

Describing Sections of the Body That Have Sick Due Working using Standard Nordic Questionnaire (SNQ) at PT XYZ

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Abstract: PT. XYZ is a company engaged in the manufacturing of doors. PT. XYZ process consists of 7 work stations, namely sorting of raw material, the unification of the core material, reaping, laminating, manufacture of components, finishing, and packing. Among 7 work stations, only 1 work station to work while standing still during work (8 hours) and do not have any work that supports the work station finishing work station. The purpose of this study is to make improvements to the facilities at the finishing work desk. Facility design work is done by using quality methods to obtain technical characteristics in accordance with the desire of works. Furthermore, the results of the design tools socialized to all component companies use macro ergonomic analysis and design (MEAD). From the result of the design, the material frame of iron, the base material of foam, the base material of leather, the colour frame brown, the place mats of blue, the durability of the table at least 3 years, and additional function where the laying equipment. Result are discussed with the company designing and disseminated to the component companies.

1 INTRODUCTION

Work process is one of the most important factors in the company's progress, and is the key to success in order to improve the efficiency of the company, and can reduce the risk of injury (Mercado, 2018). The work frequency and the discomfort level of workers causes damage and abnormalities activities in some parts of the body. The application of a work combination and dynamic systems, different foot functions when standing position, can reduce inconvenience of work (Taha, 2008). Many studies also find that the poor work postures are causes sickness, stress, and stress at workplace. Losses such as lost time, deteriorating health of employees and decreasing a morality, eventually can decreases the work productivity. Finally the company productivity also decreases. The application of ergonomic principles will help improve quality and productivity, help better, help work and help while doing work. Ergonomics applications related to design and processes can reduce related work

(Maldonado and Macias, 2009), (Javier, 2008), (Asim, 2012).

Standard nordic questionnaire can know the parts of the muscles that have complaints with the level of complaints ranging from discomfort (a little pain) to very sick. By looking at and analyzing the snq body map, it can be estimated the type and degree of skeletal muscle complaints felt by workers (Lopez, 2018).

PT. XYZ is a company engaged in the manufacturing of door leaf industry. The production process of PT. Xyz consists of 7 workstations which are sorting of raw materials, unification of core materials, reinforcement, laminating, component making, finishing and packing. Among 7 workstations, only 1 work station that works with fixed standing position during work (8 hours) and does not have other working facilities that support the working position of the work station finishing. The work load emphasizes the operator to the maximum with a standing position against the desk. Working in a standing position for a long time and repeatedly pain against the body part.

Macro ergonomics is a top-down system approaches for sociotechnical which cover work system design and the application of overall work system design from human - work, human - machinery and human – software interaction. (Hendrick and Kleiner, 2001).

(Hendrick and Kleiner, 2002), (Abdollahpour, et, 2018) MEAD is macro ergonomic methods that consist of ten stages used for assessing and improving the work systems. MEAD methodology concern to systematically mapping from organisational problems and give a solutions by involving all elements of the work system (Purnomo, 2018), (Suzianti, 2018)

2 METHODOLOGY

The Research was conducted at PT. XYZ which is a company engaged in the manufacture of door leaf. The company is located in Medan, Tanjung Morawa. The time of the study was conducted in 2016-2017. This study aims to determine the parts of the body that experienced pain during work. The steps in the processing of data are (1) spreading of Standard Nordic Questionnaire (SNQ) questionnaire and recapitulation and (2) calculation and mapping of body condition. In the body map depicted body parts that experience complaints based on the results of the SNQ questionnaire

3 RESULTS AND DISCUSSIONS

3.1 Distribution of SNQ Questionnaire and Recapitulation

The first step is to spread SNQ questionnaire to operator section finishing to know the complaints experienced by operators. Questionnaire distributed to all (15 people) worker finishing. Recapitulation result can be seen in Table 1.

Table 1: Questionnaire SNQ

No	Body Part	Number of People Who Have Complaints			
		No Pain	A little pain	Pain	Very Pain
0	Upper Neck	10	5	0	0
1	Lower Neck	10	5	0	0
2	Left	10	5	0	0

	Shoulder				
3	Right Shoulder	11	4	0	0
4	Left Arm	15	0	0	0
5	Back	12	3	0	0
6	Upper Right Arm	15	0	0	0
7	Waist	15	0	0	0
8	Hose Back	15	0	0	0
9	Bottom	15	0	0	0
10	Left Elbow	15	0	0	0
11	Right Elbow	15	0	0	0
12	Lower Left Arm	14	1	0	0
13	Lower Right Arm	14	1	0	0
14	Left Wrist	15	0	0	0
15	Right Hand	14	1	0	0
16	Left Hand	15	0	0	0
17	Right Palm	15	0	0	0
18	Left Thigh	0	5	10	0
19	Right Thigh	0	5	10	0
20	Left Knee	0	5	10	0
21	Right Knee	0	5	10	0
22	Left Calf	0	7	8	0
23	Right Calf	0	7	8	0
24	Left Ankle	0	10	5	0
25	Right Ankle	0	10	5	0
26	Left Foot	1	9	5	0
27	Right Foot	1	9	5	0

The questionnaire is split complaints of pain in 28 parts of the human body into four scale of "no pain", "a little pain", "pain", and "very pain". The operator was asked to fill out the SNQ questionnaire by being accompanied by the researcher in charge of explaining the questions in the questionnaire to the individual worker.

Explanation of the perceived category of complaints operators at work are as follows:

1. Not pain (score 0), if the operator does not feel a significant complaint against the body.

2. A little pain (score 1), if the operator only feel the pain occasionally or tingling.
3. Pain (score 2), if the operator often feel pain or sore against the body.
4. Very pain (score 3), if the operator experiencing a sense of aches and pains of the old (still felt even though the work is done).

3.2 Calculation and Mapping Condition of Body Parts

Recapitulation of SNQ questionnaire results then performed percentage calculations to determine the pain conditions that occur in the body. The calculated part of the percentage is only the score part 2 (the pain) and the score part 3 (very pain). Percentage of color complaint identification can be seen in Table 2.

Table 2: Percentage of Color Complaints Identification

Percentage Number of Persons Complaining	Color	Description
0 – 20 %	Blue	Little complaints occur
21 - 40%	Yellow	Frequent complaints
41 – 70 %	Orange	Complaints are very frequent
71 - 100 %	Red	Complaints almost always occur

So, the calculations of the percentage and color mapping are according to complaints found from the results SNQ questionnaire. The results of the mapping can be seen in Figure 1.

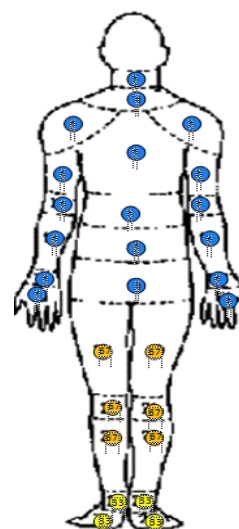


Figure 1. Mapping of Body Parts Complaints

Based on the above picture is given picture explanation as Table 3.

Table 3: Description Figure

Symbol	Description
	Complaints of illness occur with 0% percentage on the neck, shoulders, arms, hands, waist, and buttocks
	Complaints are very common with a 67% presentation on the thighs, knees and calves
	The excesses often occur with a 33% presentation on the ankles and soles of the feet

From the results of the SNQ questionnaire and recapitulation of the SNQ questionnaire, it was found that the affected body parts were the thighs, knees, calves, ankles, and soles of the feet.

4 CONCLUSION

Conclusion from the observation and data processing that was found that parts of the body that experienced pain due to work are thighs, knees, calves, ankles, and soles of the feet.

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