Factors Associated to Decision-Making Behavior for COVID-19 Vaccination among Factory Workers in Navanakorn Industrial Estate of Thailand

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Abstract:- COVID-19 vaccines are providing the great protection from serious illness and death from the coronavirus-2019. This study was to evaluate the factors related to decision making behavior for COVID-19 vaccination among factory workers in Navanakorn industrial estate. The 385 samples were selected by using purposive random sampling between August to October 2021. The participants were aged range between 18-59 years old by voluntary and can communicate in Thai language. The all of variable and outcomes were selected by using the online-structured questionnaire consisted of 5 parts with the IOC between 0.8-1.0. The Cronbach's alpha coefficients was reported more than 0.90. The data analysis was used descriptive statistics and Chi-square test. The result showed that the majority of the samples had high level of knowledge on COVID-19 vaccination (93.8%). They mostly had moderate level of attitude on COVID-19 vaccination (52.2%) and high level of decision-making behavior for COVID-19 vaccination (60.8%). Factors which remained significantly associated with decision-making behavior for COVID-19 vaccination were education level, government vaccine allocation, knowledge and attitude on COVID-19 vaccination (p<0.05). The healthcare sector can use the data to plan raise awareness of decision-making behavior for COVID-19 vaccination for increasing the proportion of vaccination.

Keywords:- Vaccinaion; Factory Woker; Coronavirus-2019.

I. INTRODUCTION

The coronavirus-2019 disease was firstly identified in Wuhan, China and continually effect to socially and economically across the world [1]. The vaccine is approved for key preventive measures in slowing the distribution of COVID 19 and reduce its impact on those effect by the corinavirus-2019 [2]. The COVID-19 vaccination is an important policy to pause the pandemic [3]. The public health and social measures were composed of contact tracing, isolation policy, surveillance and individual protection practice including staying at least 1 meter away from other people, using mask when stay with everyone, averting impurely ventilated building, staying home if illness, cleaning your hands continuously with water and alcohol jell to breaking the chain of transmission infectious [4]. The World Heath Organization reported that the morbidity mortality rate of COVID-19 has been increasing, globally reached 281,808,270 positives infected of COVID-19 and 5,411,759 of deaths on December, 2021. As of 2 January 2022, a total of 8,693,832,171 vaccine doses have been administered [5]. In Thailand, the data reported that the total case of COVID-19 have been 2,206,713 cases, including 21,656 of death on December, 2021 and a total of population have 104,524,571 of vaccine doses injection [6]. The pandemic has affected through to society and the economy [7]. There are increasing of unemployment proportion, decreased spending, and GDP in most countries is expected to sharply drop [8]. Many countries are expected to suffer a recession in 2021 [9]. Definitely, the vaccination can control the distribution of pandemic. The influence of COVID-19 vaccination was belonged on many factors. There were included efficacy of the vaccine, management of vaccine allocation, manufactured, and delivered, and how many people get vaccinated. In general, the COVID-19 vaccination is very effective to prevent the severe symptom, hospitalization and death from the disease [10].

There are many COVID-19 vaccines recommended by WHO [11]. The first vaccination was implemented starting in December 2020. The vaccination was assessed to certain for acceptable with quality standards, secured, and effective for applying with clinal treatment [12]. There have consisted of Pfizer, AstraZeneca, Moderna, Sinopharm, Sinovac, Johnson & Johnson, Bharat and etc. WHO recommended that simultaneously vaccination was localized, the people at highest risk should receive the vaccination. They were included the people who are prone to serious illnesses if they are infected (older persons, people with existing health conditions), healthcare provider, pregnant women. So, World Health Organization suggested that they are also prioritized to receive the vaccine [13]. Vaccines against of COVID-19 has permitted by the WHO, it is safe for most people 18 years old and older, auto-immune disorders person. These conditions include chronic diseases [14]. After they were got the COVID-19 vaccination, it can keep taking precautions to protect yourself, family, friends and anyone else you may come into contact. Finally, COVID-19 vaccination is highly effective, but some people will still get ill from COVID-19 after approved by vaccine [15].

Due to the hesitation of vaccines in different populations, it is a very dynamic concept. Thus, it becomes a major challenge in emergency situations such as the global COVID-19 pandemic [16]. Mass vaccinations for COVID-19 are key to achieving herd immunity. Mass vaccinations for COVID-

19 are key in achieving herd immunity. However, vaccine hesitation is continually to impede herd immunity [17]. This research was aimed to investigate the factors related with decision-making behavior for COVID-19 vaccination among factory workers in Navanakorn industrial estate of Thailand by instigating the PRECEED-PROCEED Model [18] to establish the conceptual framework of the study. The finding can apply to implement the strategy policy to raise awareness for receiving the vaccination to prevent and control the pandemic situation. So, the COVID-19 vaccination is an important tool to prevent and control the COVID-19 infectious. The most hopeful way to curb COVID-19 could be universal vaccination to achieve the immunity.

II. METHODOLOGY

This study was descriptive cross-sectional study aimed to investigate the factors associated to decision making behavior for COVID-19 vaccination among factory workers in Navanakorn industrial estate of Thailand. The study population are factory workers who were operated in Navanakorn industrial estate of Thailand. The 385 subjects were selected by purposive random sampling based on the inclusion criteria between August to October 2021.

A. Population and samples

The population in this study were placed on Navanakorn industrial estate. The participants were both of male and female aged range from 18–59-year-old, can communicate in Thai languages and participated by voluntary. The participants of this study were selected by using purposive random sampling. A sample size of this study was calculated by using Cochran formula [19]. The 385 cases were obtained to assess structured online-questionnaire. The researchers were announced the participants about the study protocol and the risk after they participated with the study.

B. Instrument of this study

The assessment tool of this study was consisted of 5 parts of online questionnaire form which developed by using PROCEED Model [18] and the literature review related to COVID-19 vaccination. The IOC values were reported by peer from 3 experts as between 0.8-1.0. The reliability was tested in factory worker in the same characteristics with the samples and reported with Cronbach's alpha coefficients had more than 0.90, it was receivable of tool. The detail of the instrument can explore as follows:

Part I: The baseline characteristics questionnaire: This part was 9 questions which aimed to record the general characteristics data such as age, sex, education level, marital status, health problem, monthly income, health insurance, living arrangement, government vaccine allocation.
Part II: The knowledge of COVID-19 vaccination questionnaire; this part was 21 questions with raged from 0-21 scores. Each question has 2 choices; "yes" or "no". When answer "yes", the score 1 was given, while score 0 was given in the answer "no". The scores were separated in 3 level based on Bloom theory [20] as follows; the scores 0-11 points represented low level of knowledge on COVID-19 vaccination, scores 12-16 points represented moderate level of

knowledge on COVID-19 vaccination, and 17-21 points represented high level of knowledge on COVID-19 vaccination.

Part III-V: The attitude, enabling factor, and decision-making behavior of COVID-19 vaccination form; the total of this part was 12 questions with ranged from 12-36 scores. This part was the Likert scale questions. Each question has 3 choices; "Much" or "Moderate" or "less". When answer "Much" in a positive question, the score 3 was given, while score 2 was given in the answer "Moderate "and score 1 was given in the answer "Less". On the other hand, in a negative question, a score was indirectly given. The scores were mentioned in 3 level based on Bloom theory [20] as follows; the scores less than 60% represented low level, the scores between 60-80% represented moderate level, and the scores more than 80% represented good level.

C. Ethical Consideration

The authors were announced the samples about the study risky with study and describe the protocol of the research before they singed a consent form and collected data by using online-questionnaire form.

D. Data Collection

The data collection was implemented as follows: 1) The researcher was requested an introduction letter from our organization to send to the president of sub-district administrative organization, to explain the objectives of this study and asked for permission for collecting data. After, we have allowed the study, the researcher will be started to implemented the data collection. 2.) The researchers were trained all of interviewer to use the instrument for evaluating in all of factors and outcome parameter 3.) The researchers were collected data by meeting the subject and introducing themselves with online platform to describe the study objectives and ask for participation in this study after they joined with the study and they could refuse or withdraw from the study at any time. 4.) The researchers were collected data by using online form and the data collection time was approximately 20 minutes per subject 5.) After, the samples were completely answered the online questionnaires, the researcher checked the completeness and thanked them for cooperation. Then, recheck before analyzing data by statistical methods.

E. Statisticla Analysis

The descriptive statistics were selected to describe the general characteristics and all of factor and variables including percentage, mean, standard division and range. The relationship between the related with decision-making behavior for COVID-19 vaccination were analyzed by Chi-square test. The significant level was defined at 0.05.

III. RESULTS

The factory worker in this study had 385 participants who were participated and measured by using the online questionnaire form. From the analysis of the general factors of the samples, the results showed a total of participants were male more than female)57.7% and 42.3%, respectively(. They

mostly had secondary education)56.1%(, single status)62.3%), having health insurance)99.0%), no health problem)89.6%) with an average age of 30.81± 7.87 ranged from 19-54 years. The majority of the samples were ranged of monthly income <15,000 Baht with an average of 18,480± 9,998. The majority of factory workers were stayed at dorm/apartment (54.0%), unsystematic and insufficient of vaccine allocation from government (91.2%).

TABLE 1. The number and percentage of subject by general characteristics of all participants in this study (n= 385)

Variables	Number	Percentage
Age (Year)		
Mean± SD.=30.81±7.87, Range= 19-54 years		
Gender		
Male	222	57.7
Female	163	42.3
Education level		
No education	5	1.3
Primary education	5	1.3
Secondary education	216	56.1
High Vocational Certificate	81	21.0
Bachelor or higher	78	20.3
Marital status		
Single	240	62.3
Married	126	32.7
Divorced/Widowed/Separated	19	4.9
Health problem		
No	345	89.6
Yes	40	10.4
Monthly Income		
< 15,000 Thai Baht	200	51.9
≥ 15,000 Thai Baht	185	48.1
Mean± SD.=18,480±9,998 Baht		
Health insurance		
Yes	381	99.0
No	4	1.0
Living arrangement		
Dorm/Apartment	208	54.0
Rental house	38	9.9
House/Condominium	139	36.1
Government vaccine allocation		
Appropriately allocation	34	8.8
Unsystematic/Not enough	351	91.2

According to analysis of factors related to decision-making behavior for COVID-19 vaccination among factory workers in Navanakorn industrial estate of Thailand. They mostly had high level, followed moderate and low level on knowledge of COVID-19 vaccination)93.8%, 4.7% and 1.6%, respectively(. The scores were ranged from 0-21 scores with an average of 19.57 and S.D. of 2.50. In addition, they mostly had moderate level)52.2%(, followed by low and good level on attitude of COVID-19 vaccination)46.0% and 1.8%, respectively(. The score ranged from 12-36 scores with an average of 27.8)S.D. = 3.77(. The majority of the samples had

high level)74.0%(, followed by moderate and low level of enabling factors for COVID-19 vaccination)23.4% and 2.6%, respectively(. The score ranged from 2-30 scores with an average of 26.03)S.D.=3.98(Furthermore, the majority of participants had high level (60.8%(, followed by moderate and poor level of decision-making behavior for COVID-19 vaccination)36.6% and 2.6%, respectively(. The score ranged from 8-24 scores with an average of 20.42)S.D.= 3.26(.

From the analysis of association between all factor and decision-making behavior for COVID-19 vaccination, it was found that educational level (X^2=19.612, p=0.043), government vaccine allocation (X^2=8.499, p=0.037), Knowledge of COVID-19 vaccination (X^2=12.60, p=0.013), social support (X^2=5.961, p<0.001) were significantly associated with decision-making behavior for COVID-19 vaccination of factory workers in Navanakorn industrial estate of Thailand.

TABLE 2. The number and percentage of subjects by the level of factors associated to decision-making behavior for COVID-19 vaccination among factory workers in Navanakorn industrial estate of Thailand (n= 385)

Variables	Number	Percentage
Knowledge of COVID-19 vaccination		
Low (0-11 scores)	6	1.6
Moderate (12-16 scores)	18	4.7
High (17-21 scores)	361	93.8
Mean± SD.=19.57±2.5, Range= 0-21 scores		
Attitude of COVID-19 vaccination		
Low (12-20 scores)	177	46.0
Moderate (21-28 scores)	201	52.2
Good (29-36 scores)	7	1.8
Mean± SD.=27.8±3.77, Range= 12-36 scores		
Enabling Factors for COVID-19 vaccination		
Low (10-17 scores)	10	2.6
Moderate (18-24 scores)	90	23.4
High (25-30 scores)	285	74.0
Mean± SD.=26.03±3.98, Range= 2-30 scores		
Decision-making behavior for COVID-19 vaccination		
Poor (8-13 scores)	10	2.6
Moderate (14-19 scores)	141	36.6
High (20-24 scores)	234	60.8
Mean± SD.=20.42±3.26, Range= 8-24 scores		

TABLE 3. Factor associated to decision-making behavior for COVID-19 vaccination among factory workers in Navanakorn industrial estate of Thailand. (n= 385)

Variables	df	X^2	p-value
Gender	1	2.485	0.777
Marital status	2	2.033	0.258
Educational level	4	19.612	0.043*
Monthly Income	1	2.947	0.630
Health problem	1	1.218	0.314
Health insurance	1	4.146	0.181
Government vaccine allocation	1	5.236	<0.001*
Living arrangement	2	6.152	0.065

Knowledge of COVID-19 vaccination	2	12.60	0.013*
Attitude of COVID-19 vaccination	2	5.961	<0.001*
Enabling Factors for COVID-19 vaccination	2	4.397	0.079

REMARK: Data were analyzed with Chi-square test
*Statistically significant at the 0.05 level, p-value<0.05.

IV. DISCUSSION AND CONCLUSION

The study design was the descriptive study. They mostly had high level of decision-making behavior for COVID-19 vaccination of factory workers in Navanakorn industrial estate of Thailand (60.8%). According to the factor related with decision-making behavior for COVID-19 vaccination were education level, government vaccine allocation, knowledge and attitude about COVID-19 vaccination (p<0.05). The result is consistent with the study of K., Chuenjai, B., Punturaumporn [21] whose studies factor affecting with the decision to vaccinate against coronavirus of the population in Bangkok. The results showed that the majority of samples were female. The results showed that the level of opinions of the overall motivation factors for disease prevention were at very high level of their opinions and the level of opinions of the overall the decision to vaccinate against Coronavirus were at very high level of their opinions. The hypothesis test found that the population in Bangkok with different age, education level, occupations and average monthly income has different effects on the decision to vaccinate against Coronavirus and the population in Bangkok with different gender does not affect the decision to vaccinate against Coronavirus. The motivation disease prevention factors were perceived the severity of the disease and effectiveness expectations affect the decision to vaccinate against Coronavirus. Similarity with B., Kajhonlit, B., Panthuramphorn [22] whose studies factors affecting the decision making on Covid-19 vaccination among population in Samutprakarn province. The results of the study revealed that personal factors of the population in Samutprakarn province of different gender, age, education level, and occupation have no different in decision making on Covid-19 vaccination is not different. While, the attitudes toward Covid-19 disease, Covid-19 vaccine's efficacy, and Covid-19 vaccine's safety affect the decision making on Covid-19 vaccination among population in Samutprakarn of Thailand. In addition, A., Inthacharoen, et al. whose study factors influencing preventive behavior towards coronavirus disease 2019 among people in Khohong Town Municipality, Songkhla Province. The results revealed that most of respondents (88.45%) had a good level of preventive behavior of Coronavirus disease 2019. Demographical factors including gender, marital status, education level, career, and monthly income, knowledge about Coronavirus, perceived susceptibility, perceived severity and gained information could together explain the variance of respondents' preventive behavior towards Coronavirus disease 2019 with 31.1%.

The results may be explained that firstly, although the general population's understanding and knowledge of the Covid-19 virus is still high level, but the attitude with Covid-19 vaccination is low and moderate level and the educational level is consistent with the decision making of Covid-19 vaccination which the higher education has more proportion of vaccination approved. The movement allocation of vaccination is related with the decision of population. Secondly, there is still uncertainty regarding the virus's origin, its symptoms, how long immunity lasts, and whether the virus will evolve to be less deadly or will mutate, rendering the vaccines ineffective; this is in addition to the conflicting news about the virus and its vaccine. This uncertainty could confuse people and increase their reliance on recommendations from others, such as family members, biologists, doctors, or governments [23]. Regardless of the progress in the public health distribution of the vaccinations, there are individuals who will perceive vaccination as unsafe and/or unnecessary. Vaccine hesitancy is defined as the delay in acceptance or refusal of a vaccine despite their availability to the public. WHO identified confidence, complacency, and inconvenience in accessing vaccines as some of the key reasons underlying vaccine hesitancy. Several psychological factors are demonstrated to influence COVID-19 vaccine hesitancy. These include: low attitude with COVID-19 vaccination and disappointment with government administrative of COVID-19 or mistrust of authority and the attitudes and behavior of others (family, friends and health professionals) [24]. There are so much of the population who were lived in the Navanakorn industrial estate is large and congestion in both living and working Therefore, vaccination is necessary to control the outbreak. Conclude, adequate COVID-19 vaccination coverage is the guarantee of herd immunity.

V. LIMITATION AND RECOMMENDATIONS

The study design cannot describe the cause-relationship. Therefore, a prospective or retrospective study would be useful to apply for future research. The multiple logistic regression should assign to assess the strongly relationship and explore the effect in order to better understand the outcome in the samples. The recommendation of the study, the health staff and local administrative can integrate the factors associated with the decision-making behavior for COVID-19 vaccination to plan and impose a policy for raising awareness to receive the COVID-19 vaccination because the vaccination is the best practice to prevent the infection from coronavirus-2019. For the next study design, the qualitive study will help to understand the cause and should add more independent variables to explore the relationship between factor and outcome such as the price of vaccines, the government's policy to encourage vaccination, the access to vaccines of the population.

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