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Knowledge Attitude and Practice among Health Care Professionals on COVID-19 Vaccine in Nepal: A Cross-sectional Online Survey

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ABSTRACT

Introduction: Vaccination is the most important preventive measure to control the outbreak of the COVID-19 pandemic throughout the world. Health care professionals face increased risk from exposure to COVID-19 in their work setting and thus, considered to be the primary recipients of vaccination. The main aim of this study was to gauge the Knowledge Attitude and Practice (KAP) about the planned vaccination campaign among health care workers in Nepal.

Methods: A nationwide web-based cross-sectional survey was done regarding the knowledge, attitude, and practice of COVID-19 vaccination in Nepal among 270 health care workers from February to March 2021. Data from Google forms were exported in Excel-13. Cleaned data were analyzed using STATA v15.

Results: A total of 270 health care professionals participated in the survey in which the mean KAP score was 12.75±2.85 with about 80% having fair KAP score about COVID-19 vaccines. There was a statistically significant association between chances of the score being poor to fair in KAP scoring with the level of education of participants, the occupation of the participants, and the first dose of vaccine receiving status.

Conclusions: The majority of health care professionals in Nepal have higher acceptance and positive attitude and practice towards the COVID-19 vaccination. Lower level of education and health care workers other than the doctor, nurses, and paramedics had lower odds of fair KAP score regarding COVID-19 vaccination.

Keywords: *COVID-19; Health Personnel; Nepal; Vaccines.*

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INTRODUCTION

Throughout the world, the vaccination against the coronavirus is in full swing yet the vaccine acceptance rate being variable in different parts of the world. Most of the studies from different countries have shown overall low acceptance rate (below 60%) albeit 60-75% individuals of a community needing to be immunized to halt the forward transmission of the virus.[1] This has posed great challenge to fulfil the objective of pandemic control.

In Nepal, the government procured and started first vaccination against COVID-19 using ChAdOx1 nCoV-19 Corona Virus Vaccine [(Recombinant), AstraZeneca (UK), produced by the Serum Institute India and marketed as COVISHIELD vaccine] targeting healthcare professionals and front line pandemic responders involved in the COVID-19 as the first priority.[2]

The main objective of this study was to assess the Knowledge, Attitude and Practice pattern and vaccination status among the health care workers (HCWs).

METHODS

This study was a nationwide, web-based cross-sectional survey on knowledge, attitude and practice regarding COVISHIELD among health professionals during the COVID-19 pandemic in Nepal. For data collection, semi-structured questionnaire designed by COVID-19 Crisis Management Committee (CCMC) was used using the online google form. The data for the survey were collected via online google form distributed among HCWs via social platform from February to March 2021.

Informed consent was taken from participants at the beginning of the questionnaire. This study was carried out after IRC approval from NAIHS-IRC (Ref. no: 415). Consent form mentioning aims and objective of the study was attested in first page of Google form. All participants who participated in the study were supposed to consent for the study.

Target population were health care workers (doctors, nurses, paramedics and others) of Nepal. Calculated sample size was 270. Convineninet sampling technique was used.

This study used the semi-structured questionnaire designed by a team of doctors from various specialties working as an expert members in COVID-19 Crisis Management Center (CCMC) along with additional questionnaire of socio-demographic profile. Socioeconomic and demographic variables such as age, gender, education level, marital status, address, occupation, working institute, duration of work, source of information about vaccine, vaccination status were included in the survey.

The appropriate response on KAP facets were scored as 1 and inappropriate as 0 (as specified in annotated questionnaire). Appropriate response to question were marked by the CCMC team. Total possible score ranged from 0-18 and 60% and above on summation score was taken as fair knowledge and less than 60% as poor score. The dependent outcome was score category and independent variables were baseline characteristics. Binary logistic regression was performed considering outcome of interest as fair score (1) over poor score (0).

The data of the survey were exported into Microsoft Excel and then imported, appropriately organized and analyzed using STATA v15. For all the variables, a univariate analysis was performed to assess the distribution of each variable in frequency and the percentage to summarize categorical variables. The statistical significance between the dependent variables with the independent variables using Chi-square analysis and binary logistic regression performed considering outcome of interest as fair score (1) over poor score (0).

RESULTS

In this survey, a total of 270 health care professionals participated. The mean age of the participants was 31.47±7.05 years and 52.2% (n=141) of participants were males and 47.8% (n=129) were females. The majority [46.3% (n=125)] of participants had bachelor level education, 60.0% (n=162) were from the Bagmati province and 59.6% (n=161) were in the married status. Among 270 participants, 66.3% (n=179) were working in the government institutions and most [42.2% (n=114)] had 1-5 years of working experience. Out of the 270 participants, 37% (n=100) participants were doctors followed by 31.1 %(n=84), nurses and 21.5% (n=58) paramedics. Among 270 participants, 63.0 %(n=170) came to know about vaccine via social media sources while the remaining knew about it from their working institution as shown in **Table 1**.

Table 1. Baseline characteristics of individuals (n=270)

Baseline characteristics		n(%)
Sex	Female	129 (47.8)
	Male	141 (52.2)
Education	Bachelor	125 (46.3)
	Intermediate	68 (25.2)
	Master and above	65 (24.1)
	SEE and below	12 (4.4)
Permanent address	Bagmati Province	162 (60.0)
	Gandaki Province	22 (8.1)
	Karnali Province	4 (1.5)
	Lumbini Province	12 (4.4)
	Province 1	26 (9.6)
	Province 2	26 (9.6)
	SudurPaschim	18 (6.7)
Marital status	Divorcee	1 (0.4)
	Married	161 (59.6)
	Unmarried	108 (40.0)
Institute	Government	179 (66.3)
	Non-Government	91 (33.7)
Occupation	Doctor	100 (37.0)
	Nurse	84 (31.1)
	Others	28 (10.4)
	Paramedics	58 (21.5)
Duration of work	> 10 years	84 (31.1)
	1 to 5 years	114 (42.2)
	5 to 10 years	51 (18.9)
	Less than 1 year	21 (7.8)
Source of information about vaccine	Social Media	170 (63.0)
	Work Place	100 (37.0)
Vaccination status	First Dose	231 (85.6)
	Not Yet vaccinated	39(14.4)

In this study, 90.4% (n=244) of the participants thought that it was necessary to get vaccinated against COVID-19 while only 1.9 % (n=5) thought that vaccine was not necessary. In the survey, 64.1% (n=173) of the participants responded positively to the need of vaccinating everyone for protection against COVID-19 while 32.2% (n=87) participants thought that COVID-19 vaccine was needed to those who are recommended. Among 270 participants, 51.9 % (n=140) had idea that the vaccination did not impart protection immediately following the first dose of the vaccine while 39.6% (n=107) responded that it might be protective immediately. In the survey, 60.0% (n=162) of the participants thought that the COVID-19 vaccine was safe while 38.1% (n=103) did not know about its safety. Among 270 participants, almost all [97.8% (n=264)] responded that we had to follow the recommended preventive measures during as well as after the COVID-19 vaccine. The majority [83.0% (n=224)] of the participants responded for the necessity of the vaccination even if previously infected yet recovered presently. Out of the total participants, 86.3% (n=233) of them knew that two doses of the COVID-19 vaccine was required to confer

high immunity and only 16.3% (n=44) of the participants thought that the vaccine's efficacy was >80% whereas 25.6% (n=69) were having doubt about the efficacy of the vaccine. In KAP questionnaire regarding COVISHIELD, 69.3% (n=184) participants were aware about the cold chain requirement (2 to 8 degrees) for storage of COVISHIELD vaccine and almost similar [68.1 % (n=184)] participants had some idea about the use of COVISHIELD vaccine in countries other than Nepal and India.

Almost all [90.4% (n=244)] participants responded that they would recommend the vaccine to their colleagues. To contain the COVID-19 pandemic, more than half [55.9% (n=151)] of the participants thought that the vaccination campaign would be helpful while 43.0% (n=116) thought it might be helpful. Out of all

participants, majority [88.1% (n=238)] of the participants considered that the COVID-19 vaccine campaign is necessary for Nepal. Among 270 participants, 63.3% (n=171) responded that they would vaccinate themselves even if they had to pay for it whereas 14.1% (n=38) participants responded that they would not get vaccinated if they had to pay. Among all participants, almost all [96.7% (n=261)] considered social-physical distancing, hand hygiene and wearing masks should be continued even after COVISHIELD vaccination. In this study, 49.6% (n=134) participants considered that drinking alcohol on the day of vaccination was prohibited whereas 32.2% (n=87) did not know whether drinking alcohol on the day of vaccination was prohibited or not. The mean KAP score of the study was 12.75±2.85 as in **Table 2.**

Table 2. KAP Variables about Vaccination

KAP Variables about Vaccination		n(%)
Is it necessary to get vaccine against Covid-19	Don't Know	21 (7.8)
	No	5 (1.9)
	Yes	244 (90.4)
Do everyone need to be vaccinated against Covid-19?	Everyone	173 (64.1)
	Not required	8 (3.0)
	Only those who are recommended	87 (32.2)
	Other	2 (0.7)
Does this vaccine protect you immediately after you receive the first dose?	May Be	107 (39.6)
	No	140 (51.9)
	Partly	3 (1.1)
	Yes	20 (7.4)
Is this vaccine against Covid-19 safe?	Don't Know	103 (38.1)
	May be	2(0.7)
	No	3 (1.1)
	Yes	162 (60.0)
Possible Contraindications$	All of the above	207 (76.7)
	Different in combination	51 (18.9)
	None of the above	12 (4.4)
What are the preventive measures you need to take during and after vaccination?	All of the above	264 (97.8)
	Masks	3 (1.1)
	Masks; Hand Hygiene	2 (0.7)
	Masks; Hand Hygiene; Avoid crowd place	1 (0.4)
Is it necessary to get vaccinated if you are previously infected and recovered?	Don't know	33 (12.2)
	No	13 (4.8)
	Yes	224 (83.0)
	Don't know	24 (8.9)
	One	6 (2.2)

How many doses are required for complete vaccination?	Three	7 (2.6)
	Two	233 (86.3)
What is the vaccine effectiveness known till now?	<50%	9 (3.3)
	> 80%	44 (16.3)
	50% to 60%	17 (6.3)
	61% to 70%	82 (30.4)
	71% to 80%	49 (18.1)
	Don't know	69 (25.6)
What is the required cold chain storage for COVISHIELD?	- 30 degree	8 (3.0)
	- 70 degree	18 (6.7)
	2 to 8 degree	187 (69.3)
	Don't know	57 (21.1)
Is COVISHIELD vaccine used in other countries apart from India and Nepal?	Don't know	58 (21.5)
	No	28 (10.4)
	Yes	184 (68.1)
Will you recommend your colleagues to get vaccinated	Don't get vaccinated	3 (1.1)
	don't know	23 (8.5)
	Yes	244 (90.4)
Will this vaccination campaign help us to overcome the COVID-19 pandemics	Maybe	116 (43.0)
	No	3 (1.1)
	Yes	151 (55.9)
Is this vaccination campaign necessary for Nepal	Maybe	29 (10.7)
	No	3 (1.1)
	Yes	238 (88.1)
If you have to pay for the COVISHIELD vaccines, will you vaccinate yourself?	Maybe	61 (22.6)
	No	38 (14.1)
	Yes	171 (63.3)
Social distance, hand hygiene and masks will be necessary after COVISHIELD vaccination	Don't know	7 (2.6)
	No	2 (0.7)
	Yes	261 (96.7)
Drinking Alcohol on the day of vaccination is prohibited	Don't know	87 (32.2)
	False	49 (18.1)
	True	134 (49.6)
KAP Score (Mean: 12.75±2.85)	Poor (<60%)	54 (20.0)
	Fair (>/=60%)	216 (80.0)

$^{\$}$less than 18 years; Pregnancy and lactating mother; People with severe disease, People with bleeding disorder were listed

In the study, there was statistically significant association between chances of the scoring poor to fair in KAP scoring with the level of education of participants (p-value=0.00), the occupation of the participants (p-value=0.00) and the first dose of vaccine received status (p-value=0.02) as in **Table 3.** The chi-square analysis of independent variables had revealed statistically significant correlation between the education level, occupation type and first dose vaccination status with the KAP scoring of poor/fair. But since each of these three variables had different strata of the levels of the participants, binary logistic regression analysis was performed to analyze the statistically significant odds of KAP score fair to poor. The binary logistic regression analysis between KAP score and the independent variables showed that SEE

and below educated has 95% lower odds of having fair KAP score in reference with bachelor educated (OR, 0.051; 95% CI, 0.006-0.433). Similarly, other categories of occupation have significant lower odds of having fair KAP score in reference to doctors (OR, 0.083; 95% CI, 0.025-0.284). Rest of the outcomes were not significant **(Table 4).**

Table 3. Cross tabulation of independent variables across dependent using Chi-square

	Variables	Poor n(%)	Fair n(%)	p-value
Sex	Female	21 (16.3)	108 (83.7)	0.14
	Male	33 (23.4)	108 (76.6)	
Education	Bachelor	16 (12.8)	109 (87.2)	<0.01*
	Intermediate	18 (26.5)	50 (73.5)	
	Master and above	10 (15.4)	55 (84.6)	
	SEE and below	10 (83.4)	2 (16.6)	
Permanent address	Bagmati Province	34 (20.9)	128 (79.1)	0.63(FET)
	Gandaki Province	4 (18.2)	18 (81.8)	
	Karnali Province	1 (25.0)	3 (75.0)	
	Lumbini Province	3 (25.0)	9 (75.0)	
	Province 1	7 (26.9)	19 (73.1)	
	Province 2	2 (7.6)	24 (92.4)	
	SudurPaschim	3 (16.7)	15 (83.3)	
Marital status	Divorcee	1 (100.0)	0 (0.0)	0.12 (FET)
	Married	35 (21.7)	126 (78.3)	
	Unmarried	18 (16.7)	90 (83.3)	
Institute	Government	41(22.9)	138 (77.1)	0.09
	Non-Government	13 (14.3)	78 (85.7)	
Occupation	Doctor	11 (11.0)	89 (89.0)	<0.01*
	Nurse	10 (11.9)	74 (88.1)	
	Others	18 (64.3)	10 (35.7)	
	Paramedics	15 (25.9)	43 (74.1)	
Duration of work	1 to 5 years	22 (19.3)	92 (80.7)	0.64
	5 to 10 years	8 (15.7)	43 (84.3)	
	> 10 years	18 (21.4)	66 (78.6)	
	less than 1 year	6 (28.6)	15 (71.4)	
Source of information about vaccine	Multimedia	35 (20.6)	135 (79.4)	0.75
	Working Place	19 (19.0)	81 (81.0)	
Vaccination status	First Dose	41 (17.7)	190 (82.3)	0.02*
	Not Yet vaccinated	13 (33.3)	26 (66.7)	

significant taken at p<0.05; FET: Fischer exact test

Table 4. Binary logistic regression

KAP Score	Adjusted OR	Std. Err.	z	P>|z|	[95% CI]
Sex					

Female®						
Male	1.05	0.57	0.08	0.93	0.37	3.0
Education						
Bachelor®						
Intermediate	0.47	0.22	-1.57	0.12	0.18	1.20
Master and above	0.97	0.57	-0.01	0.10	0.32	3.09
SEE and below	0.05	0.05	-2.73	0.00	0.00	0.43*
Permanent address						
Bagmati province®						
Gandaki Province	0.97	0.67	-0.05	0.96	0.25	3.73
Karnali Province	0.77	0.99	-0.20	0.84	0.06	9.49
Lumbini Province	1.3	1.45	0.29	0.77	0.17	11.02
Province 1	0.89	0.54	-0.19	0.85	0.27	2.94
Province 2	3.90	3.46	1.54	0.12	0.69	22.14
SudurPaschim	1.37	1.04	0.42	0.67	0.31	6.10
Marital status						
Divorcee®	1					
Married	0.98	0.55	-0.04	0.97	0.32	2.93
Unmarried	1	(omitted)				
Institution category						
Government®						
Non-Government	1.76	0.85	1.17	0.24	0.68	4.53
Occupation						
Doctor®						
Nurse	1.68	1.18	0.71	0.48	0.41	6.69
Others	0.08	0.05	-3.98	0.00	0.02	0.28*
Paramedics	0.83	0.53	-0.29	0.77	0.23	2.89
Duration in service						
1 to 5 years®						
5 to 10 years	1.01	0.66	0.01	0.99	0.28	3.63
> 10 years	0.29	0.22	-1.66	0.10	0.07	1.25
less than 1 year	0.87	0.60	-0.20	0.84	0.23	3.35
Source of vaccine information						
Multimedia®						
Working Place	1.04	0.43	0.10	0.92	0.47	2.33
Vaccination status						
First dose received®						
Not Yet vaccinated	0.45	0.22	-1.59	0.11	0.17	1.20
Current age in years	1.08	0.06	1.34	0.18	0.96	1.21
Constant	0.92	1.60	-0.05	0.96	0.03	27.51

*®=Reference, *significant taken at p<0.05 with 95% CI*

DISCUSSION

The vaccination campaign plays a crucial role in controlling pandemics and outbreaks. The success of any vaccination campaign depends on its acceptance of the targeted group or general population and the acceptance rate of the vaccination is greatly influenced by the KAP of the target population. Since, the beginning of the COVID-19 pandemic, the vaccine against the virus has emerged as a potential tool for the control of the pandemics along with other preventive measures. With this aim, a number of the vaccines against COVID-19 were studied, researched and tried and ultimately produced via the fast-track research and testing pipeline. There are numerous studies from all around the world regarding acceptance rate of the vaccine against COVID-19 disease. In this study, most (90.4%) of the participants stated the necessity to get vaccinated against the COVID-19 disease and most (85.6%) of the participants had received the first dose of COVISHILED vaccine reflecting the higher acceptance

rate of the vaccine against COVID-19. The vaccine acceptance rate of this study was comparable to vaccine acceptance rate of 91.3% from the study by Wang J et al from China[3] while higher than the vaccine acceptance rate of 57% in a survey done by Fisher KA et al among US adults[4] and that of 36.8% in a study by Al-Qerem WA et al. in Jordan.[5] The cross-sectional done by Nzaji MK, et al. among healthcare workers in the Democratic Republic of the Congo regarding acceptability of vaccination against COVID-19 found that only 27.7% of the health care worker were vaccinated against COVID-19[6] which was way below in comparison to the vaccine acceptance rate of our study and well below the suggested target immunization rate of 60–75% individuals of a community. In the study by Sarasty O, et al. done in Ecuador, the vaccine acceptance rate showed 97% higher than in other studies.[7] The higher rate of the vaccine acceptance of this study could be due to the fact that the participants were health care professionals and were the main target population in the vaccination campaign and they had a direct role in vaccination campaign and COVID-19 patient management.

In this study, more than sixty percent of participants stated that the vaccination was necessary for everyone while one third of them thought the vaccine should be given to those who would be recommended. In study by Wang J, et al. done among adult Chinese living in mainland China, majority (80.6%) of participants considered to get vaccinated if the doctors recommend it.[3] More than 51.9% of the participants of this study had the idea that the first dose of the vaccine would not protect them immediately following the vaccination. In the same study, the majority (60%) of the participants considered that the COVID-19 vaccine was safe while about one third (38.1%) did not have any idea regarding the safety of the vaccine. In a study by Fisher KA, et al. among the participants who were unsure about vaccination, almost one third (29.4.%%) had specific concerns regarding vaccine's side effects and safety.[4] In our study, almost two-third (63.3%) of the participants showed their willingness to pay for the vaccine while 14.1% of them don't think that they will be paying for it. In a survey, Sarasty O, et al. found that majority (85%) of the participants were showing their willingness to pay for the vaccine.[7] In this study, majority (80%) of the participants had fair KAP score with mean value of 12.75±2.85. The study showed that the SEE and below level of the education, occupation other than doctor, nursing and paramedics were associated with increased odds of the low KAP scoring thus playing a role in not achieving 100% vaccine acceptance rate. In a systematic review by Sallam M in 2021 regarding the COVID-19 vaccine hesitancy worldwide, it showed that the rate of vaccine acceptance was higher in Asia, Latina America and African territory while lower in North America, Middle East, European territory. Most of the included studies in Sallam M's review showed that the main reason for the vaccine hesitancy was related to lower confidence in the vaccine safety and its effectiveness.[1]

This study showed high acceptance and positive attitude and practice towards the COVID-19 vaccination campaign among the participants reflecting the recognition of the importance of vaccines in controlling the pandemic. However, most of the participants were from Bagmati Province which could impact the generalizability of our study because of decreased representation in areas where there is poor access to online survey forms like Karnali Province. The use of online format makes it difficult for health care professionals who have limited knowledge about technological devices to register their finding.

CONCLUSIONS

Most of health care professionals in Nepal have higher acceptance and positive attitude and practice towards the COVID-19 vaccination. Lower level of education, and health care workers other than doctor, nurses and paramedics had lower odds of fair KAP score regarding the COVID-19 vaccination.

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