The Relationship Between Media Involvement and Death Anxiety of Self-Quarantined People in the COVID-19 Outbreak in China: The Mediating Roles of Empathy and Sympathy

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Abstract

The COVID-19 outbreak put health threat to people globally, and self-quarantine was suggested by the Chinese government to contain the outbreak. In self-quarantine, media was the most important way to get information about the outbreak. However, the relationship between media involvement and death anxiety, and the underlying mechanism are poorly understood. We conducted an online survey of 917 participants to assess the media involvement and other potential factors (empathy, sympathy and affect) which might affect death anxiety. Correlation analysis and mediation models were conducted to examine the relationship between media

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involvement and death anxiety, and the possible mediating roles of empathy, sympathy, and affect. It was found that media involvement was positively associated with death anxiety. Empathy, sympathy, and negative affect played mediating roles between them. However, empathy and sympathy act differently in the association, as empathy could lead to the increase of negative affect, while sympathy did not.

Keywords
COVID-19, media involvement, empathy and sympathy, positive and negative affect, death anxiety

The Coronavirus disease (COVID-19) is spreading all over the world rapidly. By August 15, the COVID-19 caused more than 89,000 infection and 4708 death in China, and the situations in the whole world were even more seriously, over 21,161,000 people infected and 764,910 people died all over the world (Global Pandemic Real-time Report, 2020). At present, the COVID-19 has been able to be controlled partially in China, due to the timely self-quarantine advocated by the Chinese government, but at the beginning of the outbreak, it was seriously. The outbreak could cause many adverse mental consequences such as worry, anxiety, depression, and panic due to the person-to-person transmission of the COVID-19 (Guo & Yang, 2020; Satici et al., 2020). People would feel fear to be infected and even to death facing the COVID-19 epidemic (Kavaklı et al., 2020). The feeling of uncertainty about death caused by the outbreak might trigger death anxiety (Lu et al., 2017; Mcgregor et al., 2001).

Death anxiety is conceptualized as the feeling of worry, fear, or dread that triggered by the thought of dying and it is distinct from general anxiety (Hamid et al., 2017). Previous studies found that death anxiety had significant associations with many negative outcomes like mental illnesses and suicidal tendency (D'Attilio & Campbell, 1990; Menzies et al., 2019). Because of the negative outcomes caused by the death anxiety, many researchers began to explore the predictors of death anxiety (French et al., 2017; Ottu et al., 2017). Furthermore, during the COVID-19 outbreak, death anxiety plays a crucial role in various mental health conditions (Menzies & Menzies, 2020). Thus, it is essential to investigate the psychological contributors of death anxiety, and help individuals alleviate psychological distress.

Self-quarantine was suggested by the Chinese government to contain the outbreak. In self-quarantine, media was the most important way to get information of the epidemic. Previous study has found that exposure to media information about deaths was associated with conscious and unconscious death fears (King & Hayslip, 2002). Routledge and Juhl (2010) also proved that reminding individuals of information about mortality would lead to the increase of death

anxiety. Therefore, it is possible that involvement in media information about the COVID-19 outbreak would be associated with death anxiety. The current study aimed to examine the association between media involvement related to the outbreak and death anxiety, and to clarify the underlying mechanism.

Many studies found that people would experience diverse negative affects like anger, guilt, depression, fear, worry, and sadness during the outbreak (Ahorsu et al., 2020; James et al., 2019; Kavaklı et al., 2020). And those negative affects might result from the disaster-related media message (Pfefferbaum et al., 2014). More recently, some researchers have proved that the exposure to media contents related to the COVID-19 epidemic were associated with adverse psychological outcomes, such as negative affect (Chao, Chen, et al., 2020; Chao, Xue, et al., 2020). Furthermore, many previous studies proposed that individuals' affects could predict death anxiety. Hintze et al. (1993) conducted Stepwise Multiple Regression and they found that death anxiety was significantly predicted by anxiety and depression. And the predictive relationship between them were also be supported in some other studies (Ongider & Eyuboglu, 2013; Saggino & Ronco, 1997). The previous studies above indicated that media involvement would predict affect, and affect would predict death anxiety further. Thus, the association among media involvement, affect and death anxiety was discussed in the present study.

Empathy is a crucial ability that can impact individuals' affect when they were involve in media (Shu et al., 2017; Yang & Tian, 2020). Generally, empathy is the ability to understand the affect state of others correctly, it plays an important role in social cognitive process (Decety et al., 2016; Yan et al., 2018). In previous studies, empathy was found to be a mediator in the association between the media usage and related behaviour results, the media usage could contribute to the expression of empathy (Mößle et al., 2014; Prot et al., 2014). Thus, if individuals were exposed to a great amount of media information about the COVID-19, they might experience empathy. Besides, empathy was also associated with affect. However, previous study showed inconsistent results. Wei et al. (2011) found that empathy was correlated with positive affect, while some other researchers believed that high level of empathy might result in negative affect, such as anxiety or depression (Decety & Meyer, 2008; Gambin & Sharp, 2018; O'Connor et al., 2007), the relationship between empathy and affect in the COVID-19 outbreak was examined in the current study. In addition, a previous research also found that high level of death anxiety might have a close correlation with empathy (Servaty et al., 1996). Taken together, it is possible that media involvement, affect, empathy, and death anxiety were related.

Besides, sympathy, a very similar variable, was also taken into consideration in this study. Sympathy is a vicarious emotional reaction based on the apprehension of another's emotional state or situation (Eisenberg et al., 1991), it is a similar concept with empathy, but they act differently (Wang et al., 2017). Many studies have found that empathy and sympathy both played important

roles in understanding other's affect (Decety et al., 2016; Vossen et al., 2015). Therefore, the distinction of empathy and sympathy in the relationship between media involvement and death anxiety was investigated in the present study.

In sum, media involvement with epidemic-related information was important during the COVID-19 outbreak of the self-quarantined. We hypothesized that media involvement could influence people's affect, empathy, sympathy, and death anxiety. Amongst them, affect, empathy and sympathy may play mediating roles between media involvement and death anxiety. The purpose of present research was to investigate the underlying mechanism between those variables.

Methods

Participants

A total of 932 participants were recruited on January 28 when self-quarantine had performed for one week. The questionnaires were uploaded onto the online platform "Tencent Questionnaire", and the link was spread through the WeChat, the most popular Chinese social app. Participants who finished the questionnaires were encouraged to share the link to more people via a snowball sampling method. And the multiple participation was avoided by recording the device IP address. Considering that people whose families and friends were infected may have different emotional state compared with other people, so their data were deleted. Finally, 917 participants were reserved, among them, 304 were male and 613 were female, with an average age of 28.6 and a standard deviation of 9.47. Among the participants, 453 were single, 464 were non-single. Besides, among them, 134 had junior college education or below, 425 had undergraduate education, 358 had graduate education and above. The participants
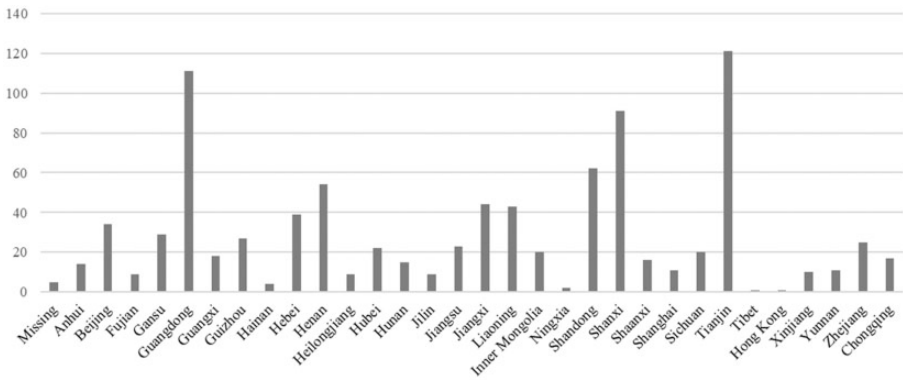

Figure 1. The Specific Locations of the Participants.

came from different regions of China, and their specific locations were shown in Figure 1.

Furthermore, the current study was approved by the ethics committee of Tianjin Normal University, and the study did not involve any acts which would violate ethics. All the participants were informed of the study purpose before they took the questionnaires, and they all consented to participate in our study.

Measures

Media Involvement Questionnaire. The Media Involvement Questionnaire measured people's involvement in media information about the COVID-19 epidemic. The questionnaire contains six items on a 5-point Likert scale (from $1 =$ never to $5 =$ always). An example question is, "How often do you view the information about the severity of the national and regional outbreak in the last week?" Higher score indicates higher level of the involvement in the media. The internal consistency coefficient (α) of the questionnaire was 0.82 and the Exploratory Factor Analysis supported its unidimensionality, indicating the questionnaire was acceptable.

Empathy-Sympathy Questionnaire. Empathy-Sympathy Questionnaire measured people's empathy and sympathy towards infected people in the outbreak context. The questionnaire has two subscales: empathy and sympathy, with two 5-points Likert-type (from $1 =$ totally disagree to $5 =$ totally agree) items for each subscale. An example question of empathy subscale is, "If other people feel nervous and worried due to the outbreak, I would feel nervous and worried too". An example question of sympathy subscale is, "I would sympathize with the infected patients". Higher score indicates higher level of individual empathy or sympathy to infected patients. The internal consistency coefficient (α) of the questionnaire was 0.64. Exploratory Factor Analysis showed the two-factor structure of the questionnaire and the factor load of each item was between 0.74 and 0.92.

Positive and Negative Affect Scale. Chinese version of Positive and Negative Affect Scale was used in the current study (Huang et al., 2003). It has twenty items, and rated on a 5-point Likert scale (from $1 =$ almost none to $5 =$ extremely much) and includes two factors: positive affect and negative affect. Higher score of positive affect represents a state of happy and energetic, and higher score of negative affect represents a state of confused, pain and anxiety. The scale showed good reliability and validity (Huang et al., 2003). In the present study, internal consistency coefficient (α) for positive affect and negative affect were 0.84 and 0.90 respectively.

Death Anxiety Questionnaire. Death Anxiety Questionnaire measured the emotion of fear and worry about death caused by the COVID-19 epidemic. The questionnaire contains four items, rated on a 5-point Likert scale (from 1 = strongly disagree to 5 = strongly agree). An example question is, "My heart beat faster when I hear of the message that the outbreak of COVID-19 might cause death". Higher score indicates higher level of fear and worry about death. The internal consistency coefficient (α) of the questionnaire was 0.78, and the results of Exploratory Factor Analysis supported the unidimensionality of this questionnaire, indicating that the questionnaire was acceptable.

Data Analysis

SPSS 25.0 was used to process the data and conduct the correlation analysis, Mplus 8.0 was used to construct the mediation models.

Common Method Bias Test and Correlation Analysis. As the same raters, the same test context, and the characteristics of items might cause artificial covariation which could lead to inaccurate measurement (Zhou & Long, 2004), we used Harman's single factor test to check the common method bias. The results showed that there were 6 factors with eigenvalues greater than 1. The first factor only explained 23.08% of the variances, which was less than the critical value of 40%, indicating that there was no serious common method bias in our study.

Results

Correlation Analysis

We conducted correlation analysis to examine the association among all the variables, and the correlation matrix was showed in Table 1.

Table 1 showed that media involvement was positively related to empathy, sympathy, positive affect, negative affect and death anxiety. Death anxiety was positively correlated with empathy, sympathy and negative affect. Besides,

Table 1. Descriptive Statistics Results and Correlation Matrix.

| Variable	$M \pm SD$	1	2	3	4	5	6
1. Media involvement	22.30 ± 3.93	1					
2. Empathy	6.53 ± 2.12	.26**	1				
3. Sympathy	8.25 ± 1.43	.27**	.27**	1			
4. Positive affect	28.59 ± 6.02	.24**	−.01	.09**	1		
5. Negative affect	22.91 ± 7.42	.27**	.52**	.10**	.07*	1	
6. Death anxiety	12.10 ± 3.78	.28**	.68**	.28**	.02	.47**	1

Note. *$p < 0.05$. **$p < 0.01$.

negative affect was positively associated with empathy and sympathy. However, the correlation between positive affect and empathy or death anxiety was not significant. Thus, the positive affect was not included in the following model processing.

Mediation Analysis

According to the theoretical basis of previous studies and the correlation matrix of the current study, we took media involvement as the independent variable and death anxiety as the dependent variable. Empathy, sympathy and negative affect were taken as the mediating variables. Mplus 8.0 was used to conduct the mediation models by sampling 5000 times with bootstrap method.

Mediation Analysis with Empathy and Negative Affect as Mediators. Figure 2 displayed the multiple chained mediation model with empathy and negative affect as mediators (with standardized path coefficients). For this saturated model, CFI = 1.000, TLI = 1.000, and RMSEA = 0.000. Information criterion AIC was 14328.697 and BIC was 14386.550. The results showed that media involvement positively predicted death anxiety, empathy and negative affect ($\beta = 0.087$, SE = 0.025, $p < 0.001$; $\beta = 0.260$, SE = 0.033, $p < 0.001$; $\beta = 0.141$, SE = 0.030, $p < 0.001$), both empathy and negative affect predicted death anxiety positively ($\beta = 0.578$, SE = 0.025, $p < 0.001$; $\beta = 0.152$, SE = 0.030, $p < 0.001$), which indicated that empathy and negative affect played a mediating role. Additionally, empathy also predicted negative affect positively ($\beta = 0.481$, SE = 0.025, $p < 0.001$), which suggested that empathy and negative affect worked as the chained mediation. Moreover, both the direct effect size and the indirect
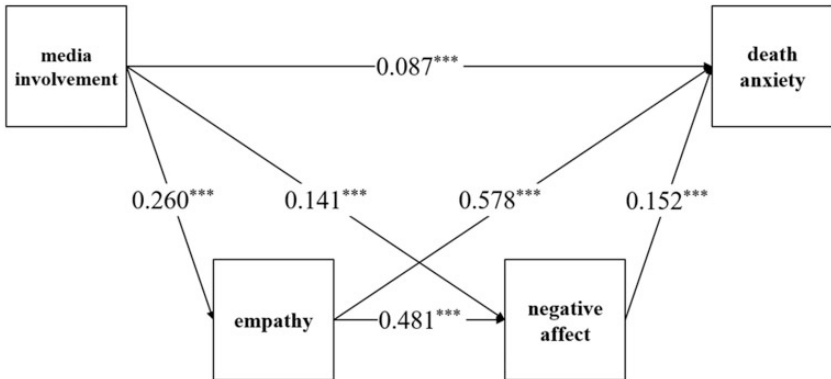
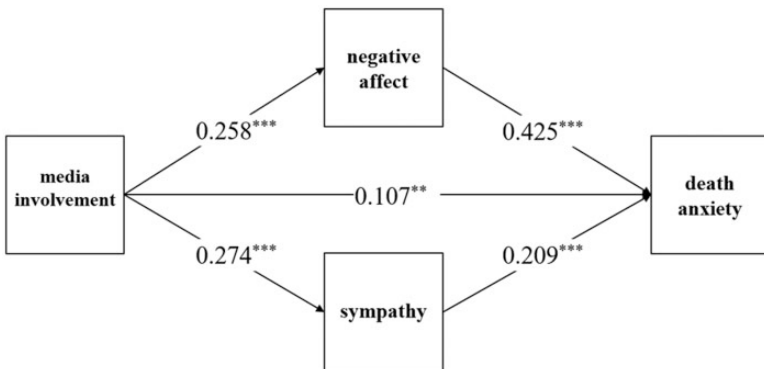Note: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

effect in the relationship between media involvement and death anxiety via empathy and negative affect were significant, and the mediating variables explained 68.59% of the total variance (see Table 2). It could be seen from the results that empathy and negative affect played a partial mediating role in the relationship between media involvement and death anxiety.

Mediation Analysis With Sympathy and Negative Affect as Mediators. Figure 3 displayed the multiple mediation model with sympathy and negative affect as mediators (with standardized path coefficients). The results showed that media involvement could positively predict death anxiety, sympathy and negative affect ($\beta = 0.107$, SE $= 0.031$, $p < 0.01$; $\beta = 0.274$, SE $= 0.035$, $p < 0.001$; $\beta = 0.258$, SE $= 0.034$, $p < 0.001$). Both sympathy and negative affect predicted death anxiety positively ($\beta = 0.209$, SE $= 0.031$, $p < 0.001$; $\beta = 0.425$, SE $= 0.030$, $p < 0.001$), while the predicted effect of sympathy on negative affect was not significant, formed a multiple mediation model (the insignificant path was not

Table 2. The Effect Sizes With Empathy and Negative Affect as Mediators.

Effect	Point Estimate (95% Confidence Interval)	Proportion
MI→DA	0.087 (0.039, 0.136)	31.41%
MI→EM→DA	0.150 (0.111, 0.189)	54.15%
MI→NA→DA	0.021 (0.009, 0.034)	7.58%
MI→EM→NA→DA	0.019 (0.010, 0.028)	6.86%
Total	0.277	

Note. MI = media involvement; EM = empathy; NA = negative affect; DA = death anxiety.

Note: $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

shown). For model fit, CFI, TLI, and RMSEA approximately equalled 1.000, 1.000, and 0.000 respectively, together with AIC equalling 14150.785 and BIC equalling 14208.639. In addition, both the direct and indirect effect that shown in Figure 3 were significant and the mediating variables explained 60.95% of the total variance (see Table 3). It indicated that sympathy and negative affect also played a partial mediating role in the relationship between media involvement and death anxiety.

Discussion

The present study explored the relationship among media involvement, empathy, sympathy, positive affect, negative affect and death anxiety in the COVID-19 outbreak in China. The results showed that the correlation between positive affect and death anxiety was not significant, while negative affect was positively related to death anxiety. Thus, positive affect was excluded from the mediation model analysis. After that, two path model were conducted. One was a multiple chained mediation model with empathy and negative affect as mediators, the other was a multiple mediation model with sympathy and negative affect as mediators. The model results indicated that people's media involvement in information about the COVID-19 outbreak was associated with their death anxiety. To be specific, individuals could experience higher levels of empathy (or sympathy) and negative affect with the increase of their involvement in the media information about the outbreak, resulting in higher level of death anxiety. It was inferred that people would feel the pain and suffering of the patients, vicarious negative affect and concern about their own health would arise, and they would also be afraid of being infected by the virus, after reading much more media reports about the outbreak.

From the result of correlation matrix, we could find that both positive affect and negative affect were associated with media involvement positively, this might be because the media information people got would involve in both negative and positive aspects, such as the severity of the outbreak, the number of deaths, or the effective measures to control the epidemic which taken by the

Table 3. The Effect Sizes With Sympathy and Negative Affect as Mediators.

Effect	Point estimate (95% confidence interval)	Proportion
MI→DA	0.107 (0.046, 0.169)	39.05%
MI→SY→DA	0.057 (0.035, 0.079)	20.80%
MI→NA→DA	0.110 (0.076, 0.143)	40.15%
Total	0.274	

Note. MI = media involvement; SY = sympathy; NA = negative affect; DA = death anxiety.

government, the heroic deeds of medical staff and the assistance from society. And the media content that includes information useful for self-protection, such as, people's heroic deeds or speeches from experts and the authorities, may be helpful to people during such an epidemic outbreak (Chao, Xue et al., 2020). It indicates that the government should take media as an effective supporter to make the public maintain good emotional state, and the media should report much more positive message about the outbreak or the official interpretation to improve people's awareness towards the COVID-19 outbreak.

Noteworthily, the model results showed that empathy and sympathy played different role in the mechanism between media involvement and death anxiety, as empathy might lead to the increase of negative affect, while sympathy did not. This might be attribute to their different impacts on feelings. Empathy is the comprehension about others' affect and psychological state, and it emphasizes that one is trying to feel others' feelings, while sympathy consisted of the concern to others' painful experience (Eisenberg, 2000), which emphasized the understanding of the plight of others, without the sense of substitution like empathy (Hein & Singer, 2008; Wispé, 1986). Thus, people who had empathy could feel others' feelings and even produced similar painful feelings (Decety & Meyer, 2008). Compared with sympathy, people who experienced empathy would report much more painful feelings which might trigger personal distress (Eisenberg, 2000). During the epidemic, people who experienced empathy were not only worried about themselves, but also be more susceptible to others' negative affect, while sympathetic individuals were just feeling sorry for others' suffering. In previous studies, researchers believed that empathy had positive effect on people. For example, individuals with higher ability of empathy would show more prosocial behaviour and could better understand others' feelings, and communicate with them (Eisenberg & Fabes, 1990; Graaff et al., 2017; Jing et al., 2017). However, people who had strong sense of empathy could also generate more negative affect (like anxiety and depression) and painful feelings or even death anxiety in adverse circumstances, which might result in some adverse impact on their life (Decety & Meyer, 2008; Gambin & Sharp, 2018; O'Connor et al., 2007).

Moreover, although death anxiety has negative influences on many different aspects of the lives of those who suffer from it and even lead to worse spiritual well-being (Soleimani et al., 2018), the impact of death anxiety is not entirely bad, the moderate level of death anxiety is also an instinctive self-protection reaction (Zhang et al., 2005). Terror Management Theory (TMT) proposed that when people realized they were facing the threat of death, they would start the mental defence mechanism and tried to change their cognition and behaviour to alleviate the impact of death anxiety on themselves (Lu et al., 2017). Thus, people who experienced moderate level of death anxiety might take self-protection work more seriously (change behaviour), reminders of death make them wear protective gear or self-isolating more seriously (Menzies & Menzies,

2020), which might help them alleviate the bad feelings caused by the death anxiety, which was beneficial to themselves.

To some extent, the current study can provide some enlightenment for individuals and the government to take some specific measures to alleviate individual suffering. For example, the media should report much more positive message about the outbreak to increase people's confidence in fighting the epidemic rather than put their attention to the negative sides completely, and that could help people stay rational and do not generate too much empathy, sympathy or negative affect, it may also help people maintain moderate level of death anxiety which make them take self-protection work more seriously. In addition, it may be helpful to organise some online psychological counselling or telephone hotline spontaneously to help people with negative affect and death anxiety.

What should be pointed out is that the current study is on a cross-sectional design, if want to establish the causal relationships among research variables, longitudinal design may be a good choice. And the current study was implemented in China, the conclusion may be inapplicable to other countries because of the different situation of the outbreak and cultural difference. In addition, the measurements used in this study were a little short, because of the huge amounts of items (this study only covered partial items) and the limitation of time.

In conclusion, the current study figured out the external factor (media involvement) and some psychological contributors (empathy, sympathy and affect) which may result in people's death anxiety during self-quarantine in China, and investigated the mechanism underlying them. This study could bring some enlightenment to individuals and the government to take some specific measures to alleviate individual suffering during the outbreak.

Conclusions

The current study suggested that (1) Positive affect was not associated with death anxiety caused by the outbreak. (2) Media involvement was indeed associated with death anxiety. (3) Empathy, sympathy and negative affect all played mediating roles in the relationship between media involvement and death anxiety. (4) The mediating effect of empathy and sympathy was different, as empathy could lead to the increase of negative affect, while sympathy did not.

Declaration of Conflicting Interests

Funding

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