

RESEARCH ARTICLE

THE RELATIONSHIP BETWEEN AGE GROUPS AND KNOWLEDGE AND UNDERSTANDING OF **COVID-19 VACCINE**

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Abstract

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Coronavirus disease 2019 (COVID-19) is still an ongoing issue in the New Normal world. As COVID-19 is a human-to-human transmission disease, the viruses spread widely, and many people got infected. There are several preventative measures used to protect an individual from this situation, including vaccination. Thus, more vaccine candidates have been provided to generate a specific immune response against the disease-causing agent, and are prepared. Additionally, not all vaccine candidates are suitable for each individual. The main purposes of this study were to evaluate and determine the knowledge and understanding of the COVID-19 vaccines and the relationship between age groups and Thai citizens. To test whether the two aforementioned variables correlate, we conducted a cross-sectional survey through an online platform, Google form. Four hundred and Ten participants completed the survey. To determine the correlation, we used Statistical Product and Service Solution version 22.0 (SPSS) for data analysis. Pearson's correlation test revealed that there is no significant correlation between age groups and knowledge and understanding of COVID-19 vaccines. Although we did not find any correlation, we think that there may be other factors affecting people's knowledge about the COVID-19 vaccines such as the sudden awareness due to the new pandemic outbreak and the straightforwardness of our online questionnaire. Since most people are now facing the third ripple of COVID-19 crisis, there might be a higher consumption rate of COVID-19 vaccine news and the majority of seniors (aged above 60) tend to reject answering the online questionnaire which significantly reduced our sample size.

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Introduction:-

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by a newly discovered Coronavirus, Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Coronavirus is a large family of viruses that cause illnesses in animals and humans (Aaron Kandola, 2020). In the case of humans, many types of Coronaviruses can cause respiratory diseases from the common cold to more severe diseases such as SARS (Severe Acute Respiratory

Syndrome) and MERS (Middle East Respiratory Syndrome). Coronaviruses are common in certain species of animals, such as cattle and camels. Although, the transmission of coronaviruses from animals to humans is rare (Aaron kandola, 2020). The Coronavirus can be spread from person to person, and viral particles are released into the air when an infected person breathes, talks, laughs, sings, coughs or sneezes. Larger droplets may fall to the ground in a few seconds, but tiny infectious particles can linger in the air and accumulate in indoor places, especially where many people are present, and ventilation is poor (World Health Organization, 2020).

The virus spread throughout the world and affected many countries, and Thailand is the first foreign country with the first imported case. On January 31st 2020, the Ministry of Public Health, Thailand reported the first imported case of lab-confirmed novel coronavirus from Wuhan, China. As an ongoing pandemic emerges nationwide, several preventative measures are used to protect an individual from this COVID-19 situation. Firstly, people are encouraged to wear a facial mask that covers their nose and mouth. Secondly, they should avoid touching their eyes, mouth and nose before washing hands. Next, one should refrain from going to crowded places or poorly ventilated indoor spaces; if necessary, they should stay 6 feet apart from others. Getting a COVID-19 vaccine is another effective way to protect individuals from the infection and to alleviate the severity of symptoms once a person is infected (National Center for Immunization and Respiratory Diseases, 2021).

Normally, vaccine development lasts for 10 to 15 years, while COVID-19 vaccines become available in merely a year. This, as a result, has raised concerns to the public about vaccine safety. The compelling reason why the process went so fast is because the modern scientific tools are becoming more advanced than old ones. The usual barriers and delays during vaccine research had been removed and reduced because of the worldwide effort (Kara Gavin, 2020). Moreover, many people have volunteered for clinical trials of the vaccines, which helped shorten the time spent on acknowledging answers of the safety and protection (Kara Gavin, 2020).

Prior to the current pandemic, researchers have been working for years to develop novel technologies for vaccine production. According to GAVI, the Vaccine Alliance, there are more vaccine candidates simultaneously developed for COVID-19 than ever before for an infectious disease. All of them are trying to achieve the same thing – immunity to the virus; they do so by stimulating a response to the antigens, also known as active components that generate a specific immune response. In the case of COVID-19, the antigen is typically the characteristic spike protein found on the surface of the virus that facilitates human cell invasion. Currently (May 2021), there are many approaches for vaccine development, and vaccines can be broadly classified by how the antigens are prepared. There are four main categories of vaccines in clinical trials: whole virus, protein subunit, viral vector, and nucleic acid, though they may be categorized differently depending on the organizations (GAVI Alliance, 2021).

The whole protein vaccines, also known as inactivated vaccines, use a weakened (attenuated) or deactivated form of the pathogen (The U.S. Department of Health and Human Services (HHS). These vaccines contain viruses whose genetic material has been destroyed by heat, chemicals, or radiation, so they cannot infect human cells and replicate, but can still trigger a protective immune response (GAVI Alliance, 2021). Examples of inactivated vaccines developed for COVID-19 are Sinovac (CoronaVac) and Sinopharm (BIBP-CorV). The "Subunit" vaccines inject only some specific pieces of the pathogen to stimulate immune responses. They are considered very safe, since those selected pieces utilized in the vaccine are incapable of causing disease. However, viral vector-based vaccines differ from most conventional vaccines. They use what is called the vector, and when injected into the body, harmless pieces of COVID-19 causing viruses known as spike proteins are then created. They are simply noticed by the immune system; therefore, antibodies are produced to intercept the diseases. Examples of a viral vector vaccine are Oxford's AstraZeneca, Johnson & Johnson and Sputnik V. Lastly, the "Nucleic acid" vaccines, such as BNT162b2p (Pfizer-BioNtech), use a new technological method to trigger immune responses. Genetic materials of pathogens are utilized in the vaccine, and once injected into the host cells, it is read by a protein-making apparatus that produces antigen to prompt immune responses.

Having the knowledge and understanding regarding vaccination will be crucial in order to end the pandemic, since vaccines are one of the most important public health measures and most effective strategies to protect the population from COVID-19. According to the Thai Health Literacy Survey (THL-S) in 2019, elderlies (aged above 60) usually have insufficient knowledge of health literacy (Wimon Roma, 2020). Another study on Age Differences in the Effects of Domain Knowledge on Reading Efficiency stated that age plays an important role for participants in performing high level scores in knowledge test, and ability to recall a series of short passages which in turn suggest that ability to acquire knowledge may be correlated to the age group of the participants (Lisa Miller,2009). Because

this previous evidence showed that age may influence the general perception on vaccination, the goal of this study is to examine the correlation between age groups and knowledge/understanding of the COVID-19 vaccine which is conducted under the hypothesis that Thai's early and middle-aged adults (19 to 39 and 40 to 60, respectively) will have more knowledge and understanding in COVID-19 vaccine than seniors (above 60). In contrast, elderlies aged above 60 will have substantially lower knowledge about vaccines compared to others. The COVID-19 vaccine knowledge may play vital roles for choosing vaccines as a particular brand of vaccine may not be suitable for everyone. We hope that this study will be able to help authorities and institutions provide and announce specific information to not only certify but also educate those who lack literacy understanding of vaccines.

Methodology:-

A questionnaire containing 25 general questions was designed to capture some of the main dimensions of the correlation between age groups and knowledge and understanding of COVID-19 vaccines. It was anonymously conducted as an online survey sent to random participants. Our questionnaire contained multiple choices with 6 main topics including (1) benefits of COVID-19 vaccine, (2) types of COVID-19 vaccine, (3) vaccine immunity, (4) who should be vaccinated, (5) COVID-19 vaccine safety, (6) vaccine production and vaccine transportation. Questions that had Item-Objective Congruence (IOC) scores higher than or equal to 0.5 were inspected and revised by three specialists. Finally, the internal reliability of the questionnaire was determined using Cronbach's alpha to ensure that the survey results were reliable and Cronbach's alpha value must be at least 0.8. There were two sections in the questionnaire: (1) Personal information and (2) knowledge and understanding of COVID-19 vaccines. In terms of sampling procedure, a convenience sampling method was taken in this study. The number of participants was 410, consisting of 155 adolescents (13-18 years old), 140 individuals in early adulthood (19-39 years old), 99 individuals in middle adulthood (40-60 years old), and 16 seniors (above 60 years old).

Results:-

Table 1:- General information about participants (n=410).

P	articipants' demographic information	Frequency	Percentage (%)
	Male	129	31.5
	Female	276	67.3
Gender	Prefer not to say	5	1.2
	13-18	155	37.8
	19-39	140	34.2
	40-60	99	24.1
Age	Above 60	16	3.9
	Uneducated	1	0.2
	Elementary Education	1	0.2
	Junior High School	4	1
Education level	Senior High School / Vocational Certificate	168	41
	High Vocational Certificate	8	2
	Bachelor's Degree	166	40.5
	Master's Degree	56	13.6
	Doctor's Degree	6	1.5
	Currently Studying	208	50.7
	Farmers	3	0.7
	Merchants	37	9
	Civil Servant	35	21
	Government-owned Company	62	15
	Private Company	9	2.2
_	Housewife	5	1.2
Career	Others	1	0.2
	Less than 10,000 baht	189	46.1
	10,001 - 20,000 baht	37	9.0
	20,001 - 50,000 baht	117	28.5
Salary	50,001 - 99,999 baht	45	11

		More than 100,000 baht	22	5.4
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Table 2:- Descriptive Statistics (Mean and Standard Deviation).

	Mean	Std. Deviation	Ν
Score on the online survey (out of 25)	18.32	3.37	410

Table 1 illustrates the general information about our participants. The majority was teenagers (aged 13-18) with 37.8%. This was followed by early adults ages (18-39) and middle age (aged 40-60) with 34.2% and 24.1%, respectively, while elderlies (aged above 60) were only at 3.9%. Moreover, there were more participants who were female (67.3%) than male (31.5%). Lastly, just above 50 percent of our participants were still studying in schools and universities.

Table 2 illustrates the mean and the standard deviation from 410 participants. The mean of the score was 18.32, while its standard deviation was rounded up to 3.37. The highest score was 25 out of 25 points; however, the lowest was 4 out of 25 points.

Discussion:-

Our results from the student's t-test showed that age may not have an impact on the knowledge and understanding of the COVID-19 vaccine in Thai citizens at all; the mean scores of each age group are very close to others. More than 70 percent of the test takers scored above average. This could be due to the fact that Thailand is facing a COVID-19 vaccine shortage (BangkokPost, 2021), which possibly urges Thai people to take interest in this issue. It's also crucial to assume that the overall test used in this research to determine the knowledge and understanding is too straightforward, and the Item difficulty index indicated that the test was easy, with 21 out of 25 items classified as easy, 3 items as medium difficulty and 1 as hard (Analyzing Item Difficulty and Discrimination, 2020). Hence, in order to be determined as having above average knowledge and understanding, individuals must score more than 22 marks while there are less than 30 percent of all the participants who are determined as above average

Moreover, most of the participants are teenagers and early adults (teenage at 38.7 and early adults at 34.7). The research could have focused more on elderly, aged above 60 years old. The online questionnaire is unable to reach this age group, partly might be because of their preference to authentic sources, such as paper-made form or direct conversation (CNBC, 2013) and lack of technological skills, resulting in having only 3.6 percent of elderlies as participants. We could implement a more initiative approach by a direct confrontation or face-to-face meeting, (However, during COVID-19 pandemic, we may be reserved to only real time video calls), to ask questions instead of giving them online questionnaires.

It is also crucial to consider that seniors (aged 60 and above) have the same capacity of learning and processing new information as the adolescence (13-18 years old), as aging does not negatively affect configural learning. Thus, seniors (aged 60 and above) can incidentally learn configural knowledge as well as young adults (Rachel Clark, 2020). Especially during the COVID-19 pandemic, many individuals will seek knowledge in order to be more prepared in spite of their age (Fosca Giannotti, 2021).

Conclusion:-

This research focused on the relationship between knowledge and understanding of the COVID-19 vaccine and age groups. According to the results, there was no correlation between them. It showed that overall Thai citizens have average knowledge and understanding of the COVID-19 vaccine, more than 60 percent of the test takers of all age groups scored above 18 out of 25 questions in the test (Analyzing Item Difficulty and Discrimination, 2020); thus, it suggests that age may not impact the scores on our online survey. Nevertheless, the questionnaire may be uncomplicated, allowing the participants to account for higher average scores on the test in regard to the COVID-19 vaccine. Moreover, adolescents (aged between 13 to 18) and early adults (aged between 18 to 39) are likely to consume online information more than other groups (Joseph Johnson, 2019). Whilst having them as the majority of the sample, with only few seniors (aged above 60), might decrease the accuracy of the result. Therefore, we cannot truly claim that age is not a factor contributing to knowledge and understanding of the COVID-19 vaccine and the research will need to be executed again in the future.

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