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Factors that influence suffered of Low Back Pain (LBP) in MRI examination patients in Hospitals Semarang City

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Abstract

Low back pain can be caused by a variety of musculosceletal diseases, psychological disorders and mobilization. Patients who performed MRI examinations were mostly caused by indications of Low Back Pain (LBP). LBP became an important problem in the United States, in Indonesia an estimated 40% of the population of Central Java aged over 65 years have suffered from low back pain, the prevalence in men is 18.2% and in women is 13.6%. In recent years, Magnetic resonance imaging (MRI) has been used widely, including for diagnosis of LBP. This study aims to identify factors that affect the suffered of low back pain in patients undergoing an MRI examination which consists of personal factors covering : age, habits, smoking exercise habits, height, obesity, and work factors (tenure, work duration). The research categorize as a quantitative research with cross-sectional design. This study used a sample of all cases of MRI examination with complaints of low back pain as many as 60 patients. Statistical tests using chi square and non-parametric Mann Whitney tests. From the results of the study found that those who suffer of LBP are mostly from personal factors covering : men, have jobs that have more burden (weight), more at the age of ≥ 35 years, no smoking, no exercise, height ≥ 163 cm, overweight / obesity, with tenure of ≥ 10 years, with a work duration ≥ 8 hours a day, and type of LBP suffered in the chronic categorized. The factors that caused LBP in this study were personal factors in the most dominant sequence is caused by age, smoking habits, exercise habits, height, BMI, tenure and work duration and type of LBP chronik.

Keywords: *Low Back Pain, magnetic resonance imaging, Semarang*

INTRODUCTION

MRI is a technique inspection provide information either Anatomy or Physiology in non-invasive with computer-based modalities with the cross-sectional Imaging.An MRI generates images of structures through the interaction of magnetic fields and radio waves with the network so no ionization radiation because it does not use x-rays – X (Ballinger, 2003). Kolumna vertebrae consists of vertebrae, intervertebral discs, muscles, and ligaments. Vertebral Column composed of 7 cervical, 12 thoracal, 5 lumbar, sacrum and coccyx. In addition, there is the spinal canal that contains the spinal cord and nerve root.The lumbar vertebrae are the largest, heaviest burden of having to prop up (Fast and Goldsher, 2007). Low back pain usually takes a 6-7 week for healing well against the soft tissues or joints, but 10% of whom do not

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experience improvement within. 5 lower back pain is a symptom, not a diagnosis. Back pain is a disorder with different etiology and requires the handling of simtomatis as well as medical rehabilitation.In the application of the magnetic field magnitude 0064 used Tesla – 1.5 Tesla. Research conducted Jackson (1989) proved that MRI is more accurate in predicting and assessing the various suffered on lumbar, compared with CT-Scan and myelografi. Disadvantages of MRI imaging time is relatively long especially when used MRI modalities with the strength of the magnetic field under 0.5 T. Based on preliminary study, which was done while an internship in August 2016 around 40% MRI examination conducted in semarang city hospital is a clinical low back pain, therefore we would like to lift the phenomena. MRI is an inspection technique that provides information on both anatomy and non invasive physiology with modalities computer-based with crossectional imaging. MRI produces structural images through the interaction of magnetic fields and radiofrequency with tissue so that there is no ionizing radiation because it does not use X-rays (Ballinger, 2003).

RESEARCH METHODS

The vertebral column consists of vertebrae, intervertebral discs, muscles, and ligaments. The column is vertebral composed of 7 cervical, 12 thoracal, 5 lumbar, sacrum and coccyx. In addition, there is a spinal canal containing the spinal cord and nerve root. Lumbar is the largest vertebra, because it must support the heaviest load (Fast and Goldsher, 2007).Usually low back pain takes 6-7 weeks to heal both soft and joint tissues, but 10% of them do not experience improvement during this period. Low back pain is a symptom, not a diagnosis. Back pain is a disorder with various etiologies and requires symptomatic treatment and rehabilitation medical. in its application the magnetic field used was 0.064 Tesla - 1.5 Tesla. Research conducted by Jackson (1989) proves that MRI is more accurate in predicting and assessing various lumbar disorders, compared to CT scan and myelography. MRI deficiency is a relatively long imaging time especially when using an MRI modality with magnetic field strength < 0.5 T. Low Back Pain is pain that is felt in the lower back region, can be local pain or radicular pain or both. This pain is felt between the ribs bottom to fold the bottom buttocks in the lumbar and or lumbo-sacral areas and is often accompanied by a spread of pain towards the legs and feet. LBP which is more than 6 months is called chronic. (Sadeli & Tjahjono, 2001) Low Back pain can be divided into 6 types of pain, namely:

1. Local back pain
   This type is most commonly found. Usually there is a center line with radiation to the right and left. This pain can come from the lower parts like fascia, paraspinal muscles, vertebral body, joints and ligaments.
2. Irritation of the roots
   Pain can vary with paresthesias and is felt in the dermatome concerned on one side of the body. Sometimes it can be accompanied by loss of feeling or motor dysfunction. Irritation can be caused by the process of pushing space on the vertebral foramen or in thecanal vertebral.
3. Somatic referral pain
   The irritation of sensory fibers on the surface can be felt more deeply in the dermatome concerned. Conversely, irritation in the inner parts can be felt in the more superficial part.
4. Viserosomatic referral pain

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There is a disturbance in thedevices retroperitonium, intra-abdominal or in the pelvic chamber can be felt

5. Pain due to ischialgia
   This pain is felt such as pain in intermittent claudication that can be felt in the lower waist, in the gluteus or radiating to the thigh. Can be caused by blockage in the aortic branching or in the common iliac artery.
6. Psychogenic
   pain Pain that is not normal and not in accordance with the distribution of nerves and dermatomes withfrequent facial reactions.(Rumawas, 1996)

Incidents of Epidemiological data on LBP in Indonesia do not yet exist, but an estimated 40% of the population of theisland of Central Java aged over 65 years have suffered from low back pain, prevalence in men 18.2% and in women 13.6. Incidence based on patient visits to several hospitals in Indonesia ranges from 3-17%. (Sadeli & Tjahjono, 2001). Low Back Pain Various Prevention The various causes of LBP require a variety of management. However, basically there are two stages of LBP therapy, namely:

a. Conservative therapy, which includes bed rest, medicine and physiotherapy.
b. Operative Therapy

Both of these stages have the same goal of rehabilitation. Treatment of back pain is very dependent on the cause. Another cause, another treatment. There are a variety of actions for back pain, from the simplest of which are bed rest, for example in the case of the muscle attracted or ligament sprain, to very sophisticated treatment, such as replacing the spinal pillow. If the bed rest does not heal, it must be increased by ray examination. X-or by MRI (magnetic resonance imaging). After that,can be done physiotherapy, treatment with injections, muscle exercise, to surgery. There are still other treatment techniques, for example through surgery with endoscopy (spinal surgery), the method of attaching the pen, to replacing bone pads. (Murtagh, 2003).

MRI is a gold standard imaging with 100% sensitivity and 97% sensitivity in diagnosing HNP (Roudsar and Jarvik, 2010; Chou, Qaseem, Snow, et al. 2007; Jarvik and Deyo, 2002). MRI is modality a very good in showing soft tissue structure and another advantage of MRI is not using radiation. MRI sequences are used in lumbosacral MRI examinations of T1W1 and T2W1 axial and sagittal pieces. The T2W1 sequence shows a picture very good because annulus which is rich in connective tissue will give apicture hypointense while the-nucleus pulposus water rich looks hyperintense. MRI Examination is indeed a gold standard in diagnosing LBP but expensive MRI examinations and examinations are long-term not available in Indonesia. MRI examination is a contra indication for pace maker users or claustrophobia. Intervetebral disc degeneration due to oxygen reduction and supply nutrient due to the aging process. End plates Vertebral play an important role.

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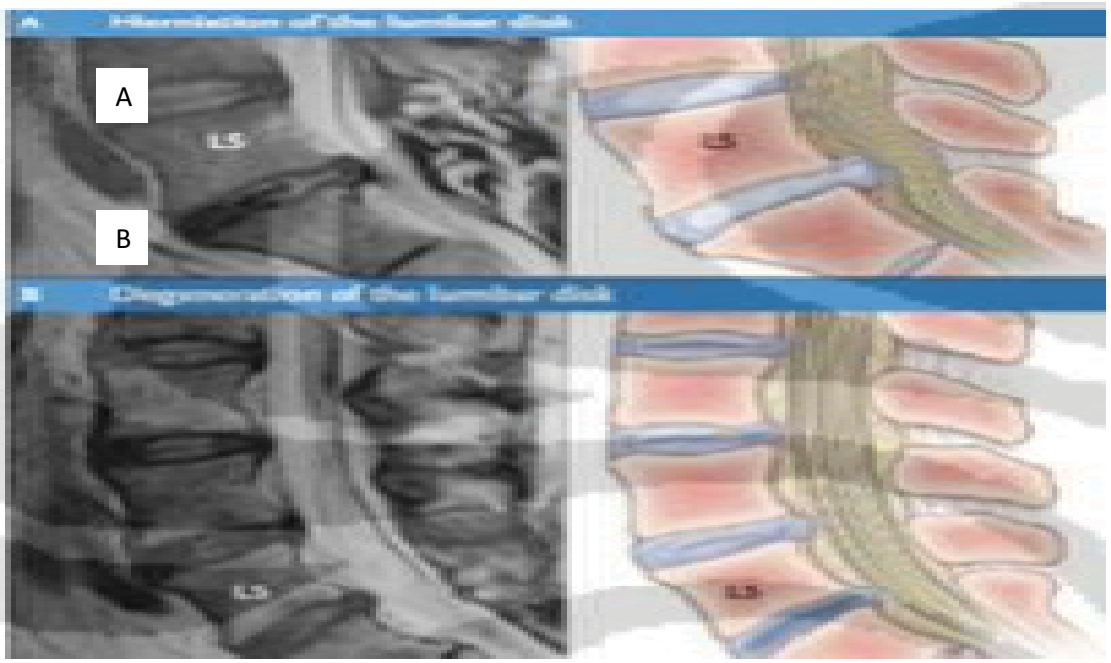

Figure 1. Herniation (A) and Degeneration of Vertebral Discus (Carragee, 2005)

Vertebral Column is an important part of ergonomics because this sceleton is a framework that supports the body human along with the pelvis to transmit the load to both legs through the joints found in the groin. The spine consists of several parts, namely: Cervical spine; consists of 7 segments bone that have the shape of a small bone with a spine or spinous process(a part like the wing on the back of the bone) that is short except the 2nd and 7th bones. This bone is a bone that supports the neck. Thoracic spine; consists of 12 segments bone also known as dorsal bone. The spinous procesus in this bone is connected to the rib cage. The possibility of several circular movements can occur in this bone. Lumbar spine; consists of 5 segments bone which are the most robust part of the construction and bear the heaviest burden of 12 other bones. This section allows flexion and extension of the body, and some rotation small degrees of. Sacrum bone; consists of 5 segments bone. The bones join and do not have a gap or intervertebral disc with each other. This bone connects between the back and pelvis. Coccyx spine; consists of 4 segments bone which are also joined without a gap between 1 and the other. Coccyx andbones combine sacrum into one unit and form strong bones. In the spine there is a bearing that is the intervertebral disc which is located along the spine as a connection between the bones and serves to protect the spinal cord.

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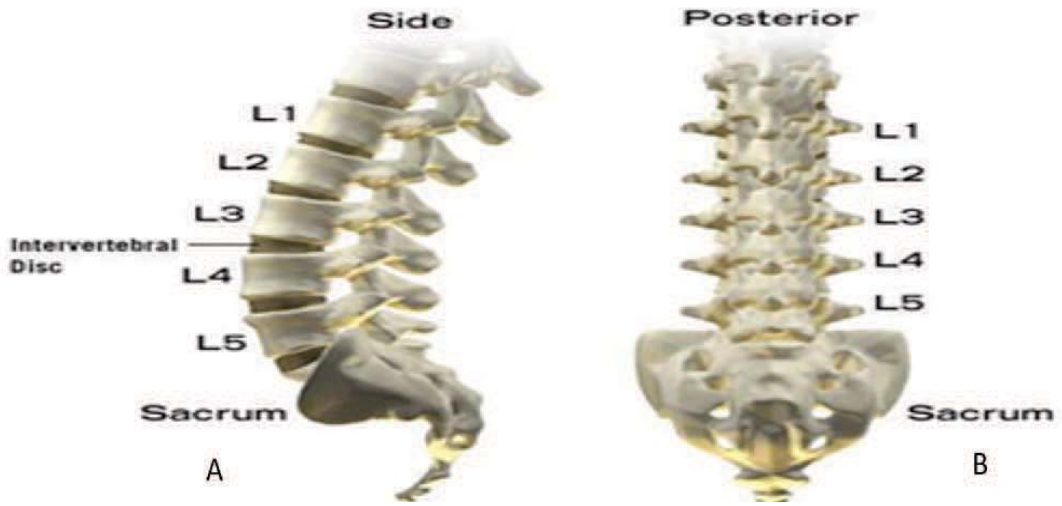

Figure 2. Vertebral column Structure (A. Lateral Aspect, B. Anterior aspect)

The outer part of the bearing consists of an annulus fibrosus made of cartilage and the nucleus pulposus which is jelly-like and contains a lot of water. With this bearing allows movement of the spine and as a barrier if there is pressure on the spine as in a jump state. If there is damage to this part, the bone can compress the nerves in the spine, causing pain in the back lower and legs. The structure of this spine must be maintained in good condition so that no damage can cause injury. Several randomized clinical trials have shown that in patients with low back pain without red flags, imaging does not show significant results. Nearly 70% of acute lower back pain provides symptoms that lead to muscle strain and sprain spinal, usually occurring in younger age, which shows simple back pain. In this state, MRI does not need to be done in the first 4-8 weeks after onset symptom. International guidelines, such as the Agency for Health Care Policy and Research (AHCPR) and the European Commission Research Directorate-General Department of Policy Coordination and Strategy, say that in patients with acute low back pain without red flags, spinal abnormalities are not required in 4 -8 first week. American of Radiology (ACR) appropriate criteria states that patients with low back pain with red flags in the form of trauma, osteoporosis, focal and progressive deficits, age 70 years, or long duration of symptoms, require MRI without contrast, whereas in lower back pain with red flags in the form of suspicion of cancer, infection, or immunosuppression requires an MRI examination without and with contrast.

Table1. Sensitifity and specifity in low back pain diagnose last and hulbert, 2009

Diagnose	Sensitivity	Spesifity
Discus Degeneration	60-100%	43-97%
Spinal Stenossis	77-90%	72-100%
Infection	96%	92%
Ankylosing Spondilosys	25-85%	90-100%
Metastase	83-100%	92%
Compression Fracture	95%	95%

The Factors Caused Low Back Pain Occupational Factors (Work factors). Based on the characteristics of work performed by a person in their interactions with the work system. Based on research it has been proven that biomechanical reviews and statistical

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data show that factors job contribute to injury muscle due to work (Armstrong, 1979; Wisseman & Badger, 1970; Werner, 1997. cited by Chaffin 1999. Job factors that can cause injury to the muscles or tissues of the body are posture, repetition, static work and work that requires energy.

Individual Factors (Personal factors)

The condition of a person who can cause musculoskeletal disorder (MSDs). Some personal risk factors that influence the incidence of MSDs are years of service (Guo, 2004), age (Guo et al. 1995; Chaffin 1979, gender (Chiang et al. 1993, Bernard et al. 1994, hales et al. (1994), and Johansonb 1994, habits smoking (Finkelstein 1995; Owen and Damron 1984; Frymoyer et al. 1983; Svensson andal. 1984 Anderson 1983; Kelsey et), habits exercise(Cady et al (1979), height, obesity (Van Dieen, 1997, and duration of work per day. Environmental Factors conditions of the environment that can cause musculosceletal disorder's (MSDs). Among them are vibration and extreme temperature (Mustafa, 1992).This research is a study quantitative with crossectional study design because in this study the independent variables and dependent variables were measured at the same time to determine the factors that influence suffered of low back pain in patients with MRI examination in Semarang City. This research was conducted at the Hospital of Semarang City which has a modality, Magnetic Resonance Imaging (MRI) imaging with Magnetom MRI Siemens1.5 Tesla. Univariate analysis was carried out on each variable from the results of this study to see frequency distribution and percentage, which included suffered of low back pain, work, individuals factor (gender, age, habits smoking, exercise habits, height, obesity, tenure, and duration of work, and diagnosis of MRI expertition. Bivariate analysis to prove the hypothesis in this study by using the chi square statistical test revised for 2X2 table, namely yate's correction. The revised chi square requirements for 2X2 table are yate 's correction ie the expected value of each cell should not be <5. If there is an value expectation in cell <5 then use test an alternativefor fisher exact test (Dahlan, 2013) . Values degree of freedom (df) or the degrees of freedom of a 2X2 table with the formula (Notoatmodjo, 2010):

df = (row-1) X (column-1) = (2-1) x (2-1) = 1. By thus the value of X2 table with α = 5% (0.05) is = 3.841 (Sugiyono, 2013). Test the acceptance or rejection of the hypothesis using the following provisions:

1. If X^2 counts> X^2 table and p value <from α = 0.05, then Ha is accepted and H0 is rejected, so there is a relationship between the independent variable and the dependent variable.
2. If X^2 counts <X^2 table and p value> from α = 0.05, then Ha is rejected and H0 is accepted, so there is no relationship between the independent variable and the variable dependent.

RESULTS AND DISCUSSION

1. Baseline data of patients MRI examination Lumbar / Lumbosacralin Semarang City

Frequency of patients MRI examination Lumbar / Lumbosacral between personal factors: work period, habit smoking, gender, age, exercise habits, BMI and duration of work. and work factors: (posture, repetition, static work, work that requires energy).

2. Factors Causing the occurrence of low back pain (LBP)

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Based on the results of this study obtained from data processing and analysis data as follows:

Table 2. Crosstabulation relation between age with low back pain suffered in Semarang City

Age	LBP				Jml	%
	Suffered		No Suffered			
	n	%	n	%		
≥35 th	35	58,33	9	15	44	100
< 35 th	4	6.67	12	20	16	100
Jml	39	65	21	35	60	100

X^2 count = 13,041 p *value* = 0,000 OR = 11,667 (3,031-44,913)

Based on table.2 above shows for respondents age responden 35 years, there are suffered LBP as many as 35 respondents (58,33%) more than there were no suffered LBP as many as 9 respondents (15%). Respondents aged <35 years, there were LBP complaints as many as 4 respondents (25.0%) less than no LBP suffered as many as 12 respondents (20%). From the results of Yate's Correction statistical test obtained the value of X^2 count = 13.041> X^2 table = 3.841 and p value count = 0.000 <α = 0.05, so Ha is accepted. Ha accepted if the value of X^2 count> X^2 table and count value p <0.05 significance level of 5% or 0,05. Its means no association of age with LBP in Semarang. Based on the results of OR (Odds Ratio) = 11,667 with a 95% confidence interval = 3,031-44,913. This means that respondents aged ≥ 35 years are at risk of experiencing suffered LBP (OR> 1) compared to respondents aged <35 years.

Based on table 3 below shows the smoking habits of respondents, there are complaints LBP was 15 respondents (25%) more than there were no LBP complaints as many as 2 respondents (3,33%). Respondents who did not smoke, there were 24 LBP suffered (40%) more than 19 respondents (31,67%). From the statistical test result Yate's Correction values obtained following :

Table 3. Cross tabulation of the relationship between smoking habits and LBP in Semarang City

Smoking Habit	LBP				Jml	%
	Suffered		No Suffered			
	n	%	n	%		
Smoking	15	25	2	3,33	17	100
No Smoking	24	40	19	31,67	43	100
Jml	39	65	21	35	60	100

X^2count = 4,294 p value =0,038 OR = 5,938 (1,207-29,217)

Table 4. Cross Tabulation Relationship between Exercise Habits and LBP in Semarang City

Exercise	LBP				Jml	%
	Suffered		No Suffered			
	n	%	n	%		
Exercise	27	45	7	11,67	34	100
No Exercise	12	20	14	23,33	26	100
Jml	39	65	21	35	60	100

X^2 count = 5.776 p value = 0,007 OR = 4.5 (1.448 to 13.849)

Based on table 4 above indicate if the habit of respondents who do not exercise In the body, there were LBP complaints as many as 27 respondents (45%) more than there were no LBP suffered as many as 7 respondents (11,67%). Respondents who

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exercise, there are LBP suffered 12 (20%) less than no LBP suffered as many as 14 respondents (23,33%). From the results of Yate's Correction statistical test obtained the value of X^2 count = 5.776> X^2 table = 3.841 and p value count = 0.007 <α = 0.05, so Ha is accepted. Ha accepted if the value of X^2 count> X^2 table dan value count p <0.05 significance level of 5% or 0.05. This means that there is a relationship between sports practice and LBP in Semarang City. Based on the results of OR (Odds Ratio) = 4.5 with a 95% confidence interval = 1.448-13.849. This means that respondents who have no exercise habit are at risk of having,LBP suffered (OR> 1) than those who exercise.

Table 5. Cross tabulation of body height with LBP in Semarang City

Height	LBP				Jml	%
	Suffered		No Suffered			
	n	%	n	%		
≥163 cm	27	45	6	10	33	100
< 163 cm	12	20	15	25	27	100
Jml	39	65	21	35	60	100

X^2 count = 7,549 p value = 0,006 OR = 5,625 (1.753 to 18,045)

Based on table 5 above shows the respondent's height ≥ 163 cm, there were LBP suffered as many as 27 respondents (45%) more than there were no LBP suffered as many as 6 respondents (10%). Respondent's height was <163 cm, there were 12 LBP complaints (20%) less than no LBP suffered as many as 15 respondents (25%). From the results of Yate's Correction statistical test obtained the value of X^2 count = 7.549> X^2 table =3.841 and p value count = 0.006 <α = 0.05, so Ha is accepted. Ha accepted if the value of X^2 count> X^2 tabll dan value countp <0.05 significance level of 5% or0,05.Berarti no height relationship with LBP in Semarang.Based on the results of OR (Odds Ratio) = 5.625 with a 95% confidence interval = 1.753-18.045. This means that respondents who have a height of ≥ 163 cm are at risk of experiencing LBP complaints (OR> 1) compared to the height of respondents <163 cm.

Table 6. Cross tabulation relationship between BMI and LBP in Semarang City

Height	LBP				Jml	%
	Suffered		No Suffered			
	n	%	n	%		
Overweight	25	41,67	6	10	31	100
Ideal	14	23,33	15	25	29	100
Jml	39	65	21	35	60	100

X^2 count = 5.551 p value = 0,018 OR = 4.464 (1.412 to 14.111)

Based on table 6 above indicates obesity overweight respondents, there were LBP complaints as many as 25 respondents (41,67%) more than there were no LBP complaints as many as 6 respondents (10%). Obesity was ideal respondents, there were complaints LBP as many as 14 respondents (23,33%) less than with no complaints LBPas many as 15 respondents (25%). From the results of Yate's Correction statistical tests obtained the value of X^2count = 5.551>X^2 table = 3.841 and p value count = 0.018 <α = 0.05, so Ha is accepted . Ha accepted if the value of X^2 count> X^2 table dan value count p <0.05 significance level of 5% or 0,05. That means there is a relationship of obesity is a is the BMI (Body Mass Index) with LBP in Semarang City Based on the results of OR (Odds Ratio) = 4.464 with a 95% confidence interval = 1.412-14.111.

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This means that respondents who have overweight are at risk of having LBP suffered (OR> 1) than ideal.

Table 7. Crosstabulation relationship tenure and LBP in Semarang City

Tenure	LBP				Jml	%
	Suffered		No Suffered			
	n	%	n	%		
≥10 tahun	27	45	8	13,33	35	100
< 10 tahun	12	20	13	21,67	25	100
Jml	39	65	21	35	60	100

X^2 count = 4,239 p value = 0,040 OR = 3,656 (1.202-11,124)

Based on table 7 above 27 (45%) more much compared to showing the working period of respondents ≥ 10 there were no LBP suffered as many as 8 (13,3%) respondents in the year, there were LBP suffered as many as 27 respondents (45%) more than there were no LBP complaints as many as 8 respondents (13,33%). The working period of respondents is <10 years as many as 12 repondents (20 %). The working period less than 10 years suffered LBP 12 (20%) and no suffered 13 (21,67%). From the results of Yate's Correction statistical test obtained the value of X^2 count = 4,239> X^2 table =3.841 and p value count = 0.040 <α = 0.05, so Ha is accepted. Ha accepted if the value of X^2 count> X^2 table dan value count p <0.05 for X^2count = 4.239>X^2table = significance level of 5% or 0,05. Its meansi no count 3,841 and p value = 0,040 <α = 0, 05, the relationship between the duration of work period with LBP in the Semarang City so that Ha is accepted. Ha is accepted if the value of X^2 counts> X^2 tables and p value counts <0.05 for Semarang City.

Table 8. Cross tabulation relationship between work duration and LBP in Semarang City

Work Duration	LBP				Jml	%
	Suffered		No Suffered			
	n	%	n	%		
≥8 jam	28	46,67	8	13,33	35	100
< 8 jam	11	18,33	13	21,67	25	100
Jml	39	65	21	35	60	100

X^2count = 5,131p value = 0.023 OR = 4,136 (1.345-12,721)

The work duration of the respondent were ≥ 8 jam 28 respondents (46,67%) suffered LBP more than no suffered LBP 8 respondent (13,33%). And the respondent that were work duration <8 hours, there were LBP suffered as many as 11 respondents (18,33%) less than there were no LBP suffered as many as 13 respondents (21,67%). year, there were 12 LBP complaints. From the results of the Yate's Correction statistic test was respondent (18,330%) less than the X score with no LBP complaints as many as 13 respondents (21,67%). From the results of Yate's Correction statistical test obtained the value of X^2count = 5.131> X^2table =3.841 and p value count = 0.023 <α = 0.05,so Ha is accepted. Ha accepted if the value of X^2count> X^2 table and value count p <0.05 for X^2count = 4.239>X^2 table = significance level of 5% or 0,05. That means no count 3,841 and p value = 0,040 <α = 0, 05, the relationship between the duration of work with LBP in the Semarang City so that Ha is accepted. Ha is accepted if the value of X^2. Based on the results of OR (Odds Ratio) = significance level of 5% or 0.05. Means that there is a relationship between the tenure with LBP in Semarang City. Based on Table 9 below the most dominant factor of LBP factors based Odds Ratio (OR) is an factor age factors then of smoking habits, height, exercise habits, BMI, duration of work and working period.

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Table 9. Recapitulation of Results of Odds Ratio (OR) Cross Tabulation Relationship between LBP Factors and LBP in Semarang City

No	Risk Factor	OR	IK (95%)
1.	Age	11,667	3.031-44,913
2.	Smoking habit	5,938	1,207-29,217
3.	Exercise habit	4,5	1,448-13,849
4.	Height	5,625	1,753-18,045
5.	BMI	4,464	1,412-14,111
6.	Tenure	3,656	1,202-11,124
7.	Work Duration	4,136	1,345-12,721

1. Baseline data of patients with MRI examination Lumbar / Lumbosacralin Semarang City

Results were compared with theory: frequency of patients Lumbar / Lumbosacral MRI examination defined commonly by gender, man higher than woman. From the results of the study found that those who suffer of LBP are mostly from personal factors covering : men, have jobs that have more burden (weight), more at the age of ≥ 35 years, no smoking, no exercise, height ≥ 163 cm, overweight / obesity, with tenure ≥ 10 years, with a work duration ≥ 8 hours a day, and type of LBP suffered in the chronic categorized. The factors that caused LBP in this study were personal factors in the most dominant sequence is caused by age, smoking habits, exercise habits, height, BMI, tenure and work duration and type of LBP (chronic).

Incidents of LBP related between personal factors: The frequency of patients with Lumbar / Lumbosacral MRI examination between personal factors: work period, habits smoking, gender, age,habits exercise, BMI and duration of work. and work factors: (posture, repetition, static work, work that requires energy)

2. Factors that cause low back pain (LBP)

a. Relationship of Age with LBP in Semarang City

Age of respondents ≥ 35 years, there were LBP complaints as many as 35 respondents (58,33%) more than no LBP complaints as many as 9 respondents (15 %). Respondents aged <35 years, there were LBP complaints as many as 4 respondents (6,67%) less than no LBP complaints as many as 12 respondents (20%). From the results of Yate's statistical test Correction obtained the value of X2count =13.041> X2table = 3.841 and p value count = 0.000 <α = 0.05, so Ha is accepted. Ha accepted if the value of X^2 count> X^2 table and value count and p <0.05 significance level of 5% or 0,05. It means no association of age with LBP in Semarang. Based on the results of OR (Odds Ratio) = 11,667 with a 95% confidence interval = 3,031-44,913. This means that respondents aged ≥ 35 years are at risk of experiencing LBP complaints (OR> 1) compared to respondents aged <35 years. As age increases, bone degeneration will occur and this condition begins to occur when a person is 30 years old (Bridger, 2003). At the age of 30 years degeneration occurs in the form of tissue damage, tissue replacement to scar tissue, reduction of fluid. This causes the stability of the bones and muscles to decrease. In short, the older a person is, the higher the risk of the person experiencing a decrease in elasticity in the bones, which triggers the onset of symptoms of Musculoskeletal Disorders (MSDs). Baseline data of patients with MRI examination Lumbar / Lumbosacral in Semarang City

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Related between personal factors: The frequency of patients with Lumbar / Lumbosacral MRI examination between personal factors: work period,habits smoking, gender, age,habits exercise, BMI and duration of work. and work factors: (posture, repetition, static work, workthat requires energy)

b. The Relationship between Smoking Habits and LBP in Semarang City

The habit of smoking respondents, there were 15 LBP complaints (25%) more than there were no 2 LBP complaints (3,33%). Respondents who did not smoke, there were 24 LBP complaints (40%) more than 19 respondents (31,67%). From the results of Yate's Correction statistical test obtained the value of X^2 count = 4.294> X^2 table = 3.841 and p value count = 0.038 <α = 0.05, so Ha is accepted. It is accepted if the value of X^2 counts> X^2 table and p count <0.05 for a significance level of 5% or 0.05. Means there is a relationship of smoking habits with LBP in the city of Semarang. Based on the results of OR (Odds Ratio) = 5.938 with a 95% confidence interval = 1.207-29.217. This means that respondents who have a smoking habit are at risk of having LBP complaints (OR> 1) than respondents who do not smoke. Several studies have provided evidence that a positive history of smoking is associated with MSDs such as low back pain, sciatica, or intervertebral disc hernias [Finkelstein 1995; Owen and Damron 1984; Frymoyer et al. 1983; Svensson and Anderson 1983; Kelsey et al. 1984].

Increased muscle complaints are closely related to the duration and level of smoking habits. The longer and the higher the frequency of smoking, the higher the level of perceived muscle complaints. Increased muscle complaints are closely related to the duration and level of smoking habits. Risks increase by 20% for every 10 cigarettes per day. In a Finnish study aged 30-64, [Makela et al. 1991], neck pain was found to be significantly associated with current smoking (OR 1.3, 95% CI 1- 1.61) when the logistic model was adjusted for age and sex. Some explanations for the relationships that have been formulated. One hypothesis is that back pain is caused by coughing from smoking. Coughing increases abdominal pressure and intradiscal pressure and puts a strain on the spine. Several studies have observed these relationships (Deyo and Bass 1989; Frymoyer et al. 1980; Troup et al. 1987). Other proposed mechanisms include nicotine that enters the blood astream to the tissue and decreases its strength [Frymoyer et al. 1983] and smoking causes bone mineral content to decrease, causing microfracture.

c. Relationship between Sports Habits with LBP in Semarang City

The habit of having respondents who did not exercise, there were LBP complaints as many as 27 respondents (458%) more than no LBP complaints as many as 7 respondents (11,67%). Respondents who exercise, there are LBP complaints as many as 12 respondents (20%) less than no LBP complaints as many as 14 respondents (23,33%). From the results of Yate's Correction statistical test obtained the value of X2 count = 4.773> X2 table = 3.841 and p value count = 0.029 <α = 0.05, so Ha is accepted. Ha is accepted if the value of X^2 counts> X^2 table and p value counts <0.05 for a significance level of 5% or 0.05. Means that there is a relationship of exercise habits with LBP in Semarang City based on the results of OR (Odds Ratio) = 0.194 with a 95% confidence interval = 0.049-0.769. This means that respondents who have no risk of exercise do not experience LBP complaints (OR, 1) compared to respondents who exercise.

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Aerobic fitness increases the ability of muscle contraction. Eighty percent (80%) of cases of back pain are caused by poor levels of muscle tone (tonus) or lack of exercise. Weak muscles, especially in the abdominal area, are unable to support the back to the maximum. The level of muscle complaints is also influenced by the level of physical fitness. Based on a report from NIOSH cited from the results of research Cady et al (1979) states that for a low level of body freshness, the risk of complaints is 7.1% the level of physical fitness is the risk of skeletal muscle disorders is 3.2% and high physical fitness, the risk for skeletal muscle complaints is 0.8%.

d. Relationship between height and LBP in Semarang City

Respondent's height was ≥ 163 cm, there were 27 LBP complaints (45%) more than 6 respondents (10%) had no LBP complaints. Respondent's height was <163 cm (20%), there were 12 LBP complaints (20%) less than no LBP complaints as many as 15 respondents (256%). From the results of Yate's Correction statistical test obtained the value of X^2 count = 7.549> X^2 table = 3.841 and p value count = 0.006 <α = 0.05, so Ha is accepted. Ha is accepted if the value of X^2 counts> X^2 table and p value counts <0.05 for significance of 5% or 0.05. Means there is a relationship of height with LBP in the City of Semarang. Based on the results of OR (Odds Ratio) = 5.625 with a 95% confidence interval = 1.753-18.045. This means that respondents who have a height of ≥ 163 cm are at risk of experiencing LBP complaints (OR> 1) compared to the height of respondents <163 cm Although the effect is relatively small, height is a factor that can cause skeletal muscle complaints , Heliovaara's (1987) study, quoted by NIOSH (1997) states that a person's height affects herniated appearance lumbardisc on female gender. and male Schierhout (1995), found that in short a person associated with complaints of neck and shoulders. At highbody a generally often nausea complaints of back pain, but high body does not have an effect on complaints in the neck, shoulders, and wrists. When noted, skeletal muscle complaints associated with body size are caused more by the balance condition of the skeletal structure in accepting the burden, both body weight and other additional burdens (Tarwaka et al, 2004).

Pheasant (1986) is quoted in Nurmianto (1993). Inoue, Miyagi, Uchida, et al (2015) research in Japan for respondents who work sitting, those who are as tall as 170 cm carry an RR of around 1.4 compared to those aged 160-169 cm. The results of research by Heuch I, Heuch I, Hagen K, and Zwart JA (2015) that women with a body height of at least 170 cm, who did not experience LBP at baseline, had a 19% increased risk of LBP than women with a height of less than 160 cm. A height of 70170 cm can predispose to chronic LBP 11 years later. This may reflect mechanical problems or

show hormonal influences. The results of Hershkovich, et al (2013) showed that respondents' height> 168 cm was at risk of LBP complaints.

e. The relationship between IMT and LBP inSemarang City

IMT of respondents overweight, there were 25 LBP complaints (41,67%) more than there were no 6 LBP complaints (10%). Ideal respondents' BMI, there were 14 LBP complaints (23,33%), fewer than 15 respondents (25%). From the results of Yate's Correction statistical test obtained the value of X2 count = 5.551> X2 table = 3.841 and p value count = 0.018 <α = 0.05, so Ha is accepted. Ha is accepted if the value of X 2 counts> X2 tabe l and p value count <0.05 for significance level of 5% or 0.05. Means there is a relationship of obesity with LBP in Semarang City Based on OR (Odds Ratio)

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= 4.464 with 95 % confidence intervals= 1,412-14,111. This means that respondents who have overweight are at risk of having LBP complaints (OR> 1) than ideal. BMI (Body Mass Index) according to WHO can be defined as a condition that shows the accumulation of fat in body fat tissue. BMI is divided into: underweight, ideal, overweight and obesity. This condition of overweight or obesity is caused by an imbalance between calorie consumption and energy needs, where consumption is too excessive compared to needs. The excess is stored in fat tissue. Excessive body weight (overweight / obesity) causes weak abdominal muscle tone, so that a person's center of gravity will be pushed forward and cause lumbar lordosis, which will increase which then causes fatigue in the paravertebrate muscles, this is the risk of LBP. (Van Dieen, 1997). According to WHO (2003) classifies BMI as follows: <18.5 is said to be underweight, 18.5-24.9 is categorized as normal, overweight (overweight) if BMI ≥ 25 and said to be obese if BMI T 30.

f. Relationship between Tenure with LBP in Semarang City

The period of employment (tenure) of respondents was ≥ 10 years, there were LBP complaints as many as 27 respondents (45%) more than there were no LBP complaints as many as 8 respondents (13,33%). The tenure of respondents is <10 years, there are LBP complaints as many as 12 respondents (20%) less than no LBP complaints as many as 13 respondents (21,67%). From the results of Yate's Correction statistical tests obtained the value of X^2 count = 4.239> X^2 table = 3.841 and p value count = 0.040 <α = 0.05, so Ha is accepted. Ha is accepted if the value of X^2 counts> X^2 table and p value counts <0.05 for significance level of 5% or 0.05. Means that there is a relationship between the working period with LBP in Semarang City). Based on the results of OR (Odds Ratio) = 3,656 with a 95% confidence interval = 1,202-11,124. This means that respondents who have a tenure of ≥ 10 years are at risk of experiencing LBP complaints (OR> 1) compared to respondents with a tenure of <10 years. Based on the characteristics of the work done by someone in their interaction with the work system. Based on research has shown that the review of biomechanics and datastatistics shows that employment factors contribute to the occurrence of muscle injury due to work (Armstrong, 1979; Wisseman & Badger, 1970; Werner, 1997) quoted by Chaffin (1999). A job that requires someone to stay in his position, a change in position in the work will cause the work to stop. Jobs with dynamic posture, have a lower risk of musculoskeletal disorder (MSDs) compared to jobs that require static posture. This is because static posture can increase the risk associated with decreased blood circulation and nutrition in muscle tissue. The results of the research of Nuryaningtyas and Martiana (2014) were> 5 years who experienced musculosceletal complaints. According to Suma'mur (2009) muscle disorders appear 2 years after working with the same type of work. Rihimaki et al opinion in Hikmah (2011) states that working period has a strong relationship with muscle complaints.

g. Relationship between Work Duration and LBP in Semarang City

Duration of work of respondents was jam 8 hours, there were complaints of LBP as many as 28 respondents (46,67%) more than there were no LBP complaints as many as 8 respondents (13,33%). The work duration of the respondent was <8 hours, there were LBP complaints as many as 11 respondents (18,33%) less than there were no complaints of LBP as many as 13 respondents (21,67%). From the results of Yate's Correction statistical test obtained the value of X^2 count = 5.131> X^2 table = 3.841 and

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p value count = 0.023 <α = 0.05, so Ha is accepted. Ha is accepted if the value of X^2 counts> X^2 table and p value counts <0.05 for the significance level of 5% or 0.05. Means that there is a relationship of duration of work with LBP in the City of Semarang Based on OR (Odds Ratio) = 4.136 with a 95% confidence interval = 1,345-12,721. This means that respondents who have a working period of ≥ 8 hours are at risk of experiencing LBP complaints (OR> 1) compared to respondents with a working period of <8 hours.

Moving is needed for nutrition to the disc, so static work can reduce these nutrients. Besides static work causes stretching of the muscles and ligaments of the back region, this is a risk factor for LBP. (Riihiimaki, 1988)

Force or energy is the amount of physical effort needed to complete a task or movement. Work or movement that uses large power will provide a large mechanical load on the muscles, tendons, ligaments, and joints. Heavy loads will cause irritation, inflammation, muscle fatigue, damage to muscles, tendons, and other tissues. Sukarto (2007) said, when humans sit, the maximum load is 6-7 times heavier than standing. Atlas bones that support the skull experience the heaviest burden. If the driver's body position is wrong, the lumbar vertebrae 2-3 (near the hip bone) will suffer from lower back pain. The length of time a person works a day is generally 6-8 hours. Within a week people can only work well for 40-50 hours. More than that the tendency for negative things to arise. The longer the working time, the more likely the things that are not desired. Reduction of 81/4 hour working hours to 8 hours accompanied by increased work efficiency. The same old job can cause LBP complaints, namely work that uses the same muscle for a long time or more than 2 hours. (Suma'mur, 2009)

CONCLUSION

Based on the results of the study it can be concluded as follows: Baseline Profile of MRI examination data conducted in the city of Semarang Approximately 1 month totaling 60 people who were referred to conduct Lumbal / Lumbosacral MRI examination. As for the number of male respondents 27 respondents (45.0%) and women 33 respondents (55.0%). Working 44 respondents (73.3%) and not working 16 respondents (26.7%). Age of respondents ≥ 35 years 44 respondents (73.3%) and <35 years 16 respondents (26.7%). The relationship with personal factors is the smoking habit of respondents not smoking 43 respondents (71.7%) and smoking 17 respondents (28.3%), exercise habits respondents exercise 39 respondents (65.0%) and do not exercise 21 respondents (35.0%), height ≥ 163 cm 33 respondents (55.0%) and <163 cm 27 respondents (45.0%), BMI overweight 31 respondents (51.7%) and ideal 29 respondents (48.3 %), and work factors namely tenure ≥ 10 years 35 respondents (58.3%) and <10 years 25 respondents (41.7%) and the duration of work ≥ 8 hours is 36 respondents (60.0%) and <10 year 24 respondents (40.0%). LBP has complaints 39 respondents (65.0%) and no complaints 21 respondents (35.0%). Respondents' jobs include: traders / sellers / sales, laborers, military / police, housewives, students / administration, employees, entrepreneurs, retirees, company leaders, farmers, mining, and civil servants / teachers. Factors related to the occurrence of Low Back Pain suffered based on this study were personal factors covering : age, smoking habits, exercise habits, height, BMI, tenure and work duration.

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