
Relationship of trust on selected health information sources and COVID-19 vaccine acceptance among older adults

Eunice Simone R. Tung¹, Danielle Janica Ballescas¹, Xyle Arani Ysabel B. Balquiedra¹, Rowell Kian B. Carig¹, Rommel Angelo P. Sanchez¹, Vincent Gerald M. Santos¹, Janelle P. Castro, PhD, RN¹; Tricia Kaye F. Palola, RN¹; Jocelyn M. Molo, DrPH, MPH, RN¹

Abstract

Introduction In order to suppress the COVID-19 virus, several vaccines have been developed. The administration of COVID-19 vaccines entails its acceptance. However, misinformation and vaccine uncertainty are main factors that affect vaccine acceptance. This study aimed to determine the most trusted health information source, the most frequently accessed health information source, and health literacy of older adults within Metro Manila.

Methods This study employed a quantitative non-experimental design utilizing correlational and descriptive approaches. Convenience sampling was utilized via Facebook to recruit participants. The survey was adapted from four different questionnaires and went through reliability testing and expert validation.

Results The researchers collected responses from a total of 123 participants. The participants were noted to have an overall high level of acceptance for the COVID-19 vaccine (\bar{x} 4.10, SD \pm 0.22).

The study revealed that doctors were the highly trusted health information source (\bar{x} =3.69, SD \pm 1.30), followed by government health agencies (\bar{x} =3.18, SD \pm 0.73), whereas religious organizations and leaders (\bar{x} =2.45, SD \pm 0.48) were the least trusted sources. However, despite being the least trusted source, religious organizations and leaders were shown to be positively related (p =0.049) and highly predictive of COVID-19 vaccine acceptance. The most frequently accessed health information source, health workers, have a weak correlation (r =.323) and were found to be significantly positively related (p =0.008) and highly predictive of the acceptance of the COVID-19 vaccine. The credibility of health information sources is likely to influence their selection, influencing decisions and behaviors.

Key words: SARS-CoV-2, vaccine acceptance, health information sources, older adults, gerontology nursing

Correspondence:

Eunice Simone R. Tung, College of Nursing, University of the East Ramon Magsaysay Memorial Medical Center, Inc., 64 Aurora Boulevard, Barangay Doña Imelda, Quezon City, PH 1113; Email: tunge4862@uerm.edu.ph; Telephone: 0923 626 1323

Dr. Fernando S. Sanchez Research and Publication awardee, 24th Annual Research Forum, UERMMMCI Research Institute for Health Sciences, November 23, 2022

¹College of Nursing, University of the East Ramon Magsaysay Memorial Medical Center, Inc., Quezon City, PH

Globally, the COVID-19 pandemic is rising morbidity and mortality rates, particularly in Southeast Asian countries such as the Philippines. Several COVID-19 vaccines surfaced to prevent further infections. Despite the vaccine's scientific backing and rapid answer to the world health crisis, some people remain skeptical. According to a local study, some people are hesitant to obtain the COVID-19 vaccine because they are concerned about its safety and efficacy.¹ Misinformation and uncertainty of vaccines are the main factors that affect an individual's vaccine acceptance in the Philippines. According to WHO

Philippines (2021), in spite of the progress in other priority groups, vaccination rates among older adults in the Philippines remain low, with only around 25% fully vaccinated and only about 35% receiving their first dose.² This underscores the rationale behind the researchers' decision to focus on older adults as their target population. Limited studies have been conducted that identify whether a significant relationship exists between trust on health information sources and COVID-19 vaccine acceptance. Moreover, studies have yet to be conducted to discover whether there is a significant relationship with the most frequently accessed health information sources and COVID-19 vaccine acceptance.

Trust comprises different concepts and domains which affect the individuals' decision regarding vaccine acceptance. An individual's trust in their government, health information sources, and the vaccine itself are some of the factors that affect their vaccine acceptance as shown in previous studies.^{3,4} A study found out that individual drivers of vaccine adoption include faith in national health authorities, scientists, and personal health concerns, according to predictors.³ On the other hand, one study claimed that people use the trustworthiness of health sources as a fundamental strategy of settling issues, and confidence in authorities is a multi-component construct.⁴ These insights are essential to public health which can potentially increase vaccine acceptance. Specifically, both literatures concluded that high levels of trust can be correlated with positive outcomes which include higher vaccination rates. While favorable results were previously mentioned, negative outcomes may also exist, as demonstrated by lesser perceived danger risks. A nonlinear relationship was recorded in the results involving generalized trust as well as possibility of vaccine acceptance another study.⁵ However, there is a strong linear relationship between vaccination acceptance and trust in the vaccine, its production and process, and trust in information sources, indicating that these variables have an impact on an individual's vaccine acceptance. Furthermore, the findings of the aforementioned study indicate that the active participation of public health organizations, press entities, and political leaders plays a crucial role in bolstering trust in COVID-19 vaccination. This aligns with the conclusions drawn by other studies.^{3,4}

Literature from studies conducted abroad showed that among the older population, the primary health information source utilized was the internet, followed

by health care professionals, traditional media, and family and friends and a smorgasbord approach, which is a combination of sources.⁶ Personal testimony from immunized families and friends regarding their experiences were also recognized as a reliable source of information by another study.⁷ People with lower health literacy are inclined to place less trust in medical sources, while they are more likely to trust social media and other outlets. Consequently, social media can be employed as a tool to enhance health literacy and build trust in health-related sources. On the other hand, vaccine acceptance encompasses a variety of attitudes and behaviors, from outright rejection of all vaccines to full endorsement and compliance with recommendations of immunization.⁸

However, there are studies done overseas that showed no difference in vaccine acceptance among different age groups.^{9,10} Vaccine acceptance is multifactorial and can change over time. One's willingness to get vaccinated may not be a good predictor of acceptance. Attitudes and beliefs towards vaccination, perceived risk or severity of disease or vaccine, personal health concerns, and vaccine characteristics are the factors noted in a study conducted on West European and North American societies.¹¹ Research conducted in Australia, as well as the study in the UK, revealed minimal reluctance toward COVID-19 vaccination.^{12,13} Therefore, the study aimed to determine the most trusted health information source, the most frequently accessed health information source, the health literacy level, and the level of vaccine acceptance among older adults within Metro Manila.

Methods

This study employed a quantitative design utilizing correlational and descriptive approaches to understand whether trust on health information sources and the sources themselves have a relationship with COVID-19 vaccine acceptance. The study's target population were older adults aged 60 years old and above, residing within Metro Manila, Philippines. The selection of participants was carried out through a convenience sampling method utilizing Facebook. The researchers employed a bilingual online questionnaire that underwent testing for both reliability and expert validation.

Descriptive statistics were performed. Pearson's *r* was done to examine if the level of trust towards health information sources is related to COVID-19

vaccine acceptance among older adults within Metro Manila as well as between the most frequently accessed health information sources and COVID-19 vaccine acceptance among older adults. The researchers also performed regression analysis to determine the trusted information sources and most frequently accessed information sources that are most predictive of COVID-19 vaccine acceptance. Statistical analysis was done using SPSS.

Results

Trust in health information sources

The researchers calculated the weighted mean for each scale, consisting of six questions related to the level of trust in five choices: doctors, government health agencies, family or friends, charitable organizations, and religious organizations and leaders. Doctors received a very high level of trust, while government health agencies, family and friends, and charitable organizations were rated with a high level of trust by the participants. However, religious organizations and leaders received a low level of trust (Table 1).

Frequency of use of health information sources

Regarding the most frequently accessed health information sources, participants reported a weighted mean of 4.13 (SD ± 0.45) for mass media health information sources, suggesting occasional access (approximately 1 time per 15 days). Interpersonal health information sources scored 4.07 (SD ± 0.41), also indicating occasional access (around 1 time per 15 days). Official health information sources received

a score of 2.67 (SD ± 0.19), suggesting infrequent access (approximately 1 time per 2 months).

Health literacy

Health literacy status among older adults was measured through a 5-point Likert scale. The overall health literacy status was expressed through their weighted means. Overall, the results show an overall health literacy level of 3.64 (SD ± 0.67) indicating an overall high literacy level.

COVID-19 vaccine acceptance

The participants had an overall weighted mean of 4.10 (SD ± 0.22) indicating an overall high level of acceptance for the COVID-19 vaccine. Correlation analysis between trust in health information sources, and COVID-19 vaccine acceptance is shown in Table 2. The results indicated that religious and organization leaders are significantly positively related to vaccine acceptance (p=0.049), displaying a very weak correlation (r=.190). Most frequently accessed health information sources, and COVID-19 vaccine acceptance was also correlated. Results showed that news websites and/or valid websites have a weak correlation (r=.258) and a significantly positive relationship with vaccine acceptance (p=.006), the internet (e.g. general blogs, personal pages) has a weak correlation (r=.229) and a significantly positive relationship (p=.015), and that health workers (e.g. nurses, pharmacists) also have a weak correlation (r=.323) and a significantly positive relationship (p=.001) with vaccine acceptance.

Table 1. Weighted means and SDs among the study variables.

| Variable | Overall Weighted Mean | SD | Verbal Interpretation |
|--|-----------------------|--------|--------------------------------|
| <i>Trust Level Health Information Sources</i> | | | |
| Doctor | 3.69 | ± 1.30 | Very High Level of Trust |
| Government Health Agencies | 3.18 | ± 0.73 | High Level of Trust |
| Family or Friends | 2.99 | ± 0.73 | High Level of Trust |
| Charitable Organizations | 2.60 | ± 0.59 | High Level of Trust |
| Religious Organizations and Leaders | 2.45 | ± 0.48 | Low Level of Trust |
| <i>Most Frequently Accessed Health Information Sources</i> | | | |
| Mass Media Information Sources | 4.13 | ± 0.45 | Sometimes (1 time per 15 days) |
| Interpersonal Information Sources | 4.07 | ± 0.41 | Sometimes (1 time per 15 days) |
| Official Information Sources | 2.67 | ± 0.19 | Rarely (1 time per 2 months) |
| Health Literacy | 3.64 | ± 0.67 | High Literacy |
| Vaccine Acceptance | 4.10 | ± 0.22 | High Level of Acceptance |

Table 2. Correlation analysis between level of trust towards health information sources, most frequently accessed health information sources and COVID-19 acceptance.

| Variable | r | p-value |
|--|-------|---------|
| <i>Level of trust</i> | | |
| Doctor | .144 | .138 |
| Family or friends | -.077 | .430 |
| Government health agencies | .121 | .212 |
| Charitable Organization | .129 | .183 |
| * Religious organizations and leaders | .190 | .049 |
| <i>Most frequently accessed health information source</i> | | |
| Newspaper/Magazines | .128 | .178 |
| Radio | -.065 | .493 |
| Television | .095 | .321 |
| Electronic press (e.g. electronic newspapers) | .150 | .113 |
| * News websites and/or valid websites | .258 | .006 |
| * Internet (e.g. general blogs, personal pages) Social networks (e.g. Facebook, Twitter, Instagram, YouTube, etc.) | .229 | .015 |
| Personal doctor | .149 | .115 |
| * Health workers (e.g. Nurses, Pharmacists) | .155 | .102 |
| Family | .323 | .001 |
| Friends | .096 | .314 |
| Department of Health | .097 | .308 |
| European C.D.C | .066 | .495 |
| World Health Organization (WHO) | -.105 | .281 |
| Scientific journals | .000 | .996 |
| Open electronic, digital libraries | -.092 | .331 |
| Libraries that offer information on COVID-19 | .067 | .483 |
| | -.023 | .814 |

*Correlation is significant at the 0.05 level (2-tailed).

Table 3. Regression analysis of predictors of COVID-19 vaccine acceptance.

| | t | p | β | F | Sig. | adj. R |
|---|--------|------|-------|-------|-------|--------|
| Trust in health information sources | | | | 2.420 | .041b | .063 |
| A doctor | 1.120 | .266 | .119 | | | |
| Family or Friends | -.663 | .509 | -.073 | | | |
| Government Health Agencies | .671 | .504 | .077 | | | |
| Charitable Organizations | 1.788 | .077 | .196 | | | |
| * Religious Organizations and Leaders | -2.369 | .020 | -.263 | | | |
| Most frequently accessed health information sources | | | | 2.298 | .006b | .176 |
| Newspapers/magazines (printed press) | 1.264 | .210 | .140 | | | |
| Radio | -.783 | .436 | -.096 | | | |
| Television | .227 | .821 | .029 | | | |
| Electronic press | -.443 | .659 | -.070 | | | |
| News websites and/or valid websites | 1.806 | .074 | .300 | | | |
| Internet | .750 | .455 | .127 | | | |
| Social networks | -.674 | .502 | -.099 | | | |
| Personal doctor | -.970 | .335 | -.165 | | | |
| * Health workers | 2.730 | .008 | .419 | | | |
| Family | .688 | .493 | .112 | | | |
| Friends | -.193 | .847 | -.033 | | | |
| Department of Health | .415 | .679 | .055 | | | |
| European CDC | -.731 | .467 | -.119 | | | |
| World Health Organization (WHO) | -.386 | .700 | -.061 | | | |
| Scientific journals | -1.513 | .134 | -.290 | | | |
| Open electronic, digital libraries | 1.216 | .227 | .212 | | | |
| Libraries that offer information on COVID-19 | -1.055 | .295 | -.176 | | | |

* significantly associated

Table 3 shows the regression analysis of predictors of COVID-19 vaccine acceptance. That the most frequently accessed health information sources and COVID-19 vaccine acceptance showed health workers have a weak correlation ($r=.323$) and is significantly positively associated ($p=0.008$) with and also highly predictive of COVID-19 vaccine acceptance.

Discussion

The study revealed that doctors were the highly trusted health information source, followed by government health agencies, and religious organizations and leaders were the least trusted sources. According to one study, health experts are sources of trustworthy information about vaccines justifying the results of having a very high level of trust towards doctors.³ Similar results were evident in one study wherein the most utilized health information sources were providers (e.g., doctor, nurse, social worker) and the internet (independent use).⁶ In the study, newspaper/magazines, radio, television, electronic press (e.g. electronic newspapers), social networks (e.g. Facebook, Twitter, Instagram, YouTube, etc.), personal doctor, family, friends, the Department of Health, European C.D.C, the World Health Organization (WHO), scientific journals, digital libraries, and libraries that offer information on COVID-19 did not have significant relationships with vaccine acceptance, with very weak correlations as well. Despite being the most trusted source, doctors have not shown to influence the decisions of the participants in choosing to accept a vaccine. People's decisions with vaccination were heavily influenced by cultures that sprung from shared beliefs about disease etiology, safety and efficacy of vaccines as well as encounters with local health services and vaccination settings. In the aftermath of the COVID-19 outbreak, older adults are more reliant on local government to cover their healthcare needs because they have fewer resources than the other age groups. It can be concluded that older adults may have difficulty using different gadgets to seek health information, are unable to communicate with their families on a regular basis or lack sufficient understanding of where to acquire health information. Despite being the least trusted source, religious organizations and leaders were shown to be positively related to vaccine acceptance with a seemingly weak correlation. The authors could not directly discern if exposures to messages from government health

organizations and religious leaders had such positive relationships with the outcome because they are least trusted sources, but these two have traditionally played an important role in influencing public perception to vaccine acceptance. A study based on the African American community, where faith is of importance, has identified religious and faith leaders as crucial figures in mobilizing and encouraging communities to get vaccinated against the COVID-19 virus.¹⁴ In the local context, a study argued that the Catholic Church, being an influential institution in the Philippines, can also establish trust and increase acceptance among Filipinos.¹⁵ The Department of Health has acknowledged the importance of having different sectors endorse the vaccine, and it is highly suggested that a partnership between the Church and the government be formed to boost the vaccine uptakes within the country.¹⁵

Interestingly, the most frequently approached health information sources, was not necessarily perceived as the most trustworthy ones. Television has been one of the most frequently accessed mass media sources of information. One possible cause is that older adults generally have lower responsiveness, which makes keeping up with fast-paced technology more difficult. Considering also that older adults have a higher risk of acquiring the virus, they have been unable to consult their personal doctors and have instead depended on government pronouncements or television coverage. Families and friends were some of the highly trusted and frequently accessed interpersonal health information sources of the participants. This finding emphasizes the role of personal testimonies of vaccination experiences in informing public health messaging campaigns to increase vaccine uptake. One study showed that vaccine hesitancy was strongly related to vaccination behavior.¹⁶ Families who refused vaccination are concerned about the long-term health problems caused by the vaccination and vaccine safety. Overall, when it comes to the frequency of use of health information sources, mass media and interpersonal health information sources are preferred over official health information sources. People actively seek or search for health information. Health information plays an essential role in health promotion by influencing individuals' health behavior adaptation and decision making. As they cope with anxiety and fear, people may choose to share COVID-19

information from the news media, social media, and family.¹⁷

In addition to being in a COVID-19 pandemic, people are also living with an “infodemic” where there is a widespread amount of false and misleading information circulating the digital platform especially on Social Networking sites. In contrast to the results of the study, local research has suggested how prevalent poor health literacy is among Filipinos. Based on a study that was conducted among selected Filipino adults aged 50-70 years old, 93.8% of the participants had inadequate health literacy levels.¹⁸ This should be considered as a public health “issue” especially since people who fall within the age group of 50 years and above comprise the high-risk population and are more vulnerable to the COVID-19 virus. Having adequate and good health literacy levels are important for individuals to be able to understand health information and judge whether information coming from different sources are to be considered.

The participants had an overall high level of acceptance for the COVID-19 vaccine. This outcome suggests that older adults recognize the benefits of safeguarding themselves against the virus through COVID-19 vaccination. Given the right information from the right sources, older adults were likely to accept COVID-19 vaccines as supported by the findings of a study which identified the factors that influenced the individuals’ acceptance as trust in their national health authorities and personal health concerns.³ On the other hand, vaccine efficacy, vaccine safety, and risk of infection are among the reasons for low vaccine acceptance according to a scoping review of 22 studies.¹⁹

Conclusion

Vaccine acceptance of the elderly population in the Philippines remained low as of 2021. Factors that influenced the population’s vaccine acceptance include the desire to return to previous ways of living and protect their loved ones from cross-infection. Results revealed that religious and organization leaders are significantly positively related to vaccine acceptance ($p=0.49$). To further support this, regression analysis of the level of trust in health information sources and COVID-19 vaccine acceptance showed that religious organizations and leaders had the only significantly positive relationship ($p=0.020$) and are highly predictive of vaccine acceptance. Religious leaders play a significant role in promoting vaccine

acceptance by having a great influence among their church members. As members of the church, older adults are likely to support the views and stand of their religious leaders on critical matters, like vaccine acceptance. A separate regression analysis of most frequently accessed health information sources and COVID-19 vaccine acceptance showed health workers have a weak correlation ($r=.323$) and is significantly positively associated ($p=0.008$) with and are also highly predictive of COVID-19 vaccine acceptance.

Limitations and Future Studies

A convenience sampling method was distributed through Facebook where the population was limited to those who only had access to this platform. Furthermore, the study did not investigate the impact of health literacy on the ability of the respondents to choose health information sources, and how this can also further impact COVID-19 vaccine acceptance. The possibility of common method bias is also considered since the instrument utilized can introduce this where data sources were only obtained from the respondents which are self-reported. Another limitation is that the study only investigated trust on five health information sources, where the study failed to discover the trust ratings on other existing health information sources. Future research is recommended to employ a mixed methods approach to fully capture the COVID-19 vaccine acceptance of the chosen population. Lastly, future researchers may also assess the occupational status of families and friends as health information sources, considering that there may be a possibility for them to be healthcare workers, which can further influence the study’s results.

Acknowledgements

The researchers would like to thank and acknowledge Ms. Portia Abog, Ms. Raiza Que, Ms. Jessie Bacudo-Mangundayao, and Ms. Pinky Carig for taking the extra mile to guide the researchers through their expertise. Special thanks to the respected Ethics Review Committee, former dean Wilhelmina P. Atos, PhD, MAN, RN, Prof. Paulo Carl Mejia, DNS, DNM, RN, and the thesis defense panel members for the knowledge and skills that you have equipped the researchers and for greatly improving the study. Furthermore, the researchers would also like to thank the Dean of the College of Nursing in UERMMMCI for her great support and also for approving our research study. Lastly, the researchers owe their

greatest thanks to the participants who completed the online survey.

References

- Bautista AP, Bleza DG, Balibrea DM, Equiza C. Acceptability of vaccination against COVID-19 among selected residents of the cities of Caloocan, Malabon, and Navotas, Philippines. Preprints [Internet] 2021, 2021040702 (doi: 10.20944/preprints202104.0702.v1).
- World Health Organization. WHO Philippines expresses concern at the low COVID-19 vaccination rate among senior citizens in some LGUs amid rising threat from new variants. World Health Organization. 2021. Available from: <https://www.who.int/philippines/news/detail/30-07-2021-who-philippines-expresses-concern-at-the-low-covid-19-vaccination-rate-among-senior-citizens-in-some-lgus-amid-rising-threat-from-new-variants>
- Lindholdt MF, Jørgensen F, Bor A, et al. Public acceptance of COVID-19 vaccines: Cross-national evidence on levels and individual-level predictors using observational data. *BMJ Open* 2021; 11: e048172. doi: 10.1136/bmjopen-2020-048172
- Sopory P, Novak JM, Day AM, et al. Trust and public health emergency events: A mixed-methods systematic review. *Disaster Medicine and Public Health Preparedness* [Internet] 2022; 16(4): 1653-73. doi: 10.1017/dmp.2021.105
- Szilagyi PG, Thomas K, Shah MD, et al. The role of trust in the likelihood of receiving a COVID-19 vaccine: Results from a national survey. *Preventive Medicine* [Internet] 2021 Jan; 153: 106727. Available from: <https://doi.org/10.1016/j.ypmed.2021.106727>
- Turner AM, Osterhage KP, Taylor JO, Hartzler AL, Demiris G. A closer look at health information seeking by older adults and involved family and friends: Design considerations for health information technologies. *AMIA Annual Symposium Proceedings. AMIA Symposium 2018*; 1036–45.
- Purvis RS, Hallgren E, Moore RA, et al. Trusted sources of COVID-19 vaccine information among hesitant adopters in the United States. *Vaccines* [Internet] 2021; 9(12): 1418. Available from: <http://dx.doi.org/10.3390/vaccines9121418>
- Feemster KA. Overview: Special focus vaccine acceptance. *Human Vaccines & Immunotherapeutics* [Internet] 2013; 9(8): 1752–4. Available from: <https://doi.org/10.4161/hv.26217>
- Dror AA, Eisenbach N, Taiber S, Morozov NG, Mizrachi M, Zigran A, Srouji S, Sela E. Vaccine hesitancy: The next challenge in the fight against COVID-19. *Eur J Epidemiol* [Internet] 2020 Aug; 35(8): 775-9. doi: 10.1007/s10654-020-00671-y
- Wong LP, Alias H, Wong PF, Lee HY, AbuBakar S. The use of the health belief model to assess predictors of intent to receive the COVID-19 vaccine and willingness to pay. *Human Vaccines & Immunotherapeutics* [Internet] 2020; 16(9): 2204–14. Available from: <https://doi.org/10.1080/21645515.2020.1790279>
- Eilers R, Krabbe PFM, de Melker HE. Factors affecting the uptake of vaccination by the elderly in Western society. *Preventive Medicine* [Internet] 2014 Dec; 69: 224-34. Available from: <https://www.sciencedirect.com/science/article/abs/pii/S0091743514003818>
- Aitken Z, Emerson E, Kavanagh A. COVID-19 vaccination coverage and hesitancy among groups prioritised in Australia's vaccine rollout. *MedRxiv* [Internet] 2022. Available from: <https://doi.org/https://doi.org/10.1101/2021.08.05.21261633>
- Robertson E, Reeve KS, Niedzwiedz CL, et al. Predictors of COVID-19 vaccine hesitancy in the UK household longitudinal study. *Brain, Behavior, and Immunity* [Internet] 2021 Mar; 94: 41–50. Available from: <https://doi.org/10.1016/j.bbi.2021.03.008>
- Privor-Dumm L, King T. Community-based strategies to engage pastors can help address vaccine hesitancy and health disparities in black communities. *J Health Commun* [Internet] 2020 Oct 2; 25(10): 827-30. doi: 10.1080/10810730.2021.1873463
- Gopez JMW. Building public trust in COVID-19 vaccines through the Catholic Church in the Philippines. *J Public Health (Oxf)* [Internet] 2021 Jun 7; 43(2): e330-e331. doi: 10.1093/pubmed/fdab036
- Chen H, Li X, Gao J, et al. Health belief model perspective on the control of COVID-19 vaccine hesitancy and the promotion of vaccination in China: Web-based cross-sectional study. *J Med Internet Res* [Internet] 2021 Sep; 23(9): e29329. doi: 10.2196/29329
- Lu L, Liu J, Yuan YC, Burns KS, Lu E, Li D. Source trust and COVID-19 information sharing: The mediating roles of emotions and beliefs about sharing. *Health Educ Behav* [Internet] 2021 Apr; 48(2): 132-9. doi: 10.1177/1090198120984760
- Agosto HGC, Briones MVA, Palatino MC. Correlates of health literacy among Filipinos aged 50-70 years old belonging to low-income families in a selected community. *Acta Med Philipp* [Internet] 2018 May 31; 52(3). Available from: <https://actamedicaphilippina.upm.edu.ph/index.php/acta/article/view/397>
- Joshi A, Kaur M, Kaur R, Grover A, Nash D, El-Mohandes A. Predictors of COVID-19 vaccine acceptance, intention, and hesitancy: A scoping review. *Front Public Health* [Internet] 2021 Aug 13; 9: 698111. doi: 10.3389/fpubh.2021.698111