Knowledge, Attitudes, and Practices towards COVID-19 among Non-healthcare Individuals in the Municipality of Pateros, Metro Manila

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Abstract: - The Philippines is one of the many developing countries struggling with the availability and accessibility of healthcare resources in this time of COVID-19 pandemic. It is of paramount importance to recognize the knowledge gaps, beliefs, and behavioral patterns that may identify the needs, problems, and barriers that will aid in the planning, optimization, and implementation of interventions for COVID-19 response. The research's aim was to address this by assessing the knowledge, attitude, and practices (KAP) of 398 non-healthcare affiliated individuals from ages 18-59. The sample population for this study were the residents of the Municipality of Pateros. The research design followed a descriptive cross-sectional format. Participants were selected through convenience sampling via the dissemination of an online survey on the major social media platforms. The mean statistics of the KAPs were analyzed and it was found that the participants demonstrated inadequate knowledge, negative attitudes, and inappropriate practices. In addition to these findings, ANOVA testing showed significantly differing groups were observed with age and practices, employment and knowledge, and finally, hours spent online and knowledge and practices. Therefore, in response to the demonstrated KAP scores, optimized interventions centered on health education should be prioritized in order to respond to the threat of COVID-19.

Key Words: — ***COVID-19, Healthcare resources, Municipality of Pateros.***

I. INTRODUCTION

Ever since its discovery, the novel coronavirus, officially tagged as COVID-19, has left an irreparable mark on the global community. The pandemic brought about by the virus has claimed lives and altered the entirety of a functional human society. On January 31, 2020, the World Health Organization (WHO) declared a public health emergency of international concern (PHEIC) due to the widespread incidence of COVID-19. Two months later, the WHO announced the outbreak to be a pandemic. As a novel virus, it was seen as an emerging and dangerous infectious disease that lacked supporting studies regarding its nature and control and the vaccine that would combat it. However, China's epidemic and the declaration of a PHEIC did not prompt a worldwide public reaction to adopt health-protective measures. Instead, most countries and regions only responded to the pandemic after their case counts increased (Hou, Z. et.al, 2020). As of early October of the year 2020, there have been over a million deaths worldwide. In the Philippines alone, over 340,000 confirmed cases and more than 6,000 deaths had been documented (DOH – COVID Tracker). It must be considered that the Philippine healthcare system is less developed compared to those of developed countries (e.g., United States, China, Russia, etc.). In the Philippines, there is an evident shortage in facilities, technology, and material and human resources that has threatened the country even before the surfacing of the pandemic. Thus, there is an undeniable need to optimize efforts in combating the COVID-19 pandemic in order to utilize the country's only available resources efficiently.

With this goal in mind, measuring the knowledge, attitudes, and practices of the Filipinos were proven valuable by allowing the identification of knowledge gaps, beliefs, and behavioral patterns that can help in the development of more efficient and effective interventions.

However, due to the ongoing pandemic, there have been many limitations that prevent the research from targeting a broader

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scope. A focus group needed to be selected that would give an initial view on the impact of COVID-19. The Municipality of Pateros was determined as the best candidate because after viewing the DOH's COVID-19 case updates, it was observed that this area in the National Capital Region holds the highest COVID-19 cases to population ratio in the whole NCR. The conduction of the research in this area was appropriate due to the serious condition the municipality currently faces.

Another focus that this research tackled was the involvement of non-healthcare affiliated individuals. In a study by Asraf et al. (2020), it was concluded that individuals in the medical fields were inclined to be better informed regarding the virus than those in other non-medically focused fields. In addition, a discussion paper published in 2019 concluded that there were more non-healthcare affiliated individuals in the Philippines than there were healthcare affiliated individuals (Abrigo, 2019). By strictly focusing on the non-healthcare affiliated individuals, this study targeted the larger sector of the Philippine population.

A. Objectives of the study

Given the disadvantages developing countries such as the Philippines have during the emergence of the COVID-19 disease, it is of paramount importance that efforts to combat the pandemic are optimized to ensure that resources are not put to waste. This study's main objective was to identify knowledge gaps, beliefs, and behavioral patterns among non-healthcare individuals in the Municipality of Pateros that may identify needs, problems, and barriers that can help in planning and implementing interventions against the COVID-19 pandemic. To this effect, the research aimed to fulfill the following:

- To gauge the knowledge of non-healthcare individuals of the Municipality of Pateros regarding the COVID-19 disease and preventive practices against it.
- To assess the attitude of non-healthcare individuals of the Municipality of Pateros towards the COVID-19 disease and preventive practices against it.
- To determine the inclination of non-healthcare individuals of the Municipality of Pateros towards exercising COVID-19 preventive practices.
- To identify any association between the demographic profile of the non-healthcare individuals of the Municipality of Pateros and their:
    a. knowledge regarding the COVID-19 disease and preventive practices against it;
    b. attitude towards the COVID-19 disease and preventive practices against it; and
    c. Inclination towards preventive practices against the COVID-19 disease.

B. Problem Statement

The Philippines is one of the many developing countries struggling with the availability and accessibility of healthcare resources amidst the COVID-19 pandemic. Given this dilemma, it is of utmost importance that responses to the crisis are optimized to avoid misuse of the limited resources that the country has. Measuring the knowledge gaps, beliefs, and behavioral patterns among non-healthcare individuals would aid in the strategic planning for the pandemic response. In line with that, this study seeks to answer the following research problems:

- How knowledgeable are the non-healthcare individuals of the Municipality of Pateros about the COVID-19 disease and its preventive practices?
- What are the attitudes of non-healthcare individuals in the Municipality of Pateros towards the COVID-19 disease and preventive practices against it?
- What is the inclination of non-healthcare individuals in the Municipality of Pateros towards exercising COVID-19 preventive practices?
- Is there an association between the demographic profile of non-healthcare individuals of the Municipality of Pateros and their:
    a. knowledge regarding the COVID-19 disease and preventive practices against it;
    b. attitude towards the COVID-19 disease and preventive practices against it; and
    c. Inclination towards preventive practices against the COVID-19 disease?

C. Scope and limitations/Research Impediments

The study only assessed individuals who fell within the range of 18 to 59 years old, were not affiliated with the health sector, and were residing within the borders of the Municipality of Pateros. Any individual that did not match these criteria was immediately excluded from the data collection procedure. This study does not aim to evaluate the efficiency of health information dissemination in the Philippines. However, results may provide insights regarding possible modifications and improvements that may be implemented in the country's health

information dissemination system. This study also employed a cross-sectional research design; therefore, results may not be used to establish cause and effect relationships between the variables in focus. In addition, data was collected at only a single point in time. Results may differ if the data collection was to be carried out during a different time-frame.

This study also presents a number of research impediments. Data was gathered using questionnaires that are self-reported and are subject to a degree of personal bias. Results drawn from these data may be non-reflective of the total population. In addition, requisition of proof of identity to verify the participants' non-affiliation to the health sector was not imposed by the researchers due to ethical concerns. Hence, the legitimacy of the participants' identity may not be guaranteed. However, their residency in the target area was verified with the help of the local barangay. The study was conducted online on account of the current circumstances in the Philippines, where quarantine is being implemented due to the ongoing spread of COVID-19. These methods may result in data that are not fully representative of the target population.

D. Significance of the study

The results of the study will be of great benefit to the following:

To the Clinical Laboratory:

The results of this study can provide information that may be used in the optimization of interventions done against the COVID-19 pandemic. This will help maximize the material resources available in the clinical laboratory and avoid the exhaustion of its human resources.

To the Academe:

This study will provide an overview of the times during the COVID-19 pandemic. Thus, allowing members of the academe to refer to this research during future discussions regarding the disease and how it was perceived during the earlier days of its transmission. This will provide the academe with firsthand knowledge and a more holistic perspective of how people reacted and felt during these circumstances. With this information, the academe will be able to initiate and define lessons and strategies that focus on future benefit with the objective of emphasizing future precautionary measures to develop enabled and situationally flexible individuals.

To the Research:

The study may serve as an excellent foundation for future research and those interested in expanding relevant information regarding the disease. It can also contribute to the previous studies by fortifying the existing knowledge about the disease, which will allow for the comparing and contrasting of results. With the combined understanding, a more accurate and credible set of data and information can be generated.

To Other Professions or Fields:

The findings in the study can be applied outside the medical field in a manner that helps non-healthcare professions build crucial knowledge on the disease as a national crisis and not merely as an illness. As a result, it will enable them to achieve a certain level of comprehension on the complexity of the issue, eliciting cooperation and support, among other lines of work.

To the Community:

The specific details of this research will yield advantages to the community by way of enlightenment regarding the conditions in the regions devastated by the novel disease. This may assist the community in developing additional preventive measures that can further help in eliminating the disease. For that reason, it can be considered vital in the pursuance of a flattened curve.

To the General Public:

The study can be beneficial to society because it can be presented as a tool to increase awareness among the general public. It may guide every individual towards understanding the disease and teach the practical approach when dealing with the disease. As a consequence, this may also lead to a changed behavior among individuals especially those who refuse to participate in the precautionary steps implemented by the government.

E. Definition of terms

This section defines the following key terms in the context of the study.

COVID-19. COVID-19 is an infectious disease caused by a newly discovered virus called SARS-COV 2.

Pandemic. A pandemic is an epidemic occurring worldwide. This means that it is crossing international borders and usually affects a large number of people.

Municipality of Pateros. The Municipality of Pateros is the lone municipality of Metropolitan Manila, Philippines, and is the area of focus in the study.

Knowledge. Knowledge refers to the information an individual possesses regarding the COVID-19 disease and the preventive practices against it.

Attitudes. Attitudes refer to the manner in which an individual perceives the information they possess regarding the COVID-19 disease and the preventive practices against it.

Practices. Practices refer to the actions an individual takes in response to the COVID-19 disease pandemic.

Non-healthcare individuals. Individuals that are neither working nor studying in the healthcare sector.

Adequate knowledge. Adequate knowledge refers to the possession of information and awareness regarding the COVID-19 disease and its corresponding preventive practices that aid in making informed and favorable health decisions.

Inadequate knowledge. Inadequate knowledge refers to the lack of information and awareness regarding the COVID-19 disease and its corresponding preventive practices that can be attributed to the making of misinformed and unfavorable health decisions.

Positive attitude. A positive attitude refers to an individual's perception of the COVID-19 disease and the preventive practices against it that predisposes them to make favorable health decisions.

Negative attitude. A negative attitude refers to an individual's perception of the COVID-19 disease and the preventive practices against it that predisposes them to make unfavorable health decisions.

Appropriate practices. Appropriate practices refer to actions that supplement the goal of efficiently and effectively deterring the spread of the COVID-19 pandemic.

Inappropriate practices. Inappropriate practices refer to actions that do not supplement the goal of efficiently and effectively deterring the spread of the COVID-19 pandemic.

Favorable health decisions. Favorable health decisions are choices an individual makes that benefit not only their personal health but also the community they belong in.

Unfavorable health decisions. Unfavorable health decisions are choices an individual makes that are detrimental not only to their personal health but also to the community they belong in.

II. Review Of Related Literature

The review of related literature is focused on the known information that has been disseminated regarding COVID-19 and the measures being taken to address it. In addition, several studies that discuss the knowledge, attitudes, and practices of various groups of people during the pandemic were compiled and reviewed.

COVID-19:

The novel Coronavirus, officially known as SARS-CoV-2 or COVID-19, was first reported in December 2019 as the causative agent of an acute respiratory illness found in Wuhan, China. According to Harapan (2020), this virus continued to spread and cause disease until it reached a degree of severity, which eventually had it declared by the WHO as a Public Health Emergency of International Concern (PHEIC). In a study conducted by Wu (2020), the initial transmission of the virus can be linked to the first cases traced back to the Huanan Seafood Wholesale Market. It is also stated that the virus was suspected of coming from a bat, an animal that carries a very similar coronavirus disease. Rahman (2020) states that human-to-human transmission is, in fact, a common mode of viral spread because a growing number of patients without a history of exposure to the market had acquired the disease. The study by Rahman (2020) further specifies that human-to-human transmission can be through various routes. These routes include direct contact, aerosols, and droplets.

Prevention and Management:

"Flattening the curve" still stands as an effective prevention and management method for COVID-19, since there are limited hospitals and healthcare personnel available. According to the World Health Organization (2020), a high curve is created due to a steep increase in cases, followed by a quick decrease in cases. On the other hand, a flatter curve is created by a slower increase in cases followed by a slow decrease in cases. The number of infections over time will still reflect roughly the same numbers, although there will be a discrepancy in cases per day. This will lessen the chances of a country's health system to be exceeded, as it will be more difficult if a high number of individuals need healthcare at the same time. In order to flatten the curve, it is important to slow the transmission of the virus.

According to Guner (2020), preventive measures are the current strategy to limit transmission of COVID-19. These measures include early screening, diagnosis, isolation, and treatment. The study also states that the spread can be limited through the use of face masks, personal protective equipment, school closures, office closures, social distancing, and voluntary quarantine.

The World Health Organization (WHO) advises the use of facemasks to limit the spread of COVID-19. According to interim guidance by the World Health Organization (2020), masks can be used both as a means of protection for healthy persons and as means for source control to prevent transmission. An article by the Centers for Disease Control and

Prevention (2021) states that wearing face masks is recommended in public settings, at events and gatherings, and whenever around other people. Masks should also have two or more layers of breathable fabric, complete coverage of the nose and mouth, and a snug fit against the sides of the face with no gaps (CDC, 2021).

Social distancing is also a preventive measure that should be practiced along with other preventive measures in order to slow the spread of COVID-19. According to the Centers for Disease Control and Prevention (2020), COVID-19 spreads among those who are within about 6 feet from one another for a long period of time, as droplets from an infected person can easily be inhaled by others. The Centers for Disease Control and Prevention (2020) also states that limiting close face-to-face contact with others is the best way to reduce the spread of COVID-19.

Handwashing is a very effective way to prevent infection. According to the Centers for Disease Control and Prevention (2020), it is important to wash your hands with soap and water for at least 20 seconds, especially before eating or preparing food and touching your face, and it is important to wash your hands after leaving a public place, blowing your nose, sneezing, coughing, handling your mask, changing a diaper, caring for someone sick, and touching animals.

The CDC also highlights in its website the need to recognize the difference between mild and serious symptoms and what to do in either of these cases. In the event that a person is experiencing symptoms such as fever or chills, cough, shortness of breath, fatigue, muscle aches, headache, loss of taste or smell, sore throat, congestion, nausea, and/or diarrhea, 2-14 days after exposure, it is important to make sure that the person stays at home, quarantines themself, and takes care of themself for the meantime. However, if the condition worsens and the patient starts to experience serious symptoms such as trouble breathing, persistent pain or pressure in the chest, inability to wake or stay awake, and/or has bluish lips, it is then essential to seek medical care immediately (CDC, 2020). Even though the CDC has given these guidelines, they still recommend that protecting oneself from the transmission is still the best way to avoid catching the virus.

Government Interventions:

Due to the public health crisis, the government response was needed in order to manage the effects of COVID-19 in the country. According to a study by Vallejo (2020) covering the government policies in response to the pandemic in the Philippines, the first intervention by the Philippine government was to implement selective quarantine on February 2, 2020, for returning overseas Filipino workers. The first local transmission was reported by the Department of Health on March 7, 2020. A state of emergency was declared as Proclamation 922 was issued by President Rodrigo Duterte just a day after, on March 8, 2020. Under the proclamation, all agencies were required to give full assistance in response to COVID-19. Shortly after a state of emergency was declared, a Luzon island-wide Enhanced Community Quarantine and travel restrictions were implemented, which were made effective from March 17, 2020, to April 30, 2020. In order to mandate World Health Organization recommendations in the Philippines, Social amelioration initiatives were also implemented on March 24, 2020. (Vallejo, 2020)

Vaccine:

Another topic that was in deep discussion in the context of the COVID-19 pandemic is the procurement of a vaccine. According to the WHO, there are more than 50 COVID-19 vaccine candidates under trial. In the Philippines, on January 14, the Pfizer BioNTech COVID-19 vaccine was the first among these candidates to have been granted emergency use authorization (EUA) in the country by the FDA Philippines. CNN Philippines also reported, on the same day, that the US and the UK also granted the Pfizer vaccine their country's EUA after the vaccine candidate showed a 95% effectiveness in preventing infections after the administration of two doses (CNN Philippines Staff, 2021). Given these circumstances, Carlito Galvez Jr., vaccine czar of the Philippines, stated that the country aimed to procure 148 million doses of vaccine and to inoculate around two-thirds of the population within the year 2021 (Reuters, 2021). However, a news article released by Rappler on January 28, 2021, revealed that there were still Filipino citizens who were skeptical about the vaccine's trustworthiness. The fear being attributed to the recent Dengvaxia scandal in 2017 (Rappler, 2021). But it must be taken into account that vaccines revolve around the principle of creating antibodies against the disease without the individual actually having to contract disease in its entirety (Nhs choices, 2022); and the use of this principle has been proven safe and has worked wonders in preventing the contraction of many disease according to the CDC.

Misconceptions:

In, addition, according to WHO Director-General Tedros Adhanom Ghebreyesus, the world is not just battling a virus, but it is also battling against the trolls and conspiracy theorists

that push mis- and disinformation, which greatly affects the local and international COVID-19 response. The COVID-19 is the first pandemic in history in which technology and social media are being used on a massive scale to keep people safe, informed, productive, and connected (WHO, 2020).

With this, population vulnerability becomes the target with the so-called "infodemic". In a joint statement by WHO, UN, UNICEF, UNESCO, etc., an infodemic is defined as the overabundance of information, both online and offline. This coincides deliberate attempts to disseminate wrong information to undermine the public health response and advance alternative agendas of groups or individuals. Wrong or false information can be classified under two categories: misinformation and disinformation.

The World Health Organization defines misinformation as false information that was not created with the intention to hurt others. Misinformation is often started by someone who genuinely wants to understand a topic and cares about keeping other people safe and well, for which it is then shared by others who feel the same. At the other end of the spectrum is disinformation. Unlike misinformation, this is false information created with the intention to profit from it or cause harm. That harm could be to a person, a group of people, an organization, or even a country (WHO, 2020).

For example, it is stigmatized that only elderly people and immunocompromised individuals are susceptible to COVID-19, but in fact, everyone can be infected including young adults, teenagers, and even children (WHO, 2020). Centers for Disease Control and Prevention have released protocols to prevent being infected with COVID-19 and combat its possible spread; the guideline enumerates handwashing, use of facemask, physical distancing, and proper hygiene as the best ways to handle the situation (CDC, 2020). Moreover, because of the rampant effects of the infodemic, vulnerable individuals have been affected by the circulation of false information. A prime manifestation of this is what happened in Iran, where more than 700 people died after ingesting toxic methanol while erroneously thinking it can cure the coronavirus after posts regarding suggested home remedies started to appear on social media (Aljazeera, 2020).

In the Philippines alone, "home remedies" have rapidly caught the attention of social media users (Rappler, 2020). The Department of Health Philippines has warned the public regarding the truthfulness of such information circulating online. Among these are the method of gargling saline and chewing garlic, which claims that it can protect humans from COVID-19 infection. In response, both the DOH and WHO denied its effectiveness against the virus (Rappler 2020). Furthermore, it was also clarified to the public that the fear of most people regarding the long use of facemask would not cause carbon dioxide intoxication, thus, it is unlikely to cause them oxygen deficiency (DOH Mythbuster, 2020).

Non-healthcare individuals:

It was determined under the careful judgment of the researchers that the intended target for this KAP study should be non-healthcare affiliated individuals. This decision was largely arrived at by reviewing a KAP study conducted by Asraf (2020), conducted in Nepal. The study concluded that individuals who were involved in the health sector were more shown to have better attitudes and practices during this pandemic as opposed to individuals not exposed to the healthcare sector on a daily basis. In addition, a discussion paper in 2015 by Abrigo titled, "Who Are the Health Workers and Where Are They?" Revealed Preferences in Location Decision among Health Care Professionals in the Philippines" was able to establish that for every 10,000 population in the Philippines, there were 34.9 professional nurses, 8.6 health care technicians, 5.2 physicians, 2.7 dentists, 1.0 physiotherapists, 0.7 professional midwives, 0.5 nutritionists and dieticians, and 0.4 optometrists and opticians employed in the country. Therefore, by reviewing the studies of Asraf and Abrigo, it is appropriate that this research focus on the non-healthcare affiliated; to avoid bias from individuals who are already presumed to know better due to their day-to-day exposure to the healthcare sector, and at the same time, cater to the larger sector of the Philippine population.

Municipality of Pateros:

As for the location of the study, it was decided that due to the stringent limitations imposed on the researchers due to the current pandemic, that a smaller target population will be targeted. The Municipality of Pateros according to the 2015 census had the smallest population in the NCR. In addition, upon observing the DOH COVID Tracker, as of January 28, 2021, it was seen that Pateros had the highest COVID case to population ratio among all the cities in the NCR (DOH, 2021). It was also noted that the Pateros Municipal Government even implemented a lockdown every Sunday to curb the spread of COVID-19 in the area. The municipality has also started registering people who want to be vaccinated via three methods: submitting an online form, QR code, and getting forms from health centers (Boliver, 2020). Due to a large number of cases in the area and the drastic changes the

municipality has had to face up to date, it was decided that the Municipality of Pateros be chosen as the target population.

KAP Studies:

Considering these circumstances brought about by the pandemic the need for optimized intervention is needed and this is only attainable by further understanding the situation caused by the pandemic. This introduces the need for Knowledge, Attitudes, and Practices (KAP) studies. These types of studies provide relevant information regarding the situation and help determine recommendations that will indirectly ease the burden of the disease. This is supported by a KAP study in Bangladesh that was conducted by Karim, et. al. (2020) that provided crucial information for researchers and policymakers that allowed them to develop effective strategies based on results from those living in Bangladesh. Furthermore, a KAP study conducted by Erfani in Iran was also able to provide adequate insight that was enough to conclude the need for better health education during this pandemic in order to address the uninhibited spread of the virus.

During this literature review, different KAP studies were sought to find research that would highlight the ability of KAP studies to acquire adequate data regarding the COVID-19 situation with the ultimate goal of providing recommendations and optimized interventions that could possibly be effective in lessening the burden of the disease. In addition, these studies were heavily reviewed for their methodology and questionnaire to observe modifications that could be applied in the design of this research's data collection plan. The following studies were reviewed:

The study by Erfani titled, "Knowledge, Attitude and Practice toward the Novel Coronavirus (COVID-19) Outbreak: A Population-Based Survey in Iran" was one of the first to be reviewed. This study was able to establish that knowledge, attitudes, and practices were significantly correlated, and it was recommended that health education programs should be prioritized to influence the improvement of these variables. The main insight gained from reviewing this study was that due to the measurement of these variables, the researchers were able to gauge the situation in Iran during this time and they were able to provide a solution that aimed to indirectly ease the burden of the disease without a vaccine. This study was designed as a cross-sectional web-based survey with an estimated sample size of 6, 592 participants, which is highly suited to the quarantine being imposed during this pandemic, and at the same time, it allows the survey to be easily disseminated via online means. As for the questionnaire that was used, it was based on the WHO questionnaire for the detection, prevention, response, and control of COVID-19 with further modifications to cater to the Iranian population. There was a demographic section that identified potential participant identifiers that could be used during the correlation of results. Demographic factors such as age, sex, occupation, level of education were focused on. Furthermore, the questionnaire was sectioned into knowledge, attitudes, and practices. These sections were similarly-formatted with either a multiple-choice or true or false format. Each item was worth a point/s that corresponded to their scoring system. Their knowledge section was composed of questions targeting disease characteristics, transmission, prevention & control, and possible risk groups. In addition, questions regarding 'what to do' in the event of possible infection were common. The attitudes section was focused on how participants viewed the necessity of quarantining, perceived severity of the virus, and the necessity for accurate information. The practices section was centered on questions that target hygiene practices and outdoor tendencies. Each section was analyzed and a corresponding score was given to each participant which was used in further analysis to make the aforementioned conclusion.

The next study that was reviewed was "Knowledge, Attitudes, and Practices Towards COVID-19: An Epidemiological Survey in North-Central Nigeria" by Reuben. This study was able to conclude that the recognition of the epidemiology of the disease and the success of the measures implemented within the country are influenced by the knowledge, attitude, and practices of the people toward COVID-19. This conclusion follows the same conclusion made by Erfani in the sense that both studies established a correlation between knowledge, attitudes, and practices, and in the end of their respective studies, there was a recommendation to intensify the health education programs during this pandemic to reduce the burden caused by this disease. The research followed a cross-sectional design and a semi-structured questionnaire was used. The determined sample size was 598 participants and this was disseminated using an online platform, google forms; a snowball sampling technique was used. Similarly to Erfani, this study sought to utilize the far-reaching capability of online dissemination means in light of the enforced quarantine measures. The questionnaire was designed according to the guidelines recommended for the awareness and prevention of COVID-19 by the NCDC, and also from the KAP studies from previous outbreaks (Ebola and Lassa fever) in Nigeria. In addition, the questionnaire was further modified to be more appropriate for the participants and was made to be answerable in 6 minutes.

The questionnaire was reasonably structured in the same manner as Erfani with a section dedicated to demographics that focused on age, gender, marital status, level of education, state of residence, residential location, residential layout, and residential structure. A section for knowledge, which contained 10 questions centered on the awareness of COVID-19 and the source of information, cause and modes of transmission, symptoms, individuals at risk and preventive measures. These questions were formatted differently with some questions being answerable with yes-no, multiple-choice, or select all that apply. The attitude section had 13 items directed towards attitudes towards COVID-19 preventive measures, adherence to government disease prevention orders, social distancing, use of facemask, feelings, and adaptive measures towards the pandemic. These questions were formatted with Likert scales and select all that apply however the answerable options were not uniform for the Likert scale questions. The practice section differed from that of Erfani because in this section the questions were designed to assess certain perceptions towards the COVID-19 pandemic, government response, compliance and satisfaction with NCDC guidelines, media coverage, & acceptance of possible COVID-19 vaccine. However, none of the practice questions assessed the current practices of the participants. After the data collection, the data was organized, categorized, and analyzed to arrive at the conclusion.

Another study reviewed was a cross-sectional study by Sari titled, "Positive Correlation Between General Public Knowledge and Attitude Regarding COVID-19 Outbreak 1 Month After First Cases Reported in Indonesia." This study is the only non-KAP study that was reviewed because it provided insightful information regarding the correlation between knowledge and attitudes during the COVID-19 outbreak. The study was able to conclude that the general public had good knowledge and a positive attitude regarding COVID-19 however participants seemed to struggle the most with questions pertaining to the actions that need to be taken when there are symptoms of COVID-19. The study was mainly concerned with the risk of misinformed individuals regarding the disease. Although no recommendations were explicitly mentioned, the aforementioned studies also recognized the risk COVID-19 posed to a misinformed society which is indicated by their recommendation for intensified health education measures. The research followed a cross-sectional design. An online questionnaire was used for dissemination and this contained a series of questions relating to the people's knowledge and attitudes regarding COVID-19 infection in Indonesia and. It does not mention any basis for the questionnaire however it is stated that it underwent validity and reliability testing so it is assumed the questionnaire was designed by the proponents; the google forms platform was used for online dissemination. The research took into account the answers from only 201 out of the 245 participants. The knowledge section consisted of questions regarding the awareness of the virus and symptoms of COVID-19; there were no indicated choices so it is assumed this was an identification type test. While the attitude section was centered on the participants' agreeableness to comply with preventive measures and was answerable by Y-N only. It should be noted that the questions in this section are phrased similarly to the practice questions in the other reviewed literature. The results from the study were subject to categorization and further analysis that resulted in the conclusion stated.

The final study reviewed was by Al Hanawi titled, "Knowledge, Attitude and Practice Toward COVID-19 Among the Public in the Kingdom of Saudi Arabia: A Cross-Sectional Study." This study was able to establish that there was good knowledge, positive attitude, and good practices amongst the public in Saudi Arabia. However, the most relevant information obtained from this study was that similarly to the other reviewed literature, it was also recommended to prioritize health education during this time. The need for better knowledge, attitudes, and practices during this time is invaluable to stemming the tide of COVID-19. This study utilized a cross-sectional design as well. A sample size calculator was used to calculate a sample size of 3388. The following factors were considered in the calculation: a margin of error of ±4%, a confidence level of 99%, a 50% response distribution, and 34,218,169 people. An online self-reported questionnaire was used, and the questions were made in accordance with the CDC community guidelines of COVID-19; questions were translated to Arabic to accommodate participants. The first part of the questionnaire focused on ensuring the participants were well informed regarding the background and objectives. The participants were also guaranteed confidentiality and could withdraw their participation at any time. The questionnaire was structured in the same manner as the previous KAPs reviewed. The demographic questions did not significantly differ from the other literature reviewed. The knowledge section contained 22 items on modes of transmission, clinical symptoms, treatment, risk groups, isolation, prevention and control. The attitudes section assessed participants' attitudes toward COVID-19 particularly, their opinion on compliance with stringent prevention methods (e.g. social-distancing, handwashing,

staying at home) using a five-point Likert scale. The practice section consisted of five questions related to practices and behavior, including (a) going to social events with large numbers of people, (b) going to crowded places, (c) avoiding cultural behaviors, such as shaking hands (d) practicing social distancing, (e) washing hands after sneezing, coughing, nose-blowing, and, recently, being in a public place. The practice questions were consistently formatted answerable by Y-N only. The results from which were subject to a univariate and multivariate linear regression analysis with a STATA software.

Upon review of the various related literature, it was observed that the questionnaires used were appropriately based on valid authority (CDC, WHO COVID-19 guidelines) and were subject to validity and reliability testing. Therefore, upon the development of this research's questionnaire, it was decided that the survey used in the study by Al Hanawi et al. (2020) entitled, "Knowledge, Attitude and Practice Toward COVID-19 Among the Public in the Kingdom of Saudi Arabia: A Cross-Sectional Study". will be used as the reference/template. Further modifications can be made to better accommodate the target population of the study. Some key modifications may include: (1) knowledge questions should focus on disease characteristics, transmission, prevention & control, and possible risk groups, (2) attitude section must assess perception and readiness to comply with stringent prevention practices, and (3) practices section must observe a tendency to follow hygiene practices and preventive outdoor practices. Uniformity of question format in each section should also be observed to avoid confusion. Preferably, a Likert scale should be used in the attitude and practices section. In addition, the answerable options for the Likert-scale questions should be uniform per section.

A. Theoretical Study

The main theoretical model that served as the basis of the study was the KAP Theory. It categorizes the changes in human behavior into three distinct and successive processes: the acquisition of knowledge, the generation of attitudes, and the formation of a behavior (Fan, 2018). Essentially, the theory states that individual practices may be influenced by adjustments in attitude through the acquisition of knowledge (Muleme, 2017). Findings in a study conducted by Prasetyo et al. (2020) entitled "Factors affecting perceived effectiveness of COVID-19 prevention measures among Filipinos during Enhanced Community Quarantine in Luzon, Philippines: Integrating Protection Motivation Theory and extended Theory of Planned Behavior" support this theory.

Apart from this, a theoretical model on human behavior called Protection Motivation Theory (PMT) was employed in the aforementioned study. It is used mainly in explaining an individual's decisions and actions towards health. This theory states that the primary stimulus for adopting healthy behavior is the perception of a severe threat that is likely to occur in the absence of healthy behavior. In addition, the individual must be convinced to some degree that engaging in the behavior is feasible for themself and would not cost a great deal to do. This theory rationalizes how knowledge affects attitudes and how this influence may affect behavior.

Furthermore, a study conducted by Asraf et al. (2020) found that individuals who had medical backgrounds exhibited better attitudes towards COVID-19 prevention. This suggests that a more detailed and specific investigation on the knowledge, attitudes, and practices of individuals who do not possess a medical background should be conducted.

B. Conceptual Framework

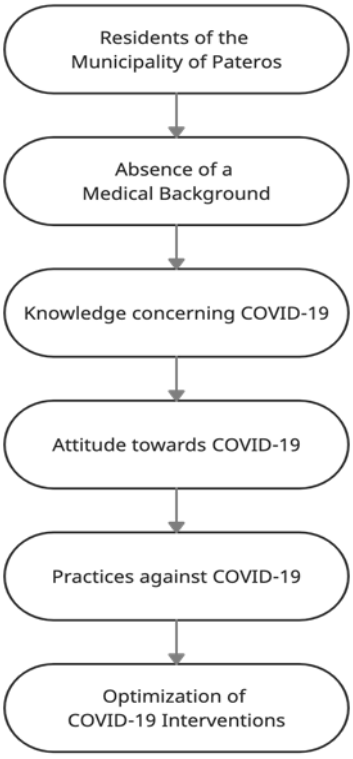

Figure 1. Conceptual Framework of the Study

The conceptual framework illustrates how information gathered regarding the COVID-19 knowledge, attitudes, and practices from individuals residing in the Municipality of Pateros who do not have a medical background may be used to

optimize the interventions being developed and implemented against the COVID-19 pandemic.

III. METHODOLOGY

A. Research Design

The research design followed a descriptive cross-sectional format. As such, this study is purely non-experimental and only provides an overview of the target population's characteristics at the time of conducting the study. As such, this study was not used to establish cause and effect relationships. However, a relatively passive approach may be employed to draw causal inferences based on the findings. Thus, recommendations regarding possible action based on the observed relationships can still be made.

B. Subjects and Study Site

Sampling Method:

The study made use of the convenience sampling technique in the gathering of research participants.

Inclusion and Exclusion criteria:

The study made use of the following inclusion and exclusion criteria. Those included met the following requirements: (1) falling between 18-59 years of age, (2) no affiliation with the health sector, and (3) residing within the Municipality of Pateros. Individuals who do not meet the aforementioned criteria were excluded from the study.

Sample Size:

Considering convenience sampling was used and that there is a lack of available information about the population proportion of non-healthcare individuals who are considerably knowledgeable on the COVID-19 disease, prevention, practices, and interventions, a hypothesized proportion of 0.5 (50%) was used. Additionally, since the margin of error allowed is only 0.05 (5%), and the population size of Pateros is 63,840 individuals (PSA, 2015), the sample size for a finite population was computed using Slovin's formula.

$$n = \frac{N}{1 + Ne^2}$$

Where,

n = $sample\ size$

N = $population\ size$

e = $margin\ of\ error$

Thus,

$$n = \frac{63{,}840}{1 + 63{,}840 \times 0.05^2} = 397.51 \approx 398\ participants$$

Hence, the information had to be collected from at least 398 residents of Pateros city.

Source of Subjects:

The individuals who will take part in the study were sourced using social media platforms. Subsequent tagging of participants was encouraged in order to increase the overall reach of the survey throughout the Municipality of Pateros.

Duration of the study:

A working time frame of 10 months (August 2020 - May 2021) was required, with at least two months dedicated to the data gathering procedure. Participation of the sample population was only done at the end of the survey questionnaire.

Research Platform:

The data collection procedure was conducted using an online platform that is far-reaching and readily accessible. The researchers chose the Google Forms platform based on the requirements as mentioned earlier.

C. Data Instrumentation

The data was collected using a questionnaire previously used in a study by Al Hanawi et al. (2020) entitled, "Knowledge, Attitude and Practice Toward COVID-19 Among the Public in the Kingdom of Saudi Arabia: A Cross-Sectional Study". Necessary modifications were done to meet the objectives of the study, reflect updated COVID-19 information, and to cater to the Philippine setting. The questionnaire was initially composed in English then translated to Filipino to accommodate the masses. A final retranslation to English was done to check if the intended meaning has been retained after translation. Then, it underwent validation under the expertise of qualified English and Filipino editors. Finally, the questionnaire was subjected to reliability testing using Cronbach's alpha. Adjustments were made accordingly.

Upon opening the link to the survey questionnaire, the participants were asked to choose a language of preference that they would like to take the survey in. Then, a text window containing information regarding the purpose of the study, procedure to be followed, risks and benefits of participation,

compensation schemes, voluntariness, and confidentiality appeared. This was followed by a prompt requesting their consent to participate in the study. Those who expressed consent moved on to the screening process, and those who did not were redirected to the submission page. The consenting participants were screened according to the inclusion and exclusion criteria of the study. Participants who did not pass the screening process were directed to the submission page and thanked for their participation. Those who passed proceeded to the survey proper.

The questionnaire was divided into four sections. All items required a response to avoid the occurrence of incomplete surveys that would complicate the statistical analysis.

The first section determined the sociodemographic characteristics of the target population. It also required the participants to indicate the specific barangay they reside in and to provide their full names, which will be used solely for the purpose of verifying their residence in the area with the help of the corresponding barangay offices. Only verified responses were used in the study to ensure that the collected data was representative of the target area. Once unverified responses have been filtered out, a code number was assigned to each participant prior to the analysis of their responses to maintain their anonymity.

The following three sections covered the three KAP domains: 1) knowledge-related questions regarding general awareness of the disease, its causative agent, transmission, and preventive practices against it; 2) attitude-related questions covering risk perception and general disposition towards exercising preventive measures; and 3) practice-related questions that will determine the general preventive measures incorporated in the daily functions of the participants. Items incorporated in these sections were pulled out from the previously mentioned reference questionnaire by Al Hanawi, et. al. (2020) as well as an additional reference by Erfani et. al. (2020). Correct answers from both references were rechecked using information acquired from credible sources such as the CDC, WHO, and DOH websites. This was done in light of the rapidly increasing knowledge of the COVID-19 disease pandemic. It ensures that the modified questionnaire only recognized the most recently released COVID-19 information and not those that have already been officially debunked by authorized agencies.

The knowledge section consisted of 21 items equivalent to a total of 33 points. Distribution of points varied depending on the content of the item. The attitude section consisted of 10 items prompting the participants to express their degree of agreement to each statement through a five-point Likert scale. Lastly, the practice section consisted of 15 items and a 3-point Likert scale that assessed the frequency of execution.

Twenty percent of the attitude and practice items were structured in negative sentences to avoid patterns that could potentially compromise the validity of the results. Negatively structured items were scored inversely. Overall, the survey KAP sections amount to a total of 128 points. Scores greater than or equal to 85% for each section were interpreted as adequate knowledge, favorable attitudes, and appropriate practices. Any scores below this mark were interpreted as the opposite. Should the participants wish to decline or terminate their participation, at any point in time, they were free to do so by simply exiting the forms and/or social media applications.

D. Data Gathering Procedure

Data was collected online with the use of Google Forms. Questionnaires were disseminated to non-healthcare individuals living in the Municipality of Pateros through a "pass it on" or blasting strategy to ensure maximum distribution and that the target sample size is met. Filter questions were used in the survey to ensure data collected only came from the target population. The collected data was handed over to the statistician for data computation and analysis.

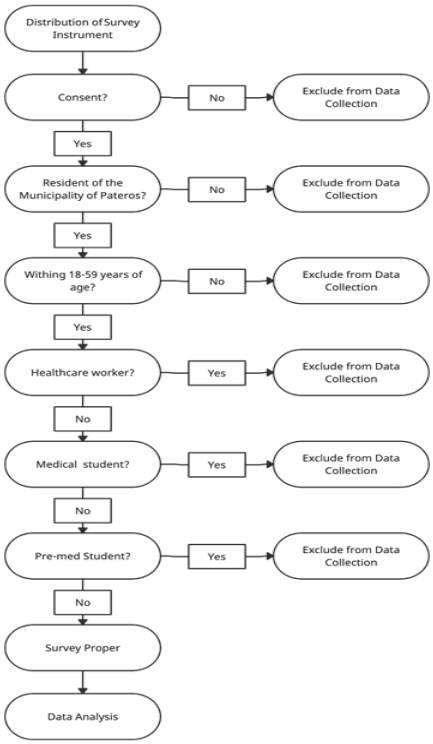

Figure.2. Data Collection and Procedural Flowchart

E. Ethical Considerations

In an aim to establish well-founded research, all data and information to be collected were treated and handled with utmost significance whilst following the standards of conduct. To fulfill this, several principles were put into consideration, focusing on the protection of the rights and welfare of the participants. The researchers guaranteed that participation in the study was free from any form of coercion. Accomplishment of consent forms were required prior to data collection, verification of the participants' decision to partake as purely autonomous. In addition to this, strict confidentiality of the gathered information and the participants' anonymity was observed. Only the researchers had access to the data that was stored and secured through a single computer drive. It was guaranteed that all data and information were used solely for the purpose of the study and were destroyed immediately once the research project reached full completion to acknowledge the Data Privacy Act of 2012. On assessing participants' knowledge, behavior, and practices, sensitive and highly personal questions that may potentially trigger guilt or traumatic memories were avoided through careful planning and piloting of the survey forms. All sources that were utilized throughout the study were given proper acknowledgment through various referencing systems.

Before proceeding with the study, the researchers assured that the study shall pose no risk to the participants. If possible risks were identified, the benefits must have outweighed these risks; otherwise the study would have needed to be redesigned. Lastly, an approval from the Ethics Review Committee was secured to ensure that the highest ethical standards were upheld by the researchers and that the work was essential enough to yield results that may greatly contribute to the scientific community.

F. Data Analysis

Since this study employed a descriptive research design, summary statistics such as mean, standard deviation, median, minimum, and maximum were computed for numeric variables while frequency tables showing the counts and percentages of each category were shown for categorical data. In addition, the scores for knowledge, attitude, and practice for each participant were computed using the sum of scores. The formula for sum of scores is given below.

$$\boldsymbol{Y_i = \sum_{j=1}^{k} y_{ij}}$$

Where,

Y_i = *total score of participant i for outcome variable Y*

y_i = *response of participant i on the* j^{th} *item for outcome variable Y*

k = *number of items corresponding to outcome variable Y*

Then, the estimate for the average score of the sample was given by the sample mean.

$$\boldsymbol{\bar{x} = \frac{1}{2}\sum_{i=1}^{n} Y_i}$$

Where,

$\bar{x}$ = *sample mean for outcome variable Y*

Y_i = *total score of participant i for outcome variable Y*

n = *total number of participants*

After computing the summary statistics, a test of association was conducted between the selected demographic profile of the respondents and the outcome variables of the study (Knowledge, Attitude, Practice). Assuming the outcome variables come from a normal distribution and the demographic variable has only two categories, an independent sample t-test for difference of two population means was used. This tested the null hypothesis of two groups having the same or equal population means. Assuming the equal and unknown population variance, the test statistic was given by:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)\left(\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}\right)}}$$

Where,

$\bar{x_1}$ = *sample mean of group* 1

$\bar{x_2}$ = *sample mean of group* 2

$S^2{}_1$ = *sample variance of group* 1

$S^2{}_2$ = *sample variance of group* 2

n_1 = *sample size of group* 1

n_2 = *sample size of group* 2

Under the null hypothesis the test statistic t follows a t distribution with degrees of freedom $n_1 + n_2 - 2$ but under the central limit theorem, the distribution of t approximates the standard normal distribution for large enough sample size. The null hypothesis was rejected if the p-value of the computed t statistic was less than the level of significance (0.05).

Next, if the variable had more than 2 categories, a one-way analysis of variance (ANOVA) was used to determine if there were significant differences in the population mean among the groups. ANOVA divides the total variation of the data into two sources, the between group variation and the within group variation (also called variation due to error). A significantly large between group variation compared to within group variation indicates that there were significant differences among the means of the groups. ANOVA results are usually presented in the following table format.

Table.1. *Table format of ANOVA results.*

Sources of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F value
Between group	SSB	$k-1$	$MSB = \frac{SSB}{k-1}$	
Within group	SSW	$n-k$	$MSW = \frac{SSW}{n-k}$	$F = \frac{MSB}{MSW}$
Total	SST	$n-1$		

Where n = sample size and k = number of categories. Under the null hypothesis, the test statistic F follows an F distribution with k - 1 numerator degrees of freedom and n - k denominator degrees of freedom. The null hypothesis was rejected if the p-value of the test statistic was less than the level of significance (0.05).

IV. Data Presentation, Analysis, And Interpretation

A. Data Presentation

Demographic Profiles:

This section presents the summary of the demographic characteristics of the respondents from the Municipality of Pateros. A total of 398 individuals have participated in the survey that ran from February 2021 to April 2021. The majority of the respondents were young adults (18 to 29 yrs. old) which comprise about 57% of the total respondents. Female respondents dominated the sample (55%) in terms of numbers. Also, about 3 in every 5 respondents have a college degree. Moreover, more than half of the respondents were currently employed (government employee, private employee, or self-employed).

Table.2. Summary of the Demographic Characteristics of Non-Healthcare Individuals Living in Pateros

Variable	Frequency	Percentage
Age		
18-19 yrs. old	28	7.04%
20-24 yrs. old	101	25.38%
25-29 yrs. old	96	24.12%
30-34 yrs. old	50	12.56%
35-39 yrs. old	38	9.55%
40-44 yrs. old	31	7.79%
45-49 yrs. old	24	6.03%
50-54 yrs. old	20	5.03%
55-59 yrs. old	10	2.51%
Sex		

Female	219	55.03%
Male	179	44.97%
Highest Educational Attainment		
Elementary	5	1.26%
Junior High School	56	14.07%
Senior High School	79	19.85%
College	238	59.80%
Post-graduate	12	3.02%
Vocational/Certificate/ALS programs	8	2.01%
Employment Status		
Employed (government)	80	20.10%
Employed (private)	91	22.86%
Self-employed	51	12.81%
Student (government)	39	9.80%
Student (private	47	11.81%
Unemployed	90	22.61%

Table.3. Summary of the Online Presence of Non-Healthcare Individuals Living in Pateros

Variable	Frequency	Percentage
Internet Connectivity		
Excellent	49	12.31%
Good	206	51.76%
Intermittent	100	25.13%
Poor	43	10.80%
Hours Spent Online		
Less than 2 hrs.	40	10.05%
2 to 6 hrs.	150	37.69%
6 to 10 hrs.	117	29.40%
More than 10 hrs.	91	22.86%

Table.3. presents the summary of the online presence of the survey respondents. More than 64% of the respondents had an excellent or good internet connection at home. Unfortunately, a huge part of the sample had a poor or intermittent internet connection at home. Furthermore, only 10% of the respondents were online for less than 2 hours a day. The majority of them were online for about 2 to 6 hours (38%) or from 6 to 10 hours (29%).

About 1 in every 5 respondents answered that they were online for more than 10 hours per day.

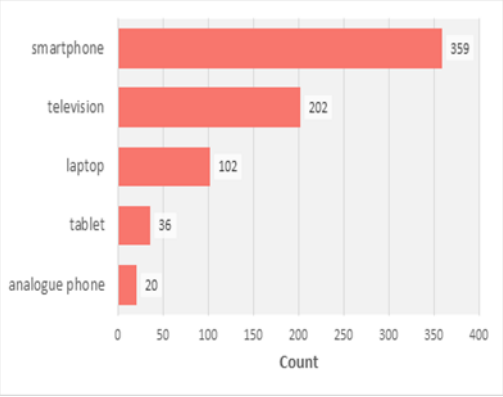

Figure.3. Most Common Gadgets Used to Keep Updated with COVID-19 News

Figure 3 presents the most common gadgets used by the respondents to keep updated with COVID-19 news in the country. Unsurprisingly, smartphones emerged as the most common gadget used by the respondents which are used by 359 out of 398 or about 90% of the total respondents. Televisions came in second place which is used by about 51% of the respondents. Other responses include laptops (26%), tablets (9%), and analog phones (5%).

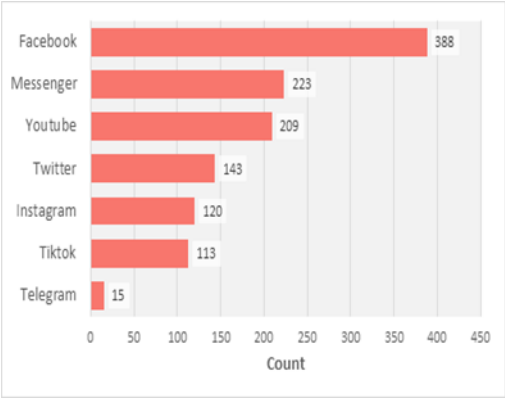

Figure.4. Most Popular Apps Used to Keep Updated with COVID-19 News

Figure 4 displays the most popular websites or applications that are used by the respondents to keep in touch with the current events regarding COVID-19. As expected, Facebook came out as the most popular website/application among the respondents with more than 97% of them as Facebook users. This is followed by the Messenger app with users comprising 56% of the sample and YouTube with users amounting to 53% of the respondents. Others also use Twitter (36%), Instagram (30%), and TikTok (28%). Very few (4%) use the messaging app Telegram to keep updated with COVID-19 news.

Table.4. Health-Related Profiles of Non-Healthcare Individuals Living in Pateros

Variable	**Frequency**	**Percentage**
Affiliated with organizations that cater to the health	28	7.04%
Participated in any health-related courses/training/seminars	80	20.1%
With family member working in the health sector	71	17.84%
With friends working in the health sector	135	33.92%
Was tested positive from COVID19 (or knows someone close that tested positive)	146	36.68%
With the local health unit actively spreading COVID-19 information	339	85.18%
With local government unit actively implementing COVID-19 quarantine protocols?	379	95.23%

Table 4 presents the health-related profile of the respondents. Only 7% of them were affiliated with health organizations (such as Red Cross) and about 20% of them have participated in health-related courses/training/seminars. About 18% of the respondents had family or relatives that were working in the health sector while 34% of them have close friends working in the health sector. About 37% of the respondents have been tested positive with COVID-19 or knows someone close to them who had been tested positive for COVID-19. Meanwhile, 85% of the respondents agreed that their local government was actively disseminating COVID-19 information in their area and about 95% of them agreed that their local government was strictly implementing COVID-19 quarantine protocols.

B. Data Analysis and Interpretation

Knowledge, Attitudes, and Preventive Practices against COVID-19:

This section presents the basic summary statistics of the computed Knowledge, Attitude, and Preventive Practices against COVID-19 of the respondents. In the computation of the scores, the researchers got the total score of each respondent across the 3 sets of items (KAP). Then the corresponding scores were transformed in a linear scale such that all 3 scores are

bounded between 0 and 100. The researchers used the following formula to transform the scores.

$$z = \frac{X - min}{max - min} \times 100$$

Where,

z = *transformed score Kn*

X = *raw total score*

min = *lowest possible score on the set*

max = *highest possible score on the set*

The closer the score to 100 means the higher their level of knowledge about COVID-19 or the better their attitude or perspective towards COVID-19 and the more frequent they practice COVID-19 preventive measures.

Table.5. Summary Statistics of Knowledge, Attitude, and Practice Scores

Variable	**Mean**	**Std. Dev**
Knowledge	77.07	16.03
Attitude	69.3	21.14
Practice	79.8	16.47

Based on table 5, the average Knowledge scores of the respondents was 77.07 points with a standard deviation of 16.03 points which indicates that the respondents had inadequate knowledge about COVID-19. Moreover, their mean Attitude scores were 69.3 points with a larger standard deviation of 21.14 points. This suggests that the respondents somehow exhibited negative attitudes regarding COVID-19. Lastly, the average Practice score of the respondents was 79.8 pints with a standard deviation of 16.47 points. This suggests that they were demonstrating inappropriate preventive measures against COVID-19 often.

Association with Demographic Variables:

This section presents the test of association between knowledge, attitude, and preventive practices against COVID-19 of the respondents and their demographic characteristics. To do this, the computed mean scores of the groups was compared and tested for significance using either independent samples t-test or one-way ANOVA. In addition, Fisher's Least Significant Difference Method was used for the post-hoc test in the event the null hypothesis was to be rejected (p-value < 0.05). This was used to determine which pairs of groups were significantly different. The computed means per group and the corresponding results of the significance testing are displayed in the following tables.

Table.6. Mean Scores of Knowledge, Attitude, and Practice Scores by Age Group

Age Group	***Knowledge***	***Attitude***	***Practice***
18-19 yrs. old	*73.94*	*67.59*	*79.05*
20-24 yrs. old	*75.86*	*69.75*	*79.47*
25-29 yrs. old	*78.49*	*71.38*	*83.09[a]*
30-34 yrs. old	*79.35*	*70.45*	*81.00*
35-39 yrs. old	*74.54*	*65.20*	*79.56*
40-44 yrs. old	*76.11*	*68.63*	*77.20*
45-49 yrs. old	*77.36*	*66.35*	*76.67*
50-54 yrs. old	*78.65*	*73.88*	*80.17*
55-59 yrs. old	*81.62*	*59.50*	*63.33[a]*
One-way Analysis of Variance			
F statistic	*0.6805*	*0.7869*	*2.0225*
p-value	*0.7088*	*0.6145*	*0.0427**

[a] Significantly different pairs
** Denotes significance at a 5% alpha*

Table 6 presents the mean knowledge, attitude, and practice scores of the respondents per age group. Based on the table, it seems that the youngest age group had the lowest average score on knowledge about COVID-19. This is most

probably due to the youngest age group not being familiar with general health-related concepts due to lack of experience. Another probability is that this age group does not prioritize the acquisition of information regarding COVID-19 through approved and credible sources because they are still under the care of their elders. Meanwhile, the oldest age group got the highest average score on knowledge about COVID-19. A probable reason for this would be the age group (55-59 years old) were more familiar with health-related concepts as a result of experience. This category of individuals may have also been more inclined to acquiring ample knowledge on the disease, as they are an age group that possess a higher risk of severe infection compared to younger age groups. However, it is of note that there was no noticeable pattern on the mean knowledge scores per age group and the differences between them were not that large. Based on the F-statistic of the one-way ANOVA, there was no sufficient evidence to conclude that the mean knowledge score differed by age group ($p = 0.7088$). Hence, age and knowledge about COVID-19 were independent. Next, the lowest mean attitude score was 59.5 points for the 55-59 yrs. old age group while the highest mean score was on the adjacent younger age group. Again, there is no noticeable pattern that can be observed on the mean attitude scores by age group. With a p-value = 0.6145, there was no sufficient evidence to conclude that attitude scores differed by age group hence, attitude towards COVID-19 and age were not associated. Lastly, the oldest age group got the lowest average score regarding preventive practices against COVID-19 while the 25-29 yrs. old had the highest average score. Since the p-value of the ANOVA F-statistic was less than 0.05, there was sufficient evidence from the sample to conclude that the mean practice score differed by age group. Specifically, the mean practice score of the respondents aged 55-59 years old was significantly lower compared to the mean practice score of the respondents aged 25-29 years old. This can be an indication that the frequency of practicing preventive measures against COVID-19 was associated with age.

Table.7. *Mean Scores of Knowledge, Attitude, and Practice Scores by Sex*

Sex	***Knowledge***	***Attitude***	***Practice***
Female	*77.69*	*68.62*	*79.50*
Male	*76.31*	*70.14*	*80.17*
Independent Samples T-test			
T statistic	*0.8528*	*-0.7136*	*-0.4033*
p-value	*0.3943*	*0.4759*	*0.6869*

Table 7 presents the mean knowledge, attitude, and practice scores of the respondents per sex. Based on the table, females seem to have had a higher mean score in terms of knowledge about COVID-19 compared to males, but males had higher means scores for attitude and practice of preventive measures against COVID-19. However, according to the results of the one-way ANOVA, all the computed p-values were not less than 0.05, hence, there was no sufficient evidence to conclude that knowledge, attitude, and practice are associated with sex. It is of note, that the independent samples t-test was used instead of the ANOVA since only the means of two groups (male and female) were being compared. However, taking the square of the t-test statistic is equal to the corresponding F-statistic if ANOVA was used to compare the means of the two groups. Thus, this implies that the t-test is equivalent to a one-way ANOVA for two groups.

Table.8. *Mean Scores of Knowledge, Attitude, and Practice Scores by Employment Status*

Employment Status	**Knowledge**	**Attitude**	**Practice**
Employed (government)	77.87	69.13	79.17
Employed (private)	75.74[a]	65.88	78.61
Self-employed	84.00[a]	74.75	84.58
Student (government)	76.58	70.45	78.38

Student (private	78.55	73.09	81.42
Unemployed	73.21[a]	67.36	78.63
One-way Analysis of Variance			
F statistic	3.2942	1.6462	1.2202
p-value	0.0063**	0.1468	0.2988

[a] *Significantly different pairs*

** *Denotes significance at a 1% alpha*

Table 8 presents the mean knowledge, attitude, and practice scores of the respondents per employment status. As seen from the table, the lowest average score on knowledge about COVID-19 was 73.21 points for the Unemployed respondents. In contrast, the average score of the self-employed respondents was 84.0 points which is 10.79 points higher than the unemployed group. With a p-value of 0.0063, the one-way ANOVA suggests a strong piece of evidence to conclude that the mean knowledge scores differ by employment status. Particularly, the mean knowledge scores of unemployed respondents and the respondents working in private companies were statistically lower compared to those who are self-employed. This could possibly be the case because knowledge regarding COVID-19 which has been made available to the workplace is not accessible to those who are unemployed. While in the case for the employed individuals, it is possible that employers do not prioritize the dissemination of sufficient information to their employees regarding the current COVID-19 situation. Meanwhile, the self-employed group also got the highest mean scores for attitude and practice. However, the result of the ANOVA indicates that there was no significant difference in the average attitude and practice scores of the respondents by employment status.

Table.9. *Mean Scores of Knowledge, Attitude, and Practice Scores by Hours Spent Online*

Hours Spent Online	***Knowledge***	***Attitude***	***Practice***
Less than 2 hrs.	*76.15*	*66.63*	*82.92*
2-6 hrs.	*73.62*	*69.57*	*76.58[a]*
7-10 hrs.	*82.31[a]*	*69.12*	*82.96[a]*
Greater than 10 hrs.	*76.42*	*70.27*	*79.67*
One-way Analysis of Variance			
F statistic	*6.8631*	*0.2871*	*3.9174*
p-value	*0.0002***	*0.8347*	*0.0089***

[a] *Significantly different groups*

** *Denotes significance at a 1% alpha*

Table 9 presents the mean knowledge, attitude, and practice scores of the respondents per hours spent online. Based on the table, the respondents spending about 7 to 10 hours a day online had the highest mean knowledge score at 82.31 points. This was a lot higher than the rest of the groups. In addition, the mean knowledge score of the respondents spending 7 to 10 hours a day online was significantly higher than the rest of the respondents (p = 0.0002). Meanwhile, the mean attitude scores of the respondents across all levels of time spent online did not differ that much which is supported by the result of the ANOVA (p = 0.8347). Thus, attitude towards COVID-19 was not associated with time spent online. Finally, the respondent spending 7 to 10 hours online per day got the highest score again but for the practice against COVID-19 with 82.96 points while the respondents spending 2 to 6 hours a day online had the lowest mean score at 76.58 points. The p-value of the F-statistic was 0.0089 which suggests a strong piece of evidence that the mean practice scores differed by time spent online. Specifically, the mean preventive practice score of the respondents spending 7 to 10 hours online a day was significantly higher than those of spending 2 to 6 hours a day online. This also indicates that the frequency of practicing preventive measures against COVID-19 was associated with the time spent online of the respondent. A possible explanation to this is because people who exhibit a larger online presence may be more aware and/or involved in the movement of information regarding the do's and don'ts of COVID-19 as well as the consequences of failing to act accordingly; therefore they

may be more inclined to know more and to practice more appropriately.

V. CONCLUSION

Summary:

The Knowledge, Attitudes, and Practices towards COVID-19 of 398 non-healthcare residents of Pateros within the ages 18-59 years old were measured via an online survey that was distributed across social media platforms (e.g. Facebook, Instagram). After the acquisition and analysis of data, it was found that the mean score of the participants showed inadequate knowledge, negative attitudes, and inappropriate practices. The following evidences were also observed upon testing for association: wherein age and practices, employment status and knowledge, and hours spent online and knowledge and practices were found to show strong evidence of significantly differing groups. These differing groups are statistically significant but can only serve as indications and not associations with regards to possible relationships. The inability to conclusively identify an association is due to limited data and the limitations of ANOVA/Independent samples t-test. In light of these findings, the improvement of KAPs should be made a primary concern due to the implications and risks that may occur in the absence of adequate knowledge, positive attitudes, and appropriate practices. The improvement of these KAPs through health education is recommended.

Conclusion:

Based on the results, the residents of Pateros who participated in the study exhibited substandard scores that were interpreted as: inadequate knowledge, negative attitudes, and inappropriate practices. These findings do not represent the entirety of Pateros. Thus, this conclusion should only serve as an indication of the possible KAPs being displayed by individuals in Pateros.

Recommendations:

Health education should be made a priority. In order to combat the uninhibited spread of the virus, the people should be made more adept in knowledge, attitudes, and practices so that they can not only care for their own well-being but also that of their fellow countrymen. Any attempts to improve health education (e.g. webinars, social media campaigns, flyers) should be prioritized. Since no conclusive associations among KAPs and demographics were determined, a targeted health education program can not be specified. Further research should be done with a different analysis approach and a larger sample size to determine the presence or absence of conclusive associations.

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