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Vaccine Perception among Geriatrics in Batangas City, Philippines

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Abstract – Unsuccessful vaccination administrations in the past have caused mistrust in vaccines among Filipinos. This could be a major concern amidst the COVID-19 pandemic wherein vaccine hesitancy could stifle national treatment. Particularly, the geriatrics are a high risk and high priority population for immunization. Despite having various studies about vaccine perception among adults, there are no published studies that assess the attitudes of the geriatric population towards vaccination measures. A survey was conducted among 125 respondents aged sixty to seventy-nine years old in Batangas City. Information was gathered through a validated questionnaire and distributed through Google Forms. The collected data was analyzed using descriptive statistics. The study determined the attitudes of the geriatrics toward vaccine perception in terms of the following aspects, namely, of vaccine promotion, vaccine impediment, and the improvement of healthcare delivery. The results of the respondents' attitudes towards vaccination when grouped according to profile revealed that they were all insignificant. This means that regardless of age, sex, education, and information sources, the geriatrics from Batangas City all agreed that current vaccination information and protocols need further improvement. The information also identified the need for better government interventions to fortify the acceptability, accessibility, and reliability of current vaccination practices among the geriatrics.

Keywords – Acceptability, disease prevention, elderly care

INTRODUCTION

Geriatrics, or elderly people, are among those classified as immunocompromised individuals meaning that their immune systems are weaker than normal due to degenerative functions overtime. These individuals have a high susceptibility towards diseases. This is especially significant in the current Coronavirus Disease 2019 (COVID-19) pandemic where many confirmed deaths could be prevented with proper healthcare action. Out of the over 1.1 million confirmed cases in the Philippines so far, individuals aged 25 to 34 years old are the most affected age group. However, out of the 18,562 confirmed deaths in the nation, the most affected age group were those aged 65 to 74 years old followed by those aged 60 to 64 years old [1]. This means that although many cases of COVID-19 stem from a young adult demographic, there are comparatively more deaths resulting from the geriatric populations, yet there does not seem to be much emphasis on these individuals. Vaccination induces the human immune system to defend itself

against pathogens, but there has still been a growing vaccine hesitancy accompanied by more vaccine-preventable disease outbreaks [2]- [4]. The plummet of vaccine confidence in the Philippines and damaged credibility of the Department of Health (DOH) could be traced to the nationwide panic caused by a dengue vaccine called "Dengvaxia" created by Sanofi [5]-[6]. This negatively affected the perception and attitudes toward all vaccine-related events. Recently, the COVID-19 pandemic became the focus of all healthcare institutions globally. Interventional education campaigns, a positive social media presence of vaccines, and multidisciplinary collaboration among all stakeholders could be the solution against misinformation and low inoculation rates [7]-[9].

Countries highly afflicted by the COVID-19 virus, such as the Philippines, are at risk of becoming an epicenter of the pandemic. The Philippine government negotiated with seven manufacturers to procure several million doses of vaccines, with geriatrics as one of the next priorities

for vaccination after frontliners [10]. Nevertheless, there are still cases where respondents deferred vaccination due to negative media and public misinformation [11]. Acceptability, availability, financial capability, and geographic accessibility are still barricades to effective healthcare delivery [12]. Although the North Capital Region (NCR) has the highest number of COVID-19 cases, the CALABARZON region is second with Batangas City having the highest number of COVID-19 cases in its province [13]. Plus, the geriatric population in Batangas City is prominent for those ages 60 to 79 years old [14].

Despite having various studies about vaccine perception among adults, there are no published studies that assess the attitudes of the geriatric population towards the vaccination measures. With the onset of COVID-19, there has been more skepticism towards the efficacy of vaccines. Information from this research identified problems in current vaccination practices to further improve geriatric vaccination experience.

OBJECTIVES OF THE STUDY

This study aimed to assess the perception of vaccines from geriatrics aged 60 to 79 years old in Batangas City. Specifically, it described the profile of the respondents in terms of age, sex, highest educational attainment, and information sources; determined the attitudes toward vaccine perception in terms of vaccine promotion, vaccine impediment, and the improvement of healthcare delivery; and compared the respondents' attitudes towards vaccination when grouped according to profile.

MATERIALS AND METHODS

Research Design

The descriptive method was used to assess the geriatric perception of vaccination in Batangas City. Descriptive research observes and describes data in their natural state instead of identifying why they occur [15]. Numerical values were given to each response, which was further interpreted, and conclusions were drawn.

Respondents of the Study

The respondents of the study consisted of 125 geriatric residents of Batangas City. The inclusion criteria indicated that they must be in the age range of 60 to 79 years old, residing in Batangas City, and had a vaccination history. Due to degenerative

problems or technology-related problems encountered by the nature of the elderly respondents, the respondents were also allowed to answer the survey questionnaire with the aid of another individual given that the responses were purely their own.

Data Gathering Instrument

A survey questionnaire that was validated by a research specialty advisor was the main instrument to gather answers. Content validity testing was also done. Additionally, the translations were validated by two psychology professors. The statements were adapted from the questionnaires of two vaccination studies [16], [17]. The former served as a main basis for the development of the statements used in the survey questionnaire, and the latter played a bigger role in distinguishing the variables of the research.

The questionnaire consisted of two parts: the participant profile and the geriatric perception of vaccines proper. The first part of the survey sought to describe the profile of the respondents in terms of age, sex, education, and their main source of information. The responses of the second part of the survey evaluated the perception of geriatrics towards vaccines by assigning verbal interpretation ranging from mostly disagree, disagree, agree, and mostly agree. These verbal interpretations were then given scalar weight values of 1 through 4, with 1 as the lowest to 4 as the highest, to analyze statistically.

For internal validity and reliability testing, a pilot test was conducted among the three categories of the survey questionnaire proper using Cronbach alpha. The aspects of vaccine promotion, vaccine impediment, and improvement of healthcare delivery, received scores of 0.896, 0.794, and 0.814, which were remarked as good, acceptable, and good, respectively.

Data Gathering Procedure

Data for this research study was gathered using the survey questionnaire made with Google Forms that was sent to each respondent through social media platforms like Messenger and Facebook. The needed data was collected, encoded, and further analyzed.

Ethical Consideration

The study was performed in accordance with the National Ethical Guidelines [18]. The institutional

Research Ethics and Review Committee (RERC) gave their approval before the formal conduction of the study. Voluntary and informed consent from each of the respondents was obtained through a consent form. Participants were briefed on the purpose and aims of the study before the survey proper. To ensure privacy, all the data gathered was only accessible by the researchers and used strictly for research purposes. The completed Google Forms were encoded and anonymized.

Data Analysis

To elucidate the respondent's profile and the correlations between the variables, descriptive statistics were used. Statistical tools like frequency distribution, weighted mean, t-test, Analysis of Variance (ANOVA), and a post-hoc test was used. The objectives of the study were the basis of the statistical tools used, with each table number corresponding to the objectives of the study. The software, SPSS version 14, was used for the analyses of the study. Frequency count was utilized to describe the profile of the respondents and to tabulate the number of respondents of a certain demographic.

Weighted mean and ranking were used to assess the attitudes. Moreover, determining the weighted mean and ranking them allows a better representation of the responses with regards to the population [19].

The Mann-Whitney U test determined the relationship between the sex of the respondents to the variables of vaccination attitudes. The ANOVA test determined the variation and means among the different research variables. The Scheffe test provided more statistical information of the ANOVA results by determining whether the attitudes towards vaccination differed based on the vaccine promotion, vaccine impediment, and improvement of healthcare delivery [20].

RESULTS AND DISCUSSION

Table 1 shows how the respondents were grouped based on their demographic profile including their age, sex, highest educational attainment, and source of news/information. Among the respondents, the majority belonged to 60-64 age group with a frequency of 51, while the 70-74 and 75-79 age groups had the lowest frequency of 20. The table also shows that most of the respondents

were female with a frequency of 82. As for the educational attainment, college education had the highest frequency of 58, while the response of no education received the lowest frequency of 3. With regards to their sources of information, most of them relied on television indicated by a frequency of 98, while the newspaper had the lowest frequency of 30.

Table 1. Respondents' Profile

Age	Frequency	(%)
60 – 64	51	41.10
65 – 69	33	26.60
70 – 74	20	16.10
75 – 79	20	16.10
Sex		
Male	42	33.90
Female	82	66.10
Highest Educational Attainment		
No education	3	2.40
Elementary	29	23.40
High School	28	22.60
College	58	46.80
Masters/PhD	6	4.80
Source of News/ Information		
Newspaper	30	10.70
Radio	56	20.00
Social Media (Facebook, Twitter, Blogs)	56	20.00
Television	98	35.00
Word of Mouth	40	14.30

This result shows that women have a greater participation in this study as compared to men. With majority of the respondents coming from the 60-64 age bracket, they remain updated with current issues in healthcare delivery given that they are new members of the geriatric population. Aside from that, most of the respondents have received a formal education; thus, they can discern credible from false information. Many respondents rely on television as their main source of information as it is free, regularly updated, and perceived as highly credible.

In correlation, other studies have shown the willingness of female participation in research and active social engagement of 60- to 64-year-olds too [21]-[22].

Table 2.1. Attitude Towards Aspects of Vaccine Promotion

	WM	VI	Rank
1. I know what vaccines are and how they work.	3.16	Agree	3
2. I get enough information about vaccines and their safety.	3.02	Agree	8
3. I trust that the information I receive about vaccination is reliable.	2.89	Agree	11
4. I believe getting vaccinated against diseases is important.	3.27	Agree	1
5. I get vaccines even when it is not mandatory.	2.75	Agree	12
6. I feel safer after getting vaccinated.	2.92	Agree	10
7. I believe that vaccines are needed even if the diseases are rare.	3.09	Agree	5
8. Vaccines are easily accessible and available in my area.	2.39	Disagree	15
9. I can afford vaccines.	2.58	Agree	14
10. Vaccination is a good idea because it makes me feel less worried.	3.12	Agree	4
11. I would advise the people to take vaccines.	3.03	Agree	6
12. I would take a vaccine if majority of the people will take it.	2.96	Agree	9
13. I take vaccines when someone recommends it for me.	3.02	Agree	7
14. I am afraid of getting a disease that could have been prevented with a vaccine.	3.18	Agree	2
15. I am likely to get a disease without a vaccine.	2.74	Agree	13
Composite Mean	**2.94**	**Agree**	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Table 2.1 shows the assessment on the attitude towards the aspect of vaccine promotion. The composite mean of 2.94 indicates that the respondents agree on the given indicators. In a more in-depth analysis, the respondents strongly agree that getting vaccinated against diseases are important (3.27). This was followed by being afraid of acquiring a vaccine-preventable disease and knowing how vaccines work, which had weighted means of 3.18 and 3.16 respectively. This indicated that the respondents understand the importance of vaccines and their capability to prevent certain fatal diseases. Furthermore, these results indicated that the respondents are aware that certain diseases are preventable by vaccines. This may be attributed to the respondents' awareness of how vaccines work in general. It coincides with the findings of recent surveys which presented significant improvements in vaccine confidence [9]. This strongly supports the result that most of the respondents view vaccines with importance.

On the other hand, respondents disagree that vaccines are easily accessible and available in their area, which obtained the lowest rating of 2.39. The respondents also agree that they can afford vaccines and the likelihood of contracting a disease rises without the vaccine, which garnered weighted means of 2.58 and 2.74 respectively. This data shows that the geriatric population believes vaccines are hardly available in certain areas in the Philippines, due to the absence of concrete roads and bridges, making it impossible for efficient healthcare delivery. Moreover, respondents perceived vaccines as affordable which relies on the idea that local health centers provide vaccinations. This is contrary to a study which found that Filipino men accepted vaccines based on its affordability [23]. With mostly female respondents in this study, it suggests that Filipino women are more willing to spend on vaccinations than men. In relation to vaccine distribution, de Vera [24] mentioned COVID-19 vaccine rollout is hindered by poor infrastructure and underdeveloped access roads.

Table 2.2 shows the assessment on the attitude towards aspects of vaccine impediment. The composite mean of 2.78 shows that the respondents agree with the aforementioned indicators. Respondents are unable to receive vaccination due to impaired accessibility and scarce supply, which garnered a weighted mean of 3.29. Another top indicator is the hesitancy in receiving vaccines as they may be faulty or fake, which garnered a weighted mean of 3.27, followed by the concern in vaccine safety (3.23). Vaccine supplies are scarce in rural areas as only few methods of transportation are available. COVID-19 vaccine supplies are scarce and is further complicated by underdeveloped roads, making it impossible to reach most of the rural areas [24].

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Table 2.2. Attitude Towards Aspects of Vaccine Impediment

		WM	VI	Rank
1.	I do not know enough about the vaccines (i.e., COVID-19 vaccine, rabies vaccine, etc.).	2.73	Agree	8
2.	I am concerned about the safety of vaccine.	3.23	Agree	3
3.	I get scared that some vaccines are fake or faulty.	3.27	Agree	2
4.	I am worried that the vaccine is expensive.	3.14	Agree	5
5.	Vaccines are not easy to access, or they are not available.	3.29	Agree	1
6.	I do not have enough time to get a vaccine.	2.48	Disagree	11
7.	Vaccines are not necessary.	2.18	Disagree	15
8.	There are no diseases in my area that would make me want a vaccine.	2.42	Disagree	12
9.	Vaccines can give negative side-effects when administered.	3.08	Agree	6
10.	I had a bad experience receiving a vaccine from a medical professional.	2.39	Disagree	13
11.	Vaccines contain substances that are harmful to health.	2.56	Agree	10
12.	I experienced side effects when I received vaccinations before.	2.61	Agree	9
13.	There is not enough evidence that vaccination prevents occurrence of harmful diseases.	2.77	Agree	7
14.	Vaccines do not prove to be effective	2.35	Disagree	14
15.	I will only take vaccines if I had enough information on it.	3.19	Agree	4
	Composite Mean	**2.78**	**Agree**	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Meanwhile, respondents disagree that vaccines are not necessary, obtaining a rating of 2.18, which was the lowest weighted mean among the given indicators. The respondents also disagree that vaccines are not effective, and that they had a bad experience with medical professionals, who administered vaccines to them with weighted means of 2.35 and 2.39 respectively. This data shows that the respondents still perceive vaccines as necessary in preventing diseases.

As per the results in table 2.3, the statement with the highest mean pertains to hospitals and other healthcare settings should be given better equipment with mean of 3.68. Also having a mean of 3.65 refers to the statement that the government's response to the pandemic and other diseases needs improvement, meaning geriatrics are disappointed with the government.

The third highest place is statement 14 which refers to healthcare services needing to be more organized for better delivery with a mean of 3.64. Notably having a higher mean than the rest is statement 11 which says, "Healthcare providers should provide simple explanations for me to understand clearly", with a mean of 3.61.

Table 2.3. Attitude Towards Improvement of Healthcare Delivery

		WM	VI	Rank
1.	I am not satisfied with our current healthcare system.	3.40	Agree	10
2.	The government's response to the pandemic and other diseases needs improvement.	3.65	Strongly Agree	2
3.	The government has ineffective protocols in providing quality healthcare.	3.40	Agree	9
4.	The government does not do a good job in assessing patients' needs and expectations.	3.41	Agree	8
5.	I do not receive sufficient support from our healthcare system.	3.26	Agree	12
6.	The healthcare provider gives me adequate information about my vaccination.	2.98	Agree	15
7.	The healthcare professionals treat me well.	3.14	Agree	14
8.	Hospitals and other healthcare settings should be given better equipment.	3.68	Strongly Agree	1
9.	Generally, I listen to the advice of my doctor or healthcare provider about my immunizations.	3.39	Agree	11
10.	It would be better if healthcare services were faster.	3.55	Strongly Agree	6
11.	Healthcare providers should provide simple explanations for me to understand clearly.	3.61	Strongly Agree	4
12.	There should be more hospitals or clinical laboratories available for easier access.	3.59	Strongly Agree	5
13.	Hospitals should have modern operating rooms.	3.52	Strongly Agree	7
14.	Healthcare services need to be more organized for better delivery.	3.64	Strongly Agree	3
15.	Healthcare services are not as accommodating unless you have money.	3.22	Agree	13
	Composite Mean	**3.43**	**Agree**	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Given their age, geriatrics may be having difficulties in comprehension, which shows to be one of their concerns. The statement that there should be more hospitals or clinics available for easier access also has a high mean of 3.59. This may be linked to geriatrics having limited strength and power to go to hospitals, which is why more accessible hospitals near them is beneficial. Better organization and budget allotment could lead to better supplies for the much-needed healthcare facilities, which in turn could provide better healthcare performance and accessibility. An analysis of Duterte and his administration facing COVID-19 noted the forceful and strict lockdown measures used rather than focusing on health sectors and their development which would target the welfare of citizens better [25]-[26].

On the other hand, the statement with the lowest mean pertains to the healthcare providers not giving the respondents adequate information about the vaccination with 2.98. The statement "The healthcare professionals treat me well" also has a lower mean at 3.14. Lastly, the statement "Healthcare services are not as accommodating unless you have money" also has a lower mean of 3.22. Although having a lower mean than the rest, it still has an interpretation of "Agree" which denotes that most of the geriatrics agree. The two lowest mean statements are related to the healthcare personnel performance, which highlights the lack of in-depth information when being treated. The failure to provide more information may be linked to the distress of healthcare workers. Biana & Joaquin [27] illustrated how Philippine healthcare workers have suffered from psychological, emotional, and spiritual distress on top of lacking equipment and being underpaid. The third lowest ranking statement is justified by findings of wealth-based disparities in the health services in the Philippines where less than half of poor households receive medical deliveries [28].

Table 2.4. Summary Table on the Attitude Towards Medical Measures

	Weighted Mean	Verbal Interpretation	Rank
1. Aspects of Vaccine Promotion	2.94	Agree	2
2. Aspects of Vaccine Impediment	2.78	Agree	3
3. Improvement of Healthcare Delivery	3.43	Agree	1
Composite Mean	**3.05**	**Agree**	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Table 2.4 reveals that "Improvement of healthcare delivery" ranks first with a weighted mean of 3.43, followed by "aspects of vaccine promotion" with a weighted mean of 2.94, and "aspects of vaccine impediment" with a weighted mean of 2.78. All the weighted means presented had the verbal interpretation of "agree". Among the variables, the respondents mostly agree that the Philippines' healthcare delivery system needs more improvement when addressing geriatric vaccination. They also agree that they are knowledgeable of the different factors for taking vaccinations to improve their health and acknowledge that different factors like vaccine hesitancy and the lack of adequate resources may stop them from getting vaccinated.

Table 3 displays the comparison of responses on the attitude towards medical measures when grouped according to profile. It was observed that there were no significant differences since all computed p-values were greater than a 0.05 alpha level. Therefore, the responses do not vary statistically and imply that the assessment was the same across the respondents' profile. Thus, age, sex, and education does not affect the respondents' attitude toward vaccine perception in terms of promotion, impediment, and improvement of healthcare delivery. However, it is prominent that geriatrics from Batangas City reach a consensus for the need of improvement on vaccination campaigns, administration, and response from the government and healthcare sectors. Likewise, a cross-locational study showed that residence, sex, and educational attainment did not affect the participants' judgement of getting vaccinated [29].

Table 3. Difference of responses on attitude towards medical measures when grouped according to profile

Age	F-value	p-value	Interpretation
Aspects of Vaccine Promotion	0.426	0.734	Not Significant
Aspects of Vaccine Impediment	0.850	0.469	Not Significant
Improvement of Healthcare Delivery	0.497	0.685	Not Significant
Sex			
Aspects of Vaccine Promotion	0.256	0.799	Not Significant
Aspects of Vaccine Impediment	0.815	0.416	Not Significant
Improvement of Healthcare Delivery	1.080	0.282	Not Significant
Highest Educational Attainment			
Aspects of Vaccine Promotion	2.198	0.073	Not Significant
Aspects of Vaccine Impediment	1.919	0.112	Not Significant
Improvement of Healthcare Delivery	0.816	0.517	Not Significant

Legend: Significant at p-value < 0.05

CONCLUSION AND RECOMMENDATION

Based on the findings, there were no significant relationships between the respondents' profile and their perceptions towards vaccination. In short, the respondents' age, sex, and highest educational attainment, does not affect their attitudes toward their perception to vaccinations. However, across all variables, the geriatrics have agreed that information, education, equipment, facilities, and services, need better government administration and involvement. From the findings, majority of the respondents were females aged 60-64 years old having a college degree as the highest educational attainment with television as their main source of information. Results also showed that geriatrics are confident with vaccine efficacy and are aware of a vaccine's benefits but, the lack of information about vaccinations led to concerns of safety and validity.

For future researchers, a higher sample population, with respondents from different areas, will provide more diversity and accuracy in the results. Assisting the respondents or having face-to-face interaction, if allowed, may also bring better results. Furthermore, the researchers recommend that the government and health sectors promote public awareness initiatives through educational campaigns using television as a primary medium to disseminate the information in an easily understood way for all geriatrics since the findings of the paper revealed that there were no significant associations between respondent profile and vaccine perception, that there is a lack of information about vaccines, and that televisions were used as the most common information source.

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