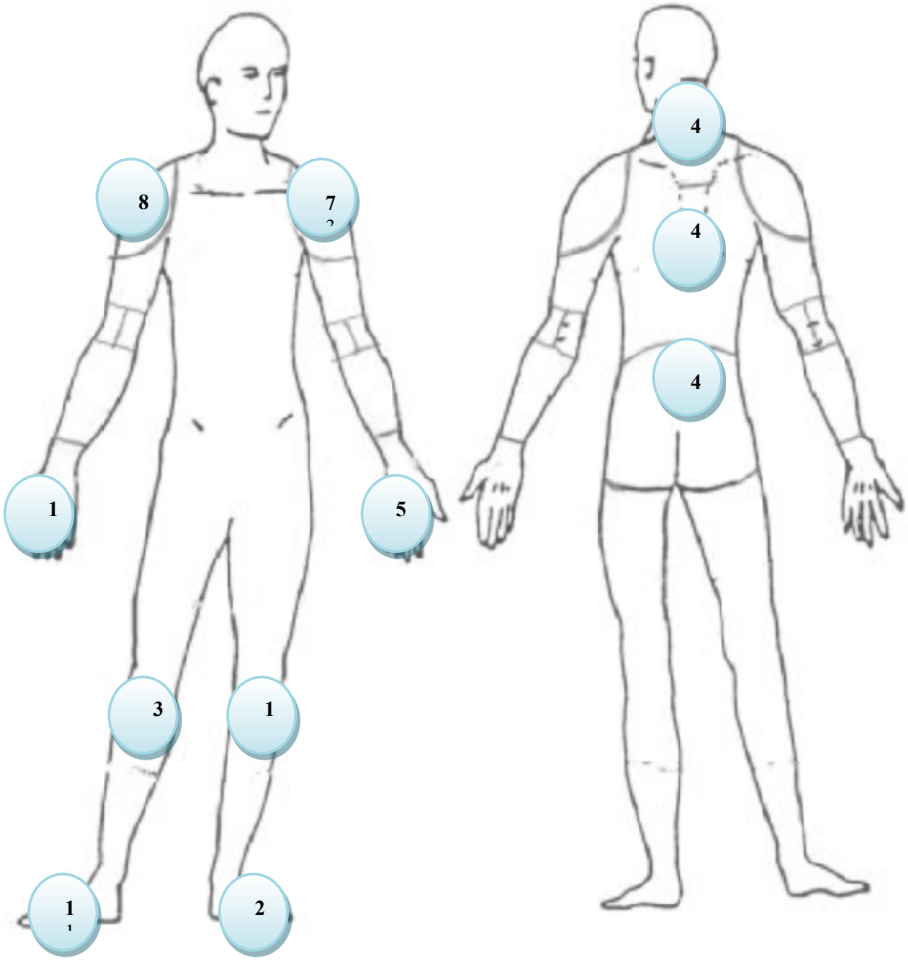


Figure 2. Number of workers at San Miguel Plant that report experiencing pain for more than 7 days corresponding to the anatomical location.



With respect to the knowledge regarding the risks of musculoskeletal injury in their workstation, a third stated knowing they exist. In the same way as with the causes of pain, the risks mentioned are individual. That is, are related to a specific condition of the workstation corresponding to the worker pointing it out, although posture and throwing bundles stand out. Table 3 describes the risks specified by the workers.

Table 3. Distribution of the frequency of the ergonomic risks mentioned by the workers. N=16

Ergonomic risks	Frequency
Bending down	1
Grabbing a bundle from behind and throwing it	4
When covering another team	1
Not keeping good posture	4
Machine is too high or too low	2
Board for sleeves is too high	1
Chair cannot be raised or lowered	1
Working in a standing position	1
Using a single arm for the work	1

Risk ergonomics

Of the total workers, 49 stated knowing that an Ergonomics Program exists and 40 stated having received training. Table 4 shows the topics the workers expressed as received during training; the majority mentions the ergonomic exercises, use of protective equipment and the adoption of good posture.

Table 4. Topics of Training received by workers.

Topics received	**Frequency**
Ergonomic exercises	18
Use necessary Protective Equipment	8
Maintaining good posture	9
Do not remember	4
Adapting the work to the worker	3
How to lift loads	2
Job rotation	1
How to care for ears, muscles and joints	1
How to sit correctly	1
Team work	1
How to sleep	1
The risks that could occur	1
Not strain yourself	1
Last training received	
Less than 1 week ago	7
Between 1 – 4 weeks ago	12
More than 1 month ago	6

In regard to the transmission of information the workers state that talks and messages over the public announcement system are the most frequent method of communication (Table 5).

Table 5. Frequency of the methods of transmission of Ergonomics information. N=58

Transmission of information	Frequency
Posters	6
Talks	14
Brochures	6
Public Announcement System	24
Flyers	2
Drama	1
Video	5

Table 6. Changes to workstations performed by the company according to the perception of the workers.

Changes performed	Frequency
Adjust machine, raise and lower	1
Change machine shift	1
Change method and raise table	1
Changed the chairs	2
Making changes but not helping	1
Rotating personnel	3
Rotating the machine	1
None	10

Survey of workers at Rio Nance Hosiery Plant #3.

A total of 40 workers were surveyed, 24 males, with an average age of 28 years, minimum age of 21 years and maximum age of 40 years. Of those workers, 27 are between the ages of 21 and 30 years. The majority of the workers (38) stated working longer than 3 years at the Plant. Table 7, reflects the type of activity performed by surveyed workers.

Table 7. Distribution of the frequency of activities performed by surveyed workers.

Activity performed	Frequency
Machine operator	10
Ironing	7
Folder	4
Packer	4
Knitting operator	3
No Data	3
Palletizer	2
Utility	2
Cone re-threader	2
Knitting dye	1
Placing sticker	1
Banding	1
Total	40

In regard to pain (discomfort), 22 of the workers expressed that it was caused by the current work performed and 8 expressed that it has worsened due to it. Table 8 reflects that 14 workers first experienced pain after a period of less than 6 months of working, 22 state that the pain is felt during the workday and 16 that it presents itself when performing activities outside of work.

Table 8. Distribution of the frequency of the evolution of pain experienced by surveyed workers.

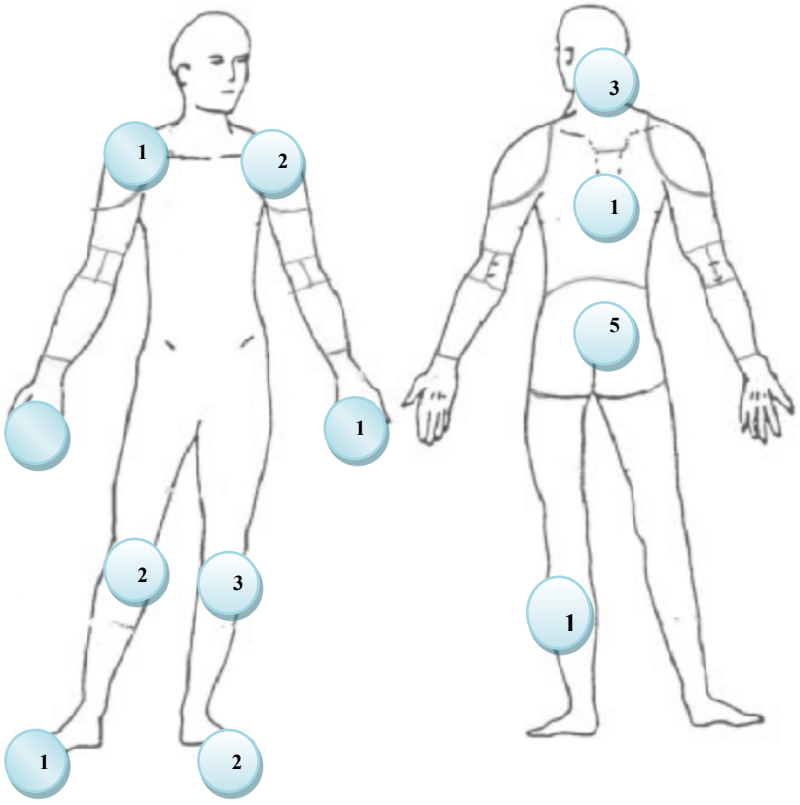
Evolution of pain	**Frequency**
Onset of pain	
Less than 6 months	14
Between 6 months - 1 year	7
Greater than 1 year	2
Pain experienced during workday	22
Pain experienced in activities away from work	16
Pain experienced at the end of the workday	15

Following is a description of the opinion of workers regarding the causes of pain (Table 9).

Table 9. Distribution of the frequency of causes of pain in workers.

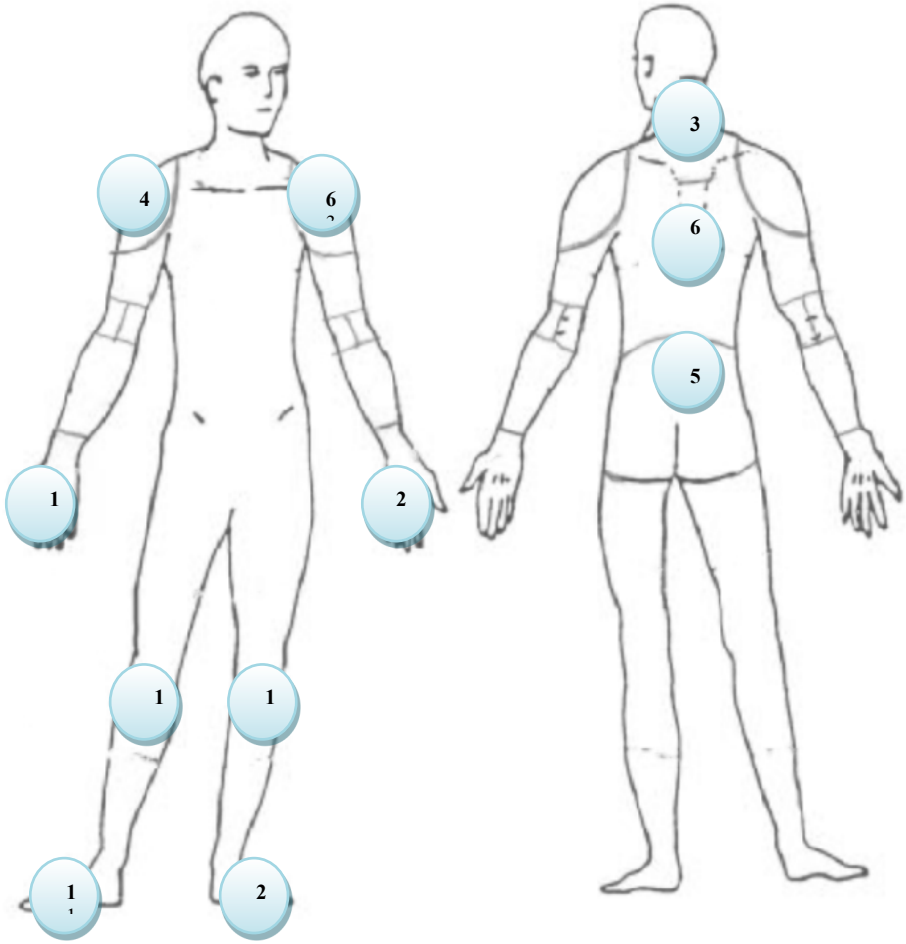
	Frequency
While lifting a load	7
Repetitive movements	4
In standing position without rest	5
Bending and sleeping cause back pain	1
Getting the job done, to achieve standards	1
Walking more than usual	1
Folding 3 sock forms –Repetitive movements	1
Leaning head downward	1
Too much work	1

Figure 3. Frequency of pain during the last 7 days, presented by workers in terms of anatomical location. N= 40.



Of the 40 workers, 6 have expressed having pain (discomfort) in the back, and 3 in the shoulders in the last 7 days (figure 3).

Figure 4. Frequency of the presence of pain (discomfort) experienced by workers for more than 7 days, according to anatomical location. N=40



Of the 40 workers, 11 expressed having back pain (discomfort), and 10 in the shoulders, for more than 7 days (figure 4).

Of the total workers surveyed, 18 expressed having knowledge about the ergonomic risks in the workstation. The main risks signaled are described in table 10.

Table 10. Distribution of the frequency of ergonomic risks mentioned by workers.

Ergonomic risks as perceived by the worker	Frequency
Bending down	5
Walking more than usual	2
When thread is changed	1
Straining yourself	4
Inadequate work position	3
Lifting a heavy load	5
Table is too high	1
Working in a standing position for too long	2
Is too high, about 3 forms	1
Form is too big	1

Table 11. Frequency of Training received on the subject of Ergonomics.

Topics received	**Frequency**
How to lift a load	10
How to sleep	6
Work Adaptation	5
Ergonomics	54
Relaxation exercises	2
How to improve work	1
Correct force	1
Nothing	1
Has not received	1
Ergonomic Risks	1
Health	1
Last training received	
Less than 1 week ago	1
Between 1 – 4 weeks ago	27
More than 1 month ago	1

Of the total workers, 36 stated knowing that the Ergonomics Program exists and 33 stated having received training. Table 11 describes the topics workers expressed as having received, the majority mention the topics of how to lift loads, work adaptation,

ergonomics and how to sleep. Also, 27 stated that the last training received occurred between 1 and 4 weeks prior to the interview.

Table 12. Frequency of methods of transmission of Ergonomics information. N=58

	Frequency
Talks	19
Brochures	8
Video	5
Training	5
Card	4
Newsletter	2
All media	3
Photographs	2
Slips of paper	1
Ergonomics Week	1
Murals	1

Of the total workers, 19 stated that the method used for transmission of information is talks, 8 through brochures and 5 videos and training, respectively (table 12).

Table 13. Number of workers that indicated they perceived changes in the working conditions at the plant.

Changes performed	**Frequency**
None	19
Installed a ramp	4
Yes	3
Ladders have been installed	2
Placed some cardboard boxes	1
Ergonomic mat	1
Rotation from line 13	1
Not much	1

The majority of the workers have not noticed any changes to the working conditions in the plant (table 13). Only 4 stated the placement of a ramp to lift the workstation for a change. However, these are available throughout the entire area, although it is obvious that the majority do not know how to use them (see for example, the case where the response was “I placed some cardboard boxes” when the ramp could have been used). It is interesting that only 2 workers noticed the placement of the ladder for changing

thread when this change is a result of a worker's proposal. In general, polled workers in this factory are unaware of the reasons behind the changes, and as such they do not identify them as ergonomics changes.

Interviews with doctors from San Miguel Plant.

Main causes for consult

The main causes for worker consult are: upper respiratory infections, dermatological disorders, gynechological disorders, gastrointestinal disorders, and musculoskeletal injury. Among the latter the most frequent are cervicalgia, cervicobrachialgia, dorsalgia and left shoulder pain. One doctor expresses that of the 25 patients (500 patients per month) seen daily, 5 are for Musculoskeletal Injury, the most frequent being: left shoulder pain, cervicalgia and dorsalgia.

Medical attention flow

The worker with symptoms is given treatment and rest, if the patient returns or the problem persists; he/she is sent for complementary examinations (X-rays and ultrasound). If the pain persists the worker is referred to the physiatrist and if there is no improvement then referred to the orthopedist. Medical leave is only granted by the specialist handling the case (orthopedist). In case of injury, the worker is sent to the IHSS Commission for a final ruling, accompanied by an inspection of the workstation.

Job function of Plant Doctor

The doctor gives medical attention at the clinic to workers that so require it. In addition they tour the plant, inspect the workstations, including taking photographs and measurements. The doctor can propose solutions on the spot, in collaboration with the Head of Hygiene and Safety and the Head of Maintenance. "The decision to relocate workers is made together". The activities that have been performed during these tours are: reach measurements, high or low, changes in type of table, removing pedals, workstation modification, redesign of the workstation such as moving the table forward in the case of a problem with reach. They interview workers to learn if the changes implemented have worked.

Plant Health Care Service

The Health Care Service at the plant started in 1992, when an agreement was reached with Social Security in an effort to bring Social Security services closer to the workers. This system consists of giving consult, prescribing treatment, referring patients, ordering exams, etc. All procedures followed correspond to Social Security. According to interviewees from the Department of Labor and IHSS, this system represents an advantage for the worker, because “The worker does not have to travel from one place to another, does not travel to the pharmacy”, “The attention is quicker”.

The Back School.

It is important to make note of the initiative of the “Back School”. This is a program from the rehabilitation clinic, which manages cervical pain, back pain and lumbago where no serious damage is present. In the school, workers are explained the correct posture that they must adopt, how to get up and how to lift loads. This is a 10 day program.

Ergonomics Training.

The periodicity of training given to doctors is once per year for each topic. However, this depends on the planning and needs. Training is also given to nurses yearly (2-3 days).

The interviewed doctors expressed having received an intensive theoretical and practical course with a duration of 3 days. This course was imparted by a specialist from the Ergonomics Center of North Carolina State University. Among the topics covered are musculoskeletal injuries, tools for evaluating workstations (NIOSH, RULA, REBA), workstation design, handling and movement of loads and correct posture. They also practiced using the “Edgar” software in the textile area, where inspection workstations were evaluated.

They point out that it is a challenge to the company to develop doctors in terms of ergonomics and hearing conservation. Nonetheless, to their knowledge it is the only company that has certified its doctors in hearing conservation. In addition, they have been provided with an audiometric booth with an audiometer for examinations at the clinic.

They also indicate that workers are trained using the public address system, distribution of leaflets, posting subjects of importance on murals regarding good physical health and about the injuries that may arise caused by bad posture. Mid-level management meets once a month in the plant to discuss ergonomics and other issues in each shift. Line supervisors are also trained, emphasizing the subject of posture, being very helpful in the notification of some potential cases. In their opinion, they consider that the best training method is in person, people are gathered in a classroom, an ergonomics talk is imparted for up to 50 minutes during orientation and an exam is applied to evaluate comprehension.

Ergonomic Program at the Plant.

According to the interviewees the Ergonomics Program consists of helping the worker have an adequate job and feeling healthy and physically well. It focuses on musculoskeletal injuries. It is also aimed at hearing conservation. The program included training imparted through the public address system, leaflets and murals. Supervisors are trained and oriented on posture. “They are helpful and notify of some potential cases”. The supervisors gather their teams and lead conversations about better posture and better methods. One interesting activity that is part of the program is Ergonomics Day, where talks are given, a dramatization was presented, the Back School was introduced, newsletters and leaflets were distributed and messages were constantly conveyed on the public address system.

Changes in consultations after the implementation of the Ergonomics Program

According to one of the interviewees, workers have gained confidence and visit the clinic on their own after identifying symptoms. “Previously, workers didn’t come for fear of being dismissed. Now they come in for medical consultation because they identify their own symptoms and inform the doctor. Workers have knowledge and are completely immersed in injuries; people are talking about the rotator cuff. They have lost all fear of coming and stating their symptoms, which gives way to early intervention, preventing progression, and also enables a vision of the workstation or operation.”

Ergonomic Improvements.

According to the interviewed doctors changes to workstations have been applied, mainly in the cases where workers have requested a medical examination twice for

musculoskeletal problems. One of the improvements applied was to move the table forward in order to improve reach; prior to this, height measurements were performed to evaluate the reach issue. In addition, changes are being implemented in vulnerable workstations like set sleeves and inspection as a result of an evaluation brought on by cases of sick leave caused by shoulder problems, cervicalgia, wrist tendinitis and cervicogenic dorsalgia. Continuous orientation is also provided regarding bad posture and chair adjustments. As per the interviewees, interviews are conducted following the changes to identify if they are working.

Interviews with doctors at Río Nance #3 Hosiery Plant.

Main causes of medical consultations

The main causes of worker medical consultations are: upper respiratory infections, dermatological disorders and musculoskeletal injuries. Among the latter, the most frequent are lumbago, cervic pain and painful shoulder. Between 180 and 200 workers receive consultation each month in two shifts. This past month, between 13 and 14 workers received medical attention due to musculoskeletal injuries, among them back pain, lumbago and painful shoulder.

In their opinion, a pattern of disease related to the job has not been identified; the disease is related to activities outside of work. For example, some workers say: “I was laying construction blocks”; “I work as a mason or am sowing the field”. For them the problems are not occupational. “We investigate further if the diseases are caused by activities in the home”.

Medical attention flow.

First, the worker goes to the workstation and then makes an appointment, the worker is seen first by the nurse, who examines the workers and provides medication. If the worker returns, the worker is then seen by the doctor. However, if during the first visit the worker requests to be seen by the doctor, the doctor will consent.

If the doctor suspects an Occupational injury, the workstation is examined and the worker is sent to Social Security. If the specialist rules that the case is an Occupational Disease, the worker is sent again to the clinic with the diagnosis. If the worker is not

diagnosed with an Occupational Disease, the workers is treated at the clinic or reassigned. In the case of recurrence, the workstation will be evaluated with the help of the nurse and the engineer.

When the patient arrives with an injury, the Ergonomic Committee reviews the need for relocation and meets to assess the workstation; the entire committee does not always meet, it is actually done by the doctors. Various workers have been reassigned.

Job functions of the doctor.

The job function is prevention and treatment; they also perform a pre-hiring examination and go to recruitment. Prevention consists of going to the plant to confirm that ear plugs are used, in verifying that ramps are used and good posture is adopted. A tour of the plant is done to identify bad posture and explain correct posture to the worker. For example, if when lifting a load the worker bends, they explain how it should be done. However, evaluations to workstations during plant visits are not reported.

Plant Health Care Service.

It is an extension of Social Security to free up primary attention at Social Security. Initial medical consultation is given here. If the condition is an emergency or requires a specialist, the worker is referred to Social Security. Both company and Social Security resources are managed. One of the advantages of this system is that the worker does not have to wait in line at the hospital or lose an entire day of work. When they are free, they come here because at Social Security they lose a work day and for the company it is a loss also.

The Back School.

The plant doctor and nurse received training through an intensive theoretical and practical course for a period of one week imparted by the IHSS Rehabilitation Center. This program treats workers with back pain. This program seeks to teach the worker to care for their back and is developed during 10 sessions. During the program the worker learns to care for the back, they are educated about causes of pain and its prevention, correct posture and relaxation exercises. At its conclusion, the worker receives a manual about “Caring for the Back”, which describes the most frequent causes of pain,

prevention as it relates to good posture and the exercise program of the cervical and lumbar spine.

During the tour of the plant, it was observed that they have a space equipped with chairs, mats, weights and other accessories suitable for the implementation of the program.

Plant Ergonomics Program.

There is a partnership with North Carolina State University since 2009. The program aims to prevent Musculoskeletal Injury (MI). It includes an orientation training given when a worker joins the company: “a virtual tour, an introduction, a presentation or talks with workers are given, there is also a question and answer session”. Once the worker is hired, if they have hearing loss it is not cause for dismissal, rather, they enter a hearing conservation program y are monitored by performing two hearing screenings per year. Some workers are reassigned to another location for one or two days and returned once they have improved. There is involvement in hearing conservation. They mention that it is unknown if an ergonomic evaluation has been performed.

Ergonomics Training.

The interviewee states that during the year a training course has not been received. Nonetheless, the doctor has read very much about ergonomics on his own account. Personally, a change of chair and footrest has been implemented. Among the job functions are giving talks about: Ergonomics, lifting and load handling at home, bad posture, use of ear plugs, the ergonomics concept, and the objective. The talk can be completed through the public announcement system, about personal hygiene and there is a question and answer session.

Changes in medical consultations after the implementation of the Ergonomics Program.

In the opinion of the interviewees, before the implementation of the program there were many cases of painful shoulder and lumbago. However, they consider that these ailments didn’t necessarily correspond to situations in the work environment. In the words of one of the doctors interviewed, “it is important to know how to sleep, how to carry a child”. They acknowledge that workers do their part and are concerned with not

becoming ill. In addition, the workers observe that the company is concerned about the health of its workers because it sends the doctors to training to be able to provide better care and improve the health of its workers.

Ergonomics Improvements.

The doctors interviewed state that emphasis has been made on the height of the person, since it has been observed that the workers strain themselves to introduce the sock in the form for ironing. To resolve this issue, a step (ramp) has been placed for lower height people and the tables have been raised for taller people. In their opinion this measure has decreased the number of cases of painful shoulder. However, there is no data that supports that the decrease in the number of cases is caused specifically by the measures implemented. Another aspect considered is that of repetitive movements. In these cases workers are rotated in order to decrease the movements that may cause discomfort. For example, a worker from the ironing area is reassigned to packaging or placing stickers. Data was not presented regarding the number of cases that have been corrected nor with what frequency the job reassignments are done.

In order to determine the measure to be implemented the situation is individualized. When there is a particular case, a meeting is called with the medical team and the clinical history is presented to assess how the patient can be helped from the medical standpoint. In addition, workers are talked to about doing the exercises that are being implemented.

Records of Musculoskeletal disorders in workers at Gildan San Miguel and Gildan Hosiery Nance 3.

Records of Musculoskeletal disorders at Gildan Hosiery Rio Nance #3. June-November-2011		
Month	**Disorder**	**Sick Leave Days**
June	Foot trauma (Sprained ankle)	
	Tendinitis of right shoulder and	5
	Lumbago	1

July	Acute Right Shoulder Pain	1
	Acute Lumbago	
	Lumbar Discopathy	1
	Left finger Trauma	3
		-
August	Lumbago	5
	Lumbago caused by herniated disc	5
October	Painful shoulder	1
	Lumbago	3
November	De Quervain's Tendinitis	1
	Pain in right hand	3
	Tendinitis	1

Records of Musculoskeletal Disorders at Gildan San Miguel. August-November-2011

August	Painful shoulder (4 cases)*	1
	Dorsalgia	1
	Lumbago	1
	Tendinitis of the right forearm	1
September	Right shoulder (4 cases)	1
	Tendinitis	1
	Lumbago	1
	Painful shoulder (2 cases)	3
October	Painful shoulder (3 cases)	1
	Lumbago (2 cases)	1
	Chronic Lumbago	1
	Tendinitis (3 cases)	3
November	Tendinitis (3 cases)	2
	Cervicogenic dorsalgia	1
	Dorsalgia (2 cases)	1

* When various cases of the same disorder are present in a single month, the number of sick leave days is the average.

Interviews with social actors.

Honduras Women's Collective (CODEMUH).

According to the studies and worker requests for support from CODEMUH, the musculoskeletal problems suffered more frequently are in the shoulders, neck, hands, joints and column. They express that of the workers that request support from CODEMUH, the majority have injury of: one or both shoulders, herniated discs, cervical, lumbar, tendinitis, carpel tunnel syndrome and arthrosis of the spine.

Table 15. CODEMUH Records about Musculoskeletal Disorders in Gildan workers (all plants), diagnosed by the IHSS Commission.

No.	Musculoskeletal Disorders	Percentage of Sick Leave*
1	Painful Shoulder Syndrome of the left shoulder	17
2	Painful Shoulder Syndrome of the right	29
3	Cervicobrachialgia- rotator cuff syndrome	24
4	Bilateral Painful Shoulder Syndrome	28
5	Cervicobrachialgia secondary discopathy	37
6	Tendinitis of both shoulders	26
7	Bilateral Supraspinatus Tendinitis	22
8	Bilateral Rotator Cuff Tendinitisl	22
9	Left Rotator Cuff Syndrome	17
10	Chronic Cervicobrachialgia	29
11	Supraspinatus Calcific Tendinitis	21
12	Chronic Cervicobrachialgia of the C5-C6 and C7	37
13	Chronic Rotator Cuff Tendinitis, left shoulder bursitis	24

* The percentage of sick leave is an estimation of the loss of abilities produced by an incapacitating injury in a person according to the scale used by the Honduras Social Security Institute.

Company Health Care System.

In their opinion, the company health care system is good for Social Security, but it loses control of the doctor; Social Security does not know about the doctor's level of service provided, if they work ethically or not. As an example, they cite that there is discrimination in pre-employment checkups, when women are stripped down; workers who have been going to work daily for 1 to 2 weeks to complete a physical process and tests; during the physical examination their joints are pressured to see if they feel pain, if they feel pain they are not hired. On the other hand, they think that the Back School is an option to involve workers, because if medical attention is concentrated, workers will not go to Social Security, they will not have an official ruling risking that the disease will not be confirmed by Social Security. It is a system of discrimination.

Company work system.

In regard to this, they indicate that the main problem is that they must work 11 hours for four consecutive days (4x4) and produce 500 dozens with a team of 16 workers; if one worker is absent, that worker is substituted by a person with less experience and ability.

They also point out that problems exist in some processes, especially with Set Sleeves. In their opinion, the modification done to this method now brings about damage to both shoulders. The modification to the method indicated here is a change in the position to alternate the arm used the most during the operation. In reality, the problem is not with the change in position per se, but with the fact that the workers cannot identify the moment when the change in position should be done nor do they know the reason for the change in position. Therefore, the pause or rest that is anticipated for the implicated muscle group is not occurring at the necessary moment. On the contrary, another muscle group is being fatigued, only alternatively. For this reason, it is important for workers to participate in method changes. When there are new methods there is an additional movement and the worker is fatigued. Some say this method is a "killer".

On the subject of the Ergonomics Program, they consider that it does not encircle more than the relaxation exercises, earplugs, ergonomic mats, alleged training that only exists on paper and not as formal training, and in addition is only focused on identifying uncomfortable positions. Furthermore, of the 5 minutes for relaxation exercises, four are used for cleaning the machine and clearing the trash and only one minute for the exercises. An ergonomics study is required at Gildan: "We do not believe that measurements are done due to the intense work shift and repetitive movements, because they continue to put or pick up work from below and they continue to throw bundles, there are people that work in materials handling, with the new method they have tendinitis of both shoulders and neck".

Suggestions from the Women's Collective.

The Women's Collective expresses that it is important to conduct a study of the workstation, with the participation of the workers in decision making as in all Ergonomics Programs. The Plant Health Care Service must be evaluated, to guarantee confidence in the committee that provides the final ruling on diagnoses. In addition, formal training of

workers should be conducted. Finally but not less important, is to conduct an evaluation of psychosocial risks.

Department of Labor

Two officials were interviewed from this Department: a Hygiene and Work Safety Inspector and the Chief of Occupational Medicine. They stated that ergonomic problems are aggravated because of the work schedule and work methods: greater than 8 hours, 4x4 model system, long 12 hour workdays and piece rate pay system. This problem has worsened in the past 6 to 7 years, the most frequent ailments being, tendinitis, carpel tunnel syndrome, back and upper extremity problems; previously, upper respiratory disease was the most important. On the other hand, they consider that this problem is not exclusive of GILDAN Activewear.

They also stated having no knowledge about Gildan's Ergonomics Program. They are only aware that they have two doctors who specialize in Occupational Health, and that they train technical personnel and line supervisors. They are also unaware if workers are trained, although they have knowledge of the relaxation exercises and the chairs that have been provided.

With respect to the plant health care system, they consider that Gildan surpasses the other manufacturers because they conduct pre-employment checkups, employ qualified doctors, have a Back School Program on site, has trained doctors and nurses, workers receive therapy and are immediately integrated back to work.

Regarding the procedure for the flow of medical attention for workers, they know that workers communicate their ailment to their supervisor who then verifies if they can be accommodated on that day. If not, they will be scheduled the following day. Once seen by the doctor, treatment is given as indicated by the severity and in some cases three day medical leave is granted; if the worker returns with the same problem, the worker is referred to a specialist.

In reference to improvements done by Gildan, the changes in the chairs done two years ago, the machine modifications and the facilitation of ergonomic mats were mentioned.

Honduras Social Security Institute.

As per the interviewee, musculoskeletal disorders represent approximately 90% of occupational disorders at all manufacturing plants in the region, the most frequent being painful shoulder (rotator cuff) and lumbago. There is an impression that at GILDAN Activewear's manufacturing plants, the incidence of musculoskeletal disorders is greater than in the rest, but this is due to the fact the people compare the number of cases and not the incidence rate. In their opinion, GILDAN Activewear surpasses other manufacturing plants in the region with regard to Safety and Occupational Health. As an example, they cite that other companies have not established the Safety Committee; the accident and occupational disorder rates are lower than those of other manufacturing plants.

Attention to worker health problems is provided through the Plant Health Care Service, a system implemented in the 90´s to aid the IHSS with its needs. In this service, the doctors are hired by the company and IHSS provides the supplies. The sick worker is seen by a plant doctor who then makes a diagnosis, treats and refers them to a specialist when deemed necessary. If occupational disease is suspected, the worker is referred to the Medical Commission for Occupational Risks, who then makes a medical ruling and recommendations pertinent to the case: referral to rehabilitation, education or suggest relocation as per the limitations. The commission takes into account the specialist's diagnosis, the workstation evaluation (performed by the IHSS inspector) and the worker's occupational history.

According the interviewee, the Plant Health Care Service benefits everybody involved: IHSS because it reduces costs, workers because they do not have to leave the premises or risk their lives and the company because the worker does not miss a workday.

Ergonomics Center of North Carolina State University.

In order to learn more about the Ergonomics Program in practice at GILDAN plants an interview was requested via electronic communication with a person from the Ergonomics Center at North Carolina State University. Due to personal reasons, this person was unable to attend the meeting. As an alternative, the questions were emailed in order for this person to facilitate the information. Unfortunately, the answers did not allow in depth knowledge about the reasons that motivated some aspects of the program, specifically the lack of worker involvement in the Ergonomic Committee or the lack of participation in the identification of problems or their possible solutions. Following is a summary of the information obtained from the answers given by the representative of the Ergonomics Center.

The Ergonomics Center initiated work with Gildan in 2009. On that year, one of the ergonomist from the center visited various plants to conduct an audit of the existing Ergonomics Program and conducted an evaluation of the workstations. Based on this, they worked with the company on an Ergonomics Program Maturity Matrix that advances from Reactive to Proactive then World-class. They have also conducted training of the members of the Ergonomics Committee for different plants in Honduras and periodic audits of the advances of the program.

The maturity matrix is used by the Corporate Health and Safety Manager and his team at different plants to develop different aspects of the program: program management, managerial support, training, risk evaluation and mitigation, etc. The program is an effort that will take several years to accomplish and currently evaluates the impact on the reduction of injury and complaints, as well as worker morale.

Conclusions.

Once the following were considered: 1) the context of health and occupational safety in textile maquilas in the region; 2) high production goals and the use of the 4x4 model for the organization of work shifts; 3) the existence of production tasks, at both evaluated plants, that are characterized by repetitive movements of the upper extremities, adoption of forced posture for shifts longer than 8 hours that increases the probability of cumulative musculoskeletal trauma; 4) the program structure and content, and the compliance with planned activities in its execution; and 5) the organizational structure developed for the implementation of the program; the conclusion is that GILDAN has in the reviewed plants (San Miguel and Rio Nance #3) a robust and well-structured Ergonomics Program, suited to the requirements in these plants. This program incorporates the necessary elements to improve working conditions, worker health and maintain quality and productivity. Nonetheless, it presents some limitations in its origin, which will be remedied as the implementation progresses.

In both plants the implementation of the program is in the final stages of the second level (Reactive), with some bases set for the start of the third level (Compliance).

Both plants have a good organizational structure of the human resources at different levels, from the administrative management through plant workers.

With respect to the training process, despite the great effort directed towards the training of workers at different levels, it is observed that at the level of production workers, there is poor comprehension and ownership on this subject. They know that there is an Ergonomics Program but do not remember the topics covered in training and are unaware of what the ergonomic risks are.

The program includes good strategies for the dissemination of information; however, it is important to follow-up with workers, especially those in production, with respect to attention, comprehension and assimilation of the information received through different dissemination methods.

An evident weakness in the implementation of every process in the Ergonomics Program is the little or no participation of production workers in the various planned activities. The majority ignore the changes that have been performed on workstations. This is considered a priority to achieve success in the implementation of the program.

During the tour of the workstations it was observed that almost entirely, the workers that work in a static seated position, work with forced posture and do not properly use the chair in spite of being adjustable (San Miguel Plant) and in static standing position for long periods of time and work with forced posture (Hosiery Rio Nance #3).

In relation to the attention to the health of workers, both plants have a Company Health Care System, that is well organized, has well-equipped clinics, and has 3 to 4 doctors and full-time nurses. Despite the gap that exists in industry standards on health and hygiene regarding the number of doctors required per number of plant workers. However, in order to achieve the integrated care of workers, it is necessary to strengthen the education of medical personnel that care for workers; the majority are certified as general practitioners. Company doctors must be certified in Occupational Medicine. Another relevant aspect of the Health Care System is that it includes the Back School, which is directed to the care of worker's back problems.

There is a high correlation between the discomforts reported as experienced by surveyed workers and the diseases that have been diagnosed by the Plant Health Care System and the Honduras Social Security Institute. The most frequent musculoskeletal discomforts, according to the survey, are evident at the levels of shoulder, back and hands. On the other hand, according to the record of musculoskeletal disorders at both plants (San Miguel and Hosiery Rio Nance #3) and the record of musculoskeletal disorders diagnosed by the IHSS, the predominant disorders are lumbago, dorsalgia, painful shoulder and tendinitis.

In reference to the ergonomic evaluations, these are not done systematically with respect to plant production and only use two instruments of evaluation.

Recommendations

These recommendations are aimed at strengthening the gaps found in some elements of the Ergonomics Program at both plants.

1. Training.

The goal is for training and dissemination of information about topics in ergonomics to reach production workers directly. For this, it is important to take advantage of the organizational structure of the human resources available to the company, in the workstations as well as the distribution of workers.

The recommendation is to create the Occupational Health Brigade or facilitators. They can be selected from mid-level management or those responsible for workstations and then train them on ergonomics and occupational health, and allow them to be the facilitators and be responsible for training more directly and focused on a smaller group, which facilitates comprehension and assimilation of the topics taught.

The Occupational Health Brigade would also play an important role in the different strategies for dissemination of information to the group in their charge and in monitoring and following up with workers once they are trained in the compliance with adequate work techniques, in adoption of correct posture and in the correct use of adjustable chairs among others. In addition, the workers would feel greater confidence in communicating ergonomic risks or problems identified within their workstations and in the activity they perform and to suggest changes. Communication towards workers about the planned activities or activities guided by the Ergonomics Committee would be through one channel and directed to workers and to the attitude changes coming from them.

2. Worker Participation.

The objective is to achieve the active participation of workers in the development of the program. The recommendation is to accelerate the incorporation of production workers into the different phases and implementation activities in the Ergonomics Program such in the training and dissemination activities. There should be representation of production workers in the Ergonomics Committee; they should participate in the ergonomic evaluations and in the development of proposals for control of changes in different workstations.

3. Integral care of worker health.

The objective is for the doctor to perform an early diagnosis and an adequate management of musculoskeletal disorders related to the job. It is recommended that plant doctors that care for workers, have a formal education in Occupational Medicine in order to provide integral care of workers that goes beyond recognizing common ailments. It is also important, that the doctor, as a member of the Ergonomic Committee continue education in ergonomics.

With respect to the Back School Program, it should be aimed at prevention of back problems in the healthy worker and not only at workers that have symptoms or a diagnosed back disorder. It is important that the doctor who is responsible for the Back School Program develops a schedule of activities and actions directed towards the prevention of back problems in the healthy population of workers.

4. Ergonomic Evaluation.

The goal is to conduct ergonomic evaluations of all workstations. One of the most important activities in the Program is to conduct ergonomic evaluations, but these must be performed at each workstation and not only where they are requested by the worker or in workstations where musculoskeletal problems are recognized or diagnosed; the evaluation process must be preventive.

Due to the large number of workstations at both plants, it is important to develop a work plan for the performance of the ergonomic evaluations, utilizing multiple evaluation tools, with a schedule and well defined goals. The formal education or training in Ergonomics for various resources is recommended in order to comply with this priority.

5. Surveillance system for Musculoskeletal disorders.

The company, in both these plants, has the personnel and an electronic record keeping system for recording musculoskeletal disorders. Therefore, in is important to focus on the source of information that feeds these records, on the development of simple tools for the collection of information from workers and on the development of investigations. The sources are the doctors that care for workers, the workers themselves, mid-level supervisors and the Occupational Health Brigade once created.

6. Production goals and pauses.

It is important to manage correctly the time assigned to worker pauses during production. Due to the need to achieve a production goal, the worker is performing activities at a high rate without pause between cycles. This causes muscle fatigue and as a consequence injury emerges. According to Kanawaty[1] work cycles with a duration less than 0.17 minutes induce muscular fatigue and therefore require pauses for rest, which should be longer, the shorter the cycle duration. On the other hand, the mechanism for occurrence of injury and muscular disorders, proposed by Järvholm and collaborators[2], which points out that when there are insufficient pauses between contractions an edema forms that increases intramuscular pressure. These changes in intramuscular pressure lead to degenerative changes and inflammation of the muscles (Armstrong et al., 1993)[3]. For these reasons, an evaluation of work times is required as well as the establishment of rest periods. One alternative for acquiring pauses is that the bundles of pieces given to workers contain a fewer number of pieces. This will compel workers to pause to obtain the next bundle of pieces and as such give rest to the muscular group involved in the repetitive movement.

[1] Kanawaty G., 1992. Introduction to work study. International Labor Organization, Geneva.
[2] Järvholm U., Styf J., Suurkula M., Herberts P. 1988. Intramuscular pressure and muscle blood flow in supraspinatus. European journal of applied physiology, 58: 219-24-
[3] Armstrong t., Buckle P., Fine L., Hagberg M., et al. 1993. A conceptual model for work-related neck and upper-limb musculoskeletal disorders. Scandinavian Journal of Work, Environment and Health. 19: 73-84.

Annexes

RESEARCH CENTER FOR HEALTH, LABOR AND ENVIRONMENT
FACULTY OF MEDICAL SCIENCE, UNAN-LEÓN

Questionnaire about pain (discomfort) in muscles and joints

The objective of the present questionnaire is to identify if you are experiencing any pain (discomfort) in joints and/or muscles related to your job. All information provided will be kept **anonymous and confidential** and for the only purpose of recommending action aimed at eliminating or reducing the causes of these pains. For this reason, we ask that all questions be answered with the greatest honesty. Remember, your answers will contribute to a work environment that guarantees the health and wellbeing of you and your coworkers. Thank you for your time.

File No. _____ Date:___/___/___

I. General Information.

1. Sex: Female ☐ Male ☐ 2. Age: _____ (years)

3. Current position in the company: _____

4. Time working in this position: _____ (months)

II. Pain (discomfort) related to the current job.

Please mark with an X, if you identify with any of the following questions. **Mark only one option**.	**Yes**	**No**
5. Have you experience any pain (discomfort) in muscles or joints that you consider to have been **caused** by the work you perform in your current position?		
6. Have you experienced any pain (discomfort) in muscles or joints that you feel have **worsened** due to the work you perform in your current position?		

If the answer to question 5 or 6 is NO, continue to question 11
If the answer to question 5 or 6 is YES, continue to question 7

7. When did the pain (discomfort) start?_____.

8 This pain (discomfort) ocurrs:
During the workday ☐ At the end of the workday ☐

9. Does this pain (discomfort), also occur when performing activities outside of work? For example, opening a jar, cooking, using a knife, using scissors, doing laundry, carrying something, playing with your children, dancing, etc. SI ☐ NO ☐

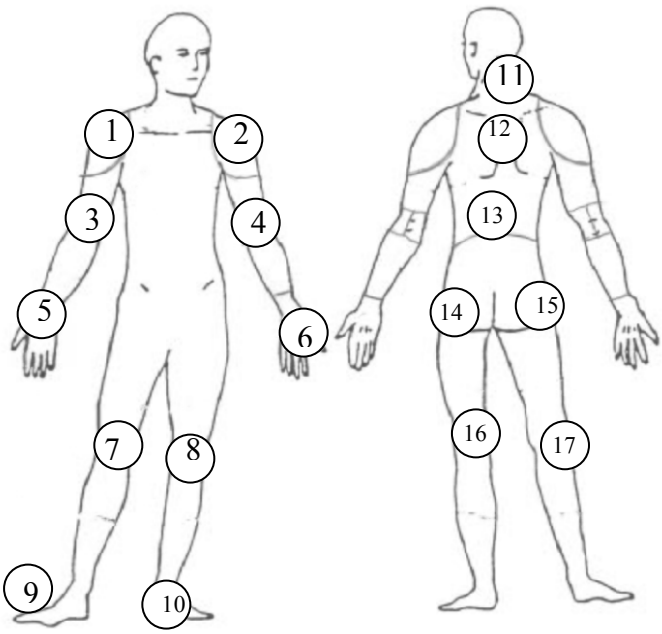
10. Could you please indicate the cause of this pain?_____
_____

On the following figure, please indicate the region on the body where you experience pain (discomfort).

If the pain started during the last 7 days, mark an [x] , if the pain has been felt for more than 7 days, mark a [√]

1. Right Shoulder
2. Left Shoulder
3. Right Elbow
4. Left Elbow
5. Right Hand/Wrist
6. Left Hand/Wrist
7. Right Knee
8. Left Knee
9. Right Foot
10. Left Foot
11. Neck
12. Upper Back
13. Lower Back (tailbone)
14. Left Thigh
15. Right Thigh
16. Left Leg
17. Right Leg

_____



11. Do you know if ergonomic risks exist in your workstation? YES ☐ NO ☐

12. If the answer is YES, please describe these risks: _____
_____
_____

13. Please describe if ergonomic changes have been applied to your workstation to eliminate or reduce an ergonomic risk:_____
_____

14. Do you know if there is an Ergonomic Program in the company? YES ☐ NO ☐

15. Have you received training on Ergonomics topics? YES ☐ NO ☐

16. Please mention the topics received:
    Topic 1:_____
    Topic 2:_____
    Topic 3:_____
    Topic 4._____

17. When was the last time you received training?_____

18. Please mention how the information relating to Ergonomics is transmitted._____
_____

THANK YOU VERY MUCH FOR YOUR PARTICIPATION

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Interview Guide

Honduras Social Security Institute.

1. General issues of maquilas in Honduras.
2. Knowledge about the ergonomics program in maquila enterprises.
3. Main causes of medical consultation of maquila workers in general.
4. Which are the primary musculoskeletal disorders in general?
5. Which are the most frequent musculoskeletal disorders and the causes of sick leave at Gildan San Miguel and Gildan Hosiery Rio Nance 3?
6. Input regarding costs generated by musculoskeletal disorders to Social Security.

Department of Labor.

1. General issues of maquilas in Honduras
2. Information regarding findings related to ergonomic conditions found on inspections.
3. Knowledge about the ergonomics program in maquila enterprises in general.
4. Changes observed subsequent to the implementation of the ergonomics program at Gildan San Miguel and Gildan Hosiery Rio Nance 3.
5. The difference with other maquilas
6. What are the primary complaints from workers from Gildan San Miguel and Gildan Hosiery 3, regarding ergonomic conditions and health problems?

North Carolina State University.

1. Was a preliminary analysis conducted in order to define the Ergonomics Program?
2. What was the basis for the program structure?
3. Why were workers not involved in the Program implementation from the start?
4. To what extent were the 4 x 4 Work Model System and production goals considered in the preparation of the program?
5. Limitations found during the implementation of the Program.
6. In your opinion, what is the current impact of the program in the reduction of musculoskeletal injuries?

Honduras Women's Collective (CODEMUH).

1. General Issues in maquilas in Honduras.
2. Knowledge regarding the Ergonomics Program and its implementation at Gildan San Miguel Plant and Gildan Hosiery 3 Plant.
3. Changes observed in time and work environment.
4. Key worker complaints.
5. Musculoskeletal health problems and general health problems of workers.