







REVIEW ARTICLE

# Vaccine literacy: A concept analysis

Avie Rotsen Badua,  Krystelle Joy Caraque,  Marjorie Cruz  and  
Roison Andro Narvaez   
St. Paul University Philippines, Tuguegarao, Philippines

**ABSTRACT:** *The 2019 Coronavirus Disease (COVID-19) is dubbed as one of the deadliest and worst global pandemics. Many pandemic policies and programs were implemented in different countries across the globe, including the creation of vaccines that would enhance human immunity against the symptoms caused by the virus. Since then, debates on vaccines have emerged, citing vaccine hesitancy often associated with certain factors like socioeconomic status, beliefs, and vaccine awareness. This birthed to an intensive call for vaccine literacy as an effective means of encouraging people to get vaccinated against viruses. This paper uses the Walker and Avant's (2019, *Strategies for theory construction in nursing*, 6th edn. New York, NY: Pearson) approach of concept analysis with the help of its eight systematic stages. Results showed that vaccine literacy was adopted after the concept of health literacy. It is defined as a process of providing vaccine information, building communication, and increasing people's engagement about vaccines. The identified defining attributes of vaccine literacy include 'health literacy', 'disease prevention', 'education', and 'immunization'. Vaccine literacy is considered relevant in the nursing practice as knowledge on vaccine literacy easily advances nurses' practice roles through vaccination education, creating developmental policies about vaccines, and prescribing immunization to patients.*

**KEY WORDS:** *concept analysis, COVID-19, nursing, vaccine literacy, Walker and Avant.*

## INTRODUCTION

In December 2019, the Wuhan Municipal Health Commission reported a series of pneumonia cases in Wuhan, China. Later on, it was identified that this event was caused by a novel coronavirus –COVID-19. The World Health Organization (WHO) then started to set up an Incident Management Support Team (IMST) in January 2021, which was tasked to help the entire organization prepare for this outbreak. Several developments regarding the virus happened, such as delivering

the news on the reported series of pneumonia cases in Wuhan, its probable effects if not contained, and lots of reminders to the public in keeping themselves safe from the virus. On the 13th of January 2020, the first case of COVID-19 outside China was tracked in Thailand until it was considered a global pandemic in March of the same year. The COVID-19 pandemic has undoubtedly impacted almost all countries worldwide, and during those times, there was nothing more important than a strategic preparedness and response plan against the invisible enemy. Countries from all across the globe employed many preventive measures until they realized that the best solution is to vaccinate every individual to immune them from the symptoms of the virus. This birthed discussions about the challenges caused by the lack of vaccine literacy for a collective immunization in communities.

The COVID-19 pandemic caused significant loss of human life worldwide. According to Elflein (2021), the COVID-19 pandemic reached 4.5 million deaths. In not more than two years of living with a pandemic,

**Correspondence:** Roison Andro Narvaez, St. Paul University Philippines, Mabini Street, Tuguegarao, Cagayan 3500, Philippines. Email: rnarvaez@spup.edu.ph

**Declaration of conflict of interest:** The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Avie Rotsen Badua, RN.

Krystelle Joy Caraque, RN.

Marjorie Cruz, RN.

Roison Andro Narvaez, MSN, RN.

Accepted February 28 2022.

there were many solutions that both government agencies and private companies came up with. Indeed, these solutions should not just remain as a fight of Science alone; but there is so much more about it (Abrams, 2020) until the world began to understand that the best solution to curb the virus is to vaccinate all individuals against COVID-19. Due to the increase in fatalities, scientists have announced the potential vaccine against coronavirus that causes the COVID-19 pandemic last April 2, 2020 (Kim *et al.*, 2020). Today's available vaccines include Pfizer-Biontech, Moderna, Johnson & Johnson's Janssen, AstraZeneca, and Sinovac (Centers for Disease Control and Prevention, 2022). On March 4, 2021, the Philippines was the first country in Southeast Asia to receive vaccines from the COVAX facility with more than 480 000 doses of AstraZeneca vaccines (WHO, 2021). The distribution of vaccines worldwide was affected by vaccine hesitancy caused by the lack of sufficient vaccine literacy. Vaccine literacy is an initiative to get more people to get vaccinated. Its goals include the possible decrease of certain disease cases (Biasio, 2019).

Johns Hopkins Medicine (2021) said that all authorized COVID-19 vaccines are highly effective in reducing infections, viral transmission, hospitalization, and death from COVID-19. However, despite the availability of the vaccine, a survey revealed that out of 7.6 billion people worldwide, more than 1 billion people decided to not get vaccinated. In some countries, citizens lack trust in their government which compromises unwillingness to be vaccinated (Baragona, 2021). According to Pulse Asia Survey (2021), 6 out of 10 Filipino adults are not inoculated to be vaccinated. Some reported that the vaccine might not be effective, the vaccine might be expensive, and they have the fear over possible side effects and because of the Dengvaxia controversy. The number of vaccinated individuals in Region 12 is still low. Mostly, senior citizens and people with comorbidities are hesitant in accepting the COVID-19 vaccine due to the reports of the increased death toll after being vaccinated (Department of Health, 2021). These events added to the public's doubts and lack of trust when it comes to vaccines, making it more challenging to vaccinate every individual against COVID-19.

This concept analysis presents the definitions and uses of vaccine literacy. It aims to give the public a better understanding of the concepts and importance of vaccine literacy as part of health literacy. It involves different scholarly articles, case studies, research studies, and other related case analyses to dig the meanings

and concepts of vaccine literacy as used in Science. The procedures employed in this study follow the Walker and Avant's (2019) Method in concept analysis.

## DEFINITIONS AND USES OF CONCEPTS

Vaccines manifest the visible progress in the field of Medical Science. These are originally developed during the 18th Century as an initiative to curb the smallpox disease. Edward Jenner was the first person who ever discovered the ability of vaccines to demonstrate immunity from specific infectious diseases. As mentioned, the first vaccine was made primarily for smallpox patients, as Jenner successfully developed the first vaccine for a 13-year-old boy. After two centuries, the world has finally reached a collective immunization against the disease. Since then, vaccines have been used to decrease the number of cases and death from other infectious viruses and diseases. One of these is the COVID-19 pandemic.

Vaccine literacy is considered a huge part of health literacy. A study from Biasio *et al.* (2020) said that vaccine literacy (VL) is based on the overall idea of health literacy (HL). Health literacy is a process of relating abilities to meeting the demands of health. It contributes to disease prevention and promotion of health, as well as to making decisions about healthcare. As described in the study regarding the validation of Italian tools in assessing vaccine literacy in vaccinating adults in this country, vaccine literacy is connected with the motivation, knowledge, and competence of people about vaccines if they are capable of understanding and using this information to get vaccinated children and adults.

Biasio (2016) argued that vaccine literacy does not always come out of scholarly articles and publications in a similar study. However, the ideas of vaccine literacy can be traced back to its most relevant form, health literacy.

The way it was used in the study that both discussed vaccine literacy and vaccine hesitancy highlighted that vaccine literacy must not be considered merely knowing vaccines. Instead, it is more about creating systems that would increase people's engagement toward vaccines. Of course, vaccine literacy is used to treat vaccine hesitancy. It is typically used to introduce vaccines to anti-vaccination groups by motivating them and increasing their confidence in these vaccines.

Vaccine literacy may be an existing concept even before the emergence of the global COVID-19 pandemic. Still, there is a lack of developed systems to

improve people's literacy that will increase disease prevention and health promotion. Vaccine literacy is considered a part of obtaining vaccine convenience and employing communication strategies where concepts of vaccine literacy are introduced to those who may have a low literacy level. This concept is not present in many research studies. This adds up to a lack of understanding of people on vaccines and disables people from accepting vaccines when they are most confident and motivated (Biasio, 2019).

Wang *et al.* (2018) conducted a study assessing the effects of a major vaccine scandal that happened in China in 2016 on the trust of parents in vaccines. It intended to connect and build an association between the outcomes of vaccination-related reports that mislead people about the scandal and their vaccine literacy. The study implied that health literacy is a general term for vaccine literacy. It described vaccine literacy as a tool that helps in reducing the adverse effects of having too many misleading reports about vaccination. It means that these reports are treated as a factor that decreases people's vaccine literacy and increases their vaccine hesitancy.

Gusar *et al.* (2021) agreed that the concept of vaccine literacy was founded by a much more significant concept, health literacy. The researchers believed that there is a low literacy associated with vaccine rejection. However, the researchers irradiated that there is no clear line that distributes differences between the literacy level of people on health and the decision that they make in receiving vaccinations. In this matter, vaccine literacy serves as a solution to curb illiteracy about vaccines. The global COVID-19 pandemic is seen as an excellent opportunity to develop a more robust system in introducing vaccines and increase understanding of the positive outcomes of being vaccinated.

Michel and Goldberg (2021) cited that the COVID-19 pandemic is a timely opportunity to link education and vaccines. For these researchers, this is the central concept of vaccine literacy. It is the ability to connect health and education to positively influence their take on vaccines. The concept is also described as the application of health information to give proper judgments to induce better decisions related to the healthcare they want to receive, diseases they want to prevent, and the overall promotion of health.

Ratzan (2011) said that vaccine literacy could be a shot to advance and promote health. It is defined as a degree wherein the public can understand the health information including the services that will guide them through their health decisions. The United Nations

takes this concept as a relevant factor to ensure development regarding health literacy promotion. This was described after the Ministerial declaration of the United Nations in 2009. For the researchers, it is essential to have the ability to obtain information about vaccines and process these for smoother decision-making on receiving vaccines.

The European Chamber of Commerce of the Philippines (2021) was allowed to describe the concepts of vaccine literacy during an online dialogue as their response in building public support for the vaccines available to curb the COVID-19 pandemic. The organization said that vaccines' roll-out has opened debates about vaccines, leaving unanswered questions to millions of Filipinos. The session was entitled 'COVID New Vaccine Information, Communication, and Engagement', implying that vaccine literacy is about providing vaccine information, building communication, and increasing people's engagement about vaccines.

## METHODS

This concept analysis uses different methods to ensure that the concepts, definitions, and ideas of the topic being discussed are properly analysed based on how they are used in other scholarly articles and research studies. It focuses on the steps of concept analysis as prescribed by the Walker & Avant's Method that was introduced in 1994 with eight main steps.

A concept analysis is a particular exercise for students or researchers to become familiar with different concepts. In the case of this study, it analyses the concepts of vaccine literacy knowing that the term is very rampant today due to the emergence of the global COVID-19 pandemic which, to get immune out of its possible symptoms, a person is recommended to take a vaccine shot (usually two shots). This paper strictly follows the Walker and Avant's Method (2019) in crafting a concept analysis as it specifically mentions the steps and data that must be accomplished during the study.

As mentioned, the primary method used in this concept analysis is the Walker and Avant's Method (2019) and is performed using eight main stages. These include: (1) Selection of concept, (2) Determining the aims or purpose of analysis, (3) Identifying the uses of the concept discovered, (4) Determining the defining attributes of the concept, (5) Identifying a model case, (7) Identifying the borderline, related, contrary, invented, and illegitimate cases connected in the concept, and (8) Identifying the antecedents and consequences as well as defining its empirical referents.

These steps are employed in this concept analysis to analyse how vaccine literacy is used in the research field.

As seen in the Walker and Avant's Method (2019), it does not present how a researcher must accomplish the project. Instead, it specifically mentions the data that must be analysed to ensure that a researcher knows precisely where he should extract its definitions, meanings, concepts, and uses. The data collected in this paper studies different scholarly articles and researches. For instance, the part of data collection was categorized based on the form of the document. The Walker and Avant's Method (2019) suggests the researcher collect case studies, model cases, related cases, contrary cases, and borderline cases. It also includes the concept's antecedents, consequences, and empirical referents that are all connected with the concept of vaccine literacy.

### Data collection

This concept analysis data collection that follows the Walker and Avant's Model (2019) of concept analysis relies on the list of documents that support the concept. Firstly, it presents its defining attributes that serve as the heart of the study, followed by related cases, case studies, a model case, contrary cases, and borderline cases. It also includes the concept's antecedents, consequences, and empirical referents.

### Defining attributes

The defining attributes serve as the heart of concept analysis. A concept requires another related concept to be formed. The University of Saskatchewan (2017) said that the term 'concept' is usually taken differently and misused in some contexts, and to create a good concept, a researcher must learn how to discriminate and generalize the concept. Discrimination looks at how different an object is, while generalization is the stage of grouping the stimuli or attributes to build a concept. There are different attributes under the concept 'vaccine literacy'. Indeed, these attributes help make the concept more understandable and distinct from the other terms.

There are two different types of attributes that a concept analysis must obtain. These include the critical attributes that are required to build the concept whole. Meanwhile, the other kind of attribute is non-critical attributes that may be present in the concept but are not always necessary. Based on the related scholarly

articles and studies cited in this study, the concept of vaccine literacy is directly related to the terms 'health literacy', 'disease prevention', 'education', and 'immunization'. These are part of the critical attributes of the term 'vaccine literacy'.

Biasiao (2019) said that vaccine literacy is the ability to understand health information and services to develop an appropriate decision that concerns health. It was also noted that the concept of vaccine literacy was patterned after health literacy. It is concerned with the abilities and knowledge to fulfil the demands of health. Vaccine literacy is directly associated with health literacy, knowing that vaccines are used to stimulate a body's immunity as a response against a disease. This connects with another attribute of the concept, which is 'disease'. The condition is related to the prevention and health promotion of the public. Biasiao (2019), in his study, irradiated that vaccine literacy keeps the public safe from health challenges such as diseases.

Another attribute that would help define the concept is 'education'. According to the United Nations Education, Scientific and Cultural Organization [UNESCO] (2019), education serves as a good foundation for well-being and health. The organization believes that education contributes to having enough knowledge to avoid any sickness or diseases. The Global Education Monitoring Report, commissioned by UNESCO, proves that the education of parents influences the nutrition and vaccination rates of their children. This has helped the public become safer from preventable diseases. A framework published in 2016 confirms that education gives a person the right attitude, skills, and values to make an informed decision about their health and adequately respond to the challenges that may or may not affect them.

The last defining attribute of vaccine literacy is 'immunization'. This attribute, most of the time, relates to the terms 'vaccination' and 'inoculation'. The Centers for Disease Control and Prevention defines 'immunization' as a process where a person is being protected against a particular disease. The person receives vaccination to increase his immunity. In a study by Biasiao (2019), the term immunization is used to serve as a tool to assess vaccine literacy. This only proves how important this term is in this concept.

The non-critical defining attributes of the concept being discussed include 'information', 'knowledge', and 'awareness'. These terms are present in most of the related articles and studies cited in this paper but were not given emphasis. This only shows how relevant and

connected these terms are in the concept and, though not required, will provide a better understanding to readers. These critical and non-critical attributes of vaccine literacy make the concept distinct from other concepts. For instance, the term may be directly related to health literacy, but vaccine literacy is unique as it caters to education regarding immunization from a challenging disease.

### Case studies on vaccine literacy

Different case studies published worldwide relate to vaccine literacy and its attributes. However, the concept of vaccine literacy remains new for some people, which also becomes a reason why there is still an increasing case of vaccine hesitancy globally. This makes the concept of vaccine literacy more challenging to deal with, even harder to encourage people to get vaccinated while bearing the correct information and knowledge about vaccines. Some of the relevant studies about vaccine literacy can be found below.

Lots of infectious diseases in the history of mankind have taken millions of lives and jeopardized human health. Prymula (2013) said that despite the existence of advanced methods in treating diseases and preventing them, history dictates the positive aspects of vaccination. There were many controversies received by vaccinations, and it will continue to happen to know that there is no vaccine present today that is 100% safe or effective. Getting vaccinations equates to having risks, which reasons out the growing controversies of vaccines. This case study proved that vaccination has helped reduce the number of deaths of certain diseases (i.e., measles, pertussis, polio, mumps, and diphtheria). Looking at measles cases in the Czech Republic before vaccination, there are 50 000 cases and 50 recorded deaths. Meanwhile, after vaccination, the cases of the disease as mentioned above were reduced to 10, and no deaths aside from the exceptional cases due to postponed immunization.

Wiltshire is a city located in South West England and has a total area of 3485 km<sup>2</sup>. This country's council is consistent in creating a series of case studies about vaccination, the COVID-19 pandemic, and vaccine literacy. This initiative reflects the city's belief in health literacy, saying that the local government must prioritize local health protection, social care systems, and planning. A case study published by the Local Government Association of Wiltshire (2021) tried to promote vaccination towards travelers and communities in the area. Currently, there is a total of 20 vaccination centers in the country, catering to more than 500 000

people. Experts have seen how the rate of vaccination becomes lower among their residents. This was the sign for them to employ a vaccination literacy program. They used a TV star to promote vaccination and built pop-up vaccination clinics across the area. The case study concluded that the initiative must be implemented nationally as vaccine literacy is expected to make a further difference in communities.

A case study conducted in Japan involving older Japanese parents' family caregivers mentions that the Japanese government was already starting to vaccinate older people in June 2021. It focuses on the response of caregivers of the older population and how their presence in the care facility would impact the vaccination decisions of aging parents. Constantini (2021) said that the study's goal is to look at vaccination literacy and health literacy based on how the participants assess their sources of information, mass media, social media, professions, colleagues, friends, and others. The study included 292 participants and looked at their ages, genders, and work hours. It was found that those caregivers who are older, have lower vaccine literacy levels. The study recommends the Japanese government use social media and other networks to tailor better health communication strategies that would increase the vaccine literacy of caregivers.

Biasiao *et al.* (2020) conducted a case study on vaccine literacy, highlighting an online survey as a tool to identify the knowledge and perceptions of participants about COVID-19 vaccinations. The participants of the study include the adult population of Italy. All data were collected by 'SurveyMonkey,' an online-based service that builds surveys. By using different statistical tools and methods, the researchers found out that respondents' mean vaccine literacy score was 2.92. The score was lower among female respondents compared to males. The respondents also did not favor vaccines because they think these are unsafe (83%) and they have a natural immunity (84%). This shows how low vaccine literacy is in the most adult population.

The studies above dictate the current status of vaccine literacy in many countries. As seen in some of the cited case studies, some countries were doing their best to influence the literacy of their population, while some countries are still struggling to convince the government to create a program that will increase mass' vaccine literacy. Overall, it was seen how low vaccine literacy was in most countries, and it only shows that the concept of vaccine literacy is more relevant than ever. These studies are all related to other cases presented in this paper that can be found under the model case, borderline case, related cases, and contrast case. This means that all of the case studies cited

contributed to building up the concept of vaccine literacy in this paper.

## Case studies

### *Model case*

A model case is an example of the use of the concept that demonstrates all the defining attributes of the concept (Walker & Avant, 2019).

In this concept analysis, it can be said that there are not enough resources about vaccine literacy. Its contrast case, on the other hand, called vaccine hesitancy, has many existing model cases and analyses. However, to fully understand the concept of vaccine literacy, below is an example of a model case consisting of all attributes of the concept such as 'health literacy', 'disease prevention', 'education', and 'immunization'.

Patient Ali always reads news updates online. She found out that it was March 2020 when the World Health Organization announced the emergence of the 2019 Coronavirus Disease (COVID-19) pandemic. It was dubbed one of the deadliest and worst global pandemics and the smallpox disease, black death plague, and the third plague pandemic that killed millions of people throughout history. She also read that COVID-19 killed more than 4 million people and has recorded over 200 million cases worldwide. Since then, Patient Ali became more educated about the processes on how to improve her immune system and take care of her family's health during the pandemic. Then, due to the increase in fatalities, scientists have announced the potential vaccine against coronavirus that causes the COVID-19 pandemic last April 2, 2020. She always reads about different surveys about vaccines to help her decide whether she would also receive the vaccine or not. According to Pulse Asia Survey (2021), she found out that 6 out of 10 Filipino adults are not inoculated to be vaccinated. Some reported that the vaccine might not be practical, expensive, fear possible side effects, and might become the same as what happened in the Dengvaxia controversy. These added to her doubts and lack of trust regarding vaccines, making it more challenging to vaccinate every individual against COVID-19. When the government official asked the patient if she wanted to get vaccinated, she immediately looked for information about COVID-19 vaccines. She found that experts believe that this global pandemic is an excellent opportunity to educate people about vaccines as it helps immune people from the symptoms of COVID-19. In June 2021, Patient Ali successfully received her first COVID shot and expects to receive her second shot by July 2021. She now educates many people about the effectiveness of vaccines.

*Analysis.* This is a case model because it has every defining attribute of vaccine literacy. Patient Ali is being educated about the Covid-19 disease and the available vaccines by reading news updates and surveys to become more health literate. Through her reading, she found out the effect of vaccines, their potential to prevent disease, and further complications. Therefore, she was convinced and got vaccinated. As mentioned, the case of COVID-19 became an opportunity for experts to educate people about the effectiveness of vaccines. By learning the individual concepts of 'health literacy', 'disease prevention', 'education', and 'immunization', all in one model case, it only shows that the overall theme of the case is vaccine literacy.

### *Related cases*

Related cases are instances of concepts that are related to the concept being studied but that do not contain all the defining attributes. They are similar to the concept of being studied; they are connected to the main concept (Walker & Avant, 2019).

An increasing study states that there is existing vaccine literacy during the global COVID-19 pandemic. This only proves a need to further re-evaluate governmental programs about vaccine literacy to pull more people who avoid jabs against the virus. There is a long history of vaccination, but problems are being encountered about people's awareness and knowledge about the safety and effectiveness of vaccines. Several related cases are present, but not all of these explain the defining attributes of the concept, as cited in this paper.

Mayor Arroyo knows how important it is for local government units to build programs that will motivate people to get a COVID-19 jab. He established a series of case studies about vaccine literacy but does not contain all the attributes of the concept since it relies more on follow-up and vaccine tracking. It is an initiative to increase the participant's engagement on vaccines, which the City has been doing since 2015. Throughout the run of the study, the vaccinators were able to get more than 1000 people who came forward for COVID-19 vaccination after declining for a jab for the first time. This made the program track the vaccination status in the area and also serves as an outreach worker to follow up with the foreseen decline of the vaccine at the same time. The team is planning to involve the city's mobile clinics to target more groups who are hesitant to get vaccinated.

*Analysis.* This is not mainly about vaccine literacy as the case above does not explicitly state that the Mayor

wants his people to be literate about vaccines. Instead, motivated to get the vaccines through a continuous follow-up and tracking of their vaccination status.

#### *Contrary case*

Walker and Avant (2019) said that contrary cases are clear examples of 'not the concept'.

There are not many resources about the concept discussed in this paper. There are much more resources about its contrary cases, such as vaccine hesitancy, health education, and health literacy. These terms are related to vaccine literacy and may be considered generalities of its attributes but are not the concepts. Instead, the studies have focused on vaccine literacy, as the concept discussed in this paper, the studies are more concerned and focused on other ideas. An example of a contrary case is below.

Patient Bernie is a 50-year-old man with two sons and one daughter. He is already recovering from COVID-19 after staying at the hospital for a few weeks. All of his family members were already vaccinated after they received a good conversation with a Government Health Officer in their area about the effectiveness of COVID-19 vaccines. The problem is that the old man declined to get vaccinated even after his family encouraged him to get vaccinated as soon as his doctor allowed him to have it. He was too mad, saying that he could survive the virus only with the help of his natural immunity.

*Analysis.* This case is a contrast case because it is not directly about vaccine literacy, but it contributes to people's overall perceptions toward vaccines. It is about vaccine hesitancy. Vaccine hesitancy is defined as a delay or refusal of receiving a vaccine despite its availability. The case presented shows how colossal vaccine hesitancy and low health literacy affect their engagement toward vaccines. There are available vaccines for these preventable diseases, but it appears that despite their access, some people would not prefer to get vaccinated due to misinformation.

#### *Borderline case*

Borderline cases are examples or instances that contain most of the defining attributes of the concept being examined but not all of them. They may contain most or even all of the defining characteristics but differ substantially in one of them, such as length of time or intensity of occurrence (Walker & Avant, 2019).

It was mentioned that there was a lack of scholarly articles regarding vaccine literacy. However, COVID-19

became an opportunity for health experts to advertise vaccines and introduce its positive effects and impacts during the existence of a deadly global pandemic. The concept of vaccine literacy may be new, as health literacy is the term usually used by health experts. Still, it did not become a hindrance for scholars to create studies that embody the defining attributes of vaccine literacy. Going back to the attributes as cited above, vaccine literacy becomes a concept through its directly related terms 'health literacy', 'disease prevention', 'education', and 'immunization'. Walker and Avant (2019) irradiated that the borderline cases are examples of studies that consist of only a few of the defining attributes of the concept.

Patient Cathy lives in the Philippines. It is one of the countries in the world with the most significant number of COVID-19 cases. This pandemic has affected so much, including the economy, the education sector, and of course, the health sector. As a way for the Philippine government to ensure that the Filipino people would go back to normal, they advertise vaccination as a tool to get immunity from COVID-19 symptoms such as headache, body pain, difficulty breathing, cough, and many more. However, the government noticed that there is still a considerable number of Filipinos who are hesitant to take COVID-19 jabs. Its goal is to vaccinate more people, including Patient Cathy who does not know about vaccines.

*Analysis.* Patient Cathy is aware of the vaccine's immunity because of some government advertisements; however, she has lacked knowledge about the full effect and benefit of the vaccine. She has not been educated by the government but needs to be vaccinated as imposed by the Government. The case cited above is an example of a borderline case because it is about vaccine literacy, despite that it does not consist of all of its defining attributes. The defining attributes included in the borderline case are 'disease prevention' and 'immunization' only, leaving 'health literacy' and 'education' behind.

#### **Antecedents**

Walker and Avant (2019) said that antecedents are incidents or events that must happen first before the concept occurs. This case analysis focuses on vaccine literacy, which is basically about educating the public regarding vaccines. It is important to note that vaccines are part of medical solutions to protect people from a specific disease. This only means that the antecedents

of vaccine literacy must have something to do with diseases and other health concerns.

Stern and Markel (2005) said that humans have already benefited from vaccines for not less than two centuries. But despite this, there is still a continuous public doubt on vaccinations. The first vaccine was made by Dr. Edward Jenner, a doctor living in Berkeley, England, for the smallpox disease during the 1790s. He successfully vaccinated an 8-year-old child named James Phipps. This event became the foundation of modern vaccinology, which paved the way for creating other vaccines against diseases. The Centers for Disease Control and Prevention said that certain diseases are already being forgotten due to vaccines. These diseases have killed millions of people worldwide, and some cases still exist today, but the way vaccines have helped solve these long-rooted diseases only means that vaccines work. This means that the antecedents of the concept of vaccine literacy are the existence of (1) diseases, (2) epidemics, and (3) pandemics. There is vaccine literacy because there are health concerns that must be solved.

### Consequences

Consequences are described as events or incidents that result from a particular aspect (Walker & Avant, 2019). In this concept analysis, the consequences of vaccine literacy are not limited to the positive outcomes such as the public's acceptance of vaccines, but it also includes negative outcomes.

The defining attributes of vaccine literacy cited in some parts of this concept analysis are reflected in the consequences of the concept. It is known that vaccine literacy talks about education and information about the effectiveness of vaccines. Based on the model cited under the model case and analysis in this paper, both vaccine literacy and health literacy, as published by Michel and Goldberg (2021), equate to different attributes such as vaccine empowerment, confidence (vaccine trust and effectiveness), healthcare system trust and vaccine delivery convenience, and vaccine acceptance and uptake. These serve as the positive consequences of vaccine literacy toward the public. On the other hand, some negative consequences that vaccine literacy might deliver include the chances of lack of vaccines due to high demand from the public and negative impacts on people's health if the vaccine is not indeed studied and effective. Also, social media platforms became the source of information about vaccines, which impact people's decision-making. The

concept of vaccine literacy sees the mentioned positive outcomes as their results, and not their counterparts.

### Empirical referents

Walker and Avant (2019) said that these include classes or categories of an actual event or phenomena that demonstrate the occurrence of a particular concept. In this paper, the concept being studied is vaccine literacy, which certainly has something to do with people's trust and acceptance of vaccines. Sarathchandra *et al.* (2018) conducted a study regarding an effective tool that measures people's vaccine acceptance. It was highlighted in this paper that measuring vaccine acceptance is very important as it states the anxiety and knowledge of the public toward vaccines. The researchers highlighted five key factors in vaccine acceptance with this tool, which certainly comes after vaccine literacy. The list includes (1) perceived safety of vaccines; (2) perceived effectiveness and necessity of vaccines; (3) acceptance of the selection and scheduling of vaccines; (4) positive values and affect toward vaccines; and (5) perceived legitimacy of authorities to require vaccinations. These key factors serve as tools that will help researchers measure not just the acceptance of the public on vaccines but also their vaccine literacy. These are measured using Cronbach's Alpha with five subscales.

### DISCUSSION

This concept analysis focuses on vaccine literacy. Biasio *et al.* (2020) said that vaccine literacy (VL) is based on the overall idea of health literacy (HL). Health literacy is a process of relating abilities to meeting health demands. It contributes to disease prevention and promotion of health, as well as to making decisions about healthcare. Several researchers described the concept as a degree wherein the public can understand the health information, including the services that will guide them through their health decisions (Ratzan, 2011).

This paper uses the Walker and Avant's (2019) Method of concept analysis. Its main stages include: (1) Selection of concept, (2) Determining the aims or purpose of analysis, (3) Identifying the uses of the concept discovered, (4) Determining the defining attributes of the concept, (5) Identifying a model case, (7) Identifying the borderline, related, contrary, invented, and illegitimate cases connected in the concept, and (8) Identifying the antecedents and consequences as



well as defining its empirical referents. Indeed, these steps were followed in this concept analysis.

The United Nations takes this concept as a relevant factor to ensure development regarding health literacy promotion. Now, it is easier to say that vaccine literacy is connected with health literacy, knowing that scholars also used the concept in their respective studies. Of course, this concept is built by different defining attributes. As cited in this paper, its critical attributes include 'health literacy', 'disease prevention', 'education', and 'immunization'. It also includes non-critical attributes, which are relevant factors but are not needed in this concept such as 'awareness', 'information', and 'knowledge'. These make up the concept of vaccine literacy and help people understand what it is really about. The only model case that consists of all these defining attributes can be found in the model created by Michel and Goldberg (2021) after the COVID-19 pandemic emerged, stating that both health literacy and vaccine literacy starts with education and result in vaccine empowerment, confidence (vaccine trust and effectiveness), healthcare system trust and vaccine delivery convenience, and vaccine acceptance and uptake.

Lastly, by looking at the studies and other scholarly articles included in this paper for review, it appears that there are not enough resources about vaccine literacy. During COVID-19, experts saw an opportunity to promote vaccines to the public. Aside from this, there is also an increase in vaccine hesitancy found in many countries like the United States, Jordan, Japan, Hong Kong, Italy, and China. The only thing seen as a solution for this is vaccine literacy's concept being analysed.

### Limitations

This concept analysis successfully reviewed the existing scholarly articles and studies about the concept of vaccine literacy. However, there were limitations upon the fulfilment of this paper. Firstly, it is known that there is already an idea about vaccine literacy even before the pandemic started. Still, the conversations about this concept became more significant due to the emergence of the COVID-19 pandemic. This contributed to the limited resources encountered by the resources, which indirectly affected the structure of this paper. Secondly, people are more familiar with the term 'health literacy' than 'vaccine literacy'. This influenced the available research studies published by researchers. Thirdly, this paper was fulfilled during the strict

implementations of health protocols and lockdowns in the Philippines. This limited the ability of the researchers to look for other relevant articles and studies. Lastly, the limitation of this study is secluded in the concept of vaccine literacy alone, but not limited to diseases with available vaccines and vaccination programs. This provides the researchers the freedom to expand the limit of the study as long as it is still related to the concept.

### IMPLICATION FOR NURSING PRACTICE

The study analyses the concept of vaccine literacy as part of health literacy. This means that nurses are directly impacted by the lack of vaccine trust and acceptance of patients, especially global challenges like COVID-19. Nurses also play a massive part in the vaccination process of their patients. They assist in administering these vaccines and contribute to solving the issues caused by viruses. Aside from that, as front liners and part of the medical experts, they are responsible for ensuring that the population they are serving believes that vaccines work as they receive correct and appropriate information about vaccines. Suppose nurses have suitable vaccine literacy, more than what the public knows about the vaccines. In that case, this will also serve as their way to show their leadership roles in pulling the public out of vaccine hesitancy.

### CONCLUSION

Based on the cited research studies and other scholarly articles, it was shown how huge the influences of vaccines were in solving global health challenges. The researchers use Walker and Avant's (2019) Method of concept analysis.

Studies about vaccine literacy are lacking due to its counterpart, health literacy. However, these two terms are directly connected as vaccine literacy was created based on health literacy.

The defining attributes of vaccine literacy, as studied in this concept analysis, and based on different scholarly articles and studies, are 'health literacy', 'disease prevention', 'education' and 'immunization'. These defining attributes are considered 'critical'.

There is a growing vaccine hesitancy seen across the globe, based on the studies and articles cited in this paper, and vaccine literacy serves as a way to counteract it.

The antecedents of vaccine literacy include the existence of (1) diseases, (2) epidemics, and (3) pandemics.

There is vaccine literacy because there are health concerns that must be solved.

In terms of vaccine literacy's consequences, positive outcomes include vaccine empowerment, confidence (vaccine trust and effectiveness), healthcare system trust and vaccine delivery convenience, and vaccine acceptance and uptake; and its negative consequences include the lack of supply due to high demand of vaccines from the public and negative impacts on people's health if the vaccine is not indeed studied and effective.

The empirical referents of vaccine literacy are based on five critical factors as determined by Sarathchandra *et al.* (2018). It includes: (1) perceived safety of vaccines; (2) perceived effectiveness and necessity of vaccines; (3) acceptance of the selection and scheduling of vaccines; (4) positive values and affect toward vaccines; and (5) perceived legitimacy of authorities to require vaccinations.

Knowledge on vaccine literacy helps nurses quickly advance their practice roles through vaccination education, creating developmental policies about vaccines and prescribing immunization to patients.

## AUTHOR CONTRIBUTIONS

Made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data: ARB, KJC, MC, RAN. Involved in drafting the manuscript or revising it critically for important intellectual content: ARB, KJC, MC. Given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content: RAN. Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved: ARB, KJC, MC, RAN.

## FUNDING STATEMENT

The author received no financial support for the research and/or authorship of this article.

## REFERENCES

- Abrams, D. (2020). *To solve the problems of this pandemic, we need more than just 'the science'*. [Cited 15 November 2021]. Available from: URL: <https://www.theguardian.com/education/2020/apr/29/to-solve-the-problems-of-this-pandemic-we-need-more-than-just-the-science>.
- Baragona, S. (2021). As Vaccine Confidence Grows, So Do Concerns About Doubters. *Voice of America (VOA)*. [Cited 15 November 2021]. Available from: <https://www.insidevoa.com/p/5831.html>
- Biasio, L.R. (2016). Vaccine hesitancy and health literacy. *Human Vaccines & Immunotherapeutics*, 13 (3), 701–702. <https://doi.org/10.1080/21645515.2016.1243633>
- Biasio, L.R. (2019). Vaccine literacy is undervalued. *Human Vaccines & Immunotherapeutics*, 15 (11), 2552–2553. <https://doi.org/10.1080/21645515.2019.1609850>
- Biasio, L.R., Bonaccorsi, G., Lorini, C. & Pecorelli, S. (2020). Assessing COVID-19 vaccine literacy: A preliminary online survey. *Human Vaccines & Immunotherapeutics*, 17 (5), 1304–1312. <https://doi.org/10.1080/21645515.2020.1829315>
- Centers for Disease Control and Prevention (2022). Different COVID-19 Vaccines. [Cited 15 November 2021]. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines.html>
- Costantini, H. (2021). COVID-19 Vaccine Literacy of Family Carers for Their Older Parents in Japan. *Healthcare. Multidisciplinary Digital Publishing Institute*. 9 (8), 1038. <https://doi.org/10.3390/healthcare9081038>
- Department of Health (2021). 2019-nCoV Interim Guidelines. [Cited 15 November 2021]. Available from: <https://doh.gov.ph/covid19/amendment-to-interim-guidelines-on-the-administration-and-management-of-covid-19-vaccine-booster-%20to-priority-group-a2-senior-citizen-%20and-priority-a3-adults-with-comorbidities>
- Elflein, J. (2021). Number of coronavirus (COVID-19) cases, recoveries, and deaths worldwide. [Cited 15 November 2021]. Available from: <https://www.statista.com/statistics/1087466/covid19-cases-recoveries-deaths-worldwide/>
- European Chamber of Commerce of the Philippines (2021). *Vaccine Literacy: Building Public Support for COVID-19 Vaccine*. [Cited 15 November 2021]. ECCP. <https://www.eccp.com/events/914>.
- Gusar, I., Konjevoda, S., Babić, G. *et al.* (2021). Pre-vaccination COVID-19 vaccine literacy in a Croatian adult population: A cross-sectional study. *International Journal of Environmental Research and Public Health*, 2021 (18), 7073. <https://doi.org/10.3390/ijerph18137073>
- John Hopkins Medicine (2021). COVID-19 Vaccine: What You Need to Know. [Cited 15 November 2021]. Available from: <https://www.hopkinsmedicine.org/health/conditions-and-diseases/coronavirus/covid-19-vaccine-what-you-need-to-know>
- Kim, E., Erdos, G., Huang, S. *et al.* (2020). Microneedle array delivered recombinant coronavirus vaccines: Immunogenicity and rapid translational development. *EBioMedicine*, 55, 102743. <https://doi.org/10.1016/j.ebiom.2020.102743>
- Local Government Association (2021). *Wiltshire council: Promoting vaccination among traveller and houseboat communities*. [Cited 15 November 2021]. Available from: URL: <https://www.local.gov.uk/case-studies/wiltshire-council>

- promoting-vaccination-among-traveller-and-houseboat-communities.
- Michel, J.P. & Goldberg, J. (2021). Education, healthy ageing and vaccine literacy. *The Journal of Nutrition, Health & Aging*, 25, 698–701. <https://doi.org/10.1007/s12603-021-1627-1>
- Prymula, R. (2013). Controversies in vaccination. *European Review*, 21 (S1), S56–S61. <https://doi.org/10.1017/s1062798713000227>
- Pulse Asia (2021). February 2021 nationwide survey on COVID-19. [Cited 15 November 2021]. Available from: <https://www.pulseasia.ph/february-2021-nationwide-survey-on-covid-19/>
- Ratzan, S.C. (2011). Vaccine literacy: A new shot for advancing health. *Journal of Health Communication*, 16 (3), 227–229. <https://doi.org/10.1080/10810730.2011.561726>
- Sarathchandra, D., Navin, M.C., Largent, M.A. & McCright, A.M. (2018). A survey instrument for measuring vaccine acceptance. *Preventive Medicine*, 109, 1–7. <https://doi.org/10.1016/j.ypmed.2018.01.006>
- Stern, A. & Markel, H. (2005). The history of vaccines and immunization: Familiar patterns, new challenges. *Health Affairs*, 24 (3), 611–621. <https://doi.org/10.1377/hlthaff.24.3.611>
- United Nations Education, Scientific, Cultural Organization (2019). *Education for health and well-being*. [Cited 15 November 2021]. UNESCO. Available from: <https://en.unesco.org/themes/education-health-and-well-being>.
- University of Saskatchewan (2017). Instructional Approaches: A Framework for Professional Practice. Saskatchewan Education. Retrieved November 15, 2021. <https://publications.saskatchewan.ca/api/v1/products/10120/formats/15320/download>
- Walker, L.O. & Avant, K.C. (2019). *Strategies for theory construction in nursing*, 6th edn. New York, NY: Pearson.
- Wang, X., Zhou, X., Leesa, L. & Mantwill, S. (2018). The effect of vaccine literacy on parental trust and intention to vaccinate after a major vaccine scandal. *Journal of Health Communication*, 23 (5), 413–421. <https://doi.org/10.1080/10810730.2018.1455771>
- World Health Organization [WHO] (2021). Philippines welcomes the arrival of COVID-19 vaccines via COVAX facility. [Cited 15 November 2021]. Available from: <https://www.who.int/philippines/news/detail/04-03-2021-philippines-welcomes-the-arrival-of-covid-19-vaccines-via-covax-facility>