



## Knowledge, Attitude, and Practices of Medical and Non-medical Frontliners in the 3rd District of Cagayan on Severe Acute Respiratory Syndrome

Jinky Marie T. Chua\*, Mark Kelwin Daguiao, Julius T. Capili

*Cagayan State University, Andrews Campus, Tuguegarao City, Cagayan Valley,  
Northern Philippines*

**Key words:** KAP, Severe Acute Respiratory Syndrome, Medical Frontliners, Allied Health Practitioners

<http://dx.doi.org/10.12692/ijb/23.3.11-23>

Article published on September 03, 2023

### Abstract

Respiratory infections are the leading cause of morbidity and mortality in developing countries. This study generally examined the knowledge, attitude, and practices of medical and non-medical frontliners in the 3rd District of Cagayan on Severe Acute Respiratory Syndrome. This cross-sectional design study used a questionnaire to obtain the necessary data. A total of 385 respondents were chosen using a stratified random sampling procedure. The study revealed that the respondents have a moderate level of knowledge of the cause and transmission, a high level of clinical manifestation, and a low level of knowledge of the treatment and management, including the control and prevention of SARS. The level of educational attainment, occupation, and source of information are significant to their knowledge, attitude, and practices. Employment status, monthly income, and institutions visited when they are not feeling well greatly influence their attitude. However, the number of seminars on SARS significantly correlates with their knowledge level. Lastly, there is a significant association between the respondents' level of knowledge and attitude and practices towards respiratory infection.

\* **Corresponding Author:** Jinky Marie T. Chua ✉ [jchua@csu.edu.ph](mailto:jchua@csu.edu.ph)

## Introduction

According to the World Health Organization, occupational risks are the 10th leading cause of illness and death at work. Almost one million work-related deaths and 250 million work-related accidents occur annually. An estimated 100,000 people die of occupational diseases, while around 400,000 new cases are diagnosed yearly (Ajayi *et al.*, 2006; Bell *et al.*, 2013). Respiratory secretions are one of the occupational hazards that our frontline health care workers (HCW) are exposed to every day. Their proximity to patients with respiratory diseases and handling human secretions make them particularly vulnerable to transmission of droplet-transmitted respiratory infections. Over the past years, respiratory infections are the leading cause of morbidity and mortality in developing countries. It is accountable for around four million mortality every year. While the burden of disease is well recognized in the elderly and immunocompromised, only limited information exists on the impact of respiratory infections on our frontliners (Bellei *et al.*, 2007). According to the Department of Health, the morbidity of respiratory disease among Filipinos was approximately two million. The morbidity rate of acute respiratory disease was around 1.1 thousand per 100,000 population in the Philippines. In 2020, the City of Tuguegarao tallied Acute Respiratory Infections as the leading cause of morbidity in all age groups, accounting for 1260.32 rates per 100,000 population based on the Department of Health-Region 2 data. The burden of respiratory diseases affects individuals and their families, schools, workplaces, neighborhoods, cities, and states. The burden of respiratory diseases also falls on society because of the cost to the health care system; it is paid for with tax, higher health insurance rates, and lost productivity.

For almost a year, we have been experiencing the wrath of a respiratory virus that killed over three million people worldwide. This statistic includes the death amongst frontliners, aside from increased rates of illness and absenteeism from nosocomial respiratory infections. Our front liners may also be a

source of infection in nosocomial outbreaks. Transmission of disease from patient-to-frontliner and frontliner-to-patient have been identified in many cases, highlighting the importance HCWs play in-hospital transmission. In this pandemic, HCW will be at high risk of exposure and likely become ill at rates similar to the general population. This will reduce the number of HCWs available to cope with the expected increase of patients requiring care (Stuart and Gillespie, 2008). Hence, we need to protect the HCWs who protect us all. Despite the growing rate of mortality caused by respiratory infections and developed programs in combating respiratory infection, national efforts to decrease respiratory infection mortality and morbidity tend to focus more on the effective use of appropriate antibiotics and community-based medical beliefs but not on the HCW's adherence to prevention and control. As a result, the cases of respiratory diseases are not going down. Profound knowledge supports an optimistic attitude and appropriate workplace practices, which helps deter the risk of infection (McEachan *et al.*, 2016; Quintos *et al.*, 2022; Capili *et al.*, 2022). HCWs' adherence to control measures is affected by their knowledge, attitudes, and practices (KAP) towards respiratory diseases. Therefore, it is crucial to understand the medical providers' knowledge and determine the factors that affect their attitudes and practices to have adequate practices and protection.

It is, therefore important to perform behavioral studies in different populations to understand the determinants that influence behaviors. Previous studies during the Severe Acute Respiratory Syndrome (SARS) outbreak 2003 have shown that individual beliefs and perceptions play an important role in subsequent desired behavior change. Higher perceived effectiveness of measures undertaken and higher perceived threat of the disease led to higher rates of positive behavioral change, and better knowledge also increased the uptake of preventive measures (Leung *et al.*, 2005; Yap *et al.*, 2010). The success of these measures is largely influenced by their knowledge, attitudes and practices (Zhong *et al.*,

2020). As supported by KAP theory, changes in human behavior are divided into three successive processes: the acquisition of knowledge, the generation of attitudes and the formation of behavior. It is based on the notion that increasing knowledge will influence behavior change (WHO, 2012).

Respiratory diseases have been one of the leading causes of mortality, for which appropriate infection prevention and control measures need to be adopted. HCWs' adherence to prevention and control measures is affected by their knowledge, attitudes, and practices (KAP) towards respiratory diseases. Thus, this study aimed to assess the KAP of medical front liners and allied health practitioners towards respiratory infections. The result of this study will measure the extent of what is known, confirm and disprove the hypothesis and provide new tangents on respiratory diseases, especially among frontline HCWs.

## Methodology

### *Locale and duration of the study*

This study was conducted in the Third District of Cagayan, specifically in the different barangays and hospitals located at Amulung, Enrile, Penablanca, Piat, Tuguegarao City and Tuao.

### *Research design*

This study used a cross-sectional study to gather information on the knowledge, attitude, and practices of Medical and Non-medical Frontliners towards Severe Acute Respiratory Syndrome. It is also used to determine the characteristics of the respondents and the correlation of these to their current behaviors and practices towards SARS and how their knowledge influences their attitudes and practices. 385 Medical and Non-medical frontliners from the 3rd District of Cagayan were randomly selected.

### *Sampling design*

The researchers obtained the selected respondents of this study from the identified barangays and hospitals located in the different municipalities in the Third District of Cagayan. Three hundred eighty-five (385) medical and non-medical front liners were identified

using stratified random sampling. Among the 244 non-medical frontliners are 266 Barangay Health Workers, 11 Ambulance Drivers, 4 Security Guards, and 3 Janitors/Janitresses and among the 141 medical frontliners are 88 Nurses, 16 Medical Technologists, 7 Respiratory Therapists, 16 Midwives, 8 Nursing Aides, and 6 Radiologic Technologists.

### *Data gathering procedure*

The researchers strictly followed the ethical and legal standards in the conduct of this study. Research Ethics Clearance was sought from Region II Trauma and Medical Center (R2TMC) prior to the conduct of the study. Validation of the questionnaire and pilot testing were completed prior to implementation. Pilot testing was conducted on a small subsample of the sample population, with 30 respondents, to ensure that the respondents match the demographic, socioeconomic, and employment status of the larger sample that will be surveyed later in the study. Permission to conduct the study was sought from the heads of the barangay health units and hospitals before data collection commenced. The respondents voluntarily gave informed consent by signing the informed consent form (ICF), where the nature and purpose of the study and strict confidentiality were assured throughout the study. The survey questionnaire was the main data collection method used. The survey questionnaire for the profiling and the self-assessment took an average duration of 10-15 minutes and it was handed to the HR department of hospitals and Barangay Captains to float to the respondents who signed the ICF. The answered questionnaires were checked for completeness and consistency and lastly, the data collected was set for analysis and interpretation.

### *Data analysis*

Data was entered into STATA 17 for analysis. The data on the demographic profile of the respondents was analyzed using descriptive statistics. Frequency count, percentages, and mean were used to describe the data. To answer the inferential questions in this study, a test of difference was utilized. Specifically, the independent samples chi-square test was used to

test the difference between the two groups. Spearman rho was used to determine the association between knowledge, attitude, and practices. The hypotheses in the study were tested at a 0.05 level of significance.

### Results and discussion

Table 1 shows the frequency and percentage distribution of the respondents according to age, sex, civil status, highest educational attainment, and number of seminars and trainings attended on severe acute respiratory syndrome. A total of 385 medical and non-medical frontliners responded to the

questionnaire, giving a response rate of 100%. The age distribution pattern shows that the mean age of the study population was found to be 48 years old, mostly referred to as Generation X. Results revealed that the majority of the respondents fall between the age group of 40-49-year-old and dominated by women representing 25.5% and 79.7%.

The youngest, in fact, was 23 years old and the oldest was 75 years old. Given their age profile, it is not surprising that the majority of the respondents are married (66.5%) and followed by single (25.5%).

**Table 1.** Frequency and percentage distribution of the respondents' demographic profile.

Variable	Frequency	Percentage
Age		
20 - 29	57	14.8
30 - 39	93	24.2
40 - 49	98	25.5
50 - 59	85	22.1
60 - 69	40	10.4
>70	12	3.1
Sex		
Male	78	20.3
Female	307	79.7
Civil status		
Single	98	25.5
Married	256	66.5
Widowed	24	6.2
Annulled	3	0.8
Live-in	4	1.0
Educational attainment		
Vocational	18	4.7
Elementary undergraduate	6	1.6
Elementary graduate	28	7.3
Highschool undergraduate	19	4.9
Highschool graduate	89	23.1
College undergraduate	62	16.1
College graduate	149	38.7
Post-graduate	14	3.6
Numbers of seminars and trainings attended on SARS		
None	238	61.8
1-2	110	28.6
3-4	29	7.5
More than 5	8	2.1

As to educational attainment, most of the respondents were college graduates (38.7%). This one is analogous to the basic requirements for recruiting medical front liners in order for them to practice their profession. Out of the total number of respondents, 14 of the (3.6 %) medical front liners pursued their master's and Doctor of Philosophy. Continuing

professional development (CPD) in healthcare is fundamental for ensuring frontline staff practice safely and effectively. It is important for medical frontliners to update their knowledge and skills regularly to match the changing complexity of healthcare needs. Eighty-nine (89) of the respondents were high school graduates (23.1%).

**Table 2.** Frequency and percentage distribution of the respondents' socioeconomic profile.

Variable	Frequency	Percentage
Occupation		
Nurse	88	22.9
Medical Technologist	16	4.2
Respiratory Therapist	7	1.8
Midwife	16	4.2
Nursing Aide	8	2.1
Radiologic Technologist	6	1.6
Barangay Health Worker	226	58.7
Ambulance Driver	11	2.9
Security Guard	4	1.0
Janitor/Janitress	3	0.8
Years in Service		
Less than 2 years	77	20.0
2 to 5 years	135	35.1
6 to 10 years	98	25.5
11-15 years	46	11.9
16 to 20 years	29	7.5
Employment Status		
Regular /Permanent	180	46.8
Contract of Service	124	32.2
Casual	34	8.8
Job Order	47	12.2
Average Monthly Income		
Less than P 10,957	324	84.2
P 10,958- P 21, 914	56	14.5
P 21,915- P 43,828	3	0.8
P 43,829- P 76,669	2	0.5
Sources of Information		
Newspapers	27	7.0
Radio	36	9.4
TV	134	34.8
Brochures, Posters & other IEC Materials	13	3.4
Health Workers	153	39.7
Family, Friends, Neighbors, and Colleagues	13	3.4
Others	9	2.3

The interview done by the researcher revealed that they experience poverty and need to work at an early age to help their parents provide for their family's basic needs, causing them not to engage in formal schooling. In addition, 4.7% of the respondents had received alternative education and training provided by the Technical Education and Skills Development Authority (TESDA), mainly driving and housekeeping courses. The majority of the respondents (61.8%)

could not attend any training on severe acute respiratory syndrome. They expressed their concerns regarding the limited health education, training, and seminar opportunities.

Only a few of them, around 2.1%, stated that they attended more than 5 seminars like, Severe Acute Respiratory Syndrome- A Re-emerging Disease, and Management of Severe Acute Respiratory Syndrome.

**Table 3.** Frequency and percentage distribution of the respondents' health seeking behavior.

Variable	Frequency	Percentage
Medical personnel sought for consultation about ailments		
Physician	230	59.7
Nurse	43	11.2
Midwife	36	9.4
Neighbors	9	2.3
BHW	55	14.3
Co-worker	2	0.5
Relatives in allied health field	10	2.6
Institutions visited for medical consultations		
Private hospital	72	18.7
Public hospital	155	40.3
City health office	64	16.6
Barangay health centers	81	21.0
Private clinics	10	2.6
Others	3	0.8
Platforms utilized for health consultations		
Texting	25	6.5
Virtual consultation	33	8.6
Face-to-face	297	77.1
Self-directed	26	6.8
Others	4	1.0
Frequency of visit to healthcare institution for consultations		
Once a year	130	33.8
Twice a year	149	38.7
Once in past 3 years	44	11.4
Never in past 3 years	29	7.5
Others	33	8.6

Table 2 shows the frequency and percentage distribution of the respondents according to occupation, years in service, employment status, average monthly income and source of information. The researcher also described that the majority of the respondents are non-medical frontliners who are not directly involved in patient care but are potentially exposed to infectious agents while working in a healthcare setting. They are the barangay health workers (58.7%), ambulance drivers (2.9%), security guards (1%), and janitor/janitress (0.8%). Among the medical front-liners who have direct contact and exposure with the patient's majority of them are nurses (22.9%), followed by medical technologists and midwives (4.2%), then nursing aides (2.1%), respiratory therapists (1.8%), and radiologic technologist (1.6%) have the least number. The

majority are nurses, followed by midwives. In terms of years of service, the majority of them worked as front liners and continued serving for 2-5 years (35.1%) and 6-10 years (25.5 %). Among the 385 respondents, 29 served and are still in the service for more than 16 years and 77 in less than 2 years. For the employment status, almost half of the respondents were regular/permanent (46.8 %), and only a few were casual (8.8%).

Approximately 84.2% reported a monthly income of less than 10, 957 Php, 14.5% with a monthly income of 10,958-21, 914 Php. Only a few had monthly income of greater than 21, 914 Php (1.3%). This was corroborated by the respondent's occupation and employment status. Table 2 indicates that the respondents consider other health workers or their

co-workers (39.7%) to be their trusted source of information. Television (34.8%) was the second major source of information for the respondents on Severe Acute Respiratory Syndrome, followed by radio (9.4%). This was similar to the study of Kharel *et al.* (2020), wherein one of the major sources of information regarding infectious diseases was found to be media like Radio and television. Interestingly, few proportions of the respondents cited newspapers (7.0%) and IEC materials such as brochures and

posters (3.4%) as sources of SARS information. This indicates that IEC materials need to be developed and distributed so that health workers can maximize the benefits of health facility visits by communicating correct information about Severe Acute Respiratory Syndrome, its possible threats and prevention.

Furthermore, the survey showed the increasing role that both Facebook and the Internet (2.3%) play in information delivery.

**Table 4.** Weighted Mean of the Respondent's Knowledge on SARS.

Category	Percentage	Interpretation
Cause and Transmission	70.90	Moderate Level
Clinical Manifestation	82.96	High level
Treatment and Management	49.21	Low level
Control and Prevention	55.85	Low level
Weighted Mean	64.73	Moderate Level

Table 3 shows the frequency and percentage distribution of the respondents on the medical personnel they sought for consultation about their ailments, the institution they visited for medical consultation, the platforms they used for health consultations and how frequently they visited a healthcare institution for consultation. Regarding the health-seeking behavior of the respondents, most of them consult a physician (59.7%) whenever they are sick or not feeling well. As advised by the WHO, 2019, it is important to ask the help of a doctor when you are not feeling well to have an appropriate medication and management. A total of 55 respondents stated that when their ailment is not serious, they tend to ask for help from the barangay health worker (14.3%).

Barangay health workers are frontline health workers who provide basic health education, select primary health care services, and link clients to health facilities. Only a few of the respondents consulted the nurse (11.2%) and midwife (9.4%). Almost half of the respondents visited a public hospital (40.3%) for medical consultations, while many non-medical frontliners admitted that they sought help from the barangay health centers (21%). Also, 3 respondents consulted a quack doctor when they had a health

problem. Based on their experiences, the respondents stated that even during this pandemic, face-to-face consultation (77.1%) is still the best platform and a few of them tried virtual (8.6%) and texting (6.5%) consultation. A total of 149 respondents visited a healthcare institution for consultation at least twice a year, while the others only consulted once in the past 3 years (11.4%) and never in the past 3 years (7.5%). Some only visit when their condition is serious and cannot be treated through home remedies, herbal plants, and medicines (8.6%).

Table 4 shows the respondents' level of knowledge on the cause and transmission, clinical manifestation, treatment and management and control and prevention of SARS. The respondents said that the disease is spread by air. The good awareness of respondents about SARS cause and transmission ways was obtained through television and health workers. Both the government mass media and non-government mass media made a great contribution to increasing awareness of SARS.

SARS clinically presents with high-grade fever, chills and rigors, myalgia, headache, and cough with or without sputum. In the present study, a large majority

of respondents were able to adequately identify the most frequently cited symptoms of SARS. They identified: cough (85.6%), fever (80.89%), weakness and fatigue (82%), nausea and vomiting (95.55%) and difficulty of breathing (85.08%) and some complications such as pneumonia (87.96%) and

bronchitis (84.82%). This is similar to the findings of (Yapi *et al.*, 2021). This level of good knowledge is expected due to the increased population's interest in information regarding SARS-COV-2 and the perceived impact of the pandemic on participants' lives.

**Table 5.** Weighted Mean of the Respondent's Attitude on SARS.

Statement	Weighted Mean	Description	Interpretation
I am afraid of severe acute respiratory syndrome because it is infectious.	4.45	Strongly Agree	High Regard
Severe acute respiratory syndrome is a serious condition.	4.47	Strongly Agree	High Regard
I am at risk of getting severe acute respiratory syndrome.	3.75	Agree	Moderate Regard
Severe acute respiratory syndrome can be prevented.	4.32	Strongly Agree	High Regard
Bird flu, MERS-COV, and HIN1 crises are over, and I still need to worry about contracting severe acute respiratory syndrome.	3.19	Uncertain	Either Regard or No Regard
I generally agree on wearing of face mask.	3.46	Agree	Moderate Regard
I think influenza vaccines protect everyone from severe acute respiratory syndrome.	3.96	Agree	Moderate Regard
If I have a severe acute respiratory syndrome, I may spread it to others.	3.85	Agree	Moderate Regard
I feel that if someone who has severe acute respiratory syndrome, he/she should cover his mouth and nose with a handkerchief when coughing or sneezing.	4.34	Strongly Agree	High Regard
Using a hand sanitizer or alcohol can prevent you from getting severe acute respiratory syndrome.	4.12	Agree	Moderate Regard
I think severe acute respiratory syndrome can be prevented by wearing a mask outside my house.	4.13	Agree	Moderate Regard
I think severe acute respiratory syndrome can be prevented by wearing of face shield alone when I go outside.	2.55	Disagree	Less Regard
Weighted Mean	3.88	Agree	Moderate Regard

The study showed that the majority of the respondents had a low level of knowledge about the treatment and management of the disease (49.21%). The study of (Abdulbari Bener and Abdullatif Al-Kha, 2004) supports the finding. The lowest proportion of correct responses (32.98%) was obtained for one of the questions related to treatment for SARS. This suggests that the health authorities should have been more alert in producing television documentaries, radio programs, books, journal articles and newspaper reports on this virus to educate the community. HCWs play a vital role in the management, control, and prevention of the spread of the disease. Good knowledge of HCWs on the transmission and preventive measures against SARS

can help to improve their skills to limit occupational risk and further spread to the community. A majority of the respondents believed that SARS can be successfully controlled or prevented by hand washing and the use of hand sanitizers (84.87%). Interestingly, the majority of the healthcare providers incorrectly answered the role of vaccines in the prevention of SARS. Wearing face masks in public is considered one of the most important measures to prevent transmission of this infection. Nevertheless, most of the respondents have moderate knowledge of these (Alremeithi *et al.*, 2021).

Table 5 shows the respondents' attitude toward SARS with a mean score of 3.88 and a descriptive value of



"Agree". The attitudes of HCWs influence their practice of infection prevention and control measures. This study showed that the majority of the participants had a high regard for the seriousness (4.47) and towards successful prevention of SARS (4.43) and were afraid of it because it is infectious (4.45). This finding is consistent with recent studies conducted, where the majority of participants were convinced that the disease is serious and curable and that their country will combat it (Al-mohrej *et al.*, 2016). This perception is possibly related to the shortage of personal protective equipment and inadequate training on SARS in the country. Additionally, the majority of the respondents believe that SARS can be prevented by wearing of face shield alone. Table 6 shows the respondents' practices

towards SARS. The mean score was 3.63 with a descriptive value of "Often". Most of the respondents had good practice toward prevention methods of SARS, such as eating a balanced diet, wearing facemasks in public, and practicing frequent handwashing with soap, which was expected considering the national awareness programs and the adherence to the sanitization campaigns across the country. The same applies to aspects such as avoiding touching one's own face, handshaking, isolation, and consulting an HCW. However, these practices toward COVID-19 were lower than the practices of many other countries (Zhou *et al.*, 2020; Zhong *et al.*, 2020). The lack of infrastructure and poor training given to healthcare providers may be the cause of this disparity.

**Table 6.** Weighted Mean of the respondent's Practices on SARS.

Statement	Weighted Mean	Descriptive Value	Description
I eat vegetables to maintain a good health and prevent acquiring severe acute respiratory syndrome.	3.68	Often	Good Practices
I eat fruits to maintain a good health and prevent acquiring severe acute respiratory syndrome.	3.7	Often	Good Practices
I use soap to wash my hands to avoid acquiring severe acute respiratory syndrome.	3.74	Often	Good Practices
When wearing a mask, I test it to ensure it fits properly.	3.72	Often	Good Practices
I use disinfectant or disposable wipes or hand gel to wash my hands.	3.71	Often	Good Practices
I use a washable cloth handkerchief to clean my hands.	3.58	Often	Good Practices
I wash my hands after touching the personal items of someone who has a cough and/or cold.	3.73	Often	Good Practices
I wash my hands after shaking hands with people who have a cough and/or cold.	3.72	Often	Good Practices
I refrain from being close to those who cough or sneeze.	3.76	Often	Good Practices
I refrain from shaking the hands of those with a cough and/or cold.	3.72	Often	Good Practices
I refrain from often touching my nose.	3.8	Often	Good Practices
I isolate myself from my family whenever I have flu-like symptoms.	3.57	Often	Good Practices
I consult a physician immediately whenever I have flu-like symptoms.	3.5	Often	Good Practices
I consult a physician whenever I have flu-like symptoms instead of buying over-the-counter drugs.	3.72	Often	Good Practices
Aside from consulting a physician, I also visit a faith healer whenever I have flu-like symptoms.	3.15	Sometimes	Either Good Practice or Poor Practice
I do not use alternative medicine (e. g. ointment, oil liniment, essential oils) whenever I have flu-like symptoms.	3.61	Often	Good Practices
I received the flu vaccine.	3.32	Sometimes	Either Good Practice or Poor Practice
Weighted Mean	3.63	Often	Good Practices

This shows that further implementation and support from the government are needed to put best practices for SARS and its prevention into effect. Lastly, some of the respondents often use alternative medicine and visit a faith healer whenever they have flu-like symptoms. This may be attributed to the lack of

sufficiently accurate and up-to-date information on SRAS, especially among community health workers; there is a risk of high levels of disinformation and possible questionable practices. Although the HCWs in the study reported using many effective infection control practices, the study also highlighted the need

for more comprehensive training programs on the disease.

Table 7 shows that knowledge, attitude and practices on SARS infection among the respondents were significantly associated with the highest educational attainment, occupation, and sources of information. Respondent's age, gender, civil status and years in service were not related to the knowledge level, attitude and practices of SARS.

Since knowledge was associated with educational levels and 42.3% of respondents held a diploma degree or higher, this may explain the good

knowledge level of the respondents, and more focus needs to be given to groups in the health care setting with lower educational levels. This is consistent with the study of (Qutob and Awartani, 2021). Nevertheless, even though respondents with higher educational levels demonstrated more awareness of the virus, they had a more positive attitude against SARS. Undergraduate respondents were more susceptible to undesired practices toward SARS, which could be important from the perspective of prevention management. Low-income respondents tend to express negative emotions, such as anxiety and panic, during a pandemic that could affect their attitude (Blendon *et al.*, 2004).

**Table 7.** Test of difference on the Level of Knowledge, Attitude, and Practices of the Respondents when Grouped According to Profile Variables.

Variables	Knowledge P-value	Attitude P-value	Practices P-value
Age	0.7433	0.2937	0.122
Gender	0.8364	0.9017	0.4903
Highest Educational Attainment	0.0004**	0.0053**	0.0473**
Civil Status	0.1163	0.1265	0.5632
No of Seminar On SARS	0.0122*	0.2137	0.3569
Occupation	0.0205*	0.0227*	0.0001**
Years in Service	0.532	0.6013	0.7253
Employment Status	0.3524	0.0014**	0.1812
Monthly Income	0.0597	0.0088**	0.1245
Source of Information	0.0056**	0.0001**	0.0205*
Medical Person Sought	0.001**	0.0001**	0.2717
Institutions Visited	0.108	0.0174*	0.0703
Platforms Utilized	0.0228	0.6288	0.0438*
Frequency of Visits	0.0034**	0.2162	0.0134*

\*at <0.05 = Significant

\*\*at <0.01 =Highly Significant.

This study found that clinical HCWs were more likely to have sufficient knowledge of SARS compared to their non-clinical counterparts.

This finding is not surprising given clinical HCWs' unique training, experience, and knowledge of other infectious diseases. Positive attitudes were higher among those working in the hospital setting. This may be due to their direct involvement in the containment and mitigation of the virus. These positive attitudes should be key measures for the effective management of SARS, especially in highly populated and low-

health care-resourced countries. The higher odds of developing poor practices were found to be associated with the occupation and this finding is in line with the previous Bangladeshi study that assessed KAP toward COVID-19 (Anwar *et al.*, 2020). The risk of having a low score of knowledge, attitude, and practices was found to be higher among respondents who obtained information on SARS from newspapers rather than television and health workers, as television is an effective learning and reliable medium for all kinds of information, which might be resulting knowledge into behaviors (Kundu *et al.*, 2021).

Televisions and health centers are clearly important sources of information and should continue to be utilized to communicate COVID-19 education messages. Table 8 shows a weak but significant positive correlation between knowledge and attitude ( $r_s = 0.2219$ ,  $p = < 0.000$ ), knowledge and practice ( $r_s = 0.312$ ,  $p = 0.000$ ), and attitude and practice ( $r_s = 0.1488$ ,  $p = 0.0036$ ). In the context of SARS, knowledge of the disease may influence attitudes and practices, and poor attitudes and practices directly increase the risk of infection with SARS.

Knowledge of SARS is closely related to attitude toward SARS prevention practices. The respondents

who had less knowledge were more likely to have lower levels of perceived susceptibility to SARS. Respondents with higher knowledge displayed higher efficacy beliefs for personal hygiene practices, such as wearing masks and practicing hand hygiene.

Knowledge can play a crucial role in enhancing the practice of public preventive behavior, as the findings showed that knowledge was associated with attitudes and preventive behaviors. Respondents adopted good and safe practices by providing education and outreach materials to increase public understanding of the disease and influence behavioral change (Al-Hanawi *et al.*, 2020).

**Table 8.** Correlation Test Results between the Knowledge of the Respondents on SARS with that of their Attitude and Practices.

	Spearman's Rho	P-Value	Interpretation
Knowledge and Attitude	0.2219	0.0000*	weak positive relationship
Knowledge and Practices	0.312	0.0000*	weak positive relationship
Attitude and Practices	0.1488	0.0036	weak positive relationship

Attitudes had a significant and robust impact on practicing preventive behaviors, implying that promoting preventive behaviors toward SARS would require promoting both knowledge and efficacy beliefs among HCWs. The study found that compliance with preventive measures greatly depended on the individual's perceptions regarding their likelihood of getting infected rather and the severity of the disease itself and their understanding of the transmission of SARS. This is consistent with evidence that efficacy beliefs serve as significant predictors of preventive behaviors (Lee and You, 2019). For the public to perform precautionary behaviors after acquiring information, they then need to believe that such practices would be effective.

### Conclusion

The overall sample shows a moderate level of knowledge of the characteristics of SARS. The respondents have a moderate level of the cause and transmission, a high level of the clinical manifestation, and a low level of treatment, management, control, and prevention of the disease.

The greater the healthcare worker's knowledge regarding the SARS, the more confident the healthcare workers are in dealing with the case. The respondents disagreed with their risk of getting SARS and the protection of influenza vaccines against the disease. Also, the respondents disagreed that having SARS can automatically spread it to others and that using hand sanitizer or alcohol, wearing a mask outside, and wearing a face shield alone when going outside is enough to prevent the spread of the virus. The respondents also have good practices in terms of taking good care and protecting themselves from the virus. The study shows that educational attainment, sources of information, and occupation have a significant relationship with their knowledge, attitude, and practices. However, the level of knowledge on SARS and attitude are significantly related to the medical person they sought when they have health-related concerns. Furthermore, there was no relationship between the respondents' age, gender, civil status, and years in service. Lastly, there is a significant association between the level of knowledge and attitude and practices of the respondents towards SARS.

**References**

- Ajayi AO.** 2006. A Study on occupational Safety Practices among Rural Farmers in Ile-Ife Area of Osun State, Nigeria: an Emphasis on relevant Training Needs. *Research Journal of Agricultural and Biological Sciences* **2(5)**, 227-235.
- Al-Hanawi MK.** 2020. Knowledge, Attitude and Practice Toward COVID-19 Among the Public in the Kingdom of Saudi Arabia: A Cross-Sectional Study. *Frontiers in public health* **8**, 217.
- Rabaan AA, Al-Ahmed SH, Bazzi AM, Al-Tawfiq JA.** 2017. Dynamics of scientific publications on the MERS-CoV outbreaks in Saudi Arabia. *Journal of infection and public health* **10(6)**, 702–710.  
<http://dx.doi.org/10.1016/j.jiph.2017.05.005>
- Alremeithi HM, Alghefli AK, Almadhani R, Baynouna AlKetbi LM.** 2021. Knowledge, Attitude, and Practices Toward SARS-COV-2 Infection in the United Arab Emirates Population: An Online Community-Based Cross-Sectional Survey. *Frontiers in public health* **9**, 687628.  
<https://doi.org/10.3389/fpubh.2021.687628>
- Anwar S, Araf Y, Newaz Khan A, Ullah MA, Hoque N, Sarkar B, Reshad RAI, Islam R, Ali N, Hosen MJ.** 2020. Women's Knowledge, Attitude, and Perceptions Toward COVID-19 in Lower-Middle-Income Countries: A Representative Cross-Sectional Study in Bangladesh. *Frontiers in public health* **8**, 571689.  
<https://doi.org/10.3389/fpubh.2020.571689>
- Bell EJ, Lutsey, PL, Windham BG, Folsom AR.** 2013. Physical activity and cardiovascular disease in African Americans in ARIC. *Medicine and science in sports and exercise* **45(5)**, 901.
- Bellei N, Carraro E, Perosa A, Granato C.** 2007. Patterns of influenza infections among different risk groups in Brazil. *Brazilian Journal of Infectious Diseases* **11(4)**, 399-402.
- Bener A, Al-Khal A.** 2004. Knowledge, attitude and practice towards SARS. *The journal of the Royal Society for the Promotion of Health* **124**, 167-70.  
<http://dx.doi.org/10.1177/146642400412400408>.
- Blendon RJ, Benson JM, DesRoches CM, Raleigh E, Taylor-Clark K.** 2004. The public's response to severe acute respiratory syndrome in Toronto and the United States. *Clinical infectious diseases: an official publication of the Infectious Diseases Society of America* **38(7)**, 925–931.  
<https://doi.org/10.1086/382355>
- Capili J, Chua JM, Mallabo LA, Calubaquib JB.** 2022. Knowledge and Attitude towards Childhood Vaccination of Indigenous Peoples in Cagayan, Philippines. *International Journal of Biosciences* **21(6)**, 151-159.
- Lee M, You M.** 2020. Psychological and Behavioral Responses in South Korea During the Early Stages of Coronavirus Disease 2019 (COVID-19). *International journal of environmental research and public health* **17(9)**, 2977.  
<https://doi.org/10.3390/ijerph17092977>
- Leung GM, Ho LM, Chan SK, Ho SY, Bacon-Shone J, Choy RY, Hedley AJ, Lam TH, Fielding R.** 2005. Longitudinal assessment of community psychobehavioral responses during and after the 2003 outbreak of severe acute respiratory syndrome in Hong Kong. *Clinical infectious diseases: an official publication of the Infectious Diseases Society of America* **40(12)**, 1713–1720.  
<https://doi.org/10.1086/429923>
- McEachan R, Taylor N, Harrison R, Lawton R, Gardner P, Conner M.** 2016. Meta-analysis of the reasoned action approach (RAA) to understanding health behaviors. *Annals of Behavioral Medicine* **50(4)**, 592-612.

**Molla KA, Abegaz SB.** 2021. Community knowledge, attitude and practices to SARS-CoV-2 disease 2019 (COVID-19): A cross-sectional study in Woldia town, Northeast Ethiopia. Published: April 20, 2021.

<https://doi.org/10.1371/journal.pone.0250465>

**Quintos JA, Ramos DC, Ramos HC, Ravelo LB, Relon RF, Chua JM.** 2022. A Comparative study on the Knowledge, Attitude, and Practices of Mothers towards Children Immunization in Flora, Apayao, Philippines. *International Journal of Biosciences* **21(2)**, 3017-327.

**Qutob N, Awartani F.** 2021. Knowledge, attitudes and practices (KAP) towards COVID-19 among Palestinians during the COVID-19 outbreak: A cross-sectional survey. Published: January 5, 2021

<https://doi.org/10.1371/journal.pone.0244925>

**Stuart RL, Gillespie EE.** 2008. Preparing for an influenza pandemic: healthcare workers' opinions on working during a pandemic. *Healthcare infection* **13(3)**, 95-99.

**World Health Organization.** 2012. Health education: theoretical concepts, effective strategies and core competencies retrieved from [https://applications.emro.who.int/dsaf/EMRPUB\\_2012\\_EN\\_1362.pdf](https://applications.emro.who.int/dsaf/EMRPUB_2012_EN_1362.pdf)

**World Health Organization.** 2018. The Philippines Health System Review retrieved from <https://apps.who.int/iris/bitstream/handle/10665/274579/9789290226734-eng.pdf>

**Yap J, Lee VJ, Yau TY, Ng TP, Tor PC.** 2010. Knowledge, attitudes and practices towards endemic influenza among cases, close contacts, and healthcare workers in tropical Singapore: a cross-sectional survey. *BMC Public Health* **10(1)**, 1-8.

**Yapi RB, Hounbedji CA, N'Guessan DKG, Dindé AO, Sanhoun AR, Amin A, Gboko, KDT, Heitz-Tokpa K, Fokou G, Bonfoh B.** 2021. Knowledge, Attitudes, and Practices (KAP) Regarding the COVID-19 Outbreak in Côte d'Ivoire: Understanding the Non-Compliance of Populations with Non-Pharmaceutical Interventions. *International journal of environmental research and public health* **18(9)**, 4757.

<https://doi.org/10.3390/ijerph18094757>

**Zhang M, Zhou M, Tang F, Wang Y, Nie H, Zhang L, You G.** 2020. Knowledge, attitude, and practice regarding COVID-19 among healthcare workers in Henan, China. *Journal of Hospital Infection* **105(2)**, 183-187.

**Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, Li Y.** 2020. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. *International journal of biological sciences* **16(10)**, 1745.