Relieving the Pain: An Ergonomic Analysis of Low Back Pain among Tricycle Drivers in the Vicinity of University of Santo Tomas-Manila

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Abstract

Low Back Pain (LBP) is a common global musculoskeletal problem and has been the leading cause of disability among public transport drivers. The present design of motorized tricycles in the Philippines focuses more on aesthetics, neglecting the drivers' comfort, safety, and well-being. It is a concern that drivers' quality of life and transportation needs to be improved. The study aims to identify the ergonomic risk factors of LBP among tricycle drivers in the vicinity of the University of Santo Tomas-Manila. Moreover, this study will provide improvements and recommendations to prevent low back pain and provide convenience and comfort. The data was gathered through a questionnaire and analyzed through Ordinal Logistic Regression using SPSS statistical software. Further assessment was made on the significant factors affecting the lower back of the tricycle drivers. The results showed that the age, sitting height, and hip breadth measurements, and environmental conditions such as type of traffic and motor vibration significantly contributed to the LBP of the tricycle drivers. The findings implied that tricycle drivers are at risk of developing reduced well-being and comfort. A lifestyle modification for tricycle drivers and the establishment of procedures aimed to address the LBP were recommended.

Keywords:
Ergonomics, Public transportation, Motorized tricycle, Low back pain, Tricycle drivers

1. Introduction

In the Philippines, the traditional tricycle is one of the most commonly used public transportation. A traditional tricycle is composed of a motorcycle connected to a passenger cab or commonly known as a sidecar. The tricycle's fare is cheap, and the tricycle itself is accessible, small, and can drop the passengers to their preferred destinations such as offices, schools, public markets, etc. However, the present design and construction of the tricycle focus more on aesthetics, which neglects the comfort, safety, and well-being of the commuters and even the drivers. According to Gumasing and Liao (2021) policies and regulations are absent regarding the Philippines' standard design of public vehicles. This lack of policies resulted in different designs and sizes of public vehicles. Based on the Philippine Statistics Authority (PSA) data as of 2021, there are 4,488,507 registered motorized tricycles in the country, and 853,075 or 19% are from Metro Manila. In a 2021 analysis of the Global Burden of Disease (GBD) by the World Health Organization (WHO), the approximate number of people with Musculoskeletal Disorders is 1.71 billion worldwide, and 369 million are from South-East Asia. Also, according to WHO, low back pain is the main contributor to MSD with 568 million people, fractures with 436 million people, osteoarthritis with 343 million, neck pain with 222 million, and amputations with 175 million people. According to GBD, Low Back Pain (LBP) is a common global problem and still increasing every year. LBP is defined as "pain in the area on the posterior aspect of the body from the lower margin of the twelfth ribs to the lower gluteal folds with or without pain referred into one or both lower limbs that lasts for at least one day". Since 1990, LBP has been the leading cause of years lived and the leading global cause of disability. Up until today, it is still a significant global public health problem.

1.1 Objectives

The main objective of the study is to identify the ergonomic risk factors of Low Back Pain among tricycle drivers in the vicinity of University of Santo Tomas-Manila. Moreover, this study will provide improvements and recommendations to prevent low back pain in order to provide convenience and comfort.

2. Literature Review

2.1 The prevalence of Low Back Pain (LBP) among Drivers

Low back pain (LBP) affects workers in different sectors including the transport sector. LBP requires special attention as they can negatively affect the productivity of a person or certain sector due to injuries. The transport sector is a significant part of the economy. Transport services in the country mainly consist of jeepneys, tricycles, buses, taxis, and pedicabs which are commonly used by commuters both in rural and urban areas. According to Espinosa and Estember (2020) three transport drivers such as jeepney, taxi, and bus drivers indicated that the five most common body parts with musculoskeletal disorders (MSDs) are: the neck, lower back, lower legs, upper arm, and wrists. Aside from these transport services, motorized tricycle drivers are also prone to the risk of developing these musculoskeletal disorders, especially LBP. These are due to awkward posture because of prolonged sitting, long-term exposure to whole-body vibration, and driving over bumps on rough road surfaces (Ilah and Ahmad 2019). With the high demand for tricycles as the means of transportation in the country, drivers experience discomfort and at risk of developing musculoskeletal disorders in riding motorized tricycles. The most affected parts of the drivers when riding tricycles in terms of discomfort are the lower back, hip or buttocks, thigh, and upper back. In the study of Levin et al. (2018) episodes of LBP are very common among workers especially drivers because of their exposure to whole body vibration that is common to driving professions.

2.2 Effectiveness of ergonomics training program

People having musculoskeletal disorders continue to rise, especially in the low back, upper limbs and neck which affects the health and productivity of office workers (Sohrabi and Babamiri 2021). A quasi-randomized trial study was conducted, and the results analyzed using repeated measures of variances. The study shows significant effects on the low back, neck, left shoulder, right wrist, and left thigh discomforts, social support, and physical job demands. Therefore, implementing an ergonomic training program is effective for office workers to reduce the MSD in the upper limbs and neck. Also, the study recommends having continuous ergonomic training programs for the workers to prevent and control the body discomforts.

2.3 Awareness and Prevention of Low Back Pain

According to Chetan et al. (2018) 73.9 million individuals are using computers, and they are using them for gaming, work, browsing social networking, etc. Most people using computers do not have any idea that it has effects or negative impacts on their health. Nowadays, millennials start using gadgets at a very young age that may cause MSDs, neck pains, and back pains. In a study of Chetan et al. (2018) the findings show that 67.16% are not aware of the ergonomics and the factors of it, problems on the workstation, and a majority of the respondents feel various pains such as neck pains, back pains, etc. Recommendations such as improving their posture while using their computers, such as how to correctly position the monitor, reduce the glare, correct sitting position, training, working hours on their computers, table height, to move legs to avoid numbness, and health checkup camps were included.

2.4 Causes of Low Back Pain in the Public Transport Sector

With the increase in the volume of commuters in the Philippines, there is also an increase in the number of tricycles. This will result in a higher number of passengers' complaints of experiencing discomfort and pain (Gumasing and dela Cruz 2018). This also translates in a higher number of tricycle drivers experiencing discomfort and pain which can result in moderate risk of MSDs. Arma et al. (2019) conducted a study in Palembang to analyze factors that affect LBP in which Nordic Musculoskeletal Questionnaire (NMQ) was used to measure risk factors and data was analyzed using logistic regression analysis. The results showed that the greatest association to the incidence of LBP is Body mass index (BMI). The study explained that individuals who are overweight to extremely obese cause abdominal muscle tone to weaken which causes fatigue in the lower back. However, the study of Hakim and Mohsen (2017) found out that BMI was not associated with the prevalence of LBP using bivariate analysis. Another study assessed the whole body vibration exposure and prevalence of MSDs among auto rickshaw drivers (Singh 2019). The results showed that body vibrations due to exposure to road conditions and number of passengers had a significant influence on MSDs, especially on the LBP. In the study of Wang (2017) the prevalence of LBP among Chinese taxi drivers was investigated. Using Univariate and multivariate logistic regression, it was revealed that longer daily driving duration, night shifts, and increasing work years as a taxi driver were related with increased risk of LBP. On the other hand, rest days per month, longer sleep duration, and more exercise decreased the risk of LBP. Roy et al. (2021) conducted a study to find out the prevalence of LBP among bus conductors in India and other associated MSDs in various upper and lower body areas. Oswestry Low back pain disability index was used for prevalence of LBP and Cornell Musculoskeletal Disorder Questionnaire (CMDQ) was used to find out the musculoskeletal discomfort. The results showed that bus conductors have a higher risk to the back, neck, and knees. Terfa et al. (2022) conducted a study in Ethiopia where ergonomic factors for LBP were identified among three wheel drivers. Using binary logistic regression, the correlation between ergonomic risk factors and LBP were determined. The results showed that factors such as uncomfortable sitting posture, steering wheel handling, number of passengers, rest breaks, and different brands of three wheeled cars are significantly associated with LBP. The study suggested that lifestyle modification and adequate policy briefs about occupation-related problems should be established.

2.5 Physical Therapy Approaches in the Treatment of Low Back Pain

High-income countries usually provide evidence for LBP prevention and treatment. Low- and middle-income countries will have different public health goals and priorities than high-income countries. Changes to disability and compensation claim policies may also be required. Modifiable risk factors for disabling low back pain must be addressed by developing and implementing strategies. International and national policymakers must fund and promote the prevention of low back pain. Patients should be able to consult the appropriate healthcare providers at the proper time, thanks to the development of healthcare pathways. Improved healthcare professional training could reduce unnecessary medical treatment. Clinical pathways should be reorganized to achieve best practice, and treatments to reduce work disability should be included in health care and workplace settings.

2.6 Transportation Industry Trends on Public Utility Vehicles (PUV) in the Philippines

Transportation performs a crucial function in moving people and goods in any major urban developing city where trade and economic activity are concentrated. In 2020, the urban population growth in the Philippines was reported at 1.8932% which is considered an increase compared to the previous years (World Bank 2018). As the country is experiencing rapid urbanization, the demand for transportation is also expected to increase proportionally, especially in metropolitan areas. Commuters in the Philippines have long been compelled to ride in public utility vehicles (PUVs) that are unsafe, uncomfortable, poorly maintained, and that pose environmental risks because of smoke-belching. In 2017, the Department of Transportation (DOTr) issued a Department Order 2017-11 also known as the Public Utility Vehicle Modernization Program (PUVM). It is a system reform that aims to transform the road sector of public transportation through a restructured, modern, environmentally sustainable, and well-managed transport sector, in which drivers and operators will have a secure, sufficient, and dignified livelihood while commuters are able to travel quickly, safely, and comfortably. There have been attempts to implement it in the country like the existing electric tricycles with the improved passenger seats. According to Dela Cruz (2019) in his report on Philippine News Agency, the head of the Liga ng Transportasyon at Operators sa Pilipinas (LTOP) called for the modernization of tricycles in the country for a safe, convenient, and environmentally friendly travel for commuters. Tricycles must not be left behind in the Public Utility Vehicle modernization as they contribute a major part to the transportation sector.

3. Methods

For the methodology, the researchers gathered data of 214 registered tricycle drivers from the Tricycle Operators and Drivers' Association (TODA) within the University of Santo Tomas - Manila vicinity. A survey was conducted to collect data contributing to the lower back discomfort experienced by tricycle drivers. The survey consisted of data about tricycle condition, postural condition, health condition, environmental condition, and driving condition. The first factor considered was tricycle condition, which involves the seat's comfortability and motorcycle brand. Postural conditions of drivers were considered in determining the discomfort level, as some of them may be subjected to awkward postures while riding tricycles. Moreover, health conditions were assessed. This includes age, body mass index, and smoking habits. The environmental condition was evaluated as well, in which the noise, weather temperature, and vibration are to be considered in the discomfort level while riding a tricycle. Lastly, the driving condition includes years of experience, working days per week, and rest breaks between driving. Descriptive measures were used to analyze summary factors collected from data gathering. The Ordinal Logistic Regression was utilized for statistical data analysis to identify relationships between the ordinal dependent variable and independent variables.

The sample size for the study was 100 respondents out of 214 registered tricycle drivers based from the average relative bias of fixed effect estimates from research entitled *"Sufficient Sample Size and Power in Multilevel Ordinal Logistic Regression Models.*

4. Data Collection

This study utilized a questionnaire that was disseminated using forms. The questionnaire included the sub-factors of health and road conditions and were answered by the tricycle and drivers in the vicinity of University of Santo Tomas - Manila. The data in this questionnaire were subjected to statistical analysis. This questionnaire was written in both English and Filipino for easier understanding by the respondents. equipment used for other data gathering procedures. Equipment was used for other data gathering. A tape measure was used to measure postural conditions of the drivers. Moreover, this will be used to measure the height of the respondents for body mass index (BMI). A weighing scale was used to measure the weight of the drivers for BMI. Lastly, a vibration meter was used to measure the vibration level of the tricycle.

5. Results and Discussion

5.1 Graphical and Numerical Results

Model Fitting Information

Table 1 shows the model fitting information that contains the likelihood chi-square test used to compare the full model against an intercept-only model. The test results presented in Table 1 are statistically significant with significant values less than 0.05. Accordingly, there is a significant difference between the baseline and final models, concluding that all variables in the analysis fit together.

Table 1. Model Fitting Information of the Results

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	254.353			
Final	142.256	112.097	30	.000

Goodness-of-Fit

The Goodness-of-Fit, **Table 2** test if the observed data is consistent with the fitted model. Pearson's significance values should be greater than 0.05 to accept the null hypothesis. Table 2 has the goodness of fit with the fitted data.

Table 2. Goodness - of - Fit of Frequency of the Data

	Chi-Square	df	Sig.
Pearson	299.463	366	.995
Deviance	169.781	366	1.000

Pseudo R-Square

The Pseudo R-squares shown in **Table 3** give information about how much variance is explained by the independent variables. **Table 3** has the significance value of Nagelkerke greater than 0.7. Thus, the variances of the independent variables on the frequency of experiencing LBP are proportional.

Table 3. Pseudo R-Square of Frequency of the Data

Cox and Snell	.674
Nagelkerke	.732
McFadden	.441

Test of Parallel Lines

Table 4 resulted in a significance value greater than 0.05; thus, the location parameters are uniformly distributed across response categories. The result showed that the parallel assumption holds for each significant independent variable used in the ordinal logistic regression model.

Table 4. Test of Parallel Lines of the Data

Model	-2 log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	142.256			
General	66.778	75.478	90	.864

Parameter Estimates

Table 5 shows the legend for values in SPSS that were used in the discussion of Parameters Estimates **Table 6.**

Table 5. Legends for Parameter Estimates

Independent Variables	Parameter	Value in SPSS
Brand A	Type of Brand 1	1
Brand B	Type of Brand 2	2
Brand C	Type of Brand 3	3
Brand D	Type of Brand 4	4
Brand E	Type of Brand 5	5
Brand F	Type of Brand 6	6
Brand G	Type of Brand 7	7
Brand H	Type of Brand 8	8
18-25 years old	Age 1	1
26-30 years old	Age 2	2
31-35 years old	Age 3	3
36-40 years old	Age 4	4
41 or above years old	Age 5	5
Non-Smoker	Smoking Habit 1	1
Smoker	Smoking Habit 2	2
Rough Surface	Road Surface 1	1
Smooth Surface	Road Surface 2	2
Light Traffic	Kind of Traffic 1	1
Moderate Traffic	Kind of Traffic 2	2
Heavy Traffic	Kind of Traffic 3	3
1-10 Years of Experience	Years of Experience 1	1
11-20 Years of Experience	Years of Experience 2	2
21-30 Years of Experience	Years of Experience 3	3
31-40 Years of Experience	Years of Experience 4	4
41-50 Years of Experience	Years of Experience 5	5
Underweight	Body Mass Index 1	1
Normal	Body Mass Index 2	2
Overweight	Body Mass Index 3	3
Obese	Body Mass Index 4	4

Table 6. Parameter Estimates of the Data

FACTORS		Estimate	Sig.
Health Condition	**Age of Tricycle Drivers** (31-35 yrs old)	-2.656	0.003
Environmental Conditions	**Motor Vibration**	-0.004	0.009
	Kind of Traffic (Light Traffic)	-1.835	0.041
	Kind of Traffic (Moderate Traffic)	-2.135	0.000
Postural Conditions	**Sitting Height**	-0.179	0.006
	Hip Height	0.163	0.017

Table 6 shows the parameter estimates of the independent variables relating to the frequency of tricycle drivers experiencing LBP as the dependent variable. Locations with 0 value estimates are used as referential. Tricycle drivers with ages 31 to 35 years old [Age=3] have a statistically significant (p-value = 0.003) lower frequency of experiencing LBP (estimated coefficient of -2.656) than those Tricycle drivers between 41 years old and above [Age=5], the reference category. For the kind of traffic, light traffic [Kind of Traffic=1] and moderate traffic [Kind of Traffic=2] have a statistically significant (p-value=0.041 and p-value=0.000) lower frequency of experiencing LBP (estimated coefficients of -1.835 and -2.135) for the Tricycle drivers than having heavy traffic [Kind of Traffic=3] regarding the environmental conditions. Under environmental conditions, motor vibrations have a significant difference (p-value=0.009) in the frequency of experiencing LBP. Motor Vibrations have a negative slope (estimated coefficient of -0.004) that indicates a lower frequency of experiencing LBP of the tricycle drivers. For the postural conditions, sitting height (p-value=0.006) and hip height (p-value=0.017) have a statistical significance to the frequency of experiencing LBP. Sitting height has a negative slope (estimated coefficient of -0.179) that indicates a lower frequency of experiencing LBP. In comparison, hip height has a positive slope (estimated coefficient of 0.163) that indicates a higher frequency of experiencing LBP.

Odds Ratio

Table 7. Odds Ratio

	Parameter	**Estimate**	**Exp**	**Sig.**
Threshold	LBP_Frequency - 1.00	-19.994		0.958
	LBP_Frequency - 2.00	3.775		0.992
	LBP_Frequency - 3.00	5.837		0.988
	LBP_Frequency - 4.00	9.046		0.981
Location	Workdays	0.155	1.167657961	0.774
	Rest_Breaks	-0.007	0.993024443	0.49
	Sitting_Height	-0.179	0.836105899	0.005
	Hip_Height	0.163	1.17703669	0.018
	Hip_Breadt	0.004	1.004008011	0.973
	Buttock	-0.143	0.866754069	0.053
	Popliteal	-0.032	0.968506582	0.613
	Motor_Vibration	-0.004	0.996007989	0.009
	Brand = 1.00	-0.18	0.835270211	0.922
	Brand = 2.00	1.181	3.257630205	0.51
	Brand = 3.00	17.951	62520183.59	0.992
	Brand = 4.00	-0.206	0.813833076	0.913
	Brand = 5.00	1.521	4.576799707	0.418
	Brand = 6.00	2.155	8.627890179	0.254
	Brand = 7.00	4.121	61.6208323	0.076
	Brand = 8.00	0		
	Age = 1.00	-42.227	4.58191E-19	0.97
	Age = 2.00	-1.076	0.340956628	0.487
	Age = 3.00	-2.656	0.070228575	0.002
	Age = 4.00	-0.345	0.708220353	0.539
	Age = 5.00	0		
	SH = 1.00	-0.16	0.852143789	0.74
	SH = 2.00	0		
	RoadSurface = 1.00	0.154	1.166490887	0.781
	RoadSurface = 2.00	0		
	Traffic = 1.00	-1.835	0.159613502	0.041
	Traffic = 2.00	-2.135	0.11824459	0
	Traffic = 3.00	0		
	Y_Experience = 1.00	17.25	31015573.27	0.964
	Y_Experience = 2.00	17.714	49327880.18	0.963
	Y_Experience = 3.00	17.528	40955636.41	0.963
	Y_Experience = 4.00	12.061	172991.8911	0.975
	Y_Experience = 5.00	0		

	BMI = 1.00	-1.53	0.216535667	0.232
	BMI = 2.00	0.276	1.317847864	0.686
	BMI = 3.00	-0.126	0.881614847	0.86
	BMI = 4.00	0		

Table 7 shows the odds ratio which represents the odds of falling into a higher or lower category on the dependent variable with a unit change in the independent variable. For the age of the tricycle drivers, the odds of having a frequency of experiencing LBP are 0.070 times low when tricycle drivers are ages 31 and 35. The odds of experiencing the frequency of LBP increases with heavy traffic. This shows that the odds of frequent experiencing LBP will decrease if the traffic is light and moderate since both Exp values are lower than 1. For the measurements, the odds of lower frequency of having LBP are 0.836 times lesser for lower sitting height than higher sitting height. The odds of higher frequency of having LBP are 1.167 greater for higher hip height in comparison to lower hip height. For the motor vibrations, the odds of lower frequency of LBP are 0.996 lesser for lower vibrations than higher vibrations experienced by the tricycle drivers.

Kendall W Coefficient of Concordance

Table 8. Kendall W Test

Hypothesis Test Summary			
Null Hypothesis	**Test**	**Sig.**	**Decision**
The distributions of Frequency of LBP, Number of Working Days, Rest Breaks in Minutes, Seat Height in Cm, Hip Height in Cm, Hip Breadth in Cm, Buttock Height in Cm, Popliteal Height in Cm and Motor Vibration in Hz are the same	Related Samples Kendall's Coefficient of Concordance	.000	Reject the Null Hypothesis

Table 9. Test Statistic for Kendall's W

Test Statistics	
N	100
Kendall's W	.928
Chi-Square	1391.673
df	15
Asymp. Sig.	.000

Kendall's Coefficient of Concordance (W) is a measure of the agreement among several quantitative variables that are assessing a set of n objects of interest. **Table 9** shows the hypothesis test summary of the distributions of the dependent and independent variables using Kendall's W. The data shows that the variables are statistically significant therefore null hypothesis is rejected. The Kendall W value is 0.928 which means that the higher the value of Kendall's (0.9 and above), the stronger the association.

Table 10. The Mean Measurement of Sitting Height, Hip Height and Motor Vibration of the Tricycle Drivers within the vicinity of UST

	Average/Mean Measurement
Sitting Height (cm)	79.41
Hip Height (cm)	92.11
Motor Vibration (Hz)	779.42

The scale independent variables, specifically sitting height, hip height, and motor vibrations had a significant difference on the frequency of tricycle drivers experiencing LBP as shown in the data of the parameter estimates. **Table 10** shows the mean anthropometric of sitting height, and hip height of the tricycle drivers in the vicinity of UST with an average value of 79.41 cm and 92.11 cm, respectively. In addition, tricycle drivers are exposed to a mean motor vibration of 779.42Hz when driving a motorcycle. According to International Organization for Standardization (ISO) standard 5349, humans are sensitive to 8-16 Hz.

5.2 Proposed Improvements

Respondents should do the following recommendations based on the data gathered and its interpretation. Thirty-one to thirty-five years old (31-35 years old) is the preferred age group to be a tricycle driver. Since it indicates negative estimates, the tricycle drivers' frequency of LBP in this age group is lower than the other age groups. Light and moderate traffic are the preferred traffic for tricycle drivers since this has a lower frequency experience of LBP. Researchers recommend that tricycles should have proper scheduling trips. Drivers should be scattered in the schedule, especially during rush hours to prevent LBP. In addition, the mean anthropometric sit height and hip height of the tricycle drivers in the vicinity of UST are 79.41 and 92.11 cm, respectively. Therefore, it recommends that motorcycle distributors near the said location should consider these mean anthropometric measurements in designing motorcycles. Lastly, the motor vibration indicates that the lower vibration means a lower frequency of LBP. The tricycle drivers are exposed to the mean motor vibration of 779.42Hz when driving a motorcycle. According to Gumasing and Liao (2021) this vibration may be caused by the wrong type of tires, inadequate seat cushion to the driver's seat, and poor design of the engine chassis. The researchers suggested that the respondents add a muffler or silencer and seat cushion to their motorcycles to lower their motor vibration. Moreover, LTO should regularly inspect the motorcycles regarding their maintenance chassis and engine. They should also strictly implement the tire type drivers will use in riding a tricycle.

The researchers recommend that tricycle drivers should have knowledge regarding the proper body mechanics when riding the tricycle to prevent having frequent LBP by attending seminars free of charge by the LGUs. Every TODA should have equipment such as a weighing scale and sphygmomanometer for the tricycle drivers to monitor basic information that has an impact on their health. Moreover, TODAs should have weekly surveys regarding the well-being of every member of the said association.

6. Conclusion

The finding shows that a positive estimate of independent variables is associated with an increasing likelihood of cases falling into a higher category in the dependent variable which is the frequency of experiencing LBP of the tricycle drivers. On the other hand, a negative estimate indicates decrease in relationships between predictors and outcome. Ergonomic risk factors such as the age of the tricycle drivers, the kind of traffic, motor vibrations, sitting height, and hip height are significantly associated with the frequency of tricycle drivers experiencing LBP. On the other hand, there is no significant difference in the frequency of experiencing LBP based on the brand of the motorcycles, smoking habits of the tricycle drivers, road surface, years of experience, BMI of tricycle drivers, number of working days, number of rest breaks, postural conditions such as hip breath, buttock popliteal height.

As referred to in the previous findings, the age of the tricycle drivers has a significant association with LBP (Arma et al. 2019). Levin et al. (2018) stated that episodes of low back pain (LBP) are very common among workers especially drivers because of their exposure to vibration that is common to driving professions. Another study by Singh (2019) reported that environmental conditions, specifically kinds of traffic and motor vibrations, significantly influenced MSDs, especially on the LBP of Indian auto-rickshaw drivers. In addition to these, motorized tricycle drivers are also prone to LBP due to prolonged driving and sitting. They can develop awkward postures when exposed to long-term whole-body vibration and dealing with bumpy roads. Tricycle drivers can develop awkwardness and stagnation in posture when exposed to long-term whole-body vibration and dealing with traffic that impairs productivity. The study by Terfa et al. (2022) identified that prolonged uncomfortable posture due to postural conditions while driving is one of the risk factors for LBP among drivers. Moreover, it stated a mismatch between anthropometric measurements of drivers while driving. The finding implies that many tricycle drivers are at risk of developing reduced well-being and comfort. A lifestyle modification for tricycle drivers and an adequate procedure that addresses the problem of LBP should be established. This study aimed to identify the ergonomic risk factors of LBP among tricycle drivers in the vicinity of University of Santo Tomas-Manila. In addition, this study provided improvements and recommendations to prevent LBP in order to provide convenience and comfort.

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