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Assessment of the knowledge, attitude, and practices of frontliners toward community-acquired pneumonia in the Cagayan, Philippines

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ABSTRACT

Healthcare workers (HCWs) are at elevated risk of respiratory infections due to their close proximity to patients and exposure to respiratory secretions. Despite the high prevalence and significant impact of (Community-acquired pneumonia) CAP, there is limited information on how well front-liners adhere to prevention and control measures, influenced by their (Knowledge, Attitude, and Practices) KAP. A cross-sectional study via a validated questionnaire was conducted involving 385 randomly selected front liners. The results indicated a low level of knowledge regarding the cause and transmission of CAP, with a categorical mean of 59.08%. Although most respondents correctly identified that CAP is caused by bacteria, awareness of other transmission methods was moderate to low. Knowledge about clinical manifestations of CAP was moderate, with high recognition of common symptoms but significant gaps in awareness of less obvious signs. Respondents demonstrated a moderate understanding of CAP treatment and management, particularly regarding the use of antibiotics and preventive measures like vaccination and hand hygiene. The correlation analysis revealed weak but significant relationships between knowledge, attitudes, and practices, suggesting that while knowledge influences attitudes and practices, other factors also play crucial roles. These results suggest that enhancing knowledge could positively influence attitudes and practices. The study underscores the need for targeted educational programs to improve the KAP of front liners regarding CAP, which is crucial for effective infection control and prevention in healthcare settings.

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INTRODUCTION

According to the World Health Organization, occupational hazards rank as the 10th predominant cause of morbidity and mortality in the workplace, with nearly one million fatalities and 250 million incidents related to work occurring each year (Coffin, 2008). Healthcare professionals, who frequently occupy a pivotal role during epidemics, may experience a significantly elevated risk of contracting respiratory viral infections relative to the broader populace (Ahmed *et al.,* 2022). Their close interactions with patients suffering from respiratory ailments, in conjunction with the management of human secretions, render them especially susceptible to the transmission of droplet-borne respiratory pathogens (Bae, 2020; Preti *et al.*, 2020).

In recent years, respiratory infections have emerged as the predominant contributors to morbidity and mortality rates in developing nations, resulting in approximately four million fatalities annually. Although the disease burden is extensively documented among the elderly and immunocompromised populations, there exists a paucity of information regarding the effects of respiratory infections on frontline health workers. In the Philippines, the incidence of respiratory diseases within the general population was estimated to be around two million, with the morbidity rate for acute respiratory diseases approximating 1.1 thousand per 100,000 individuals. In Tuguegarao City, in 2020, most people got sick from Acute Respiratory Infections. This affected all age groups with a rate of 1260.32 per 100,000 people (Preti *et al.*, 2020; Sanchez *et al.*, 2015).

Frontline workers are very important in handling and treating patients with CAP. It is key that these workers understand what causes CAP, its symptoms, and how to manage it properly to ensure patients get the care they need quickly and effectively. Their view on preventive steps such as vaccines and using protective gear also heavily influences how well CAP can be controlled in healthcare settings. Looking into how medical and non-medical frontline workers prevent, identify, and manage CAP is important for creating specific actions and improving how patients do. By knowing more about their practices, we can spot where improvements are needed and start specific training and guidelines.

Knowing how frontline workers in the 3rd District of Cagayan think about and handle CAP is critical for making detailed plans to tackle this public health issue effectively. This would help create specific actions and policies that boost the abilities of frontline workers to reduce the effects of CAP in their communities.

MATERIALS AND METHODS

Locale and duration of the study

This research was executed within the Third District of Cagayan, with a particular focus on the various barangays and medical institutions situated in Amulung, Enrile, Penablanca, Piat, Tuguegarao City, and Tuao.

Research design

A cross-sectional study design was employed to collect data on the KAP of medical and non-medical frontliners regarding CAP. The study also aimed to determine the correlation between their current behaviors and practices towards CAP and to analyze how their knowledge influences their attitudes and practices.

Sampling design

A total of three hundred eighty-five (385) individuals comprising medical and non-medical frontliners were selected through the methodology of stratified random sampling.

Data gathering procedure

Ethical clearance for the research was duly acquired from the Region II Trauma and Medical Center (R2TMC) before the initiation of the study. The questionnaire was subjected to a validation process and pilot testing involving a select subsample of 30 participants to ensure alignment of demographic, socioeconomic, and employment status with the

broader sample. Authorization to proceed with the study was obtained from the administrators of barangay health units and hospitals.

Informed consent was voluntarily provided by respondents through signing informed consent forms (ICF), which outlined the study's nature and assured confidentiality. The major methodology for data acquisition was a survey questionnaire, which encompassed sections for profiling and self-evaluation, with an estimated completion duration of 10-15 minutes.

The distribution of the questionnaires was facilitated via the Human Resources departments of healthcare institutions and local barangay leaders to the participants who provided their consent by signing the Informed Consent Form (ICF). The filled questionnaires were carefully checked if complete and consistent before analyzing and understanding the data.

Data analysis

Descriptive statistics, encompassing frequency counts, percentages, and means, were employed to conduct an analysis of the Knowledge, Attitudes, and Practices (KAP). Spearman's rho was utilized to ascertain the relationships among knowledge, attitudes, and practices. All hypotheses were evaluated at a significance level of 0.05.

RESULTS AND DISCUSSION

Level of knowledge on the characteristics of CAP

Table 1 presents the frequency and percentage of respondents' correct answers for each statement related to CAP transmission.

The overall categorical mean was 59.08%, indicating a low level of knowledge regarding the cause and transmission of CAP among the respondents.

The findings reveal significant gaps in the knowledge of front liners about the cause and transmission of CAP. While a majority (81.94%) correctly identified that CAP is caused by bacteria, indicating a strong foundational understanding, there is a notable drop in awareness regarding other critical aspects of transmission. A moderate level of knowledge was observed concerning the spread of CAP through droplets (75.39%), contact with infected objects (62.04%), and shaking hands (64.92%). This suggests that while respondents are somewhat aware of common transmission methods, there are misconceptions or lack of clarity about the specific mechanisms and preventive measures.

Table 1. Categorical mean of the respondent's knowledge on the cause and transmission of CAP

Statement	Frequency n=385	Percentage	Interpretation
Community-acquired Pneumonia is caused by bacteria.	313	81.94	High
Community-acquired pneumonia is spread through droplets.	288	75.39	Moderate
Community-acquired pneumonia is spread by touching infected objects when followed by touching the face, especially the mouth, nose, or eyes.	237	62.04	Moderate
Community-acquired pneumonia can potentially be spread by shaking the hands of an infected person if the hands then touch the face, particularly the mouth, nose, or eyes.	248	64.92	Moderate
Close person-to-person contact, especially through respiratory droplets from coughing or sneezing, transmits community-acquired pneumonia.	238	62.30	Moderate
Community-acquired pneumonia cannot be transmitted through food particles and water.	138	47.91	Low
Community-acquired pneumonia can spread quickly.	73	19.11	Low
Categorical Mean		59.08	Low

The low percentage (47.91%) of respondents recognizing that CAP cannot be transmitted through food particles and water points to a critical area for educational intervention. This misconception could lead to unnecessary anxiety and misdirected preventive efforts.

The lowest awareness was found in the rapid spread potential of CAP (19.11%), highlighting a significant underestimation of the disease's transmission speed. Not knowing enough could slow down and make less effective the actions taken during an outbreak.

Table 2. Categorical mean of the respondent's knowledge of the clinical manifestations of CAP

Statement	Frequency	Percentage	Interpretation
Cough is a symptom of community-acquired pneumonia.	318	83.25	High
Lack of appetite is a symptom of community-acquired pneumonia.	291	76.18	Moderate
Fever is a symptom of community-acquired pneumonia.	328	85.86	High
Coughing up phlegm/sputum is a sign of community-acquired pneumonia.	317	82.98	High
Headache is a symptom of community-acquired pneumonia.	89	23.30	Low
Weakness and symptoms of community-acquired pneumonia.	305	79.84	Moderate
Shortness of breath is a sign of community-acquired pneumonia.	323	84.55	High
Difficulty of breathing is a symptom of community-acquired pneumonia.	321	84.03	High
Profuse sweating is a sign of community-acquired pneumonia.	49	12.83	Low
Categorical Mean		68.09	Moderate

Table 3. Categorical mean of the respondent's knowledge of the treatment and management of CAP

Statement	Frequency	Percentage	Interpretation
Community-acquired pneumonia is determined based on physical signs and chest x-ray.	329	86.13	High
Azithromycin and Clarithromycin the drug of choice for community-acquired pneumonia.	274	71.73	Moderate
Bed rest and proper hydration relieve symptoms of community-acquired pneumonia.	296	77.49	Moderate
Community-Acquired Pneumonia is a treatable disease.	327	85.60	High
Community-Acquired Pneumonia can be controlled and treated when I follow my doctor's order and advice.	347	90.84	High
There are some alternative ways to treat community-acquired pneumonia other than drugs.	187	48.95	Low
There is a vaccine for community- acquired pneumonia.	343	89.79	High
Vaccines for community-acquired pneumonia are available in the Philippines.	347	90.84	High
Ensuring a healthy diet can help me to get rid of community-acquired pneumonia.	13	3.40	Low
Receiving vaccinations can help protect me from community-acquired pneumonia.	347	90.84	High
Washing my hands with hand sanitizers can help protect me from community-acquired pneumonia.	335	87.70	High
Covering your nose with your hands can help protect you from community-acquired pneumonia.	318	83.25	High
Community-Acquired Pneumonia is a preventable disease.	353	92.41	High
Wearing a face mask can help protect me from community- acquired pneumonia.	343	89.79	High
Wearing a mask when I am sick can prevent the spread of community-acquired pneumonia.	341	89.27	High
Categorical Mean		78.53	Moderate

Several studies show that frontline workers, like those in healthcare, might not fully understand the causes and ways CAP spreads, similar to what was found several studies (Smith *et al.*, 2019; Patel and Orenstein, 2018). It is important to fix these knowledge gaps because they can affect how patients are cared for and how infections are controlled. Also, some research found confusion or wrong ideas about how CAP is passed on, which matches what was seen in this study. On the other hand, there is a higher level of understanding among frontline workers about how CAP spreads, especially through droplets and touching infected objects (Johnson *et al.*, 2010). However, this study shows different results, suggesting that the lack of knowledge seen here might not be the same everywhere and could change depending on the place and healthcare setting.

Table 2 shows that people have a moderate level of understanding about the signs of CAP, with an average score of 68.09. This suggests that people know somewhat about how CAP shows itself in patients. The high number of respondents who knew the common signs like cough, fever, coughing up phlegm/sputum, shortness of breath and trouble

breathing shows that frontline workers generally understand the important signs of CAP well. This matches with past studies that have also noted that healthcare workers are aware of these key signs.

However, the study also showed big gaps in understanding less obvious signs like headaches and heavy sweating. A small number of people knew these could be signs of CAP, pointing to a need for more education and training to fully understand all possible signs among frontline workers. This supports findings which highlight the urgent need for training programs to clear up wrong ideas and fill knowledge gaps among healthcare staff about CAP (Patel and Orenstein, 2018).

The differences in understanding less common symptoms raise worries about how it might affect patient care and the early diagnosis of CAP. More education and training are needed to make sure that frontline workers can recognize and respond correctly to all the different signs of CAP. This is very important because CAP can look different in different people and can have unusual symptoms, especially in certain age groups or in people with other health problems.

Table 3 presents the overall categorical mean of 78.53%, indicating a moderate level of knowledge regarding the treatment and management of CAP among the respondents.

The results demonstrate a generally high level of knowledge among respondents about key aspects of CAP treatment and management. Most respondents correctly identified that CAP can be diagnosed based on physical signs and chest x-ray (86.13%) and that it is a treatable disease (85.60%). Additionally, there is a strong awareness of the effectiveness of following medical advice (90.84%) and the availability and importance of vaccinations (89.79% to 90.84%).

While the majority recognized the importance of antibiotics like Azithromycin and Clarithromycin (71.73%) and supportive measures such as bed rest and proper hydration (77.49%), fewer respondents were aware of alternative treatment methods (48.95%) and the benefits of a healthy diet (3.40%).

These gaps show a need for more education on the full care of CAP, including lifestyle and other helpful steps.

The knowledge about using antibiotics like Azithromycin and Clarithromycin for treating CAP is high, which matches what past studies have shown (Mandell *et al.*, 2007). But, knowledge about supportive care, including bed rest and drinking water, is only moderate. This shows we need to teach more about these non-drug ways to help treat CAP, as they are important too (Waterer *et al.*, 2011).

Moreover, only 48.95% of people in this study knew about other ways to treat CAP, which matches with what other studies say about healthcare providers often pushing drugs more than other kinds of care (File *et al.*, 2014). But, some studies suggest bringing in different therapies, like better nutrition, to help patients get better (Zar *et al.*, 2013). This might be why not many knew about these options in this study. The good grasp of steps to stop illness, like getting vaccinated, washing hands, and wearing masks, is hopeful and fits with what health groups say (WHO, 2012). This is key, as these steps work well in lowering the number of CAP cases (CDC, 2019). However, the low awareness about the importance of eating well in dealing with CAP (3.40%) goes against studies that show how proper nutrition helps boost the immune system and helps recover from lung infections (Martinez-Gonzales, *et al.*, 2015).

Level of the attitude of the respondents toward community-acquired pneumonia

Table 4 shows that the people asked think well of CAP, with an average score of 3.70. This means they feel good about it. They strongly agree with things like "I am sure I can stop CAP" (4.30) and "I think CAP can be stopped" (4.10). This shows they trust in their own power and the steps to prevent it. This matches up with other research that says believing in yourself is key to changing health actions (Bandura, 1997).

Table 4. Weighted mean of the respondent's attitude on CAP

Statement	Mean	Descriptive value	Interpretation
I am confident in my ability to prevent CAP.	4.30	Agree	Positive
I believe that CAP is a serious condition.	1.66	Strongly disagree	Negative
I am at risk of getting community-acquired pneumonia.	3.67	Agree	Positive
I believe that CAP can be prevented.	4.10	Agree	Positive
Though the bird flu, SARS, MERS-COV, and HINI crises are over, I still need to worry about contracting pneumonia.	3.12	Neutral	Positive
I support wearing a face mask to prevent infections.	3.87	Agree	Positive
Pneumonia vaccines protect everyone from CAP.	4.08	Agree	Positive
Pneumonia vaccinations are safe and effective.	3.33	Neutral	Positive
CAP vaccines are affordable and accessible.	3.50	Neutral	Positive
I trust scientific information about pneumonia vaccines.	3.88	Agree	Positive
Getting a pneumonia vaccine is easy and convenient.	3.76	Agree	Positive
I believe that I have community-acquired pneumonia, I may spread it to others.	3.18	Neutral	Neutral
I feel that someone who has pneumonia should cover his mouth and nose with when coughing or sneezing.	4.71	Strongly agree	Positive
Every time my sweat dries up on my back, I do not worry that I might get pneumonia.	3.57	Agree	Positive
I believe that using hand sanitizer or alcohol can prevent getting CAP.	3.76	Agree	Positive
I think CAP can be prevented by wearing a mask.	3.73	Agree	Positive
I think CAP can be prevented by wearing a mask outside my house.	3.71	Agree	Positive
Affordable medicines help people follow the doctor's prescription for CAP.	3.16	Neutral	Positive
I wish to encourage other people with CAP to be conscious of their health in the hope to control the disease.	4.27	Strongly agree	Positive
I always search for ways how to control and prevent CAP.	4.05	Agree	Positive
The medicines given to an individual with CAP are antibiotics and medicines for cough.	4.07	Agree	Positive
I want an individual with CAP to enjoy their life and be happy despite having the disease.	3.92	Agree	Positive
Weighted Mean	3.70	Agree	Positive

The belief in how well and safe pneumonia vaccines work (3.33 for safety and effectiveness, 4.08 for protection) is good news. It supports what other studies have found about people's trust in vaccines (Larson *et al.*, 2014). The agreement that getting a pneumonia vaccine is easy and convenient (3.76) also shows this positive view.

However, the very negative reaction to the statement "I believe that CAP is a serious condition" (1.66) is worrying. This gap shows that while respondents feel sure about prevention and management, they might not fully grasp how severe CAP can be.

This is different from other research that shows CAP can cause lot of sickness and death, especially among people who are more at risk (Torres *et al.*, 2015).

Neutral opinions on the risk of CAP spreading (3.18) and the cost and availability of vaccines (3.50) show where we need to do better. Health campaigns can help close these gaps by highlighting how CAP spreads and making sure everyone knows that vaccines are available for all. Under the Department of Health's National Immunization Program, the pneumococcal conjugate vaccine is given out for free.

Interestingly, people's positive views on using things like face masks (3.87) and hand sanitizers (3.76) match with what was seen during the COVID-19 pandemic, where more people accepted these measures (Chu *et al.*, 2020). This shows that the lessons from recent pandemics are having a good impact on how people think about preventing CAP.

Level of the practice of the respondents toward Community-Acquired Pneumonia

Table 5 shows the average score for each practice-related statement. The overall average score of 4.28 indicates that these practices are done often, and many are rated as "very good."

Table 5. Weighted mean of the respondent's practices on CAP

Statement	Mean	Descriptive value	Interpretation
When wearing a mask, I test it to ensure it fits properly.	4.62	Always	Very good
I use disinfectant or disposable wipes or hand gel to wash my hands.	4.48	Often	Very good
I wash my hands after touching the personal items of someone who has a cough and/or cold.	4.66	Always	Very good
I wash my hands after shaking hands with people who have a cough and/or cold.	4.59	Always	Very good
I refrain from being close to those who cough or sneeze.	4.40	Often	Very good
I refrain from shaking the hands of those who have a cough and/or cold.	4.29	Often	Very good
I refrain from often touching my nose.	4.19	Often	Good
I received the pneumonia vaccine.	3.90	Often	Good
I do practice good hygiene to prevent community-acquired pneumonia	4.77	Always	Very good
I always clean our surroundings to prevent the development of pneumonia.	4.70	Always	Very good
I follow the doctor's advice regarding the proper way of using medicines whenever I have pneumonia.	4.75	Always	Very good
I immediately bring anyone I know who has a symptom of pneumonia to the doctor.	4.35	Often	Very good
I follow the proper use of community-acquired pneumonia medications because disregarding them is dangerous.	4.20	Often	Very good
I immediately treat the mild symptoms of community-acquired pneumonia to prevent it from getting worse.	4.07	Often	Good
Weighted Mean	4.28	Often	Very good

Table 6. Correlation test results between the knowledge of the respondents on CAP with that of their attitude and practices

	Spearman's Rho	*p*-value	Interpretation
Knowledge and attitude	0.3366	0.0000	Weak positive relationship
Knowledge and practices	0.2383	0.0000	Weak positive relationship
Attitude and practices	0.1165	0.0226	Very weak positive relationship

People often said they wash their hands well, like after touching things from those who show symptoms (4.66) and after handshakes (4.59). These matches what the Centers for Disease Control and Prevention (CDC) suggest, highlighting hand washing as key in stopping the spread of diseases that affect breathing (CDC, 2020). They also reported checking how well masks fit (4.62) and wearing masks (4.40) often. This shows they follow preventive steps well, which is supported by studies from the COVID-19 pandemic showing that correct mask use greatly cuts down the spread of germs that affect breathing (Chu *et al.*, 2020). Cleaning the area around you (4.70) and having good hygiene (4.77) are other things where people showed they did well. These actions are very important in making the environment less dirty and stopping the spread of germs, as shown in many studies about stopping infections (Dancer, 2014).

Medical advice and taking correctly were ranked high (4.75 and 4.20). This shows people know it's important to stick to their treatment plans. This is supported by research showing that compliance with medical advice and medication regimens is essential for effective disease management (McEachan *et al.*, 2011).

However, there are areas where practices could be improved. Receiving the pneumonia vaccine scored a mean of 3.90, suggesting that while many respondents are vaccinated, there is still room for improvement. Vaccination is a key preventive measure endorsed by health authorities worldwide (WHO, 2014).

Interestingly, the practice of immediately treating mild symptoms (4.07) and bringing symptomatic individuals to the doctor (4.35) shows a proactive approach to managing CAP. This is consistent with

recommendations for early intervention to prevent disease progression (Mandell *et al*., 2007).

Correlation between knowledge, attitude, practice

Table 6 shows that in the correlation analysis, there are statistically significant relationships between knowledge, attitudes, and practices concerning CAP among respondents. However, the strength of these relationships varied, indicating different levels of influence.

The weak positive correlation (Spearman's Rho = 0.3366) between knowledge and attitude suggests that as respondents' knowledge about CAP increases, their attitudes towards the disease become slightly more positive. This result matches earlier studies showing that knowledge can change attitudes, but the impact might not be strong. A study by McEachan *et al.* (2011) found that more knowledge about health conditions can improve attitudes, but other elements like personal beliefs and cultural influences are also important.

Similarly, the weak positive correlation (Spearman's Rho = 0.2383) between knowing about a subject and acting on it shows that more knowledge leads to better actions in preventing and managing CAP. This supports the Health Belief Model, which says that people who know more about a health risk are more likely to take steps to prevent it (Rosenstock, 1974). However, the weak link implies that knowledge alone doesn't fully determine behavior. Other things like perceived obstacles and the influence of others might also play a big role in how people act.

The very weak positive correlation (Spearman's Rho = 0.1165) between attitude and practices shows that while good attitudes towards CAP can lead to better practices, the effect is very small. This result is a bit different from the Theory of Planned Behavior, which says that attitudes should have a bigger influence on behavior (Ajzen, 1991). The small link might be because human behavior is complex, and attitudes alone are not enough to change practices without the help of knowledge, motivation, and outside factors like social norms and access to resources. Also, the very small link between attitude and practices is different from what Pender and others found, as they saw a stronger connection between positive health attitudes and preventive health actions (Pender *et al.*, 2011). This difference could be because of different groups of people studied or different health actions looked at. It suggests that for CAP, other things beyond attitudes might be more important in changing practices.

The findings between knowledge, attitudes, and practices (KAP) match with many studies in health learning and actions. Glanz *et al.* (2008), for instance, found that while learning can increase knowledge and views, turning these into steady actions often needs more steps like skills training and help from the surroundings.

CONCLUSION

The study on the knowledge, attitudes, and practices (KAP) of frontliners in the 3rd District of Cagayan regarding community-acquired pneumonia (CAP) showed important learning gaps, mainly around how the disease spreads and is taken care of. Although the people knew about CAP being caused by bacteria and main symptoms like cough and fever, there were errors in knowing less common symptoms and other ways to treat it. The overall medium level of understanding about how CAP appears and its treatment points out the need for better education and training programs. Despite these learning gaps, the people showed positive attitudes towards stopping and handling CAP, having trust in actions like getting vaccinated and maintaining good cleanliness.However, the weak correlations between knowledge, attitudes, and practices suggest that while improving knowledge can influence attitudes and behaviors, other factors such as cultural beliefs, accessibility of resources, and motivational elements are also critical. Addressing these factors through comprehensive educational interventions and public health campaigns could further improve CAP management and prevention practices among frontline workers.

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