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Perception and Barriers of COVID-19 Vaccination among Mothers in Lake Sebu, South Cotabato

Nikka Jamae Razon, Princess Yen Demafeliz, Erwin M. Faller, Sheldon Jay Silva, Rosemarie Mamangkiang, Prem Rose Agarrado

Pharmacy Department, St. Alexius College, General Santos Drive, Koronadal City, South Cotabato, Region XII, (083) 228-2019; (083) 228-4015, st.alexiuscollege@yahoo.com

ABSTRACT

Background: For about one (1) year of facing the COVID-19 pandemic, vaccines all over the world are now gradually rolled out. The challenge in implementation of vaccination program is to increase the uptake of vaccines and restoring the public's confidence in vaccines.

Objective: To determine the perception of individuals regarding COVID-19 vaccination and what are the barriers needed to be addressed.

Method: A quantitative research design was used and a cross-sectional survey was conducted in Lake Sebu, South Cotabato on March 15 – April 16, 2021. The participants will include mothers ages 18 years old and above. Random sampling method was used in selecting the respondents.

Results: The findings revealed that most of the respondents have a negative perception on COVID-19 vaccination regardless of their demographics. Perceived barriers to vaccination mostly include concern for safety and efficacy, rapid development, and reliability of studies about COVID-19 vaccines. To address these, findings showed that sufficient data on the safety and efficacy of COVID-19 vaccines must be provided.

Conclusion: Thus, healthcare workers should raise awareness of the necessity, safety, and efficacy of the COVID-19 vaccines.

Keywords: COVID-19 Vaccination, Barriers of Vaccination, Perception on Vaccination, Mothers, Lake Sebu, South Cotabato

INTRODUCTION

The first case of COVID-19 was reported in Wuhan, China, on December 2019 [1]. The World Health Organization declared Coronavirus Disease 2019 (COVID-19) as a Public Health Emergency of International Concern (PHEIC) on January 30, 2020. With the same date, the Philippines had its first confirmed case [2] As of February 5th 2021, there have been 531,699 confirmed cases of COVID-19 in the Philippines [3] and 1, 497 COVID-19 cases in South Cotabato [4].

In the absence of COVID-19 vaccine, every country around the world is struggling to reduce the spread of COVID-19 infection with the enactment of community quarantine, lockdowns, social distancing policy, use of

facemasks, and travel restrictions [5].

For about one (1) year of facing the pandemic, vaccines all over the world are now gradually rolled-out. As of February 15, 2021, over 80 countries had started rolling out vaccines [6]. Currently, the Philippine government is in the initial phase of COVID19 vaccine roll-out with the availability of both AstraZeneca and Sinovac vaccines [7]. According to Secretary of Health, Dr. Francisco Duque, the challenge in implementation of vaccination program is to increase the uptake of vaccines and restoring the public's confidence in vaccines [7]. In the Philippines, parents are now refusing to immunized their children due to nationwide scare of dengue vaccine, which killed 14 individuals [8]. This occurrence then gives rise to vaccine hesitancy [9].

Therefore, the objectives of this study were to determine perception of mothers residing at Lake Sebu, South Cotabato regarding COVID-19 vaccination. Their acceptance of COVID-19 vaccination will be assessed. Barriers of COVID-19 vaccination and cues to action to promote COVID-19 vaccination acceptance were also studied. The health belief model was used as the theoretical framework.

COVID-19 Outbreak

On December 2019, the cause of local outbreak of pneumonia in Wuhan, China was unknown. It was then studied and scientist discovered that it is caused by a novel coronavirus which is the SARS-CoV-2 or the severe acute respiratory syndrome coronavirus 2 [10]. The WHO has officially announced the name of the disease last February 11, 2020. It is abbreviated as "COVID-19". "CO" for corona, "VI" for virus, and "D" for disease. The 19 in the name of the disease comes from the year when it was originally started, on 2019. Before the name COVID-19, it was called as 2019 novel coronavirus or 2019-nCoV. They are named for their crown-like characteristics [11].

The COVID-19 was declared as pandemic by WHO last March 11, 2020. The World Health Organization (WHO) was concerned about the increasing number of COVID-19 cases and has called countries to take preventive measures to contain the spread of coronavirus disease [12].

COVID-19 Vaccination

Vaccination has the greatest contribution to global health[13]. The development of COVID-19 vaccine is an effective way of reducing cases of coronavirus infection[2]. Vaccines save millions of lives each year [14]. They work by mimicking the virus or bacteria that causes the disease and triggers body's production of antibodies. These antibodies are responsible for the protection of an individual against microorganisms when a person gets infected with the disease. The possible side effect of vaccination includes swelling at the injection site, redness, pain, itching, fever, feeling of weakness, fatigue, headache, dizziness, nausea, and diarrhea [15]. Before manufacturers of COVID-19 vaccine receive the approval and validation of World Health Organization, they must undergo rigorous testing in clinical trials to prove that they meet the agreed benchmarks for its safety and efficacy[16].

According to the Department of Health, as of April 19, 2021, there are six (6) vaccines that has been approved by the FDA including Pfizer-BioNTech,

Oxford AstraZeneca, Sinovac CoronaVac, Gamaleya Sputnik V, Johnson and Johnson's Janssen, at Bharat BioTech's Covaxin[17].

COVID-19 Vaccine Roll-Out

For about one (1) year of facing the pandemic, vaccines all over the world are now gradually rolled-out. As of February 15, 2021, over 80 countries had started rolling out vaccines. In North America, approximately 15 doses were administered per 100 people while in Asia and Pacific, less than 2 doses were administered per 100 people. Factors that contribute to the slow process of vaccination includes: limited supply of vaccine, lack of funding, lack of facilities and resources, lack of staff, and vaccine hesitancy [6].

The first person who get vaccinated against COVID-19 vaccine was Margaret Keenan, she is a UK grandmother who turns 91 last 2020. She received the first dose of Pfizer-BioNTech COVID-19 vaccine jab as a part of mass vaccination program in UK [18]. The United States launched a first rollout of Pfizer BioNTech COVID-19 Vaccine on December 14, 2020. Due to limited sources of the vaccine, the Centers for Disease Control and Prevention advised that front-line health workers and people who are more vulnerable to the COVID-19 such as the elderly will be prioritized [19].

The first COVID-19 vaccine rollout in the Philippines was conducted on March 1, 2021. At least 756 front liners had received the vaccination for their first day. These healthcare frontline workers are from different hospitals (PGH, Lung Center, Tala, Veterans, V. Luna, and PNP General Hospital) in Metro Manila. Among the individuals who first received Sinovac's CoronaVac was the Philippine General Hospital Chief, Dr. Gerardo Legaspi. The Chair of the Task Force against the COVID-19, Secretary Delfin Lorenza, said that the rollout of the COVID-19 vaccination program in the Philippines will hasten the country's recovery from the pandemic. The government aims to be COVID-free in the year 2022 [7].

According to Secretary of Health, Dr. Francisco Duque, the challenge in implementation of vaccination program is to increase the uptake of vaccines and restoring the public's confidence in vaccines. The government is encouraging individuals to seize the opportunity to get vaccinated against COVID-19[7]. The intention to accept vaccine against an infectious disease is the number one factor affecting the success of vaccination programs. Vaccine scandals and reports regarding the serious side effects of vaccination have led to distrust of individuals in vaccination programs and vaccine hesitancy [5].

Vaccine Controversies

Vaccination history is marked by many controversies that have resulted in negative impact on the general population's perceptions of vaccination. Vaccine Controversies are considered as the core of vaccine hesitancy or refusal and decline of the vaccine. These are often associated with severe adverse events and spread through mass media and social media. It can be country-specific; for example, the MMR Vaccine controversy in United Kingdom. The pandemic flu vaccine, Pandemrix, was found to be associated with increased risk of narcolepsy. Other review of the vaccine also found that seasonal flu vaccine is associated with

Guillain-Barre syndrome. Other associated vaccines and severe adverse events includes: Hepatitis B Vaccine and multiple sclerosis, Aluminum adjuvants and Alzheimer's disease, and Human papillomavirus Vaccine and multiple sclerosis. The other three associations have never been supported by any scientific evidence[20].

Dengvaxia, a novel dengue vaccine, has also been subjected to controversy due to the claim of various people that that the vaccine has caused deaths and severe sufferings. This is introduced by DOH on year 2016 in Philippines for over 800,000 people[21]. After the vaccination of Dengvaxia, not infected individuals have a higher risk of developing a severe form of dengue and resulted in some deaths. This made the Dengvaxia vaccine suspend its distribution and it results in controversy. Dengavxia controversy results in vaccine fear syndrome and give rise to vaccine hesitancy. Parents are now refusing to vaccinate their children despite the availability and effectiveness of the vaccine[9]. This leads to the decrease of confidence of the public in vaccines and vaccination programs[21]. Though some controversies have no scientific data to support their theories, this can result to decreased and weakened confidence in vaccination[22]. The spread of these controversies reduces the intention to vaccinate and results to more occurrence of outbreaks[23].

Perception on Vaccination

The availability of the vaccine will not guarantee the high success rate of vaccination in different populations. Responses to vaccination campaigns are based on individual perception, occupation, exposure to COVID-19 infected patients, and history of vaccination to influenza or other vaccines prior to COVID-19 pandemic[24]. The primary factors why individuals are willing or unwilling to get vaccinated are the safety and efficacy of COVID-19 vaccine[25].

Studies showed that Chinese healthcare workers has higher levels (76.4%) of willingness in accepting the COVID-19 vaccination[26] while those HCW in United States has low levels (36%) of willingness in accepting COVID-19 vaccination[27]. In the Philippines, an OCTA survey in Metro Manila shows lower rates (25%) of willingness in accepting, 28% refuses to accept COVID -19 vaccination and 47% are still undecided whether to accept or decline COVID-19 vaccination [28].

Barriers to Vaccination

Determining the potential barriers of vaccination is important to raise awareness of the vaccine, and vaccine acceptance and vaccine uptake[29].

Barriers of the vaccination are often related to different factors such as concerns in vaccine safety, vaccine efficacy, vaccine adverse, effects, and the risks that the vaccine will give[30]. Studies showed that higher percentage of effectivity of the vaccine is associated with higher vaccination acceptance[31]. Lack of access and the travel time are considered also as barriers to vaccination[29]. Parents are less likely to accept vaccination due to cost of the vaccine especially if they have multiple number of family members[30].

Mistrust to vaccination in the Philippines started in the vaccination in dengue that caused a lot of controversy during that time[32]. For the past years

now, public are now at doubt with regards to vaccine and year by year the percentage of it is increasing. Dengvaxia vaccine develops vaccine hesitancy within the Philippines. Three main reasons why some are at doubt with regards to COVID-19 vaccine are; too dangerous because it was produces in a rush; considering it useless; and lastly general lack of trust in the vaccine[9].

A recent conducted by Vergara et al., in 2020 suggested that building a sense of public trust toward vaccination programs is an effective way of response to COVID-19 vaccine hesitancy[33]. Thus, it is important to disseminate factual and correct information about the vaccine to improve the rates of vaccination in certain population[34].

METHODS

Research design

A quantitative research design was used and a cross-sectional survey was conducted to assess the sociodemographic data of the mothers in Lake Sebu, South Cotabato, this data includes age, ethnicity, marital status, etc. Their perception on COVID-19 vaccination as well as the barriers to receiving the vaccination was also determined. Cross-sectional survey refers to the study that aimed at determining the frequency (or level) of a particular attribute, such as a specific exposure, disease or any other health-related event, in a defined population at a particular point in time[35].

Sampling and Sample Size

Random sampling method was used in selecting the respondents. Researchers selected respondents from their sampling frame following the inclusion criteria set by the researchers. The sample size was determined using Slovin's Formula (Appendix A). To generate a confidence level of 95% with a 5% margin of error, a sample size of 398 was needed.

Participants of the Study

The respondents were mothers ages 18 years old and above, and a resident of Lake Sebu, South Cotabato. Every 19 Barangays had 21 samples who answered the provided survey questionnaire. The researchers chose mothers to be their respondents because, in a family setup, a mother is the one in charge of the decision-making in terms of the health of her other family members especially her children[36].

Locale of the study

The research was conducted in Lake Sebu, South Cotabato. 2015 Census reported that its population was 87, 442. In the total population of South Cotabato province, Lake Sebu covers 9.55% of the total population and it consists 1.92% of the overall population of the SOCCSKSARGEN region. Lake Sebu has 19 barangays which includes Brgy. Bacdulong, Denlag, Halilan, Hanoon, Klubi, Lake Lahit, Lamcade, Lamdalag, Lamfugon, Lamlahak, Lower Maculan, Luhib, Ned, Poblacion, Siluton, Takunel, Talisa,Tasiman and Upper Maculan[37].

Research Instrument

The study utilized a validated survey questionnaire as a research instrument. The survey questionnaire included questions which assessed socio-demographic background of the respondents, risk of exposure of respondents to COVID-19 infection,

perception on COVID-19 vaccination, barriers to COVID-19 vaccination, and reasons to receive COVID-19 vaccination.

The content of the questionnaire was validated by three healthcare professionals. The first part of the questionnaire focused on the sociodemographic data of the respondents (age, ethnicity, marital status, highest education level, occupation, and annual average household income). The second part assessed the health of the respondents by using the COVID-19 health declaration form which is answerable by "yes" or "no". The purpose of using health declaration form is to determine the threat that the respondents are facing which is the risk of exposure to COVID-19 infection. According to the HBM model, when an individual perceives a serious threat that person will be more likely to take action to reduce that threat.

The third and last part of the survey questionnaire used a modified Likert scale to measure the different opinions and attitudes of respondents (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree). The third part assessed the perception of respondents regarding the COVID-19 vaccination. The health belief model was applied in this part. This consists of questions regarding perceived responsiveness to the COVID-19 vaccination, perceived severity or side effects of COVID-19 vaccination, and the perceived benefits of COVID-19 vaccination. The last part of the questionnaire assessed the barriers to COVID-19 vaccination.

Ethical Considerations

The important ethical concerns that are considered in conducting this study were respect for person, confidentiality, and informed consent of the respondents. The participants in this study have the right to decide whether or not they get involved in this research. Their personal information was not indicated in the research to protect and secure the data gathered. The researchers were legally bound not to reveal the identity of the participants to anyone. For the data gathering, the researcher provided a letter of consent approved by the research adviser and the municipality mayor of Lake Sebu, South Cotabato. The participation of the respondents is voluntary and they knew all things above the research they participated in. They were informed of all the procedures, risk potential, and benefits of the research. They were also informed that the research did not intend to cause harm to their identity and profession.

Ethics Approval

This study was approved by the Pharmacy Research Ethics Committee (PREC) at St. Alexius College (Approval: SAC-PREC-01-FEB-003).

Data Analysis

The study used both descriptive and inferential statistics to determine the factors influencing the level of perception and barriers of COVID-19 vaccination among mothers in Lake Sebu, South Cotabato.

The frequency and percentage distribution were used in analyzing the demographics of the respondents. In terms of analyzing the perception and barriers of COVID-19 vaccination, the researchers used measure of central tendency in which they determined the mean levels of the responses in

modified likert scale.

In addition, the interpretation matrix to gauge the perception and barriers to COVID-19 vaccination is based from the study of Wibowo & Suyatmi, 2016. This is used to evaluate the overall value of the answers in Likert Scale by their respective means. The matrix is commonly referred to as the "four categories of Likert Scale"[38].

RESULTS AND DISCUSSION

Despite several challenges, the immunization program of the Philippine government continues across the country. Hence, for this study, the researchers aimed to determine the level of perception and barriers of COVID-19 vaccination among mothers in Lake Sebu, South Cotabato.

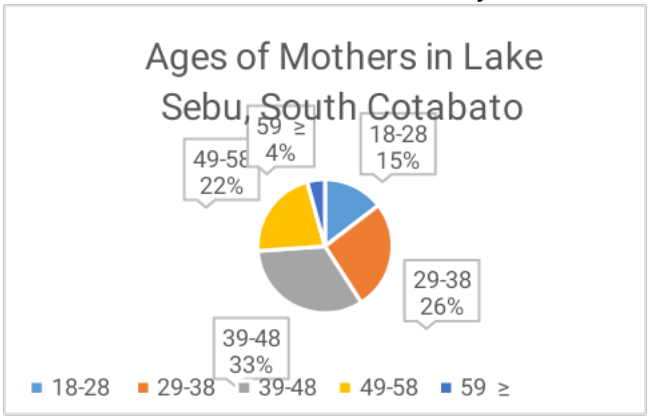
Demographic Profile

The demographic characteristics of the respondents were recorded and the results are shown in the pie charts 1A, 1B, 1C, 1D, 1E, and 1F. In addition, the health status of respondents regarding the risk exposure to COVID-19 vaccination was shown in bar graph 1G.

Pie Chart 1A

Demographic Profile of the Respondents (n=398)

Results of the survey indicated that most of the respondents were 39-48 years old (32.9%). This was followed by 29-38 years old (26.4%) and 49-58 years old (21.9%).

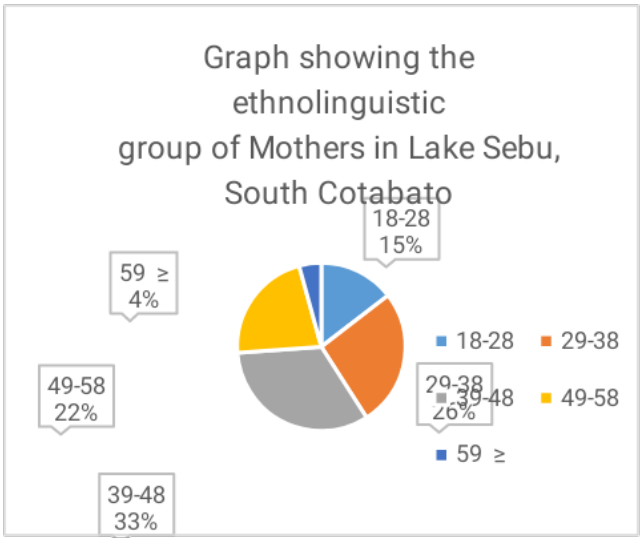


The consideration of age in determining the factors influencing the perception and barriers among mothers to receive the COVID-19 vaccine was considered for this study as there some issues surrounding the probability that receiving the COVID-19 vaccine could lead to infertility. [39].

Pie Chart 1B

Demographic Profile of the Respondents (n=398)

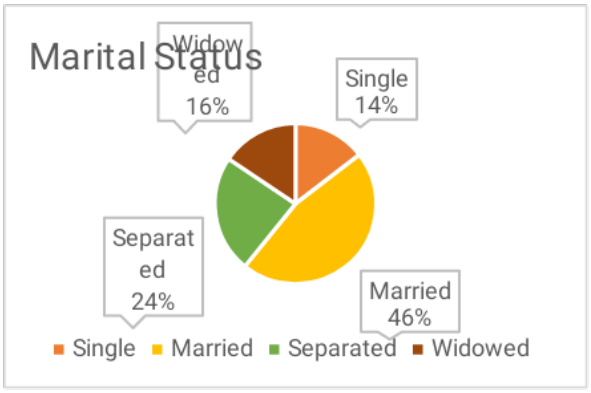
In terms of ethnicity, the majority of the respondents belong to the T'boli tribe (73.1%) and 26.1% were Hiligaynon.



Pie Chart 1C

Demographic Profile of the Respondents (n=398)

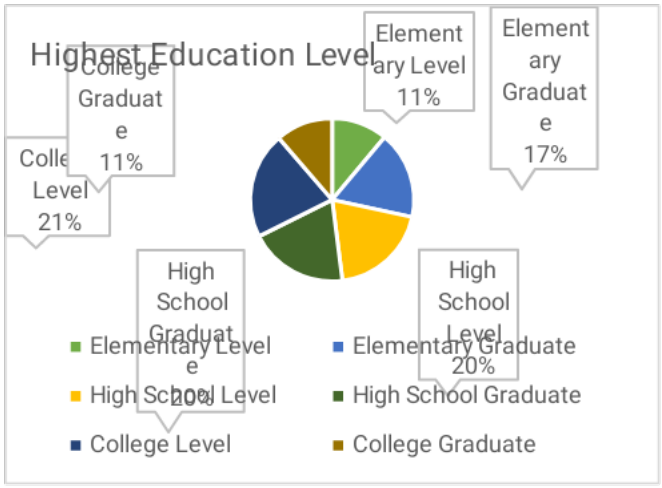
For the marital status, most mothers are married (46.2%), followed by separated (22%), widowed (21%), and single (14%).



Pie Chart 1D

Demographic Profile of the Respondents (n=398)

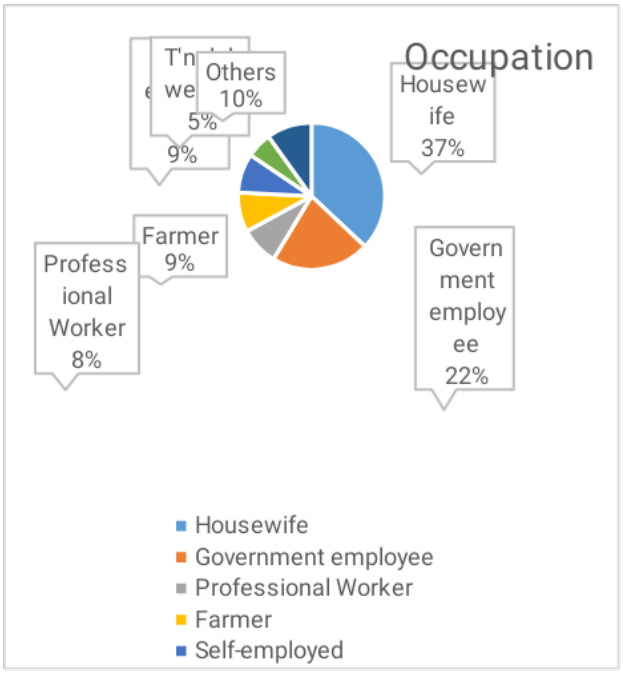
Likewise, the majority of them were high school (19.6%) and college level (21.1%).



Pie Chart 1E

Demographic Profile of the Respondents (n=398)

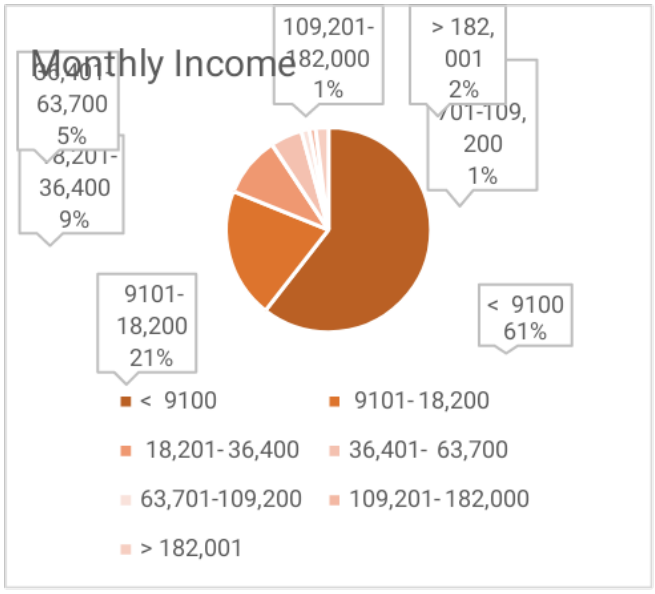
Additionally, most of them are working as housewives (36.4%) and as a government employee (22%).



Pie Chart 1F

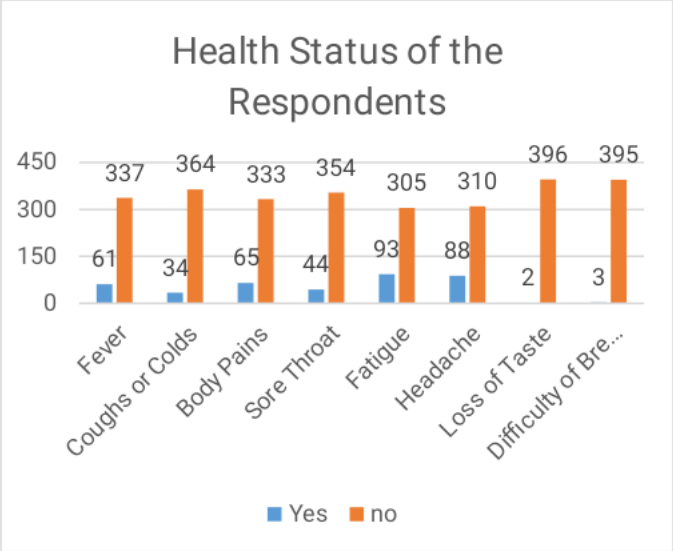
Demographic Profile of the Respondents (n=398)

Findings also revealed that the majority of the respondents has <P 9100 monthly income (60.6%) which falls to the poor income cluster[40].



Graph 1G

Demographic Profile of the Respondents (n=398)



The survey results indicated that the most common health issues among mothers are fatigue (93) and Headache (88). This table also recorded other health issues which are essential in the health assessment of symptoms of COVID-19 disease which include fever, coughs, body pains and others. Moreover, this data shows that the risk of exposure of respondents to COVID-19 infection is low. This indicates that the threat of having COVID-19 infection for the respondents is relatively low.

According to the Health Belief model, when an individual perceives a serious threat that person will be more likely to take action to reduce that threat[41]. In relation to this, the respondents' negative perception about COVID-19 vaccination is influenced by their perceived threat or signs and symptoms of COVID-19 infection. This then became one of the reasons why respondents are unwilling to be inoculated by COVID-19 vaccine.

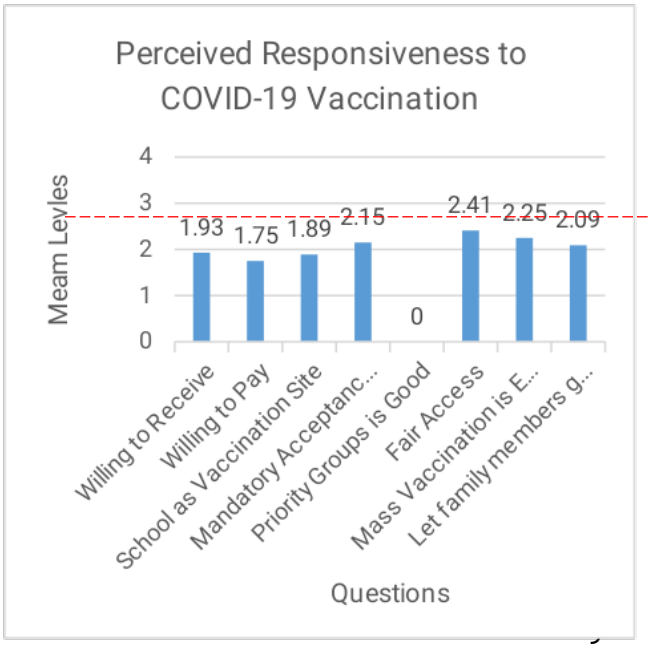
Level of Perception

In the determination of the level of perception among mothers on COVID-19 vaccination, the level of perception was measured based on responsiveness, perceived severity (side effects), and benefits.

Graph 2A

The Mean Level of Perception among Respondents on COVID-19 Vaccination (n=398)

Results of the survey clearly indicated the negative perception among mothers toward COVID-19 vaccination. Based on the interpretation matrix used by Wibowo & Suyatmi (2016), the descriptive equivalent of willingness to receive COVID-19 vaccination (1.93) and letting their family get vaccinated by COVID-19 vaccine (2.09) is low. This is related to the result of an OCTA survey in Metro Manila where the recent study shows lower rates (25%) of willingness in accepting COVID-19 vaccination in which 28% refuses to accept COVID-19 vaccination and 47% are still undecided whether to accept or decline it[28].



Regarding the respondents' willingness to pay for COVID-19 vaccination (1.75), its descriptive equivalent is very low. This result is related to the cues to action #4, which states that the respondents will more likely to receive COVID-19 vaccination if it will be given for free. This is now resolved and implemented because according to the Philippine Information Agency, Filipinos will not pay for COVID-19 vaccination. All the fees and costs are shouldered by the Philippine government[42]. Furthermore, the results of this survey also showed that considering schools as vaccination sites (1.89) is relatively low. However, in the initial phase of COVID-19 vaccine rollout in the Philippines, there are at least 40 schools prepared in Taguig city that will serve as community vaccination centers[43].

With this development, the government ensures that the schools that have been used as vaccination sites have passed the requirements of Department of Health and IATF such as sufficient facilities, space, human resources, and other requirements[44]. Likewise, the results also showed a low descriptive equivalent for the respondents' response about "mass vaccination is effective" (2.25). Nevertheless, the Philippine government had started the COVID-19 mass vaccination[45]. The first COVID-19 vaccine rollout in the Philippines was conducted on March 1, 2021, and at least 756 frontliners had received the vaccination for their first day[7]. In addition, the Parañaque Mayor, Edwin Olivarez, said that the LGUs in Metro Manila are looking forward to mass vaccination by the month of June. He added that it is necessary to achieve 70% of herd immunity in their area[45]. In relation to this, before the implementation of mass vaccination, the World Health Organization ensures that every country has the capacity to implement it. Also, they ensure that countries had followed the WHO recommendations on providing high-quality vaccination campaign such as additional human and financial resources, implementation of physical distancing and other specific IATF COVID-19 protocols and preventive measures. To this regard, healthcare professionals and individuals who will be vaccinated must adhere to Infection Prevention and Control (IPC) good practices to minimize COVID-19 transmission which includes wearing of masks, proper handwashing, use of hand sanitizers, and wearing of proper PPE[46].

Apart from this, findings of the study also indicated a low descriptive equivalent for the response of respondents regarding "mandatory acceptance of COVID-19 vaccination is NOT necessary" (2.15), which means that the respondents are in favor of mandatory acceptance of COVID-19 vaccination. However, according to the DOH, COVID-19 vaccination is not compulsory for Filipinos. Still, the government is highly encouraging everyone to get vaccinated by COVID-19 vaccine to protect themselves as well as the people who surround them from COVID-19 infection[15].

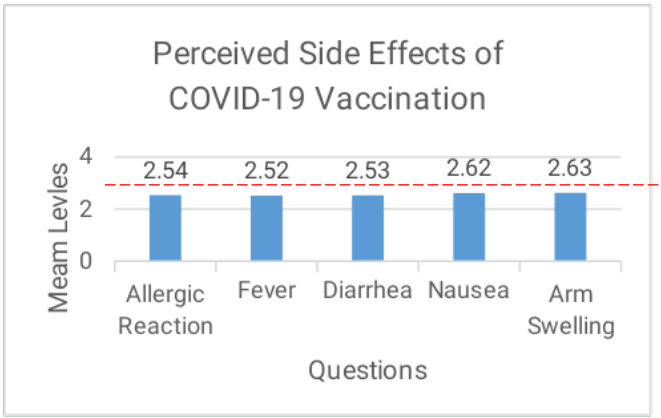
Likewise, the survey results indicated that having a fair access to COVID-19 vaccination (2.41) is also low, which means that the respondents believe that there is an unfair distribution of COVID-19 vaccination. Possible reasons for these results are: many of the respondents have not yet

received the COVID-19 vaccination because it is not yet accessible in their respective barangay, and they are not listed in the priority groups for the inoculation of COVID-19 vaccination. These reasons were concluded by the researchers. They based it on the demographic profiles of the respondents where most of them are 39 -48 years old (which are not considered as senior citizens), working as housewives, and fall in poor income cluster.

In contrary, the findings indicated a high descriptive equivalent in terms of the respondents' response about "priority group for COVID-19 vaccination is a good decision", this means that the respondents are in favor of priority groups even though most of them are not listed in it. In relation to this, the Inter-Agency Task Force (IATF) for the Management of Emerging Infectious Disease has embraced the prioritization framework due to the limited supply of COVID-19 vaccines worldwide. This will ensure that those individuals who have a higher risk of exposure to COVID-19 and death will be protected from the disease[47]. Priority groups will be (in order) frontline workers in health facilities and health professionals, senior citizens ages 60 years old and above, individuals with comorbidities, frontline personnel, indigent population, teachers and social workers, other government workers, other essential workers, socio-demographic groups that have higher risk for COVID-19, OFWs, and the rest of Filipino citizens[48]. Children are not in the eligible groups to be vaccinated due to insufficient results from phase II and III of COVID-19 vaccines[49].

Graph 2B

The Mean Level of Perception among Respondents on COVID-19 Vaccination (n=398)



In terms of perceived severity (side effects), the respondents highly believe that receiving COVID-19 vaccine could result in various side effects of allergic reaction, fever, diarrhea, nausea and arm swelling.

In relation to this, according to the Centers for Disease Control and Prevention (CDC), side effects are normal, and these are signs that the body is reacting with the vaccine. Also, these side effects will disappear for few days[50]. Previously, issues about the rare cases of blood clot as side effects of COVID-19 vaccine (AstraZeneca) had risen. Nevertheless, these issues were resolved after the discussions of DOH with other experts, they concluded that currently, there are no known risk factors for VITT or blood clot, and they ensure that the benefits of getting vaccinated by COVID-19 vaccine always outweighs the risks[51].

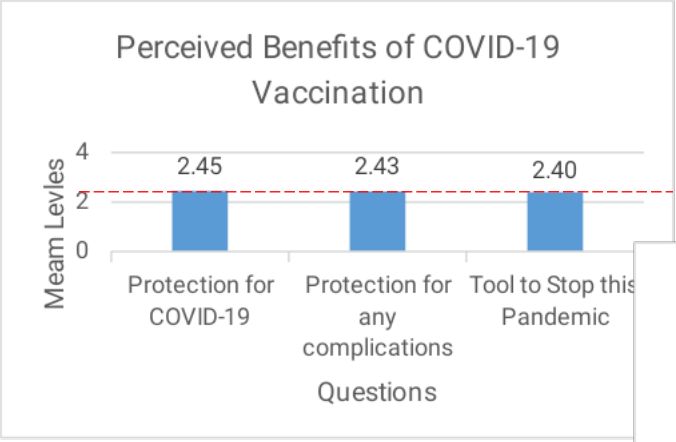
For this reason, "benefits outweigh the risks," individuals are accepting COVID-19 vaccination. Moreover, according to the FDA and DOH, countries that vaccinated over 1

million individuals reported that only 1.5% of the vaccinees had experienced serious side effects of COVID-19 vaccine. The rest of the population only experienced mild and common side effects. The DOH and FDA also added that the serious side effects are coincidental and unrelated to COVID-19 vaccine. Thus, the risks of COVID-19 vaccine are much lower compared to its benefits[51].

Graph 2C

The Mean Level of Perception among Respondents on COVID-19 Vaccination (n=398)

Meanwhile, the level of perception among respondents in terms of the benefits when receiving the vaccine was found to be relatively low: protection for COVID-19 infection (2.45), protection for any complication (2.43), and belief as a tool to stop this pandemic (2.4).



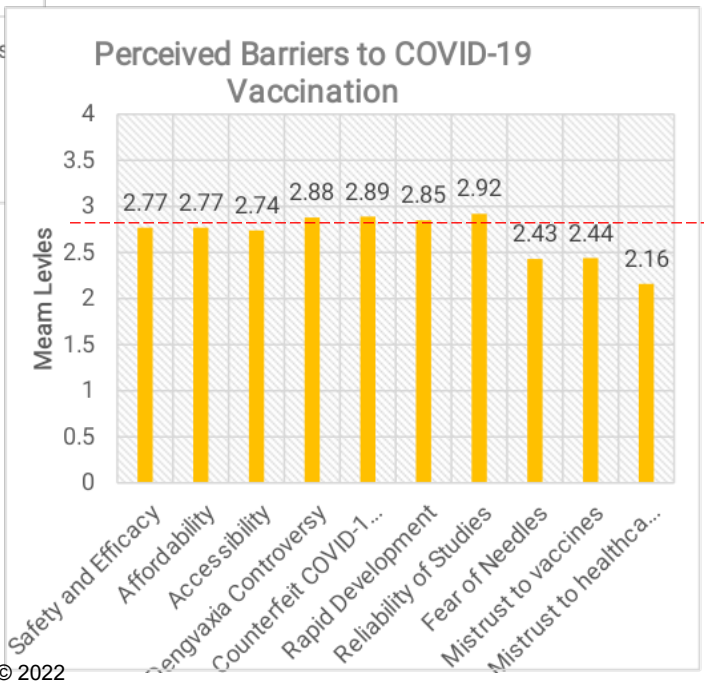
These results mean that most respondents believe that being inoculated could not guarantee 100% protection against COVID-19 infection and its complications. In relation to this, according to the CDC, people who are completely vaccinated with COVID-19 vaccine can still be hospitalized and die from COVID-19 infection. The CDC also added that it is possible for some vaccinated individuals to be infected just before or after the vaccination, and this can be referred to as "vaccine breakthrough cases". This is because it takes 2 weeks or more for the body to build the immune response and protection after the vaccination. Thus, the effect depends on the individual's response to COVID-19 vaccine. Also, new variants of the virus can contribute to this[52]. Nevertheless, the CDC considered COVID-19 vaccination as a tool to stop the COVID-19 pandemic if it is implemented, following IATF protocols and other preventive measures such as wearing masks and social distancing[53].

Perceived Barriers

Meanwhile, to determine the barriers to COVID-19 vaccination, the respondents were asked based on the safety and efficacy, affordability, accessibility, trust, and others. Overall results are shown in Graph 3.

Graph 3

The Mean Level of Perceived Barriers among Respondents on COVID-19 Vaccination (n=398)



Results of the survey indicated that some of the perceived barriers among respondents to received COVID-19 vaccine are the safety and efficacy (mean = 2.77) of the vaccine, affordability (mean =2.77), accessibility (mean 2.74), negative experience or news received from another vaccination program of the government, and the rapid development and reliability of current vaccine. The results of the study show that the respondents trust vaccines, as well as the healthcare professionals, but are hesitant to receive COVID-19 vaccination due its rapid development and the Dengvaxia controversy.

Dengvaxia, a novel dengue vaccine, has been subjected to controversy due to the claim of various people that that the vaccine has caused deaths and severe suffering. This was introduced by DOH in 2016 in the Philippines for over 800,000 people[21]. As a result, confidence in vaccines has decreased[54]. To address these barriers, cues to action must be done. In this study, providing sufficient data about the safety and efficacy of COVID-19 vaccines is necessary to restore the public's confidence in vaccines. Despite the fact that COVID-19 vaccines are rapidly developed, the FDA ensures their safety and efficacy by evaluating the data from clinical studies of these vaccines. The FDA granted COVID-19 vaccines the "Emergency Use Authorization" because the data from clinical trials clearly showed that the benefits of COVID-19 vaccines had outweighed the potential risks. Additionally, both the FDA and CDC monitor the COVID-19 safety after the authorization to rapidly detect and investigate if safety problems have emerged such as anaphylaxis, severe side effects, and adverse reactions[55].

The study of Soborg et al., about "Vaccines in a hurry" showed that in recent years, vaccine for poliomyelitis was also rapidly developed. Double-blinded placebo and controlled studies were conducted from the year 1954 to 1955. The results of these trials had proved the safety and efficacy of the vaccine. Thus, this led to the authorization of the vaccine for use. The vaccine campaign for this poliomyelitis was a huge success leading to the decrease in polio cases in the population who administered this vaccine[56].

Significant Relationship Between Sociodemographic profiles and the Level of Perception and Barriers on COVID-19 Vaccination

To determine if there is an existing significant difference in the mean level of perception and barriers according to demographic profile, statistical analysis was conducted and results are shown in Table 1.

Table 1

Testing the Significant Relationship Between Sociodemographic profiles and the Level of Perception and Barriers on COVID-19 Vaccination (n=398)

Parameters	Variables	P-value	Remarks*
Age	Perception	0.524	Not significant
	Barriers	0.411	Not significant
Ethnicity	Perception	0.625	Not significant
	Barriers	0.630	Not significant
Marital Status	Perception	0.775	Not significant
	Barriers	0.714	Not significant
Highest Educational Attainment	Perception	0.142	Not significant
	Barriers	0.145	Not significant
Monthly Income	Perception	0.252	Not significant
	Barriers	0.254	Not significant

Results of statistical analysis

revealed that there is no significant difference (p>0.05) or significant relationship on the mean level of perception and perceived barriers of COVID-19 vaccination among the respondents which means that whether rich or poor, educated or not, from T'boli, Hiligaynon, or other ethnic groups that the respondents came from, most of them were afraid to get vaccinated by COVID-19 vaccine. Thus, this indicates that most of the respondents have a negative perception toward COVID-19 vaccination regardless of their demographics. For this reason, this becomes a major barrier for COVID-19 vaccination.

In relation to this, #5 statement in cues to action is needed which is about providing a sufficient data on the safety and efficacy of COVID-19 vaccines. According to Sagor & AlAteeq (2018), an individual's knowledge about the vaccine is influenced by their sources of information that can result to misconceptions and affect the intention regarding vaccine uptake or vaccine decline. Additionally, poor knowledge is also related to lack of awareness of how often the vaccine should be given and how it was administered, which significantly results in low vaccine uptake rates. To overcome this, more public education about the vaccine is required. Thus, it is crucial to disseminate factual and correct information about the vaccine to improve the rates of vaccination in a certain population[34].

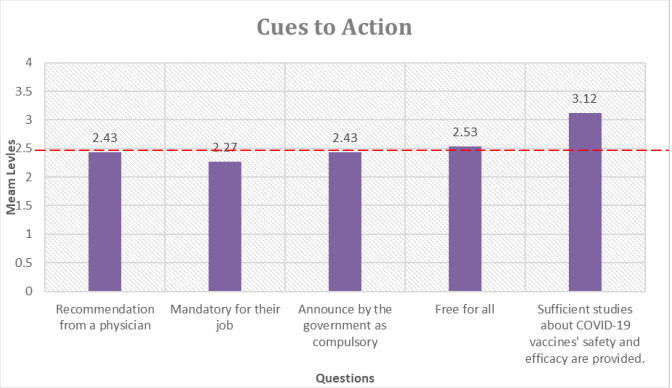
Cues to Action

Furthermore, to determine the cues to action to the barriers of COVID-19 vaccination, the respondents were asked based on recommendation, the decision of the government, and availability and reliability of studies about COVID-19 vaccination. Overall results are shown in Graph 4.

Graph 4

Reasons that Respondents will Likely Accept COVID-19 vaccination (n=398)

Results of the survey indicated that the COVID-19 vaccination program of the government might likely be effective in rural areas if it is given for free (mean value = 2.53), and it will show sufficient data on the safety and efficacy of its use (mean=3.12).



Reason #4, which indicates "COVID-19 vaccination must be free for all" is now implemented because according to Dr. Dominic Maddumba of the DOH's Health Promotion Bureau, Filipinos will not pay for the COVID-19 vaccine. The government will shoulder all the costs for vaccination[42]. With this result, the respondents will most likely receive COVID-19 vaccination if given for free because based on their demographics, most of them have a less than P9,100 monthly income which falls under the poor income cluster[40].

Discussion

In December 2019, the cause of the local outbreak of pneumonia in Wuhan, China, was unknown. It was then

studied, and scientists discovered that it is caused by a novel coronavirus, the SARS-CoV-2 or the severe acute respiratory syndrome coronavirus[10]. The WHO has officially announced the name of the disease last February 11, 2020. It is abbreviated as "COVID-19". "CO" for corona, "VI" for the virus, and "D" for disease. The 19 in the name of the disease comes from when it was originally started, in 2019. Before the name COVID-19, it was called 2019 novel coronavirus or 2019-nCoV. They are named for their crown-like characteristics[11]. It spreads mainly through respiratory droplets. These droplets can travel through air if an individual sneeze, cough, or talk. These droplets can be transmitted if people who are infected and near you breathe[57]. Coronavirus disease can affect people in different ways. It can cause mild to moderate symptoms for most individuals. The most common symptoms of this disease are fever, dry cough, and tiredness. Less common symptoms can include body aches and pains, sore throat, diarrhea, headache, loss of taste and smell, and a rash on the skin. Severe symptoms of the disease can cause difficulty in breathing or shortness of breath, chest pain, and loss of speech or ability to move. On average person, it takes 5-6 days for the symptoms to show, but it can take up to 14-21 days[58].

Additionally, the COVID-19 was declared a pandemic by WHO last March 11, 2020. The World Health Organization (WHO) was concerned about the increasing number of COVID-19 cases and has called countries to take preventive measures to contain the spread of coronavirus disease[12].

In the absence of vaccines and approved treatment of COVID-19, all nations worldwide are struggling to prevent the spread of infection[5]. Preventive measures to lessen cases of COVID19 include voluntary or mandatory quarantine and lockdowns. Handwashing or using sanitizers and avoiding crowded places is vital to reduce risk of transmission. Countries worldwide prohibit face-to-face learning, implement limitations or restrictions of gatherings, mandatory quarantine, wearing face masks, and stay-at-home and social distancing policy[59].

For about one (1) year of facing the pandemic, vaccines all over the world are now gradually rolled out. As of February 15, 2021, over 80 countries had started rolling out vaccines[6]. Currently, the Philippine government is in the initial phase of the COVID19 vaccine roll out with the availability of both AstraZeneca and Sinovac vaccines. The country is also in the process of negotiations with the other vaccine manufacturers, such as the COVAX facility[49]. The first COVID-19 vaccine rollout in the Philippines was conducted on March 1, 2021. At least 756 frontliners had received the vaccination for their first day[7]. According to Secretary of Health Dr. Francisco Duque, the challenge in the implementation of vaccination programs is to increase the uptake of vaccines and restoring the public's confidence in vaccines[7].

Therefore, this study examines the perception and barriers of COVID-19 vaccination among mothers in Lake Sebu, South Cotabato. The study was conducted during the COVID-19 pandemic and with the process of developing COVID-19 vaccines. During the data collection period, March 19 - April 15, the number of cases in Lake

Sebu, South Cotabato is minimal compared to cases all over the Philippines[4]. In the same month, the rollout of COVID-19 vaccine in the Philippines has started[7]. Of notable importance, our data represent a low level of perceived susceptibility (responsiveness) and high severity (side effects) of COVID-19 vaccination. In relation to this, our data indicated a lower perceived benefits and higher perceived barriers of COVID-19 vaccination. Thus, patient education and other cues to action in addressing these barriers must be provided by the government and healthcare professionals. Furthermore, respondents' self-efficacy was not determined in this study because the results have shown a negative perception on COVID-19 vaccination, which means that the mothers' to successfully get the COVID-19 vaccination cannot be measured.

The theoretical framework used in the study is the Health Belief Model (HBM). It is used to examine the health-related behavior of individuals[60] and to determine their vaccination intention[5]. It is used in the previous study in determining parents' perception and decisions regarding vaccination against seasonal influenza[61]. The HBM has six (6) components: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy[62]. Perceived susceptibility involves individual's perception and feelings to a certain condition or diagnosis[63].

In the study, the researchers used the word "responsiveness" to COVID-19 vaccination instead of "susceptibility" to prevent misleading respondents to potential casualties of vaccination. This gave a clearer picture of the respondents' perception regarding the COVID-19 vaccination. Perceived severity involves the potential consequences[64] of the COVID-19 vaccination. Perceived benefit involves an individual's beliefs toward positive outcomes of particular course of action[65]. Perceived barrier refers to the difficulties and challenges in the implemented health action[65], and cues to action are strategies or reasons that will motivate individuals to adopt a particular action or behavior, such as recommendations of physician or adequate information regarding the COVID-19 vaccination[60]. Self-efficacy involves an individual's belief about their ability to succeed in a certain action[66].

The study findings indicated that the respondents have a low perceived threat of having COVID-19 infection, which is associated with the respondents' decision to less likely accept the COVID-19 vaccine. According to the study of Fayanju et al. in 2014, the HBM suggests that when an individual perceives a serious threat, that person will be more likely to take action to reduce that threat[41].

Additionally, the results indicated that the respondents' perceived susceptibility (responsiveness) is low and is associated with the negative perception of COVID-19 vaccination. Also, the study showed that the respondents are afraid to get COVID-19 vaccination regardless of their social status, education, income, occupation, and age. Thus, this indicates that regardless of their demographics or ethnicity, both have a negative perception on COVID-19 vaccine. This contradicts the study of Sun et al. (2018), which states that the willingness

to get vaccinated is correlated with the demographics of individuals[67]. On the other hand, the idea of Dror et al. in 2020 that parents' responses to vaccination programs are based on the individual's perception affirms this idea[24].

Moreover, in terms of perceived severity (side effects), the respondents indicated and highly believed that receiving COVID-19 vaccine could result in various side effects of an allergic reaction, fever, diarrhea, nausea and arm swelling. This has the same result with the side effects of vaccines that the FDA mentioned: pain at injection site, tiredness, headache, muscle pain, chills, fever, and joint pain[68]. Since the result indicated a low perceived susceptibility (responsiveness) and high perceived severity (side effects), the perceived benefit of COVID-19 vaccination is also relatively low. Clearly, this indicates that the negative perception of COVID-19 vaccine is associated with the perceived benefits and decision of individuals to get vaccinated or not.

In relation to the low perceived benefits of COVID-19 vaccine, the perceived barriers of COVID-19 vaccine are high (namely safety and efficacy of the vaccine, affordability, accessibility, negative experience or news received from other vaccination programs of the government, and the rapid development and reliability of current vaccine). This is related to the findings of Kang et al., 2017 about the barriers of vaccination. Their study found that vaccination barriers are often related to different factors such as concerns in vaccine safety, vaccine efficacy, vaccine adverse effects, and the risks that the vaccine will give[30]. Likewise, this is also affirmed by the study of Bleza et al. in 2021 that the safety and efficacy of the COVID-19 vaccine are the primary factors why individuals are willing or unwilling to get vaccinated[25]. Also, this result is related to the findings of Wang and peers that the individuals wanted to delay their vaccination until the safety of the vaccines was confirmed[69]. Furthermore, the safety of the vaccines is also related to the trust of individuals in vaccines. Therefore, safety of vaccines has a significant role in vaccine acceptance or vaccine refusal rates of vaccination[70].

For the efficacy concerns as a barrier, this is affirmed by the study of Harapan et al. in 2020. Individuals are concerned about the efficacy rates of the vaccines and their participants would like to be vaccinated if the vaccine has 95% efficacy the government has proven but if the vaccine has 50% effectiveness, the rate of vaccination uptake is relatively low[31]. Thus, it will be difficult for the population to take COVID-19 vaccine if it has relatively low effectiveness. Another barrier to vaccination that is found in the study is the concern for the affordability of vaccines. Likewise, this result is supported by the survey that vaccination costs can be a significant barrier of vaccination[71]. Also, the study of Kang et al. in 2017 affirmed to this. Parents are less likely to accept vaccination due to the cost of the vaccine especially if they have multiple family members[30]. A study conducted by Liu et al. in 2020 suggests that low-income countries considered the costs of the vaccines and the inability to afford it as the most significant barrier for COVID-19 vaccination[72]. In this pandemic, 2020, this challenge is exacerbated; there is an increase in price and a worsening in inequity and disparity[72]. The study of Liu et al. in 2020 also suggests that the

distribution of the vaccine is associated with the ability to develop and test and also the ability to purchase[72]. Producers of the vaccines negotiate with different sectors, both private and public, for purchasing and sales[72]. The cost of vaccines is the greatest barrier for people in accepting vaccination[72]. Some people might think that vaccination is beneficial for health, but they found it inconvenient. Financial support then is needed. Young people have a low chance of having the vaccine because of the lack of money to have them vaccinated[72].

Furthermore, the study results indicated that the accessibility of the vaccine is also considered a barrier to COVID-19 vaccination. This is affirmed by the study of Bedford et al. in 2018 where they found that vaccine hesitancy is influenced by convenience and geographical accessibility[73]. In addition, the study of Lee Ventola also supports this, He suggested that noncompliance with the vaccine is associated with the transportation problem[71]. Another study conducted in India, Pakistan, Turkey, Bangladesh, Brazil, Uganda, China, Nigeria, Columbia, Cambodia, Kenya, and South Africa is related. They have shown that lack of access to vaccination services was the most frequent reason for the unvaccinated population[74]. Likewise, the counterfeit vaccine is also considered a barrier to vaccination. This idea concedes with the idea of Khan et al., 2016, where they found that a fake Hepatitis B vaccine could lead to a decline of public trust to immunization[75].

In terms of the rapid development of the vaccine as a barrier to COVID-19 vaccination, this is supported by the study of Fatima and Syed, 2018[9]. The primary concerns of noncompliant patients during immunization programs are the rapid development of vaccines and the Dengvaxia controversy[9]. Meanwhile, the study indicated that the reliability of studies regarding COVID-19 vaccine is also a barrier to COVID-19 vaccination. Likewise, this idea is supported by the study where they found that a person will accept or reject the vaccine based on their personal attitudes such as influence of vaccine recommendation from different sources and knowledge on the vaccine[76].

To address these barriers and the unwillingness of the respondents to get vaccinated by COVID-19 vaccines, cues to action are determined. Meanwhile, the results of the study indicated that COVID-19 vaccination program of the government might likely be effective in rural areas if it is given for free, and it will show sufficient data on the safety and efficacy of its use. This is affirmed by the study suggesting that mandatory vaccines with free of charge must be implemented regardless of where the individuals are to reduce the vaccination barrier[77]. In addition, the national vaccination program against COVID-19 aims to provide free, effective, and high-quality vaccines[42]. Furthermore, the belief of individuals and their health behavior primarily depends on their knowledge. According to Esposito et al. in 2014, lack of parents' knowledge toward vaccine creates negative impact to the vaccination decision of parents in children[78]. Also, the misinformation provided by media and other anti-vaccinators lead parents to wonder and consider vaccine as unsafe and ineffective[78].

Likewise, the information about vaccination should be provided to

parents in order for them to have knowledge in the decision in taking or not taking the vaccine for their child[78]. In addition, the Health Belief Model proposed that knowledge is a factor that influences individual's beliefs and actual health behavior[78]. Thus, background knowledge on the importance of vaccination is also important in decision -making about vaccine acceptance or vaccine refusal[79]. Furthermore, this is also affirmed by the study of Lee Ventola where he found out that lack of knowledge is a major reason why individuals are noncompliant to vaccination programs. Noncompliant individuals are not aware of the importance of vaccines. They also don't understand why recommended dose are needed[71]. Clearly, this indicated that poor knowledge is also related to lack of awareness on how often the vaccine should be given and how it was administered and this is significantly resulted in low rates of vaccine uptake.

To overcome this barrier, more public education about vaccine were required[34]. Additionally, individual's knowledge about the vaccine is influenced by their sources of information that can result to misconceptions and affect the intention regarding vaccine uptake or vaccine decline. Thus, it is important to disseminate factual and correct information about the vaccine to improve the rates of vaccination in certain population[34]. As such, the healthcare workers should strongly provide information drive campaign to provide relative and factual information on the effectiveness and necessity of receiving the vaccine. With this, patient education is necessary. A study conducted by Leung et al. (2017), indicated that the impact of patient education is significant results to a higher vaccination uptake rate[80]. Individuals who were undecided whether to receive vaccination seemed to demonstrate larger beneficial effects[80]. Overall, if this premise will be sufficiently provided, the COVID-19 vaccination drive in tribal areas may become successful.

SUMMARY OF FINDINGS

SOP#1: What are the demographic profiles of the respondents in terms of: a) Age b) Ethnicity c) Marital Status d) Highest Education Level e) Occupation f) Annual Income and g) Health Status.

The survey result indicated that most of the respondents were 39-48 years old (32.9%). This was followed by 29-38 years old (26.4%) and 49-58 years old (21.9%). In terms of ethnicity, the majority of the respondents belong to the T'boli tribe (73.1%) and 26.1% were Hiligaynon. For the marital status, most mothers are married (46.2%), followed by separated (22%), widowed (21%), and single (14%). Likewise, the majority of them were high school (19.6%) and college level (21.1%). Additionally, most of them work as housewives (36.4%) and as government employee (22%). Findings also revealed that the most of the respondents have less than < 9, 100 monthly income (60.6%) which fall to the poor income cluster (PSA 2015a, 2017). For the health status, results of the survey indicated that the most common health issues among mothers are fatigue (93) and headache (88) which means that the risk of exposure of respondents to COVID-19 infection is low.

SOP#2: What are the perceptions of the respondents regarding COVID-19 vaccination?

Results of the survey revealed that the respondents have a negative perception toward COVID-19 vaccination. Additionally, most of them were unwilling to receive and pay for COVID-19 vaccination. Furthermore, the survey results also showed that the respondents are not in favor of using schools as vaccination sites and implementation of mass vaccination. However, findings revealed that the respondents favor of mandatory acceptance of COVID-19 vaccination, but believed that there is an unfair distribution of COVID-19 vaccination. On contrary, findings of the study revealed that respondents are in favor of priority groups even though most of them are not listed in it.

In terms of perceived severity (side effects), the respondents indicated and highly believe that receiving COVID-19 vaccine could results to various side effects of an allergic reaction, fever, diarrhea, nausea and arm swelling, which are normal and these are signs that the body is reacting with the vaccine. Moreover, the results revealed that most respondents believe that being inoculated could not guarantee 100% protection against COVID-19 infection and its complications.

SOP#3: What are the barriers to the COVID-19 vaccination among mothers in Lake Sebu, South Cotabato?

Results of the survey indicated that some of the perceived barriers among respondents to received COVID-19 vaccine are the safety and efficacy (mean = 2.77) of the vaccine, affordability (mean =2.77), accessibility (mean 2.74), negative experience or news received from another vaccination program of the government, and the rapid development and reliability of current vaccine. The results of the study show that the respondent's trust vaccines, as well as the healthcare professionals but, are hesitant to receive COVID-19 vaccination due to its rapid development and the Dengvaxia controversy.

SOP#4: What is the relationship between the sociodemographic profiles of the respondents and their perception of the COVID-19 vaccination?

Results of statistical analysis revealed that there is no significant relationship on the mean level of perception and perceived barriers of COVID-19 vaccination among the respondents which means that whether rich or poor, educated or not, from T'boli, Hiligaynon, or other ethnic groups that the respondents came from, most of them were afraid to get vaccinated by COVID-19 vaccine. Thus, this indicates that the respondents have a negative perception toward COVID-19 vaccination regardless of their demographics.

SOP#5: What are the reasons that will make the respondents more likely to accept the COVID-19 vaccination?

Results of the survey indicated that the COVID-19 vaccination program of the government may likely be effective in rural areas if it is given for free (mean value = 2.53) and it will show sufficient data on the safety and efficacy of its use (mean=3.12). According to Dr. Dominic Maddumba, DOH's Health Promotion Bureau, Filipinos will not pay for the COVID-19 vaccine[42].

CONCLUSION

The availability of vaccines does not guarantee the success of vaccination programs. Despite the

challenges such as vaccine hesitancy in the Philippines, the government continues to implement COVID-19 immunization program. The negative perception to COVID-19 vaccination will be addressed by providing sufficient data regarding the safety and efficacy of COVID-19 vaccines. The HBM model can be used to develop interventions that can promote COVID-19 vaccine uptake. Most importantly, the findings revealed that barriers to COVID-19 vaccination are associated with vaccine safety and efficacy, affordability, and access to studies that have been available today. This is also related to the decreased confidence in vaccines. Thus, healthcare workers should raise awareness of the necessity of the COVID-19 vaccine.

RECOMMENDATIONS

Having have realized that fake news has an impact on the residents of Surallah, Philippines, the study submits the following recommendations:

For the Government:

- The healthcare workers should intensify their educational campaign drive for the COVID-19 vaccine especially in tribal areas with less access to socio-economic and political opportunities and services, like health and education. If necessary, try to communicate with them using their desired language or mother tongue.
- They can use the government vehicle with megaphones or speakers (recorida) to spread factual information regarding the COVID-19 vaccination, to help combat the vaccine hesitancy within its people.
- Also, the government can have a program where vaccinated individuals can share their experiences after administering the COVID-19 vaccine to help individuals that are hesitant to receive COVID- 19 vaccination.

For Schools and Universities:

- Conducting a seminar or webinar about the safety and efficacy of COVID-19 vaccines is necessary to help students that are hesitant to know more about the COVID-19 vaccination.
- Also, schools and universities should invite speakers like physicians, pharmacist, other healthcare providers and a person who completes the 2 doses of the COVID-19 vaccine who can testify that it is safe and effective, that can encourage the student and teachers in universities to willingly take the COVID-19 vaccine.

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