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The Impact of Covid-19 Pandemic to the Construction Industry in Malaysia

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Abstract: Covid-19 is an infectious disease caused by a newly discovered strain of coronavirus; a type of virus known to cause respiratory infections in humans. This new strain was unknown before December 2019, when an outbreak of pneumonia of unidentified cause emerged in Wuhan, China. The first case of Covid-19 in Malaysia was detected on 25th January 2020. The World Health Organization (WHO) Country Office in Malaysia has been working closely with the Ministry of Health to respond to this outbreak. The National Security Council of Malaysia (MKN) enforced a Movement Control Order (MCO) started on March 2020 to break the chain of Covid-19. Malaysia has facing it more than a year since the arrival of Covid-19. Thus, the country's economic growth has lowered down and affected many industries including the construction industry. Most of developments and construction projects were delayed due to this pandemic issues. Therefore, this study was conducted with the purpose to investigate the impact of Covid-19 pandemic to construction industry in Malaysia. The study implied a questionnaire surveys method using Google Form and involved of 79 respondents coming from the construction industry. Then the results obtain was analyzed using Microsoft Excel and Likert scale. From the study, the most prominent impacts of Covid-19 found are deduction of salary, forbidden to go to the construction site, projects delayed, lost of job, and new cluster of Covid-19 among the construction industries. The findings also help project stakeholders to realize the sequences of the sudden epidemic and prepare for the worst-case scenario during the planning stage of construction projects. The effect of Covid-19 pandemic towards construction industry is predicted to have long term impact especially in development and economic growth.

Keywords: Covid-19, construction, industry, impact, project delayed

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1. Introduction

Covid-19 can be defined as the 2019 Novel Coronavirus which is a pandemic issue that attacking the whole world. On 30th January 2020, The World Health Organization (WHO) avowed the outbreak a Public Health Emergency of International Concern, and it was declared as pandemic on 11th March 2020. This pandemic affected people around the world and spread globally to 9.54 million people. It affected 485, 000 people in 215 countries until 25th June 2020 [1]. Wuhan City, China is the first place that recorded this pandemic issue and is located in Hubei Province [2,3]. To prevent COVID-19 from spreading to the community, the lockdown was enforced in several countries thus people need to stay at home [4]. The government needs to stop many sectors including the construction sector to make sure this pandemic can be controlled [5]. Due to this, all of the sectors in Malaysia are closed. Work from home has been introduced by Malaysia's government as an alternative working style in order to prevent the spreading of Covid-19 in the workplace [6]. But in this case, work is not practical and for construction sector, working at the construction site is more practical. This also can cause negative economic growth and make the construction sectors slow [6].

Covid-19 and its appearance in many nations also pose a variety of issues for the Engineering and Construction (E&C) business to the global economy and industry. Due to the effects of COVID-19 on the firms and governments who commissioned them, certain building projects have been postponed and canceled. An extension of the Movement Control Order (MCO) until 14th April is likely to considerably slow down the expansion of the construction sector. The economy in Malaysia incurred roughly RM 11.6 billion, after the closure of the first phase of the Movement Control Order (MCO) of the country's construction industry. This study was focused on the stakeholders in the construction industry which includes the contractor, supplier, consultant, and also the workers. This study also focused on how this pandemic affected the person that always works at the construction sites. For example, the question in the google form survey asked about the SOPs applied when working at a construction site. Also, the question asked about whether or not the worker's salaries and the customer demand were affected by the Covid-19 pandemic. The expectation of this study is to observe the workers working at the construction site are following the Standard of Procedure (SOP) which was prepared by Malaysia's government to control this pandemic. Not only that, but this research also identifies that the construction industry is the main of the sectors that contribute to Malaysia's economy and cause a negative impact if it is required to shut down during the MCO period. In order to prove this pandemic of Covid-19 affected the construction industry, a few studies were used to investigate the cause of the increasing case of Covid-19 all around the world. This section focused on the cause or the implications of the Covid-19 pandemic on the construction industry in Malaysia.

The construction industry suffers as a result of Covid-19. Delays in the building sector, particularly in project management, may be the source of the epidemic. The last study on Covid-19 and its influence on the construction business was conducted by a researcher, who conducted research by gathering data from experts and individuals involved in the building sector [7]. This study will conduct a survey with a questionnaire to a construction sector practitioner working in Kuwait. This survey is for engineers, surveyors, architects, and construction managers. Based on the results of this study, certain issues have been highlighted, such as crucial delay, concurrent delay, and independent delay in the construction sector during the pandemic. This is due to the fact that the pandemic may cause the daily working hours to be different than usual and to be decreased. In addition, according to the research, the pandemic has had a detrimental influence on corporate performance in the construction industry[8]. This study discovered that the majority of Chinese companies were experiencing difficulties managing their financial data from 2014 to 2020, which identified business performance. Based on the financial data, it is possible to assume that the comparison of this data has influenced the company's performance, particularly during the pandemic in 2020. According to the Ministry of Health (MOH) until 22 January 2020, there are many cluster that were reported. This cluster involves workplace clusters where among them is a construction site cluster which is 53 clusters where the percentage is 23.6% [9]. So that, with

the addition of Covid-19 related clusters, it will slow down the growth of the construction industry and cause development in Malaysia to stagnate. Not only that, workplace clusters are also showing a high upward trend and worrying many parties. Not only construction site clusters, workplace clusters such as factories and other sectors are also contributing to the increase in covid-19 cases in Malaysia . Most of the states that recorded a worrying increase in cases were Selangor with 74 clusters (25.78%), Johor with 53 clusters (18.47%) and Penang with 31 clusters (10.80%) [10].

In order to address the COVID-19 epidemic in the construction sector, solutions must be developed. A research has found a difficulty performing construction to build a Leishenshan Hospital during the pandemic to explore methods to manage the COVID-19 pandemic in the construction sector[11]. Which are to deal with difficulties such as designing, project delivery, and providing information to project stakeholders through communication. Based on data collected from a variety of sources, the researchers discovered that using organisation and process modelling in conjunction with building information modelling (BIM) enabled ultra-rapid creation, project management, and communication information, resulting in the successful implementation of this fully functional. The the government has to bear the cost of subsidized Covid-19 swab test to foreign workers so that the disease can be curbed and not spread more that will harm the health department. Almost RM 500 million had estimated by the construction industry for the government to help them in this particular things[13]. As a result, the information provides academics some ideas on how to tackle the situation, particularly how to establish a hospital during the epidemic. Furthermore, according to a research complaining about the existing catastrophe resilience methods and tactics specified in the SFDRR can fix numerous issues related to pandemic COVID-19[12]. In this study, the researchers made several important recommendations about knowledge and scientific provision in comprehending the current state of this pandemic that has impacted health and catastrophe. Thus, raising public awareness, particularly in terms of increasing community-level readiness and reaction. The **Figure 1** below shows the increasing trend of covid-19 cases and caused Movement Control Order (MCO) 3.0 to have to be done to curb this matter from further deterioration.

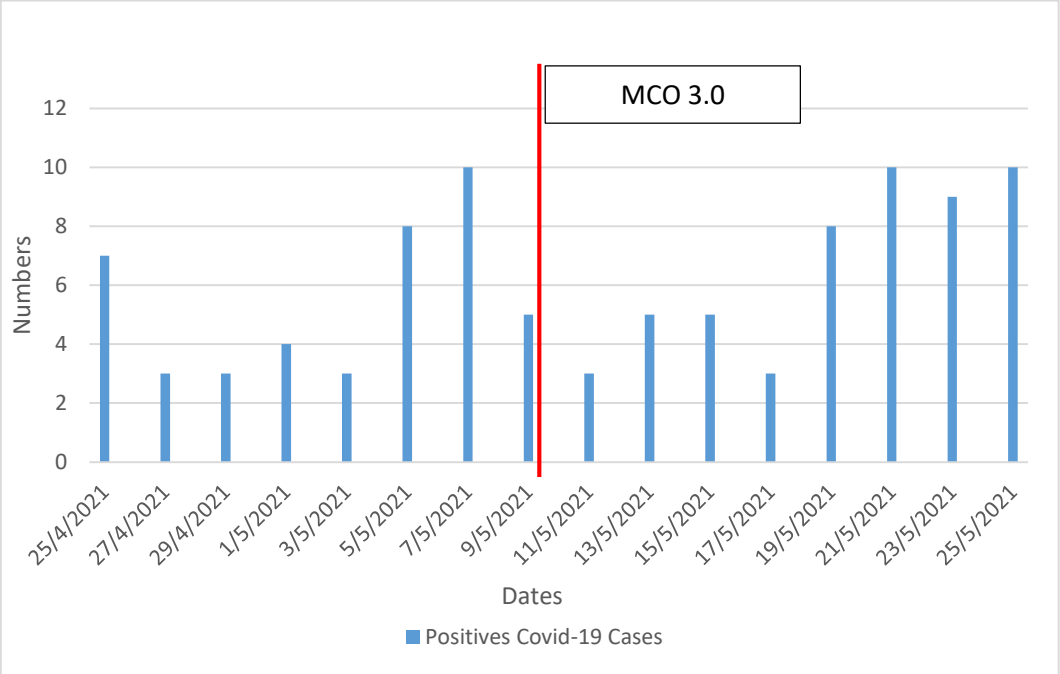

Figure 1 : Numbers of Malaysia's workplace clusters in 2021 according to the change of date

The majority of scholars have completed their research on the implications of Covid-19 on the building sector. According to research, the study focuses on the influence of Covid-19 on the building project in Kuwait[7]. As a consequence, the influence on Malaysian building projects has not been defined because this research only focuses on Kuwait, and the respondents were chosen at random rather than targeting a specific location in Kuwait.The responder was involved in any other project except those in the construction industry. Following that, study will be conducted to investigate the mechanism required by industry practitioners. A reseach was conducted on the difficulties and solutions to an issue in the construction sector during this pandemic [8]. The discovery provides some information to help enhance the building process and the proper method to make a choice. Aside from that, a research that looked at a variety of industries that were affected by the pandemic [11]. In other words, these studies are useless since they did not examine the specific impact of Covid-19 on the building industry. Furthermore, a research on the Sendai Framework for Disaster Risk Reduction (SFDRR) was carried out [12]. Various risk methods regarding disaster risks and potential health emergencies will be highlighted during Covid-19. This study addressed critical solutions for disease-related issues, especially health-related emergency hazards for humanitarian cooperation. As a result, the purpose of this research is to raise awareness among construction workers about diseases that might harm their health and to address the effects of Covid-19 in the construction sector, particularly in Malaysia.

2. Methodology

In this study, the online surveying form were used by Google Form medium in order to collect data from respondents. The questionnaire were classified into three sections which are demography of respondents, impact of Covid-19 towards employee and employer and lastly impact of Covid-19 towards the company. The collected data from targetted respondents were presented in pie chart and bar chart in the nex section which is the result and discussion section on result and discussion section. **Figure 2** shows the flowchart of this study.

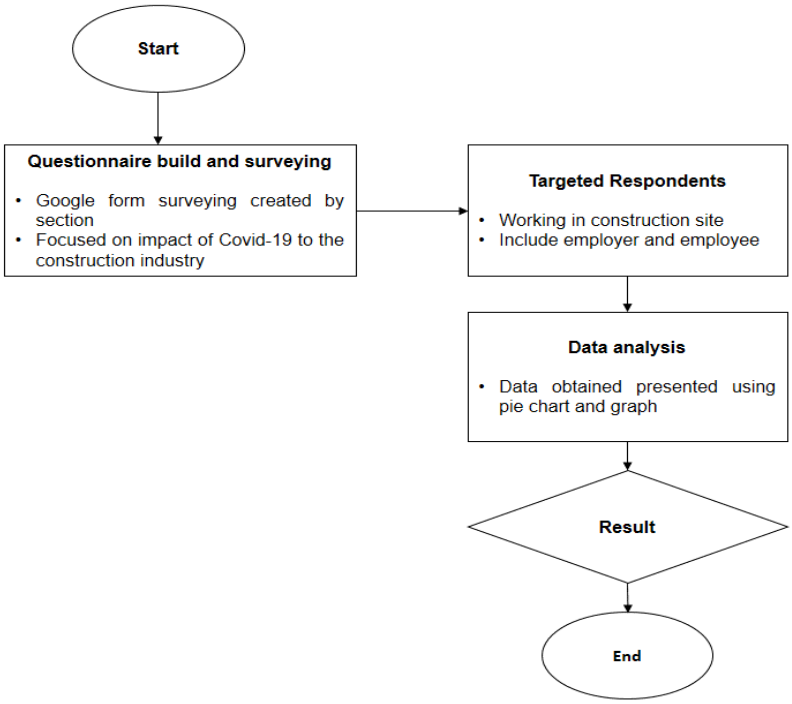

Figure 2: Flowchart of methodological process

2.1 Methods

2.1.1 Study participants

This research is focussing on the person that working in the construction sector. The stakeholders or the respondents are coming from the consultants, contractor, dealers , site engineer and also the other position that related to the construction industry.

2.1.2. Study design

The survey were provided to do some observation for this research. The questionnaire that used for this study is Google Form. This survey collected demographic data and social data . The respondents need to answer this survey by clicking the provided link that sent through Email, WhatsApp application or personal chat by using others social media.

2.1.3. Demographic social data

This data obtained from the survey provided at the first section of the survey. This include age, stakeholder, working experience, dependents , citizenship and also status. Job possession need to be filled as the position of the respondents in the company.

2.2 Composing questionnaire

In conducting the survey , there are several steps need to be considered. First, need to be considered the topic that need to be asked and collected. In a survey , the data such as respondents' background is the most important. Next, the first draft of the survey need to be constructed. After that, the survey need to be revised and do some editing to make sure that the survey is straight to the main point. By doing these steps , the survey is ready to blast.

2.3 Sampling

The sample is identified as a framework for the researchers to pick the sample. In this study, statistical approaches are employed to create a sample that will produce results that reflect the total population. The sample size picked for the survey procedure by the researchers are 79 since the respondents work in the same industry and their replies represent the newest. These responses assist the scientist collect data on the effects of COVID-19 on the building sector in Malaysia.

2.4 Pilot Test

The pilot test is the important steps before the survey to blast. This steps is to make sure that the survey followed the characteristics that the needed to put in the report. Pre-testing also help to identify if the survey is easily to understand by the respondents. On this research, this survey was checked by several expertise to make sure that the survey related to the objective and also the topic. The questionnaire was piloted for 3 times and have some comments to make sure that no further changes after the last edited.

2.5 Data collection

This survey is in English .Data collection for this survey targeted 70 respondents and above. This to make sure that data that collected is strong and ready to be analysed . The survey contains of 3 sections which are Section 1, Section 2 and Section 3. This survey had 28 questions that constructed to study the impact of Covid-19 towards the construction industry in Malaysia. The section was focussed on the impact of Covid-19 towards the Malaysian employee, Malaysian employer and also the company.

2.6 Likert' scale

Likert scale is one of the method used to measure the frequency gained from the survey and divided into five range of Average Index. There are five scale used in this survey which is scale from 1 to 5 that will be choose by respondents based on their preferences.

Table 1 : Avergae Index (AI) for likert's scale

Scale	Frequency	Average Index (AI)
1	Absolutely no	0.00<AI<1.50
2	No	1.50<AI<2.50
3	Maybe	2.50<AI<3.50
4	Yes	3.50<AI<4.50
5	Absolutely Yes	4.50<AI<5.00

Table 1 above shows the Average Index (AI) in Likert's scale. Likert's scale was used for this survey. This method is used to present how the respondents are totally agree or not based on the scale 1-5. This scale is used as a measure to the data obtained and will be presented in this study.

3. Results and Discussion

All of the data and informations needed were obtained and collected from Google Form Surveying. The results were illustrated into tables, charts and graphs in order to make an easier investigation towards the response of employees and employers of construction company.

3.1 Demographic Information of Respondents

Basic information regarding respondents were collected in the first section which obtained from the questionnaire that have been blast through social media. The data that have been collected from this survey were age, gender, working experience and the status of the respondent if they are livingwith family that had been positive to Covid-19 or not.

Table 2: Respondents background

Background	Information	Frequency	Percentage (%)
Age	20-30	28	35.4
	31-40	23	29.1
	41-50	22	27.8
	51-60	6	7.6
Gender	Male	48	60.8
	Female	31	39.2
Working experience	< 5	26	32.9
	5-10	13	16.5
	11-15	12	15.2
	16-20	8	10.1
	>20	20	25.3
Close contact with positive Covid-19 person	Yes	7	8.9
	No	72	91.1

Based on **Table 2**, the data obtained were shown that most of them are around 20-30 years old and the percentage is 35.4% out of 79 respondents. Meanwhile, the minority of them from 61-60 years old and the percentage is 7.6% out of 79 respondents. Next, the data that obtained is gender. Most of the respondnents were male and the frequency is 60.8% out of 79 respondents. The minority of this background is female which the percentage is 39.2% out of 79 respondents.

In addition, the data that obtained was working experience. The information that obtained was, the majority of them had less than 5 years of experience. The percentage of this majority is 32.9% out of 79 respondents and the minority of them was from range 16-20 years of experience. The percentage of the minority is 10.1% out of 79 respondents.Lastly,the data obtained from this survey was the status of the respondent if they were living with family that had been positive to Covid-19 or not. Most of them were not living with family that had been positive fo Covid-19 and the percentage is 91.1% out of 79 respondents. But some of them were living with the family that had been positivw to Covid-19 and the percentage is 8.9% out of 79 respondents.

Table 3: Respondents' demography

Item	Category	Items	Frequency	Percentage (%)
1	Job Position	Malaysian Citizen Employee	74	93.7
		Malaysian Citizen Employer	5	6.4
		Total	79	100
2	Detailed Job Position	Owner	4	5.1
		Project Manager	12	15.2
		Engineer	28	35.4
		Architect	1	1.3
		Quantity Surveyor	9	11.4
		Safety and Health Officer	1	1.3
		Labor Worker	3	3.8
		Others	21	26.5
		Total	79	100
3	Stakeholder Specialization	G1 Contractor	2	2.5
		G2 Contractor	1	1.3
		G3 Contractor	4	5.1
		G4 Contractor	6	7.6
		G5 Contractor	1	1.3
		G6 Contractor	0	0
		G7 Contractor	23	29.1
		Developer	14	17.7
		Consultant	10	12.7
		Supplier	2	2.5
		Others	16	20.2
		Total	79	100

The data of respondents' demography gained as shown in **Table 3**. The data illustrations the demography of the respondents that include the respondents' job position, detailed job position and stakeholder specialization. Based on the data obtained from the survey, the table above show the frequency and the percentage for the respondents' demography. From this table, conclusion that can be made are the all of the respondents come from construction industry. The majority of them are the

Malaysian employee and position as an engineer. This is because the percentage that obtained from the survey are the highest for each category. For Malaysian citizen employee is 93.7% and for the engineer is 35.4%. In addition, it was found that most of the respondents are coming from G7 contactor. The percentage for this category is 29.1% out of 79 respondents.

3.2 Descriptive Analysis

This part introduce the analysis of the data collected through an online questionnaire survey which 79 respondents need to answer the level of impact of Covid-19 ranging from 1 to 5. 74 respondents consists of Malaysian employees and the rest 5 are Malaysian employers.

Table 4: Assessment on impacts of Covid-19 towards construction industry

Category	Statements from Google Form Survey	Frequency Levels of Impact					AI
		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	
Malaysian Employee	Feel safe during working	28	12	23	8	3	2.27
	Affect personal financial	6	9	23	12	24	3.53
	Need to find other ways to get financial resources	7	13	20	16	18	3.34
	Affect mental health	1	5	19	23	26	3.92
	Ever thought about quitting job	46	5	8	5	10	2.03
Malaysian Employer	Feel safe during working	0	1	1	2	1	3.60
	Affect personal financial	1	1	0	0	3	3.60
	Need to find other ways to get financial resources	1	0	1	1	2	3.6
	Affect mental health	1	2	2	0	0	2.20
	Ever thought about shut down company	1	1	1	1	1	3.00

From the the data obtained as shown on **Table 4**, the results were analyze and several main points were extracted which are, Covid-19 outbreak causes the unsafeness condition during working for employee and contra for employers. Mostly, employees still need to work as usual and keep in touch with colleagues to complete the works of the company. Meanwhile, the employers just need to direct the work and most of employers work at home during Covid-19 which makes them feels safe thus agree with the statement. This pandemic also affected financial the most as the maximum frequency obtained from both employees and employers absolutely agree with this statement. Thus brings to the new idea to find other ways in order to get extra financial resources.

This happens because Covid-19 has affected construction industry which bring difficulties for the company to gain more money and this statement was strongly agreed by 51 respondents which is the highest value of frequency on impact of Covid-19 towards the company. Next, Covid-19 pandemic impact mental health of the employees because of the struggles to survive in this hard situations. Majority of employees did not tend to quit job because of the difficulties to find a new opportunity of working in a new company during this outbreak. In addition, due to the outbreak, both employees and employers need to follow the SOP during working, but this had interrupt the effectiveness of work thus impacting the quality of company's projects.

Based on the **Figure 3**, the data average index (AI) for employer and employee were shown. By doing this, the conclusion that can be made from the figure below, the analysis shows that the data obtained did not differ much between employees and employers. From the figure the three data shows the not differ much which were affect personal financial, need to find other ways to get other financial resources and affect mental health. However, there were also data that show significant differences. The data were about the feeling during work and the mindset to quit job or shutting down company.

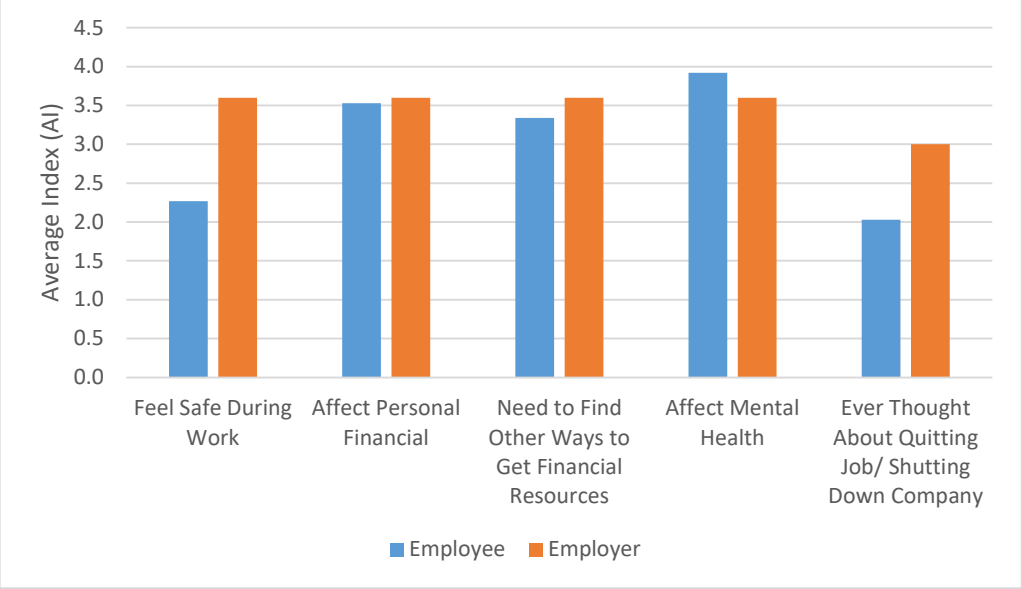

Figure 3: Average index (AI) for employer and employee of company

Table 5: Company likert's scale

Category	Statement from Google Form surveying	Scale					AI
		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	
Company	Sop set by MOH interrupt effectiveness during working	14	7	20	13	25	3.35
	Produce good project output quality	22	27	23	6	1	2.33
	Covid-19 affect construction industry	1	3	6	18	51	4.46

Table 5 shows the output towards the assessment of impact Covid-19 to the construction company in Malaysia. This is done by using Likert's type scale where the frequency of impacts and average index (AI) were both counted and calculated. Average index shows degree of impact following the number of scales from 1 to 5. From the data obtained, the highest AI is 4.46 which refers to Covid-19 affect the construction industry following with, the SOP set by Ministry of Health interrupt the effectiveness of workers during working. The projects output quality produced by one company also not high in quality due to Covid-19 as 22 respondents strongly disagree with the statement, outbreak can producing the good project quality.

3.3 Status of working throughout pandemic

Employees' status of working throughout pandemic were shown on **Figure 4** below. Majority of respondents have own work and also jobless during the pandemic. From this figure, the percentage of the majority is 78.4% out of 74 respondents. Meanwhile, the minority of them that become jobless is 21.6% out of 74 respondents. This shows that pandemic can give a negative impact for construction employees' job. Some of respondents have work but have a problem to handle. Meanwhile some of respondents lose their job because of this pandemic. As a result, the minority of them became jobless and difficult to find another job in this pandemic.

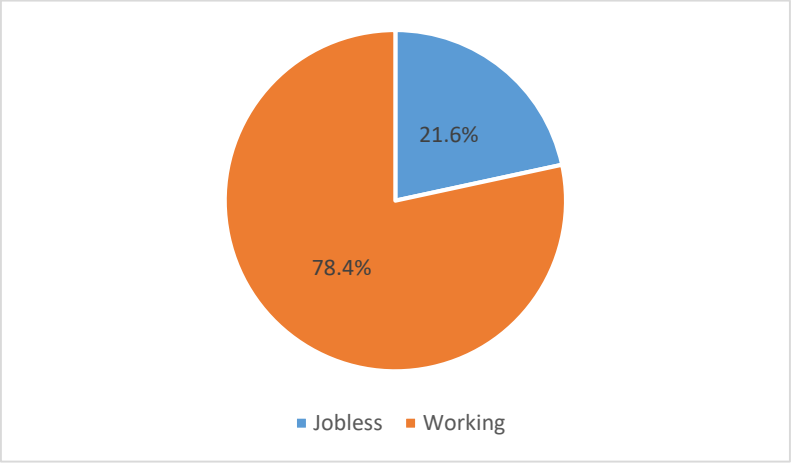

Figure 4 : Employee's working status during Covid-19 outbreak

3.4 Affect of Covid-19 towards construction industry

Based on the data obtained, **Figure 5** below shows that the employees' salary deduction from employer. Most of the respondents' salary did not been deducted during the pandemic, but some of have been deducted. The percentage of the majority that answered 'No' is 64.9% out of 74 respondents. Meanwhile, the minority of them is 35.1% out of 74 respondents. This will lead to critical problems in the construction world if appropriate action is not taken immediately. The responsible party must play an important role and take proactive action so that the construction industry, which is also one of Malaysia's largest economic resources does not going backwards.

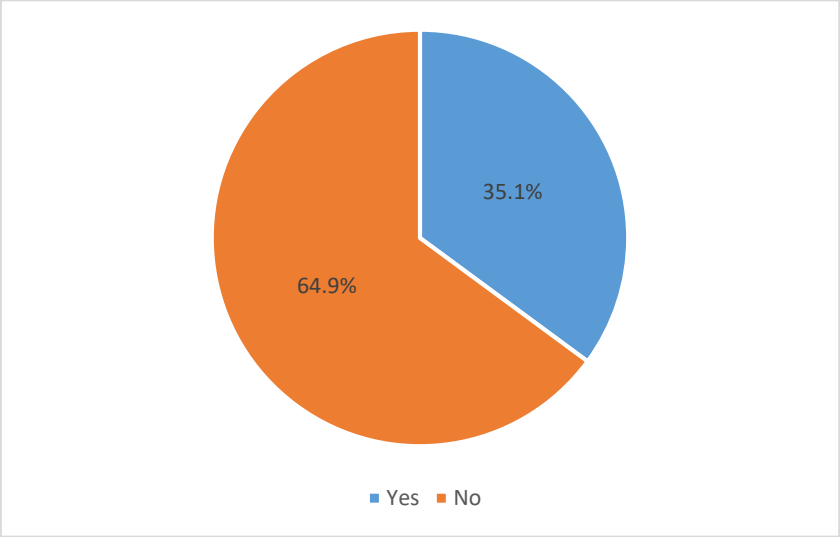

Figure 5: Employee's Salary Deducted or Payment Delayed

3.5 Style of working during Covid-19 pandemic

During Covid-19 outbreak, a lot of initiative were taken to impove the styles of working for construction industries. This actions were made to prevent Covid-19 to spread widely to the workers .

Table 6 : Style of working during Covid-19 pandemic

No	Category	Style of working	Percentage (%)
1	Employee	Work from home	29.7
		Work usual according SOPS	21.6
		Work in shift according SOPS	39.2
		Not working	5.4
2	Employer	Work from home	40.0
		Work usual according SOPS	20.0
		Work in shift according SOPS	40.0

Based on **Table 6**, the table shows the style of employer and employee working during the Covid-19 pandemic. From the table, the conclusion that can be made is the employee and the employer mostly work on shifts according to the SOPS that had been made of the government. This also can be seen at the **Figure 6** below because the graph show that similiraity among the work in shifts parts.

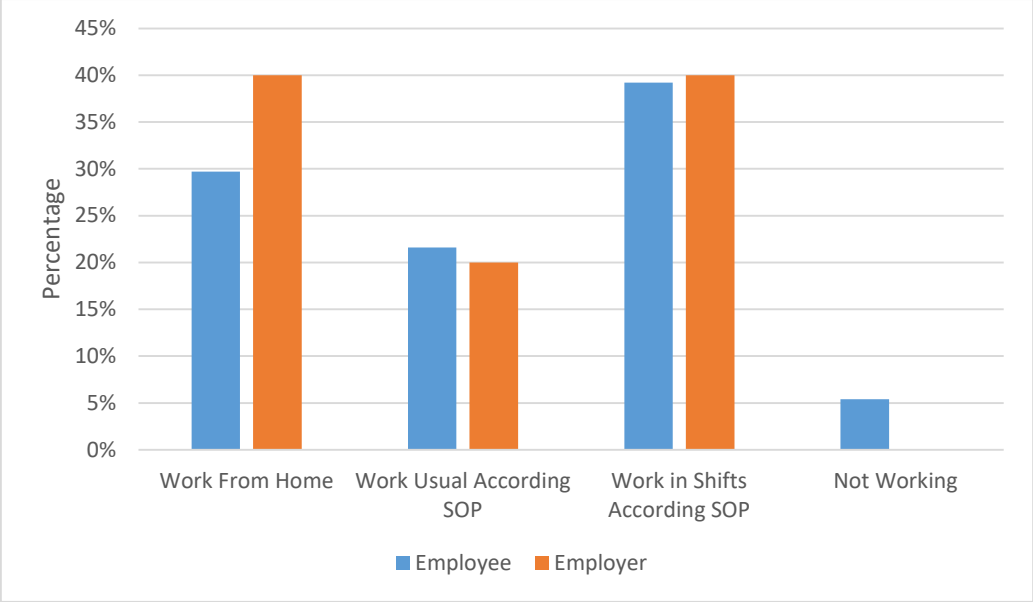

Figure 6 : Analysis for style of working style during Covid-19

3.6 Most crucial phase by company during Movement Control Order (MCO)

Based on the **Figure 7** below, the most crucial phase was on Movement Control Order (MCO) 1.0. This is because the data recorded showed that 48.1% out of 79 respondents and made it as the majority of this part. This followed by the Movement Control 3.0 that had been announced after the MCO 2.0 did not show any encouraging reduction in Covid-19 cases in Malaysia. Therefore, most of them were affected by the MCO 3.0 after the MCO 1.0.

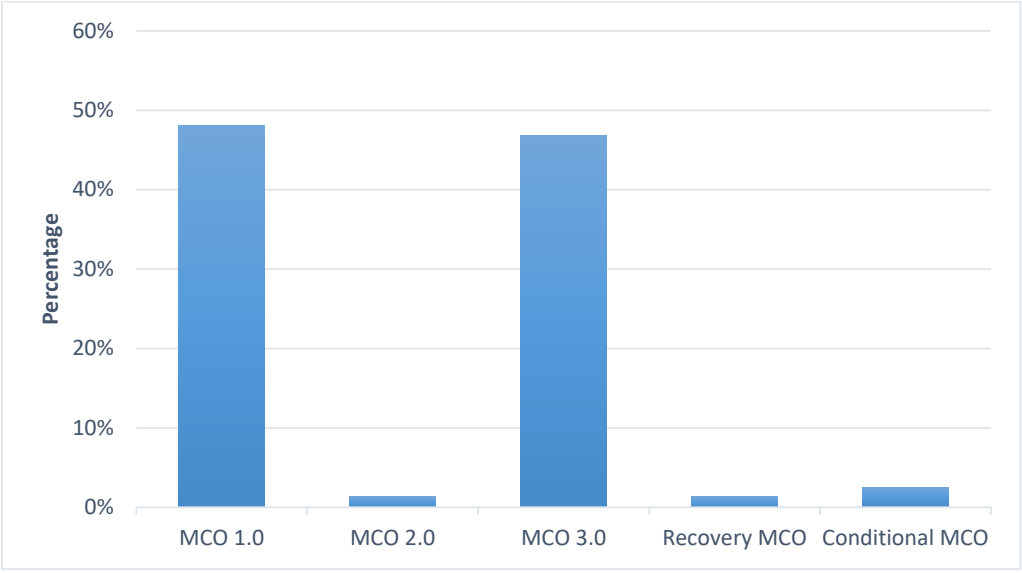

Figure 7 : Crucial phase during MCO

Based on the **Figure 8** below, there were some company need to lay off their employees in order to make sure that their business did not affected. To the crucial phase, maybe during the MCO 1.0, certain company were able to survived, but after the MCO 3.0, the company need to do other ways by dismissal their employee in order to ensure his company is out of scope.

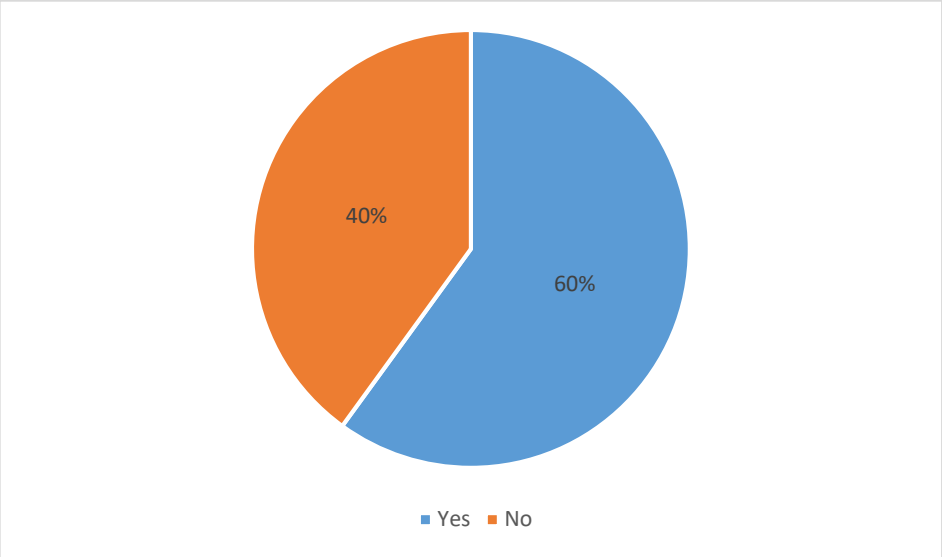

Figure 8: Lay off employee by company

3.7 Affected company's timeline

Based on the **Figure 9** below, the data that affects the company timeline was shown. The factors that affects company's project timeline were the project need to be fully stopped or delayed. From the figure below, most of the project need to be fully stopped because of some reasons. This made it as the main factor why it affects the company's project timeline.

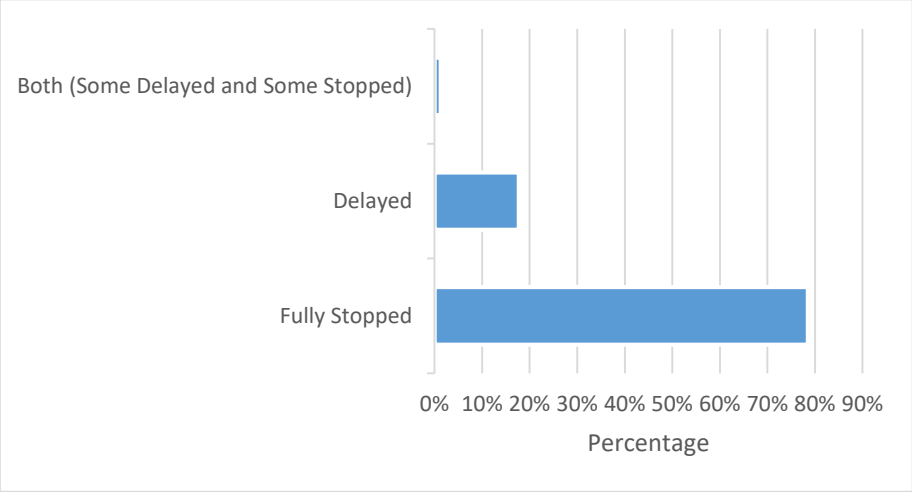

Figure 9: Company's project timeline affected

The amount of workers that allowed to work at a time by company also the main factor of the affects of the company's project timeline. If the number of employees is not enough, it will inevitably affect the preparation of a project and take a long time to complete an existing project. Thus, the project will be delayed and caused the client to feel dissatisfied and decide to stop the existing project. This can be proved by **Figure 10** below which shown the highest range of workers are below 40% in a company.

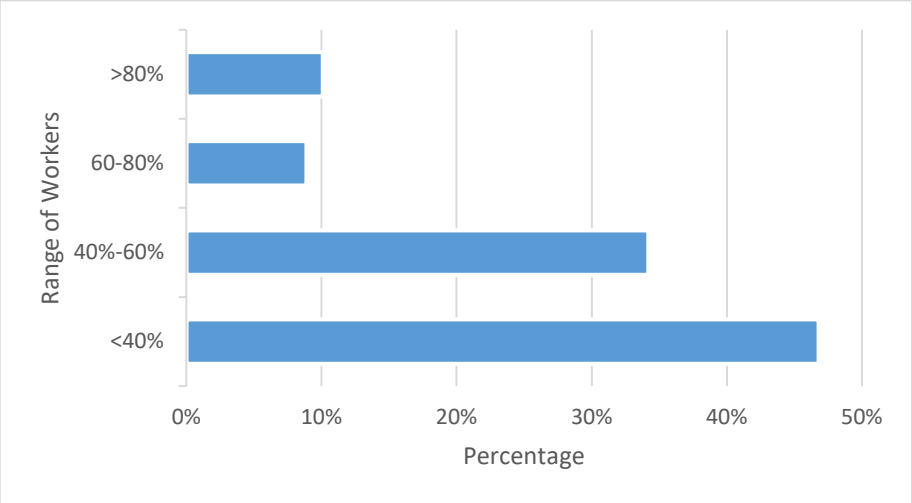

Figure 10 : Workers that allowed by company at a time

4.0 Conclusion and Recommendation

The purpose of this research paper is to study the effect of the COVID-19 pandemic towards employers and employees in the construction industry in Malaysia. This disease can cause the construction industry cannot be carried out or delayed will cause a shortage in terms of employment opportunities because the movement on site is very limited and only allowed to operate on a limited quantity of workers according to MCO. In addition, if there are some cases that happened in the construction field, the site need to be closed for sanitaze plus the employee and employer need to have RTK-antigent test or Covid-19 Swab Test for each of them.The proposal to reduce the negative effects of this disease is that the responsible party must take action by creating new ideas to deal with the case of the covid-19 spread so that the construction industry in Malaysia is not affected by this disease by doing more research on this disease. In addition, responsible parties such as the government should provide vaccines to employers and workers in the construction industry so that the disease can be reduced and employers and employees do not have to worry about doing their daily work without have anxiety.

The consequences of the COVID-19 pandemic on the building industry, either private or public, were investigate and analysed in this article. Statically, suspension and loss of jobs, overrun of time, cost overrun and financial effect have been proved to be the most significant variables. The surveys showed that all project stakeholders and the personnel had a substantial economic influence. The project developers work hard to minimise the impact by a reduction in workforce on site and the promotion of off-site activities to prevent and limit the spread of infectious viruses. Because the contractual conditions are not compliant and the project is suspended and the material price suddenly fluctuates, contractors are also unavoidable to deal with legal difficulties. These unexpected effects are undoubtedly dangerous for maintaining the development of the project. In addition, projects that continue to be carried out because medical facilities need to be expanded urgently are also appropriate for many problems, including employees' scarcity, increased material prices and shortage of supplies and supply chains. The results in this paper provide an insight into the consequences of the unanticipated and uncontrolled pandemic for the construction sector stakeholders and policymakers.

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