

A Survey on Knowledge, Attitude, and Practice on Respiratory Hygiene and Respiratory Exercises in 12-18 years School Going Children of North India

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Abstract

Background:

Covid-19 has been a global outbreak for the last 2-3 years and is still spreading worldwide. As Schools are resumed as per government guidelines, Children have to indulge in mass meetings, so the chances of transmission of Covid-19 is high in school-going children. So, it is necessary to check the knowledge of children against the precautionary measures of covid-19 and respiratory exercise and their attitude towards its practice. The study aimed to Analyze the significance and correlation between Knowledge, Attitude, and Practice in 12- 18 years School- going children of North India regarding Respiratory Exercise and Hygiene.

Methodology:

A cross-sectional survey study was done using snowballing sampling design to assess school-going children's knowledge, attitude, and practice against respiratory exercise and respiratory hygiene. A survey form was developed after a detailed review of the literature and circulated via google form among the 12-18 Years school going children of North India. A total of 740 responses were received, of which 673 students were taken for the study.

Results:

The study revealed that about 88.7% of students have good Knowledge, 10.698% have average Knowledge and 91.38% of students have a good attitude, 8.47% have an average attitude, and only 0.15% have a poor attitude; while about 66.12% of students perform good practice toward the recommended guidelines given by the Government, 33.43% of performing the average practice and only 0.45% of students perform the poor practice of respiratory exercise; using a face mask.

Conclusion:

The study found that the North India students' have good knowledge and a positive attitude regarding the precautionary measures of Covid-19, and the role of respiratory exercises, but there is a lack of practice of these recommended guidelines. Furthermore, the study finds that Knowledge, Attitude, and Practice are positively correlated. To improve the overall practice of following the advisory guidelines, public health officials need to target more customized educational programs, and communication to ensure individuals with low practice adhere to precautionary measures.

Introduction

One of the largest global outbreaks in recent years that has been identified by The International Committee of Virus Taxonomy (ICTV) and the World Health Organization (WHO) is Novel COVID-19 and the disease caused by this virus is severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and COVID-19 [1, 2]. The incidence of atypical pneumonia caused by a novel Coronavirus was discovered in December 2019 in Wuhan, China, and acquired global pandemic status by WHO in March 2020 [3-5].

Studies have suggested that SARS-CoV2 is an air-borne disease and routes of transmission are directly through respiratory droplets from infected people or contaminated materials to others, fecal-oral, blood borne, mother-to-child, and animal-to-human transmission [6]. The medical treatment involves anti-viral drugs, psychotherapy, supportive treatment, and oxygen support and a mechanical ventilator may be recommended. [3, 7-9].

In addition to the medical treatment, Respiratory Rehabilitation has also been shown to improve respiratory status by reducing oxygen demand and thus, reducing hospital stay. Studies have also revealed that due to sedentary lifestyle, lack of awareness, and government-imposed curfews during the pandemic have led to a significant decline in physical activity for people of all ages [10].

WHO and The Centers for Disease Control and Prevention

(CDC) have introduced a few precautionary measures in their protocol to prevent transmission of Covid-19 such as vaccination drives; Home quarantine or isolation; social distancing from others.

The role of Respiratory Hygiene is also of utmost importance to limit community spread, which will further lessen the burden on the health care system and respiratory hygiene programs by wearing properly fitted face masks (surgical, N-95 or FFP3), face shields; Cover both mouth and nose with a bent elbow or tissue while coughing or sneezing; Dispose of used tissues immediately and frequently washing hands with soap and water for at least 20 seconds or with hand sanitizer with at least 60% of alcohol [3, 8, 11-14].

According to studies, it is also estimated that Minors are a vulnerable population along with geriatrics, and people with comorbidities are at a higher risk of COVID-19 and special considerations should be developed to treat the special population [15, 16].

As per the Government Guidelines, the schools have been resumed after a long time so it is reckoned that Children would engage in mass meetings, considering the ongoing awareness

programs [17, 18]. Thus, there is a dire need to understand the Knowledge, attitude, and practices among children going to school after the Covid-19 pandemic outbreak.

The government has initiated a lot of education measures and awareness programs for adults. However, it is still not known whether these measures are enough for children.

Several studies have been conducted on respiratory hygiene and respiratory exercise. A study conducted on a population in Korea to know the level of knowledge and practice of respiratory hygiene concluded that Compliance with respiratory hygiene increased significantly when the daily frequency of hand washing was high and the knowledge of respiratory hygiene was high [11]. A study conducted on primary school children to assess the KAP on hand washing concluded that most students were knowledgeable about hand washing, and more than half of the children have a positive attitude while some did not [14].

Methodology

This study was based on a cross-sectional survey to assess the knowledge about Respiratory exercises and hygiene and their attitude towards its practice among school-going children of North India. This study was conducted in 2 phases. In phase 1, A self-administered questionnaire was formulated after a detailed review of the literature. The questionnaire initially, had 3 domains with 34 MCQs and was reviewed by a panel of 6 experts, a few questions were reduced and a few were modified.

In the final questionnaire, there were 29 Questions in 3 domains: Knowledge, Attitude, and Practice domain; and the demographic details were asked from students like age, class, gender, and Covid-19 status whether they had a history of Covid-19 or not. Each participant's response was assigned a score: A Maximum point was assigned to the most appropriate response, while zero points were assigned to the least appropriate or don't know type of response.

The 1st domain deals with 7 multiple choice questions with a total scoring of 0 - 28 and each question have a scoring of 0 - 4, In the 2nd domain, there were 10 multiple choice questions with a total scoring of 10-50, with each question has a scoring of 1 to 5, and the last domain of the survey questionnaire consists of 12 Multiple choice questions with a total scoring of 0-48, and each question has a score of 0 to 4. Each section is divided into 3 categories: poor, average, and good based on scores obtained by the students. And the scorecard is like this.

Knowledge	Attitude	Practice
Poor: 0 – 9	Poor: 0 –17	Poor: 0 – 16
Average: 10 – 18	Average: 18 - 35	Average: 17 - 33
Good: 19 – 28	Good: 36 – 50	Good: 34 - 48

The study was conducted between January and March 2022 which includes voluntary participation of 12-18 Years school-going children who were registered at secondary schools, who can comprehend English, and are equipped to enter details on a google form eligible for the study. Specially, abled students or those with reading and comprehension issues, and who did not have access to Google Forms were excluded from this study. The calculated sample size was 650, determined by using a margin of error of 5% and a Confidence interval (CI) of 95%. To account for errors and non-respondents, we enrolled a larger sample size of 800 students.

The sampling method used for the study was Snowballing sampling. After approval from IEC Committee, we approached some schools from 4 states and 2 union territories of North India via email, and consent was obtained from parents via a google form link, followed by the administration of a questionnaire by participants. The survey questionnaire was filled out by participants in the google form. Only those participants who accomplished the inclusion criteria and gave their consent were included in this study.

Data Collection

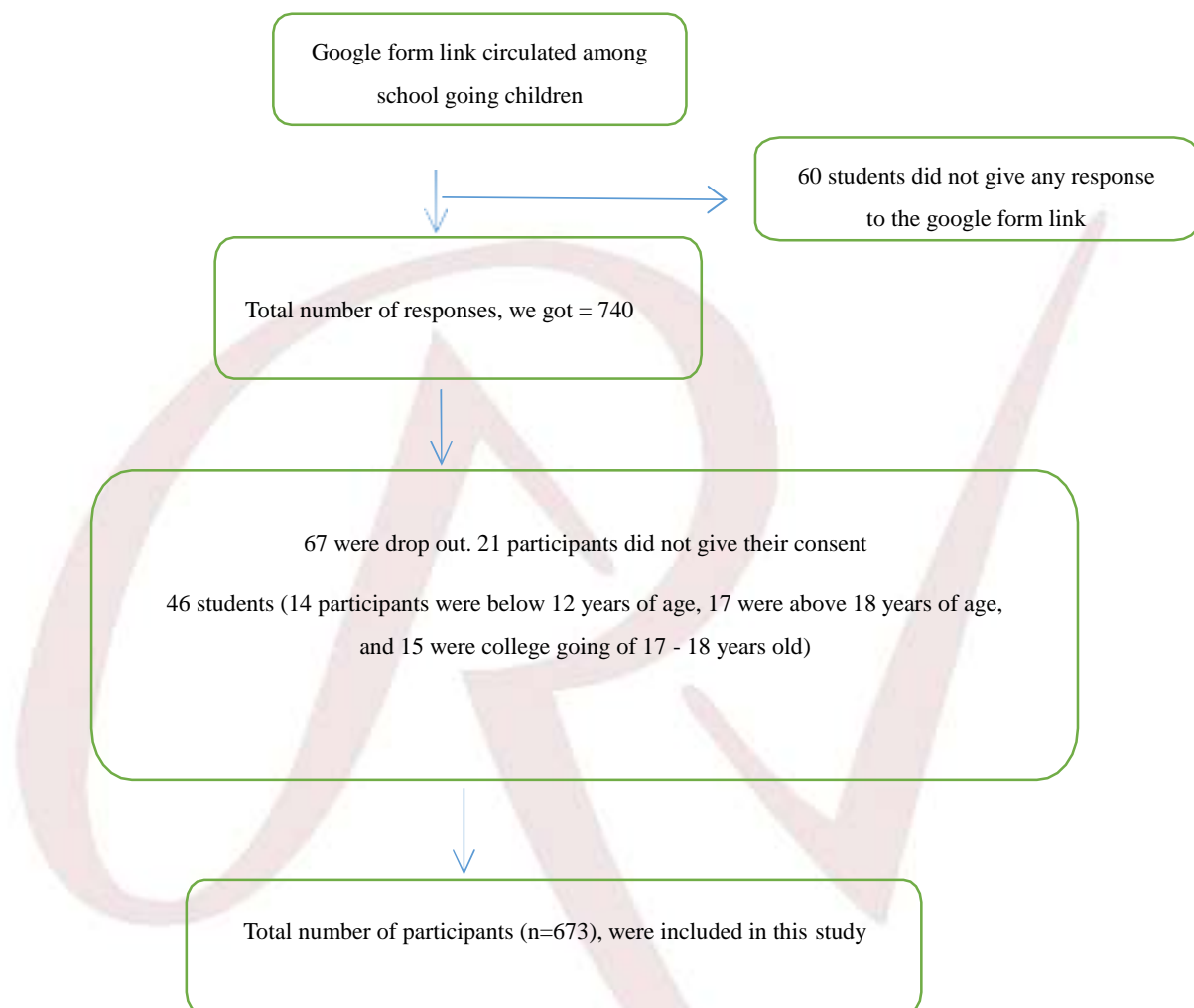
We circulated this questionnaire among approximately 800 students, out of which 60 students did not give any response. In total, 740 responses were there, out of which 67 participants were excluded from the study. So out of 740, only 673 students were considered in this study for further analysis in SPSS. A consort flow chart is given below.

Results

The study included 673 participants from North India. The data were analysed as Descriptive and Correlational statistics.

- For Descriptive analysis, mean, standard deviation and independent t-tests were used between 3 domains of the survey questionnaire based on all the independent variables.
- For Correlational Analysis Karl Pearson, and Spearman's Rank Correlation was used to find out the relationship between 3 domains *i.e.*, Knowledge vs Attitude, Knowledge vs Practice, and Attitude Vs Practice.

CONSORT CHART



Demographic Details

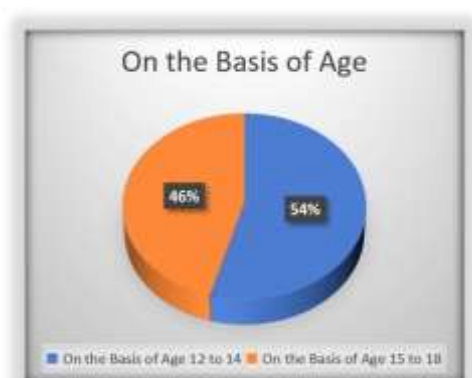


Figure No. 1: Shows the Demographic details of the participants based on Age



Figure No. 2: Shows the Demographic details of the participants based on Gender



Figure No. 3: Shows the Demographic details of the participants based on the Class Group

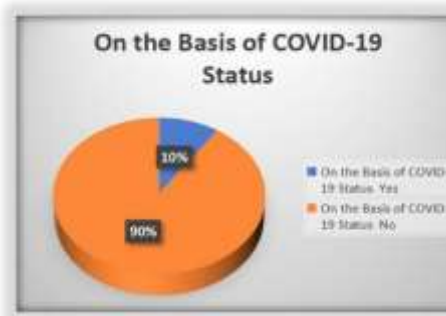
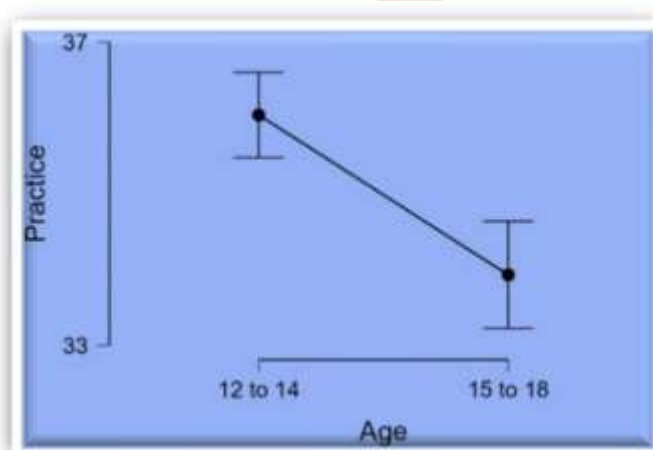


Figure No. 4: Shows the Demographic details of participants based on the Covid-19 Status

Based on Age Group							
	Age Group	No. of Samples (N)	Mean	Standard Deviation (SD)	t- stat	df	p-value
Knowledge	12 to 14	366	22.77	3.21	0.98	671	0.33
	15 to 18	307	22.52	3.4			
Attitude	12 to 14	366	42.24	5.09	0.18	671	0.86
	15 to 18	307	42.17	4.68			
Practice	12 to 14	366	36.04	5.46	4.64	671	<0.001*
	15 to 18	307	33.93	6.3			

Table No. 1: Shows the Descriptive analysis of Knowledge, Attitude, and Practice based on the Age Group of the participants

According to table no. 1: - The practice domain is highly significant (p value=0.001) among 12-14 years and 15-18 years old students; in which 12-14 years (36.04 ± 5.46) old students have a better score in practice than 15-18 years (33.93 ± 6.3) students



Practice

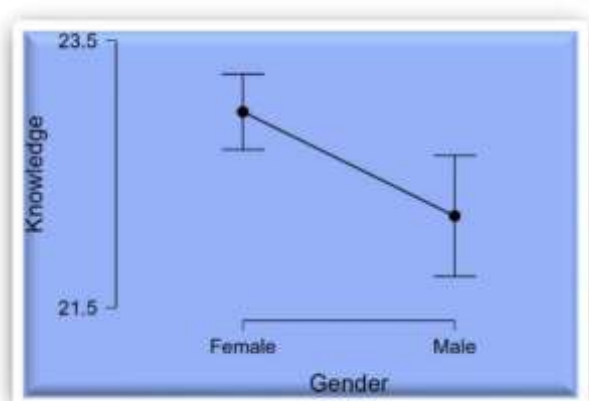
Graph No. 1: - Showing the graphical representation of Practice based on the Age of participants.

Based on Gender							
	Gender	No. of Samples (N)	Mean	Standard Deviation (SD)	t-stat	df	p-value
Knowledge	Male	269	22.19	3.77	3.02	671	0.003*
	Female	404	22.97	2.9			
Attitude	Male	269	41.42	5.6	3.42	671	<0.001*
	Female	404	42.73	4.3			
Practice	Male	269	33.48	5.65	5.81	671	<0.001*
	Female	404	36.14	6.04			

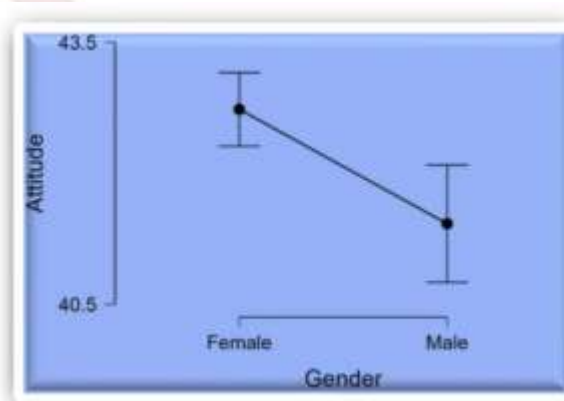
Table No. 2: Shows the Descriptive Analysis of Knowledge, Attitude, and Practice-based on the Gender of the participants

According to table no. 2: -

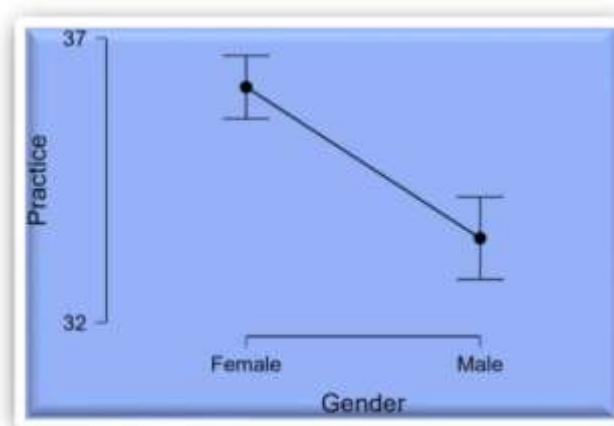
- Knowledge domain is significant (p-value=0.003) between males and females, and females (22.97±2.9) have good knowledge than males (22.19±3.77).
- Attitude domain is highly significant (p-value=0.001) between males and females, and females (42.73±4.3) have a better attitude towards Covid-19 and its precautionary measures than males (41.42±5.6).
- The Practice domain is highly significant (p-value=0.001) between males and females, and females (36.14±6.04) do better practice against precautionary measures of covid-19 than males (33.48±5.65).



Knowledge



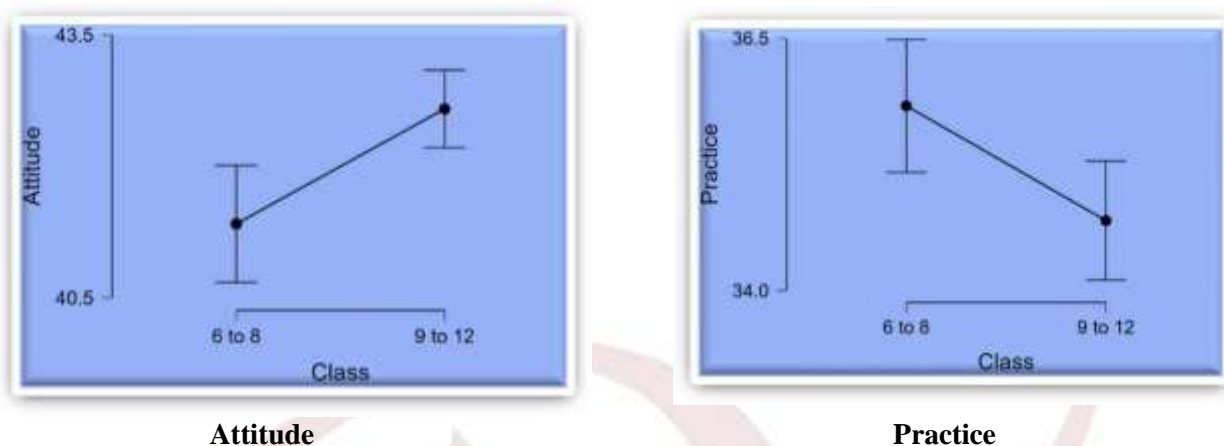
Attitude

**Practice****Graph No. 2:** - Showing the graphical representation of Knowledge, Attitude, and Practice based on the Gender of the participants

Based on Class Group							
	Class Group	No. of Samples (N)	Mean	Standard Deviation (SD)	t-stat	df	p-value
Knowledge	6 to 8	228	22.45	3.03	-1.14	671	0.26
	9 to 12	445	22.78	3.42			
Attitude	6 to 8	228	41.34	5.1	-3.31	671	<0.001*
	9 to 12	445	42.65	4.74			
Practice	6 to 8	228	35.83	5.04	2.35	671	0.019*
	9 to 12	445	34.69	6.34			

Table No. 3: Shows the Descriptive Analysis of Knowledge, Attitude, and Practice based on the class group of the participants**According to table no. 3: -**

- The Attitude domain is highly significant (p-value = 0.001) among the class groups of 6th to 8th and 9th to 12th, but 9th to 12th class students (42.65 ± 4.74) have better attitudes than the class group of 6th to 8th (41.34 ± 5.1).
- The Practice domain is significant (p-value= 0.019) based on class groups, but students of class 6th to 8th (35.83 ± 5.04) are doing more practice than students of class group 9th to 12 (34.69 ± 6.34).



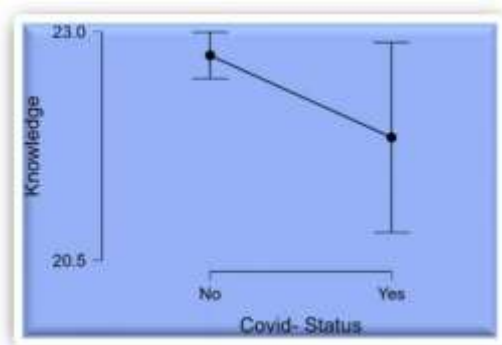
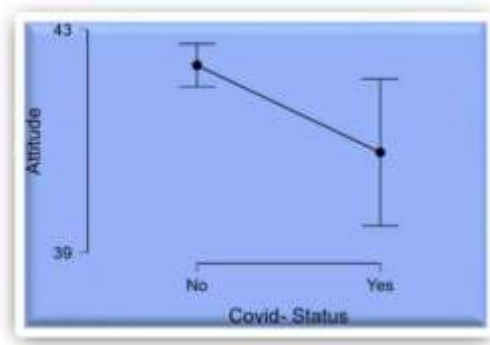
Graph No. 3: - Showing the graphical representation of Attitude, and Practice based on the Class Group.

Based on Covid-19 Status							
	Covid Status	No. of Samples (N)	Mean	Standard Deviation (SD)	t-stat	df	p-value
Knowledge	Yes	64	21.84	4.16	2.07	671	0.039*
	No	609	22.74	3.18			
Attitude	Yes	64	40.8	5.27	2.43	671	0.015*
	No	609	42.36	4.84			
Practice	Yes	64	33.86	6.03	1.72	671	0.085
	No	609	35.2	5.93			

Table No. 4: Shows the Descriptive Analysis of Knowledge, Attitude, and Practice based on the Covid-19 status of participants

According to table no. 4:-

- Knowledge domain is significant (p-value = 0.039) among the students who have no covid history and those who have covid-19 history, but students who had no Covid-19 history (22.74 ± 3.18) have higher knowledge than the students having covid history (21.84 ± 4.16).
- Attitude domain is also significant (p-value = 0.015) based on Covid-19 history, but students who don't have any history of Covid-19 (42.36 ± 4.84) have a better attitude towards its precautionary measures than the students who already had a history of Covid-19 (40.8 ± 5.27).

**Knowledge****Attitude**

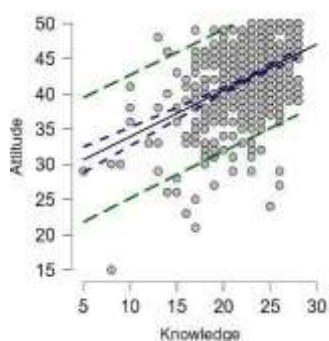
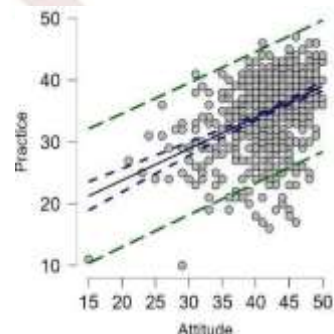
Graph No. 4: - Shows the graphical representation of Knowledge, Attitude, based on the Covid- 19 status of participants

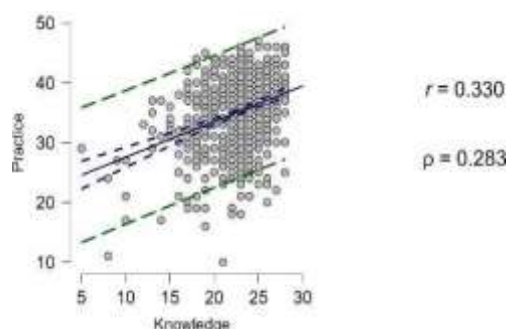
Correlational Study

	N	Pearson		Spearman	
		R	P	rho	P
Knowledge- Attitude	673	0.44	<0.001*	0.32	<0.001*
Knowledge - Practice	673	0.33	<0.001*	0.28	<0.001*
Attitude- Practice	673	0.42	<0.001*	0.38	<0.001*

Table no. 5: Shows the correlational study between all these 3 domains i.e., Knowledge, Attitude, and Practice

According to table no. 5: - There is a positive correlation between Knowledge vs Attitude ($p=0.001$), Knowledge vs Practice ($p=0.001$), and Attitude vs Practice ($p = 0.001$) in all correlation tests i.e., Karl Pearson, Spearman, and as well as for Kendall.

**Knowledge vs Attitude****Attitude vs Practice**



Knowledge vs Practice

Graph No. 5: - Shows the graphical representation of the Correlation between Knowledge vs Attitude, Attitude vs Practice, and Knowledge vs Practice in the participant

Discussion:

The Covid-19 epidemic has proven to be quite challenging for everyone around the world [3-5]. The number of cases continues to rise at an alarming rate worldwide, preventive measures are necessary to break the virus's chain of transmission and decrease infection rates.

According to some studies, vulnerable populations such as minors (adolescents) and geriatric populations need some special consideration (19, 20). Various advisories like public awareness programs and preventive strategies have been issued by the Government of India to minimize the spread of infection (19, 20).

In this study, the survey questionnaire has 3 sections consisting of the Knowledge section, Attitude, and Practice section which have 29 questions in total.

For the Knowledge Section:

This section consists of 7 questions related to respiratory exercises, respiratory hygiene, and hand hygiene used to assess the awareness and knowledge of precautionary measures and use of exercises in Covid-19 among school-going children with a total scoring of 28 for this section. The scoring of this section was divided into 3 parts i.e., good knowledge (19-28), average knowledge (10-18), and poor knowledge (below 10).

The study revealed that about 88.7% of students have good Knowledge, 10.698% of students have average Knowledge and only 0.59% of students have poor Knowledge about respiratory exercise; the importance of using a face mask, respiratory hygiene, and hand hygiene technique. This shows that to a large extent government's precautionary guidelines have been successfully implemented and followed

by teenagers.

Out of 673 students, 366 students from age 12 to 14 years are having a slightly more-mean value than the 15 to 18 years of the age group of students. This may show that as 12-14 Years students are entering into the phase of teenager so they are more serious about Covid-19 precautionary measures and the guidance that their parents, teachers, or the Government told them as compared to 15-18 Years teenagers.

According to the current study, females are more Knowledgeable about precautionary measures of Covid-19 than males which can be depicted as that the females are more-sincere and more precautionous about hygiene and exercises related to Covid-19 than males.

There were 228 students from class 6th to 8th with a lower mean value as compared to the 9th to 12th class of participants. The presented data shows that class 9th to 12th students have higher Knowledge about Covid-19 than students of class 6th to 8th. This may be because, after the reduction in the incidence of Covid-19, only class 9th to 12th students were going to school as per government guidelines, and in schools, they received Knowledge about the role and use of respiratory exercise in preventing Covid-19; the need of using the face mask, and hand hygiene technique.

According to our study, 609 students did not have any history of Covid-19 with a higher mean value, while 64 students had a history of Covid-19 before filling this questionnaire having a lower mean value relatively. This shows that students who did not have a history of Covid-19 are more knowledgeable about precautionary measures of Covid than students with a history of Covid-19; this may be because those who are not infected with Covid-19 are trying to explore more and more knowledge about Covid-19 to protect themselves from Covid-19.

For the Attitude Section:

This section consists of 10 questions related to respiratory exercises, and respiratory hygiene, used to assess the Attitude towards precautionary measures and respiratory exercises in Covid-19 among school-going children with a total scoring of 50 for this section. The scoring of this section was divided into 3 parts i.e., good attitude (36 - 50), average attitude (18-35), and poor attitude (below 17).

The current study suggested that about 91.38% of students have a good attitude, 8.47% of students have an average attitude, and only 0.15% of students have a poor attitude toward respiratory exercise; and precautionary measures such as the importance of using a face mask, respiratory hygiene, and hand hygiene technique.

Out of 673 students, 366 students were from age 12 to 14 years and 307 were from the age group of 15 to 18, the stats scoring is coined that both the age groups are having a similar mean score significantly. This is suggesting that the attitude of both groups of age are the same for Covid-19. A previous study advocated that More than half of elementary school children have a positive attitude, and the majority of study subjects have adequate knowledge about hand washing (23).

According to the descriptive stats, there were 404 students where females had the more mean value than Males who cover the 39.97% of the total population of the participants, and data imparts that females are having a better attitude toward COVID-19 about precautionary measures of Covid-19 than males which can be depicted as that the females have a more positive attitude towards hygiene and exercises related to Covid-19 and males did not care about respiratory hygiene and hand hygiene as they are more indulge in playing indoor and outdoor games.

There were 228 students from classes 6th to 8th with a lower mean value as compared with the 9th to 12th class of participants. The presented stats data shows that class 9th to 12th students having a better attitude relatively about Covid-19 than students of class 6th to 8th may be due to, after reduction in the incidence of Covid-19, only class 9th to 12th students were going to schools as per the Government guidelines, and in schools, they having the good attitude towards the use of respiratory exercise and the role of exercise in preventing Covid-19; the need of using the face mask, and hand hygiene technique.

As per the Education Ministry of Education reported guidelines Schools should concentrate on the most vulnerable children, such as those with special needs and those whose families have been directly touched by COVID-19-related mortality or illness. Directives have been issued to ensure that the children's dietary needs are met (The Hindu).

However, stats show that there is a significant difference between them as the t-stat value shows that the students who did not have a history of Covid-19 are having a better attitude towards precautionary measures of Covid than students with a history of covid-19; this may be due to those who had no history of Covid-19 are having a better attitude towards the precautionary measures and admitted that these precautionary measures help prevent them and they are more cautious about Covid-19, while those who are already infected are more relaxed and having a neutral attitude towards Covid-19.

For the Practice Section:

This section consists of 12 questions related to respiratory exercises, respiratory hygiene, and hand hygiene used to assess whether students are practicing precautionary measures recommended by the Government and whether they are performing respiratory exercises to prevent themselves from Covid-19 with a total scoring of 48 for this section. The scoring of this section is as follows: good practice (34-48 scores), average practice (17-33 scores), and poor practice (below 17) of precautionary measures of Covid-19 and respiratory exercises.

According to the result, about 66.12% of students perform good practice toward the recommended guidelines given by the Government, 33.43% of students perform the average practice of respiratory exercises and respiratory hygiene, and only 0.45% of students perform the poor practice of respiratory exercise; using a face mask.

Out of 673 students, 366 students from age 12 to 14 years are having a more-mean value than the 15 to 18 age group of students. According to data, 12-14 Years students are more seriously practicing precautionary measures such as Hand Hygiene, and respiratory exercises than students of the 15-18 years of age group, this may be due to the reason that 12-14 Years students are more interesting to do new things which their parents, teachers and the Government told them to do or maybe more-sincere because their parents and teachers asked them to follow these guidelines to prevent from Covid-19.

According to our results, 404 students were female having the more-mean value concerning the Males who cover the 39.97% of the total population of the participants, and our results is advocating that females are more indulged in practicing precautionary measures of Covid-19 than males as depicted that the females are more diligent about respiratory hygiene and exercises related to Covid-19 respectively.

There were 228 students from class 6th to 8th with a higher mean value as compared with the 9th to 12th class of participants. The coined stats data shows that class 6th to 8th students have higher consciousness for practicing of the

norms about Covid-19 than students of class 9th to 12th students because 6th to 8th class students are more interesting to do things that their parents told them to do. According to our study, 609 students did not have any history of Covid-19 with a higher mean value, while 64 students had a history of Covid-19 before filling this questionnaire having a lower mean value relatively. Our stats show that there is a highly significant difference between them which shows that the students who did not have a history of covid-19 are more indulging themselves in practicing the norms of the precautionary measures of Covid than students with a history of covid-19; this is because as they are more indulge in taking precautionary measures, they are trying to protect themselves from Covid-19.

Evidence suggests that public knowledge and prevention strategies are important in epidemic control. As a result, health officials have taken important steps to ensure that accurate information is regularly disseminated to control and manage public behavior [6].

Correlational Study:

Data reveals that there is a positive correlation between knowledge and attitude of 12-18 Years school going children regarding the precautionary measures of Covid-19 and respiratory exercises this may be due to the reason that if the children have a good knowledge of precautionary measures such as the role of social distancing and role of face mask, and role of doing respiratory exercise then they must have a positive attitude towards it.

The study reveals that there is a positive correlation between knowledge and practice of 12-18 Years school going children regarding the guidelines of precautionary measures of Covid-19 and respiratory exercises, this may be due to the reason that students have high knowledge of precautionary measures and how Covid-19 can transmit from 1 person to other so they are practicing more and more to protect themselves from Covid-19 pandemic.

According to the results, there is a positive correlation between attitude and practice of 12-18 Years school-going children because they have a good attitude towards the precautionary measure such as the role of face masks in preventing the spread of Covid-19.

Limitations of the Study:

The current study was survey-based research, and it has taken only the Northern part of India. Since the study did not consider the other parts of India, we cannot generalize the findings to the whole of the country. And, as the data was collected from the 4 states and 2 UTs of North India, the

sample size is small relatively.

Future Recommendation:

Descriptive studies can be conducted to understand better the age vs attitude and behaviour towards the practice of COVID-19 protocols. The schools should formulate more customized programs/awareness protocols to enhance students' knowledge, attitudes, and practices about Covid-19 and its proactive measures.

Conclusion

The study found that the North India students' have good knowledge and a positive attitude regarding the precautionary measures of Covid-19, and the role of respiratory exercises, but there is a lack of practice of these recommended guidelines. Furthermore, the study finds that Knowledge, Attitude, and Practice are positively correlated. To improve the overall practice of following the advisory guidelines, public health officials need to target more customized educational programs, and communication to ensure individuals with low practice adhere to precautionary measures.

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