

A Risk Level Assessment of Food Delivery Riders for COVID-19

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Abstract

The primary objective of this study is to measure the risk levels of food delivery riders for COVID-19 Infection by looking into the health risk, behavioral risk, exposure risk, and social policy risk. The participants for the study were 30 food delivery riders from the Philippines, and the RKA assessment tool was utilized. For the statistical treatment of data, the researchers used descriptive statistics for the demographic profiling and correlation analysis for determining the significant relationship between different factors incorporated in the study. In the findings, for the health risks, the risk scale is low in age and comorbidities but high in gender and smoking habit. For the behavioral risks, there is low risk in handwashing, sanitation, social distancing, and trust in government, but the high risk in the use of face masks and anxiety. For exposure risks, there is low risk in residential type and travel history but a high risk in occupation. For social policy risk, the risk scale is low in the effectiveness of lockdown but is high in community compliance. In the correlation, it was established that there is a high correlation between total risk score and sanitizing. There were also moderate correlations between several pairs such as age and face mask, total risk score and age, total risk score and government trust, total risk score and residential, total risk score and travel history, and total risk score and lockdown. Other relationships either had minor or no correlation.

Keywords

COVID-19, risk assessment, food delivery

1. Introduction

When COVID-19 came into view, the normal lives of society suddenly changed. Society and the economy have also been widely affected. People are forced to perform different activities and do their jobs inside their homes due to the risks posed by the virus. As the movement of people between places has been limited due to the lockdowns and community quarantine, the demand for delivery services has emerged. One of those workers who provide services for the convenience of many includes food delivery riders.

Although ideally, people have work amidst the pandemic, it is still true that the risk for going outside to work is indeed high. They are prone to get infected by the virus because they are the ones doing all the interactions in the restaurant and also transporting it to the customers. They were out and about while the majority of people are contained in their houses. This study aims to assess the level of risk that food delivery drivers are facing just to earn a living in a deadly situation.

1.1 Objectives

The primary objective of this study is to assess and measure the risk levels of food delivery riders for COVID-19 Infection by looking into the health risk, behavioral risk, exposure risk, and social policy risk. The researchers also look into the relationship between the different factors that are incorporated in the study.

2. Literature Review

GrabFood or GrabPH is a food delivery service that connects local food businesses to people. This service has the simple process of customers placing orders with the GrabFood application so that the company receives this order and places personnel to buy and deliver the order the customer has placed (Grab, n.d).

Meanwhile, Food Panda also is another company that provides food delivery services from local food businesses. Just like how it was mentioned with the previous application, an order is placed by a customer, the food delivery company transacts this order and sends personnel to do the errand, and finally deliver the order the customer has placed.

A research study by Kulanthayan, S., See, L.G., Kaviyarasu, Y., and Afiah, M.Z.N. (2012) entitled Prevalence and Determinants of Non-Standard Motorcycle Safety Helmets Amongst Food Delivery Workers in Selangor and Kuala Lumpur, mentions that the global traffic accidents or crashes involve pedestrians, cyclists, and two-wheel users. In this study, they had the objective of determining the factors that influence the standard of safety helmets concerning the Standard and Industrial Research Institute of Malaysia. In their conclusions, they have mentioned that non-standard helmets were more likely to fail the standards penetration test, and were more likely to be worn by older, more experienced riders.

Another study by Byun J.H., Jeong, B.Y., Park, M.H. (2017) entitled Characteristics of Motorcycle Crashes of Food Delivery Workers had the objective of understanding accident characteristics of food delivery workers who use motorcycles. The researchers were able to gather data from 1,310 food delivery workers that have been approved as on-duty industrial crashes since 2015. In their results, they have mentioned that 99.2% of the victims were males, 82.6% only had 6 months of work experience, 76.2% were employed by companies with less than five workers. They also mentioned that there was a difference also in accident characteristics, in terms of age, type of cuisine, accident time of the day, and the injured organs and injured body parts.

A study by Bokim, L. (2019) entitled Working Conditions and Health Status of Delivery Workers compared working conditions and the health status of Parcel Delivery Workers and Food Delivery Workers. The research was able to determine and examine the factors that influence the health status of the said group. In terms of fatigue, it was mentioned that Parcel Delivery Workers and Food Delivery Workers did not show any statistical difference with each other. With the use of multiple logistic regression analysis, it was revealed that low temperatures, smoking tobacco, standing for long periods, and job stress were significant predictors of fatigue or the well-being of Food Delivery Workers.

A research study conducted by Hsieh, C.N., Lu, Y., Chuang, Y., Xu, Q.Y., (2020) entitled A Comparative Study on Taiwanese and Chinese Occupational Safety and Health Protection on Online Food Delivery Workers finds out the parameters and measures governing Occupational Safety and Health Protection of personnel in the online food delivery industry in Taiwan and China. The paper had the objective of trying to understand the similarities and differences of protective measure that has been established for workers in the online food delivery platform. The researchers were able to find multiple findings for this topic. One of which is that in both Taiwan and China, until lately neither of the two passed down any new legislation by the legislative body of the two countries for governing the related problems of online platform food delivery workers nor the Ministry put out regulatory regulations to govern them.

A case study conducted by Ortiz-Prado, et. al (2021) entitled High Prevalence of SARS-CoV-2 Infection Among Food Delivery Riders: A Case Study from Quito, Ecuador highlights that food delivery riders are a potentially high-risk population for the said disease infection. The paper had the objective of examining and being able to describe the presence of SARS-CoV-2 among the food delivery personnel in the city of Quito, Ecuador. In their findings, they have found out that 22 of the total 145 food delivery workers tested positive for SARS-CoV-2. It was also mentioned that the majority of the food delivery workers were men (n=138) and the average age of male workers was 32 years old. They have also stated in their finding that only 9 subjects or about 6% of the population showed the presence of mild symptoms. They have concluded that the results they have gathered emphasize the need for policymakers in the area to look at the current pandemic from as many populations' sub-groups as possible.

A paper written by Sarwar, A., Maqsood, U., and Mujtaba, B.G., (2020) entitled Impact of Job Insecurity due to COVID-19 on the Psychological Wellbeing and Resiliency of Food Delivery Personnel mentions that job insecurities

due to COVID-19 leads to a decrease in the wellbeing of hotel (restaurant) delivery personnel. The paper also mentioned that it examined as well as the resiliency between job insecurity and employee anxiety. The researchers were able to collect 253 respondents of food delivery personnel from different hotel restaurants. In short, their conclusions mention that the findings suggest that job insecurity because of the COVID-19 pandemic leads to a decrease in an employee's well-being via financial stress.

A research study conducted by Nguyen, T.H.D., and Vu, D.C. (2020) entitled Food Delivery Service During Social Distancing: Proactively Preventing or Potentially Spreading Coronavirus Disease-2019? mentions that although the food delivery service sector sparked a surge in response to the social distancing measure, this distribution may still pose a potential risk of spreading the disease. In the paper, the researchers have mentioned that 60% of infected cases occurring in a public hospital in Hanoi, Vietnam, are caused or linked to food delivery of presymptomatic non-clinical staff working at the hospital criteria. The researchers mentioned that delivery workers are urged to the frontlines of the COVID-19 pandemic.

A paper written by Amin, A. et. al (2021) entitled Using Mobile Food Delivery Applications During COVID-19 Pandemic: An Extended Model of Planned Behavior focuses on consumers' behavior and their continuance intention of using mobile applications in food delivery. The researchers examined the impact of social isolation, food safety, delivery hygiene, subjective norms, etc. In the results of this research paper, they have mentioned that the factors delivery hygiene, subjective norms, attitudes, and behavioral control were all related to both behavioral and the continuance intention to use mobile food delivery applications.

As a synthesis of the related literature presented, it can be observed that food delivery workers/personnel play a big role in the functioning economy in the COVID-19 pandemic. Some studies mentioned that consumers' behavior caused by different factors lets them continue to the intention of using mobile applications in food delivery. Some of the related literature is concerned with the physical safety of food delivery workers. It was mentioned that certain personal factors such as smoking and age, influence the number of accidents in a particular setup. It was also mentioned in a study that the need for legislative actions for occupational health and safety is needed for the overall safety of food delivery workers. Another part of the compiled related literature studies about food delivery workers towards the COVID-19 pandemic. A study mentions that although online food delivery greatly utilizes the social distancing rule, food delivery workers are urged in the frontlines of the pandemic exposing the consumers and the personnel themselves. Another study mentions that COVID-19 also creates an impact on the well-being of food delivery workers. It was mentioned that due to financial stresses in the industry the workers are at, this leads to a decrease in their wellbeing. Overall, the related literature suggests that information about the safety of food delivery workers is needed in pursuit of dealing with the COVID-19 pandemic for the safety of the customers transacted with and as well as the food delivery personnel themselves.

3. Methods

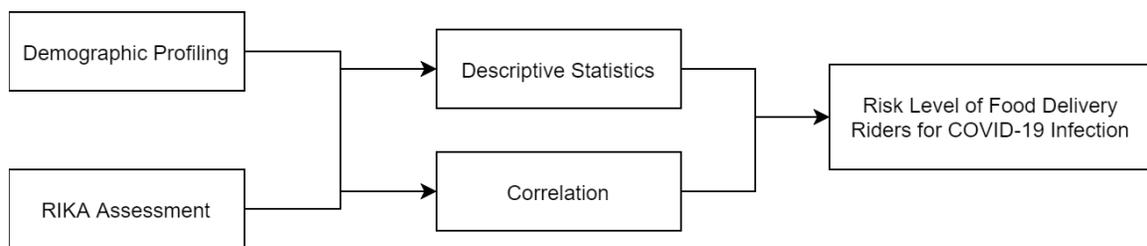


Figure 1. Conceptual Framework

Throughout the study, the researchers were guided by the following conceptual framework as shown in Figure 1. Primarily, the inputs obtained from the demographic profiling and RIKA assessment tool were analyzed using descriptive statistics and correlation, and regression. The results of the analyses resulted in the measurement of the risk level of food delivery riders for COVID-19 infection.

3.1 Respondents of the Study

The participants for the study were 30 food delivery riders from the Philippines. These respondents were essential because the study concerns the risk level measurement of these riders especially during the time of the COVID-19 pandemic.

3.2 Risk Assessment Tool

The RIKA Assessment Tool was used in this research. The said research tool consisted of questions related to the health risk, behavioral risk, exposure risk, and social policy risk of the delivery riders. This questionnaire was useful in evaluating the risk level of food delivery riders during COVID-19.

3.3. Statistical Treatment of Data

Various statistical tools and analyses were applied in this study. First, this research utilized descriptive statistics for the profiling of respondents concerning the gender, age, area of residence, company, years employed, employment status, and monthly income. Second, Correlation Analysis was applied to determine the significant relationship between different factors incorporated in the study.

4. Results and Discussion

Firstly, the researchers have obtained the demographic profiling of the respondents – the food delivery riders. With regards to their gender, 86.67% were male while 13.33% were female. For the age, 53.33% were between 21 to 30 years old, 36.67% were between 31 to 40 years old, and 10% were between 41 – 50 years old. Meanwhile, no respondents were 50 years old and above. Concerning their area of residence, 83.33% reside in the National Capital Region while 16.67% reside in CALABARZON. For the company, 20% were from Food Panda, 56.67% were from Grab Food, and 23.33% works for Lala Food. Regarding the years they are employed as a delivery rider, 56.67% had been doing it for less than a year, 33.33% had been working for 1 to 3 years, and 10% had been a rider for more than 3 years. For their employment status, 43.33% were part-time, while the remaining 56.67% were full-time. For the monthly income, the results were 46.67% for 10,000 and below, 43.33% for 10,000 – 19,999, 6.67% for 20,000 – 39,999, and 3.33% for 200,000 and above. Table 1 summarizes these results.

Table 1. Summary Statistics of Demographic Profile

Respondent's Profile	Category	N	%
Gender	Male	26	86.67%
	Female	4	13.33%
Age	21 - 30	16	53.33%
	31 - 40	11	36.67%
	41 - 50	3	10.00%
	51 - 60	0	0.00%
	60 and above	0	0.00%
Area of Residence	NCR	25	83.33%
	CALABARZON	5	16.67%
Company	Food Panda	6	20.00%
	Grab Food	17	56.67%
	Lala Food	7	23.33%
Years Employed	less than a year	17	56.67%
	1-3	10	33.33%
	3 years and above	3	10.00%
Employment Status	Part-Time	13	43.33%
	Full Time	17	56.67%
Monthly Income	10,000 and below	14	46.67%
	10,000-19,999	13	43.33%
	20,000-39,000	2	6.67%
	200,000 up	1	3.33%

Then, with regards to the risk assessment scale for health risks, the factors such as age, comorbidities, gender, and smoking habit were considered. First, for the age, the older the age of the riders would, the higher the risk for the virus. This is supported by Ho et al., (2020) which states that there is high COVID-19 mortality in older adults. Based on the responses for age, 53.33% have a risk scale of 1, 36.67% have a risk scale of 2, while 10% have a risk scale of 3. Concerning the comorbidities, health issues pose significant risks for the virus (Wang et al., 2020). Based on the responses, 90% have a risk scale of 1 and the remaining 10% have a risk scale of 2. With regards to gender, male riders have higher risks since males have a lower survival rate for COVID-19 (Mi et al., 2020). Based on the responses, 13.33% have a risk scale of 1 while 86.67% have a risk scale of 2. For the smoking habit, there is a higher risk for those riders who smoke frequently, as severe COVID-19 cases were observed mostly for those who have a prevalent smoking history (Cattaruzza et al., 2020). Based on the results of the risk assessment, 46.67% were on a risk scale of 1, 10% for a risk scale of 2, 16.67% for a risk scale of 3, and 26.67% for a risk scale of 4. Table 2 summarizes these results.

Table 2. Summary of Risk Assessment Scale for Health Risks

Factor	Variable	Risk Scale	N	%
Age	21 - 30	1	16	53.33%
	31 - 40	2	11	36.67%
	41 - 50	3	3	10.00%
	51 - 60	4	0	0.00%
	60 and above	5	0	0.00%
Comorbidities	none	1	27	90.00%
	1	2	3	10.00%
	2	3	0	0.00%
	3 or more	4	0	0.00%
Gender	Female	1	4	13.33%
	Male	2	26	86.67%
Smoking habit	Never	1	14	46.67%
	Seldom	2	3	10.00%
	Occasionally	3	5	16.67%
	Very frequently	4	8	26.67%

Regarding the risk assessment scale for behavioral risks, the study by Amin et al., (2021) have examined the impact of social isolation, food safety, delivery hygiene, and subjective norms on the risk for COVID-19 infection. Hence, in this study, the risk scale for behavioral risks depends on the compliance of the food delivery rider to factors such as the use of face masks, frequency of handwashing, sanitation, social distancing, anxiety, and trust in government measures.

The percentages for risk scores for use of face masks were 13.33%, 63.33%, and 23.33% for scales 1, 2, and 3, respectively. For the frequency of handwashing, the percentages were 66.67%, 30%, and 3.33% for scales 1, 2, and 3, correspondingly. For sanitation, 70% has a risk scale of 1 while 30% has a risk scale of 2. Concerning the anxiety about the situation, 10% have a risk of 1, 30% have a risk of 2, and 60% have a risk of 3. Finally, for the trust in government measures, the percentages for the food delivery riders were 36.67%, 26.67%, and 36.67% for risk scales of 1, 2, and 3, respectively. Table 3 shows the results.

Table 3. Summary of Risk Assessment Scale for Behavioral Risks

Factor	Variable	Risk Scale	N	%
Use of face mask	N95 mask	1	4	13.33%
	medical mask	2	19	63.33%
	cloth mask	3	7	23.33%
	others	4	0	0.00%
Frequency of hand washing	very frequently	1	20	66.67%
	frequently	2	9	30.00%
	seldom	3	1	3.33%

	never	4	0	0.00%
Sanitizing before touching the face	yes	1	21	70.00%
	sometimes	2	9	30.00%
	no	3	0	0.00%
Following social distancing	yes	1	24	80.00%
	sometimes	2	6	20.00%
	no	3	0	0.00%
Anxiety about situation	not very	1	3	10.00%
	a little bit	2	9	30.00%
	very much	3	18	60.00%
Trust in gov't measures	yes	1	11	36.67%
	maybe	2	8	26.67%
	no	3	11	36.67%

With regards to the risk assessment scale for exposure risks, the factors of residential type, occupation, and travel history were considered in the present study. Firstly, the place of residence contributes to the risk for COVID-19 such that having a more crowded neighborhood is not ideal for the current situation due to lack of social distancing and difficulty in isolation (Khalatbari-Soltani et al., 2020). Based on the responses, 53.33% have a risk of 1, 33.33% have a risk of 3, and 13.33% have a risk of 4. Next, for the occupation, since all of the respondents are essential workers due to them being delivery riders, their risk score would all be 2. With regards to the travel history, 63.33% have a low risk of 1 since they have no recorded travels, 10% have a risk of 2 since they have traveled for the past days, 20% have a risk of 3 since they have attended mass gatherings, while 6.67% have a risk of 4 because they have both traveled and attended mass gatherings. Table 4 summarizes the results.

Table 4. Summary of Risk Assessment Scale for Exposure Risks

Factor	Variable	Risk Scale	N	%
Residential type	detached home	1	16	53.33%
	condo	2	0	0.00%
	apartment	3	10	33.33%
	informal settlement	4	4	13.33%
Occupation	offsite worker	1	0	0.00%
	essential worker	2	30	100.00%
	frontliner	3	0	0.00%
	medical personnel	4	0	0.00%
Travel history	no history	1	19	63.33%
	with travel history	2	3	10.00%
	attended mass gathering	3	6	20.00%
	travel history & mass gathering	4	2	6.67%

For the social policy risks, the risk scale would be higher if the citizens do not follow the policies of the government. This is supported by the findings of Nofal et al., (2020) which states that the virus transmission is lower in communities that follow social distancing and have seldom the movement of people between places. For the responses, the percentage of risk scales for the effectiveness of lockdown are 66.67%, 43.33%, and 23.33% for 1, 2, and 3, respectively. Then, for the community compliance, the percentages were 10%, 53.33%, and 36.67% for 1, 2, and 3, correspondingly. Table 5 summarizes the results.

Table 5. Summary of Risk Assessment Scale for Social Policy Risks

Factor	Variable	Risk Scale	N	%
Effectiveness of lockdown	most are following	1	20	66.67%
	some are following	2	13	43.33%
	very few are following	3	7	23.33%
	most are following	1	3	10.00%

Community compliance	some are following	2	16	53.33%
	very few are following	3	11	36.67%

In consideration of the risk assessment scale for health, behavioral, exposure, and social policy risks, Table 6 summarizes the risk levels of the food delivery riders. 50% have low-risk levels while the remaining 50% have moderate risk levels. This could be because most of the respondents were younger and have no comorbidities. Also, this could be due to their precautions especially in avoiding the virus.

Table 6. Summary of Risk Level

Risk level	Frequency	%
low	15	50%
moderate	15	50%
high	0	0%

The researchers have also conducted a correlation analysis to establish relationships between the factors summarized in Table 7. Based on the results, the highest Pearson correlation coefficient was between total risk score and sanitizing. There is also a moderate correlation between other specified factors. The first is in comorbidities and hand washing since the riders might tend to wash their hands frequently if they are aware that they have comorbidities and a high risk for getting the virus. The second is in total risk score and age such that the increase in age also increases the risk for the virus. Third is in total risk score and smoking habit because frequent smoking also increases the COVID-19 risk. Fourth is in total risk score and government trust since an increase in total risk score could also be explained by the extent of one's confidence in the policies and measures of the government. Fifth is in total risk score and residential type because more crowded places tend to give higher risks for coronavirus. Sixth is in total risk score and travel history such that the movement between far places could increase the chances of getting the virus. Last is in total risk score and lockdown such that failing to prohibit people from leaving their homes influences the risks for COVID-19.

Table 7. Summary of Correlation Analysis

Variables	Pearson Correlation	P-Value	Remarks
Age and Comorbidities	0.05	0.793	no correlation
Age and Face Mask	-0.142	0.454	minor correlation
Comorbidities and Hand Washing	0.386	0.035	moderate correlation
Age and Sanitizing	0.098	0.606	no correlation
Comorbidities and Sanitizing	0.267	0.154	minor correlation
Age and Anxiety	-0.186	0.325	minor correlation
Comorbidities and Anxiety	-0.248	0.186	minor correlation
Total Risk Score and Age	0.488	0.006	moderate correlation
Total Risk Score and Comorbidities	0.114	0.549	minor correlation
Total Risk Score and Smoking Habit	0.384	0.036	moderate correlation
Face Mask and Anxiety	-0.208	0.27	minor correlation
Hand Washing and Anxiety	0.136	0.473	minor correlation
Sanitizing to Anxiety	-0.271	0.147	minor correlation
Face Mask and Government Trust	0.021	0.911	no correlation
Total Risk Score and Face Mask	0.272	0.146	minor correlation
Total Risk Score and Hand Washing	0.177	0.349	minor correlation
Total Risk Score and Sanitizing	0.597	0.000	high correlation
Anxiety and Government Trust	0.157	0.406	minor correlation
Total Risk Score and Anxiety	-0.239	0.203	minor correlation
Total Risk Score and Government Trust	0.349	0.059	moderate correlation
Total Risk Score and Residential	0.449	0.013	moderate correlation
Lockdown and Compliance	0.298	0.109	minor correlation
Total Risk Score and Travel History	0.472	0.008	moderate correlation
Total Risk Score and Lockdown	0.375	0.041	moderate correlation

Total Risk Score and Compliance	0.219	0.246	minor correlation
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5. Conclusion

As conclusions of this study, the researchers were able to do demographic profiling for the respondents in which the profile of the respondents was identified. It showed that more than half of the respondents were 21-30 years old. 90% of the respondents also were profiled as them having no comorbidities. The behavioral risks in risk assessment were also computed. Such findings say that more than half of the population of respondents use medical face masks in their delivery transactions. The majority of them very frequently wash their hands, sanitation before touching their face was observed by the majority, following social distancing was also done by the majority. More than half of the respondents say that they are experiencing anxiety because of the current situation due to the pandemic, and an almost equal distribution (yes, no, maybe) is observed when it comes to trusting the government measurements. In assessing the risk levels of the respondents gathered, 50% have a minimal risk level meanwhile the other 50% have a moderate risk level. This is because most of the respondents were young and did not have any comorbidities. Hence, for the health risks, the risk scale is low in age and comorbidities but high in gender and smoking habit. For the behavioral risks, there is low risk in handwashing, sanitation, social distancing, and trust in government, but the high risk in the use of face masks and anxiety. For exposure risks, there is low risk in residential type and travel history but a high risk in occupation. For social policy risk, the risk scale is low in the effectiveness of lockdown but is high in community compliance.

Looking at the study in finer detail, the researchers also determined correlational relationships between factors that were important. In ranking the factors which got high correlation results, the Total Risk Score and sanitizing came first. Some factors had moderate correlations. Namely, Age and Face Mask, Total Risk Score and Age, Total risk Score and Government Trust, Total Risk Score and Residential, Total Risk Score and Travel History, and Total Risk Score and Lockdown. Other relationships either had minor correlation or no correlation at all.

In conclusion, the data calculated from the statistical analysis can be used as a model in measuring the risk levels of food delivery riders for COVID-19 infections. The health, behavioral, exposure, and social policy risks are described by the different findings and therefore can be used in examining the food delivery platform during the COVID-19 pandemic.

6. Recommendation

The authors of this study suggest management from the food delivery companies mentioned above that they use this model or perhaps improve this in their perspective to determine safety standards for their delivery personnel.

The authors of this study also recommend that a long time would be required in gathering the data for this study to have more accurate findings. It has been a limitation that only 30 respondents were gathered in concluding the given data. For future research, it is recommended that being able to provide a greater number of respondents would give a better and accurate statistical result that can be used.

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