

# Pharmacy Educationists on Post-COVID-19: A Lockdown Exit Preparedness Survey

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## ABSTRACT

**Purpose:** Most of the educational institutions are now closed in many parts of the world due to the pandemic outbreak of COVID-19. Rebooting the institutions, at the times when an effective therapy or vaccine is still awaited, is very risky. The aim of the study was to assess the post-COVID-19 lockdown exit preparedness of Indian pharmacy educationists. **Basic procedures:** Pharmacy academicians were included in the study to assess their preparedness for the post-COVID-19 lockdown exit using a cross-sectional survey. **Main Findings:** A total of 715 pharmacy educationists (37.9% females) participated in the study encompassing all levels of academic positions and teaching experiences from across the country. A majority of the study respondents recommended for frequent sanitization of campus (87.4%), adoption of hand sanitization practice by all (97.1%), face mask usage(96.1%), thermal screening in the campus (92.7%), reduction in physical class strength (67.6%), social distancing in campus(95.4%), reduction in contact hours (80.1%) and precaution while animal experimentation (88.4%). **Principal conclusion:** The study revealed the perceptions and recommendations of the study participants for a reboot of the educational institutions in the pandemic situation which may be used by policymakers while devising guidelines for operations of educational institutions during the pandemic situation.

**Key words:** SARS-CoV-2, COVID-19, Pandemic preparedness, Educational institution, Social distancing, Education.

## INTRODUCTION

The declaration of the World Health Organization (WHO) regarding the pandemic outbreak of SARS-CoV-2 (COVID-19) on 11<sup>th</sup> March 2020 has triggered the healthcare policymakers across the globe to frame strategies and to get prepared to effectively handle the healthcare emergency situation. Based on the lessons learned from previous pandemics, various non-pharmacologic measures were adopted by many governments including the ban on mass gatherings, ban on travels of any form, border closures, social distancing, home quarantine and subsequently complete lockdown of all activities barring those few of very essential nature.<sup>1-3</sup> These extreme measures are often chosen during pandemic infections with a high case fatality rate in the event of non-availability of pharmaceutical care options

including an effective vaccine.<sup>4,5</sup> On 24<sup>th</sup> March 2020, the Government of India has declared a timely nationwide lockdown for twenty-one days which further got extended in a phased manner with graded relaxations and as of now while writing the manuscript, the lockdown is in force till 30<sup>th</sup> June 2020 in the containment zones. India was quick to close its international borders and enforce an immediate lockdown, which WHO praised as “tough and timely”. Much remains unknown at this stage in terms of the duration and scope of the crisis and understandably the current emphasis is on slowing and stopping the spread of the coronavirus.<sup>6,7</sup> More or less, this crisis will affect all countries and each nation will face different problems during the outbreak and in its aftermath. Essentially,

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the lockdown has provided sufficient time to the governments to rapidly prepare the necessary healthcare infrastructure while the transmission chain of the virus got disrupted. However, due to the negative socio-economic and health consequences, particularly in low- and middle-income countries, these extreme measures cannot be kept in place for a long time required for the development of a vaccine or an effective anti-viral drug.<sup>8-12</sup>

The educational system got badly affected by the COVID-19 pandemic leading to a temporary closure of schools, colleges and universities across the globe.<sup>13,14</sup> The disruption to learning is unprecedented and places new challenges on governments to ensure the continuity of learning and on learners, parents and faculty.<sup>15</sup> The impact of the pandemic on higher education institutions is abrupt and in the majority of cases, there is no contingency plan other than to attempt to continue classes remotely.<sup>16</sup> As ever the most vulnerable and disadvantaged learners are hardest hit. Going forward it is important that attention is shifted to post-pandemic reboot planning to ensure the highest degree possible of quality, inclusion and equity for all teachers and students.

In this scenario, careful planning of exit strategies is required to ensure that the second wave of infections is avoided in educational institutions, to emerge out of this crisis and to reboot organization to near normalcy. These exit strategies should be tailored to each country's situation and place on the trajectory of the pandemic spread. The objective of the present survey was to assess the preparedness of Indian pharmacy educationists on post-COVID-19 lockdown exit, their opinions and recommendations.

## MATERIALS AND METHODS

Pharmacy academicians across India with varying levels of experience and roles were included in the study for assessment of their preparedness for the post-COVID-19 lockdown exit using a cross-sectional survey administered by online mode during the second week of June 2020. Approval to perform the study was granted by the authors' institution. Participants had the study confidentiality statement verbally explained to them, with a signed copy of the approved confidentiality policy being provided only upon request.

The survey questionnaire was developed based on existing literature published by WHO; Indian Council of Medical Research (ICMR), New Delhi; Ministry of Health, Government of India; The International

Pharmaceutical Federation (FIP); and The Indian Pharmaceutical Association (IPA). A questionnaire was developed for the survey and tested for reliability and validity. The item objective congruence (IOC) technique was used for detecting validity. A team of external experts in the field scored and commented on each item. Items with an average score from the committee less than 0.5 were excluded from the set of questionnaires, while items with an average score between 0.51 and 0.7 were revised according to the comments. Items with scores greater than 0.7 were included in the questionnaire set. The questions in the survey questionnaire were coherent and homogeneous (Cronbach's alpha=0.823). The questionnaire included 41 questions divided into five sections. The first section comprised 13 questions covering the study participants' demographics. The second section contained 10 questions to capture the views of the subjects on the workplace readiness, the third section contained 11 questions related to teaching and learning aspects, the fourth and fifth sections contained three questions each related to student assessment and extra/co-curricular activities. Finally, one open-ended question was included to capture any specific recommendations/opinions of the participants related to post-COVID-19 lockdown exit strategies for pharmacy educational institutions of India. Data were analyzed in SigmaStat software package (Systat Software Inc., California) using descriptive statistics and Chi-square tests were used to detect the association between variables at a significance level of  $\alpha=0.05$ .

## RESULTS AND DISCUSSION

A total of 715 respondents (37.9% of females) participated in the study encompassing all levels of academic positions and teaching experiences from across the country (Table 1). The study population had a mean age of 33.6 years and ranged in teaching experience from 1 to 35 years (mean experience = 8.4 years). The workplace location of the majority of respondents was in urban areas (49.3%) and is demarcated as a green area (40.5%) (Table 2). So far as the highest educational qualification of the respondents is considered, the majority of the respondents were having M.Pharm as the highest academic qualification (44.9%) followed by Ph.D. (33.4 %). The employment role of the respondents varied from research scholars up to Principals/directors with a majority of respondents serving their institutions as lecturers/assistant professors (44.2%) (Table 2).

**Table 1: Socio-demographic details of the study respondents.**

Particulars	Number	Percentage (%)
<b>Age (Years)</b>	Mean-33.6	-
<b>Gender</b>		
Male	444	62
Female	271	37.9
<b>Workplace location</b>		
Rural	187	26.1
Sub-urban	79	11.0
Urban	353	49.3
Metro	96	13.4
<b>COVID-19 Status in the locality</b>		
Containment/Red zone	192	26.8
Orange zone	233	32.6
Green zone	290	40.5
<b>Highest qualification</b>		
B.Pharm	38	05.3
M.Pharm	321	44.9
Pharm D	117	16.4
Ph.D	239	33.4
<b>Teaching experience (Years)</b>	Mean-8.4 ; Range- 1 to 35)	-
<b>Current designation</b>		
Research Scholars	101	14.1
Lecturer/Assistant Professor	316	44.2
Reader/Professor	168	23.5
Professor	75	10.5
Principal/Director	55	07.7

### Workplace preparedness

A huge population of 1.3 billion across diverse states, health inequalities, widening economic and social disparities and distinct cultural values present unique challenges to India during this pandemic situation. Without a vaccine on the immediate horizon, educational institutions will have to reopen the gates of the campus while COVID-19 is still in the picture. The present study revealed the preparedness and the recommendations of Indian pharmacy educationists on workplace culture during post-COVID-19-lockdown. The majority of the study respondents (87.4%) agreed upon more frequent sanitization of the campus premises during this pandemic. The effect of categorical variables like gender, highest qualification, COVID-19 status of the locality, workplace location and designation of the participant was found statistically insignificant

(Chi-square test;  $p > 0.05$ ) on the response type (Table 2). To ensure the safety of students, staff and visitors, it is crucial to take all precautionary measures to keep the workplaces clean and decontaminated.<sup>17-19</sup> A 97.1% of respondents confirmed that everybody in the campus must practice hand sanitization and 72.9 % of respondents recommended easy availability of hand sanitizers throughout the campus including entry and exit gates. Public transport for staff and students may be a source of infection during a pandemic.<sup>20-22</sup> Data-driven analysis carried out to assess the association between public transport and the outbreak of novel coronavirus in China suggested a strong and significant association.<sup>22</sup> However, in the present study, the majority of the respondent academicians (63.6%) agreed upon resuming the public transport systems for staff and students. The qualification of the academician affected the response significantly Chi-square-11.93;  $p < 0.008$ ) with 72.3% educationists with Ph.D. as their highest qualification recommended to resume transportation facility (Table 2). India is a country with wide income inequality among its citizens and hence, public transport has been a preferred mode of mobility for low and middle-income people. Most of the students and staff of educational institutions prefer to opt for public transport in India due to economic constraints. Probably, this fact has led the study respondents to recommend a resume of public transport for students and staff in spite of the fact that it carries risks of transmission of infection. Further, 90.3 % of study respondents were of the opinion to follow strict respiratory hygiene and social distancing norms in public transport (Table 2). The recommendations included a reduction of commuters to half of the actual capacity of the vehicle, thermal screening and mandatory usage of face mask in the vehicle.

96.1% of respondents recommended usage of face mask while on campus and 89.7 % recommended the installation of face mask dispensers at the workplace (Table 2). Universal masking has been proposed as an additional strategy for reducing community transmission.<sup>23,24</sup>

Thermal screening of citizens has been recommended to detect infection en masse and the present study also attempted to capture the opinion of the study respondents in this regard. In the present study, 92.7% of respondents were in favor of thermal screening at the workplace (Table 2). An individual will be detected during thermal screening if his/her infection is symptomatic, febrile and exceeds the incubation period.<sup>25</sup> However, there is increasing evidence that many patients with COVID-19 are asymptomatic or have

**Table 2: Lockdown exit preparedness of the study respondents (n=715).**

Particulars	Number (%)	Gender		Highest qualification				Covid 19 status (Zones)			Workplace location				Current designation					Chi-squared (p-value)		
		Male	Female	B.Pharm	M.Pharm	Pharm. D	Ph.D	Chi-squared (p-value)	Red	Orange	Green	Rural	Sub-Urban	Urban	Metro	Chi-squared (p-value)	Lecturer/Asst. prof	Reader/Asso. Prof	Prof	Principal/Director	Research Scholar	
1. Workplace preparedness																						
Frequency of sanitization of workplace be increased post-lockdown																						
Yes	625	387	238	31	281	102	211	1.35	173	196	256	156	72	312	85	4.1	277	142	66	51	89	2.77
No or not sure	90	57	33	7	40	15	28	(0.71)	19	37	34	31	7	41	11	(0.24)	39	26	9	4	12	(0.59)
Hand sanitization practice be restricted to-																						
Students	11	8	3	2	4	4	1	NA	3	6	2	6	1	3	1	NA	3	3	0	0	5	NA
Teaching staff	06	2	4	0	2	2	2		1	2	3	1	4	1	0		0	5	1	0	0	
Non-teaching staff	04	4	0	0	2	1	1		1	1	2	2	2	0	0		2	0	1	0	1	
All	694	431	263	36	313	109	235		187	223	283	178	73	347	95		311	159	73	55	95	
Operation of public transport for staff/students																						
Yes	455	288	167	23	189	70	173	11.93	116	147	192	112	51	233	59	2.21	199	105	53	38	60	3.24
No or not sure	260	156	104	15	132	47	66	(0.008*)	76	86	98	75	28	120	37	(0.52)	117	63	22	17	41	(0.51)
Strategy to reduce the transmission of Covid 19 in public transport																						
Reduction of number of commuters to half of actual seating capacity	17	12	5	0	7	4	6	NA	4	5	8	6	4	7	0	NA	7	5	4	0	1	NA
Thermal screening of commuters	11	8	3	2	4	4	1		3	2	6	3	1	5	2		2	3	0	1	4	
Making face mask mandatory	19	14	5	1	7	4	7		4	5	10	4	4	9	2		5	6	3	2	3	
Combining all these strategies	646	393	253	35	289	105	217		176	209	261	167	70	321	88		290	147	67	50	92	

Continued...

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Particulars	Number (%)	Gender		Highest qualification				Covid 19 status (Zones)			Workplace location				Current designation					Chi-squared (p-value)		
		Male	Female	B.Pharm	M.Pharm	Pharm. D	Ph.D	Chi-squared (p-value)	Red	Orange	Green	Rural	Sub-Urban	Urban	Metro	Chi-squared (p-value)	Lecturer/Asst. prof	Reader/Asso. Prof	Prof.	Principal/Director	Research Scholar	Chi-squared (p-value)
Yes	687	427	260	36	313	106	232	NA	187	228	272	172	76	345	94	305	162	72	54	94	NA	NA
No or not sure	28	17	11	2	8	11	7	(0.96)	5	5	18	15	3	8	2	11	6	3	1	7		
Installation of face mask dispensers at the workplace																						
Yes	641	394	247	36	290	111	204	9.41	173	204	264	160	72	319	90	288	149	66	46	92	5.49	3.51
No or not sure	74	50	24	2	31	6	35	(0.02)*	19	29	26	27	7	34	6	28	19	9	9	9	(0.13)	(0.47)
Availability of hand sanitizers																						
At the entrance of campus	58	34	24	2	28	11	17	NA	17	14	27	18	6	28	6	25	11	8	3	11	NA	NA
At the exit of the campus	02	1	1	0	0	1	1		1	1	0	0	1	1	0	0	1	1	0	0		
At entrance and exit of campus	134	95	39	11	53	17	53		26	51	57	41	19	56	18	58	34	18	13	11		
Throughout the campus	521	314	207	25	240	88	168		148	167	206	128	53	268	72	233	122	48	39	79		
Thermal screening recommendations at the workplace																						
Yes	663	410	253	35	301	104	223	3.21	177	216	270	172	70	331	90	295	158	68	54	88	2.85	8.21
No or not sure	52	34	18	3	20	13	16	(0.36)	15	17	20	15	9	22	6	21	10	7	1	13	(0.41)	(0.08)
Willingness to discuss about Covid 19																						
Yes	690	434	256	37	312	108	233	NA	185	222	283	178	77	341	94	306	165	75	55	89	NA	NA
No or not sure	25	10	15	1	9	9	6	(0.03)*	7	11	7	9	2	12	2	10	3	0	0	12		

Continued...

**Table 2: Lockdown exit preparedness of the study respondents (n=715).**

Particulars	Number (%)	Gender		Highest qualification				Covid 19 status (Zones)			Workplace location				Current designation					Chi-squared (p-value)	
		Male	Female	B.Pharm	M.Pharm	Pharm. D	Ph.D	Red	Orange	Green	Rural	Sub-Urban	Urban	Metro	Lecturer/Asst. prof	Reader/Asso. Prof	Prof.	Principal/Director	Research Scholar	Chi-squared (p-value)	Chi-squared (p-value)
Reduction of class strength	Yes, to be reduced to 60%	42	33	5	30	17	23	23	22	30	5.33 (0.50)	23	7	33	12	28	8	8	14	6.13 (0.72)	14.82 (0.25)
	Yes, to be reduced to 50%	297	186	18	225	71	169	124	161	198		121	51	249	62	226	111	51	37		
	Yes, to be reduced to 10-20 %	38	28	3	34	11	18	21	25	20		15	11	30	10	31	19	4	3		
	No need of reduction in strength	67	24	12	32	18	29	24	25	42		28	10	41	12	31	21	12	7		
Practice of social distancing amongst students																					
Yes	682	425	257	37	311	105	229	181	223	278	0.74	175	75	339	93	305	161	70	54	NA	NA
No or not sure	33	19	14	1	10	12	10	11	10	12	(0.01)*	12	4	14	3	11	7	5	1		
Distancing among students in the class should be-																					
At least one metre	589	392	197	28	264	84	213	158	194	237	0.17	156	69	289	75	257	139	71	48	74	14.70 (0.005)
At least one feet	123	50	73	10	57	32	24	32	39	52	(<0.001)*	31	10	63	19	59	28	4	6	26	
Reduction in No. of contact hours																					
Yes	573	356	217	28	256	83	206	155	184	234	0.29	139	66	296	72	250	142	60	43	78	2.90 (0.57)
No or not sure	142	88	54	10	65	34	33	37	49	56	(0.005)*	48	13	57	24	66	26	15	12	23	
Precautions during animal experimentation																					
Yes	632	401	231	30	286	94	222	164	204	264	3.79	163	70	314	85	275	152	69	53	83	9.44 (0.05)
No or not sure	83	43	40	8	35	23	17	28	29	26	(0.15)	24	9	39	11	41	16	6	2	18	
Need of specific SOP for Pharm D/Pharmacy practice students																					
Yes	671	418	253	32	304	107	228	184	221	266	3.98	167	76	335	93	298	160	70	53	90	5.24 (0.26)
No or not sure	44	26	18	6	17	10	11	8	12	24	(0.03)*	20	3	18	3	18	8	5	2	11	
Need to reduce hospital visits by Pharm D/Pharmacy practice students																					
Yes	517	314	203	33	243	65	176	130	171	216	2.85	136	58	253	70	233	133	56	34	61	14.65 (0.005)
No or not sure	198	130	68	5	78	52	63	62	62	74	(<0.001)*	51	21	100	26	83	35	19	21	40	

Continued...

**Table 2: Lockdown exit preparedness of the study respondents (n=715).**

Particulars	Number (%)	Gender		Highest qualification				Covid 19 status (Zones)			Workplace location				Current designation					Chi-squared (p-value)	
		Male	Female	B.Pharm	M.Pharm	Pharm. D	Ph.D	Red	Orange	Green	Rural	Sub-Urban	Urban	Metro	Lecturer/Asst. prof	Reader/Asso. Prof	Prof.	Principal/Director	Research Scholar	Chi-squared (p-value)	Chi-squared (p-value)
Yes	617	387	230	34	288	87	208	167	193	257	159	306	82	279	146	63	51	78	10.39 (0.03)*	0.72 (0.86)	
No or not sure	98	57	41	4	33	30	31	25	40	33	28	47	14	37	22	12	4	23			
Aarogya Setu app be mandatory for-																					
Students	20	13	7	3	7	6	4	8	5	7	4	5	2	4	6	1	3	6	NA	NA	
Staff	08	5	3	0	1	2	5	1	1	6	4	2	0	1	1	3	1	2			
Everybody in the campus	687	426	261	35	313	109	230	183	227	277	179	342	94	311	161	71	51	93			
Need to reduce the curricular content to be delivered																					
Yes	407	264	143	26	178	56	147	103	133	171	117	200	47	172	105	45	34	51	5.46 (0.24)*	5.12 (0.16)	
No or not sure	308	180	128	12	143	61	92	89	100	119	70	153	49	144	63	30	21	50			
3. Student assessment																					
Online mode of assessments																					
Yes	565	352	213	30	259	76	200	159	184	222	145	283	76	260	131	59	46	69	9.82 (0.04)*	0.68 (0.87)	
No or not sure	150	92	58	8	62	41	39	33	49	68	42	70	20	56	37	16	9	32			
Perceived limitation of traditional paper-based examination during this pandemic																					
Difficulty in maintaining social distancing and respiratory hygiene in examination hall	374	226	148	24	164	67	119	97	132	145	103	175	45	168	88	35	31	52	7.43 (0.49)	10.31 (0.11)	
Possibilities of staffs getting infection through handling of infected answer scripts	249	160	89	10	114	35	90	66	80	103	61	125	39	111	62	29	18	29			
No significant issues	92	58	34	4	43	15	30	29	21	42	23	4	12	37	18	11	6	20			

Continued...

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Particulars	Number (%)	Gender		Highest qualification				Covid 19 status (Zones)			Workplace location				Current designation									
		Male	Female	B.Pharm	M.Pharm	Pharm. D	Ph.D	Chi-squared (p-value)	Red	Orange	Green	Chi-squared (p-value)	Rural	Sub-Urban	Urban	Metro	Chi-squared (p-value)	Lecturer/Asst. prof	Reader/Asso. Prof	Prof.	Principal/Director	Research Scholar	Chi-squared (p-value)	
Lacks fairness, students may involve in malpractices	249	145	104	8	130	40	71	19.74 (0.003)*	75	84	90	8.40 (0.07)	51	29	135	34	10.83 (0.09)	125	55	23	14	32	11.19 (0.19)	
Many students don't have access to internet	223	133	90	8	91	44	80		61	78	84		64	24	98	37		85	62	22	18	36		
Many students are not technologically sound for online mode	243	166	77	22	100	33	88		56	71	116		72	26	120	25		106	51	30	23	33		
<b>4. Co-/extra-curricular activities</b>																								
Co-/extra-curricular activities be resumed																								
Yes	551	348	203	32	244	87	188	2.12 (0.54)	151	190	210	6.46 (0.03)	138	62	273	78	2.18 (0.53)	238	136	59	37	81	5.63 (0.22)	
No or not sure	164	96	68	6	77	30	51		41	43	80		49	17	80	18		78	32	16	18	20		
Restrictions to contain the infection will land up students in stress/depression																								
Yes	371	256	115	21	150	58	142	9.27 (0.02)*	101	111	159	2.72 (0.25)	107	48	173	43	7.72 (0.05)	154	90	43	32	52	3.22 (0.52)	
No or not sure	344	188	156	17	171	59	97		91	122	131		80	31	180	53		162	78	32	23	49		

NA indicate not applicable; \* statistically significant at p<0.05



only mild symptoms, but they are able to transmit the virus to others.<sup>26</sup>

In the present study, 96.5% of respondents expressed their willingness to discuss about COVID-19 with their colleagues and students (Table 2). Pharmacy educationists (teaching pharmacists) are one among the key stakeholders in society for creating awareness about health, healthcare and diseases. During the pandemic situation, the pharmacists have been considered as one of the most trusted trained healthcare professionals to deliver messages and educate the public.<sup>27,28</sup>

### Teaching and learning aspects

During this pandemic situation, the stress and anxiety can be felt by the educationists in students, faculty, staff and preceptors as the pharmacy programs navigate the uncharted waters of empty classrooms, alternative educational formats and platforms, teleworking situations for faculty and staff and stressed clinical practice sites. However, the challenges of the pandemic have forced the educationists and other policy academic policymakers to evolve novel ways of teaching, learning and assessment.<sup>29</sup> Strategic reduction in class size, reduction in contact hours, social distancing in the classroom, the decision about any modification in curricular content to be delivered, animal experimentation, visits to clinical practice sites, etc are some of the key facts to be addressed during post lockdown resuming of academic sessions. In the present study, 67.6 % of the total respondents expressed their view of reducing the class size to 50% of the actual strength (Table 2). The highest qualification, as a categorical variable, was found statistically significant (Chi square=21.13;  $p=0.01$ ) and affected response outcome (i.e. reduction in class strength). 47.3 % of the respondents with B.Pharm as the highest qualification recommended for the reduction of class size to 50 % of the actual strength and 31.5 % recommended no need for any modification in class strength (Table 2).

95.4 % of the study population expressed their view on the maintenance of proper social distancing in the classroom (Table 2). Further, 82.4 % of the respondents recommended for at least one-meter distancing among persons in the classroom. The gender (Chi square=29.0;  $p<0.001$ ), highest educational qualification (Chi square=19.33;  $p<0.001$ ) and designation (Chi square=14.7;  $p=0.005$ ) of the respondent educationists were the categorical variables which were found significantly affecting the response outcome (Table 2).

80.1 % of the study respondents expressed their opinion to reduce the contact hours in the campus with a more focus on virtual/online classes (Table 2). The highest

educational qualification (Chi square=12.74;  $p=0.005$ ) and the location of the workplace (Chi square=9.19;  $p=0.02$ ) of the respondents were the categorical variables significantly affecting the response outcomes. The flipped virtual classroom will be a simple strategy whereby the learning resources like articles, pre-recorded videos and YouTube links, etc will be shared before the class. The online classroom time will then be used to deepen understanding through discussion with faculty and peers. This is a very effective way of encouraging skills such as problem-solving, critical thinking and self-directed learning.

88.4 % of the study population recommended the adoption of precautionary measures while performing animal experimentation (Table 2). As an allied healthcare professional course, the pharmacy curriculum includes experiments using animals and during this pandemic, the zoonotic aspects of COVID-19 should be given due consideration while handling animals in the laboratory. In the recent past, several zoonotic coronaviruses have emerged and caused outbreaks in humans; SARS-CoV (2002, Betacoronavirus, subgenus Sarbecovirus) and MERS-CoV (2012, Betacoronavirus, subgenus Merbecovirus). Earlier studies indicated a zoonotic connection of COVID-19.<sup>30,31</sup>

93.8 % of the study respondents expressed their opinion to bring about a more specific standard operating procedure for Pharm.D and Pharmacy practice course work where frequent visits to clinical site and patient interaction occurs. The highest educational qualification (Chi square=8.67;  $p=0.03$ ) and workplace location (Chi square=9.64;  $p=0.02$ ) of the respondents as variables significantly affected the response outcome (Table 2).

Though clinical practice site visits are an integral part of pharmacy education, 72.3 % of the study respondents recommended for reduction in frequencies of visits to clinical practice sites during this pandemic (Table 2). The categorical variables which affected the response outcomes were the highest educational qualification (Chi square= 22.46;  $p<0.001$ ) and designation (Chi-square=14.65;  $p=0.005$ ) of the study respondents. 56.9 % of respondents expressed their opinion to modify and reduce the content of the curriculum to be delivered to the students during this pandemic situation (Table 2). The highest educational qualification, as a categorical variable affected the response outcomes (Chi square=8.29;  $p=0.04$ ). A majority (68.4%) of the study respondents with B.Pharm as their highest qualification recommended for reduction in the curricular content (Table 2).

Aarogya Setu is a Bluetooth enabled contact tracing mobile App launched by the Indian Government to help augment the efforts of limiting the spread of COVID 19 and dissemination of useful information.<sup>32</sup> In the present study, 86.3 % of the respondents agreed that the App is useful and 96.1 % of respondents recommended making the app mandatory for everybody on the campus in the post lockdown era (Table 2).

### Student assessment/ Co-curricular activities

The study captured opinion regarding assessment modalities to be adopted during the post COVID lockdown era. 79 % of the study respondents recommended for online mode of all assessments during this pandemic situation (Table 2). The categorical variables that affected the response outcomes were the highest educational qualification (Chi square=17.62;  $p<0.001$ ) and designation (Chi square=9.82;  $p=0.04$ ) of the respondents (Table 2). Further, 52.3 % of respondents expressed their concern of difficulty in maintaining respiratory hygiene and social distancing in traditional paper-based examination during this pandemic situation. 34.8% of respondents were of the opinion that the traditional method of examination may lead to infection to the people handling the physical answer scripts followed by 12.9 % of the respondents who perceived no issues with the traditional examination system (Table 2). Online mode of teaching-learning and assessment is supposed to be the boon sparing the need for handling of physical answer scripts and mass gathering during the pandemic situation.<sup>21,33-37</sup> However, in the present study respondents expressed their opinion regarding the limitations of the online mode of student assessment. 34.8 % of the respondents expressed their concern about online examinations being unfair with students involving in malpractice followed by 34 % of the respondents who worried that many students would not be technologically sound to handle online examination which is not conventional in the Indian system of education (Table 2). Access to the internet is another issue in remote areas for the successful exploitation of virtual education and assessment. In the present study, 31.2 % of the respondents expressed their concern of no or limited access to the internet for the students. The categorical variable which affected the response outcome were gender (Chi square=6.14;  $p=0.04$ ) and the highest educational qualification (Chi square=19.74;  $p=0.003$ ) of the study respondents (Table 2).

A majority of the study respondents (77.1%) recommended resuming co-/extra-curricular activities during the post COVID period. A majority of respondents (51.9 %) were of the opinion that the students might be

under stress or depression due to the extreme restrictions imposed to contain the infection (Table 2).

### CONCLUSION

The questionnaire-based online survey to capture the post-COVID-19 lockdown exit preparedness of the Indian Pharmacy educationists revealed the perceptions and recommendations of the study participants for a reboot of the educational institutions in the pandemic situation. The study retrieves the views and opinions of the participants on various aspects like workplace preparedness, teaching and learning aspects, student assessment and co-curricular activities during the post lockdown era in the pharmacy educational institutions. The information may be utilized by academic institutions, policymakers and government organizations while formulating guidelines and standard operating procedures for educational institutions during the pandemic situation.

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### CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

### ABBREVIATIONS

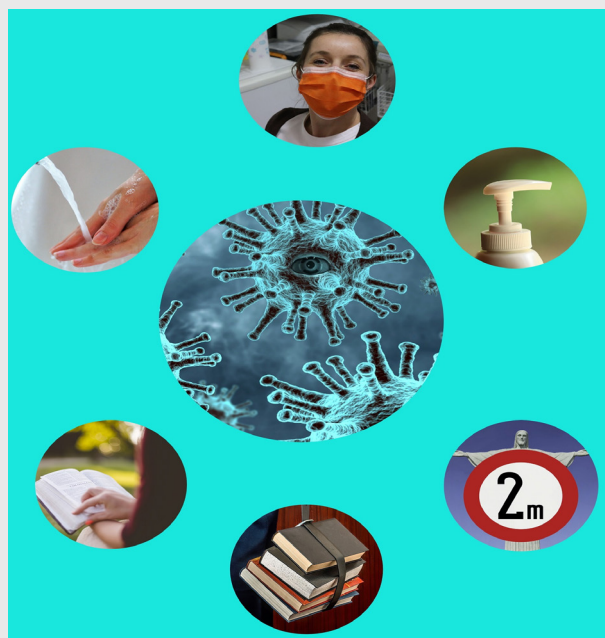
**COVID-19:** Coronavirus disease; **SARS-CoV-2:** Severe acute Respiratory Syndrome Coronavirus-2; **WHO:** World Health Organization; **ICMR:** Indian Council of Medical Research; **FIP:** The International Pharmaceutical Federation; **IPA:** The Indian Pharmaceutical Association.

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## PICTORIAL ABSTRACT



## SUMMARY

The COVID-19 pandemic is not yet over and the best way to prevent/ slow down its transmission is to be well informed about the causative organism, the disease it causes and the modes of its spread. The lockdown has now been partially lifted in many parts of the world including in India. However, in many parts of India, educational institutions are not yet opened for students. The present questionnaire-based survey captured the post-COVID-19 exit preparedness of pharmacy educationists of India. The views and opinions of the study participants are analyzed and presented in this article which may be useful for other stakeholders while decision/policy making.

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