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Factors Related To Cummulative Trauma Disorder Lamentation to Employees of Pt Pertamina (Persero) Upms VII Makassar

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Abstract:- Cumulative Trauma Disorder (CTD) as one of Musculoskeletal Disorder (MSDs) was often caused by using monoton position on working especially on upper limb. The CTD symptoms may usually appear on the monotone job, unnatural work behavior, the over use of the body motion. The aims of this study was identifying the factors related to Cumulative Trauma Disorder lamentation to employees of PT Pertamina (Persero) UPMS Makassar. This analityc observational study used cross sectional methods with the population all employees. Sampling technique used exhaustive sampling by sample size were 35 employees. Data were collected used Nordic body map and Rapid Upper Limb Assesment (RULA) and analized by chi square test. The result showed that age, working time and body position were correlated to CTD. It suggested to used ergonomic body positions when working by doing some various motions of the body while the employees did their jobs and for next research to measure CTD lamentation by using some medical equipments

Keywords:- cumulative trauma disorder, employees characteristic, working time, body position

I. INTRODUCTION

Computer was one of the technologies resulted from the development of information technology, of which its use is so helpful or can ease in accomplishing any work. This computer has been used by many people for typing, designing, browsing, and so on. On the other hand, the use of computer may also have some negative effects for people's health especially ergonomic problems which were caused by either the bad workstation or anomalous posture.

The effect of the use of computer as one of the working tools may cause what is called by Cumulative Trauma Disorder (CTD). CTD is one of Musculoskeletal Disorders (MSDs) which impinges the motion tool at the top part of the body and is categorized into the softest neurosis that is caused by the over use of the nerve (Pulat, 1991)[1].

CTD was a set of terms for syndrome having the characteristics like feeling uncomfortable, damage, physical defect, or disability and pain that attack the ligament or body joints, muscles, soft tissue and others within physical manifestation(Kroemer, 2002)[2].

The CTD symptoms may usually appear on the monotone job, unnatural work behavior, the over use of the body motion. Sometimes those symptoms are supposed to be small things or trivial matters. The CTD can also be caused by anomalous position of the body when using the computer continuously, the support of the body that is not suitable, and having a seat in the same position for a very long time.

PT Pertamina UPMS VII Makassar office was the working place where most of the workers or staffs work by using computer as one of the tools in accomplishing their jobs. Those employees who interact with the computer in doing their jobs may be riskier to suffer CTD. This was influenced by repetitive motions when using computer for a very long time, the work characteristics that can be seen from the hand position when using the computer, the duration of the hand position when using the computer, and the duration of the rest time. The work related to administration may have various tasks and responsibilities such as typing, writing, and saving the data. Those tasks were assumed to have long duration and repetitive motion that may produce some anomalous body positions. This was supposed to be the risk factors that may lead to get CTD in the body.

Based on the explanation and the data elaborated above, the researcher was very interested in conducting the research on the factors related to Cumulative Trauma Disorder lamentation to employees of PT Pertamina (Persero) UPMS Makassar.

II. MATERIALS AND METHODS

This research was conducted at PT Pertamina (Persero) UPMS VII Makasar which was one of the state companies (BUMN) in Sulawesi area located on Jl. Garuda 1 Makassar, South Sulawesi on 20th July 2012 to 25th July 2012.This research was an analytical survey research using cross sectional study approach. The population was all the staffs or employees who work or take part in sales division for Sulawesi area such as

FRM region VII, HSSE Sulawesi area, IT area M & T Makassar, Finance M & T Off-site Supp Region VII, and LPG & Gas Products Region VI in PT Pertamina (Persero) UPMS VII Makassar were about 55 employees. Sample was took used Exhaustive Sampling technique, sample size were 38 employees.

The primary data about age, sex type, working time, and CTD lamentation were gained by doing the direct interviews with the participants of the research and also giving the questionnaires. Meanwhile, the data were collected used form of Nordic Body Map to know parts of the body that were mostly lamented in relation to CTD. To measure the body position when working were gained referring to the result of measuring activities by using ergonomic measurement – RULA (Rapid Upper Limb Assessment)

The data presentation was done by using the frequent distributive tables, dependent and independent variable percentage, and cross tabulation between independent and dependent variables. To know the correlation between those two variables, the researcher used chi-square test.

III. RESULT AND DISCUSSION

3.1 Employees Characteristics

In this research, the characteristics of the workers or employees contained about a group of age, level of education, function, the frequency of lamentation, and the level of the damage made. From 38 subjects of this research, it was found that the most percentage referring to the age group derived from those who were 23-27 years old. There were 11 subjects (28,9%). Meanwhile, the least percentage derived from those who were 33-37 and 38-42years old. There were about 4 subjects (10,5%).

The biggest percentage according to the level of education went to those who graduated from university, there were about 34 subjects (89,5%). The least percentage went to those who only graduated from high school, there were about 4 subjects (10,5%). On the other hand, referring to the function, the biggest percentage was owned by those who took part in LPG and Gas products division, there were about 11 subjects (28,9&). And the least percentage was owned by those who took part in Sales area-FRM, HSSE and IT divisions, there were 6 subjects (15,8%).

Referring to the level of frequency of CTD lamentation, the biggest percentage belonged to those who lamented 1-2/month, there were 14 subjects (36,8%). And the smallest percentage belonged to those who lamented every day, there was only 1 subject (2,6%). And finally, based on the level of the damage made, the most percentage was the light/small damage showed by feeling uncomfortable, there were 17 subjects (44,7%). And the least percentage was the worst damage showed by losing capability of working, there was only 1 subject (2,6%%).

3.1.1 CTD lamentation

There were 21 employees (55,3%) who underwent the CTD lamentation and there were 17 employees (44,7%) who did not feel the CTD lamentation.

3.1.2 Age

The employees who were old (more than 30 years old) were about 25 subjects (65,8%) and those who were still young (under 30 years old) were about 13 subjects (34,2%).

3.1.3 Sex Type

There were 10 female employees (26,3%) and there were 28 male employees (73,7%).

3.1.4 Working Time

There were 20 employees (52,6%) who had been working for less than 5 years and there were 18 employees (47,4%) who had been working for more than 5 years.

3.1.5 Body position when working

The employees who did not have ergonomic body position were about 29 subjects (76,3%) and those who had ergonomic body position when working were 9 subjects (23,7%).

3.2 Bivariat Analysis

3.2.1 Correlation between age and CTD lamentation

Among 38 employees, there were 25 subjects who were categorized into old people and 13 subjects who were categorized as young people. Referring to the age category, the highest CTD lamentation went to those who were old, there were 20 subjects (80%) who had CDT lamentation, while the respondents who did not feel CTd lamentation, the highest score went to those who were young, there were 12 subjects (92,3%).

Referring to the results of chi-square test using Continuity Correction, it was found (p value=0,000) meant p was less than 0,005, so that Ho was supposed to be refused while Ha was accepted. The interpretation was that there was meaningful correlation between age and CDT lamentation for the employees of PT Pertamina (Persero) UPMS VII Makassar.

3.2.2 Correlation between sex type and CTD lamentation

Among 38 respondents in this research, there were 28 male employees and 10 female employees. Referring to the male classification above, the highest CTD lamentation was undergone by male employees, there were 13 subjects (46,4%). While the respondents who did not feel CTD lamentation, the highest score also belonged to male employees, there were about 15 subjects (53,6%).

Based on the results of chi-square test using Fisher's Exact, it was found (p value=0,136), which meant that p was bigger than 0,005. Hence, Ho was accepted and Ha was refused. This was interpreted that there was no correlations between sex type and CTD lamentation for employees of PT Pertamina (Persero) UPMS VII Makassar.

3.2.3 Correlation between working time and CTD lamentation

Among 38 respondents in this research, there were 20 subjects who had been working for a long time and 18 subjects who were supposed to be the new employees. Referring to the working time category, the highest CTD lamentation went to those employees who had been working for a long time, there were 16 subjects (80,0%), while the respondents who did not feel CTD lamentation, the highest score went to those who were supposed to be the new employees, there were 13 subjects (72,2%).

The results of chi-square test using Continuity Correction showed that there was found (p value=0,0004), which meant that there was meaningful correlation between working time and CDT lamentation for employees of PT Pertamina (Persero) UPMS VII Makasar.

3.2.4 Correlation between body position in working and CDT lamentation

Among 38 respondents who joined this research, there were 29 subjects who did not have ergonomic body position when working and 9 subjects who had ergonomic body position when working. The highest CDT lamentation went to those who did not have ergonomic body position when working. There were about 20 employees (69,0%). Meanwhile, the highest point from those who did not have CDT lamentation went to those who did not have ergonomic body position when working, there were about 9 subjects (31,0%).

The results of chi-square test statistics using Fisher's Exact showed that there was found 9p value= 0,0005), which meant that p was less than 0,05. Hence, Ho was refused and Ha was accepted. This was interpreted that there was meaningful correlation between the body position and CDT lamentation for employees of PT Pertamina (Persero) UPMS VII Makassar.

IV. DISCUSSION

4.1 CTD Lamentation

CTD is a set of terms used for syndrome characterized by feeling uncomfortable, damage, physical defect, disability and pain that may occur to bones, ligaments, muscles, and soft tissues within physical manifestation (Kroemer, 2002)[2]. The CTD symptoms usually appear at monotone jobs, unnatural work behaviours, and overuse of muscles. CTD lamentation in this research was measured with the use of questionnaires using Nordic Body map (NBM) which was done by doing some interviews to the employees directly to know whether there was CTD lamentation felt by those employees or not (Budiono, 2003)[3].

Based on the findings or results of this study, it was found that most of the employees or respondents in this research got CTD lamentation. Among 38 respondents, there were 21 respondents (55,3%) who felt CTD lamentation while there were 17 respondents (44,7%) who did not feel CTD lamentation.

The CTD lamentation was caused by the overuse of the body position which was not ergonomic when working, the monotone tasks or working activities, repetitive similar motion in working, and limited place/space to work. The limited space of the room made the employees unable to work freely and move their body when they felt tired of working. This made them hard to relax and loose their muscles after working for hours.

4.2 Correlation between age and CTD lamentation

Generally speaking, aging may decrease the physical strength. This aging process may be followed by the decrease of work capacity because of some changes made by the body such as organs, and cardiovascular and hormonal system (Suma'mur, 2009)[4]. Most of the respondents who participated in this research were young, there were 11 subjects (28,9%).

Based on the data collected and described in the respondents' distribution tables, according to the two age categories – old (above 30 years old) and young (under 30 years old), it was known that most of the employees here were old, there were 25 subjects (65,8%) and the others were young about 13 people (34,2%).
Referring to the research results on the age tabulation with CTD lamentation, the old respondents were dominant to have CTD lamentation, there were 20 people (80,0%). Referring to the chi-square statistic test conducted by using Continuity Correction, there was found (value p=0,000), which meant that there was correlation between age and CTD lamentation since value p was less than 0,005.

This huge number of the respondents who had CTD lamentation was caused by musculoskeletal lamentation that was felt when they were 30 years old and this would increase when they were above 40 years old. This was because naturally the old ages make the body endurance and muscles capacity decrease significantly. At 45-60 years old the body endurance may decrease 25%, sensory capability may decrease 60%. And the physical condition of those who are above 60 years old will remain 50% of those who are 25 years old (Tarwaka, et,al, 2004)[5].

There were some employees who were categorized into young age but they also had CTD lamentation. This was because there was the problem at their shoulders which was not caused by working. So that those employees were categorized into the respondents who had CTD lamentation since what they lamented derived from the top parts of the body.

This research was in line with the research conducted by Hendra (2009) revealed that the employees who were above 35 years old risked bigger 2,56 times to have CTD lamentation rather than the employees who were under 35 years old.

4.3 Correlation between sex type and CTD lamentation

The female body size and work strength was relatively less than male ones. Physically woman has 2:3 of man. Based on the respondents' distribution results according to sex type, most of respondents were male, there were about 28 subjects (73,7%) and the others were female, there were about 10 subjects (26,3%).
Referring to the research results by tabulating the correlation between sex type and CTD lamentation, it was found that the most of the respondents who had CTD lamentation were male, there were about 13 subjects (46,4%). And most of the respondents who did not have CTD lamentation were also male, there were 15 people (53,6%). The statistic test results using Fisher's Exact showed that there was found (value p=0,136), which meant that there was no correlations between sex type and CTD lamentation since the value p was more than 0,05.

The female employee proportions were less than male. This made no correlations between sex type and CTD lamentation. However, if it were seen from the crosstab tables conducted between sex type and CTD lamentation, the highest percentage showing feeling of CTD lamentation went to female employees about 80,0%. It meant that female employees had bigger risk to have CTD lamentation.

Musculoskeletal lamentation tended to be felt more by female employees since female is supposed to have some hormonal cycles that make women be riskier especially when they are getting menstruation. This condition makes women get decrease 10 % of their body endurance capacity and patience when working. When she is pregnant, the muscle changes to be fetus, this makes her backbone and muscles be tense so that she tends to get more lamentation. This also happens when the women are supposed to be menopause. The bone density or solidity may decrease because of the decrease of estrogen hormone. Hence, it is possible for the women to have the lamentation.

4.4 Correlation between working time and CTD lamentation

Based on the respondents' distribution results on working time category, there were two different categories – old (more than 5 years) and new (less than 5 years). Most of the respondents had been working for a very long time or more than 5 years, there were 20 people. And the others were categorized into new employees since they had been working for less than 5 years, there were 16 people (47,45).

Referring to the research results by tabulating the correlation between the working time and CTD lamentation, it was found that the respondents who had CTD lamentation commonly belonged to the old employees, there were 16 subjects (80,0%). And those who did not have CTD lamentation commonly belonged to new employees, there were about 13 subjects (72,2%). The results of statistic test using Continuity Correction showed that there was found (value p0,0004), which meant that there was correlation between the working time and CTD lamentation since value p was less than 0,005.

The results of this research was in line with the theory proposed by Tarwaka, et al (2004)[5] ,stating that the working time is the risk factor which mostly influences a worker to get CTD lamentation especially those who have hard work to do.

The working time has a strong relationship with the muscles' lamentation. And this research also clarified the working time based on the level of adaptation and muscles' endurance - 0-5 years, 6-10 years, and more than 11 years. This was because the working burdens done had the same burdens to have high similar risks to feel CTD lamentation.

4.5 Correlation between body position when working and CTD lamentation

Based on the respondents' distribution results referring to the body positions when working by having two different categories – ergonomic (value RULA 1-4) and non ergonomic (value RULA 5-7), it was found that most of the employees of PT Pertamina (Persero) UPMS Makassar who became respondents in this

research were categorized to have non ergonomic body position when working, there were 29 respondents (76,3%) while the other respondents were supposed to have ergonomic body position.

The result on the body position tabulation when working with CTD lamentation in this research, it was found that the respondents who did not have ergonomic body positions when working were dominant to have CTD lamentation. There were about 20 subjects (69,0%). In addition, the results of statistic test using Fisher's Exact test showed that there was found (value p=0,0005), which meant that there was correlation between the body position and CTD lamentation since p was less than 0,005.

The results of this research was supported by the theory stated by Kurniawijaya (2010) explaining that unnatural posture or non ergonomic body position when working is supposed to deviate or defect from the natural or normal position. This significant deviation to the normal position will increase the muscle burdens so there will be more or bigger energy needed to work that is caused by the transfer of energy from the muscle to the bone that is not efficient. This condition may contribute to CTD lamentation.

There were some employees having no ergonomic body positions but they did not have CTD lamentation. This was because there were some employees who had not been working for a long time, they were new in the office so that the working burdens and their non ergonomic body positions had not contributed and raised the lamentation that was felt by the employees body.

V. CONCLUSION

Conclusions

1. There was correlation between age and CTD lamentation
2. There was no correlations between sex type and CTD lamentation
3. There was correlation between working time and CTD lamentation
4. There was correlation between body position and CTd lamentation

Suggestions

1. It is important that the company socialize about ergonomic body position when working.
2. It suggested that the employees have ergonomic body positions when working by doing some various motions of the body while doing their jobs in order that their muscles will not be static.
3. It is suggested to the next researcher to measure CTD lamentation by using some medical equipment.

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