

Demographic Associated Study in Relation to COVID-19

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Abstract

Introduction: Coronavirus has caused a major burden to mankind since the end of the year 2019 and is still persisting. School going children play a vital role in sustaining the human race and it is necessary to educate them about Coronavirus disease and inculcate in them the preventive measures to minimize its outbreak. This study is aimed to determine the level of awareness and knowledge on preventive measures of this disease and to find their association with demographic variables in high school students.

Methods: A close ended questionnaire based demographic study was done to assess the awareness and knowledge of COVID-19 on 242 school children, Visakhapatnam, Andhra Pradesh, India. The collected data was statistically analyzed.

Results: The study revealed that the highest percentages of students were in the age group of 14 years (41.73%) and majority of them were female (52.89%). Most of the students were residing in urban area (67.35%). The maximum source of knowledge about the disease was from mass media (75.61%). Awareness associated studies showed significance with the variables of age group ($P=0.004$), area of residence ($P=0.04$), and nutritional status of the students ($P=0.016$), while the knowledge related studies showed significance with only nutritional status of the students ($P=0.001$). Students residing in rural area decreased the odds of awareness. Female students and 13 years of age students having marginal nutrition have increased the odds of having awareness. Students who are having good health increased the odds of knowledge while those who were over nutrition decreased the odds of knowledge on preventive measures. ($P<0.05$ was considered as significant).

Conclusion: The study denotes that the efforts of the global health authorities in imparting the necessary steps through mass media to save the public were successful. More awareness and knowledge through mass media increases the tendency of gaining knowledge and awareness towards COVID-19. It is suggestible to include modern technologies and also breathing exercises in school curriculums to protect the students from COVID-19. Further study on various aspects of this respiratory disease with larger sample size will help in acquiring an in-depth knowledge on corona virus.

Keywords: COVID-19 • High school children • Awareness • Preventive measures • Demographic variables

Introduction

In the current scenario respiratory diseases are a major burden throughout the world. One such life threatening novel acute respiratory disease has made an appearance in the city of Wuhan, Hubei province of China in the end of the year 2019. The World Health Organization (WHO) has entitled this disease as Coronavirus Disease (COVID-19) in the month of January 2020 [1]. This disease

is caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). It has rapidly spread in the human population through all the regions of the world. Hence it was declared as a pandemic and also as a global public health emergency on March 11th 2020 [2]. Major initiatives have been made by WHO, United Nations International Children's Emergency Fund (UNICEF), and Centers for Disease Control and Prevention (CDC) to bring awareness, to inculcate the knowledge about COVID-19 and how to prevent the spread of this disease.

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The disease is transmitted from a COVID-19 patient to a healthy individual either through respiratory droplets, close contact or through direct contact of the fomites used by the infected person. Symptoms comprise fever, cough, and shortness of breath, pain, weakness, fatigue, myalgia, headache, confusion, and diarrhea. The period over which the person has been exposed to this infection and the advent of the initial symptoms ranges between 0-24 days. Some of the infected persons may not express any symptoms. This incubation time may differ from person to person depending upon one's age and immunity. The intensity of the infection can be mild, moderate, or acute. Some may recover without treatment, while people who are senile and with systemic co morbidities develop chronic symptoms which may become lethal [3].

As this disease is a sudden outbreak it has become difficult to identify the appropriate drug treatment. Hence, initially chloroquine or hydroxychloroquine was recommended but heavy usage of this drug caused severe side effects as it is mainly a drug for controlling malarial fever. Later, Remedisivir, Steroids, Tocilizumab, Favipiravir and Ivermectin were currently used for effective treatment. As of 7th March 2022, 445,096,612 people have been confirmed with COVID-19 including 5,998,301 deaths. COVID-19 vaccination program has been implemented with a gap of 6 months for each dose, yet it was noted that by the end of the year 2021 more than 100 million people were affected and about 2 million people had died globally. A total of 10,704,043,684 vaccine doses have been administered as of 5th March 2022 worldwide. But due to the inconsistent results of this drug and vaccination therapy, it was considered that the ideal way to deal with this virus is by combating its spread by bringing awareness and imbibing the knowledge and preventive measures of COVID-19 in the entire human population using different sources like education, mass media, family, friends, neighbors, and schools etc. Hand washing, sanitizing, wearing a face mask, self-isolation and social distancing are some of the measures to be taken which decreases the spread of this outbreak [4].

The present study is focused to assess the awareness of COVID-19 and knowledge on its preventive measures and to find their association with demographic variables among the high school children. This study brings awareness about the disease in school going children. The finding of this study can help to make correct and frank decisions to control this pandemic [5].

India which is the neighboring country of China and also the second largest populated country globally is more prone to rapid transmission of this infectious disease. The first case in this country was reported on 30th January 2020 in the State of Kerala. According to the WHO report, currently the incidence rate in India shows that about 42,967,315 of Indian Citizens have been infected and nearly 515,102 deaths have occurred [6].

The global scenario and experiences have shown that, the adult patients and older individuals are more vulnerable to this infection. Studies suggest children form an important part of the human society. They are the future of the human race. It is necessary to protect the children from this pandemic. Studies reveal that educational interventions had improved knowledge, attitude and practice of the students. Hence awareness of this disease and the preventive measures to be followed has to be taught to them. Perception the children in the society help in communicating the people about maintaining personal hygiene. It is essential to ensure that school

going children have the fundamental knowledge towards Corona virus and they would be able to clear the misbeliefs about COVID-19 [7].

Materials and Methods

A demographic study survey was conducted on 12-16 years age group of 242 high school going children out of which 127 students were from Andhra University English medium high school and 115 students were from Andhra University telugu medium high school. Both the schools are associated with the teaching and research institution Andhra University, located in Visakhapatnam, Andhra Pradesh, India. This study was performed in the month of February to March 2021 when the schools were reopened after the first COVID-19 lock down. Formal written permission was obtained from the school administrators prior to the data collection. Approval for carrying out the studies in human volunteers was taken from the institutional ethics committee, Andhra University, and Visakhapatnam, India. The researcher by person has directly participated in the collection of the data from the students in the form of questionnaire by adhering to the COVID-19 safety measures like maintaining social distance, wearing face mask and hand hygiene [8].

An informed written consent was obtained from the students after explaining the purpose of the study and confidentiality of the study was assured to them. The data obtained was planned to analyze in terms of objectives of the study using descriptive and inferential statistics. The questionnaire was designed depending on the currently available information about COVID-19 provided by WHO, CDC and National Health Services (NHS) [9]. It was designed as a close ended questionnaire which takes about 30 to 40 minutes to complete. This questionnaire was provided in both English and Telugu which is the regional vernacular language and was checked by experts for grammatical and sentence structure errors, later corrections were made as per their suggestions. It is divided into three major sections. The first section consisted of student's socio demographic variables like age, gender, residential area, socio economic status, health and nutritional status of the student, and educational status of the parents and also a question related to source through which they obtained COVID-19 information. The second section included the subject matter on COVID-19, to measure their awareness and the third section dealt with questions related to preventive measures to test their knowledge on this aspect. The assessment was done by using 30 questions apart from socio demographic variables in which 15 questions are related to awareness and 15 to preventive measures. Pilot study was conducted in the research institution for clarity and acceptability. The participated students responded to each statement in the second and the third sections with either 'Yes' or 'No' and later a scoring system was applied with each correct answer given one point and every wrong answer as zero. Thus the total score ranged from zero to maximum of 15 points in each section. The participated students were grouped into three categories depending upon the scores they achieved as 'Inadequate (0-5 points), moderate (6-10 points), adequate (11-15 points) [10].

Statistical data analysis was done by using Microsoft Excel, MEDCALC and STATA15.0 statistical software and cross checked to avoid errors. Descriptive statistics like frequency and percentage were used for measuring demographic variables, knowledge and

awareness of COVID-19 and the results were presented in tables [11]. For associated studies either *chi-square* for comparing more than two variables and t-test for comparing two variables (Gender and educational status of the parents) was used to calculate the 'p'-value. Logistic regression analysis was used to find the association of demographic variables in relation with the awareness and knowledge of COVID-19. The scores related to the questions of COVID-19 awareness and the scores related to the questions on Knowledge of COVID-19 were taken as the dependent variables and the demographic factors were taken as the independent variables with their covariates to find the association. 'P' value ≤ 0.05 for inferential analysis and logistic regression model was considered to be statistically significant [12].

Results

The demographic survey of the student participants involved in the study Table 1 shows that the highest percentage of the students were of 14 years of age (41.73%). Majority of them were female students (52.89%) [13]. Many of the student participants reside in urban area (67.35%) and are within the socio economic group of Rs.5000-10,000 monthly income (42.97%). 89.66% of the students have good health with marginal nutritional status (48.34%). Equal proportion (50.42% and 49.58%) of illiterates and literates was observed in the educational status of the students' parents (Tables 2).

No.	Demographic variables	Total (N=242) Frequency	Percentage
1	Age-12 yrs	18	0.0743
2	Age-13 yrs	81	0.3347
3	Age-14 yrs	101	0.4173
4	Age-15 yrs	35	0.1446
5	Age-16 yrs	7	0.0289
6	Gender-male	114	0.471
7	Gender-female	128	0.5289
8	Residential area-slum	15	0.0619
9	Residential area-rural	32	0.1322
10	Residential area-urban	163	0.6735
11	Residential area-suburban	32	0.1322
12	Socio-economic income)-status (monthly Rs. 1000-3000	56	0.2314
13	Socio-economic income)-status (monthly Rs. 3000-5000	56	0.2314
14	Socio-economic status (monthly income)-Rs. 5000-10000	104	0.4297
15	Socio-economic status (monthly income)-Rs. 15000-above	26	0.1074
16	Health status of the child-any history of illness	15	0.0619
17	Health status of the child-good	217	0.8966
18	Health status of the child-weak	10	0.0413
19	Nutritional status of the child-optimal	94	0.388
20	Nutritional status of the child-marginal	117	0.4834
21	Nutritional status of the child-undernourished	17	0.0702
22	Nutritional status of the child-over nutritional	13	0.0537
23	Educational status of parents-illiterate	121	0.5042
24	Educational status of parents-literate	120	0.4958

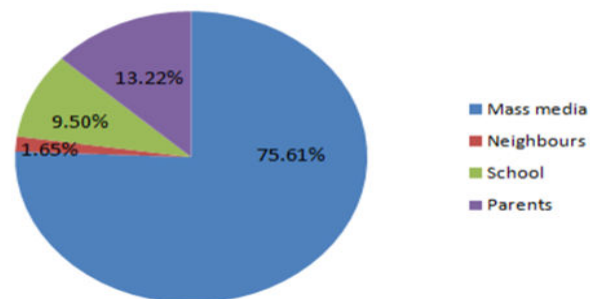
Table 1. Socio demographic characteristics of the high school student participants.

No.	Source of knowledge	Frequency (%)
1	Mass media	183 (75.61)
2	Neighbors	4 (1.65)
3	School	23 (9.50)
4	Parents	32 (13.22)

Table 2. Source of knowledge acquired about COVID-19 among the student participants. From the study it was observed that the main source of information about COVID-19 was attained from Mass media (N=183, 75.61%).

(N=32, 13.22%) of students have known about this new disease from parents and (N=23, 9.50%) from school and (N=4, 1.65%) acquired this knowledge from neighbors. (The same applies for Table 2 and Figure 1).

Source of Information about COVID-19



Collectively (76.85%) of the student participants had adequate awareness, and (23.14%) had moderate awareness and there were no student participants who had poor awareness (0%) about the disease. Out of the 242 high school student participants statistical significance was found according to the age group (P=0.004), residential area (P=0.04) and the nutritional status of the students (P=0.016) [14]. Adequate awareness about COVID-19 was found in the students belonging to the age group of 14 years, N=77, (76.23%), and in the students residing in the urban area N=113, (79.02%) and who were having marginal level of nutritional status N=102, (86.44%). But no significance was found in the awareness score with regard to the student's gender, socio-economic status, health status and their parent's educational status (Table 3) [15].

Figure 1. Source of information about COVID-19.

No.	Variable	(N=242)	Inadequate		Moderate		Adequate		P value
			Frequency	(%)	Frequency	(%)	Frequency	(%)	
1	Age-12 yrs	18	0	0	6	0.3333	12	0.6666	0.004*
	Age-13 yrs	81	0	0	6	0.074	75	0.9259	
	Age-14 yrs	101	0	0	24	0.2376	77	0.7623	
	Age-15 yrs	35	0	0	18	0.5142	17	0.4857	
	Age-16 yrs	7	0	0	2	0.2857	5	0.7142	
2	Gender	114	0	0	40	0.3508	74	0.6491	0.429
	Male								
	Gender	128	0	0	16	0.125	112	0.875	
	Female								
3	Residential area-slum	15	0	0	2	0.1333	13	0.8666	0.04*
	Residential area-rural	32	0	0	16	0.5	16	0.5	
	Residential area-urban	143	0	0	30	0.2097	113	0.7902	
	Residential area-semi urban	32	0	0	8	0.25	24	0.75	
4	Socio-economic status (Monthly Income)-Rs. 1000-3000	56	0	0	11	0.1964	45	0.8035	0.98
	Socio-economic status (Monthly Income)-Rs. 3001-5000	56	0	0	13	0.2321	43	0.7678	
	Socio-economic status (Monthly Income)-Rs. 5001-10000	104	0	0	27	0.2596	77	0.7403	
	Socio-Economic status (Monthly Income)-Rs.	26	0	0	5	0.1923	21	0.8076	

	15000 and above								
5	Health status of the child- History of illness	15	0	0	4	0.2666	11	0.7333	0.98
	Health status of the child-good	217	0	0	49	0.2258	168	0.7741	
	Health status of the child-weak	10	0	0	3	30.05	7	0.7	
6	Nutritional status of the child-optimal	94	0	0	34	0.3617	60	0.6382	0.016*
	Nutritional status of the child-marginal	118	0	0	16	0.1355	102	0.8644	
	Nutritional status of the child -under nutrition	17	0	0	4	0.2352	13	0.7647	
	Nutritional status of the child -over nutrition	13	0	0	2	0.1538	11	0.8461	
7	Educational status of parents-illiterate	122	0	0	33	0.2704	89	0.7295	0.464
	Educational status of parents-literate	120	0	0	23	0.1916	97	0.8083	

*P ≤ 0.05=significant

Table 3. Association between demographic variables with the level of awareness regarding COVID-19 among high school children.

From the overall student participants 92.97% of the students had adequate knowledge and 7.02% had moderate knowledge and there were no students (0%) who have poor knowledge on the preventive measures of COVID-19. The knowledge assessment among the student participants in association with the demographic variables

and the level of knowledge on preventive measures of COVID-19 showed statistical significance with the nutritional status of the students (P=0.001). Student participants with marginal nutritional status had adequate knowledge on the preventive measures N=112 (94.91%). No significant association was found with the other demographic variables (Table 4).

No.	Variable	N=242	Inadequate		Moderate		Adequate		P value
			Frequency	(%)	Frequency	(%)	Frequency	(%)	
1	Age-12 yrs	18	0	0	2	0.1111	16	0.8888	0.997
	Age-13 yrs	81	0	0	7	0.0864	74	0.9135	
	Age-14 yrs	101	0	0	7	0.0693	94	0.9306	
	Age-15 yrs	35	0	0	3	0.0857	32	0.9142	
	Age-16 yrs	7	0	0	0	0	7	1	
	Gender-male	113	0	0	8	0.0707	105	0.9292	0.228
	Gender-female	129	0	0	9	0.0697	120	0.9302	
2	Residential area-slum	15	0	0	1	0.0666	14	0.9333	0.983
	Residential area-rural	32	0	0	3	0.0937	29	0.9062	
	Residential area-urban	163	0	0	12	0.0736	151	0.9263	

	Residential area-semi urban	32	0	0	1	0.0312	31	0.9687	
3	Socio-economic status (Monthly income)-Rs. 1000-3000	57	0	0	3	0.0526	54	0.9473	0.803
	Socio-economic status (Monthly income)-Rs. 3001-5000	56	0	0	6	0.1071	50	0.8928	
	Socio-economic status (Monthly income)-Rs. 5001-10000	104	0	0	5	0.048	99	0.9519	
	Socio-Economic status (Monthly Income)-Rs. 15000 and above	26	0	0	3	0.1153	23	0.8846	
4	Health status of the child-history of illness	15	0	0	3	0.2	12	0.8	0.316
	Health status of the child-good	217	0	0	14	0.0645	203	0.9354	
	Health status of the child-Weak	10	0	0	0	0	10	1	
5	Nutritional status of the child-optimal	94	0	0	5	0.0531	89	0.9468	0.001*
	Nutritional status of the child-marginal	118	0	0	6	0.0508	112	0.9491	
	Nutritional status of the child-under nutrition	17	0	0	1	0.0588	16	0.9411	
	Nutritional status of the child-over nutrition	13	0	0	5	0.3846	8	0.6153	
6	Educational status of parents-illiterate	118	0	0	7	0.0593	111	0.9406	0.35
	Educational status of parents-literate	120	0	0	6	0.05	114	0.95	

*P ≤ 0.05=significant

Table 4. Association between demographic variables with the level of knowledge on preventive measures regarding COVID-19 among high school children

Awareness

Table 5 represents the statements used for assessing the awareness of the student participants on COVID-19. The correct answers to the statements are mentioned in brackets next to each question. Maximum of the students were aware that COVID-19 is a communicable disease (93.80%), and know that it is caused by a

virus (90.08%). They are also aware of COVID-19 symptoms (91.73%) and do not believe that it is God's curse (90.90%) and they have an idea as to whom to inform if they have COVID-19 symptoms (90.49%). Most of the students also discussed the awareness and preventive measures of this infection with their

family members (90.90%). 89.66% of the individuals admit that they are taking vitamin C rich foods to increase their immunity and 86.36% think that doing deep breathing and regular exercises will boost immunity and reduce the risk of infection. 84.71% have an idea that the corona virus will affect the respiratory system in the human body. 78.51% of the candidates were aware that having

strong immunity can prevent them from getting infected and lockdown will reduce the spread of this virus (78.92%). 78.51% of the participants believe that only medication can cure the symptoms of COVID-19 and they are also aware that this virus can spread through eating uncooked meat of infected animals (75.20%). Just 44.21% of the students have an idea about Personal Protective Equipment (PPE).

S. no.	Statements for assessing awareness on COVID-19 disease	Frequency (%) correct answers	Frequency (%) incorrect answers
1	Is COVID-19 is a communicable disease? (yes)	227 (93.80)	15 (6.19)
2	Do you know that COVID-19 is caused by a virus? (yes)	218 (90.08)	24 (9.917)
3	Are you aware of COVID-19 symptoms? (yes)	222 (91.73)	20 (8.264)
4	Do you think, having a strong immunity can prevent you from getting COVID-19 disease? (yes)	190 (78.51)	52 (21.48)
5	Do you think lockdown will reduce the spread of corona virus? (yes)	191 (78.92)	51 (21.07)
6	Do you think doing deep breathing and regular exercises will boost immunity and reduce the risk of COVID-19 disease? (yes)	209 (86.36)	33 (13.63)
7	Do you have any idea that corona virus will affect the Respiratory System (lungs) in our body? (yes)	205 (84.71)	37 (15.28)
8	Do you believe that COVID-19 is not a disease and it's a God's curse? (No)	220 (90.90)	22 (9.090)
9	Do you think that only medication can cure COVID-19 symptoms? (No)	190 (78.51)	52 (21.48)
10	Do you know whom to inform, if you have COVID-19 symptoms? (Yes)	219 (90.49)	23 (9.504)
11	Do you feel anxiety to discuss about COVID-19 symptoms to anyone? (No)	68 (28.09)	174 (71.90)
12	Do you have any idea about Personal Protective Equipment (PPE)? (yes)	107 (44.21)	135 (55.78)
13	Have you discussed with your family members about awareness and preventive measures of COVID-19?(yes)	220 (90.90)	22 (9.090)
14	Do you think corona virus can spread through eating uncooked meat of infected animals? (yes)	182 (75.20)	60 (24.79)
15	Do you take vitamin-C rich foods to increase your immunity? (yes)	217 (89.66)	25 (10.33)

Table 5. Responses to the questionnaire on awareness of COVID-19.

Knowledge

Table 6 represents the responses to the questionnaires on assessing the knowledge of the students on the preventive measures of COVID-19. Of the total student participants 92.97% of them have adequate knowledge on the preventive measures, while the remaining 7.02% have moderate knowledge there were no students 0% who have poor knowledge about the preventive measures of this disease. 97.93% of the students adopted in following hygienic practices like washing of hands, legs and face with soap and water before entering or immediately after entering their homes. They also practiced hand washing methods regularly (96.28%) and refrained from shake hands and rubbing of eyes after sneezing (95.45%). 92.56% of the students have the knowledge that maintaining social distance, wearing masks and regular hand hygiene helps in stopping the spread of corona virus.

They also adopted in wearing of face masks when going out (92.14%) and 91.3% of students avoided in attending any group meetings with friends in lock down period. 91.32% of them also helped in protecting others by covering their face with elbow while sneezing. 90.90% of the students also carried pocket sanitizers at all times. 88.01% of the students responded correctly that wearing mask will prevent the risk of infection. They are also maintaining social distance in schools and public places (85.95%). 86.77% of the students have knowledge that they should not share the fomites of COVID-19 infected persons. 83.05% participants agree that it is optional to wear a mask inside their homes. 77.27% of the students have the knowledge that the infected person has to be isolated from the remaining family members. Only 50.41% of the students gave the accurate answer to the question as whether to avoid close contact with the people who have COVID-19 symptoms. But the students had less knowledge (44.62%) to the question as whether it is compulsory to send the COVID-19 patients to quarantine centre.

S. no	Statements on assessing knowledge on the preventive measures of COVID-19	Frequency (%) correct answers	Frequency (%) incorrect answers
1	Do you wear mask whenever you go out of house? (yes)	223 (92.14)	9 (3.719)
2	Do you agree that wearing mask will prevent the corona virus? (yes)	213 (88.01)	29 (11.98)
3	Do you think wearing mask is necessary inside home? (No)	201 (83.05)	41 (16.94)
4	Do you wash your hands, legs, face with soap and water before entering or immediately after entering your home?(yes)	237 (97.93)	5 (2.066)
5	Did you attend any group meeting with friends in lockdown period? (No)	222 (91.73)	20 (8.264)
6	Do you maintain social distance at school and public places? (yes)	208 (85.95)	34 (14.04)
7	Do you share the things of COVID-19 infected person? (No)	210 (86.77)	32 (13.22)
8	Do you carry a pocket sanitizer at all time? (yes)	220 (90.90)	22 (9.090)
9	Do you cover or protect your face with elbow while sneezing? (yes)	221 (91.32)	21 (8.677)
10	Do you agree to isolate the family members of COVID-19 person? (yes)	187 (77.27)	55 (22.72)
11	Is it compulsory to keep the contact persons of COVID-19 patient for quarantine centre? (No)	108 (44.62)	134 (55.37)
12	Do you shake hands and rub your eyes after sneezing? (No)	231 (95.45)	11 (4.545)
13	Do you avoid close contact with the people who have COVID-19 Symptoms? (yes)	122 (50.41)	120 (49.58)
14	Do you practice hand hygiene or hand washing methods regularly? (yes)	233 (96.28)	9 (3.719)
15	Do you think that following social distance, wearing mask and hand hygiene stop the spread of corona virus? (yes)	224 (92.56)	18 (7.438)

Table 6. Responses to the questionnaire on the knowledge on preventive measures of COVID-19.

Statistically strong significant association was observed between COVID-19 awareness and age group $P=0.004$ and knowledge and nutritional status of the child ($P=0.001$) (Tables 7 and 8). Significant association was found between area of residence and awareness ($P=0.014$) (Table 8), and between nutritional status of the child and awareness ($P=0.016$). Students of 14 years (Awareness $n=112$; knowledge $n=120$), female students (Awareness $n=112$, knowledge

$n=120$), students residing in urban area (Awareness $n=133$; knowledge $n=151$) and students with marginal nutrition (Awareness $n=102$, knowledge $n=112$) Tables 7 and 8 have adequate awareness and knowledge about COVID-19. All the students were aware of the new disease in spite of their parents being literate or illiterate.

Variables	N	%	Awareness score			Mean	SD	P
			Inadequate	Moderate	Adequate			
Gender-male	114	47.1	0	40	74	57	24.041	0.41
Gender-female	128	52.89	0	16	112	64	67.882	
Age-12 yrs	18	7.43	0	6	12	9	4.242	0.004*
Age-13 yrs	81	33.47	0	6	75	40.5	48.79	
Age-14 yrs	101	41.73	0	24	77	50.5	37.476	
Age-15 yrs	35	14.46	0	18	17	17.5	0.707	
Age-16 yrs	7	2.89	0	2	5	3.5	2.121	
Residential area-rural	32	13.22	0	16	16	16	0	0.014*
Residential area-slum	15	6.19	0	2	13	7.5	7.778	

Residential area-urban	162	66.94	0	30	133	81.5	72.832	
Residential area-semi urban	33	13.63	0	8	24	16	11.313	
Socio-economic status(Monthly income)-Rs. 1000-3000	56	23.14	0	11	45	28	24.041	0.98
Socio-economic status (Monthly income)-Rs. 3001-5000	56	23.14	0	13	43	28	21.213	
Socio-Economic status(Monthly Income)-Rs. 5001-10000	104	42.97	0	27	77	52	35.355	
Socio-economic status (Monthly Income)-greater than Rs. 10000	26	10.74	0	5	21	13	11.313	
Health status of the child-history of illness	16	6.611	0	4	11	7.5	4.949	0.98
Health status of the child-good	216	89.25	0	49	168	108.5	84.145	
Health status of the child-weak	10	4.132	0	3	7	5	2.828	
Nutritional status of child-optimal	95	39.25	0	34	60	47	18.384	0.016*
Nutritional status of child-marginal	117	48.34	0	16	102	59	60.811	
Nutritional status of child-mal nutrition	17	7.024	0	4	13	8.5	6.363	
Nutritional status of child-over nutrition	13	5.371	0	2	11	6.5	6.363	
Educational status of the parents-illiterate	121	50	0	33	89	61	39.597	0.454
Educational status of the parents-literate	121	50	0	23	97	60	52.325	
Source of knowledge-mass media	183	75.61	0	40	143	91.5	72.832	0.966
Source of knowledge-neighbors	5	2.066	0	1	3	2	1.414	
Source of knowledge-school	23	9.504	0	5	18	11.5	9.192	
Source of knowledge-parents	31	12.8	0	10	22	16	8.485	

*P ≤ 0.05=significant

Table 7. Comparison of socio demographic characters and mean of awareness of COVID-19.

Variables	N	%	Knowledge score			mean	SD	P
			Inadequate	Moderate	Adequate			
Gender-male	114	47.1	0	8	105	56.5	68.589	0.192
Gender-female	128	52.89	0	9	120	64.5	78.488	
Age-12 yrs	18	7.43	0	2	16	9	9.899	0.997
Age-13 yrs	81	33.47	0	7	74	40.5	47.376	

Age-14 yrs	101	41.73	0	7	94	50.5	61.518	
Age-15 yrs	35	14.46	0	3	32	17.5	20.506	
Age-16 yrs	7	2.89	0	0	7	3.5	4.949	
Residential area-rural	32	13.22	0	3	29	16	18.384	0.983
Residential area-slum	15	6.19	0	1	14	7.5	9.192	
Residential area-urban	162	66.94	0	12	151	81.5	98.287	
Residential area-semi urban	33	13.63	0	1	31	16	21.213	
Socio-economic status (Monthly income)-Rs. 1000-3000	56	23.14	0	3	53	28	35.355	0.808
Socio-economic status (Monthly Income)-Rs. 3001-5000	56	23.14	0	6	50	28	31.112	
Socio-economic status (Monthly income)-Rs. 5001-10000	104	42.97	0	5	99	52	66.468	
Socio-Economic status(Monthly Income)-greater than Rs.10000	26	10.74	0	3	23	13	14.142	
Health status of the child-history of illness	16	6.611	0	3	12	7.5	6.363	0.316
Health status of the child –Good	216	89.25	0	14	203	108.5	133.643	
Health status of the child –Weak	10	4.132	0	0	10	5	7.071	
Nutritional status of child-optimal	95	39.25	0	5	89	47	59.396	0.001*
Nutritional status of child-marginal	117	48.34	0	6	112	59	74.953	
Nutritional status of child-mal nutrition	17	7.024	0	1	16	8.5	10.606	
Nutritional status of child-over nutrition	13	5.371	0	5	8	6.5	2.121	
Educational status of the parents-illiterate	121	50	0	11	111	61	70.71	0.4
Educational status of the parents-literate	121	50	0	6	114	60	76.367	
Source of knowledge-mass media	183	75.61	0	9	174	91.5	116.672	0.15
Source of knowledge-neighbors	5	2.066	0	0	4	2	2.828	
Source of knowledge-school	23	9.504	0	5	18	11.5	9.192	
Source of knowledge-parents	31	12.8	0	3	29	16	18.384	

*P ≤ 0.05=significant

Table 8. Comparison of socio demographic characters and mean of knowledge on preventive measures of COVID-19.

Students residing in rural area in relation to students residing in slum area decreased the odds of awareness OR: 0.153 (0.029-0.794). Student participants who are 13 years of age compared to 12 years of age students (OR: 6.250 (1.728-22.596) and AOR: 9.139 (2.065-40.441), female students compared to male students OR: 3.783 (1.975-7.247) and AOR: 4.722 (2.057-10.842)

and students who are self-identified as marginal nutrition of OR: 3.612 (1.840-7.090) and AOR: 3.314 (1.292-8.497) increased the odds of having awareness about COVID-19 (Table 9) [16].

Variable	Sub variable	Unadjusted Odds Ratio (OR) (95% CI)	P	Adjusted Odds Ratio (AOR) (95% CI)	P
Age	12 yrs (ref.)	-	-	-	-
	13 yrs	6.250 (1.728-22.596)	0.005*	9.139 (2.065-40.441)	0.004*
	14 yrs	1.604 (0.543-4.732)	0.392	2.189 (0.608-7.880)	0.231
	15 yrs	0.472 (0.144-1.541)	0.214	0.654 (0.161-2.656)	0.553
	16 yrs	1.250 (0.185-8.444)	0.819	1.841 (0.176-19.212)	0.61
Gender	Male (ref.)	-	-	-	-
	Female	3.783 (1.975-7.247)	0.000*	4.722 (2.057-10.842)	0.000*
Residential area	Slum (ref)	-	-	-	-
	Urban	0.682 (0.146-3.183)	0.626	2.942 (0.426-20.320)	0.274
	Rural	0.153 (0.029-0.794)	0.025*	0.756 (0.089-6.396)	0.798
	Semi urban	0.461 (0.085-2.501)	0.37	1.697 (0.200-14.365)	0.627
Socioeconomic status	Rs.1000-3000 (ref)	-	-	-	-
	Rs.3001-5000	0.826 (0.334-2.046)	0.681	0.545 (0.162-1.832)	0.327
	Rs.5001-10,000	0.712 (0.322-1.575)	0.403	0.497 (0.176-1.399)	0.186
	Rs.10,001>	1.050 (0.323-3.410)	0.935	0.598 (0.128-2.784)	0.513
Health status of the child	History of illness (ref)	-	-	-	-
	Good	1.246 (0.380-4.089)	0.716	1.859 (0.394-8.766)	0.433
	Weak	0.848 (0.144-4.989)	0.856	2.274 (0.225-22.978)	0.486
Nutrition of the child	Marginal	3.612 (1.840-7.090)	0.000*	3.314 (1.292-8.497)	0.013*
	Malnutrition	1.841 (0.556-6.096)	0.317	1.016 (0.212-4.869)	0.983
	Over nutrition	3.116 (0.652-14.895)	0.154	4.602 (0.711-29.785)	0.109
Education of the parents	Illiterate (ref)	-	-	-	-
	Literate	1.563 (0.853-2.864)	0.148	1.896 (0.882-4.071)	0.101

*P ≤ 0.05=significant

Table 9. Unadjusted Odds Ratio(OR) and Adjusted Odds Ratio (AOR) estimates with 95%Confidence interval (95%CI) of univariate and multivariate logistic regression model for Awareness about COVID-19, (N=242).

Knowledge: Individuals who are having good health increased the odds of knowledge on preventive measures of COVID-19 AOR: 5.954 (0.996-35.575) and children who identified themselves as over nutrition had decreased the odds of knowledge on preventive measures OR: 0.089 (0.021-0.377) and AOR: 0.094 (0.012-0.716)(Table 10).

Variable	Sub variable	Unadjusted Odds Ratio (OR) (95% CI)	P	Adjusted Odds Ratio (AOR) (95% CI)	P
Age	12 yrs (ref.)	-	-	-	-
	13 yrs	1.562 (0.288-8.458)	0.605	2.279 (0.311-16.705)	0.81
	14 yrs	1.979 (0.366-10.679)	0.427	1.875 (0.239-14.673)	0.6
	15 yrs	1.333 (0.202-8.800)	0.765	2.976 (0.288-30.657)	0.92
	16 yrs	1	-	1	-
Gender	Male (ref.)	-	-	-	-
	Female	1.285 (0.478-3.452)	0.618	1.604 (0.412-6.237)	0.495
Residential area	Slum (ref)	-	-	-	-
	Urban	0.898 (0.108-7.429)	0.921	1.582 (0.118-21.058)	0.728
	Rural	0.690 (0.065-7.249)	0.758	1.193 (0.050-28.224)	0.913
	Semi urban	2.214 (0.129-38.003)	0.584	3.803 (0.094-152.8541)	0.478
Socioeconomic status	Rs.1000-3000 (ref)	-	-	-	-
	Rs.3001-5000	0.314 (0.060-1.631)	0.168	0.1970 (0.027-1.407)	0.105
	Rs.5001-10,000	0.747 (0.140-3.982)	0.733	0.765 (0.098-5.948)	0.798
	Rs.10,001>	0.289 (0.045-1.849)	0.19	0.395 (0.032-4.746)	0.465

Health status of the child	History of illness (ref)	-	-	-	-
	Good	3.625 (0.915-14.354)	0.067	5.954(0.996-35.575)	0.050*
	Weak	1	-	1	-
Nutrition of the child	Optimal (ref)	-	-	-	-
	Marginal	1.048 (0.309-3.548)	0.939	1.404 (0.250-7.891)	0.699
	Malnutrition	0.898 (0.098-8.210)	0.925	0.878 (0.062-12.313)	0.923
	Over nutrition	0.089 (0.021-0.377)	0.001*	0.094 (0.012-0.716)	0.022*
Education of the parents	Illiterate(ref)	-	-	-	-
	Literate	1.882 (0.673-5.266)	0.228	1.148 (0.331-3.976)	0.827

*P ≤ 0.05=significant

Table 10. Unadjusted Odds Ratio(OR) and Adjusted Odds Ratio (AOR) estimates with 95% Confidence interval (95% CI) of univariate and multivariate logistic regression model for knowledge on preventive measures of COVID-19, (N=242).

Discussion

The present study is focused on the discernment of awareness and knowledge on preventive measure of COVID-19 in 242 high school students studying in Visakhapatnam during the preliminary lock down period in the unexpected COVID-19 pandemic.

Corona virus has caused a great impact on the human population. High school children between the age group of 12 to 16 years are very active and try to socialize at the maximum which can cause the spread of this disease. Compliance to the preventive measures reduces the spread of the diseases among the students, the school staff and also the community. So it is crucial for children to know about COVID-19, so that they can be cautious about protecting themselves from being infected.

The levels of COVID-19 knowledge varied among the school going student participants in various aspects like age, gender, socio-economic status, their health and nutritional status. Most of the participants were aware of this new disease. All the students had either moderate or adequate level of awareness and had knowledge on preventive measures to reduce transmission. There were no student participants who had inadequate awareness and knowledge of this disease according to the scoring system.

It was identified that mass media source has been the highest means of communication that brought awareness to the people community. Similar results have been found in the study on Egyptian, Nigerian, Ethiopian, and Saudi Arabian participants. Increased access to information through electronic media was reported in a study from Ghana the same has been revealed in this study where many of the students received the information on COVID-19 through mass media which includes internet, television, radio, and electronic devices. The use of technologies during the lockdown period helped in providing knowledge and awareness of the disease. This indicates that social media and online information have become a principle way of relaying information when compared to other sources. The Indian Ministry of Health And Family Welfare (MoHFW) and WHO have provided information about the COVID-19 pandemic, hence more attention should be focused on making use of technology like social media as they help in promoting public health education among students.

More than 90% of the student participants were aware of its symptoms and know that it is a communicable disease which is transmitted by a virus and 80% and above students not only had knowledge but also were practicing preventive measures like regular washing of hands, wearing of a mask, maintaining social distance in schools and public places, avoiding group gatherings, covering their face with elbow while sneezing and always carrying a pocket sanitizer. This is a sign of assurance that the children would manage to keep themselves safe in the community.

This demographic study also revealed that maximum of the study participants were females and the age group of the participants were between 12 to 16 years, these results were nearly related to the studies conducted on the school going children in Italy, Egypt and Ethiopia.

SARS-CoV-2 virus effects the respiratory system causing a person difficult to breath and reduces the intake of oxygen 84.71% (Table 5) of the students are aware of it. Hence it is necessary to make the respiratory system stronger by inculcating different breathing exercises in the school going children. Outbreak of COVID-19 cases is continuing, and there are chances that someone in the community or family would be affected as it is a contagious disease, 86.77% opted for avoiding the sharing of fomites used by the infected person. It is essential for the children to know how to maintain hand hygiene, and sanitation when an effected member is kept in home quarantine.

There are some limitations in this study, immediately after the survey of the students, second wave lock down measures have been implemented due to the high soaring of COVID-19 cases in India, as a result again the schools were closed and more number of participants could not be included in the study in person. It is a questionnaire based demographic survey study to assess the perception of school children about COVID-19 but it does not deal with the consequences caused by COVID-19 when an individual is infected.

Conclusion

The study imparts that on overall basis there was an adequate level of awareness and knowledge in school going children about COVID-19. Their knowledge helps in improving the general population. The awareness and the transmission of knowledge on COVID-19 can be communicated to different people in the society if the interventions on health care are given a pivotal role in curriculum of high school education. Further study on different aspects of this de nova disease with large sample size is necessary to strengthen the

knowledge so as to control future complications from this virus on mankind.

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