ISSN- 0301-1216
Indian J. Prev. Soc. Med. Vol. 53, No.1, 2022

ORIGINAL ARTICLE

Knowledge Attitude and Practices amongst Nursing Professionals of Central India during COVID-19 pandemic: A Cross Sectional study

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ABSTRACT

Introduction: Nurses being important frontline workers can also be a part of infection transmission chain which can be prevented by assessing gaps in their KAP. This study aimed to assess the awareness regarding COVID-19, attitude and coherence to the existing practices amongst nursing professionals of Madhya Pradesh during COVID -19 pandemic. **Methods:** A questionnaire was prepared based on the guidelines of WHO/ICMR and was circulated via internet to nursing professionals working in either government /private sector medical institutes between 1st May and 30th June 2020. Knowledge, attitude, practices and stress levels were assessed. **Results:** Nursing professionals from 35 districts of Madhya Pradesh participated and the average age was 29 years**.** The study showed average knowledge score (56% correct rate) with majority showing optimistic attitude and reasonable practices in fight against the pandemic. Health care training showed significant positive correlation with KAP. Public sector staff excelled more on knowledge scale, showed more positive attitudes and safer practices. Pessimistic attitudes and inauthentic practices showed significant correlation with poor knowledge scores. Majority of the nurses (78%) showed moderate to severe stress.

Key-words: COVID-19; and Practice; Attitudes; Knowledge; Nursing Staff; Personal Protective Equipment.

Introduction

WHO declared COVID-19, a public health emergency of international concern since 30th January 2020 and called for the collaborative efforts of all countries to prevent its rapid spread.[1] First case of SARS–CoV -2 in Madhya Pradesh was reported on March 20th 2020 and since then there has been an exponential rise in number of cases as well as deaths, and is amongst the worst affected states of India.[2] Amid this escalating crisis, awareness about the prevention and spread of pandemic is important, especially in health care workers. KAP theory explains significance of adherence to the control measures for a successful outcome which is largely affected by knowledge, attitude and practices (KAP) towards COVID-19. [3,4]

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Submission	22.02.2022	Revision	03.03.2022	Accepted	15.03.2022	Printing	29.03.2022

Prior Publication*: Nil*; Source of Funding:* Nil; *Conflicts of Interest*: None , *Article # 411

Nurses play an important role in imparting health education and as they remain in close contact with infected people, they can also be a part of infection transmission chain.[5] This study is therefore an attempt to assess knowledge, attitude and practices of nursing professionals working in Madhya Pradesh towards COVID-19.

Materials and Methods

This cross-sectional study was conducted from May 1st, 2020 to June 30th, 2020 during the National lockdown declared by the Government of India. Since it was not feasible to do a community-based sampling, we decided to collect the data online.

Nursing personnel working in either public or private sector, institutional setups or hospital setups of Madhya Pradesh during study period were included whereas those who were on leave /not working or who got infected with COVID-19 during the study period were excluded. Responses completed and submitted the till the stipulated date, i.e. 30th June 2020 were assessed.

According to guidelines for clinical and community management of COVID-19 by WHO and ICMR, COVID-19 knowledge questionnaire was developed. Questions were of true /false, yes/no/don't know and multiple choice questions. Questionnaire was validated for use by 10 Professors of different specialities, working in various medical institutions across India.

After obtaining the required permission from the institutional ethics committee, prepared questionnaire was deployed online using Google forms and circulated via social media, so as to reach the participants efficiently. Links were forwarded through the doctor attached to the concerned heath care set up and consent from each participant was taken before access of questionnaire.

The questionnaire consisted of two parts: (a) Demographics and, (b) KAP. Demographic variables were grouped as : age as <40 and ≥40 years), educational qualifications (as below graduate and graduate or above), gender (male/female), employment sector (public sector / private sector), status of COVID-19 training (trained /untrained), experience of working in dedicated COVID wards (yes/no) and source of updating information as (reliable/ doubtfully reliable) which included government official websites and healthcare training as reliable; social media applications/television news channels/Whatsapp and others as doubtfully reliable sources.

Knowledge was assessed on 10 questions (K1-K10): 3 questions had to be answered on a true/false basis and 7 were multiple choice type questions with an additional "Don't know" option. Each correct answer was assigned 1 point and incorrect/ unknown answer was assigned 0 points. The total knowledge score ranged from 0 to 10, with a higher score denoting better knowledge and graded as Poor (0 to 5) and Good (6 to 10).Attitudes towards COVID-19 were measured by 3 questions (A1-A3), practices by 4 questions (P1-P4) and stress levels by 2 questions (S1-S2) (Table-1).

Frequencies of correct knowledge answers, various attitudes and practices were described. Knowledge scores, attitudes and practices of different study groups, made according to demographic characteristics were compared by *t* test, one-way analysis of variance (ANOVA), or Chi-square test as appropriate. Multivariable linear regression analysis using all the demographic variables as independent variables and knowledge score as the outcome variable was conducted to identify factors associated with knowledge. Similarly, logistic regression analyses were used to identify factors associated with attitudes and practices. Odds ratios (ORs) and their 95% confidence intervals (CIs) were used to quantify the associations between variables and KAP. A data analysis was conducted using IBM SPSS software version 20 (IBM, Chicago, IL, USA). The statistical significance level was set at $P < 0.05$.

Table -1: Questionnaire for knowledge, attitude and practices towards COVID -19

Knowledge		Options
Knowledge	**K1:** Fever is the most common symptom of COVID-19	True/False/Don't Know
	K2: Wearing mask is superior to frequent hand washing in preventing spread	True/False/Don't Know
	K3: COVID-19 positive mother can continue breastfeeding her baby if her medical condition permits, using mask and hand hygiene	True/False/Don't Know
	K4: Percentage alcohol used in hand rub	≤40 / ≥70 /doesn't matter/Don't Know
	K5: Mask needed in non COVID ward	N95/Triple layer surgical/cotton/Don't know
	K6: Disinfectant agents used for cleaning are	1% sodium hypochlorite/70% ethyl alcohol/ Both/ Don't Know
	K7: Recommended dose of HCQ prophylaxis in HCW	100 mg weekly/200 mg weekly/400mg weekly/ Don't know
	K8: Corona virus can stay on plastic surface for how many days	1 day/2 day/3 days/Don't know
	K9: Disposal of contaminated PPE should be done in which bag	Yellow/Red/Black/Don't know
	K10: Aerosol generating procedures are:	Invasive ventilation/ CPR/ Tracheostomy/ Don't Know
Attitude	**A1:** Would you volunteer yourself for surveillance/ sampling activities	Yes/No/may be
	A2: Would you volunteer for convalescent plasma donation, if you contract COVID-19	Yes/No/may be
	A3: What is your future prediction for this pandemic	End soon by 2020/remain endemic always/ repeated waves will come/ can't say anything`
Practices	**P1:** Are you taking/planning to take HCQ prophylaxis	Yes/No
	P2: Do you wear mask every time before leaving from home	Yes/No
	P3: Have you visited any nonessential place after lockdown declared	Yes/No/may be
	P4: Are you using/planning to use Arogya Setu	Yes/No/Already using
Stress Scale	**S1:** How much concerned you are about getting infected in the coming months.	Highly concerned/somewhat concerned/ Not concerned
	S2: On a scale of 0 to 10, how much stressful you are with this Pandemic?	Mild stress (0 to 3)/moderate stress (4 to 7)/ severe stress (8 to 10)

Results

A total of 614 responses collected over a period of two months. Participants from 35 districts (out of total 52, 67%) of Madhya Pradesh responded amongst which majority of respondents were from the capital city of Bhopal (32.6 %). Average age of the respondents was 29 years (range 25-56 years). Distribution as per various demographic variables is mentioned in Table 2.

Table-2: Demographic characteristics of participants and knowledge score regarding COVID-19

Demographic characteristics		Number of participants		Knowledge score	P value
		No.	%	Mean ± SD	
Gender	Male	75	12.2	5.59±1.87	0.945
	Female	539	87.8	5.60±1.90	
Age	<30	446	72.6	5.43±1.96	0.004
	30 to 39	135	22	6.04±1.68	
	40 to 49	27	4.4	6.04±1.67	
	≥50	6	1.0	6.33±0.82	
Educational qualifications	ANM	214	34.9	5.82±1.84	0.001
	GNM	11	1.8	5.09±1.87	
	Graduate	313	51	5.36±1.88	
	Postgraduate	60	9.8	6.30±1.99	
	Doctorate	16	2.6	6.0±1.89	
Employment sector	Public Sector Institute/ Medical College	261	42.5	6.88±1.85	0.001
	Private Sector Institute/ Medical College	142	23.1	4.80±1.68	
	Public Sector Hospital	84	13.7	5.86±1.97	
	Private Sector Hospital	119	19.4	5.73±1.97	
	Standalone clinics	8	1.3	6.25±1.75	
Training attended for Covid-19	Yes	297	48.4	5.78±1.83	0.04
	No	317	51.6	5.46±1.94	
Experience of working in Covid dedicated areas	No	331	53.9	5.61±1.96	0.01
	Yes	283	46.1	5.97±1.83	
If yes, specify	Triage/holding	14	2.3	5.07±1.82	0.31
	General isolation ward	85	13.8	5.76±1.82	0.52
	Critical care	68	11.1	5.75±1.62	0.14
	OPD	37	6	5.73±1.995	0.73
	Surveillance teams	5	0.8	7.00±1.871	0.11
	Sampling team	54	8.8	6.02±1.79	0.15
	Quarantine centers	31	5	5.10±1.68	0.16
	Operation theatres	14	2.3	4.93±1.817	0.20
	Others	1	0.2	2.00	0.16
Relative with history of Covid-19	Yes	68	11.1	5.57±1.93	0.90
	No	546	88.9	5.60±1.89	
Source of information updates	Government websites	192	31.3	5.90±1.99	0.008
	Social media app	182	29.6	5.09±1.69	0.001
	Webinars/zoom/you tube	16	2.6	5.69±1.35	0.894
	Television and news	119	19.4	5.55±1.99	0.79
	Rely on other person knowledge	16	2.6	6.25±2.82	0.19
	Training from health professionals	92	15	5.96±1.64	0.049

The mean COVID-19 knowledge score was 5.60 ±1.899. Good knowledge (score 6-10) regarding COVID 19 was observed in 52.1% of the respondents whereas poor score i.e 1-5, was observed in 47.9%. Mean knowledge score was significantly higher in respondents with older age, higher educational qualification, public sector employees, trained

personnel, those having experience of working in COVID dedicated areas and those who used reliable sources to update knowledge (Table- 2).

To our surprise, participants using social media applications also scored well in knowledge analysis (P=0.001). multiple linear regression analysis was done amongst grouped demographic data with knowledge score of ≥ 6. It showed significant positive correlation (P<0.05) with public sector employees [0.314(SE-0.083)], attendees of COVID training [0.42(SE-0.081)], experienced staff of COVID dedicated areas [0.21(SE-0.076)] and participants using reliable sources of information [0.279 (SE- 0.085)].

264 (43%) respondents showed absolute positive response for surveillance/sampling activities whereas 222 (36%) were unclear. Average negative attitude rate was around 17%, showing unwillingness of surveillance activities (20.8%), unwillingness for plasma donation (11.4%), and belief that COVID-19 is going to stay with us as endemic disease always (18.5%) [Table- 3]. The positive attitude of volunteering for surveillance/sampling activities was seen significantly more in public sector staff, trained staff, dedicated staff of COVID units, in comparison to their counterparts. Multiple logistic regression analysis across various demographic factors found that odds of unwillingness for screening/surveillance activities was significantly higher in elder participants (OR-2.91), untrained staff (OR-1.54), participants using unreliable source of information (OR-1.61), private sector staff (OR-0.4) and poor knowledge score (OR-6.42). 398 (65%) were ready to donate convalescent plasma whenever in need whereas 148 (28%) gave an equivocal response. Regression analysis showed odds of unwillingness to donate convalescent plasma was significantly higher in participants using unreliable source of information (OR-0.54) and poor knowledge score (OR-2.07).

217 (35%) of the respondents showed optimism, believing the end of pandemic would be soon, 99 (16%) reckoned repeated waves of infection realizing the situation seen in other countries, 114 (18.5%) were pessimistic with the belief of COVID to stay with us always and 184(30%) opted to remain unopinionated. The observed difference in the future prediction of pandemic significantly differed across age and training status. Odds of perception of disease to be endemic always was significantly higher in older individuals (OR-3.479) and participants with poor knowledge score (OR-1.969) [Table- 3].

Apparently unauthentic practices were seen in around 1/4thof the participants, as 48% were not willing for chemoprophylaxis, 8.4% were not wearing masks while going outside, 30.7% visited nonessential places breaking lockdown norms and 11.5% were not willing for using 'Aarogya Setu' contact tracing phone application [Table- 4].

Hydroxychloroquine prophylaxis was opted more by undergraduates, trained staff, those with experience of working in COVID places and those using reliable sources for information updates. Practice of wearing mask while going outside varied significantly with training. Regression analysis showed that factors like untrained staff and poor knowledge score were significantly against taking HCQ prophylaxis (OR-1.616, OR-1.474) and not wearing mask always before leaving home (OR=3.117,OR-1.891). 61% of the staff was sure of not visiting any nonessential places since lockdown whereas 8% were not sure of their visit. Breaking lockdown norms was seen more in untrained personnel, those who neither experienced duties with COVID patients nor did see anyone close contracting COVID and those who relied upon non reliable sources for knowledge updates. Regression analysis showed untrained staff (OR-1.555) and those who never saw anyone close suffering with COVID, broke lockdown norms more (OR-2.075).

Table -3: Attitude towards COVID-19 by demographic variables

Demographic characteristics		Volunteer in future for surveillance/ Screening activities			Willing to donate convalescent plasma if needed			Future prediction of pandemic			
		Yes	No	May be	Yes	No	May be	End Soon Or By 2020	Will Be Endemic Always	Repeated Waves will Be There	Can't Say Any thing
Gender	Male	33 (44.0)	13 (17.3)	29 (38.7)	56 (74.7)	7 (13.3)	12 (16.0)	26 (34.7)	16 (21.3)	14 (18.7)	19 (25.3)
	Female	231 (42.9)	115 (21.3)	193 (35.8)	342 (63.5)	63 (11.7)	134 (24.9)	191 (35.4)	98 (18.2)	85 (15.8)	165 (30.6)
	P	0.714			0.152			0.725			
Age	<40	249 (42.9)	122 (21)	210 (36.1)	373 (64.2)	67 (11.5)	141 (24.3)	208 (35.8)	101 (17.4)	94 (16.2)	178 (30.6)
	>40	15 (45.5)	6 (18.2)	12 (36.4)	25 (75.8)	3 (9.1)	5 (15.2)	9 (27.3)	13 (39.4)	5 (15.2)	6 (18.2)
	P	0.92			0.387			0.015			
Educational Qualification	Below graduate	101 (45.1)	45 (20.1)	78 (34.8)	146 (65.2)	30 (13.4)	48 (21.4)	85 (37.9)	46 (20.5)	28 (12.5)	65 (29)
	Graduate & above	163 (41.8)	83 (21.3)	144 (36.9)	252 (63.3)	40 (10.3)	98 (25.1)	132 (33.8)	68 (17.4)	71 (18.2)	119 (30.5)
	P	0.73			0.36			0.22			
Employment sector	Public sector	149 (43.2)	87 (25.2)	109 (31.6)	224 (64.9)	33 (9.6)	88 (25.5)	127 (36.8)	60 (17.4)	47 (13.6)	111 (32.2)
	Private sector	115 (42.8)	41 (15.8)	113 (42)	174 (64.7)	37 (13.8)	58 (21.6)	90 (33.5)	54 (20.1)	52 (19.3)	73 (27.1)
	P	0.003			0.190			0.145			
Training Attended for COVID-19	Trained	148 (49.8)	51 (17.2)	98 (33)	189 (63.6)	40 (13.5)	68 (22.9)	121 (40.7)	58 (19.2)	42 (14.1)	77 (25.9)
	Untrained	116 (36.6)	77 (24.3)	124 (39.1)	209 (65.9)	30 (9.5)	78 (24.6)	96 (30.3)	57 (18)	57 (18)	107 (33.8)
	P	0.003			0.291			0.024			
Experience of working in Covid dedicated areas.	Yes	153 (54.1)	50 (17.7)	80 (28.3)	182 (64.3)	41 (14.5)	60 (21.2)	110 (38.9)	48 (17)	37 (13.1)	88 (31.1)
	No	111 (33.5)	78 (23.6)	142 (42.9)	216 (65.2)	29 (8.8)	86 (26)	107 (32.3)	66 (19.9)	62 (18.7)	96 (29)
	P	0.001			0.053			0.12			
Relative with history of Covid -19	Yes	46 (67.6)	4 (5.9)	18 (26.5)	46 (67.6)	12 (17.6)	10 (14.7)	33 (48.5)	13 (19.1)	8 (11.8)	14 (20.6)
	No	218 (39.9)	124 (22.7)	204 (37.4)	352 (64.5)	58 (17.6)	136 (24.9)	184 (33.7)	101 (18.5)	91 (16.7)	170 (31.1)
	P value	0.052			0.069			0.074			
Source of information updates	Reliable	136 (47.9)	56 (19.7)	92 (32.4)	174 (61.3)	39 (13.7)	71 (25)	95 (33.5)	61 (21.5)	42 (14.8)	86 (30.3)
	Doubtfully reliable	128 (38.8)	72 (21.8)	130 (39.4)	224 (67.9)	31 (9.4)	75 (22.7)	122 (37)	53 (16.1)	57 (17.3)	98 (29.7)
	P	0.070			0.144			0.314			

Aarogya Setu Mobile Application was released in April 2020 as an open source COVID-19 contact tracing and self-assessment digital service with a motive to spread awareness of COVID-19 and to connect essential health services to the people of India.[6] In our study, we found 278 (45.2%) respondents using this application and 265(43%) intended to use it, showing willingness of the majority. No variations across demographics were seen and odds of not using application.

Table -4: Practices towards COVID -19 by demographic variables

Demographic characteristics		Taking /planning to take HCQ prophylaxis		Wear mask every time before leaving from home		Visited nonessential places during lockdown			Using/planning to use Aarogya Setu App		
		Yes	No	Yes	No	Yes	No	May Be	Yes	No	Already Using
		No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Gender	Male	40 (53.3)	35 (46.7)	71 (94.7)	4 (5.3)	25 (33.3)	42 (56)	8 (10.7)	28 (37.3)	6 (8.0)	41 (54.7)
	Female	280 (51.9)	259 (48.1)	491 (91.1)	48 (8.9)	164 (30.4)	332 (61.6)	43 (8.0)	237 (44)	65 (12.1)	237 (44.0)
	P	0.82		0.298		0.579			0.195		
Age	<40	298 (51.3)	283 (48.7)	531 (91.4)	50 (8.6)	181 (31.2)	351 (60.4)	49 (8.4)	250 (43)	65 (11.1)	266 (45.8)
	>40	22 (66.7)	11 (33.3)	31 (93.9)	2 (6.1)	8 (24.2)	23 (69.7)	2 (6.1)	15 (45.5)	6 (18.2)	12 (36.4)
	P	0.085		0.61		0.566			0.37		
Educational Qualifications	Below Graduate	134 (59.8)	90 (40.2)	211 (94.2)	13 (5.8)	66 (29.5)	142 (63.4)	16 (7.1)	111 (49.6)	25 (11.2)	88 (39.3)
	Graduate and above	186 (47.7)	204 (52.3)	351 (90)	39 (10)	123 (31.5)	232 (59.5)	35 (9.0)	154 (39.5)	46 (11.8)	190 (48.7)
	P	0.004		0.072		0.568			0.052		
Employment sector	Public sector	178 (51.6)	167 (48.4)	317 (91.9)	28 (8.1)	104 (30.1)	217 (62.9)	24 (7.0)	153 (44.3)	42 (12.2)	150 (43.5)
	Private sector	142 (52.8)	127 (47.2)	245 (91.1)	24 (8.9)	85 (31.6)	157 (58.4)	27 (10)	112 (41.6)	29 (10.8)	128 (47.6)
	P	0.769		0.722		0.310			0.585		
Training Attended for COVID-19	Trained	180 (60.6)	117 (39.4)	284 (95.6)	13 (4.4)	75 (25.3)	194 (65.3)	28 (9.4)	126 (42.4)	34 (11.4)	137 (46.1)
	Untrained	140 (44.2)	177 (55.8)	278 (87.7)	39 (12.3)	114 (36)	180 (56.7)	23 (7.3)	139 (43.8)	37 (11.7)	141 (44.5)
	P	0.001		0.001		0.01			0.918		
Experience of working in Covid dedicated areas	Yes	163 (58.0)	119 (42.0)	259 (91.5)	24 (8.5)	70 (23.5)	199 (67)	28 (9.4)	137 (41)	30 (10.6)	116 (41)
	No	156 (47.1)	175 (52.9)	303 (91.5)	28 (8.5)	119 (37.5)	175 (55.2)	23 (7.3)	128 (48.9)	41 (12.4)	162 (48.9)
	P	0.007		0.992		0.008			0.052		
Relative with history of Covid -19	Yes	39 (57.4)	29 (42.6)	65 (95.6)	3 (4.4)	33 (48.5)	30 (44.1)	5 (7.4)	37 (54.4)	3 (4.4)	28 (41.2)
	No	281 (51.5)	265 (48.5)	497 (91)	49 (9)	156 (28.6)	344 (63)	46 (8.4)	228 (41.8)	68 (12.5)	250 (45.8)
	P	0.359		0.20		0.003			0.052		
Source of information updates	Reliable	165 (58.1)	119 (41.9)	263 (92.6)	21 (7.4)	88 (31)	181 (63.7)	15 (5.3)	121 (42.6)	31 (10.9)	132 (46.5)
	Doubtfully reliable	155 (47)	175 (53.0)	299 (90.6)	31 (10.4)	101 (30.6)	193 (58.5)	36 (10.9)	144 (43.6)	40 (12.1)	146 (44.2)
	P	0.006		0.375		0.038			0.820		

Stress levels were assessed on a scale of 0 to 10 with values from 0-3 showing mild stress, 4-7 showing moderate and 8-10 showing severe stress. In this study we found majority (78%) of the respondents to be suffering from moderate to severe stress, with stress level seen significantly higher in females, age >40 years, public sector workers and participants working in COVID dedicated areas 78.6% were concerned regarding getting infected in the next coming months [Table- 5]. In present study, odds of mild or no stress was observed to be 1.257 (95% CI- 0.87-1.81) in subjects with good knowledge score,

Table -5: Demographic variables and stress factor

Demographic characteristics		**Concerned about getting infected in next 3 months**			**Stress level on a scale of 0 to 10**		
		Highly concerned	**Somewhat concerned**	**Not concerned**	**Mild stress (0 to3)**	**Moderate stress (4 to 7)**	**Severe stress (8 to 10)**
		No (%)	**No (%)**	**No (%)**	**No (%)**	**No (%)**	**No (%)**
Gender	Male	33 (44)	18 (24)	24 (32)	25 (33.3)	32 (42.7)	18 (24)
	Female	267 (49.5)	165 (30.6)	107 (19.9)	109 (20.2)	249 (46.2)	181 (33.6)
	P	0.051			0.027		
Age	<40 years	282 (48.5)	175 (30.1)	124 (21.3)	130 (22.4)	268 (46.1)	183 (31.5)
	>40 years	18 (54.5)	8 (24.2)	7 (21.2)	4 (12.1)	13 (39.4)	16 (48.5)
	P	0.743			0.101		
Educational qualifications	Below graduate	105 (46.9)	71 (31.7)	48 (21.4)	41 (18.3)	100 (4.6)	83 (37.1)
	Graduate and above	195 (50)	112 (28.7)	83 (21.3)	93 (23.8)	181 (46.4)	116 (29.7)
	P	0.701			0.108		
Employment sector	Public sector	169 (49)	107 (31)	69 (20)	61 (17.7)	167 (48.4)	117 (33.9)
	Private sector	131 (48.7)	76 (28.3)	62 (23)	73 (27.1)	114 (42.4)	82 (30.5)
	P	0.592			0.019		
Training Attended for Covid-19	Trained	124 (41.8)	100 (33.7)	73 (24.6)	61 (20.5)	131 (44.1)	105 (35.4)
	Untrained	176 (55.5)	83 (26.2)	58 (18.3)	73 (23)	150 (47.3)	94 (29.7)
	P	0.003			0.314		
Experience of working in Covid dedicated areas	Yes	135 (47.7)	89 (31.4)	59 (20.8)	47 (16.6)	144 (50.9)	92 (32.5)
	No	165 (49.8)	94 (28.4)	72 (21.8)	87 (26.3)	137 (41.4)	107 (32.3)
	P	0.712			0.008		
Relative with history of COVID-19	Yes	34 (50)	29 (42.6)	5 (7.4)	23 (33.8)	27 (39.7)	18 (26.5)
	No	266 (48.7)	154 (28.2)	126 (23.1	111 (20.3)	254 (46.5)	181 (33.2)
	P	0.004			0.039		
Source of information updates	Reliable	124 (43.7)	91 (32)	69 (24.3)	51 (18)	130 (45.8)	103 (36.3)
	Doubtfully reliable	176 (53.3)	92 (27.9)	62 (18.8)	83 (25.2)	151 (45.8)	96 (29.1)
	P	0.050			0.051		

Discussion

The study showed significant and uniform coverage (67%) of the population in the region. Maximum respondents were females and of younger age groups (<30 years) indicating their active participation as seen in other studies.[7]

Only 46% of the population had experience of working with COVID-19 patients even after 6 months since the outbreak and only 48% could access the training. This can be explained by the fact of very limited involvement of private sector staff and institutes in the management of COVID-19 during the study period. This study had 47% of its participants from the private sector.

Government websites (31.2%), followed by social media (29.6%) and television (19.3%) were the top three modes used to update information, similar to other studies.[5,7] These applications serve as a platform for passive spread of updates which becomes easier to access than active search during the busy COVID days.

Knowledge is a prerequisite for establishing prevention beliefs, promoting individuals' cognition and attitudes towards disease and promoting positive behaviour.[8] We found an overall accurate rate of 56% on knowledge questionnaire (5.6/10×100) showing average performance, similar to that seen by Nemati M. et al.[5] but lesser than those seen in other studies(79%-95%).[7, 9, 10, 11, 12] Other studies were done in very early phase of pandemic covering questions specific to nursing care in contrast to assessment of comprehensive knowledge in this study.

Older staff and those with higher educational qualifications were found to be more knowledgeable, as expected, as learning comes with experience. Health care workers training specific for COVID-19 proved to be a boon showing respondents with significantly good knowledge score. Training for fighting with this pandemic was regularly imparted to the staff of government set ups and also in COVID dedicated areas thus making public sector health personnel score higher on knowledge score.

Only 17% of the respondents showed negative attitude which showed direct correlation with poor knowledge scores in line with those seen by other studies which showed higher knowledge scores as a direct correlate of positive attitude.[11,7] The proportion of participants with positive attitude (answering yes and maybe) is similar to those found in other studies (70 -80%).[9, 10]

The adaption of preventive practices is the most effective solution to defeat COVID-19, as robust evidence for proposed treatments is still lacking.[13] ICMR proposed revised guidelines for hydroxychloroquine prophylaxis for health care workers in May 2020.[14] Only 52% population in this study took chemoprophylaxis which is lesser than the frequency seen by Jha S et al.[15] (67.8%) who surveyed doctors, paramedics also along with nurses. Poor knowledge and untrained staff again were associated with avoidance of chemoprophylaxis. These differences could also be explained based on the awareness of various side effect profiles of HCQ in different age groups and co-morbidities.[16]

Majority of the respondents did not visit any nonessential places (61%) during national lockdown and practiced wearing mask whenever going outside (91.5%). This is similar to that seen in other studies by Acharyya A et al[10] (79%, 86%) and Zhong LB et al[17] (96.4%, 98%).Knowledge greatly reflects the practice of individuals as it provides a base for good practice.[18] This study showed significant association of poor knowledge scores and bad practices among the population.

Reliability of source for data and knowledge updates regarding COVID-19 proved to be a major factor contributing to higher knowledge scores and positive attitudes amongst participants. Official government websites and trainings are based on evidence based scientific data and share proven data, unlike social media applications in which

ungoverned circulation of inauthentic information may happen. Majority were concerned of getting infected in near future and also suffering from moderate to severe stress similar to other studies.[7,11,19] High stress in nurses lead to anxiety, depression and other psychological disorders .[20, 21]

As far as our literature search, this study is first of its kind in India. Findings from this study highlight the need of strengthening knowledge which will be more fruitful if done by frequently organising focussed training programmes. Inclination towards use of social media applications creates need for governance of such platforms by Health Ministry for COVID related facts. Private sector should be given opportunities to share the responsibilities as this is a "fight for all." Mental health of frontline warriors should be strengthened of during these public health emergencies.

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Citation: Motwani B, Ojha S, Sonkar Ruchi, Nadkarni. Knowledge Attitude and Practices amongst Nursing Professionals of Central India during COVID-19 pandemic: A cross sectional study. **Indian J Prev Soc Med, 2022; 53 (1): 37-47.**