



# Impact of covid-19 on intolerance of uncertainty and safety behaviour

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**Abstract-** The current study is an attempt to understand the Impact of COVID-19 on the individual's engagement in safety behaviour and the role played by the perception and intolerance of Uncertainty. A correlation research design with quantitative approach was adopted. The data for the study was collected nationwide using a convenient sampling technique through Google Forms. The tools utilized in this study are Impact of Event – Revised, Intolerance of Uncertainty, and Safety Behaviour Assessment Form. The participants were 280 professionals comprising males and females selected from various geographical areas of India. The results of the current study suggest that there is a moderate positive relationship among Intolerance of Uncertainty, Impact of the Event, and engagement in Safety Behaviours. The step wise regression analysis suggests that the influence of Impact of Event on Safety Behaviour gets affected upon the introduction on Intolerance of Uncertainty.

**Key Words:** Impact of event, Uncertainty, Safety behaviour, COVID-19

## I. INTRODUCTION

In December 2019, a new strain of Coronavirus (COVID-19) was identified to be causing pneumonia-like illness, this was reported to World Health Organization(WHO) and was declared a global pandemic months later (WHO, 2020). In a span of three months between January to March 2020, the world as we all had seen before had changed. Governments across the globe took various measures as per the advice of WHO to maintain behaviours that will curb the growth of the virus. Work from home was preferred, online classes were scheduled, lockdowns were initiated, washing hands often with soap or sanitisers were compulsory, wearing masks in public places were mandatory, maintaining 6 feet social distancing, avoid crowded places and close contacts, and coughing into an elbow, and were expected to stay at home coming out only for essential needs.

The rate at which the disease was spreading and increasing mortality rate caused a lot of distress among the general population. Even though it was considered in the line of common influenza virus, the fear of contracting the disease, the lack of availability of a standard treatment protocol, lack of availability of hospital beds and ventilators, and the increasing mortality rate was creating panic among the public. Moreover, the efforts taken to reduce the rate of spreading this novel coronavirus has impacted varied areas such as healthcare systems, financial losses, loss of livelihoods. Fear, worry, and stress are normal responses to perceived or real threats, and at times when we are faced with uncertainty or the unknown (WHO, 2020). So, it is normal and understandable that people are experiencing fear in the context of the COVID-19 pandemic. The fear of contracting of the disease and its associated distress was also observed during similar epidemic outbreaks such as Ebola and H1N1 (Blakey et al, 2015; Wheaton et al 2012).

During such pandemic situations it becomes typical for individuals to reduce their anxiety by engaging in various Safety behaviours. Safety behaviours are behavioural and cognitive processes aimed to avoid an anxiety provoking outcome in relation to a specific situation (Salkovskis, 1991). In a short term these safety behaviours can be considered as an adaptive coping mechanism (Abramowitz & Moore, 2007), but in a longer run these safety behaviours helps us to maintain the illness-based anxiety (Helbig-Lang & Petermann, 2010). Olatunji et al. (2011) suggests that engagement in safety behaviours will be to reduce the possibility of contracting the disease and this may increase distress and functional impairment.

The level of uncertainty that has been prevailing around during this pandemic has been another factor maintaining our high level of anxiety. In the last few months most of them were uncertain regarding their livelihoods, financial stability, and the uncertainty of when the life is going to return to the previously set baseline for normalcy. Intolerance of Uncertainty could be defined as *"a negative dispositional characteristic arising from a set of catastrophic beliefs about uncertainty and its consequences"* (Hebert & Dugas, 2019). In a much simpler word, an underlying fear arising out of the unknown (Carleton, 2016). Intolerance of Uncertainty has always been studied alongside Anxiety as we need to understand that Individuals with high Intolerance of Uncertainty either keep updating threat to safe association with

contingencies change or update threat to safe association during extinction learning. Studies on Intolerance of Certainty has shown that it could be a cognitive factor that could trigger and maintain anxiety and anxiety related disorders (Freeston et al, 1994; Boelen&Reijntjes, 2009; Gentes&Ruscio, 2011; Milne et al, 2019).

Both Safety behaviours during COVID-19 (Knowles & Olatunji, 2021) and Intolerance of Uncertainty during COVID-19 (Wheaton et al, 2021) has been a studied predominantly among clinical population. In this study these variables were studied on non-clinical/sub-clinical population to see the role of Intolerance of Uncertainty and Impact of Event on the maintenance of Safety Behaviours. The research question in place was does Intolerance of Uncertainty and Impact of Event influences the use Safety Behaviour? Based on this the hypothesis do Intolerance of Uncertainty and Impact of Event predict Safety Behaviour was put to test.

## II. METHODS

### **Study design and participants**

A Correlational Research Design was employed to explore the impacts of Uncertainty and Impact of COVID-19 on Safety Behaviour. Overall, 280 participants (Mean = 27) were selected pan India comprising both males and females selected from various geographical areas including Metropolitan city, Urban, Semi-urban, and Rural pockets of India using a non-probability purposive sampling method. The data collection happened within the first few days of the lockdown was put into effect.

### **Procedure**

The survey was conducted during the pandemic (COVID-19) using Online (Google Forms) self-report measure after taking the informed consent from the participants. After receiving an explanation of the content and method of the study, the 280 participants agreed to take part in the study and publish the findings of the study. The data was scrutinized, coded, and exported to Statistical Packages for Social Sciences (SPSS) and the analysis was carried out. Impact of Event and Intolerance to Uncertainty were the independent variables and the dependent variable was Safety behaviour. To test the hypothesis Descriptive Statistics, Pearson Product Moment Correlation, Step Wise Simple Linear Regression, Students 't' Test and Analysis of Variance (ANOVA) was executed. To avoid an inflated Type I error, the alpha level was set at  $p = 0.05$  for all tests

### **Measures**

#### ***Personal Information***

It consisted of the basic socio-demographic details like Name, Age, Religion, Gender, Highest Educational Qualification, Area of residence, Nationality, Profession, Past medical history and Media Exposure during the Pandemic.

#### ***Impact of Event - Revised (Weiss & Marmar, 2007)***

The tool was developed by Weiss and Marmar to assess how distressing each difficulty has been for you in the last 7 days. The scale consists of 22 questions with options ranging between "0" for "Not at all" to "4" being "Extremely". There are three Subscales as a part of this tool - Intrusion, Avoidance, Hyperarousal are a part of this questionnaire. The Alpha Co-efficient for the scale was calculated to be 0.899 for the current study.

#### ***Intolerance of Uncertainty - Short form (Carleton et. al., 2007)***

The tool was developed by Carleton, Norton, and Asumndson to assess the level of Intolerance of Uncertainty. The short form version of the tool consists of 12 questions in a 5-point Likert scale where "1" is "Not at all characteristic of me" to "5" is "Entirely characteristic of me". The Alpha Co-efficient for the scale was calculated to be 0.866 for the current study.

#### ***Safety Behaviour Assessment Form (Goodson et. al., 2016)***

This measure of safety behaviours has been developed by Goodson, Haeffel, Raush, and Hershenberg. This scale measure in a 4-point Likert scale where "0" = "Never" to "3" = "Always", the list of behaviours people

uses to make themselves comfortable. There are 3 subscales, i.e., Vigilance, Health, and Social Safety Behaviours. The Alpha Co-efficient for the scale was calculated to be 0.931 for the current study.

### Ethical Considerations

The participants in the study were informed of the purpose and content of this study, and regarding the process of completing the questionnaire, their rights as a participant, the confidentiality and anonymization of data, and confirmation of data not being used for purpose other than other than research, potential participants voluntarily accepted the consent form electronically.

## III. RESULTS

### Descriptive statistics

The age of the population ranged between 17 and 66 years with an average of 26.59±8.49 they were classified into three groups. The average age of the participants in Group 1 (17-22 years) was 20.36±1.29 they contributed to 36.4% of the participants. The Group 2 (23-45 years) accounted for 58.2% of the total samples with a mean age of 28.26±5.59. In the age group of 46+ average age was found to be 54.15±6.79 with 5.4% of the participants. There were considerably more Females (52.9%) than Males (47.1%) in the sample. The Educational qualification of the participants consisted of Doctorates (4.3%), Postgraduates (38.9%), Under Graduates (42.5%), Intermediate (10%) and Metric qualification were (3.9%). In place of residence there were 14.3% residing in Metropolitan city, 43.6% in Urban, 15.4% in Semi urban areas while 26.8% were from rural areas.

### Differences among the socio-demographics

Table 1 shows the differences in the three variables Intolerance of Uncertainty, Impact of COVID-19, and Safety Behaviour among the sociodemographic details. Intolerance of Uncertainty ( $t=.685, p>0.05$ ) and Impact of COVID-19 ( $F=.176, p>0.05$ ) shows statistically non-significant differences between the males and females. In Safety Behaviour ( $F=.224, p<0.05$ ) it was found to be statistically significant. Specifically, safety behaviours were higher in males compare to women professionals during the pandemic. In the age group comparison, Intolerance of Uncertainty ( $F=.1152, p>0.05$ ), Impact of COVID-19 ( $F=7.89, p>0.05$ ) and Safety Behaviour ( $F=1.16, p>0.05$ ) showed statistically non-significant differences among the three age groups. Therefore, age does not play any role in Intolerance of Uncertainty, Impact of COVID-19, and Safety Behaviour.

In-terms of educational qualification Intolerance of Uncertainty ( $F=1.11, p>0.05$ ) and Impact of COVID-19 ( $F=1.11, p>0.05$ ) showed statistically non-significant differences with respect to Doctorate, Postgraduate, Graduate, Intermediate and Metric. In Safety Behaviour ( $F=3.03, p<0.05$ ) a statistically significant differences among the educational qualification were identified, suggesting that education had a role to play in the usage and maintenance of safety behaviour. In the Place of residence Intolerance of Uncertainty ( $F=.308, p>0.05$ ), Impact of COVID-19 ( $F=.894, p>0.05$ ) and Safety Behaviour ( $F=1.21, p>0.05$ ) shows statistically non-significant differences for metropolitan city, urban residents, semi urban and residing in rural areas which indicated that place of residence doesn't play any role for Intolerance of Uncertainty, Impact of COVID-19, and Safety Behaviour according towards general Characteristics.

**Table 1.** Differences in Intolerance of Uncertainty, Impact of COVID-19, and Safety Behaviour (N=280)

General Characteristics			Intolerance of Uncertainty	Impact of COVID-19	Safety Behaviour
Variables	Categories	N (%)	M ± SD	M ± SD	M ± SD
Sex	Men	132(47.1)	27.14±8.53	21.59±14.40	51.48±21.84
	Women	148(52.9)	27.87±9.17	21.29±14.60	46.24±17.20
<i>t(p)</i>			.685(>0.05)	.176 (>0.05)	2.24(<0.05)
Age	17-22 <sup>a</sup>	102(36.4)	28.12±10.43	22.76±16.41	49.29±20.40
	23-45 <sup>b</sup>	163(58.2)	27.33±7.73	21.41±13.04	47.90±19.37
	46 <sup>c+</sup>	15(5.4)	25.53±9.14	12.80±13.44	53.53±17.96
<i>F(p)</i>			11.52(>0.05)	7.89(>0.05)	1.16(>0.05)

Educational Qualification	Doctorate	12(4.3)	22.50±6.59	12.16±11.27	38.67±13.78
	Postgraduate	109(38.9)	27.37±8.73	20.17±13.84	46.29±19.79
	Graduate	119(42.5)	28.36±9.67	23.63±15.81	52.51±19.03
	Intermediate	28(10)	25.78±7.17	19.25±11.38	45.64±22.62
	Metric	11(3.9)	29.00±4.56	26.90±9.90	51.82±16.33
F(p)			1.11(>0.05)	1.598(>0.05)	3.03(<0.05)
Place of Residence	Metropolitan city	40(14.3)	26.97±8.01	19.95±11.71	47.90±19.14
	Urban	122(43.6)	28.31±9.81	22.09±16.32	47.95±19.26
	Semi urban	43(15.4)	25.55±7.65	17.88±12.61	42.93±16.31
	Rural	75(26.8)	27.66±8.28	23.21±13.45	53.68±21.48
F(p)			.308(>0.05)	.894(>0.05)	1.21(>0.05)

M=mean; SD=standard Deviation; In the age variable, "a" is the 17-22 category, "b" is the 23-45 category, and "c" is the 46+ category.

### Correlations among Intolerance of Uncertainty, Impact of COVID-19 and Safety Behaviour

Correlations among the key variables and its dimensions are presented in table 2. Intolerance of Uncertainty was found to be positively correlated with both Impact of Event ( $r=.594, p<0.001$ ) and Safety Behaviour ( $r=.445, p<0.05$ ). It also can be seen that the Impact of Event is also positively correlated with Safety Behaviour ( $r=.388, p<0.05$ ). This suggests that the three variables under study are having a positive association among each other.

**Table 2.** Correlation among the key variables (N=280)

Variables	Intolerance of Uncertainty	of Impact of Event	Safety Behaviour
	M ± SD (27.52±8.87)	M± SD (21.43±14.48)	M±SD (48.71±19.66)
Intolerance of Uncertainty	1		
Impact of Event	.594***	1	
Safety Behaviour	.445***	.388***	1

**Note:** DV – Safety Behaviour; \*\*\* $p<0.001$

A 2-Step Linear Regression Analysis was performed to study the effects on an addition of a new construct and if it accounted for change in variance of the preceding predictors. Impact of Event was added as predictor at step 1, Intolerance of Uncertainty was entered at step 2 to see the effect on the dependent variable Safety Behaviour.

At step 1, Impact of Event significantly explained 15% of the total variance ( $R^2$ ) on Safety Behaviour ( $R^2 = .15, F(1, 278) = 49.104, p<0.05$ ) and it was successful in predicting Safety Behaviour ( $\beta = .527, t = 7.007, p<0.05$ ). The addition of Intolerance of Uncertainty at step 2 significantly impacted the prediction with 7.2% of the total variance on Safety Behaviour ( $R^2 = .222, F(2, 277) = 39.473, p<0.05$ ) and the change in variance was significant ( $\Delta R^2 = 0.072, F(1, 277) = 25.51, p<0.05$ ).

**Table 3.** Step wise regression of Impact of Event, Intolerance of Uncertainty on Safety Behaviour

Variable	$\beta$	SE	t
<b>Step 1</b>			
Constant			19.259***
Impact of Event	.527	.075	7.007***
<b>Step 2</b>			
Constant			6.668***
Impact of Event	.258	3.430	2,884**
Intolerance of Uncertainty	.737	.146	5.051**

**Note:** DV – Safety Behaviour; \*\*  $p<0.01$ ; \*\*\*  $p<0.001$

In step 2, Impact of Event ( $\beta = .258, t = 2.884, p<0.05$ ) and Intolerance of Uncertainty ( $\beta = .737, t = 5.051, p<0.05$ ) could predict Safety Behaviour. The addition of Intolerance of Uncertainty, Impact of Event however significantly predicted Safety Behaviour.

It can be observed that Impact of Event had a significant effect on the dependent variable Safety behaviour, the addition of Intolerance of Uncertainty further impacted the Safety Behaviour. Thus, could

be interpreted that the usage of Safety Behaviour is further enhanced by the persons Intolerance of Uncertainty along with Impact of event.

#### IV. DISCUSSION AND CONCLUSION

COVID-19 pandemic has had serious impact on the well-being of an individual on multiple domains, the cognitive domain was under investigation in this research. The aim of the current research is to study the effect of Intolerance of Uncertainty and Impact of Event on Safety Behaviour. The results of the correlation and step wise regression show the positive influence of Impact of Event and Intolerance of Uncertainty on the use of Safety Behaviour. As a result of the analysis, the hypothesis pertaining to the effect of Impact of Event and Intolerance of Uncertainty on Safety Behaviour was accepted. This indicates the chance of an individual to engage in the use of safety behaviours substantially increases or decreases with the increase and decrease of the perceived impact of the event and the individual's intolerance to undefined situation, respectively. Likewise, it was observed that introduction of Intolerance of Uncertainty further enhanced the engagement of Safety behaviour. Even though the earlier studies have not been performed among the non-clinical or sub-clinical population, substantial amount of data is available in the clinical area focus attention on areas such as Anxiety disorder, Obsessive Compulsive Disorder, and PTSD. It has been researched that during epidemics, there is an increase in negative psychological consequences (Jose et al. 2017; Mihashi et al. 2009). When there is a threat to the individuals well-being during such pandemic situation, uncertainty leads to disturbances of the daily routine thus encouraging individuals to engage more into safety behaviours. As this study was conducted during a time when no one in India had previously encountered such serious Lockdown policies, it acted as a great source of threat for many individuals. Sauer et al. (2020) in her study has demonstrated the differences in the level of anxiety among the individuals in the early phases of COVID-19 and in the later stages. It was identified in the study that illness related anxieties were very high in the early phases of COVID-19. This Impact of Event was further enhanced by creating an uncertainty of when situations will return to normalcy. These two factors together made the individuals to engage more into the safety behaviour to reduce the illness related anxiety.

In this study the Impact of the Event has been studied under three dimensions such as Avoidance, Intrusion, and Hyperarousal. Previous study suggests that safety behaviours are triggered when there is a maladaptive intrusive belief about a specific situation (Moulds et al., 2008). Even in the current context, the intrusive thoughts about COVID-19 have been regulating the Safety Behaviour of an individual. Relationship between Intolerance of Uncertainty and Health Anxiety has been thoroughly demonstrated (Abramowitz, Deacon et al., 2007; Abramowitz, Olatunji et al., 2007). The study by Olatunji et al. (2011) suggested that the role of engagement in Safety Behaviour substantially increased the Health Anxiety among the participants. Hence it can be observed that as the Intolerance of Uncertainty increases the individual's chance of engaging into Safety Behaviour. During unpredictable times, as it happened in the COVID-19 pandemic, we engage more in the use of Safety Behaviour.

To our knowledge, the interaction among three variables in a clinical or non-clinical sample has been studied for the first time. Overall, the present study suggests that there is a moderate to strong positive relationship among the variables under study. It was observed that both Impact of the Event and Intolerance of Uncertainty are having an impact on the use of Safety Behaviour. The step wise linear regression analysis suggests even though both the variables have an influence on Safety Behaviour individually, the impact increases when both the variables are present. The induction of Intolerance of Uncertainty further increased the usage of Safety Behaviour which is already been influenced by Impact of Event (COVID-19). These findings suggest that in such pandemic situations, all the three variables can be found even among the normal population and can lead to distress and low psychological well-being.

#### REFERENCES

1. Abramowitz, J. S., & Moore, E. L. (2007). An experimental analyses of hypochondriasis. *Behaviour Research and Therapy*, 45, 413–424.
2. Abramowitz, J. S., Olatunji, B. O., & Deacon, B. J. (2007). Health anxiety, hypochondriasis, and the anxiety disorders. *Behavior Therapy*, 38(1), 86-94.
3. Bish, A., & Michie, S. (2010). Demographic and attitudinal determinants of protective behaviors during a pandemic: A review. *British Journal of Health Psychology*, 15, 797–824.

4. Blakey, S. M., Reuman, L., Jacoby, R. J., & Abramowitz, J. S. (2015). Tracing “Fearbola”: Psychological predictors of anxious responding to the threat of Ebola. *Cognitive Therapy and Research*, 39(6), 816–825. <https://doi.org/10.1007/s10608-015-9701-9>
5. Boelen, P. A., & Reijntjes, A. (2009). Intolerance of uncertainty and social anxiety. *Journal of Anxiety Disorders*, 23(1), 130-135.
6. Carleton, R. N. (2016). Fear of the unknown: One fear to rule them all? *Journal of Anxiety Disorders*, 41, 5-21.
7. Carleton, R. N., Norton, M. P. J., & Asmundson, G. J. (2007). Fearing the unknown: A short version of the intolerance of uncertainty scale. *Journal of Anxiety Disorders*, 21 (1), 105–117.
8. Freeston, M. H., Rhéaume, J., Letarte, H., Dugas, M. J., & Ladouceur, R. (1994). Why do people worry?. *Personality and Individual Differences*, 17(6), 791-802.
9. Gentes, E. L., & Ruscio, A. M. (2011). A meta-analysis of the relation of intolerance of uncertainty to symptoms of generalized anxiety disorder, major depressive disorder, and obsessive-compulsive disorder. *Clinical Psychology Review*, 31(6), 923-933.
10. Goodson JT, Haeffel GJ, Raush DA, Hershenberg R. The Safety Behavior Assessment Form: Development and Validation. *J Clin Psychol*. 2016 Oct;72(10):1099-111. doi: 10.1002/jclp.22325.
11. Goodson JT, Haeffel GJ, Raush DA, Hershenberg R. The Safety Behavior Assessment Form: Development and Validation. *J Clin Psychol*. 2016 Oct;72(10):1099-111. doi: 10.1002/jclp.22325.
12. Hebert, E. A., & Dugas, M. J. (2019). Behavioral experiments for intolerance of uncertainty: challenging the unknown in the treatment of generalized anxiety disorder. *Cognitive and Behavioral Practice*, 26(2), 421-436.
13. Meyer JM, Kirk A, Arch JJ, Kelly PJ, Deacon BJ. Beliefs about safety behaviours in the prediction of safety behaviour use. *Behavioural and Cognitive Psychotherapy*. 2019 Nov;47(6):631-644. doi: 10.1017/S1352465819000298.
14. Mihashi, M., Otsubo, Y., Yinjuan, X., Nagatomi, K., Hoshiko, M., & Ishitake, T. (2009). Predictive factors of psychological disorder development during recovery following SARS outbreak. *Health Psychology*, 28(1), 91–100.
15. Milne, S., Lomax, C., & Freeston, M. H. (2019). A review of the relationship between intolerance of uncertainty and threat appraisal in anxiety. *the Cognitive Behaviour Therapist*, 12
16. Olatunji, B. O., Etzel, E. N., Tomarken, A. J., Ciesielski, B. G., & Deacon, B. (2011). The effects of safety behaviors on health anxiety: An experimental investigation. *Behaviour research and therapy*, 49(11), 719-728.
17. Olatunji, B. O., Etzel, E. N., Tomarken, A. J., Ciesielski, B. G., & Deacon, B. (2011). The effects of safety behaviors on health anxiety: An experimental investigation. *Behaviour Research and Therapy*, 49, 719–728. doi:10.1016/j.brat.2011.07.008.
18. Sauer, K. S., Jungmann, S. M., & Witthöft, M. (2020). ` of the COVID-19 pandemic: The role of health anxiety, intolerance of uncertainty, and distress (in) tolerance. *International journal of environmental research and public health*, 17(19), 7241.
19. Weiss, D. S., & Marmar, C. R. (1996). The Impact of Event Scale-Revised. In J. Wilson & T. M. Keane (Eds.), *Assessing psychological trauma and PTSD* (pp. 399–411). New York, NY: Guilford Press.
20. Wheaton, M. G., Abramowitz, J. S., Berman, N. C., Fabricant, L. E., & Olatunji, B. O. (2012). Psychological predictors of anxiety in response to the H1N1 (swine flu) pandemic. *Cognitive Therapy and Research*, 36, 210–218. <https://doi.org/10.1007/s10608-011-9353-3>
21. World Health Organization (April 27, 2020). WHO Timeline - COVID-19. <https://www.who.int/news-room/detail/27-04-2020-who-timeline—covid-19>.
22. World Health Organization (April 9, 2020). Impact of COVID-19 on people's livelihoods, their health and our food systems. <https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people%27s-livelihoods-their-health-and-our-food-systems>
23. World Health Organization (January 22, 2020). Coronavirus disease (COVID-19) advice for the public. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/coronavirus-disease-covid-19>
24. World Health Organization (March 18, 2020). Mental health and psychosocial considerations during the COVID-19 outbreak. <https://www.who.int/docs/default-source/coronaviruse/mental-health-considerations.pdf>
25. World Health Organization (October 12, 2020). Coronavirus disease (COVID-19). <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/coronavirus-disease-covid-19>
26. World Health Organization (October 13, 2020). Mental health & COVID-19. <https://www.who.int/teams/mental-health-and-substance-use/covid-19>

27. Manikandan, R., Latha, R., & Ambethraj, C. (1). An Analysis of Map Matching Algorithm for Recent Intelligent Transport System. *Asian Journal of Applied Sciences*, 5(1). Retrieved from <https://www.ajouronline.com/index.php/AJAS/article/view/4642>
28. R. Sathish, R. Manikandan, S. Silvia Priscila, B. V. Sara and R. Mahaveerakannan, "A Report on the Impact of Information Technology and Social Media on Covid-19," 2020 3rd International Conference on Intelligent Sustainable Systems (ICISS), Thoothukudi, India, 2020, pp. 224-230, doi: 10.1109/ICISS49785.2020.9316046.