Prevalence and Characteristics of Low Back Pain among Productive Age Population in Jatinangor

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Abstract

Background: Low back pain is one of the global health issues which prevalence is high among productive ages. It oftentimes corresponds with one's physical activity during work . The purpose of this study was to determine theprevalence and characteristics of low back pain among productive age population in Jatinangor, West Java, Indonesia.
Methods: This study was a cross-sectional descriptive study conducted during the period of August to October 2014 in the three villages in Jatinangor, West Java, Indonesia. In order to determine the demographic data and history of low back pain in the last three months, about 1075 productive age populations were selected through validated questionnaire as the secondary data. These data consisting of 310 subjects were then described according to the pain characteristics and physical activity during work.
Results: During three months of examination, s the prevalence of low back pain was 38.4%, with the average age 50–59 years old. Furthermore, about 22.3% subjects were indicated chronic low back pain. The most prevalent qseverity of the pain was dull pain (29.4%), followed with pins and needles pain (23.1%), As the intensity of the pain increased, there was a tendency of increasing interference in daily activities. Static posture was also the most frequent physical activity during work (53.2%).
Conclusions: The prevalence of low back pain is more than one third (38.4%) among productive age populations in Jatinangor, West Java, Indonesia.**[AMJ.2016;3(3):469–76]**

Keywords: Characteristic, low back pain, prevalence, productive age

Introduction

Low back pain (LBP) is common among populations worldwide, and one of the main causes of disability, absenteeism, and poor performance at work.[1] A systematic review which measures global prevalence of low back pain reveals that point prevalence of activity-limiting low back pain lasting for more than one day is estimated to be 11.9±2.0%, and the one-month prevalence is estimated to be 23.2±2.9%.[2] In Asia, a study in Japan[3] identified that one-month prevalence and lifetime prevalence of low back pain are approximated to be 35.7% and 83.4%, respectively. It can be said that the prevalence of low back pain varies around the world.

A hospital-based prevalence of low back pain as stated in multi-center research in 14 hospitals in Indonesia claimed that 18.37% of patients visited are diagnosed low back pain.[4] Productive age populations have the highest prevalence.It increases at the age 30 and slightly declines at 60.[5] Such increase may be caused by greater physical activity at work which includes several body positions. This is claimed to be the risk factors of low back pain.[6,7]

The prevalence of low back pain in general populations in Indonesia has not been widely investigated, moreover the characteristics of it. A population-based on research is thus needed to determine such prevalence and characteristics and also to serve early

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prevention of disability caused by low back pain. Therefore, the aim of this study was to determine the prevalence and characteristics of low back pain among productive age populations in Jatinangor, West Java, Indonesia.

Methods

This descriptive study used a cross-sectional approach and was conducted in three villages in Jatinangor, West Java, Indonesia, during the period of August to October 2014. A total of 1075 data were collected from the secondary data of Community Health and Wellness Working Group titled '*Epidemiologi Hipertensi dan Albuminuria pada Masyarakat Jatinangor*'. The main study used multi-stage random sampling as data collection method. Based on sample size calculation using cross-sectional approach, 97 subjects as minimum sample are needed.

The study population consisted of productive age populations. According to Indonesian Ministry of Health (2009), productive age is defined as those aged 15 to 64 years old.[8] This study categorized the criteria of people aged at least 18 years old who already owned an identity card. Inclusion criteria of this study were (1) 18 to 64 years old subjects whose residence located near to the study was carried out, (2) willing to be a sample in the study by filling in informed consent. whereas, the exclusion criteria were (1) subjects whose demographic data were not complete, (2) subjects who were absent t at the time the research conducted.

This study was based on validated guided-questionnaire. The questionnaire consisted of self-reported information including demographic data and current or previous history of low back pain in the last three months, along with characteristics of the pain, physical activity during work, and effort done to relieve the pain of those indicated low back pain. Ethical approval was obtained from the Health Research Ethics Committee of Faculty of Medicine, Universitas Padjadjaran, Bandung. The study consent was also obtained from the Development Planning Agency at Sub-National Level (Badan Perencanaan Pembangunan Daerah) of Sumedang.

Demographic characteristics of interest in this study included gender, age, and occupation. Low back pain was defined by pain felt at posterior aspect of the body from the lower margin of the twelfth ribs to the lower gluteal folds or lumbal and lumbo-sacral area[4], which was measured by pain drawing. Characteristics of this pain were low back pain, onset, frequency, severity, and intensity of the pain, along with effort done to relieve the pain. Based on types, low back pain was categorized by low back pain with inclination of red flags syndrome, low back pain with accompanying radicular pain, and non-specific low back pain with no red flags symptoms and radicular pain.

Based on onset and frequency, low back pain was classified into acute and chronic. Chronic low back pain had more than 12 weeks onset as a cut-off and more often frequency.[4]The severity of pain was described by sharp pain, electric shock pain, dull pain, burning pain, pins and needles pain, stiff pain, and others if any. The intensity of pain was measured by Faces Pain Scale-Revised with 0–10scale and pain interference in daily activities.[9] Physical activities during work which stated as the risk factors of low back pain were categorized by lifting heavy object, bending and twisting, bending, static posture, and others if any.

The collected data were inputs and managed using RED Cap electronic data capture tools hosted at Faculty of Medicine, Universitas Padjadjaran.10 Research Electronic Data Capture (RED Cap) is a secure, web-based application designed to support data capture for research studies, providing (1) an intuitive interface for validated data entry, (2) audit trails for tracking data manipulation and export procedures, (3) automated export procedures for seamless data downloads to common statistical packages, and (4) procedures for importing data from external sources. Furthermore, the data were analyzed using computer program. Descriptive analysis was then performed to investigate all variables.

Results

Data were collected at Desa Hegarmanah, Desa Cilayung, and Desa Cipacing, Jatinangor. From total of 1075 subjects, 172 samples had to be excluded due to incomplete demographic data, and among them, only 808 subjects fit the inclusion criteria. From total of 808 subjects, the numbers of both male and female subjects were 272 and 536, or with male:female ratio of 1:2 (Table 1).

More than half of the subjects who claimed to have low back pain history were female (64.5%); however, the proportion of low back pain in male and female were amounted to 40.4% and 37.3%, respectively. The age group of 30–49 years old was most frequently found in total subjects (n=445, 55.0%). The highest prevalence of low back pain were in

Table 1 Demographic Characteristics and Prevalences of Low Back Pain based on Gender, Age, and Occupation

Demographic Data	LBP History		LBP Proportions	
	n	%	n / Total	%
Gender (n=808)				
Male	110	35.5	110/272	40.4
Female	200	64.5	200/536	37.3
Age (n=808)				
< 20 years old	2	0.6	2/19	10.5
20–29 years old	36	11.6	36/130	27.6
30–39 years old	87	28.1	87/225	38.6
40–49 years old	84	27.1	84/220	38.1
50–59 years old	79	25.5	79/162	48.7
> 60 years old	22	7.1	22/52	42.3
Occupation (n=808)				
Unemployedt	9	2.9	9/23	39.1
Housewives	146	47.1	146/396	36.8
Entrepreneurs	72	23.2	72/172	41.8
Private employees	20	6.5	20/51	39.2
Government employees	6	1.9	6/21	28.5
Labors	38	12.2	38/85	44.7
Manufactory workers	12	3.9	12/40	30.0
Construction workers	5	1.6	5/10	50.0
Farmer and farm workers	14	4.5	14/23	60.8
Laundry workers	1	0.3	1/2	50.0
Janitors	6	1.9	6/10	60.0
Others	19	6.1	19/60	31.6

the age group of 50–59 years old (48.7%). Half of the subjects who had low back pain were housewives (n=396, 47.8%), but in comparison to the total of the subjects, farmer and farm workers had the highest prevalence of low back pain.

There were 310 subjects who claimed to have low back pain in the last three months; therefore, the three month prevalence of low back pain in this population-based study were 38.4%. Among those who claimed to have low back pain, 130 subjects (41.9%) were suspected to have low back pain with red flags syndrome (Table 2).

Low back pain with red flags syndrome was classified as having fever in accordance with the pain to suspect infection, traumatic back injury, neoplasia, and also having urinary retention to suspect cauda equine syndrome and neurologic deficit. Low back pain with radicular pain was found in one fifth of the subjects, and 51.2% of them were classified as non-specific low back pain due to no radicular pain and no red flags syndrome.

The proportion of chronic low back pain was reported more than one fifth (22.3%) of total low back pain. The severity of the pain which had the highest prevalence was dull pain (29.4%), followed by pins and needles pain (23.1%). The most frequent intensity of pain based on Faces Pain Scale was moderate. As the intensity of the pain increased, there was a tendency of increasing interference in daily activities (Table 4).

Low back pain caused absenteeism in one fourth of the subjects (25.8%). It is estimated

Table 2 Prevalence of Low Back Pain based on Types

Types of Low Back Pain	Results	
	n	%
Low back pain with suspected red flags symptoms (n = 288)		
Infection	52	18.0
Trauma	33	11.4
Neoplasia	5	1.7
Cauda equine syndrome and neurologic-deficit	40	13.8
Low back pain with radicular pain (n = 283)	56	19.7
Non-specific low back pain (n = 291)	149	51.2

to 20.6% for absenteeism of one to three days and 5.2% for more than three days of absenteeism. Static posture such as sitting and standing in longer duration had the highest proportion of physical activity during work which claimed to be the risk factor of low back pain (Table 5).

Hardly, there were one fifth of the subjects which reported seeking medical attention to relieve the pain (20.6%). There were 32.3% of them who had spontaneous healing and about one third preferred to treat themselves, for instances, by taking over-the-counter medication, getting massage, and lying down.

Discussion

This study was conducted at the three villages in Jatinangor, one of the districts in Sumedang, West Java, Indonesia. One university and three colleges were located in Jatinangor, thus, it has been known as an educational district. It further escalates physical and social development, as well as economic growth which shifts some of the subdistricts in Jatinangor into urban. On the other hand, many productive age residents still have occupation commonly found at rural area such as labor, consisting of manufactory worker, construction worker, farmer and farm worker, laundry worker, and janitor, as well as microentrepreneur such as peddler and craftsman.

The vast majority of subjects in productive age who claimed to have low back pain in the last three months were female. However, in comparison with total subjects, the proportion of both male and female were almost the same. High prevalence in male who claimed to have

Table 3 Prevalence of Low Back Pain based on Pain Characteristics

Features	Results (n)	Proportions (%)
Severity of pain (n=302)		
Sharp pain	68	22.5
Electric shock pain	18	5.9
Dull pain	89	29.4
Burning pain	50	16.5
Pins and needles pain	70	23.1
Stiff pain	55	18.2
Others	9	2.9
Intensity of pain (n=298)		
Mild	105	35.2
Moderate	157	52.7
Severe	36	12.1

Table 4 Prevalences of Low Back Pain according to Pain Interference in Daily Activities based on Intensity of Pain

Intensity of Pain	Pain Interference in Daily Activities						Total (n = 298)	
	Still able to do daily activities		Begin to distract		Disturb daily activities			
	n	%	n	%	n	%	n	%
Mild pain								
0-3 scale	91	86.7	9	8.6	5	4.7	105	100
Moderate pain								
4-7 scale	122	77.7	21	13.4	14	8.9	157	100
Severe pain								
8-10 scale	14	38.9	7	19.4	15	41.7	36	100
Total	227	76.2	37	12.4	34	11.4	298	100

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The vast majority of subjects in productive age who claimed to have low back pain in the last three months were female. However, in comparison with total subjects, the proportion of both male and female were almost the same. High prevalence in male who claimed to have low back pain may be caused by occupational exposures as explained by Punnett et al.[11], such as heavy lifting in labor workers. Whereas, study published by Fernández-de-las-Peñas et al.[12] stated that female also has risk factors to develop low back pain, one of the major causes may be due to postmenopausal osteoporosis. Doing housework can also be a risk factor for female. A study by Hoy et al.[5] claimed that the most frequent age group is 50–59 years old with the tendency of increasing prevalence and slight decrease afterwards. This possibly

Table 5 Prevalence of Low Back Pain based on Physical Activities during Work

Physical Activities during Work	Results n =310	Proportions %
Lifting heavy objects	104	33.5
Bending and twisting	52	16.8
Bending	117	37.7
Static posture	165	53.2
Others	13	4.2

is caused by high occupational exposure in early years of productive age and degenerative disease in older productive age population.

This population-based study revealed three month prevalence of low back pain that was 38.4%. This finding was higher than the previous population-based study conducted in Taiwan[13] whose finding is 25.7%. Whereas, lifetime prevalence of low back pain is two times higher (79.3%) as published by Ozdemir et al.[14] in a study in central Malatya, Turkey.

Low back pain with inclination of red flags syndrome was found in one third of the subjects, which was higher than expected. Beside questionnaire, physical examination at health facility is needed to further diagnose low back pain with red flags syndrome. In addition, an immediate plan for therapy needs to be reckoned to minimize possible paralysis . Other types of low back pain were low back pain with radicular pain and non-specific low back pain. These were found respectively in one fifth and half of the subjects. According to Indonesian National Consensus 2011 by Indonesian Neurological Association (Perhimpunan Dokter Spesialis Saraf Indonesia), prevalence of non-specific low back pain was found as the major cases. It was estimated to be 85% of all types of low back pain.[15] Those variations can be caused by different instruments used in the study. The most common etiology of low back pain with radicular pain was due to discogenic. Physical activities such as standing, bending, sitting, heavy lifting, and twisting motion can aggravate the pain, whereas, in non-specific low back pain, the predisposing factor may be due to mechanism.[15]

Prevalence of chronic low back pain was found in more than one fifth of the subjects. It was higher than a population-based study by Meucci et al.[16] in Brazil whose finding was reported only 9.6%. Ten percent of acute low back pain can also progress to chronic low back pain.15 It can increase absenteeism at work and multiply health care costs two times greater compared to people without low back pain, consisting of physician fees, investigations, medications, and hospitalizations.[17,18]

The intensity of the pain varied among the subjects. Although there was a tendency of increasing pain interference in daily activities,some subjects who claimed severe pain still had no disturbance in their daily activityies. This is possibly caused by different threshold of pain among the subjects. Another cause would probably due to financial issue which requires one to fulfill daily fees so that they are not allowed to skip work.

The severity of pain can determine specific types of pain, which consist of nociceptive pain and neuropathic pain, and therefore, the types of low back pain according to its etiology, such as radicular pain would be caused by neuropathic lesion. Despite its etiology, one can experience several severities of pain simultaneously.[4] The quality of pain in the result of this study varied in all types of low back pain,probably due to different subjects' interpretations on the questioner. It was believed that the answer was also influenced by a high subjectiveness of the pain. Descriptions of the quality of the pain in local language is highly advisable to avoid different interpretation.

Physical activities during work can predispose to low back pain due to minor injury of low back anatomy structure. A study by Mohseni-Banpei et al.[19] reported that prolonged standing, repeated movements, and awkward postures are the most prevalent aggravating factors (85.2%, 50.2%, and 48.4, respectively). Whereas, Murtezani et al.[20] published that main risk factors of low back pain are extreme trunk flexion (OR = 3.5, 95% CI 1.7-7.3), as well as lifting of loads (OR = 3.5, 95% CI 1.9-6.2), pushing or pulling heavy loads (OR = 3.5, 95% CI 1.9-6.2), and exposure to whole body vibration (OR = 1.7, 95% CI 1.0 -3.0). The results of this study are consistent with previous studies, specifically static posture in most of the subjects. Prolonged sitting, standing, and bending, such as in peddler and craftsman can increase pressure in intervertebral disk and also cause muscle tension, which further increase the risk of having low back pain.

Only one fifth of the subjects were seeking medical attention (20.6%); therefore, hospital-based study revealed lower prevalence compared to prevalence in general population, as published by multi-center research in 14 hospitals in Indonesia (18.37%).[4] One third of the subjects preferred to treat themselves, the vast majority of them were taking over-the-counter medication that probably because the analgetic medication is easily purchased.

As a conclusion, this study demonstrated that the population-based prevalence of low back pain is more than one third (38.4%) among productive age population. Age category of 50–59 years old is the most prevalent. More than one fifth has chronic low back pain. Severity of the pain which has the highest prevalence is dull pain, followed by pins and needles pain. As intensity of the pain increased, there is a tendency of increasing interference in daily activities. Static posture

is the most frequent physical activity during work, and only one fifth of the subjects are seeking medical attention.

There were some limitations of this study. The study design was a cross-sectional study, and therefore, was unable to prove causation. There were subjects who did not answer several questions, thus, there were differences in total subjects in statistical analysis. This study was also limited in methods by using secondary data from questionnaire, which might led to information bias. Slightly higher prevalence of low back pain in productive age population in Indonesia should more focus. Health education in the population such as proper body mechanism to be applied in daily activities is needed to lower the risk of low back pain and to minimize the possible paralysis caused by low back pain.

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