In press

ASSESSMENT OF THE IMPACT OF STRUCTURED TRAINING PROGRAM ON KNOWLEDGE AND ATTITUDE OF INDIAN GRADE SCHOOLERS REGARDING PRECAUTIONARY GUIDANCE AND SAFETY MEASURES FOR COVID-19- A COMPARATIVE STUDY.

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ABSTRACT

Background In the current scenario of global COVID-19(SARA-CoV-2) pandemic, it is generally being observed that a large segment of Indian population especially the povertystricken families are lacking in the appropriate knowledge and awareness against dangers of COVID-19. This paper presents an experimental study performed to assess the knowledge & attitude grade-schooler children of informal settlements regarding covid-19 precautionary guidance and safety measurements. The study took place in five most corona affected cites of India. Methods A questionnaire was used as a tool to assess the knowledge and attitude of grade-schooler children regarding covid-19 precautions. An established panel evaluated face validity, content validity, internal consistency and reliability of the proposed study. Pilot testing of the draft tool was also performed. After defining the scale items and taking expert opinion, we pretested the knowledge and attitude of 100 grade-schooler children regarding covid-19 precautions. Thereafter the information on covid-19 precautionary guidance was given to them through structured teaching program. The same children were post tested after applying the structured teaching program ResultsThe extracted data was analysed using chi & t-statistics. The analysis of pre-test data shown that the most of the children didn't have enough knowledge regarding covid-19 disease and their attitude was also not positive for the covid-19 safety measurements. The analysis of post-test data shown that the children became more knowledgeable towards precautionary guidance of covid-19 and their attitude also changed from negative to positive. Conclusion The study concluded that there is a lack of awareness among the children towards covid-19 disease. It was also found that their parents failed to educate them on this current pandemic situation. However, the government can help to educate such poor families of informal settlements otherwise it can take a move towards the danger of community spared of the disease.

Key words: Structured teaching program, Knowledge, Attitude, Grade-schoolers, COVID -19, Precautions, Awareness.



Introduction

Due to the situation of contagious COVID-19 disease the entire globe is under the uncertainty and fear. The novel corona virus is the cause of the COVID-19 (SARA-CoV-2) disease that has been declared a public health emergency (Dhama K et al. 2020)

after that emergency preventive treatments have been taken (Agrawal S et al. 2020). Fig-1 shows a general structure of corona virus. In the U.S. between the 21th January and 23th February 2020, 16 transmission cases of COVID-19 were reported out of which 12 were traveller from China (Schuchat A 2020).

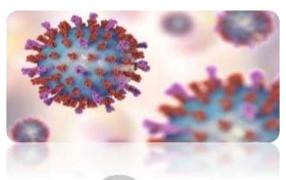


Figure-1 Corona virus structure

According to WHO, the elderly persons, children and those with underlying medical problems like cardiac disorders (Bansal M 2020), diabetes (Gupta R, Ghosh A 2020; Akhtar H 2020), respiratory problem, tumors and cancer are more likely prone to this deadly virus. It can transmit by droplets. However, the corona affected patients with good immune health and having the access to medical facilities will experience mild to moderate effect of the virus and have more than 75% chance to get well, (World Health

Organization 2020a) for our safety we should take hand sanitizer with when we go get household essentials. Fortunately, the corona situation in India is less dangerous as compared to the countries like USA, Italy and Spain. As per the statistics of 26th March 2020, as shown in Fig-2, India according to WHO has reported more than 31000 corona cases along with more than 1000 deaths while about 7696 cases have recovered.

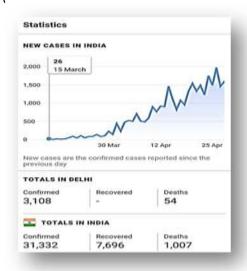


Figure-2 Statistics of corona cases in India

The districts like Mumbai, Delhi, Ahmadabad, Noida and Bhilwada have reported a significant rise in new cases of the virus, around 47% of total cases in India. These districts are the hotspots of COVID-19 cases in India. Most of the countries are engaged in making its vaccine, but no one has successful so far (Kumar Singh A et al.

2020). Figure-3 shows the continent wise confirmed corona cases as per WHO report dated 30th April 2020. The growing threat from COVID-19 necessitates the innovative advancements in the field of science and technology for fighting against current deadly contagion.



Figure-3 Continent wise Corona cases as per WHO dated 30th April 2020.

This is not the first time when world is facing ordeal pandemic but for such generation it's new. For the parents, it is not an easy task to give the answers of their questions regarding lockdown and COVID-19. According to paediatricians we need to worry how this recent tribulation of the virus is affecting the children. Hence, it is necessary that we have to give proper guidance to children over COVID-19 (Centre for disease control and prevention CDC 2020 a; 2020 b). Several research studies are beina conducted in order to cure the COVID-19 pandemic. Recently, there have been new day to day developments in discoveries on the recent pandemic. The countries like in US, UK, India and China are doing maximum

efforts for making a possible vaccine for the (Kumar Singh A et al. 2020). Unfortunately, till date, there has not been an effective medical solution in curing the novel corona virus except the treatment of the symptoms of this disease. Hence, for the time being, the best way for the flattening of the rising curve of corona infection cases is to be well informed about the disease (Chatterjee K, Chatterjee K 2020), its causes and how it spreads from person to person. We can protect our self and others by washing hands, using alcohol-based sanitizers and not touching our face without sanitizing our hands because primarily it spreads through respiratory means and

saliva droplets (Centre for disease control and prevention CDC 2020 a).

Figure-4 shows the age wise morbidity data as reported by WHO in India and Italy. It has

been absorbed that the morbidity rate is increasing day by day.

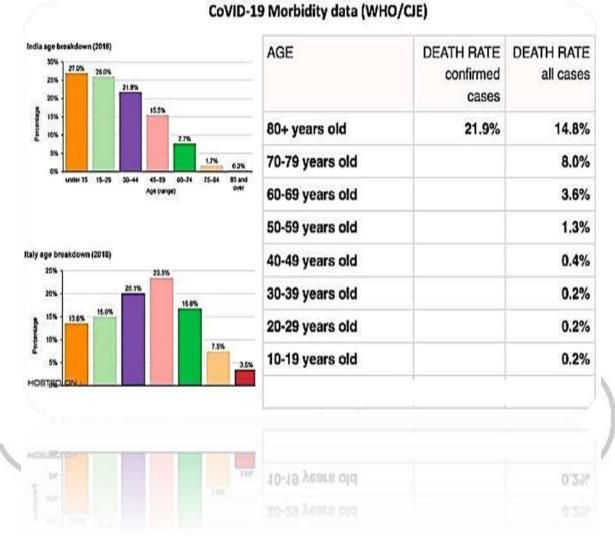


Figure-4 WHO Morbidity Data [4]

According to a recent research, it is found that the adolescents especially the children between 5 to 12 years of age group are more prone to COVID-19 infection. In this age, children start their schooling and begin to learn skills needed to become a self-sufficient individual. It is obvious that there are numerous questions the children would ask their parents on current pandemic situation. Thanks to the present state of art information technology, we are well

informed to the alarming situation as compared to the past (Shahid Z, Kalayanamitra R 2020). Especially in the Indian society, people now are more educated and well informed as they did not have the privilege of education in the past. India is the second large populated country after china (World Health Organization 2020a, Table-1).

Table-1 India statistics value of population, income. dying probability & health expenditure.

Statistics

| Total population (2016) | 1,324,171,000 |
|---|---------------|
| Gross national income per capita (PPP international \$, 2013) | 5,350 |
| Life expectancy at birth m/f (years, 2016) | 67/70 |
| Probability of dying under five (per 1 000 live births, 2018) | 37 |
| Probability of dying between 15 and 60 years m/f (per 1 000 population, 2016) | 214/138 |
| Total expenditure on health per capita (Intl \$, 2014) | 267 |
| Total expenditure on health as % of GDP (2014) | 4.7 |

In this paper we present a survey-based study in which we approached the families from the vulnerable section of society from five corona hotspot districts: Mumbai, Delhi, Ahmedabad, Noida and Bhilwada. It is being observed that the most of such families are not adhering to the lockdown rules and roaming outside. A questionnaire was prepared and distributed to them. In this questionnaire, we asked the answer of 15 different questions in order to assess their knowledge and attitude towards covid-19 disease and its precautionary measures (Balasubramanian S, Mohan Rao N). Beside the questionnaire we also gave them a presentation on COVID-19 precautions under the guidance of a pediatrician (Yasri S, Wiwanitkit V 2020). During this time all rules and regulations of lockdown were strictly adhered to for instance social distancing, alcohol-based sanitizer, masks and gloves, which were handed to the participants too (Singhal, et al 2020).

The findings of the study astonished us and it was found that children have the ability to retain information very quickly and are

eager to learn new things. After the intervention, their knowledge and attitude towards COVID -19 improved. The study concluded that there is lack of awareness among the children and parents fail to educate the young ones on this current pandemic situation. Perhaps the government can help to educate the families in less privileged areas like in the informal settlements.

The given paper is organized as follows. Section-2 elaborates the methods and the methodology used for the study. Section-3 presents the results along with the detailed analysis of the findings of the study. Section-4, concludes the paper.

Methods and Methodology

This research study was based upon primary data collection by using pre experimental design and simple random sampling technique. The target participants were grade-schoolers from informal settlements mostly as the children were playing outside. The study took place in five most corona

affected cites of India: Mumbai (Maharashtra), Delhi (New Delhi), Ahmedabad (Gujrat), Noida (UP) and Bhilwada (Rajasthan). We preferred girls and boy participant in equal ratio.

Following is a brief discussion on the methodology and the supportive materials used for the present study.

Description of surveying tools

We utilized the demographic data of surveying area and the structured questionnaire for the survey described as follows.

Demographic data: It consisted of name, age, education, religion, area of residence, number of siblings, and sources of information for the five most corona virus affected cites of India.

Structured Questionnaires: A structured questionnaire was used to assess the knowledge and attitude regarding COVID-19 & its precautionary guidance as a tool. It consists of structured knowledge and attitude questions in both English and Hindi regarding COVID-19 & its precautionary guidance as a tool.

Dependent, Independent& Attributed variables: The dependent variables were the children knowledge and attitude regarding COVID-19. Independent variables were the structured teaching program. Attributed variables were the demographic variables such as age, sex, educational status, type of family, religion, area of residence, number of siblings and source of information.

Methods of Data Collection

A Structured questionnaire, as shown in Figure-5 was thoroughly explained to the children when data was collected. The auestionnaire consisted of 10 different questions on knowledge and 5 questions on attitude regarding COVID-19 precautionary guidance. The tentative period of data collection was 4 weeks. Before the main study, we conducted validity of study with experts. The necessary modifications and further refinement of the tool was also done. Data was collected by the researchers themselves. Indian government allowed the study to be carried out in lockdown but for the safety purpose one police man came along with researchers for the observation and to ensure that lockdown rules were adhered to.

Beside the questionnaire, we also gave them as a presentation on precautions on COVID-19 under the guidance of a paediatrician.

Plan for data analysis

Descriptive and inferential statistics by Statistical Package for the Social Sciences (spss) tool such as frequency distribution, percentage and central tendency measurements (mean, median), standard deviation, chi-square and paired 't' test were used for data analysis and the analysed data was presented in the form of tables, graphs and diagrams.

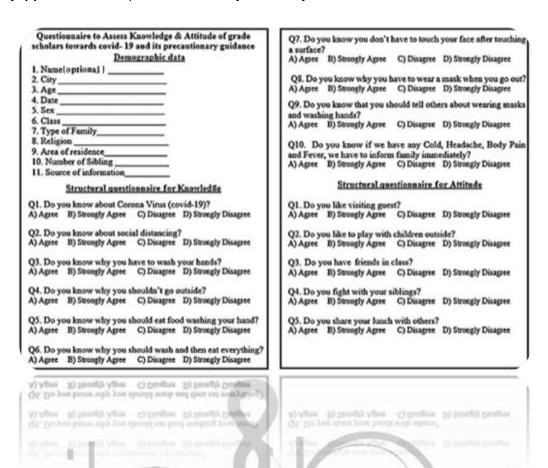


Figure-5 Structured questionnaire

Results and Analysis

This section systematically presents the findings of the proposed study by Statistical Package for the Social Sciences (spss) tool and their statistical analysis batch of the 100 grade-schoolers, participants were divided into 5 groups 20 children in each group (100%) completed both pre-test and post-test questionnaires. The average pre-test score of mean value was 1.96 and post-test

score was 12.89. The percentage of improvement in mean difference from pretest to post-test was 12.8. The average pretest score of median value was 2.00 and post-test score was 13.00. The average pretest score of std. deviation value was 1.100 and post-test score was 1.127.(Table-2)

Table – 2 Value of Mean Median and Std. deviation.

| | One-Sample Statistics | | | | | | | |
|-----------|-----------------------|-------|------------|--------|----------------|------------|--|--|
| | N | Mean | Mean | Median | Std. Deviation | Std. Error | | |
| | | | Difference | | | Mean | | |
| Pre-test | 100 | 1.96 | 1.960 | 2.00 | 1.100 | .110 | | |
| Post-test | 100 | 12.89 | 12.890 | 13.00 | 1.127 | .113 | | |

In t-test analysis pre-test t value was 17.8 and in post-test 114.3 with degree of freedom 99. P-value was 0 which indicates a rejection of null hypothesis at the 5% significance level. The paired t-test was applied to know the improvement in mean scores between pre-test and post-test which was significant at P < 0.001. (Table-3)

Table-3 Statistics of p-value.

| | One-Sample Test | | | | | | | | |
|-----------|-----------------|-----------------------------|------|---|-------|-------|--|--|--|
| | | Test Value = 0 | | | | | | | |
| | t | Df p- value Mean Difference | | 95% Confidence Interval of the Difference | | | | | |
| | | | | | Lower | Upper | | | |
| Pre-test | 17.814 | 99 | .000 | 1.960 | 1.74 | 2.18 | | | |
| Post-test | 114.353 | 99 | .000 | 12.890 | 12.67 | 13.11 | | | |
| | | | | | | | | | |

The knowledge and attitude regarding COVID 19 among children showed that in pre-test the knowledge score was low (15%) & attitude was negative (72%) after the structural teaching program the score of knowledge increased to (90%) and attitude was also converted from more negative

(72%) to less negative (32%). Before STP positive attitude score was less (28%) that means after STP attitude was more positive (68%) than negative (32%) (Table-4)

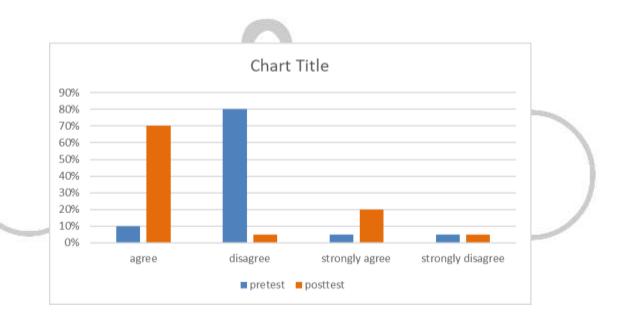
Table-4 Analysis of knowledge & attitude after pre-test & post-test.

| | Knowledg | ge | Attitude | | | |
|----------------|----------|----------|----------------|----------------------|----------|----------|
| Test | Agree | Disagree | Strongly agree | Strongly disagree | Negative | Positive |
| Pre-test (100) | 10(10%) | 80(80%) | 5(5%) | 5(5%) | 72(72%) | 28(28%) |

| Post-test | 70(70%) | 5(5%) | 20(20%) | 5(5%) | 32(32%) | 68(68%) |
|-----------|---------|-------|---------|-------|---------|---------|
| (100) | | | | | | |
| | | | | | | |
| | | | | | | |

In this chart (figure- 7) Before the STP 15% had knowledge on COVID-19 and after STP 90% were knowledgeable regarding COVID-19. Similarly, 32% had positive attitude towards COVID-19 precautions during survey and after the STP there was an increase to 68% in the attitude of the childre

Fig-6 Analysis of pre & post-test knowledge



Chi-square test was applied to analyse the improvement in scores between pre-test and post-test which was significant at $P = 0.000 \ (P < 0.05)$. (Table-7a,7b)

Chi-Square Tests

In pre-test out of 15 maximum marks 5 (5%) were in 0 (0% of marks) score, 42 (42%) were in 1 (6.6 % of marks) score, 10 (10%) were in 2 (13.33% of marks) score, 38 (38%) were in 3 (20% of marks) score & 5(5%) were in 4 (26.66% of marks) score.(Table-5)

| Pre-test Score out of 15 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|--------------------------|-----|-----------|---------|---------------|--------------------|
| Valid | 0 | 5 | 5.0 | 5.0 | 5.0 |
| | 1 | 42 | 42.0 | 42.0 | 47.0 |
| | 2 | 10 | 10.0 | 10.0 | 57.0 |
| | 3 | 38 | 38.0 | 38.0 | 95.0 |
| | 4 | 5 | 5.0 | 5.0 | 100.0 |
| | То | 100 | 100.0 | 100.0 | |
| | tal | | - 1 | | |

Table-5 Percentage

and Frequency of pre-test score.

In post-test out of 15 maximum marks 2 (2%) were in 10 (66.66% of marks) score, 11(11%) were in 11 (73.33% of marks) score, 20 (20%) were in 12 (80% of marks) score, 34 (34%) were in 13 (86.66% of marks) score, 29(29%) were in 14 (93.33% of marks) score & , 4(4%) were in 15 (100% of marks) score.(Table-6)

| Score o | at of 15 Frequency | | Percent | Valid Percent | Cumulative Percent |
|---------|--------------------|-----|---------|---------------|--------------------|
| Valid | 10 | 2 | 2.0 | 2.0 | 2.0 |
| | 11 | 11 | 11.0 | 11.0 | 13.0 |
| | 12 | 20 | 20.0 | 20.0 | 33.0 |
| | 13 | 34 | 34.0 | 34.0 | 67.0 |
| | 14 | 29 | 29.0 | 29.0 | 96.0 |
| | 15 | 4 | 4.0 | 4.0 | 100.0 |
| | Total | 100 | 100.0 | 100.0 | |

Table-6 Percentage and Frequency of post-test score

| Pre-test | Value | df | p- value |
|--------------------|---------|----|----------|
| Pearson Chi-Square | 16.256a | 16 | .435 |
| Likelihood Ratio | 15.506 | 16 | .488 |
| Linear-by-Linear | .500 | 1 | .480 |
| Association | | | |
| N of Valid Cases | 100 | | |

Table-7a.15 cells (60.0%) have expected count less than 5. The minimum expected count is 1.00.

| Chi-Square Tests | | | | | | |
|--------------------|---------|----|---------|--|--|--|
| Post-test | Value | df | P-value | | | |
| Pearson Chi-Square | 24.020a | 20 | .242 | | | |
| Likelihood Ratio | 22.203 | 20 | .330 | | | |
| Linear-by-Linear | .016 | 1 | .900 | | | |
| Association | | | | | | |
| N of Valid Cases | 100 | | | | | |

Table-7b. 20 cells (66.7%) have expected count less than 5. The minimum expected count is .40.

Discussion

As the findings of the survey-based study depict, the intervention of a structured teaching program through the questionnaire and the presentation on precautions of COVID-19 allowed the children to attain their safety and awareness themselves. We observed that the knowledge score was low (15%) among the children before the structural teaching program. After the intervention of the proposed structured teaching program, the score of knowledge increased to (90%) and the attitude was also converted from negative to positive. The attitude regarding COVID-19 children, depicted that in pre-test the attitude was also converted from more negative (72%) to less negative (32%). Before STP positive attitude score was less (28%) that means after STP attitude was more positive (68%) than negative (32%). The improved knowledge and children's attitude were

achieved by the structured teaching program which we used to articulate them about COVID-19 and its precautionary guidelines (Table-4). Other problems as observed by us during the implementation of the program were the continuation of social and psychological barriers which block the efforts of those promoting awareness of this global pandemic.

Emphasis should be given on educating and motivating the nation towards this pandemic which can be obtained from the voluntary organizations which can help in motivating the public, and this help is needed to successfully combated this deadly virus as a nation.

While doing the survey, we mainly focused on children between 5 to 12 years of age. It was discovered that the children were fast learners as compared to adults. It was captivating to see that children had the aptitude to learn new things and be very creative. Thus, by educating and raising the children's awareness about COVID-19 showed the positive and motivating results for combating the virus. Till date, the virus has globally reported over 3.17 million cases, 958000 cases have recovered, and 225000 fatalities. In India according to situation

report-106 of 5th May total 50333 cases were confirmed cases, out of which total 1763 deaths were reported.

In the beginning of survey, children were not comfortable with the researchers but after sometime they openly gave answers to our questionnaire. In each city, 20 samples were collected randomly in equal gender distribution (See fig-7). Fig-5 shows the statistics regarding number of girls and boy's participants as a sample from different cities.

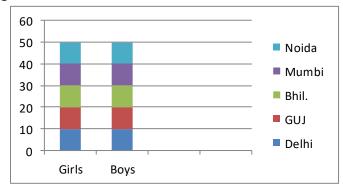


Fig-7 shows the statistics regarding number of girls and boy's participants as a sample from different cities.

Conclusion

This paper presented a survey-based study on the knowledge and attitude of gradeschoolers towards COVID-19 precautions. This study was conducted in five most affected cities of India. In the proposed study, we observed that the knowledge score regarding COVID-19 disease was low among the children before the structural teaching program. After the implementation of structured teaching program, we found that the score of knowledge increased profoundly and children's attitude was also converted from negative to a surprising positive. During the study we observed the minimal knowledge & negative attitude may be due to illiteracy in the population. One more factor which was observed is that the children were eager to learn very fast. They learned all the precautionary guidelines explained to them quickly and they were feeling curious to know more about COVID-19. We found that the proposed structural

teaching program can change the children's knowledge and attitude. It means that we can start the teaching program for parents also so that they can impart this essential information to their children as well as control the explosion of COVID -19. The Indian government is taking massive efforts on a larger scale to promote precautionary guidelines during the lockdown as well.

Compliance with Ethical Standards

Conflict of interest Authors have no conflicts of interests to declare.

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Ethical Consideration

The study was approved from Institutional Ethics Committee for Human Subject's 5. Research, Noida International University, and Uttar Pradesh 203201.

Informed consent

Informed consent was obtained from the human subjects using the form approved by the institutional ethics committee prior to commencing any work.

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