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Original Research Article

Public knowledge, attitude, practice towards acceptance of COVID-19 Vaccine: a prospective cross-sectional study in Bangalore

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ABSTRACT

Background: The world health organization has declared COVID-19 outbreak a global health emergency which has severely affected the health-care system, social networking and economic growth throughout the world. The aim of this study was to develop awareness strategy on knowledge, attitude and perception regarding COVID-19 vaccine among the general public in selected urban area of Bangalore.
Methods: The survey was conducted among 400 respondents of Hebbal constituency, Bangalore, Karnataka (India) through a structured; open and close-ended questionnaire. Content validation was done to assess the validity and factor analysis for reliability. Collected data was analyzed by using ANOVA for testing the quantitative variables (age, gender, education level, employment status) and qualitative variables (knowledge, attitude and perception).
Results: Our results indicate that there is difference of opinion in the aspect of knowledge and perception among various age groups.
Conclusions: The study concluded that there is a sound knowledge about the COVID-19 vaccine among the age group of 18-35 years whereas in the age group above 35 years, there is inadequate knowledge about COVID-19 vaccine facts and myths. Therefore, there is high need to create awareness and provide adequate information to the general public.

Keywords: COVID-19, Vaccine, Knowledge, Attitude, Perception, Bangalore

INTRODUCTION

The coronaviruses are comprised as a family of viruses which result in disease manifestations which range from common cold to various serious systemic disorders. It has been shown to infect animals belonging to various species. It exists in various strain forms of which severe acute respiratory syndrme-CoV-2 (or SARS-CoV-2) and Middle Eastern respiratory syndrome (MERS) virus found to be infecting humans. In December of the year, 2019, a disease outbreak of SARS-CoV-2 infection was reported from Wuhan city located in China. This infection then had quickly spread to approximately 200 Nations. Following which, it was declared a pandemic by the world health organization (WHO) in March, 2020.[1] In India, the first confirmed case of COVID-19 infection was reported from the state of Kerala on 30th January, 2020.[2] It primarily spreads via droplet infection produced mainly, by coughing or sneezing. Symptoms of SARS-CoV-2 rang measure that are safest and cost-effective from being- mild (with symptoms like- cough, fever, shortness of breath) to that of severe form wherein manifestations like- renal failure and pneumonia has been reported. Major factors that aid in management of this global crisis included- awareness among population and adherence to guidelines and recommendations.[1] The incubation period for COVID-19 infection to manifest ranges between 2 to 14 days. Its primary symptoms

include- pyrexia, cough, trouble during breathing, pain and pressure sensation in chest, weakness or fatigue, anosmia or loss of smell, vomiting, sore throat, joint pain or arthralgia and muscle pain/myalgia, bluish discoloration of face and lips and mental confusion.[2,3]

As per the world health organization, 80% of patients who are infected with SARS-CoV-2 present with mild symptoms and had undergone recovery with no medical support. 20% of infected individuals present with severe diseases like septic shock, shortness in breathing and failure of multiple organs. However, it has been estimated that 2% of infection turn fatal.[4] One of the common steps which was undertaken by governments across the globe was to restrict spread of virus along with flattening of disease curve.[1] Vaccines constitute the safest and cost-effective measure that are required for either preventing or controlling any disease.[5] This pandemic has severely affected entire health system, social development and economic growth across the world. Many countries have undertaken strong measures for prevention of disease spread by utilizing various treatment protocols. Vaccines shall provide long- lasting solution which will help in preventing spread of the disease and also, help in enhancement of immunity. The development and production of vaccine has provided a major hope for entire world for overcoming this pandemic. 'Covishield' and 'Covaxin' are two vaccines introduced in India and have been authorized for emergency use. India started its vaccination drive against the SARS-CoV-2 virus on 16 January 2021 which was first of all, provided to healthcare and front-line workers and later, to individuals above 60 years of age which was followed by inoculating those above 18 years of age.

The world health organization strategic expert group on immunization in 2015 has defined vaccine hesitancy as 'a delay in either accepting or refusing vaccination in spite of availability of services providing vaccination'. Addressing issues pertaining to viral hesitancy requires trust building and is a multi-factorial, complicated and endeavor which is entirely dependent upon context and needs to be addressed at sub-national, national and global levels.[6] Thus, following the available literature evidence, this study was designed to develop awareness on knowledge, attitude, practice regarding COVID-19 vaccine among the general public in selected urban area, Bangalore, India.

Objectives

Objectives of this study were; to understand the current COVID-19 vaccine status among common public; to assess the level of knowledge, attitude and perception about COVID-19 vaccine, to analyze the level of knowledge and perception about COVID-19 vaccine and to implement various measures to raise the knowledge about the facts of COVID-19 vaccine.

METHODS

This prospective cross-sectional analysis was performed by conducting survey by using a structured; open and closed ended questionnaire among the general public which was distributed by electronic mail. The area selected for conducting this study was Hebbal constituency situated in Bangalore which contain a total of 132571 residents. A total of 400 study respondents were taken for the study. The questionnaire was classified into; socio-demographic and knowledge-Attitude-Practice) KAP based questions. A total of 29 questions were comprised within the questionnaire. Inclusion criteria for subject selection was- respondents aged above 18 years were selected while the exclusion criteria were; subjects aged below 18 years and those who were not willing to participate in the study. Sampling technique used was non-probability convenient sampling. Sample size was calculated by following formula;

Sample size (n) =N/Ne*2

Where population size (N) was taken as 132571, margin of error (e) was taken as 0.05 and confidence level was taken at 95%. The calculated sample size was 398 therefore, 400 subjects were taken as participants in current study. A pilot study was conducted for checking the reliability by using Cronbach'salpha test using the SPSS reliability statistical tool. A Cronbach alpha value of 0.662 was obtained thus, indicating the validity of the study. After obtaining required data, ANOVA (analysis of variance) test was used for determining statistical significance of quantitative variables while Chi-Square test was used for Inter-group comparisons in responses received for Knowledge, attitude and practice and a P value of less than 0.01 was kept as statistically significant. To raise awareness among the general public regarding the myths prevailing in the society about COVID-19 and educating about the facts of the COVID-19 vaccine various measures were followed such as; posters regarding COVID-19 vaccination facts and its importance were displayed; Pamphlets and leaflets containing facts about the vaccine and safety measures were distributed among the public in bilingual languages (English and Kannada) and information regarding the myths and facts revolving around COVID-19 vaccine were mailed to the respondents individually.

RESULTS

This study was a questionnaire-based survey for assessing the knowledge-attitude-perception (KAP) of 400 study participants. Following statistical analysis, following observations were made; knowledge assessment: on applying ANOVA, while considering age as independent variable and knowledge as dependent variable. Significance value for the factor 'Information available regarding the facts and myths about COVID-19 vaccine?' was derived as 0.529. within F value being 0.639. The significant value for the factor 'have you heard of

COVID-19 vaccine?' was found to be 0.511 with the F value 0.673.The significant value for the factor 'have you been vaccinated?' derived was 0.195 with the F value being 1.643. The significant value for the factor 'has any of your household member received COVID-19 vaccine?' was found to be 0.149 with the F value being 1.911. The significant value for the factor 'does you know about the registration process of COVID-19 vaccination?' was 0.113 with the F value being 2.192. The significant value for the factor 'have you been provided adequate information about the registration process?' was observed as 0.004 with the F value being 5.493. The significant factor for 'do you know what documents are needed for registration? was 0.10 with the F value being 4.687. The significant factor for 'Do you know about the different types of COVID-19 vaccines available in the country?' was found to be 0.075 (Table 1).

Table 1: Table showing statistical correlation of knowledge with age (ANOVA).

Knowledge level (K)	F	Significance
K1	0.639	0.529
K2	0.673	0.511
K3	1.643	0.195
K4	1.911	0.149
K5	2.192	0.113
K6	5.493	0.004
K7	4.687	0.010
K8	2.614	0.075
K9	2.265	0.105

On applying, the Tukey post-hoc test on one-way ANOVA, it was seen that there was a statistically significant difference in between dependent variable age category (18-35 years) and independent variable that is knowledge. However, there is no difference between 36-58 years and 59-20 years was seen. As observed in 'information available regarding the facts and myths about COVID-19 vaccine?' for age group 18-35 years, the p value was found to be 0.499 and for age group 36-58years and 59-70 years, the p value was found to be 0.536. On applying Chi-square test, it was seen that the p value on comparing knowledge with age was 0.527, thus indicating nonsignificant association. Thus, based on this we accept the null hypothesis which asserts that the two variables are independent of each other (Table 1). Attitude assessment: similarly on comparing responses received for attitude with age following comparisons using Chi-square tests, no significant p value (0.322) was obtained. Hence, null hypothesis that asserts the two variables (attitude and age) are independent of each other. The result is non-significant which means the data suggests that the variables attitude regarding COVID-19 vaccine and age are not associated with each other (Table 2). Perception response: On comparing perception responses using Chi-square test, the result was again was found to be non-significant which means that the variables perception regarding COVID-19 vaccine and age were not associated with each other. Here also, the null hypothesis that perception and age are not related to each other is accepted (Table 3).

Table 2: Chi-square test for comparing knowledge with age.

Test	Value	df	Asymptotic significance (2-sided)
Pearson Chi-Square	1.283	2	0.527

Table 3: Comparison of attitude with age using Chi-square test.

Test	Value	df	Asymptotic significance (2-sided)
Pearson Chi-Square	2.267	2	0.322

Table 4: Comparison of perception with age using Chi-square tests.

Test	Value	df	Asymptotic significance (2-sided)
Pearson Chi-Square	2.782	2	0.249

DISCUSSION

In present study, on comparing Knowledge and Perception with the age, no statistical significance was obtained hence, indicating that both the quantitative variable, age and qualitative variables are independent of each other in the studied population. Hence, this required rigorous awareness programs for the general public. Our findings are in conformance of many similar studies which have been conducted in various countries as described below. Hasan et al reported that 99.3% of study subjects had knowledge about COVID-19 and the major sources of information were social media, internet sites and mass media and official governmental sites (which constituted 85.2%, 56.5% and 51%).[1] Islam et al noted that one-fourth of the study participants were of the belief that vaccine against COVID-19 was safe.[7] Bhartiya et al found that 79% were readily willing for vaccination whereas only 2% were not in favor of receiving any vaccine. It was also observed that only 2% of studied population reported hesitant behavior when compared to similar studies conducted in Brazil, Australia, Malaysia and Saudi Arabia with a negative attitude score of 12%, 12%, 15% and 16%, respectively.[8]

Jain et al found that 65.7% of studied population sample did not possess adequate knowledge concerning COVID-19 vaccine. 77% of the study respondents were not aware of the process regarding the registration process for receiving vaccine dose. 62% were unaware of the gap

required between two subsequent dosages of vaccines. Only 33.8% demonstrated knowledge regarding the side-effects following vaccination i.e. fever, myalgia, dizziness etc. only 66.3% were aware of the fact that both doses are required for achieving complete immunization. 46.9% of study respondents were of the knowledge concerning continuation of precautionary measures receiving both dosages of vaccine.[9] Elhadi et al reported that 16.3% and 20.7% were of agreement and strong agreement, respectively with any concerns regarding complications related to vaccines. 68.1% of study respondents adhered to wearing of masks. 79.6% were willing for vaccination and considered it in 70% and 50% cases.[10] Alawia et al showed that majority of study participants were aware of COVID-19 transmission while 93.5% were aware of mode of COVID-19 transmission.[11] Kumari reported that a statistically significant ($p<0.001$) number of elderly subjects were willing for vaccination while participants lesser than 45 years of age and belonging to urban areas had safety concerns related to vaccines.[12] Gohel et al in their analysis reported that approximately 40% of study cohort were geriatric age group patients.[2] In contrast, studies conducted by Zhong et al, Abdelhafiz et al and Bhagavathula et al it was observed that, 98.85%, 95.9% and 39% participants, respectively were of knowledge regarding the correct mode of transmission of SARS-CoV-2. [13-15]

Arpitha et al found that 91.84% of the study participants preferred doctor's consultation while 92.9% and 80.5% of study respondents regularly updated their knowledge and preferred wearing of masks when outside their homes, respectively.[16] Geldsetzer et al reported that 35.8% and 81.2% of US and UK residents preferred wearing masks when outside their homes.[17] Hamed et al in their study reported that only 64.7% of study group subjects in Jordan wore masks outside their homes.[18] Singh et al observed that over 70% study respondents demonstrated adequate knowledge regarding symptoms associated with COVID-19, its mode of transmission and measures of prevention. The primary information sources were; social media and television in 83% and 77% of the total population studied, respectively.[19]

Abdelhafiz et al found that the average score of knowledge was 16.39 (out of a total score of 23). 86.9% of the study population exhibited concern towards infection risk. 73% of individuals were eager about getting vaccinated whenever, it was available. Most of the study subjects believed that this disease carries higher risk and mortality among the elderly population and those suffering from chronic systemic diseases.[20] This has been supported by similar studies conducted by Li et al, Liang et al.[21,22] Giao et al in their assessment made observations that approximately two-thirds of health workers possessed sound knowledge and attitude. 57% were aware of the transmission mode, 65.8% had knowledge regarding period of isolation and 58.4% knew about the treatment. 82.3% of the studied cohort had positive attitude pertaining to risk involved in contracting the disease at a personal level while 79.8% knew about the risks of family members getting infected.[23] Al-Hanawi et al showed high knowledge level with mean attitude score of 28.23±2.76 (optimistic attitude) while the mean practice score was 4.34±0.87 (good practices) adopted. They showed that male subjects possessed lesser knowledge and lesser good practice towards this disease when compared to females. Also, older subjects were reported to possess better levels of knowledge along with practice when compared to younger subjects.[24] Okoro et al in their study reported that 87.9% of study participants practiced regular washing of hands using soap and water while 84.4% wore masks when in public places, 83% maintained social distancing and 58.9% avoided crowded places.[25]

CONCLUSION

COVID-19 infection is caused by a novel strain of coronavirus which has been termed as the 'severe acute respiratory syndrome coronavirus 2" or SARS-CoV-2. Present study was conducted to highlight various myths prevailing in general public regarding COVID-19 vaccine and an attempt was made to raise awareness regarding the same by various methods. However, there are certain limitations in this study such as; sample collection was based up on non-probability convenient sampling because of COVID-19 pandemic which led to biased sampling.The time frame was less for conducting a detailed workshop on COVID-19 vaccine facts and myths for the general public. The study focused only on attitude of people towards the vaccine but not on efficacy of the vaccine. It was not assessed that which vaccine does the common public considers to be safe.

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REFERENCES

1. Hasan H, Raigangar V, Osaili T, Neinavaei NE, Olaimat AN, Aolejmat I. A cross-sectional study on university students' knowledge, attitudes and practices toward COVID-19 IN THE United Arab Emirates. Am J Trop Med Hyg. 2021;104(1):75-84.
2. Gohel KH, Patel PB, Shah PM, Patel JR, Pandit N, Raut A. Knowledge and perceptions about COVID-19 among medical and allied health science students in India: An online cross-sectional study. Cl Epidemiol Global Health. 2021;9:104-9.
3. WHO director-general's opening remarks at the mission briefing on COVID-19. Available at: https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-mission-briefing-on-covid-19---16-april-2020. Accessed on 20 June 2021.
4. Ahmed SS. The coronavirus disease 2019 (COVID-19): a review. J Adv Med Med Res. 2020; 36:549-56.

5. Suman, Aggarwal AK, jain B, Bhadoria AS, Gawande K, Jha N. Knowledge and practice regarding pentavalent vaccination and use of multidose open vial policy: Assessment of mothers and health workers of a rural area of North, Haryana. Int J Med Publ Health. 2020;10(3):110-3.
6. Lazarus JV, Ratzan SC, Palayew A, Gostin LO, Larson HT, Rabin K et al. A global survey of potential acceptance of a COVID-19 vaccine. Nature Med. 2021;27:225-8.
7. Islam MS, Siddique AB, Akter R, Tasnim R, Sujan MSH, Sujan SH, et al. Knowledge, attitudes and perceptions towards COVID-19 vaccinations: a cross-sectional community survey in Bangladesh. medRxiv 2021;2021:e4523541.
8. Bhartiya S, Kumar N, Singh T, Murugan S, Rajavel S, Wadhwani M. Knowledge, attitude and practice towards COVID-19 vaccinnation acceptance in West India. Int J Comm Med Publ Health. 2021;8(3):1170-6.
9. Jain V, Singh S, Singh V, Jain n. Knowledge, perception and preparedness towards corona virus vaccine among Indian residents: A cross-sectional survey. J Med dent Sci Res. 2021;8(5):9-17.
10. Elhadi M, Alsoufi A, Alhadi A, Hmeida A, Alshareea E, Dokali M, et al. Knowledge, attitude and acceptance of healthcare workers and the public regarding the COVID-19 vaccine: a cross-sectional study. BMC Oral Health. 2021;21:955-76.
11. Alawia R, riad A, Kateeb E. Knowledge and attitudes among dental students about COVID-19 and its precautionary measures: a cross-sectional study. J Oral Med Oral Surg. 2021;27:17-24.
12. Kumara A, Ranjan P, Chopra S, Kaur D, Kaur T, Upadhyaya AD, et al. Knowledge, barriers and facilitators regarding COVID-19 vaccine and vaccination programme among the general population: A cross-sectional survey from one thousand two hundred and forty-nine participants. Diabetes Metab Syndr: Clin Res Rev. 2021;15:987-92.
13. Zhong BL, Luo W, Li HM. Knowledge, attitudes and practices towards COVID-19 among Chinese residents during the raid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. Int J Biol Sci. 2020;16(10):1745-52.
14. Abdelhafiz AS, Mohammad Z, Ibrahim ME. Knowledge, perceptions and attitudes of Egyptians towards the novel coronavirus disease (COVID-19). J Comm Health. 2020; 45:881-90.
15. Bhagavathula AS, Shehab A. The story of mysterious pneumonia and the response to deadly novel coronavirus (2019-nCoV): so far. New Emirates Med J. 2020;1(1):7-10.
16. VS Arpitha, Patil PS, NV Pradeep. Assessment of knowledge and practice towards COVID-19 amid inhabitants of Karnataka. Int J Med Sci Publ Health. 2020;9(5):300-5.
17. Geldsetzer P. Knowledge and perceptions of COVID-19 among the general public in the United States and the United Kingdom: A cross-sectional outline survey. Ann Intern Med. 2020;M20-0912.
18. Hamed A, Nedai A, Asma'a AM, Mohammad AL, Amin A, Hani AI. COVID-19: Knowledge, attitude and practice among medical and non-medical university students in Jordan. J Pure Appl Microbiol. 2020;14:17-24.
19. Singh JP, seroda A, gupta SD. Assessing the knowledge, attitude and practices of students regarding the COVID-19 pandemic. J Health Manage. 2020;22(2):281-90.
20. Abdelhafiz AS, Mohammad Z, Ibrahim ME, Ziady HH, Alorabi M, Ayyad M, et al. Knowledge, perceptions and attitude of Egyptians towards the novel coronavirus disease (COVID-19). J Comm Health. 2020;45881-96.
21. Li LQ, Huang T, Wang YQ. Novel coronavirus patients' clinical characteristics, discharge rate and fatality rate of meta-analysis. J Med Virol. 2020;10:1-7.
22. Liang W, Guan W, Chen R. Cancer patients in SARS-COv-2 infection: A nationwide analysis in China. Lancet Oncol. 2020;21(3):335-7.
23. Giao H, han NTN, Khanh TV, Ngan VK, Tam VV, An PL. Knowledge and attitude towards COVID-19 among healthcare workers at District 2 hospital, Ho Chi Minh City. As Pac J Trop Med. 2020;13(6):260-5.
24. Al-Hanawi MK, Angawi K, Aishareef N, Qatlan AMN, Helmy HZ, Abudawood Y et al. Knowledge, attitude and practice toward COVID-19 among the public in the kingdom of Saudi Arabia: A cross-sectional study. Front Publ Health. 2020;8:45-9.
25. Okoro J, Ekeroku A, Nweze B, Odionye T, Nkire J, Omoha M, et al. Attitude and preventive practices towards COVOD-19 disease and the impact of awareness training on knowledge of the disease among correctional officers. Emerald Open res 2020;5:51-63.

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