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The Incidence of Knee Pain Complaints in Pedicab Rides in the Kemuning District, Palembang

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Abstract

Background: Knee pain is a major source of disability, and the most frequently complained of disease in people aged 50 years and over, this complaint is often associated with osteoarthritis. Complaints of knee pain in OA patients are strongly associated with decreased stability of the knee joint. As the main stabilizer in the knee joint, extensor muscle strength plays a major role in the pain complaints that occur, so that one of the recommended physiotherapy measures for knee osteoarthritis patients in reducing pain complaints is to exercise the knee extensor muscle strengthening in the form of pedaling a bicycle. The pedaling movement is a work activity carried out by pedicab drivers. Therefore, this study was conducted to determine the incidence of knee pain complaints in pedicab riders in the District of Kemuning, Palembang. **Method:** This type of research is descriptive with cross sectional study design. The study population was pedicab drivers who operated in the Kemuning District of Palembang. Primary data were collected by conducting interviews to determine whether there were complaints of pain in the knee and assessed by the KOOS Score and Numeric Rating Scale (NRS), as well as measurements of body weight and height. **Results**: The results showed that 8 pedicab drivers (17.8%) complained of knee pain and 37 pedicab drivers (82.2%) did not complain of pain in their knees. **Conclusion:** The incidence of knee pain complaints among pedicab drivers in the Kemuning sub-district of Palembang is lower than that of pedicab drivers who do not complain of pain in their knees.

Keywords: Knee Pain, Pedicab Pedal, Osteoarthritis

1. Introduction

Knee pain is a major source of disability, and a disease most commonly complained of in people aged 50 years and over, this complaint is often associated with osteoarthritis. In Indonesia, knee osteoarthritis has a high prevalence, reaching 15.5% in men and 12.7% in women. The high prevalence of the disease and its chronic-progressive nature make osteoarthritis have a major socio-economic impact, both in developed and developing countries[1]

The socio-economic impact caused by osteoarthritis will certainly affect the patient's life, especially at work because this can hinder activities that should be done optimally.

When doing activities, especially strenuous activities such as squatting, kneeling, standing, climbing and lifting heavy weights for long and repetitive periods of time can cause complaints of knee pain[2]. This is because the joint will hold weight so that the workload of the knee joint will increase. In OA patients, there is also a shift in the load bearing point from the way it should be. The combination of these two things will cause friction between the bones to hit the periosteum which stimulates the painful nerves and triggers pain. Pain is what brings patients to come for treatment at health services[3].

Complaints of knee pain in OA patients are strongly associated with decreased stability of the knee joint. If the knee becomes stable, the load fulcrum will return to its normal position so that friction between the bones does not occur and the pain does not come back. The joint structure that plays a major role in this is the knee extensor muscle, not only as a propulsion and protection for the joint, this muscle also functions as the main stabilizer in the knee joint.

The American College of Rheumatology explains that by strengthening the extensor muscles in patients with knee osteoarthritis, apart from increasing muscle strength, it can also reduce joint pain and reduce joint stiffness. Therefore, physiotherapy is needed for knee osteoarthritis patients in reducing pain complaints by strengthening the knee extensor muscles.

Cycling activity is one of the activities that can increase the strength of the flexor and extensor muscles of the knee joint. In addition, cycling will minimize the pressure on the knees and can strengthen cartilage[5]. The presence of strong flexor and extensor muscle contractions when pedaling a bicycle followed by relaxation of the muscle contraction causes vasodilation which improves blood circulation. This is in line with several previous studies which revealed that increasing the strength of the knee extensor muscles will make the metabolic processes and local circulation in the body better so that the pain in the knee can be reduced[6,7,8,9]. But on the other hand, too much exercise can result in injury to ligaments, tendons and other tissues. There has been previous research which revealed that cycling for more than 30 minutes a day is a risk for knee osteoarthritis[10].

On this basis, researchers are interested in conducting research on the incidence of knee pain complaints in pedicab pedals in the Kemuning District of Palembang. In addition, there has been no previous research that reveals the incidence of knee pain complaints in pedicab riders making this study important to do considering the influence of daily living activities on the quality of individual life.

2. Research methods

This research is a descriptive study with a cross sectional approach (cross sectional).

This research was conducted in the Kemuning District of Palembang and took place in September-October 2019.

The population in this study were pedicab drivers operating in the Kemuning District of Palembang.

Inclusion criteria are pedicab drivers who are willing to participate in the research.

The exclusion criteria were a pedicab pedal who had knee pain before working as a pedicab driver. Pedicab driver who has anatomical abnormalities and a history of trauma and surgery to the knee.

The sample in this study is part of the population of pedicab drivers who operate in the Kemuning District of Palembang, which is included in the inclusion and exclusion criteria determined by the researcher.

This research uses purposive sampling

technique, the researcher determines the pedicab driver himself who will be taken as the research subject.

The data used in this study are primary data. Before collecting data, the researcher conducted informed consent by providing direct explanations of the aims and objectives, then asked the pedicab drivers whether they were willing to participate in the research or not. Then, data collection was done by interviewing, filling out questionnaires, taking anthropometric measurements directly to the research subject, namely pedicab drivers in the kemuning district of Palembang. After that, the results of the questionnaire will be recorded according to the variables studied, namely knee pain, age, BMI, duration of work, length of work, and previous work history.

The data obtained in this study will be processed and analyzed descriptively based on the number of cases obtained from the primary data. The data obtained will be entered into a computer, then the data is processed with the help of computerization. Presented in tabular form for each research variable and made a narrative as a complement to describe the research results.

3. Result

Research on the incidence of knee pain complaints in pedicab riders was conducted on 10 September - 10 October 2019 in Kemuning District, Palembang. This research is a descriptive study with a cross sectional study design. This study uses primary data. The study population was pedicab drivers who operated in the Kemuning District of Palembang. The research subjects were 45 pedicab pedals in the Kemuning District of Palembang who met the inclusion and exclusion criteria set by the researcher. The research variables consisted of knee pain, age, BMI, duration of work, length of work and previous work history. This research was analyzed by univariate.

Subject Distribution According to Research Variables

Age

The distribution of pedicab pedals based on age can be seen in **Table 1**. Of the 45 pedicab drivers, there are 28 subjects (62.2%) aged> 50 years and 17 subjects (37.8%) aged ≤50 years.

Body mass index

In **Table 2**, the distribution of pedicab pedals is obtained based on BMI. Of the 45 subjects, the pedicab pedals with normal BMI were more than the other BMI groups, namely 31 subjects (68.9%), the number of pedicab pedals with a fat and thin BMI were 1 subject (2.2%) and 13 respectively. subjects (28.9%).

Duration of Work

The work duration data of the subjects were analyzed using the ROC curve and the results obtained in **Figure 8**, namely the cut-off point value ≥40 minutes / day. So that in Table 4, we can see the distribution of pedicab drivers based on the duration of work. Of the 45 pedicab pedals, 24 subjects (53.3%) worked for ≥40 minutes / day and 21 subjects (46.7%) worked for <40 minutes / day.

Length of working

Table 4. shows the distribution of pedicab drivers based on length of work. The 45 pedicab pedestrians found that 38 subjects (84.4%) had worked for > 10 years, 5 subjects (11.1%) had worked for 6-10 years, and 2 subjects (4.4%) had only worked for < 6 years.

Job Experiences

Table 5. shows the data on the distribution of pedicab drivers based on previous work history. Of the 45 pedicab pedals, it is known that 25 subjects (55.6%) were pedicabs from the start, 8 subjects (17.8%) had worked as coolies, 5 subjects (11.1%) had worked as traders, then 2 subjects (4.4%) have worked as security guards, and have worked as village heads, funeral administrators, plantations, farmers and tents each as many as 1 subject (2.2%).

Incidence of Knee Pain in Pedicab Pedals in the Kemuning District of Palembang

In Table 6. presented data on the distribution of knee pain among pedicab pedals. Of the 45 pedicab pedals, there were 37 subjects (82.2%) who did not complain of knee pain and 8 subjects (17.8%) who complained of pain in the knee.

Knee Pain Distribution Based on the Characteristics of Research Subjects

In table 6, it can be seen from the characteristics of research subjects who complained of pain, namely at the age of> 50 years (n = 28) as many as 6 people and ≤50 years (n = 17) as many as 2 people. Based on BMI, it was found that pedicab pedals with normal BMI (n = 31) complained of knee pain as many as 6 people and thin BMI (n = 13) as many as 2 people. Judging from the duration of work, pedicab pedals who work ≥40 minutes / day (n = 24) complain of knee pain as many as 3 people, while the pedicab pedals who work <40 minutes / day (n = 21) complain of knee pain as many as 5 people. If viewed according to the length of work, knee pain in pedicab drivers who have worked> 10 years is the highest category to indicate the presence of these complaints. As for the work history itself, knee pain was mostly complained of in workers who had previously pedaled pedicabs and followed by a history of working as coolies.

Table 1. Distribution of Pedicabs by Age (N = 45)

Characteristic	Category	Total (n)	Percentage (%)
Age	> 50 years	28	62.2 %
	≤ 50 years	17	37.8 %
Total		**45**	**100**

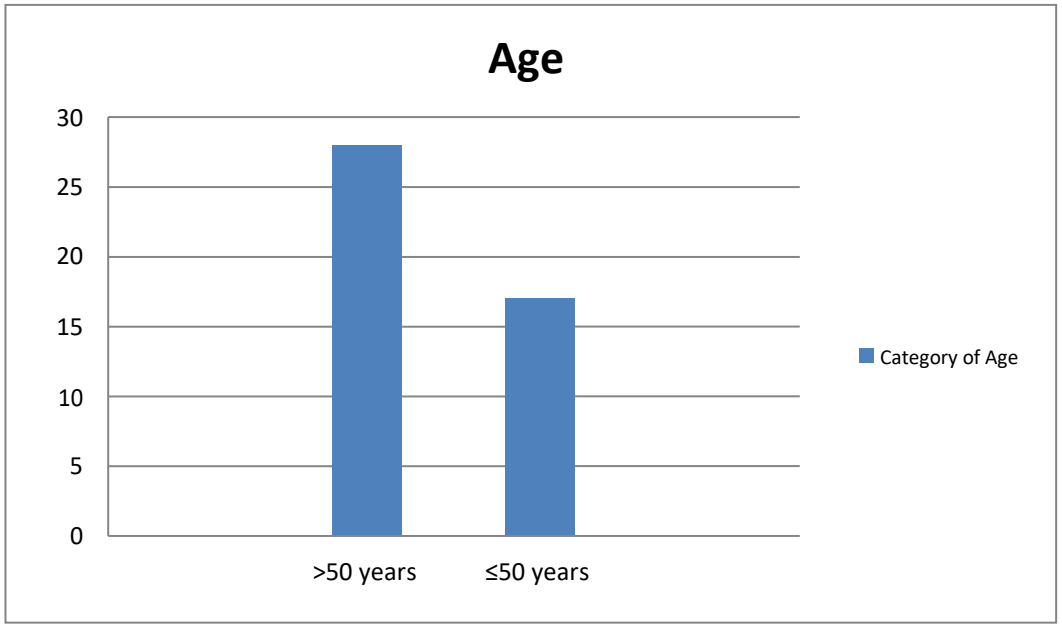
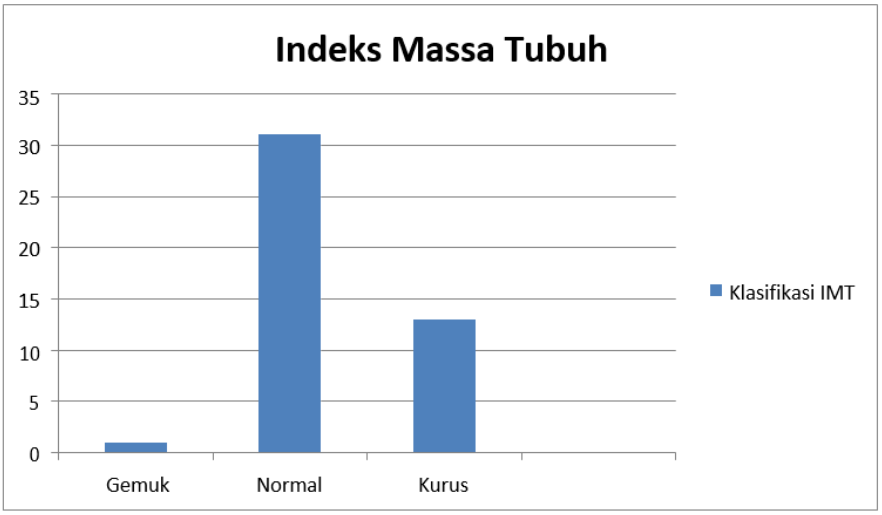


Table 2. Distribution of Pedicab Pedals based on BMI (N = 45)

Characteristics	Category	Total (n)	Percentage (%)
IBM	Fat	1	2.2 %
	Normal	31	68.9 %
	Thin	13	28.9 %
Total		**45**	**100**



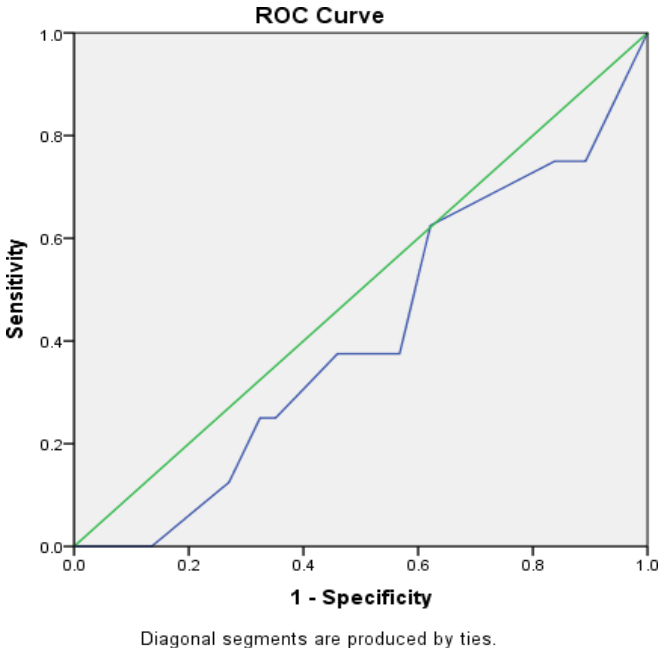


Figure 1. The Cut-Off Point Value of Work Duration (with an AUC value of 0.410)

Table 3. Distribution of Pedicab Pedals Based on Work Duration (N = 45)

Characteristics	Category	Total	Percentage (%)
Duration of working	≥ 40 minutes/day	24	53.3 %
	< 40 minutes/day	21	46.7 %
Total		**45**	**100**

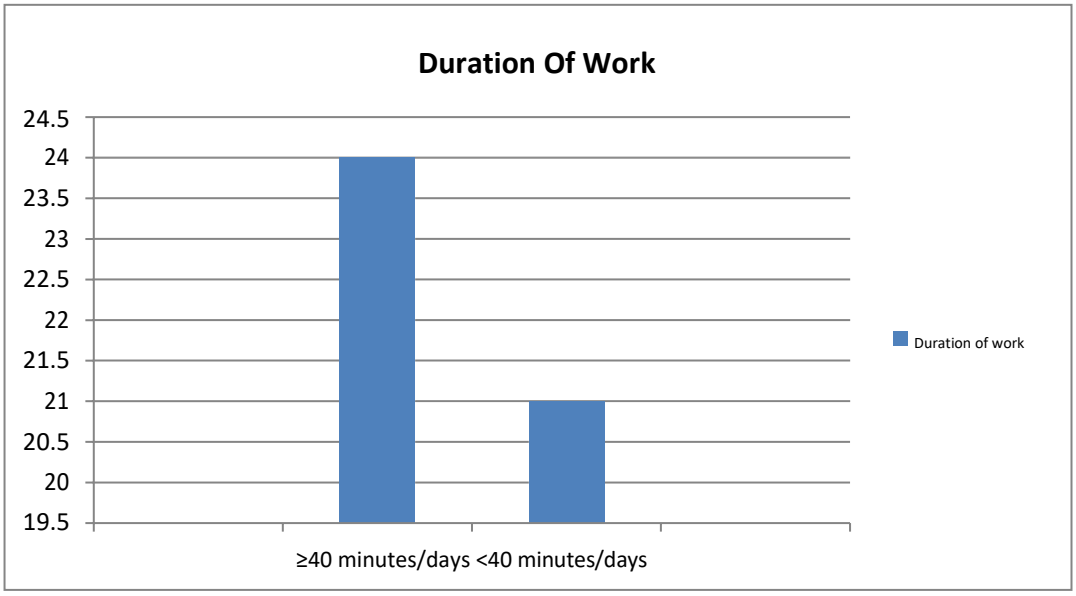


Table 4. Distribution of Pedicab Pedals Based on Length of Work (N = 45)

Characteristics	Category	Total (n)	Percentage (%)
Length of work	> 10 years	38	84.4 %
	6 - 10 years	5	11.1 %
	< 6 years	2	4.4 %
Total		45	100

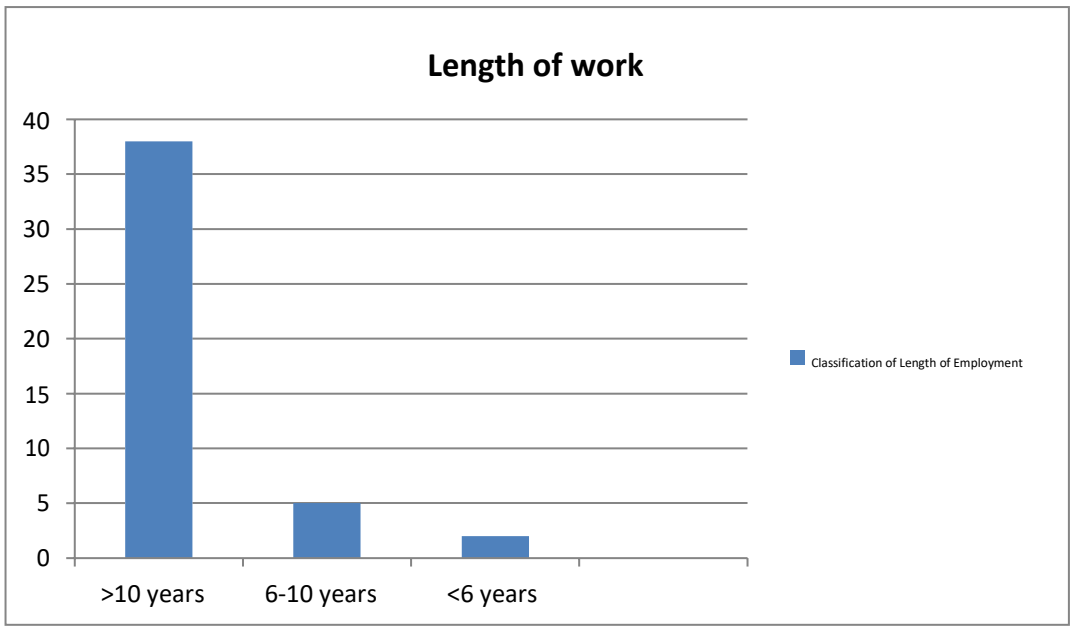


Table 5. Distribution of Becak Pedals Based on Work History (N = 45)

Characteristics	Category	Total (n)	Percentage (%)
Job Experiences	Rickshaw	25	55.6 %
	Security	2	4.4 %
	Village head	1	2.2 %
	Labourer	8	17.8 %
	Traders	5	11.1 %
	Funeral Caretaker	1	2.2 %

	Plantation	1	2.2 %
	Farmer	1	2.2 %
	Tent	1	2.2 %
Total		45	100

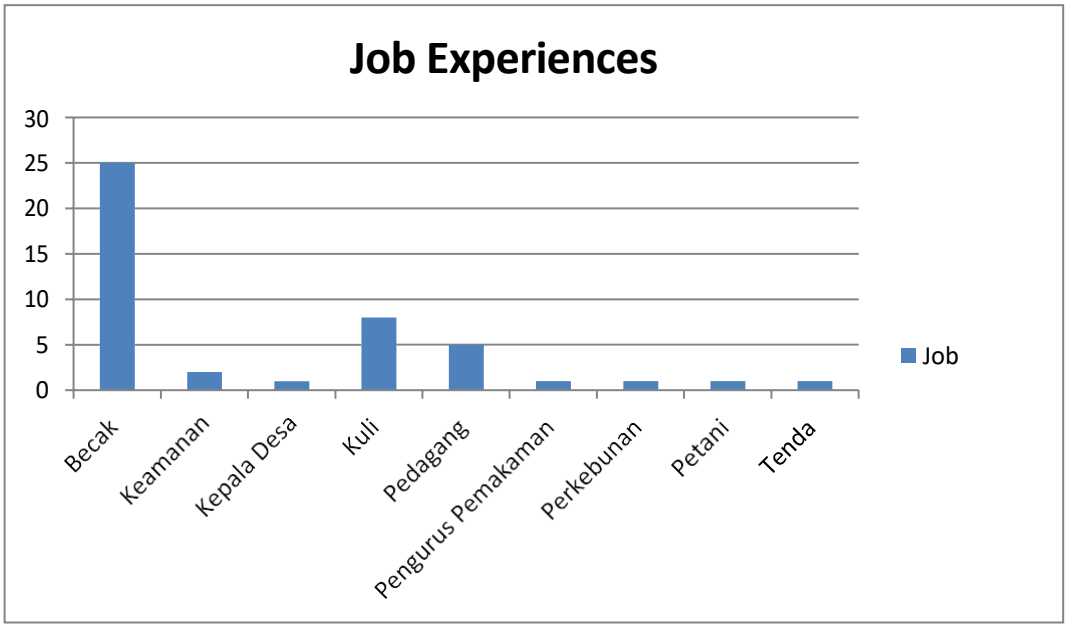


Table 6. Distribution of Knee Pain in Respondents (N = 45)

Characteristics	Total (n)	Percentage (%)
Pain	**8**	**17.8 %**
No Pain	**37**	**82.2 %**
Total	**45**	**100**

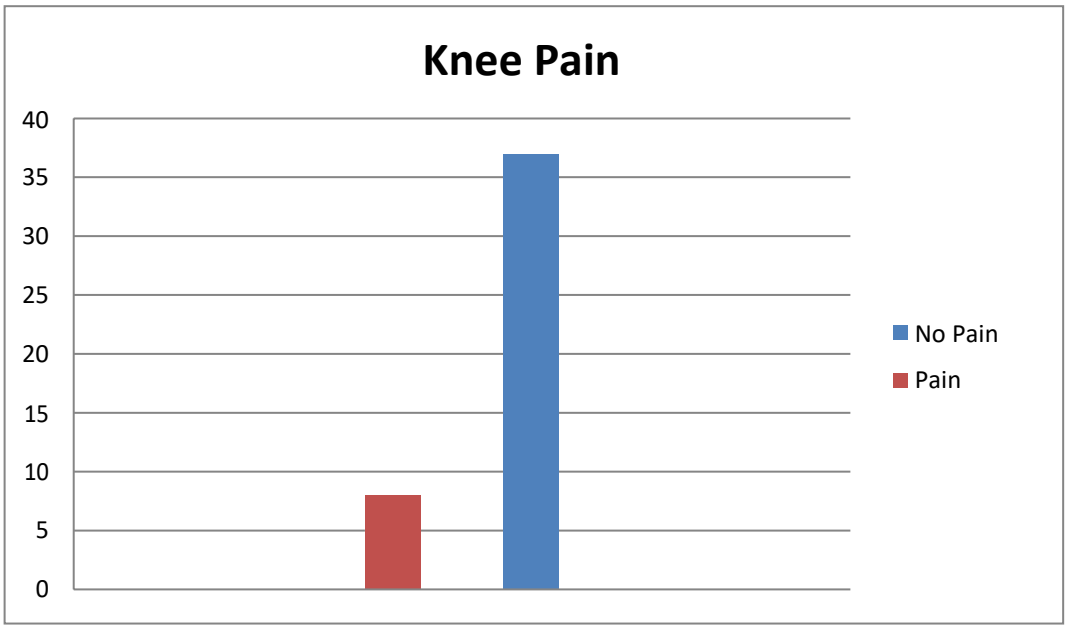


Table 6. Distribution of Knee Pain Based on the Characteristics of Research Subjects

Characteristics	Category	Pain		No Pain	
		Total (n)	Percentage (%)	Total (n)	Percentage (%)
Age	> 50 years	6	21.4 %	22	78.6 %
	≤ 50 years	2	11.8 %	15	88.2 %
IMB	Fat	0	0 %	1	100 %
	Normal	6	19.4 %	25	80.6 %
	Thin	2	15.4 %	11	84.6 %
Duration of work	≥ 40 minutes/days	3	12.5 %	21	87.5 %
	< 40 minutes/days	5	23.8 %	16	76.2 %
Length of work	> 10 years	8	21.1 %	30	78.9 %
	6 – 10 years	0	0 %	5	100 %
	< 6 years	0	0 %	2	100 %
Job experiences	Rickshaw	4	16 %	21	84 %
	Security	0	0 %	2	100 %
	Village head	1	100 %	0	0 %
	Labourer	3	37.5 %	5	62.5 %
	Traders	0	0 %	5	100 %
	Funeral Caretaker	0	0 %	1	100 %
	Plantation	0	0 %	1	100 %
	Farmer	0	0 %	1	100 %
	Tent	0	0 %	1	100 %

4. Discussion

The results of this study indicate that the incidence of knee pain complaints among pedicab drivers in the Kemuning district of Palembang is lower than that of pedicab drivers who do not complain of pain. These results are consistent with research conducted which states that cycling will minimize the pressure on the knee and can strengthen cartilage. The presence of strong flexor and extensor muscle contractions when pedaling a bicycle followed by relaxation of the muscle contraction causes vasodilation which improves blood circulation[11]. Each of his studies revealed that increasing the strength of the knee extensor muscles will make the metabolic processes and local circulation in the body better so that the pain in the knee can be reduced. This is what underlies it so that cycling activity is one of the recommendations or options for rehabilitative therapy that is recommended for most OA sufferers who usually complain of knee pain[12,13,14,15].

The presence of complaints of knee pain in pedicab riders in this study was 17.8% in line with several epidemiological studies that have been conducted which show that complaints of knee pain or knee injuries range from 14.8% to 33% in cyclists with a long time (more than 1 hour / day and has made cycling the main sport for more than 1 year) also explained that the recommended aerobic exercise (cycling) to OA patients is 20-30 minutes with a frequency of 3-4 times a week[16,17,18, 19.20].

The effect of age on the onset of pain has the same results as previous research which states that as a person ages, bone density decreases so that it is easy to experience skeletal muscle complaints and cause pain. This pain is often caused by OA and is the most common musculoskeletal complaint in old age. Kwon et al reported in their study on the Korean population, the prevalence of knee OA was 25.04% in men aged 50 years and over[21,22].

The BMI variable and the length of work duration have different results with the research that has been previously disclosed by previous researchers. Cowan et al and Taanila et al revealed that obesity is associated with an increased risk of musculoskeletal injury. This difference occurs because in this study the population of the BMI category had an unbalanced number of respondents where most of the pedicab pedals had a normal BMI but were within the lower limit of this category, this reaffirmed previous research conducted that underweight was a risk factor for muscle injury. superfluous[23].

Then in his research it was revealed that by cycling more than 30 minutes a day is one of

the risks for knee osteoarthritis. Judging from the distance traveled by workers from home to get to the workplace, there is quite a big difference, where workers who do not complain of pain in their knees live around the workplace, so that the pedicab pedals who work with a shorter duration of work but have a distance Long trips from home to work may have a greater risk of complaining of knee pain than workers closer to home, and the excessive frequency of pedaling (up to 7 times a week) among workers is one of the factors for this complaints of pain, also in this study a pedicab pedal who works with a shorter duration of work per day and complains of pain is a pedicab pedal who has worked for more than 10 years. Where the length of work mass is a risk factor for complaints of the musculoskeletal system[24,25]. This is in accordance with the results of research which revealed that along with the increasing work mass of a person, there will also be more complaints of the musculoskeletal system. Work period is a risk factor for musculoskeletal disorders, especially in jobs that require high work strength. Especially in jobs that use the knee a lot as a support when working in a bent position to lift weights and then stand upright by carrying heavy loads or working by pushing and pulling heavy loads will increase or as a risk factor for knee pain[26,27,28.]

Research Limitations

No bivariate analysis or relationship test between variables was carried out to determine whether the tested variables had a significant relationship with the complaints experienced. The number of research subjects was not normally distributed based on each of the total in the studied districts.

5. Conclusion

From the results of research regarding the incidence of knee pain complaints in pedicab drivers in the District of Kemuning, Palembang, it can be concluded that:

Most of the study subjects were> 50 years old (62.2%) and had normal BMI (68.9%), with a duration of work ≥40 minutes per day (53.3%). Most of the research subjects had a work period of> 10 years (84.4%) and most of the pedicab pedals had made pedicab their main job for a long time followed by a history of work as coolies of 17.8%.

As many as 17.8% of pedicab drivers complained of knee pain, while 82.2% of other pedicab riders did not complain of pain in their knees.

Complaints of knee pain among pedicab drivers aged> 50 years were 21.4%, higher than those aged ≤50 years who were only 11.8%. Judging from the body mass index, pedicab pedals with normal BMI complained of knee pain at 19.4% while those with low BMI (thin) were 15.4%. Pedicab pedicab drivers who have a work duration of <40 minutes / day complain of knee pain higher than workers who have a work duration of ≥40 minutes / day which is only 12.5%. All workers who have worked> 10 years have complaints of knee pain 21.1% and pedicab pedals with a history of work as coolies have the highest rate of complaints of knee pain, namely 37.5%.

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