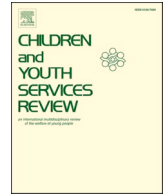




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Psychological impact of covid-19 crises on students through the lens of Stimulus-Organism-Response (SOR) model

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ABSTRACT

The present outbreak of the Covid-19 pandemic has affected 28,584,158 people world-wide as of 13th September 2020 (WHO, 2020b). This crisis has created an atmosphere of uncertainty and fear. Due to the unavailability of the evidence based medical treatment, non-pharmaceutical interventions (NPIs) are the best options at the present moment. Lockdown was one of such measures to control the spread of the Covid-19 disease. Due to lockdown measures, many countries across the globe followed the complete closure of shopping malls, transport networks, schools, universities, etc. This study aims to investigate the behavioural psychological changes among university students due to covid-19 crises and lockdown. Stimulus-Organism-Response (SOR) model has been adopted to develop a theoretical foundation for the research. Qualitative research methodology including a combination of personal interviews and focus groups has been adopted in the study to develop the themes with the help of computer-assisted qualitative data analysis software, Atlas.ti 7. It has been found that students are suffering from academic anxiety, fear, Mysophobia, etc. As far as behavioural responses are concerned following behavioural changes have been found; Panic buying, e-learning, community support, support for prime-minister, etc.

1. Introduction

The novel contagious virus named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), commonly known for Covid-19 disease has shown a pernicious effect across the globe which is evident from the figures that 28,584,158 confirmed cases and 916,955 deaths have been reported by the world health organization as of 13th September 2020 (WHO, 2020b). The novel virus evolved from the Wuhan city of China (Gibson Miller et al., 2020; Zhu et al., 2020) and spread throughout the world. Understanding the severity of the disease, WHO declared Covid-19 as a Public health emergency of international concern on 30th January 2020 and a global pandemic on 11th March 2020. Every country adopted its strategy according to its current situation to minimize the loss caused by the outbreak of Covid-19 as there is no clear standard medical evidence for the treatment of the disease till now. At the same time, one common strategy adopted by all the countries was 'lockdown' and India also adopted the same strategy and restricted the movement of its citizens and also of non-essential goods from 25th March 2020 (MHA, 2020). (Mboera et al., 2020) defined lockdown, "as a set of measures to reduce community transmission of COVID-19 that are

compulsory, and which are applied indiscriminately to the general population" and (Centers for Disease Control and Prevention, 2017) (CDC) defined quarantine as, "separation and restriction of the movement of people who were exposed to a contagious disease to see if they become sick". The implementation and execution of lockdown vary from country to country, so also its consequences. There is no denying the fact that the lockdown is the only best non-pharmaceutical interventions (NPIs) that any nation can follow to avoid the rapid transmission of the virus but concurrently it comes with some negative repercussions such as economic downfall, closure of schools and learning institutions, emotional and psychology instability (Brooks et al., 2020). (Alvarez et al., 2020) estimated the cost of lockdown and found it to be eight percent of the annual GDP of the nation. It is not only physical and economic health which is affected due to Covid-19 crises but it also leads to an increase in domestic violence (Boserup et al., 2020; Campbell, 2020), mental distress (Qiu et al., 2020; Torales et al., 2020; Webb, 2020), closure of education sector (Sahu, 2020; Viner et al., 2020), etc. At the same time, another side of the coin also shows remarkable positive results of the lockdown such as restricted spreading of virus (Lau et al., 2020), reduction in environment pollution (Muhammad et al.,

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2020), the importance of family value cultures (Haleem et al., 2020), etc. Apart from the lockdown, behavioral science as a discipline plays a decisive role in understanding and predicting the future of the Covid-19 outbreak and it is human behavior that decides the rate and intensity of the transmission (Michie et al., 2020). In the same context, the ministry of health and family welfare, the government of India recommended a set of various measures and steps to prevent the spread of covid-19 such as maintaining social distancing, frequent hand washing, avoid hand shaking, etc. (MoHFW, 2020). The combination of this precautionary behavior along with lockdown measures can control this pandemic to a greater extent and is the only exit strategy we have at the moment.

Another indispensable section of our society majorly affected by the Covid-19 pandemic and lockdown is a university and college-going students of age group between 18 and 25. This pandemic has created an environment of stress among the students due to delays in examinations and barriers to learning (Roy et al., 2020). Due to the closure of educational and learning institutions, 1.6 billion students worldwide are affected (CCSA, 2020). Total 58 countries retard their evaluation process of the students whereas 11 countries have canceled this process for the current batch (UNESCO, 2020). Students are forced to move towards the online paradigm while grappling with financial issues such as student loans, the decline in scholarships, etc. (DePietro, 2020). As result signs of anxiety have been observed in college students due to delays in academic affairs and economic downfall (Cao et al., 2020). Those students who are deprived of digital learning tools such as smart-phones and the internet will pose a challenge to the 'right to education' and poor students will be deprived of free meals provided by the institutions which may further provide health challenges (IANYD, 2020). In the same context, the United Nations, Department of Economic and social affairs youth, 2020 suggested text-based study material over video-conferencing and provide a physical copy of the learning materials via distance mode to those who are deprived of digital connectivity. Young people between the age group of 15 to 24 years are more vulnerable to unemployment than adults (ILO, 2020) and at the same time, they play an important role in inclusive recovery (United Nations, 2020). So it is important to address the effects of the covid-19 pandemic on youths especially university and college-going students.

Indian higher education is one of the largest systems in the world with 993 universities and 39,931 colleges along with 37.4 million registered students (Ministry of Human Resource Development, 2019) and 242 million population of India lie in between the age group of 10–24 years (United Nations, 2015). Before lockdown, the Indian education system mostly relies on the offline mode of study but a sudden shift to the online mode creates many obstacles in the path of learning due to unpreparedness towards this mode. In India, 25 percent of the students are unable to access online content provided by their respective institutes because they do not have basic infrastructure e.g. Laptops, smartphones, etc. for the same (Verma & Venugopalan, 2020). Even in one of the states of India, Jammu and Kashmir high-speed internet of mobile data is restricted and is limited to 2G network from almost last 9 months due to which students are not able to attend online classes on their cellular network (Hussain, 2020). (Basu et al., 2020) found that the Indian youth is more concerned about the geopolitics of the pandemic and has developed a negative attitude towards the covid-19. Understanding the same perspective, it is important to address the behavioral changes and internal emotional response of the youth towards the Covid-19 crises. The objective of this study is to investigate the behavioral psychology of university students from the lens of the S-O-R (Stimulus-Organism-Response) model in the context of Covid-19 crises. The next section of the paper, Section-2 comprised of the literature review followed by section-3 which includes research methodology, and the remaining sections of the study comprised of findings and discussions.

2. Literature review

2.1. Covid-19 and behavioral changes

The psychological influence of health threats on human behavior is well explained in the field of Health belief theories (Haefner & Kirscht, 1970; Hochbaum, 1958; Maiman & Becker, 1974; Mukhtar, 2020; Prentice-Dunn & Rogers, 1986; Rosenstock et al., 1988, 1994) where behavioral changes are said to be influenced by the solemnity of the threat and the actions required to minimize or avoid it based on the background of the classical theory of Stimulus-response model (Menon & Szalacha, 2008). Fear is a common emotional reaction by the psychological defensive mechanism of human nature to counter any threat (LeDoux, 2012). In a similar setting, the Covid-19 pandemic has also created an environment of psychological fear (Ahorsu et al., 2020; Ornell et al., 2020; Pakpour & Griffiths, 2020) across all sections of society. The covid-19 epidemic depicted a world-wide catastrophic emergency that created psychological and social pressure on individuals (Van Bavel et al., 2020) which is required to be addressed at different stages of a pandemic. Covid-19 fear broadly comprised of "fear of infection" and "fear of economic recession" has now been reported as the cause of suicidal tendencies across the globe (Mamun & Griffiths, 2020; Mamun & Ullah, 2020; Sahoo et al., 2020). World health organizations suggested preventive measures to deal with the atmosphere of fear and distrust such as listen to only a trusted source of information or news, maintain a healthy routine, online social contacting, limit news channels (WHO, 2020a). Apart from fear, disinformation, stockpiling of food supplies and ostracism are some other behavioral changes observed during this pandemic (Betsch et al., 2020). Studies in the field of clinical psychology have proved that to prevent contamination, people have tendencies to change their behavior (Del Valle et al., 2005; Ferguson, 2007; Pang, 2003). (McKinsey & Company, 2020) conducted a survey in different countries to study the behavioral changes during the covid-19 pandemic and found the variations across the many countries regarding their optimism level for the economic recovery as shown in Fig. 1. UN Women (2020) reported an increase in domestic and physical violence against women during the lockdown period and this negative behavioral change is due to lockdown stress and economic decline. The effect of Covid-19 on individual behavior varies according to age, culture, gender, and socio-economic status, and personality (Jeronimus, 2020). Lockdown measures and social disengagement can escalate the previously existing psychological issues and it has been found that it leads to anxiety, drug and alcohol abuse, and domestic violence in many cases (Brooks et al., 2020). India has also reported an increase in psychological problems and is moving towards mental crises (Moses, 2020) due to higher unemployment rates and social isolation. Another important segment of the society i.e. students is the most affected community during this crisis in terms of academic loss, fear, and stress for the future. The emotional wellness of the students is a matter of concern throughout the world as they decide the future of a nation by contributing to its development (Sailesh et al., 2020) and at the same time uncertainty about the dates of examination has added to the woes. The sudden shift from offline to online mode of teaching has created a burden in the form of personal adjustments and also from the financial point of view (UNESCO & IESALC, 2020) and most of the students have been returned to their homes and are living in social isolation. A survey conducted by (QS, 2020) on global higher education found that 47% of the students have dropped their plans to study in foreign universities due to travel restrictions and cancellations of basic examinations required to get admissions in those institutes and at the same time, the report also highlighted that 42% of the students do not want to pursue online degree courses and still prefer offline mode of teaching. Students graduating this year in India are much concerned about their jobs and have a fear of revocation of job offers (Choudhary, 2020) as the unemployment rate increased from 7.22% in January to 23.48% in May 2020 (CMIE, 2020). Young people between the age group of 18–29 years are more prone to

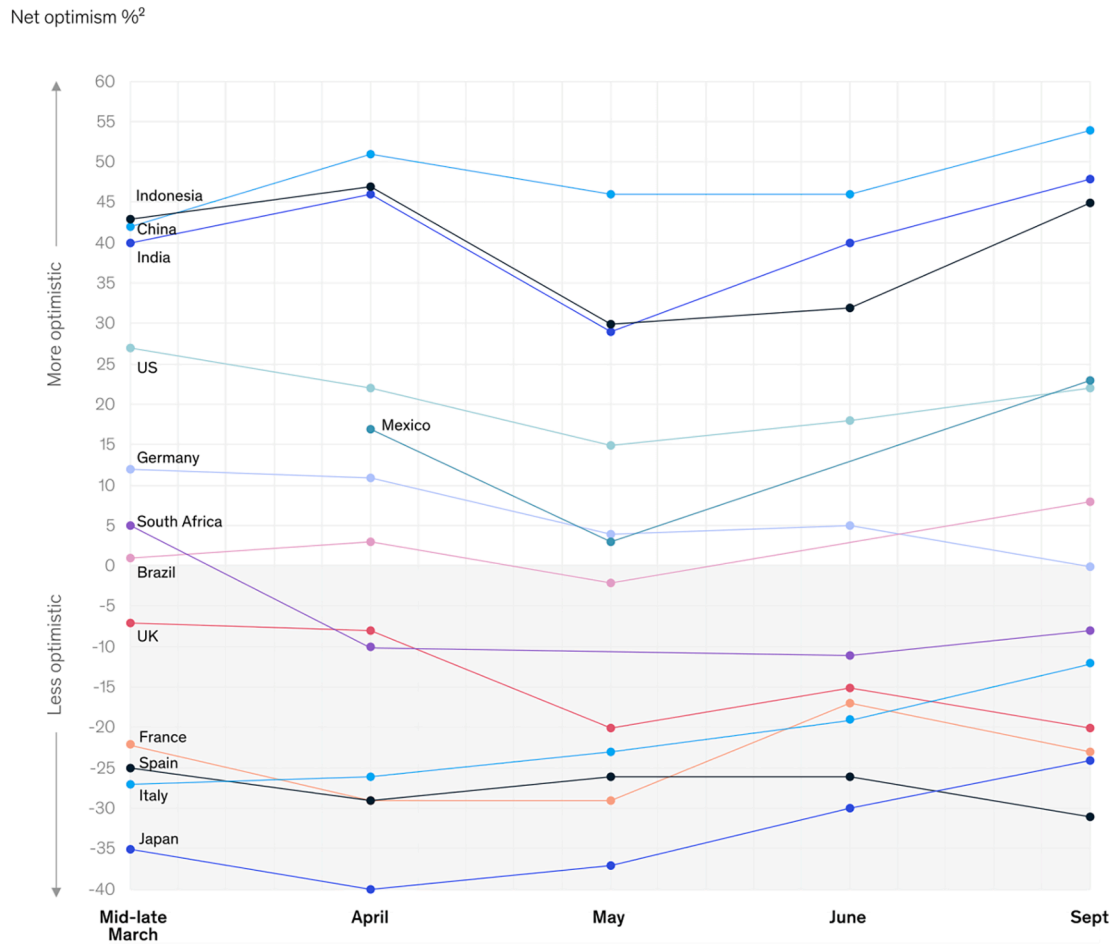


Fig. 1. Optimism level of different countries during Covid-19 pandemic (Source: McKinsey & Company, 2020).

mental trauma and stress due to social isolation and financial crises (Schaeffer & Rainie, 2020). It is well said that the fate of any country depends on its youth and countries like India where the majority of the population comprised of young aspiring citizens are required to critically think about their psychological and behavioral issues.

2.2. Stimulus-organism-response model

Stimulus-organism-model (S-O-R) was proposed by (Woodworth, 1929) as an extension to the classic theory of the stimulus-response model suggested by (Pavlov, 1927). S-O-R model is comprised of three constructs i.e. stimulus, organism, and response as shown in Fig. 2 which decide the behavioral outcome of an event. (Skinner, 1935) described the notion of stimulus and response as “parts of behavior and environment” and sudden changes in the environment can influence the psychological and emotional stability of an individual which further drives the behavioral changes (Donovan & Rossiter, 1982). The stimulus is the outside forces that affect the psychological state of an individual (Jacoby, 2002; Peng & Kim, 2014; Young, 2016) and (Eroglu et al., 2001) defined stimulus as, “the influence that arouses the individual”.

In the context of the study, here stimulus reflects the characteristics of the Covid-19 pandemic that affect the internal psychological state of the students. (Bagozzi, 1986) defined organism as the “internal processes and structures intervening between stimuli external to the person and the final actions, reactions, or responses emitted. The intervening processes and structures consist of perceptual, physiological, feeling, and thinking activities”. (Fu et al., 2020) defined organism as, “internal processes and outcomes of the stimulus, usually mediating the relationship between stimulus and response”. Organism represents the internal emotion and psychological process after encountering the stimulus and here in the study organism refers to the student’s emotional response towards the covid-19 crises. The response in the model refers to the final behavioural outcome of an individual that may be positive or negative (Donovan & Rossiter, 1982; Spence, 1950). The organism in this study represents the behavioural outcomes and changes that occurred in students as a response to the covid-19 pandemic. Stimulus-organism-response model (S-O-R) is well accepted and adopted by the researchers to study the behaviour in the context of retail buying behaviour (Chang et al., 2011), social media engagement (Ul Islam & Rahman, 2017), online hotel booking behaviour (Asilah et al., 2016),

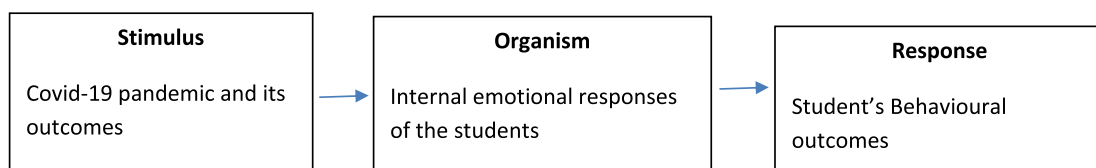


Fig. 2. Theoretical framework of the study.

mobile auctions (Chen & Yao, 2018), business relationships (Kudla & Klaas-Wissing, 2012), healthcare (Suess & Mody, 2018), etc.

3. Research methodology

3.1. Design

The study adopted an exploratory research design as it “tends to tackle new problems on which little or no previous research has been done” (Brown, 2006). The crises of the covid-19 pandemic are also new to humankind and very little is known about its psychological effects on students. This study, therefore, delves deep into the students’ minds to explore the factors affecting their emotional and behavioral aspects. Total 23 video call personal interviews and three focus group interviews of the students were conducted from different departments of the two public universities of Jammu and Kashmir, India by adopting the Subjective sampling technique. The transcripts of these interviews were evaluated through a thematic approach. Moreover, before the collection of data, a thorough literature review was performed by the researchers to collate the inputs from the literature with the collected data. Initial tentative codes were framed to develop the themes around the constructs of the S-O-R model as shown in Table 1 and the next stage, final codes were developed by validating the initial tentative codes. In the same process of data validation, some of the initial themes were dropped and few new themes were added and renamed in the final step of the thematic analysis by considering the actual data of the students. Total 23 personal interviews were conducted (mean time of 34 min) and 3 focus group interviews of 5 members each (mean time of 47 min) were conducted. A combination of the personal interviews and focus group methodology is adopted to contrast the biased effects on the responses of the students due to individual and group settings (Lambert & Loisel, 2008). To avoid the biases and to obtain the unrepressed responses from the students, it is ensured by the researchers that the participants of a particular focus group are strange to each other and belong to different fields (Morgan, 1998). The final themes and coding of the data were developed in computer-assisted qualitative data analysis software Atlas.ti 7 as shown in Fig. 3.

4. Research instrument

Video-call personal interviews of the students were conducted based on a semi-structured questionnaire. Interviews were converted into transcripts with the help of Micro-soft word 2016. A semi-structured questionnaire for data collection was based on the tentative themes generated from the literature review.

4.1. Sample description

Total 38 students (15 females and 23 males) from the two public universities of Jammu and Kashmir participated in the study which includes 23 personal interviews and 15 students who participated in the

Table 1
Initial Tentative themes related to Stimulus-Organism-Response.

Construct	Themes
Stimulus	Economic Downfall. Government’s new rules and regulations. Transport disruptions. Misinformation.
Organism	Fear and stress. Concern about academics related issues. Sensitivity to social risk
Responses	Panic-buying Digital Solutions Donations and Community Support

three focus group interviews with 5 students in each group. All the students lie between the age group of 19 to 25 years with a mean age of 22.6 years. 17 students represent the public university number 1 whereas the remaining 21 students belong to public university 2. The description of the sample including age, gender, and stream (field) is depicted with the help of Treemap graphs as in Fig. 4.

4.2. Thematic analysis procedure

Analysis and interpretation of the data are performed through thematic analysis. According to (Rishi & Gaur, 2012) this analysis has an importance “for the purpose of drawing insights from real events and experiences and further elaborates on the social context which is associated with the interpretation of these experiences”. Thematic analysis as a five-step procedure explained by (Braun & Clarke, 2006) has been adopted in this study as shown in Fig. 5.

5. Findings and discussions

Following themes were developed through a multi-method approach, a combination of the secondary data sources (journals, international reports, media reports) and primary data sources (personal interviews and focus group interviews). These themes are grouped under the constructs of the S-O-R model.

5.1. Stimulus

5.1.1. Economic downturn

There is no denying the fact that the covid-19 crises have created an economic downfall, increase in unemployment rates, fall in growth rates of many companies, etc. In a similar context, one student said: “[...] Banking, retail, real estate, auto, and educational institutes are among the worst affected sectors due to coronavirus pandemic. With the majority of the population staying indoors due to the nationwide lockdown, the economic growth has taken a severe hit resulting in various sectors of the economy facing financial stress [...]”

5.1.2. Transport disruption

Transport disruption such as the restricted movement of public transport, termination of ride-hailing services, new regulations for ride-sharing services such as single passenger is allowed in few zones whereas in less risky zones traveling of riders is restricted to two passengers (Bora, 2020). Similarly, one of the students iterated “[...] it is impossible to even think about traveling in public transport or even in ride-sharing services like Ola and Uber with strangers. You don’t know what they are carrying with themselves [...]”

5.1.3. Online- delivery restrictions

Due to the covid-19 pandemic, various restrictions were imposed for the home delivery of non-essential commodities. One of the students quoted, “[...] many confirmed orders get cancelled which also includes some components and materials for my project work [...]”. Another student quoted, “[...] received my package after one month due to restrictions in the movement of logistics [...]”.

5.1.4. Lockdown regulations

Various regulations are imposed by the government of India such as the restricted movement of individuals, classification of various zones according to risk severity, closure of colleges, and universities. One student noted, “[...] The Jammu and Kashmir administration has decided to seal the Union Territory borders with the neighboring states of Punjab, Himachal Pradesh, and the union territory of Ladakh to scale up the battle against the spread of coronavirus”. Another student quoted, “[...] due to this situation, the government have decided that places of mass gatherings like cinema theatres, malls, marriage halls, pubs, music fests, marathons, night-clubs should be closed [...]”

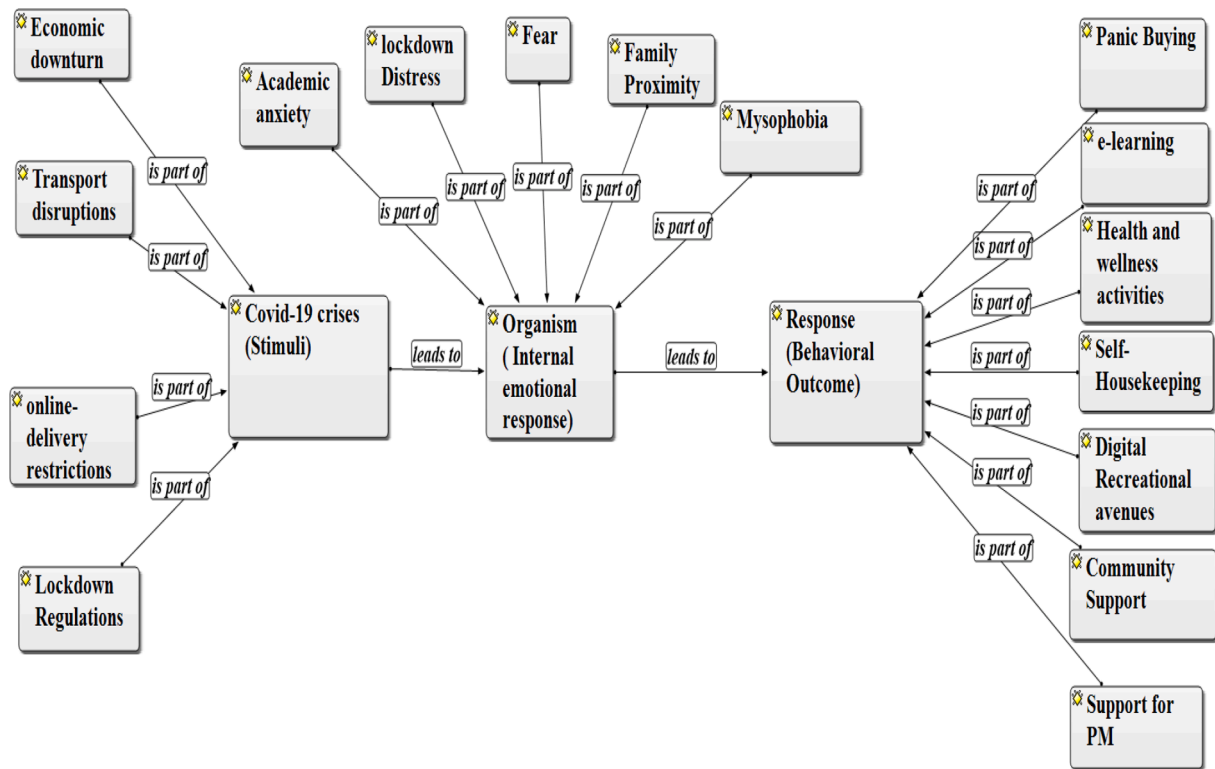


Fig. 3. Final Themes generated in Atlas.ti 7.

5.2. Organism

5.2.1. Academic anxiety

Most of the students during this time are concerned about their academic activities such as post-phone examinations, summer internships, uncertainty about the classes, etc., and are much anxious about their final placements. One student said, “[...] however, I am feeling that I am wasting my time which should be utilized for various academic purposes and this can have a huge impact on our education and career at large”. Another student quoted, “[...] by this time I would have been preparing for various summer internships, all this has now come to a standstill [...]”.

5.2.2. Lockdown distress

It is very stressful for the students to get isolated from their social circles which they are not habitual of and follow the lockdown guidelines from the government and concerned administration. In the same context, one student said, “it is very stressful for us to remain inside the house all the time [...] I think it is a sort of house arrest”. Another student quoted, “[...] when I heard about the news of lockdown in my hostel, I got worried and anxious and called my parents immediately [...] but I was not able to sleep properly and woke up many times at that night.”

5.2.3. Fear

Fear is a common emotional response to any stressful stimulus. The same has been found among the students. One of the students said, “[...] If we take a long time to develop a vaccine for the treatment of covid-19. I fear India will become the next epicenter for covid-19 cases after the US and Italy and as a result, many people will die”.

5.2.4. Family proximity

During the lockdown period, students found closeness to their family members and love to spend time with their near and dear ones and it helps them to get emotional stability during tough times. To quote, a

student, “After a very long time, I got an opportunity to have breakfast, lunch, dinner with all of my family members and is the only thing that makes me feel good during lockdown [...]”. Another student said, “I play badminton, carom, mobile Ludo with my parents and watch Ramayana and Mahabharata with them. The person who was the happiest that I am in the house is my grandmother as I feel that at this age, they want their grandson or granddaughter to be around them as long as possible”.

5.2.5. Mysophobia

It has been found in the study that students have developed a fear of contamination and virus. This fear should be addressed at an early stage otherwise it can turn into serious psychological disorders. One student said, “[...] as I frequently sanitize clothes, utensils, newspapers, mobile phones, debit/credit cards, and even doorknobs [...] wash fruits and vegetables with detergents and warm water”

5.3. Response

5.3.1. Panic-Buying

Hoardings and purchases in large quantity as a result of panic buying was also found as a behavioral change in this study. One student said, “[...] after listening to this news, I straightway took out my motorcycle and went first to ATM to take out cash and rushed to Kirana stores to buy some essential items. I bought 5 Kg Potato, 3 Kg of Pulses, 4 kg Sugar [...]”.

5.3.2. E-learning

The shift towards online learning has been found among the students. They are changing their behavioral tendency of learning from offline mode to online mode. In a similar context one student said, “[...] then I used to spend my afternoon time watching learning tutorials on YouTube, revisiting and reviewing my LinkedIn account [...]”. Another student noted, “[...] enrolled in some online courses related to my MBA from Udemy [...] get assignments and videos from our teachers via Google classes [...]”.

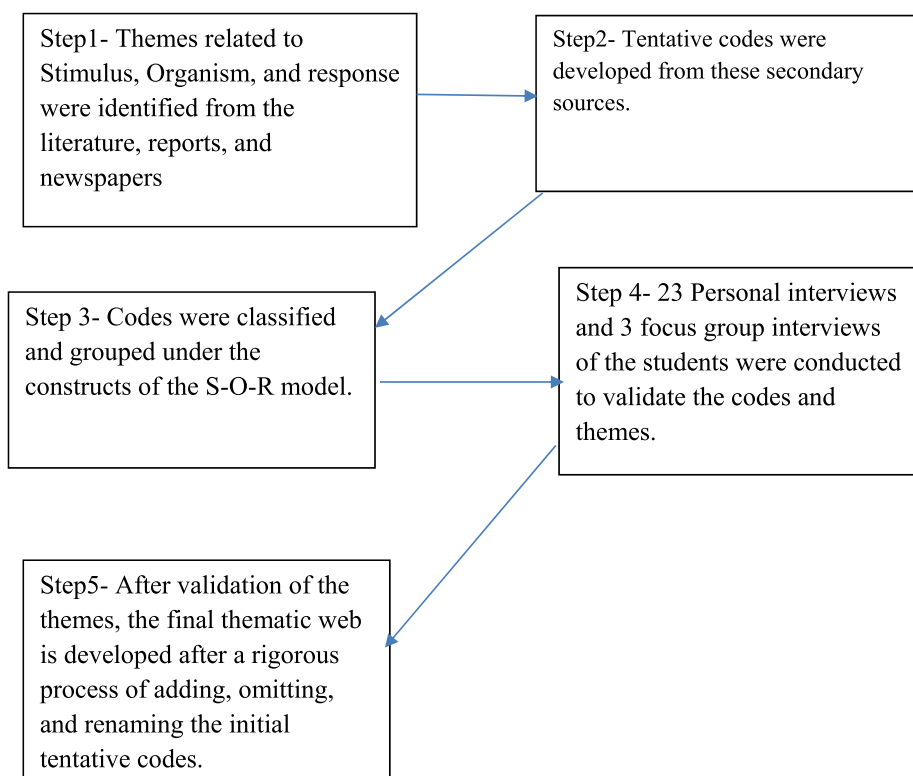


Fig. 5. Steps of Thematic analysis included in the study.

risk (Li et al., 2020) and misinformation (Kouzy et al., 2020; Smith et al., 2020). At the same time, many psychological factors have not been highlighted in the previous literature such as Monophobia, Academic anxiety, etc. Monophobia is one of the serious issues that need to be addressed by the concerned administration on a priority basis as it can escalate into a serious psychological disorder. In order to handle the queries of students related to academic concerns, the government of India has directed all the affiliated universities and colleges to constitute a special cell handling the grievance of students related academic queries during the covid-19 pandemic (Press Information Bureau, 2020).

The study adapted the S-O-R model so that the comprehensive overview of the psychological impact of Covid-19 on the students can be examined. This study provides insights about the Covid-19 as a stimulus and its impact on the emotional response (Organism) and behavioral outcome (Response) of the students. Prior studies remained confined to the emotional response of the students and primarily focused on fear and anxiety (Banerjee, 2020; Cao et al., 2020; Harper et al., 2020). Unlike prior research, this study also found positive outcomes from the dark side of the Covid-19 crises such as family proximity, the shift towards e-learning and digital solutions, support and trust for prime-minister, etc. In times of global crises, Indian students have faith and trust in the administrations and even appreciate the efforts made by the honorable prime-minister of India. At the same time, a shift towards digital learnings and family proximity have been observed that can provide emotional stability to the students. The researchers need to present both sides of the pandemic so that an overall analysis of the Covid-19 can be made.

7. Limitations and future research

Despite being a comprehensive study of the behavior of students, this study has few limitations. This study considered only full-time students who have a financial dependency on their parents, part-time self-dependent students are not included in the study and only qualitative perspectives of the respondents are considered. This study lacks

empirical shreds of evidence and primarily focuses on the qualitative aspect. More-over themes generated from the perspective of the S-O-R model have only been considered and hence questionnaire was developed accordingly. These limitations can act as a direction for future research where studies related to the self-dependent students can be conducted and inferences can be drawn with the help of empirical evidence or by adopting mixed methods (qualitative and quantitative research).

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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