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Students' Knowledge and Willingness Towards COVID-19 Vaccination, University of Bohol

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ABSTRACT

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The COVID-19 pandemic has gripped the world, necessitating a collective response. As vaccination emerges as a critical tool in the battle against the virus, this research explores the knowledge and willingness of allied medical students at the University of Bohol toward COVID-19 vaccination. With 839 students enrolled for the second semester of the academic year 2021-2022, a representative sample of 286 students was selected. Utilizing a standardized questionnaire, the study assessed knowledge levels and willingness to vaccinate among students from the College of Nursing, Pharmacy, Midwifery, and Physical and Occupational Therapy departments. Results indicate a moderate knowledge level (composite mean = 2.84), with awareness of preventive measures and the existence of a vaccine. Positive attitudes towards vaccination, emphasizing communal health responsibility and trust in healthcare providers, were evident. However, concerns about potential side effects

were relatively low. Demographic analyses revealed age and sex-based variations in knowledge and willingness, emphasizing the need for tailored educational initiatives. Notably, there was no significant correlation between knowledge and willingness, underscoring the multi-faceted nature of individuals' attitudes toward vaccination. These findings provide crucial insights for public health strategies, urging targeted educational campaigns and emphasizing nuanced approaches for different demographic groups. The study contributes valuable perspectives for refining vaccination programs and addressing the evolving challenges posed by the ongoing COVID-19 pandemic.

INTRODUCTION

Coronavirus is an infectious viral disease caused by the SARS CoV-2 virus (World Health Organization, 2020). Most COVID-19 virus-infected patients will develop mild to moderate respiratory symptoms and recover without special treatment. The COVID-19 virus spreads predominantly through saliva droplets or nasal discharge when an infected person coughs or sneezes. It is an unanticipated pandemic that has swept the globe, united people, and provided them with the knowledge and discipline needed to combat it. Having barely surfaced at the close of 2019, the COVID-19 pandemic has swiftly grown to pose a threat to the health of the world's population, infecting over 153 million individuals and tragically taking over 3.2 million lives by May 1, 2021. COVID-19 has emerged as a major cause of mortality and has indirectly contributed to a significant number of additional fatalities worldwide. It has unavoidably reduced life expectancy in several nations at the regional and national levels, with the long-term effects on morbidity still unknown (World Health Organization, 2021).

Numerous tactics have been developed to curb the COVID-19 outbreak. Despite the fact that the length of the protection period is undetermined, developing vaccines is one of their top priorities. Numerous vaccinations have been the subject of promising clinical trials conducted in several nations (Yan, Yang, & Lai, 2021). The actual efficacy of COVID-19 vaccination may be questioned due to vaccine hesitancy. The reduction in participants' willingness to receive the vaccine may jeopardize the pandemic response and the benefits of an effective vaccination for public health. In addition, a low vaccination response may make it difficult to achieve herd immunity to COVID-19 and unnecessarily prolong the pandemic. (Wake, 2021) The willingness to receive COVID-19 vaccine and its associated factors: "vaccination refusal could prolong the war of this pandemic"–a systematic review. Risk management and healthcare policy, 2609-2623.

As a result, governments must be prepared to ensure widespread distribution and fair access when a safe and effective COVID-19 vaccine becomes

available. Adequate health system capacity and procedures will be necessary to promote trust in and acceptance of the vaccination and those who administer it. According to the study, information on the vaccine production process, vaccine efficacy, and individual variability influences the proportion of participants reporting COVID-19 immunization intentions. Behavioral economics presents an empirical scheme for approximating vaccine claims to target vaccination-resistant subpopulations (Birhanu et al., 2021).

Vaccination is one of the most efficient ways to prevent COVID-19. However, the degree of vaccine adoption varies by country and demographic. As trustworthy healthcare providers, the knowledge and willingness of University of Bohol allied medical students to get vaccinated against COVID-19 may significantly impact the population's current and future vaccine acceptance rates; however, studies on vaccine willingness rates among allied medical students are limited. Vaccination techniques may increase the present demand for certain types of human resources while lowering the future need for health workers who treat vaccine-preventable diseases (Chootipongchaivat, Chantarastapornchit, Kulpeng, Ceria, Tolentino, & Teerawattananon, 2016).

All COVID-19 vaccines that WHO has licensed for emergency use have undergone randomized clinical trials to ensure their quality, safety, and efficacy. Vaccines must have a high efficacy rate of 50% or higher in order to be authorized (World Health Organization, 2021). Vaccines must be licensed by national regulators, manufactured to stringent standards, and distributed once they have been proven to be productive and safe. More than 320 vaccine candidates were in clinical development as of January 2021, some in phase III trials. (Le, Cramer, Chen, Mayhew, 2020).

Considering the misinformation regarding COVID-19 vaccines that quickly disseminated through the media, public health authorities and legislators, particularly in developing countries, must begin planning for effective communications and policies while the vaccine is being introduced.

Instead, social media can be utilized for several purposes, such as gathering and dispelling rumors or widely held misconceptions among target audiences, disseminating timely, evidence-based health information, getting immediate input on materials, conducting remote trainings, and raising awareness of projects, their goals, and events (Enders, Uscinski, Klofstad, & Stoler, 2020).

Previous studies on the acceptance of the H1N1 vaccine during the 2009 H1N1 flu pandemic in the United States, Australia, France, Greece, and the United Kingdom have yielded unsatisfactory results, with the willingness to receive the 2009 H1N1 pandemic vaccine ranging from 17 percent to 67 percent among the general population. Vaccination programs must have high acceptance and coverage rates to be successful, and they may be required in specific cases

(Holzmann and Wiedermann, 2019).

The researchers discovered that there are just a few studies that have been completed on college students' vaccination knowledge and willingness, with allied medical college students being the most rarely studied; therefore, further research is essential. This research aims to analyze the knowledge and willingness of the students enrolled in the allied medical courses of the University of Bohol to get vaccinated against COVID-19. Furthermore, this research will also give insight to the health officials regarding their immunization campaigns in our province.

RESEARCH METHODOLOGY

This study utilized quantitative research, which is a descriptive design, to determine the Students' Knowledge and Willingness towards COVID-19 vaccination at the University of Bohol. The study used a simple random sampling technique. The quantitative approach arises from the belief that the student's willingness to get vaccinated can be studied objectively. The respondents for this study are the allied medical students from the University of Bohol, specifically the College of Nursing, Pharmacy, Midwifery, and Physical and Occupational Therapy departments, in the 2021-2022 academic year. There were 839 students enrolled for the second semester of SY 2021-2022. Accordingly, the target respondents calculated are two hundred eighty-six (286) students, who were selected with a 5% margin of error at a 95% confidence interval. A standardized questionnaire from the study entitled "Knowledge, Attitude, and Acceptance of a COVID-19 Vaccine: A Global Cross-Sectional Study" by Mannan and Farhana (2020) is used to measure the level of knowledge of the respondents regarding COVID-19 and "Willingness to Vaccinate Against COVID-19 in the US: Representative Longitudinal Evidence" by Michael Daly, Ph.D., and Eric Robinson, Ph.D. was used to determine the level of willingness of the respondents towards to COVID-19 Vaccination. The researchers utilized a Likert Scale to measure the respondents' knowledge and desire towards COVID-19 vaccination.

SCALE	SYMBOL	DESCRIPTION	MEANING	INTERPRETATION
4	SA	Strongly Agree	Very true	Highly knowledgeable
3	A	Agree	Mostly true	Moderately knowledgeable
2	D	Disagree	Not very true	Somewhat knowledgeable
1	SD	Strongly Disagree	Not true at all	Not knowledgeable at all

SCALE	SYMBOL	DESCRIPTION	MEANING	INTERPRETATION
4	SA	Strongly Agree	Very Convincing	Very willing
3	A	Moderately Agree	Mostly Convincing	Moderately willing
2	D	Slightly Agree	Not Very Convincing	Less willing
1	SD	Disagree	Not Convincing at All	Not willing at all

The study underwent a thorough ethics review by the University of Bohol Research Ethics Committee (UBREC). Emphasizing voluntary participation, respondents were given the freedom to skip questions and withdraw at any point if they felt their rights were compromised. Strict privacy and confidentiality measures were adhered to during the online questionnaire administration. The researchers assured participants that the gathered data would solely be used for research purposes. To address potential discomfort, respondents were briefed beforehand about their right to withdraw if they felt uneasy about any questions, prioritizing their well-being throughout the study.

RESULTS AND DISCUSSION

The study revealed that in the first category of the demographic profile that pertains to the age range of the respondents, the result shows that the highest percentage of 63.3% was obtained from the respondents aged 20-24. Meanwhile, only one respondent belonging to the age bracket 30-34 got the lowest percentage of 0.3%. The majority of the respondents that participated in the study were females, obtaining a percentage of 81.5% with a frequency of 233. The study revealed that the highest percentage of respondents came from the College of Nursing, which is that in the fourth category of the demographic profile that pertains to the course of the respondents, the result shows that the highest percentage of 68.9% was obtained from the nursing students. In the context of address, data showed that one hundred ninety-one (191) respondents living in the town obtained the highest percentage of 66.8%.

Respondents' Level of Knowledge towards COVID-19 Vaccination. This finding suggests that respondents generally have a moderate level of knowledge about COVID-19 vaccination, as indicated by the overall composite mean of 2.84. The highest-ranked statement, "There are ways to help slow the spread of COVID-19," implies that respondents are well aware of preventive measures to control the transmission of the virus. This is a positive indication, as public awareness and adherence to preventive measures are crucial in managing the spread of infectious diseases.

The second-highest ranked statement, "Currently there is a vaccine to protect against COVID-19," suggests that respondents are aware of the existence of a COVID-19 vaccine. This essential information indicates a basic understanding of the available preventive measures against the virus.

However, the overall moderate level of knowledge indicates that there is room for improvement in terms of educating the respondents further on COVID-19 vaccination. The survey might benefit from additional questions to identify specific areas where respondents may have gaps in knowledge. This information can be used to tailor educational campaigns or interventions to address those specific areas and enhance overall public understanding of COVID-19 vaccination.

Table 1. Respondent's Level of Knowledge Towards Covid-19 Vaccination
N= 286

ITEM	WEIGHTED MEAN	INTERPRETATION	RANK
There are ways to help slow the spread of COVID-19.	3.74	Highly Knowledgeable	**1**
Currently, there is a vaccine to protect against COVID-19	3.63	Highly Knowledgeable	**2**
The health effects of COVID-19 appear to be more severe for people who already have a serious medical condition	3.58	Highly Knowledgeable	**3**
Taking Vitamin C or other vitamins will protect you from the COVID-19	3.35	Highly Knowledgeable	**4**
There are other strains of COVID-19 that can infect humans, including those that cause common cold.	3.34	Somewhat knowledgeable	**5**
There is no evidence that eating garlic will protect you against the COVID-19	3.08	Moderately Knowledgeable	**6**

There is no evidence that vaccines against pneumonia will protect you against the COVID-19	2.85	Moderately Knowledgeable	**7**
There is an effective medicine available for treating COVID-19	2.84	Moderately Knowledgeable	**8**
The virus was human-made & deliberately released.	2.68	Moderately Knowledgeable	**9**
The ordinary flu vaccine will protect me from COVID-19	2.64	Somewhat knowledgeable	**10**
The virus was genetically engineered as part of a biological weapons program	2.57	Moderately Knowledgeable	**11**
Antibiotics are an effective treatment for COVID-19	2.53	Moderately Knowledgeable	**12**
Regularly rinsing your nose with saline will protect you against the COVID-19	2.47	Somewhat knowledgeable	**13**
To date, a few in our country who were infected with COVID-19 passed it on to infect another person	1.65	Not Knowledgeable at all	**14**
To date, a few in our country have died from COVID-19	1.63	Not Knowledgeable at all	**15**
Composite Mean	2.84	Moderately Knowledgeable	

One study found that COVID-19 mortality rates vary by age and other demographic factors, with COVID-19 remaining much more lethal for older and medically frail people than younger people (Stein, 2022). A study published in The BMJ (2021) found that fewer people die from COVID-19 in better-vaccinated communities, with deaths more than 80% lower in communities with high vaccination coverage. Finally, a study on public perceptions of conflicting

information surrounding COVID-19 found that participants perceived disagreement across a range of COVID-19-related issues, though from politicians more than health experts (Nagler et al., 2020).

Respondents' Level of Willingness towards COVID-19 Vaccination. The findings indicate a generally positive attitude among respondents towards COVID-19 vaccination, with the top-ranked statement being "Getting the COVID-19 vaccine will be important for the health of others in my community" (4.16). This result suggests that a significant portion of the respondents recognize the communal importance of vaccination, indicating a sense of social responsibility. This positive attitude is reinforced by the fact that this statement received a "strongly agree" rating, indicating a high level of agreement among the respondents (Table 2).

The second-ranked statement, "I will do what my doctor or health care provider recommends about the COVID Vaccine" (3.98), also received a "strongly agree" rating. This result suggests a high level of trust in healthcare professionals, with respondents indicating a willingness to follow their recommendations regarding COVID-19 vaccination. Trust in healthcare providers can play a crucial role in influencing individuals' decisions to get vaccinated.

On the other hand, the bottom-ranked statement, "I am concerned about serious side effects of COVID vaccine" (1.92), received a lower rating, indicating a lower level of concern about potential side effects. The divergent response to this statement suggests that respondents, as a whole, may not be significantly worried about serious side effects, and this concern may not be a prominent factor influencing their willingness to get vaccinated.

Table 2. Level of Willingness towards COVID-19 Vaccination

ITEMS	WEIGHTED MEAN	INTERPRETATION	RANK
Getting the COVID vaccine will be important for the health of others in my community.	3.73	Very willing	1
I will do what my doctor or health care provider recommends about the COVID Vaccine	3.69	Very willing	2.5
The COVID vaccine will be beneficial to me	3.69	Very willing	2.5

The COVID vaccine will be important for my health.	3.64	Very willing	4
Getting a COVID vaccine would be a good way to protect me from coronavirus disease	3.63	Very willing	5
The COVID vaccine will be effective if it is approved by the FDA or CDC	3.55	Very willing	6
I think the COVID vaccine might cause lasting health problems for me	2.98	Less willing	7
The COVID vaccine will not be around long enough to be sure it's safe	2.70	Moderately willing	8
I am concerned about serious side effects of the COVID vaccine	1.92	Moderately willing	9
Composite mean	3.280	Very willing	

The findings suggest a generally positive inclination towards COVID-19 vaccination among the respondents, driven by a sense of community health responsibility and trust in healthcare providers. However, it is important to consider that individual concerns about potential side effects may vary, and addressing these concerns through transparent communication and education could further enhance vaccine acceptance.

Respondents' Profile and Their Level of Knowledge. The significant relationship between respondents' age and their level of knowledge suggests that age may play a role in shaping individuals' awareness and understanding of COVID-19. It implies that efforts to disseminate information and education about the pandemic should consider tailoring strategies to different age groups to enhance effectiveness (See Table 3).

Similarly, the observed relationship between respondents' sex and their level of knowledge underscores potential gender-based variations in awareness and knowledge regarding COVID-19. Addressing these differences may be crucial in developing targeted public health campaigns and interventions (See Table 3).

In practical terms, these findings emphasize the importance of considering demographic factors such as age and sex when designing educational

initiatives and communication strategies related to COVID-19. A nuanced approach that recognizes and addresses the diverse information needs of different demographic groups can contribute to more effective public health outcomes.

Table 3. Relationship Between the Respondents' Profile and their knowledge of COVID-19

Variables	Statistical Treatment Used	Statistical Test Value	P-value	Decision	Interpretation
Age and Level of Knowledge	Spearman Rank Test Value	0.173	0.003	Reject the null hypothesis	There is a significant correlation between the variables
Sex and Level of Knowledge	Chi-square Test Value	11.398	0.003	Reject the null hypothesis	There is a significant relationship between the variables
Year Level and Level of Knowledge	Chi-square Test Value	3.704	7.17	Failed to reject null hypothesis	There is no significant relationship between the variables
Course and Level of Knowledge	Chi-square Test Value	5.195	5.02	Failed to reject null hypothesis	There is no significant relationship between the variables
Address and Level of Knowledge	Chi-square Test Value	7.754	0.98	Failed to reject null hypothesis	There is no significant relationship between the variables

Respondents' Profile and Level of Willingness. The significant relationship between age and willingness to receive the COVID-19 vaccine suggests that younger individuals are more inclined to express a positive intention toward vaccination. This finding aligns with the broader narrative of vaccine acceptance trends, highlighting the importance of tailoring vaccination campaigns to different age groups (See Table 4).

The identified factors associated with a stronger intention to receive the COVID-19 vaccine, such as increased confidence, reduced complacency, and heightened collective responsibility, emphasize the multi-faceted nature of individuals' decision-making processes. Addressing these factors in public health

interventions may enhance vaccine acceptance and uptake. Furthermore, the link between COVID-19-related demands, work stress, and a more robust intention to receive the vaccine underscores the complex interplay between external stressors and health-related decisions. Understanding these dynamics can inform targeted strategies for encouraging vaccination among individuals facing heightened stress levels (See Table 4).

The significant relationship between academic year level and willingness to receive the COVID-19 vaccine indicates that educational context correlates with vaccination attitudes. Tailored educational interventions for specific academic cohorts could be beneficial in promoting vaccine acceptance within educational settings. Overall, these findings contribute valuable insights for designing effective public health initiatives and communication strategies aimed at increasing COVID-19 vaccination rates.

Table 4. Relationship Between the Respondents' Profile and their willingness towards COVID-19 Vaccination

Variables	Statistical Treatment Used	Statistical Test Value	P-value	Decision	Interpretation
Age and Level of Willingness	Spearman's rho	.151	.011	Reject the null hypothesis	There is a significant correlation between the variables
Sex and Level of Willingness	Chi-Square Test Value	.309	1.000	Failed to reject the null hypothesis	There is no significant relationship between the variables
Year Level and level of willingness	Chi-Square Test Value	21.244	.014	Reject the null hypothesis	There is a significant relationship between the variables
Course and Level of Willingness	Chi-Square Test Value	7.877	.400	Failed to reject the null hypothesis	There is no significant relationship between the variables
Town and Level of Willingness	Chi-Square Test Value	4.651	.533	Failed to reject the null hypothesis	There is no significant relationship between the variables

Correlation Between the Respondents' Knowledge of Covid-19 and their Willingness toward Vaccination. The analysis of the data presented in the table indicates a lack of a significant relationship between respondents' knowledge of COVID-19 and their willingness to get vaccinated. Statistical tests revealed no significant association between knowledge level and willingness regarding COVID-19 vaccination (See Table 5).

This finding underscores the importance of considering factors beyond mere knowledge in understanding their attitudes and behaviors related to COVID-19 vaccination.

Table 5. Correlation between Respondents' Knowledge of COVID-19 and Their Willingness to be Vaccinated

Variables	Statistical Treatment Used	Statistical Treatment Value	P-value	Decision	Interpretation
Level of willingness and Level of knowledge	Spearman's rho	.279	.315	Failed to reject the null hypothesis	There is no significant correlation between the variables

In practical terms, these results suggest that public health campaigns and educational initiatives may benefit from focusing not only on knowledge acquisition but also on fostering positive attitudes and community engagement to raise the importance of making the COVID-19 vaccine available. Encouraging a supportive environment and promoting a sense of responsibility towards those affected by COVID-19 can contribute to more effective public health outcomes.

CONCLUSION

Examining respondents' knowledge of COVID-19 vaccination uncovered a moderately informed cohort, as indicated by a mean knowledge score of 2.84. While awareness of preventive measures and the existence of a vaccine was evident, the study highlights the potential for targeted education campaigns to fill knowledge gaps and further enhance public understanding. The positive attitude towards COVID-19 vaccination, notably emphasizing communal health responsibility, trust in healthcare providers, and low concern about side effects, speaks to the receptivity of the respondents towards vaccination efforts.

The study's contribution lies in its exploration of the relationships between demographic variables, knowledge, and willingness. Notably, age-specific educational strategies and tailored interventions within educational settings emerge as critical considerations. Notably, the lack of a significant correlation between knowledge and willingness emphasizes the need for multi-faceted approaches, combining knowledge acquisition with the cultivation of

positive attitudes and community engagement. These insights provide a robust foundation for refining public health strategies, fostering vaccine acceptance, and effectively addressing the dynamic challenges posed by the ongoing COVID-19 pandemic.

RECOMMENDATIONS

Anchored on the conclusion above, the following proposed measures are offered.

1. Targeted educational campaigns should be developed to address specific knowledge gaps identified among the respondents. These campaigns should focus on disseminating accurate information about COVID-19, the importance of vaccination, and potential benefits. Tailoring these initiatives to the demographic characteristics of different age groups, especially considering the significant relationships found between age and knowledge, can maximize their impact. Strategies incorporating various communication channels, including social media, educational institutions, and healthcare providers, can ensure widespread dissemination of information.
2. Interventions aimed at promoting positive attitudes and community engagement towards COVID-19 vaccination are essential. Building on the identified positive inclination and communal health responsibility, public health campaigns should emphasize the collective benefits of vaccination and highlight success stories within communities. Leveraging trust in healthcare providers, interventions should involve collaboration with medical professionals to deliver accurate information and address concerns. Additionally, efforts should be made to understand and address variations in awareness between genders, ensuring that campaigns are inclusive and effectively resonate with diverse demographic groups.
3. Media options should be explored in order to disseminate the required knowledge among the underprivileged population.
4. Strict regulations should also be enacted in order to minimize the spread of misinformation and conspiracy theories.
5. Immediate and visionary working plans are warranted from the concerned authorities in order to ensure adequate availability of vaccines in the coming days.
6. Up-to-date information regarding the adverse reactions and safety profiles of respective vaccines should be updated regularly in consultation with reputed international journals and circulated accordingly among the public, especially health care professionals.
7. The government should encourage and empower the local pharmaceutical industries to invest in vaccine development.

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