Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Personality and Individual Differences 180 (2021) 110962

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

A neglected reality of mass media during COVID-19: Effect of pandemic news on individual's positive and negative emotion and psychological resilience

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ARTICLE INFO

Keywords:
COVID-19 pandemic
Positive and negative emotions
Resilience

ABSTRACT

Numerous studies have demonstrated that mass media platforms are playing a crucial role in disseminating information about the COVID-19 pandemic. As media coverage of pandemic using frightening language has been speculated to induce emotional disturbances in people and fluctuations in their resilience level, this study was performed to explore the effect of COVID-19 related news on individual's emotions and resilience. It was hypothesized that altering the type of news would produce varying levels of emotions and resilience in participants. Both the recruitment of participants and the conduction of the study were done online in September when the pandemic hit the peak in India. Randomly assigned participants were exposed to three conditions: positive news ($N = 56$), negative news ($N = 59$), and neutral news ($N = 60$) related to COVID-19. Analyses revealed negative news significantly decreased positive emotions and resilience while positive news significantly reduced negative emotions and vice-versa. These finding suggest strong impact of mass media on individual's emotions and their own self-evaluation on resilience. The study highlights the responsibility of mass media and urges for bringing necessary changes in covering pandemic news and similar other uncertain situations in keeping people's emotions stable and increasing their psychological resilience.

1. Introduction

The COVID-19 pandemic has generated an unprecedented effect all over the world. It has affected almost each and every country and infected more than 100 million people and caused 2.787,593 deaths and the number is increasing (WHO, 2020a). As per reports this transmission was firstly detected in Wuhan, China in December 2019 (WHO, 2020b). Now every country is fighting against this pandemic to protect their people and their lives by maintaining the requirement of human distancing, good hygiene, social isolation, and lockdown to reduce the contagion (Pérez-Fuentes et al., 2020). In this phase, people are likely to develop a wider range of psychological stress and disorders including mood swings, insomnia, anxiety, depression, anger, frustration, loneliness, and post-traumatic symptoms etc. (e.g., Jiao et al., 2020; Killgore et al., 2020; Montemurro, 2020). People are worried about getting sick and how long this pandemic will last and also what the future will bring.

1.1. Pandemic and mass media

Mass media or traditional media is considered to be more credible than social media due to availability of original source of information, processing of information through journalistic standards and responsibility for accuracy of news (Wada, 2018), as in the study by Tandoc (2019), it was found that the participants rated news from mass media to be more credible than those shared by their friends on the social media platform (Facebook). During the current COVID-19 pandemic a lot of studies were done addressing the spread of misinformation, infodemics and fake news and its impact on individual's mental health and well-being by social media (e.g., Brennen et al., 2020; Gao et al., 2020; Pennycook et al., 2020), but the area assessing the impact of mass media on the same during the current pandemic remains unexplored by large.

Mass media has played an important role in disseminating news about the current pandemic and curbing curiosity since the outbreak. There has been a substantial increase in news consumption in India

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https://doi.org/10.1016/j.paid.2021.110962
Received 20 December 2020; Received in revised form 16 April 2021; Accepted 22 April 2021
Available online 4 May 2021

(Banka, 2020; Jha, 2020) and the world during the present COVID-19 pandemic (O'Grady, 2020). In the past, during the Ebola outbreak instead of focusing attention on medical facts and actual viral outbreak, sensationalized coverage using less relevant content by news media outlets whipped up hysteria and fear in the USA (Kilgo et al., 2019; Towers et al., 2015). Similarly, during COVID-19, news has focused more on death and grave consequences leading to public panic and negative emotions while giving less attention to information as to how to control the spread and promote healthy practices (Basch et al., 2020). As with increased viewership and readership of COVID-19 related news content and psychological experiences (including effective coping with adversity) from previous epidemics and other natural and manmade disasters (Pfefferbaum et al., 2014), it becomes essential to empirically assess the risk factor of mass media exposure on various psychological outcomes during the current pandemic as well.

1.2. Pandemic news and emotion

Due to COVID-19 and its various restrictions like lockdown, social distancing etc. people are experiencing fear, uncertainty, social isolation, and may lose track of their normal lives. (Jiao et al., 2020; Restubog et al., 2020). Because of difficulty in getting the daily necessities, fear of infection, unavailability of cure and currently the apprehensions around vaccine of this infectious disease may also cause severe levels of anxiety, distress and emotional dysregulations (Montemurro, 2020). Emotions can be defined as multicomponent response propensities that are of short duration, and comprise cognitive processing, bodily reactions, and the subjective feelings or experience of emotion (i.e., affect) (Diener & Emmons, 1984). Emotions are often perceived as varying in valence, such as positive (e.g., happiness, euphoria, satisfaction, curiosity etc.) to negative (e.g., sadness, anger, anxiety, fear etc.). Subjectively, people experience positive emotions as feelings that reflect a level of pleasurable or desirable situational responses to the environment that are more complex and targeted than simple sensations (Cohn & Fredrickson, 2009). Negative emotions, on the other hand, reflect a general feeling of discouragement and misery (Pam, 2013).

During the current pandemic, an analysis of 141,208 headlines of global English news sources regarding the coverage of coronavirus disease revealed that a major portion (51.66%) of total news headlines were related to negative sentiments, while a small portion (30.46%) of the news headlines were of positive sentiments and the remaining 17.87% fell into the category of neutral news (Aslam et al., 2020). Other studies too have shown the rise of negative emotions by COVID-19 related mass media contents and the effect of these negative news may generate anxiety, fear, anger, homesickness, sadness etc. in a maximum number of individuals (e.g., Aslam et al., 2020; Hamidein et al., 2020). In the Indian context, there is no such research evidence of mass-media related COVID-19 news content that generated negative and positive emotional responses. So, we planned to analyze the effect of pandemic news on individual's emotions and to explore whether pandemic-related positive, negative, and neutral news would associate with varying degrees of emotions in each group of participants.

1.3. Pandemic news and psychological resilience

Psychological resilience is a quality referred to as positive adaptation to adversity or to cope effectively with hardship, adversity and uncertainty (Connor & Davidson, 2003). The result of lockdown, social isolation and physical distancing have led to a significant increase in level of mental health concerns like loneliness, depression, suicidal ideation, etc. (e.g., Killgore et al., 2020). In this traumatic period, people are trying to cope with the fear of getting infected and death and this fear is increasing the level of stress more than the level of mental flexibility required to effectively cope with this stress (Chen & Bonanno, 2020; Wan, 2020). As per Chen and Bonanno (2020) review article on resilience and COVID-19, most researchers have claimed that the majority of people have shown resilience during the similar situations (previous pandemics and epidemics) and are likely to remain during this pandemic as well, but they also concluded that many factors like individual differences, familial aspects and severity of exposure etc. contributed to the distinct level of resilience among individuals. Also, there is no such direct empirical research on the effect of mass-media related news exposure on individual's appraisal of their psychological resilience during the pandemic. Therefore, in line with the above-mentioned statement the study was meant to explore whether different types of news exposure (positive, negative and neutral news articles) to a different group of participants would actually show distinctive levels of psychological resilience.

2. Method

2.1. Participants

The study was conducted online and a self-report questionnaire was used via Google-Form. The participants were recruited with the help of 10 representatives in 2 universities and 3 organizations. At that time, only participants' consent for participation in the study and emails were taken for contacting later. 231 individuals consented to be the part of the study. All the participants were randomly assigned to the three treatment conditions, named as Group A, Group B and Group C respectively. 206 (Group A = 66, Group B = 75, & Group C = 65) filled questionnaires were obtained during one week. 31 questionnaires were not accepted for the study according to our eligibility criteria and the presence of multivariate outliers. Finally, 175 (Group A = 56, Group B = 59, Group = C; Male = 88, Female = 87) valid questionnaires were taken for the present study, which was well above the determined sample size (n = 144) for this study that would give power of 0.90 to detect a moderate effect size of 0.0625 at an alpha level of 0.05, after running a priori analysis using Gpower.

2.2. Eligibility criteria

Except for the willingness to give informed consent, people not having underlying mental health conditions, minimum age of 18 years, resident of India and able to read, comprehend and respond to the instructions regarding measuring tools, there were no other exclusion or inclusion criteria.

2.3. Procedure

Data collection was done in September (07 September 2020–15 September 2020), when in India, 42,02,570 cases of infection due to COVID-19 were reported (COVID-19 India Org, 2020). All the 231 participants were sent different Google form links according to their assigned group conditions. There were three conditions to which the participants were randomly assigned. The three conditions were named as Group A, Group B and Group C. All the three groups were provided three questionnaires with a news article clip via Google Form prepared by the researchers for manipulating participants according to their group conditions. After filling in all the demographic details, all the participants were exposed to a news article. Two of the groups were exposed to COVID-19 pandemic-related news (Group A and B) and the remaining one to the news having no relevance with the current pandemic situation (control group 'C'). To enhance the perceived authenticity of the content all the news articles were shown to be authored by specialists in their respective fields like both COVID-19 exposed articles were shown as being authored by a renowned epidemiologist of India. It was mandatory to read the complete news article before further proceeding in filling the rest of the questionnaire.

Group A was shown with a positive news article titled as "COVID-19 Pandemic: The days may be over soon." consisting of all the positive developments around COVID-19 like mortality rate going down,

concrete progress towards vaccine development, economy steadily coming back on track etc. Group B was shown with a negative news clip titled as "COVID-19 Pandemic: The days may be more darker." laden with negative developments around pandemic like the incidence of the second wave in many countries, uncertainty over reliability and availability of the underdevelopment vaccines, unemployment rise, economic slowdown etc. Group C was shown neutral news having no relevance to the COVID-19 situation titled as "Demand Heating up: Sustainable housing lands big contract". Reading the entire article and completing the questionnaire required 15–20 min.

2.4. Measures

In the present study, the following assessment tools were administered.

2.4.1. Positive and negative emotion schedule (PANAS-GEN)

PANAS scale (developed by Watson et al., 1988) was used to assess the participants' positive and negative emotions. It is a self-report questionnaire which comprises two 10-item subscales to measure the positive and the negative emotions. Each individual item of the PANAS is scored from 1(not at all) to 5(very much) on a response scale, which is stipulated as a five-point ordinal scale. The participants were instructed to respond to this question, "After reading the news, to what extent are you experiencing the following emotions at the present moment. In the present study, the scale showed good internal consistency as Cronbach's Alpha for positive emotion was 0.82 and 0.87 for negative emotions.

2.4.2. 10-item Connor-Davidson resilience scale (10-item CD-RISC)

CD RISC 10 was refined in 2007 by Campbell-Sills and Stein for the 20-item original CD-RISC (Connor & Davidson, 2003). It is used to assess the level of resilience among participants. It consists of 10 items with five categories of response ('Not at all agree', 'Agree a little bit', 'Moderately agree', 'Agree Quite a bit', and 'Extremely agree' rated 0 to 4 respectively). The total score can range from 0 to 40 for each respondent. The participants were asked to respond to the question, "After reading the news, please evaluate your ability on these following statements at the present moment". Cronbach's Alpha as a measure of reliability for this scale in this study was 0.77.

2.4.3. Authenticity of news and manipulation check related item

Apart from the above scales, two items were also added to the questionnaire for manipulation check and trustworthiness of the article.

One item i.e. "The perceived authenticity and trustworthiness of the news material you have read." measured the trustworthiness and authenticity of the news material on a 7-point Likert scale (1 = *do not trust at all* to 7 = *trust completely*).

Another single item i.e. "I was thinking about the COVID-19 pandemic while completing the questionnaire." was used as the manipulation check item measured on a 7-point Likert scale (1 = *Not at all* to 7 = *All the time*).

2.5. Data analysis

The responses obtained on various measures were scored as per their manual instructions, and data was subjected to various statistical analyses. All analyses were carried out using IBM SPSS version 26. The significance level was set to 0.05 (two-tailed). After descriptive statistical analysis, MANOVA was done as there were three dependent variables. Univariate ANOVA and Tukey Post Hoc tests for pairwise comparison between followed it.

3. Result

3.1. Trustworthiness and authenticity of the news

The ratings for the trustworthiness and authenticity of all the news materials were above the midpoint scale value of 4 (M_A=5.05, M_B= 4.61 and M_C=4.40 & SD_A=1.34, SD_B=1.39 and SD_C=1.543), indicating that the participants perceived the article as authentic and reliable.

3.2. Manipulation check

The manipulation check item was effective (M_A=4.79, M_B=4.29 and M_C=3.27 & SD_A=1.92, SD_B=1.65 and SD_C=2.07) as both the group A & group B were significantly higher than the control group in thinking about the pandemic item, $F(2, 172) = 9.79$, $\rho < 0.001$, $\eta_\rho^2 = 0.10$. Comparison between group A and Group C revealed significant difference, $t(114) = 4.08$, $\rho < 0.001$, $d = 0.76$. Similarly between Group B and Group C revealed a significant difference, $t(117) = 2.97$, $\rho = 0.004$, $d = 0.55$.

3.3. Descriptive analysis

The demographic details of the participants and the descriptive statistics of three observed variables are shown in Tables 1 and 2.

3.4. MANOVA analysis

All the assumptions for running MANOVA were satisfied. Multivariate normality was checked using Mahalanobis distance and outliers were removed from the study. The Box's M value of 24.34 was associated with a p value of 0.022, which was interpreted as non-significant based on Huberty and Petoskey's (2000) guideline (i.e., $p < .005$). Thus, the covariance matrices between the groups were assumed to be equal for the purposes of the MANOVA. There was no observed multicollinearity as evident from the correlations. The correlation between positive and negative emotions was significant ($r = -0.150$, $n = 175$, $p = .048$). The correlation between resilience and positive emotion was also significant ($r = 0.477$, $n = 175$, $p < .005$). The correlation between resilience and negative emotion was significant too ($r = -0.200$, $n = 175$, $p < .005$).

There was a statistically significant difference in dependent variables (positive emotion, negative emotion and resilience) based on the group's exposure to the type of news content, $F(6, 340) = 6.04$, $p < .005$; Wilk's $\Lambda = 0.816$, $\eta_\rho^2 = 0.096$.

Table 3 gives the results of Univariate ANOVAs, prior to which homogeneity of variance using Levene's test revealed that positive emotions ($p = .172$), resilience ($p = .180$) were non-significant and negative emotion was statistically significant ($p = .017$), despite which variance homogeneity can be assumed as variance ratio is not greater than 3 (Dean et al., 1999). As Here it was found that exposure of news has a statistically significant effect on all the dependent variables positive emotion ($F(2, 172) = 11.38$; $p < .0005$; η_ρ^2=0.117), negative emotion ($F(2,172) = 7.303$; $p < .005$; η_ρ^2=0.078) and resilience ($F(2, 172) = 14.30$; $p < .005$; η_ρ^2=0.068). A Bonferroni correction was performed to account

Table 1
Demographic characteristics of participants.

		Group A	Group B	Group C
Gender	Male	25	25	38
	Female	31	34	22
Age group	18–25	24	28	32
	26–30	26	31	26
	31–35	6	0	2
Profession	Student	26	34	19
	Government job	24	13	25
	Private job	4	6	11
	Self employed	2	6	5

Table 2
Group-wise Mean and SD for three observed variables.

		Positive emotion		Negative emotion		Psychological resilience	
Conditions	N	M	SD	M	SD	M	SD
Group A	56	36.86	5.792	25.50	9.737	30.61	4.879
Group B	59	30.85	7.244	29.15	7.423	27.39	6.071
Group C	60	34.32	7.172	23.57	6.932	30.25	5.151
Total	175	33.96	7.181	26.07	8.373	29.40	5.558

Note. Group A, positive news exposure group; Group B, negative news exposure group; Group C, neutral news exposure group.

Table 3
Univariate ANOVAs.

	F	Df	Sig.	η_p^2	Power
Positive emotions	11.388	2/172	0.000*	0.117	0.992
Negative emotions	7.303	2/172	0.001*	0.078	0.934
Psychological resilience	6.234	2/172	0.002*	0.068	0.890

* $p < .0167$.

for multiple ANOVAs. In this case, we accept statistical significance at $p < .016$.

To control the probability of committing one or more Type I errors across the multiple pairwise comparisons for the dependent variable at the 0.016 alpha level, therefore with the Bonferroni method, each comparison is tested at the alpha level for the ANOVA divided by the number of comparisons; for our example, $0.016/3 = 0.0056$. After doing multiple comparisons, it was found that as seen in Table 4, Means for Positive Emotion were statistically higher for Group A than Group B ($p < .0005$). For Negative Emotion, means were significantly higher for Group B than Group C ($p < .005$). For resilience, the means were significantly higher for Group A than Group B ($p < .005$).

4. Discussion

The study aimed to explore the impact of mass media on individual's emotions and psychological resilience in the Indian context. Here we examined participant's positive emotions, negative emotions and psychological resilience among three groups by different types of news exposure.

The results of the study clearly demonstrated that the positive emotions of the participants were significantly higher for those who were exposed to news having positive content about the COVID-19 pandemic than those who were exposed to news having negative content about the same. It was also found that negative emotions were significantly higher for the group exposed to negative and pessimistic news than the group exposed to neutral non-COVID-19 news. So, it can be ascertained that negative news resulted in elevated negative emotions and positive news resulted in increased positive emotions, which confirms the first hypothesis which says that exposure to different types of pandemic news would associate with significant varied effect on positive and negative emotions of individuals in each group. As reported by Wahl-Jorgensen (2020) during the present pandemic scenario, the excessive use of fear-inducing words and frightening language is quite prevalent and news exposure has significant effect on increasing negative emotions and also in triggering anxiety in people (Hamidein et al., 2020). Although, in the study conducted by Wang et al. (2020) based on individual emotions affected by the COVID-19 pandemic and general belief in a just world (GBJW) has shown that whether the news was positive or negative obtained responses from COVID-19 related epidemic focused group participants experienced a higher level of negative emotions. But on the basis of our findings, it can be concluded that positive news exposure helped in alleviating negative emotions among the participants.

To our knowledge, this is one of the first studies that analyzed the effect of mass-media related content on an individual's psychological resilience. We found that the psychological resilience was significantly higher for those who were exposed to news having positive content about the COVID-19 pandemic than those who were exposed to news having negative content. Psychological resilience is a construct based around adversity and positive adaptation which according to the researchers must be present while demonstrating it (Fletcher & Sarkar, 2013). While most people are likely to be resilient during the current pandemic (Chen & Bonanno, 2020) and psychological resilience being largely a stable trait (Connor & Davidson, 2003), but it has also been conceptualized as a process that changes over time which shows that it varies according to situation's adversity and life span (Windle, 2011; Luthar et al., 2000). So, participants' evaluation of themselves less on resilience scale when they were exposed to negative and pessimistic news goes on with the present findings that resilience will be affected by the severity of exposure i.e., consumption of varying degree of news related to pandemic. It is also notable that positive news doesn't facilitate that much as negative news deteriorates the output measures. As the current result suggests, if such is the effect of one-time exposure on the one's appraisal of psychological resilience, then continued exposure to the news which induces negative sentiments in individuals can badly reduce their ability to cope with adversity in long run.

This study has several limitations as it focused on only one form of media i.e., traditional/mass media exposure. While a comparison may also be useful with social media in this regard along with exploring effects simultaneously as both are inseparable and indispensable parts of everybody's life. As mass media also comes in various forms like print, audio and visual, it may also cause varying degrees of effect. The participants in the study mostly comprised of the young generation of which all were below 35 and the sample size is quite small. Another limitation of the study was that the measures were only taken after the news not before. So, the availability of baseline PANAS and Resilience measurement would further add value to the study design particularly for resilience, as it may give an insight into whether resilience could affect susceptibility to media influence. Further studies may be more benefited from the longitudinal design of the study as well. The perceived credibility of mass media in particular culture during the non-COVID situation and the duration of viewership during the pandemic could also interplay between the exposure and output variables. Lastly, since the study sample was based on the Indian population, further evidence is needed to corroborate these findings in other international cohorts in order to evaluate the generalizability of the results. Nevertheless, this study gives insight into how much mass media can have an impact on

Table 4
Tukey HSD multiple comparisons.

	Positive emotions			Negative emotions			Psychological resilience		
	MD	Std. error	Sig.	MD	Std. error	Sig.	MD	Std. error	Sig.
Group A vs. Group B	6.01	1.26	0.000*	3.65	1.50	0.043**	3.22	1.00	0.005*
Group B vs. Group C	3.47	1.24	0.016**	5.59	1.48	0.001*	2.86	0.99	0.012**
Group C vs. Group A	2.54	1.26	0.112	1.93	1.50	0.404	0.36	1.00	0.933

* $p < .0056$.
** $p < .05$.

our current emotions and especially our psychological resilience during the uncertain events like the current COVID-19 pandemic.

5. Conclusion

While there may not be any clearly defined boundary between what news is threatening and what news is cautioning, but still mass media is expected to be sensitive to the emotions of people while reporting pandemics or any similar long-term uncertain and distressful events in the future. They continuously must make people aware of the current developments and also warn them of possible consequences for their negligence, but not in a privative way to inculcate the feeling of pessimism, fear, danger, or chaos. Rather they must thoughtfully and carefully carry out preparation and presentation of news as subtle changes can affect the audience's psyche in substantial ways. Otherwise, it may generate various negative emotions which may have a detrimental effect on people's mental health and may also put an adverse effect on an individual's ability to be resilient in these conditions. As being the responsible and susceptible media, they can focus more on positive developments and help in instilling people with the belief that everything will be fine soon. In this way, the reach and effect of mass media can be best harnessed.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical statement

The study follows ethical guidelines as laid down by Indian Council of Medical Research (ICMR) on human participants.

CRediT authorship contribution statement

Shakshi Priya Giri: Investigation, Writing – review & editing, Supervision. **Abhishek Kumar Maurya:** Conceptualization, Methodology, Formal analysis, Writing – original draft.

Declaration of competing interest

No potential conflict of interest was declared by the authors.

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