

# The Effect of Anxiety towards the Perception of COVID-19 Information Mediated by Reflective Thinking Skills

*by Dessi Christanti*

---

**Submission date:** 06-Nov-2022 11:07PM (UTC+0700)

**Submission ID:** 1945921186

**File name:** 3-The\_effect\_of\_anxiety.pdf (509.14K)

**Word count:** 6835

**Character count:** 37418

## ARTICLE

# The Effect of Anxiety towards the Perception of COVID-19 Information Mediated by Reflective Thinking Skills

Nusantara Journal of  
Social Sciences and  
Humanities

Issue 1: 2020

<https://ekantara.com/index.php/njsh>

### Dessi Christanti

12

Universitas Katolik Widya Mandala Surabaya  
Surabaya, Indonesia

Email: [desi@ukwms.ac.id](mailto:desi@ukwms.ac.id)



### Maria Yuliasuti

12

Universitas Katolik Widya Mandala Surabaya  
Surabaya, Indonesia

Email: [maria\\_yuliasuti@ukwms.ac.id](mailto:maria_yuliasuti@ukwms.ac.id)



### Abstract

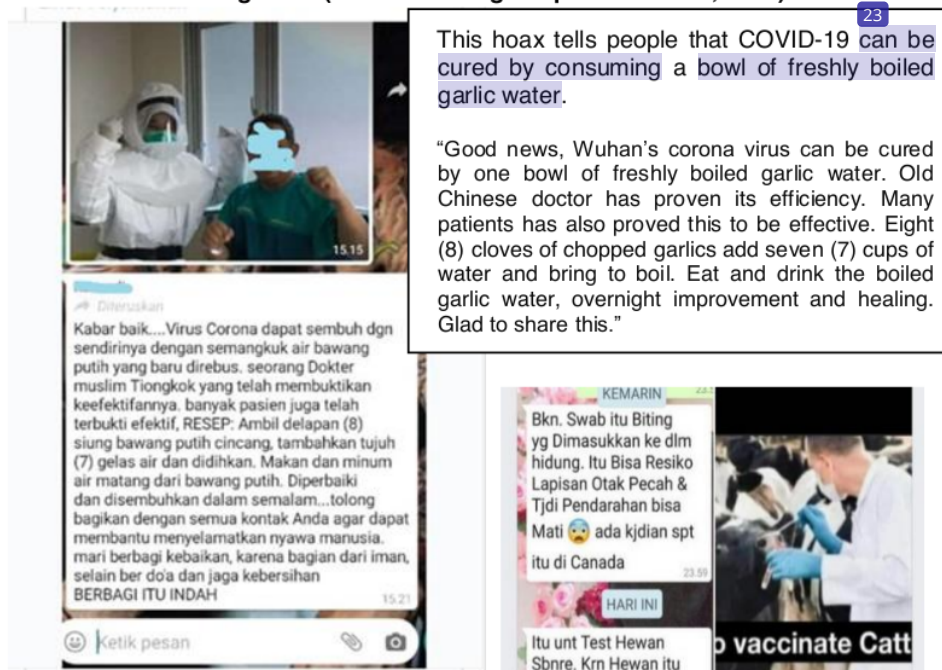
This study aimed at examining how reflective thinking skills mediated one's perception of COVID-19 related information. Throughout the COVID-19 pandemic, much information related to the novel Coronavirus was made available by the responsible parties, yet, falsehoods were also circulating much, which confuses people. Anxious individuals with low reflective thinking skills tend to respond fast to the information leading to low accuracy or even inaccuracy in perceiving information. On the other hand, individuals with anxiety yet having high reflective thinking skills will carefully select and consider the available information so they can perceive it better. This study was qualitative involving 260 students coming from different provinces of Indonesia. Data were analyzed using a Structural Equation Modelling (SEM) analysis; the analysis was done twice for the high and low Cognitive Reflection Test (CRT) groups. Different from our prediction, the findings showed that for both groups, anxiety had no significant direct effect on the accuracy of their perception. Also, reflective thinking skills had no significant direct effect on the accuracy of their perception. It can be concluded that reflective thinking skills did not mediate the effect of perception accuracy of COVID-19 related information.

**Keywords:** anxiety, reflective thinking skills, perception accuracy, information, COVID 19

## Introduction

Throughout the COVID-19 pandemic, much information related to the novel Coronavirus was made available by the responsible parties in Indonesia through the social media platforms (such as Facebook, Twitter, and Whatsapp). People need such information so they understand what COVID-19 is, how it spreads and infects people, and how to prevent its spread (Nurislaminingsih, 2020). Unfortunately, some of the information shared through social media platforms are falsehoods or hoaxes. People of all ages seem to be familiar with social media platforms these days and this makes information spreads so quickly through social media platforms; the unavailability of gatekeepers or filtering response, like other media such as newspaper or television, in the social media platforms, however, has made the platforms so vulnerable of spreading hoaxes or fake news, and the spread is so much faster than other media (Anisa & Rachmaniar, 2016). On the official website of Indonesia's task force to accelerate the handling of COVID-19, there were more than 500 hoaxes about the novel Coronavirus until November 2020 (www.covid19.go.id/p/hoax-buster). The following is an example of one of those fake news circulating through Whatsapp groups:

**Figure 1. (www.covid19.go.id/p/hoax-buster, 2020)**



Etymologically, the word hoax comes from the word hocus which means to deceive (Adipratno et al., 2017). Hoax aims to form or lead public opinion, form perceptions as well as test the intelligence and accuracy of internet users (Rahadi, 2017). Hoaxes also function to persuade, manipulate, and influence recipients of information to do things that are contrary to the correct practices or prevent someone from doing the right things (Rahutomo, Pratiwi, & Ramadhani, 2019). Hoaxes are made to mislead individuals in thinking, to make people restless, to lead them to take wrong actions (Rahadi, 2017) (Rahadi, 2017).

One has to be careful and questioning when receiving information related to COVID-19 through social media platforms, whether the information is true or not. Hoaxes spread fast as people seem to have no ability to identify the accuracy of the information they receive (Adiprasetyo et al., 2017). Personally, an individual is responsible for himself/herself to perceive whether the information related to COVID-19 they receive is right or not. If individuals can accurately perceive false information, they will ignore it—and as such, the spread of the false information will stop. Unfortunately, most individuals seem incapable of differentiating true and false information.

Some factors affecting the accurate perception of COVID-19 related information. Anxiety attacking many people through the pandemic situation may affect the accuracy of individuals in perceiving information. Bias perception somehow can harm individuals. As an example, the hoax telling the bad effect of wearing masks have made many people reluctant to do so (www.Covid19.go.id). Thus, people need to recheck the accuracy of the information they receive especially through social media platforms. Reflective thinking skills may help to improve the perception accuracy of individuals related to COVID-19 information.

### Literature Review

Perception is the process of interpreting stimulus. When processing and interpreting the information or stimuli, individuals sometimes experience bias or errors in thinking. Perceptual bias can occur because of limitations in individual cognitive capacities. A high amount of information may lead to individual cognitive capacities to become saturated. One of the ways individuals use when experiencing situations like this is to do cognitive heuristics by processing information through shortcuts so they can make decisions quickly—the drawback with this heuristic process is it often leads to errors. Individuals sometimes also do not have enough time to process information so they do a mental shortcut. As a result, their perceptions are not accurate (Suryanto et al.).

Some people of Indonesia experience a perception bias during the COVID-19 pandemic as we can see many do not comply with the government's advice to implement health protocols. Some people do not wear a mask when they leave the house (Buana, 2020). When the government urged people not to go home during Eid al Fitr, some people still went home (Novira, Iskandar, & Bahraen, 2020). These people disobey the government because they believe that they can protect themselves from the novel Coronavirus; this is a form of perceptual bias or inaccuracy (Buana, 2020). During the COVID-19 pandemic in Indonesia, many individuals experience cognitive bias that affects behavior (Agung, 2020).

Many factors influence individuals when they perceive information. How the information is presented can alter the way individuals believe it (Adhjarso, Utari, & Hastjarjo, 2018). When a hoax is said to be the result of research or coming from a certain figure, individuals tend to believe it as true. When individuals believe the source of the information, they tend to neither recheck nor clarify it—they simply accept it as truth (Adiprasetyo et al., 2017). Repeated information also increases an individual's confidence in the news (Fazio, Brashier, Payne, & Marsh, 2015; Walter & Tukachinsky, 2020). Many hoaxes use bombastic titles to attract social media users; some even use the word 'please share' so individuals tend to participate in spreading the fake news. Most social media users in Indonesia seem to not care to recheck or clarify the news before sharing it; many are easily provoked by bombastic titles and they automatically share the information without any further clarification (Mulawarman & Nurfitri, 2017). Low media literacy also contributes to how individuals

perceive information (Ilahi, 2019) as it makes it easy for individuals to perceive fake news as truth. In other words, individuals do not accurately perceive information.

Anxiety can also affect perception. Anxiety occurs when individuals experience unpleasant emotional conditions in the form of psychophysiological responses in anticipation of imagined or unreal dangers caused by intrapsychic conflicts not directly realized by the individual (Hjelle & Ziegler, 1992). Anxiety can be divided into two, namely state anxiety and trait anxiety. Trait anxiety is basic anxiety because it is a part of one's personality. Individuals with trait anxiety will always feel anxious. In contrast to trait anxiety, state anxiety is momentary anxiety. Individuals feel anxious if they perceive themselves to be in a threatening situation. The anxiety state will disappear if the individual no longer feels threatened. Anxiety can be said to be a subjective experience because each individual has their definition of what is called a threatening situation (Spielberger & Reheiser, 2009). When individuals face new situations, some can feel anxious because they perceive it as a threatening situation (Agung, 2020; Rayani & Purqoti, 2020).

COVID-19 pandemic is a new situation for all. The rapid and massive transmission of the novel Coronavirus added with the non-existence of cure or vaccine has made many people feel anxious. At the beginning of the COVID-19 pandemic, a panic buying occurred where people bought masks and necessities in large amount to keep. This is a form of individual anxiety in this tough situation. A previous study in a group of adolescents aged 12-19 years showed that 54% of the respondents experienced anxiety during the COVID-19 pandemic (Fitria & Ildil, 2020). Another study involving families with elderly people showed that 48.1% of the respondents experienced moderate anxiety during the COVID-19 pandemic (Rayani & Purqoti, 2020). Individuals feel anxious if someday they may be infected with the novel Coronavirus and they find it rather hard to adapt to the new normal.

Anxiety can serve as an alarm for an individual about impending danger, but it also harms the individual. Anxiety experienced by individuals during the COVID-19 pandemic has reduced the ability of one to concentrate (Fitria & Ildil, 2020). Low concentration levels make individuals less aware of what is happening, including filtering information about COVID-19 on social media. During the COVID-19 pandemic, some people share various information on social media platforms without realizing whether the information is true or not in the hope that this information would help prevent the spread of COVID-19.

Whether individual perceptions of COVID-19 information are accurate, or not, do not originate from anxiety alone but also depends on how the individual perceives the information. Perception involves the ability to think. Every individual has a different style of thinking. Thinking styles are related to how individuals respond to a stimulus (Thornell, 1977). Thinking styles are temporary or situational and individuals use them to receive, organize, and process the information received (Bassegy, Umoren, & Udida, 2009). Thinking styles can be divided into two, namely automatic or intuitive thinking and analytical or reflective thinking (Kahneman & Frederick, 2002; Gordon Pennycook & Rand, 2020). Intuitive thinking is also called Systems 1 and reflective thinking is also called Systems 2 (Stanovich & West, 2000). Intuitive thinking is automatically responding, effortless, associative, and fast, while reflective thinking is controlled when giving a response, effortful, deductive, parallel-slow, and applying rules (Kahneman & Frederick, 2002). Reflective thinking is classified as high thinking ability because individuals can connect and analyze experiences or information of one another (Tisngati, 2015). Individuals with low thinking

skills are less responsive when there is a correction of wrong information they once receive that misinformation continues to influence their behavior (De keersmaecker & Roets, 2017). Through reflective thinking, individuals will be able to analyze what is known and what is needed so they can reduce errors in processing information or when making decisions (Tri Wahyuni, 2018).

This difference in using intuitive and reflective thinking affects the way individuals process information and making decisions (Frederick, 2005). In the field of education, high school students who have a high level of reflective thinking tend to have better problem-solving skills than those who use an intuitive thinking style (Sani, 2016). Likewise, research on pharmacy students shows that students who use reflective thinking can make good information processing and decisions (Tsingos-Lucas, Bosnic-Anticevich, Schneider, & Smith, 2016). In companies, employees who have good reflective thinking skills show consistency in planning and decision making (Donovan, Güss, & Naslund, 2015).

Regarding the circulation of various information during the COVID-19 pandemic, reflective thinking is related to individuals' ability to recognize differentiate true information from fake one (Sindermann, Cooper, & Montag, 2020). Following the characteristics of reflective thinking, individuals will process information more slowly, in control, and take the opportunity to analyze or check the truth of the news (Gordon Pennycook & Rand, 2020). Meanwhile, individuals who have an intuitive thinking style will respond quickly without feeling the need to recheck the accuracy of the information. Previous research has indeed shown that individuals who use reflective thinking skills will more accurately distinguish information, whether it is a hoax or not (Pennycook, McPhetres, Zhang, & Rand, 2020; Taswin & Yudiana, 2018). Critical and reflective thinking skills are important elements in identifying hoaxes.

Based on the aforementioned explanation, we believed that reflective thinking skills can become a moderating variable between anxiety and perception accuracy related to COVID-19 information. A mediator is a variable that can mediate the relationship between the independent variable and the dependent variable (Abdullahi & Abdulquadri, 2018). Even though individuals experience anxiety, if they have good reflective thinking skills, they will be able to accurately perceive information about COVID-19. Conversely, individuals who are anxious and have low reflective thinking skills will experience inaccuracy in perceiving information about COVID-19.

Therefore, this study aimed at examining how reflective thinking skills mediated one's perception accuracy of COVID-19 related information during the pandemic. This study involved university students because they were using social media platforms much (Azka, Firdaus, & Kurniadewi, 2018).

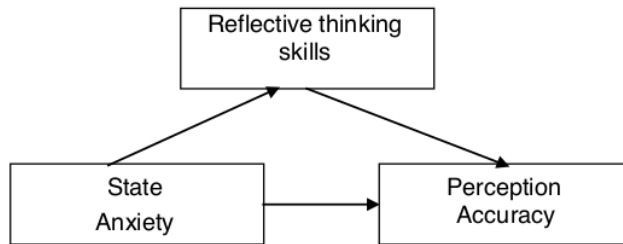
## 2.8 Research Method

### Research Design

This study was quantitative using a cross-sectional research design with three variables. (1) The dependent variable was perception accuracy related to COVID-19 information; (2) the independent variables were anxiety; (3) the mediating variable was reflective thinking skills. The hypothesis proposed in this study is: anxiety does not directly decrease perception

accuracy related to COVID-19 information, but the relationship is mediated by reflective thinking. The research design model is presented in Figure 1.

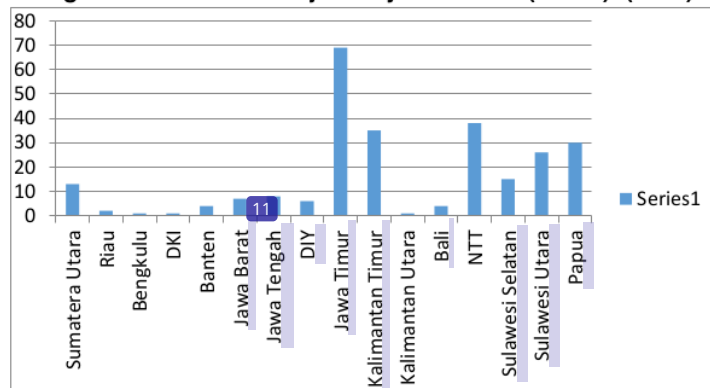
**Figure 1. Research Design (2020)**



**Research Subjects**

The research subjects were university students who were active users of social media; they were chosen using accidental sampling. The subjects consisted of 260 students: 90 male and 170 female students. They came from 16 provinces of Indonesia. Most subjects came from East Java (69 students). It was followed by East Nusa Tenggara (38 students), East Kalimantan (35 students), Papua (30 students), North Sulawesi (26 students), South Sulawesi (15 students), North Sumatera (13 students), Central Java (8 students), West Java (7 students), Yogyakarta (6 students), Banten (4 students), Bali (4 students), and Riau (2 students). Jakarta, North Kalimantan, and Bengkulu each had one student participating in the study.

**Figure 2. Research Subjects by Provinces (n=260) (2020)**



**Results and Discussion**

**Research Instruments**

*a. State-Trait Anxiety Inventory (STAI)*

Individual anxiety is measured using the State-Trait Anxiety Inventory developed by Spielberger in 1964 (Spielberger & Reheiser, 2009). STAI consists of 20 items that describe individual feelings when facing an unwanted condition. To measure State Anxiety, subjects were asked to rate their current or recent condition. The assessment used a 1-4 Likert scale, in which 1 represented Never, 2 represented Rarely, 3 represented Often, and 4 represented Always. In this study, the validity and reliability tests were still carried out for STAI. The

validity test resulted in a correlation value ranging from 0.402 to 0.752 for each item compared to the total value of all items. As the correlation of each item exceeded 0.3, it showed good validity. The results of the reliability test using the split-half method showed a Cronbach alpha value ( $\alpha$ ) of 0.909, which means that the instrument was reliable.

*b. Cognitive Reflection Test (CRT)*

Reflective thinking was measured using the Cognitive Reflection Test developed by Frederick (Frederick, 2005). We used an early version of the CRT that consisted of 3 questions to test individuals' reflective thinking. The subjects were asked to choose the most appropriate options for themselves. The validity test showed a correlation value ranging from 0.729 to 0.823 or above 0.3; this means the three CRT items were valid. The results of the reliability test using the split-half method showed a Cronbach alpha value ( $\alpha$ ) of 0.697, which means that the instrument was reliable.

*c. Perception Accuracy Related to COVID-19 Information*

The instrument to measure perception accuracy related to COVID-19 information referred to the questionnaire on information evaluation developed by Pennycook et al. (Gordon Pennycook & Rand, 2019). This instrument consists of 10 items in the form of true and false information about COVID-19. The title of the news, as the information, was taken from the hoax buster on the official website of the COVID-19 task force ([www.covid19.go.id](http://www.covid19.go.id)). News headlines were randomly selected but all the news once circulated on social media. The titles of information used on this instrument were chosen through a consultation with an expert. To fill in this instrument, the subjects were asked to determine whether the title of the information was true or not. The validity test showed a correlation value ranging from 0.670 to 0.722 or above 0.3; this means all items were valid. The results of the reliability test using the split-half method showed a Cronbach alpha value ( $\alpha$ ) of 0.620, which means that the instrument was reliable.

**46** *Search Procedures*

During the Covid-19 pandemic, the government of Indonesia has issued various policies to slow down the spread of the novel Coronavirus. One of the efforts is the regulation for online learning for university students. Thus, inevitably, data collection for this study was done online. The research instrument was created using google forms. The link was then distributed through the Whatsapp Group (WAG) of the research subjects. We asked the students to share the link with their fellow students. Through this process, we could obtain data from students in several provinces in Indonesia. The data collection process took one month.

**Results and Discussion**

Hypothesis testing was done by separating the reflective thinking data into two for the high reflective thinking group (high CRT) and the low reflective thinking group (low CRT). This classification was done based on the CRT value—the data ranged from 0 to 4. Subjects with a CRT score of 2-3 became belonged to the high CRT group, while subjects scored 0-1 belonged to the low CRT group. This classification was done to determine whether CRT could be a mediator for anxiety on perception accuracy related to COVID-19 information. The high CRT group should have a higher perception accuracy than the low CRT. The low CRT group had 209 members, while only 51 people belonged to the high CRT group.



After subjects were classified as high and low reflective thinking, the mean and standard deviation (SD) of anxiety and perception accuracy could be found. Table 1 presents the mean for anxiety of the two groups is not much different, 50.70 for the high CRT group and 54.56 for the low CRT group. This means that the average subjects had a moderate level of anxiety. The mean for perception accuracy in the two groups was not much different, 6.9 for the low CRT group and 7.39 for the high CRT group.

**Table 1. Mean and Standard Deviation (SD) for Anxiety and Reflective Thinking (Processed Data, 2020)**

Variable	High CRT Group (n=51)		Low CRT Group (n=209)	
	Mean	SD	Mean	SD
Anxiety	50.70	9.84	54.56	9.48
Reflective thinking	7.39	1.31	6.59	1.55

The next step was to analyze the data to prove the hypothesis using a Structural Equation Modeling (SEM) analysis. This analysis was done twice, for the high CRT group and low CRT group. The SEM analysis must meet the goodness of fit criteria, including evaluation of the multivariate outliers, normality test, and the suitability of the goodness of fit criteria.

To determine the outlier data, the observation number is determined and the Mahalanobis Distance value was used. If one of the P1 and P2 values is less than 0.05, the observation numbers contain outliers. In the high CRT group, outliers were not found. In the low CRT group, some data had a P1 and P2 value of less than 0.05. However, these outliers were not eliminated because, when outliers are found in a multivariate analysis, the data describe the real situation and there was no specific reason found from the respondents' profile suggesting it be excluded from the analysis (Ferdinan, 2006).

The next prerequisite before using SEM is data normality. The normality test was carried out using univariate and multivariate methods. This univariate normality test observes the skewness and kurtosis values of the data used—in the CR values on skewness and CR on the data kurtosis are between  $\pm 2.58$ , the research data can be said to be normal. The results of the normality test are presented in Table 2.

**Table 2. Normality Test Results (Processed Data, 2020)**

High CRT Group						
Variable	min	max	skew	c.r.	kurtosis	c.r.
Anxiety	30.000	79.000	.128	.376	-.008	-.011
Reflective thinking	2.000	3.000	.392	1.154	-1.846	-2.718
Perception	3.000	9.000	-.592	-1.744	-.112	-.164
Multivariate					-1.821	-1.199
Low CRT Group						
Variable	min	max	skew	c.r.	kurtosis	c.r.
Anxiety	30.000	79.000	.128	.376	-.008	-.011
Reflective thinking	2.000	3.000	.392	1.154	-1.846	-2.718
Perception	3.000	9.000	-.592	-1.744	-.112	-.164
Multivariate					-1.821	-1.199

Table 2 depicts that for the high CRT group, some kurtosis CR values are within  $\pm 2.58$ ; it can be concluded that the majority of indicators show a normal distribution in the univariate analysis. The multivariate test results in a CR value of -1.199, where the value is in the range of  $\pm 2.58$ . Therefore, it can be concluded that the model is normally distributed both in the univariate and multivariate analysis. For the low CRT group, kurtosis CR values were also in the range of  $\pm 2.58$  for the univariate analysis, yet the kurtosis CR values were far from the range of  $\pm 2.58$  for the multivariate analysis. Therefore, for the low CRT group, the model was normally distributed in the univariate analysis but not normally distributed in the multivariate test.

The third criterion of the goodness of fit is the suitability of the goodness of fit model. Table 3 presents the results of testing the goodness of fit model and it confirms that the model used met the criteria for the goodness of fit. This can be seen from the RMEA value of 0.000 or less than 0.08 and the CFI and GFI values of 1.000 or greater than 0.09. The suitability of this goodness of fit model was applied to both high CRT and low CRT groups.

**Table 3. The Result of Goodness of Fit (Processed Data, 2020)**

The goodness of fit index	Criteria	Cut of Value	Note
Chi-square	Must be small	0.000	Fit
Significant Probability	$\geq 0.05$	1.000	Fit
RMSEA	$\leq 0.08$	0.000	Fit
GFI	$\geq 0.90$	1.000	Fit
AGFI	$\geq 0.90$	1.000	Fit
CMIN / DF	$\leq 2.00$	0.000	Fit
TLI	$\geq 0.90$	1.000	Fit
CFI	$\geq 0.90$	1.000	Fit
IFI	$\geq 0.90$	1.000	Fit

Overall, it can be said that the research model has a good level of goodness of fit.

The next step was the SEM analysis in a full model to test the model and hypotheses developed. The analysis was carried out by two tests, the model fit test, and the causality significance test through the regression coefficient test. The regression weight test analysis to determine rejection or acceptance of the hypothesis was done with the following results:

**Table 4. Regression Test Results (Processed data, 2020)**

High CRT Group			Estimate	S.E.	C.R.	P	Label
Reflective Thinking	<---	Anxiety	-.004	.007	-.561	.575	par_1
Perception Accuracy	<---	Reflective Thinking	.383	.374	1.024	.306	par_2
<b>Perception Accuracy</b>	<---	<b>Anxiety</b>	-.005	.019	-.253	.800	par_3
Low CRT Group							
Reflective Thinking	<---	Anxiety	-.003	.003	-.796	.476	par_1
Perception Accuracy	<---	Reflective Thinking	-.072	.195	-.370	.711	par_2
<b>Perception Accuracy</b>	<---	<b>Anxiety</b>	-.008	.010	-.758	.432	par_3

To check whether the hypothesis was accepted or rejected, we looked at the Critical Ratio (CR) value and the probability (P) value from the results of analysis; if the CR value is above

1.96 and P-value is below 0.05 then the hypothesis is accepted. Table 4 shows that for the high CRT group, anxiety and reflective thinking did not significantly affect perception accuracy. Anxiety has a CR value of -0.253 or below 1.96 ( $0.253 < 1.96$  or  $-0.253 > -1.96$ ) and a P value of 0.800 or above 0.05 ( $0.800 > 0.05$ ). This shows that anxiety does not affect perception accuracy related to COVID-19 information. Reflective thinking has a CR value of 1.024 or below 1.96 ( $1.024 < 1.96$ ) a P value of 0.306 or above 0.05 ( $0.306 > 0.05$ ). This means that reflective thinking does not affect perception accuracy. Because both anxiety and reflective thinking show no significant effect on perception accuracy, the hypothesis proposed is rejected. Reflective thinking cannot be a mediating variable between anxiety and perception accuracy related to COVID-19 information.

The low CRT group produced similar results with the high CRT group—both anxiety and reflective thinking show no significant effect on perception accuracy. Anxiety has a CR value of -0.758 or below 1.96 ( $0.758 < 1.6$  or  $-0.758 > -1.96$ ) and a P value of 0.432 or above 0.05 ( $0.432 > 0.05$ ). This shows that anxiety does not affect perception accuracy related to COVID-19 information. Reflective thinking has a CR value of -0.370 or below 1.96 ( $0.370 < 1.96$  or  $-0.370 > -1.96$ ) and a P value of 0.711 or above 0.05 ( $0.711 > 0.05$ ).

Based on the CR value, which was below 1.96, and a P-value, which was above 0.05, in both the high and low CRT groups, it can be concluded that reflective thinking was not a mediator in the relationship between anxiety and perception accuracy.

The hypothesis was rejected; this means that in this present study reflective thinking was not a mediator in the relationship between anxiety and perception accuracy related to COVID-19 information. Reflective thinking also had no direct influence on perception accuracy. This result was different from the result of the previous research that individuals with high reflective thinking could be more accurate in determining whether the information is true or false (Pennycook et al., 2020; Taswin & Yudiana, 2018). Individuals with high reflective thinking take the opportunity to think critically before making a decision (Frederick, Loewenstein, & O'Donoghue, 2002; Thoma, White, Panigrahi, Strowger, & Anderson, 2015) including when dealing with information on social media. Seeing from the mean of perception accuracy about COVID-19 information, individuals from both groups showed good accuracy, which means they were able to distinguish true from false information.

Our findings also showed that anxiety did not have a direct effect on perception accuracy of COVID-19 information; this was different from previous research showing that state anxiety affected the perception and cognitive bias (Keogh & Cochrane, 2002; Mogg et al., 1991). However, this was possible considering our research was field research, while the previous research was experimental.

Our findings supported the results of other studies confirming that cognitive bias could make individuals feel anxious, but the anxiety did not lead to cognitive bias (Liu, Shen, & Li, 2019). Individuals can feel anxious when they receive too much information about COVID-19, but these anxious individuals then increase their awareness when later perceiving such information; individuals will be more careful in selecting which information to trust. Individuals being anxious about COVID-19 will likely to protect themselves from contracting the virus; this is similar to previous research results on firefighters showing that a dangerous situation makes individuals try to integrate all information so they can eliminate cognitive bias (Garrett, González-Garzón, Foulkes, Levita, & Sharot, 2018).

We also connected facts in the field with the results of this study. It seems that the central and local governments in Indonesia are aggressively providing information for the public through mass media, audio-visual media, and social media. The official website of the central government's task force to speed up COVID-19 handling also provides a hoax buster so the public can find out whether the information is a hoax or not. Many local governments in Indonesia have been doing various communication strategies to their respective regional communities through coercive, informative, canalizing, educative, persuasive, and redundant techniques in sending messages in the form of instructions and appeals to the public to prevent the transmission of COVID-19 (Zahrotunnimah, 2020). As an example, the local government of Surabaya launched <https://lawancovid-19.surabaya.go.id> that functions as the official website providing all COVID-19 information; this is an interactive website where the public can ask questions related to COVID-19 ([www.humas.surabaya.go.id](http://www.humas.surabaya.go.id)). Thus, during the pandemic, social media also plays a role in educating the public because the social media platforms also display accurate information about COVID-19 and direct social media users to the latest and trusted information websites regarding COVID-19 (Sampurno, Kusumandyoko, & Islam, 2020). The large amount of official information on COVID-19 that can be easily accessed helps the public to understand more about COVID-19. This also helps individuals to accurately differentiate hoaxes from the correct information.

### **Conclusion**

Reflective thinking was not a mediator in the relationship between anxiety and perception accuracy related to COVID-19 information. This was because, in dangerous situations, individuals increased their vigilance in selecting information. The official information about COVID-19 provided by the central and local governments also play a role in educating the public to filter information about COVID-19.

We suggest further research related to COVID-19 to examine anxiety, COVID-19 information needs, cognition bias about the COVID-19 vaccine, and the readiness of the community to get the COVID-19 vaccine.

### ***Limitation of the Study***

Our study had some limitations. First, data collection was carried out through the Whatsapp groups. We could not explain directly the purpose of the questionnaire and how the subject had to fill it out. This interaction limitation made the subject unable to directly ask if they did not understand any of the items. Second, the study was conducted at a time when many regions in Indonesia were ready to enter the new normal so people seemed to have been adapting well to the health protocols and many people understood how to find correct information about COVID-19.

This study had a limitation, data collection was carried out through the whatsapp group network. The Researcher could not explain directly the purposes of the questionnaire and the subject could not ask if they did not understand of the item of questionnaire.

### **Declaration of conflicting interest**

The authors declared no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

## Funding

This study was funded by the Interdisciplinary Research Grant of Widya Mandala Catholic University, Surabaya, Indonesia.

## Acknowledgement

Special thanks to Aileen Bakti, Michelle Aveline Kurniawan, and Patrichia Friska Savira Gozali for helping with the questionnaires, and coding the raw data.

## References

1. Abdullahi, A. A., & Abdulquadri, N. T. (2018) New media and adolescents' sexual behaviour in Sub-Sahara Africa: Linking Theories to Realities. *SAGE Open*, 8(4).  
<https://doi.org/10.1177/2158244018804606>
2. Adhiarso, D. S., Utari, P., & Hastjarjo, S. (2018). The influence of news construction and netizen response to the hoax news in online media. *Jurnal The Messenger*, 10(2), 162.  
<https://doi.org/10.26623/themessenger.v10i2.782>
3. Adiprasetyo, Justito, Gumilar, Gumgum, Hartoyo, & Maharani, N. (2017) Hoax, information, public, literacy media. *Jurnal Pengabdian Kepada Masyarakat*, 1(4), 271–278.
4. Agung, I. M. (2020). Memahami pandemi covid-19 dalam perspektif psikologi sosial. *Jurnal Psikobuletin: Buletin Ilmiah Psikologi*, 1(2), 68–84. Retrieved from <http://ejournal.uin-suska.ac.id/index.php/Psikobuletin/article/view/9616>
5. Anisa, R., & Rachmaniar. (2016) Hoax politik pada media sosial instagram (Studi etnografi virtual tentang keberadaan instagram dan hoax politik). In *Prosiding Seminar Nasional Komunikasi 2016* (Vol. 1, pp. 147–153). Retrieved from <http://jurnal.fisip.unila.ac.id/index.php/prosidingkom/article/view/281>
6. Azka, F., Firdaus, D. F., & Kurniadewi, E. (2018) Kecemasan sosial dan ketergantungan media sosial pada mahasiswa. *Psymphatic : Jurnal Ilmiah Psikologi*, 5(2), 201–210.  
<https://doi.org/10.15575/psy.v5i2.3315>
7. Bassey, S. W., Umoren, G., & Udida, L. A. (2009) Cognitive styles, secondary school students' attitude and academic performance in Akwa Ibom State – Nigeria. *Episteme Confernces*, 1–8. Retrieved from [www.hbcse.tifr.res.in/episteme/episteme-2/e-proceedings/bassey](http://www.hbcse.tifr.res.in/episteme/episteme-2/e-proceedings/bassey)
8. Buana, D. R. (2020) Analisis Perilaku Masyarakat Indonesia dalam menghadapi Pandemi Virus Corona (Covid-19) dan Kiat Menjaga Kesejahteraan Jiwa. *SALAM: Jurnal Sosial dan Budaya Syar-I*, 7(3). <https://doi.org/10.15408/sjsbs.v7i3.15082>
9. De keersmaecker, J., & Roets, A. (2017) 'Fake news': Incorrect, but hard to correct. The role of cognitive ability on the impact of false information on social impressions. *Intelligence*, 65(September), 107–110. <https://doi.org/10.1016/j.intell.2017.10.005>
10. Donovan, S. J., Güss, C. D., & Naslund, D. (2015) Improving dynamic decision making through training and self-reflection. *Judgment and Decision Making*, 10(4), 284–295.
11. Fazio, L. K., Brashier, N. M., Payne, B. K., & Marsh, E. J. (2015). Knowledge does not protect against illusory truth. *Journal of Experimental Psychology. General*, 144(5), 993–1002.  
<https://doi.org/10.1037/xge0000098> LK - [http://sfx.dbc.dk/dbc-45DBC\\_VIAUC?sid=EMBASE&issn=19392222&id=doi:10.1037%2Fxge0000098&atitle=Knowledge+does+not+protect+against+illusory+truth&stitle=J+Exp+Psychol+Gen&title=Journal+of+experimental+psychology.+General&volume=144&issue=5&spage=993&epage=1002&aulast=Fazio&aufirst=Lisa+K.&auinit=L.K.&aufull=Fazio+L.K.&coden=&isbn=&pages=993-1002&date=2015&auinit1=L&auinitm=K](http://sfx.dbc.dk/dbc-45DBC_VIAUC?sid=EMBASE&issn=19392222&id=doi:10.1037%2Fxge0000098&atitle=Knowledge+does+not+protect+against+illusory+truth&stitle=J+Exp+Psychol+Gen&title=Journal+of+experimental+psychology.+General&volume=144&issue=5&spage=993&epage=1002&aulast=Fazio&aufirst=Lisa+K.&auinit=L.K.&aufull=Fazio+L.K.&coden=&isbn=&pages=993-1002&date=2015&auinit1=L&auinitm=K)
12. Fitria, L., & Ildil, I. (2020) Kecemasan remaja pada masa pandemi Covid -19. *Jurnal EDUCATIO: Jurnal Pendidikan Indonesia*, 6(1), 1. <https://doi.org/10.29210/120202592>
13. Frederick, S. (2005) Cognitive reflection and decision making. *Journal of Economic Perspectives*, 19(4), 25–42. <https://doi.org/10.1257/089533005775196732>
14. Frederick, S., Loewenstein, G., & O'Donoghue, T. (2002) Time discounting and time preference: A

- critical review. *Journal of Economic Literature*, 15(February 2002), 351–401.  
<https://doi.org/10.1257/002205102320161311>
15. Garrett, N., González-Garzón, A. M., Foulkes, L., Levita, L., & Sharot, T. (2018) Updating beliefs under perceived threat. *Journal of Neuroscience*, 38(36), 7901–7911.  
<https://doi.org/10.1523/JNEUROSCI.0716-18.2018>
  16. Hjelle, L. A., & Ziegler, D. J. (1992) *Personalities Theories: Basic Assumption Research and Application*. McGraw Hill (third). New York: McGraw-Hill International.
  17. Ilahi, H. N. (2019) Women and hoax news processing on WhatsApp. *Jurnal Ilmu Sosial Dan Ilmu Politik*, 22(2), 98–111. <https://doi.org/10.22146/jsp.31865>
  18. Kahneman, D., & Frederick, S. (2002) Representativeness revisited: Attribute substitution in intuitive judgment. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment* (pp. 49–81). Cambridge: Cambridge University Press.  
[https://doi.org/10.1007/978-1-4615-4591-0\\_4](https://doi.org/10.1007/978-1-4615-4591-0_4)
  19. Keogh, E., & Cochrane, M. (2002) Anxiety sensitivity, cognitive biases, and the experience of pain. *Journal of Pain*, 3(4), 320–329. <https://doi.org/10.1054/jpai.2002.125182>
  20. Liu, J., Shen, K., & Li, H. (2019) How state anxiety and attentional bias interact with each other: The moderating effect of cognitive appraisal. *Attention, Perception, and Psychophysics*, 81(3), 694–706. <https://doi.org/10.3758/s13414-018-01650-y>
  21. Mogg, K., Mathews, A., May, J., Grove, M., Eysenck, M., & Weinman, J. (1991) Assessment of cognitive bias in anxiety and depression using a color perception task. *Cognition and Emotion*, 5(3), 221–238. <https://doi.org/10.1080/02699939108411036>
  22. Mulawarman, M., & Nurfitri, A. D. (2017) Perilaku pengguna media sosial beserta implikasinya ditinjau dari perspektif psikologi sosial terapan. *Buletin Psikologi*, 25(1), 36–44.  
<https://doi.org/10.22146/buletinpsikologi.22759>
  23. Novira, N., Iskandar, R., & Bahraen, R. (2020) Persepsi masyarakat akan pentingnya social distancing dalam penanganan wabah Covid-19 di Indonesia. *Jurnal Kependudukan Indonesia*, 29(2), 27–32. Retrieved from <https://ejournal.kependudukan.lipi.go.id/index.php/jki/article/view/573>
  24. Nurislamingsih, R. (2020) Layanan pengetahuan tentang COVID-19 di Lembaga Informasi. *Tik Ilmu : Jurnal Ilmu Perpustakaan dan Informasi*, 4(1), 19. <https://doi.org/10.29240/tik.v4i1.1468>
  25. Pennycook, G., McPhetres, J., Zhang, Y., & Rand, D. (2020). Fighting COVID-19 misinformation on social media: Experimental evidence for a scalable accuracy nudge intervention. *PsyArXiv [Working Paper]*, 1–24. <https://doi.org/10.31234/OSF.IO/UHBK9>
  26. Pennycook, Gordon, & Rand, D. G. (2019) Lazy, not biased: Susceptibility to partisan fake news is better explained by lack of reasoning than by motivated reasoning. *Cognition*, 188(September 2017), 39–50. <https://doi.org/10.1016/j.cognition.2018.06.011>
  27. Pennycook, Gordon, & Rand, D. G. (2020) Who falls for fake news? The roles of bullshit receptivity, overclaiming, familiarity, and analytic thinking. *Journal of Personality*, 88(2), 185–200.  
<https://doi.org/10.1111/jopy.12476>
  28. Rahadi, D. R. (2017). Perilaku pengguna dan informasi hoax di media sosial. *Jurnal Manajemen Dan Kewirausahaan*, 5(1), 58–70. <https://doi.org/10.26905/jmdk.v5i1.1342>
  29. Rahutomo, F., Pratiwi, I. Y. R., & Ramadhani, D. M. (2019) Eksperimen naïve bayes pada deteksi berita hoax berbahasa Indonesia. *Jurnal Penelitian Komunikasi dan Opini Publik*, 23(1).  
<https://doi.org/10.33299/jpkop.23.1.1805>
  30. Rayani, D., & Purqoti, D. N. S. (2020) Kecemasan keluarga lansia terhadap berita hoax di masa pandemi COVID-19. *Jurnal Bimbingan Dan Konseling*, 5(1), 906–912.
  31. Sampurno, M. B. T., Kusumandyoko, T. C., & Islam, M. A. (2020) Budaya media sosial, edukasi masyarakat, dan pandemi COVID-19. *SALAM: Jurnal Sosial dan Budaya Syar-I*, 7(5).  
<https://doi.org/10.15408/sjsbs.v7i5.15210>
  32. Sani, B. (2016). Perbandingan kemampuan siswa berpikir reflektif dengan siswa berpikir intuitif di sekolah menengah atas. *Jurnal Pendidikan dan Sains*, 4(2), 63–75.
  33. Sindermann, C., Cooper, A., & Montag, C. (2020) A short review on susceptibility to falling for fake political news. *Current Opinion in Psychology*, 36, 44–48.  
<https://doi.org/10.1016/j.copsyc.2020.03.014>
  34. Spielberger, C. D., & Reheiser, E. C. (2009) Assessment of emotions: anxiety, anger, depression,

- and curiosity. *Applied Psychology: Health and Well-Being*, 1(3), 271–302.  
<https://doi.org/10.1111/j.1758-0854.2009.01017.x>
35. Stanovich, K. E., & West, R. F. (2000) Individual differences in reasoning: Implications for the rationality debate? *Behavioral and Brain Sciences*, 23(5), 645–726.  
<https://doi.org/10.1017/S0140525X00003435>
  36. Taswin, M. Z. S., & Yudiana, W. (2018) Pengaruh induksi gaya kognitif reflektif terhadap persepsi akurasi berita palsu (fake news) pada situasi efek kebenaran semu (illusory truth effect). *Journal of Psychological Science and Profession*, 2(3), 193. <https://doi.org/10.24198/jpsp.v2i3.19374>
  37. Thoma, V., White, E., Panigrahi, A., Strowger, V., & Anderson, I. (2015) Good thinking or gut feeling? Cognitive reflection and intuition in traders, bankers, and financial non-experts. *PLoS ONE*, 10(4), 1–17. <https://doi.org/10.1371/journal.pone.0123202>
  38. Thornell, J. G. (1977) Individual differences in cognitive styles and the guidance variable in instruction. *Journal of Experimental Education*, 45(4), 9–12.  
<https://doi.org/10.1080/00220973.1977.11011591>
  39. Tisngati, U. (2015) Proses berpikir reflektif mahasiswa dalam pemecahan masalah pada materi himpunan ditinjau dari gaya kognitif berdasarkan langkah polya. *Beta: Jurnal Tadris Matematika*, 8(2), 142–152.
  40. Tri Wahyuni, F. (2018) Berpikir reflektif dalam pemecahan masalah pecahan ditinjau dari kemampuan awal tinggi Dan gender. *Jurnal Pendidikan Matematika (Kudus)*, 1(1).  
<https://doi.org/10.21043/jpm.v1i1.4455>
  41. Tsingos-Lucas, C., Bosnic-Anticevich, S., Schneider, C. R., & Smith, L. (2016). The effect of reflective activities on reflective thinking ability in an undergraduate pharmacy curriculum. *American Journal of Pharmaceutical Education*, 80(4). <https://doi.org/10.5688/ajpe80465>
  42. Walter, N., & Tukachinsky, R. (2020) A meta-analytic examination of the continued influence of misinformation in the face of correction: How powerful is it, why does it happen, and how to stop it? *Communication Research*, 47(2), 155–177. <https://doi.org/10.1177/0093650219854600>
  43. Zahrotunnimah, Z. (2020) Langkah taktis pemerintah daerah dalam pencegahan penyebaran virus corona Covid-19 di Indonesia. *SALAM: Jurnal Sosial Dan Budaya Syar-I*, 7(3).  
<https://doi.org/10.15408/sjsbs.v7i3.15103>

# The Effect of Anxiety towards the Perception of COVID-19 Information Mediated by Reflective Thinking Skills

## ORIGINALITY REPORT

12%

SIMILARITY INDEX

9%

INTERNET SOURCES

7%

PUBLICATIONS

2%

STUDENT PAPERS

## PRIMARY SOURCES

1	<a href="http://lib.unnes.ac.id">lib.unnes.ac.id</a> Internet Source	1%
2	<a href="http://jist.publikasiindonesia.id">jist.publikasiindonesia.id</a> Internet Source	1%
3	<a href="http://www.mendeley.com">www.mendeley.com</a> Internet Source	1%
4	<a href="http://www.learning-analytics.info">www.learning-analytics.info</a> Internet Source	1%
5	<a href="http://idimt.org">idimt.org</a> Internet Source	<1%
6	<a href="http://journal.scadindependent.org">journal.scadindependent.org</a> Internet Source	<1%
7	Irma Lusi Nugraheni, Agus Suyatna, Agus Setiawan, Abdurrahman. "Flood disaster mitigation modeling through participation community based on the land conversion and disaster resilience", Heliyon, 2022 Publication	<1%



8	<a href="http://bircu-journal.com">bircu-journal.com</a> Internet Source	<1 %
9	<a href="http://eprints.walisongo.ac.id">eprints.walisongo.ac.id</a> Internet Source	<1 %
10	Andriani, Fransisca Lio, Ariyanti Saleh, Andi Muhammad Fiqri. "MENTAL STATUS OVERVIEW IN THE ELDERLY DURING THE COVID-19 PANDEMIC: A PHYLOSOPHICAL PERSPECTIVE", Cold Spring Harbor Laboratory, 2022 Publication	<1 %
11	<a href="http://kesmavet.ditjenpkh.pertanian.go.id">kesmavet.ditjenpkh.pertanian.go.id</a> Internet Source	<1 %
12	I. Gunawan, I. Vanany, E. Widodo. "Modeling the Recall Process of Bulk-Liquid Industry: A Linear Programming Approach", 2020 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM), 2020 Publication	<1 %
13	<a href="http://ejournal.uin-suka.ac.id">ejournal.uin-suka.ac.id</a> Internet Source	<1 %
14	<a href="http://www.emeraldinsight.com">www.emeraldinsight.com</a> Internet Source	<1 %
15	Submitted to Universitas Airlangga Student Paper	<1 %

16

J. Efrim Boritz, A. Faye Borthick, Adam Presslee. "The Effect of Business Process Representation Type on Assessment of Business and Control Risks: Diagrams versus Narratives", *Issues in Accounting Education*, 2012

Publication

<1 %

17

María Falcón, Carmen Rodríguez-Blázquez, Martina Fernández-Gutiérrez, María Romay-Barja et al. "Measuring COVID-19 health literacy: validation of the COVID-19 HL questionnaire in Spain", *Health and Quality of Life Outcomes*, 2022

Publication

<1 %

18

Submitted to University of Surrey  
Roehampton

Student Paper

<1 %

19

[eprints.soton.ac.uk](https://eprints.soton.ac.uk)

Internet Source

<1 %

20

[www.bam.ac.uk](http://www.bam.ac.uk)

Internet Source

<1 %

21

[www.growingscience.com](http://www.growingscience.com)

Internet Source

<1 %

22

[dspace.ewha.ac.kr](https://dspace.ewha.ac.kr)

Internet Source

<1 %

23

[zenodo.org](https://zenodo.org)

Internet Source

<1 %

24

Herul Wahyudin, Nandang Rusmana,  
Nandang Budiman. "The Resilience of Junior  
High School Students in the Online Learning",  
Psychocentrum Review, 2022

Publication

<1 %

25

Submitted to Universitas Diponegoro

Student Paper

<1 %

26

hrmars.com

Internet Source

<1 %

27

link.springer.com

Internet Source

<1 %

28

repository.nwu.ac.za

Internet Source

<1 %

29

www.ssbfnnet.com

Internet Source

<1 %

30

Setiyani S., Waluya Y., Sukestiyarno  
Sukestiyarno, Adi Nur. "Mathematical  
Reflective Thinking Process of Prospective  
Elementary Teachers Review from the  
Disposition in Numerical Literacy Problems",  
International Journal of Educational  
Methodology, 2022

Publication

<1 %

dokumen.pub

31

Internet Source

<1 %

32

eudl.eu

Internet Source

<1 %

33

ijisrt.com

Internet Source

<1 %

34

journal.unika.ac.id

Internet Source

<1 %

35

onlinelibrary.wiley.com

Internet Source

<1 %

36

raw.githubusercontent.com

Internet Source

<1 %

37

www.ejournal.unuja.ac.id

Internet Source

<1 %

38

www.neliti.com

Internet Source

<1 %

39

"The Effect of SSCS Learning Model on Reflective Thinking Skills and Problem Solving Ability", European Journal of Educational Research, 2020

Publication

<1 %

40

Annika M. Svedholm-Häkkinen. "Highly reflective reasoners show no signs of belief inhibition", Acta Psychologica, 2015

Publication

<1 %

41	Ayang Fitrianti, Kharisma Ayu Febriana, Firdaus Azwar Erysyad. "Personal Branding Cino Fajrin through Instagram", Jurnal The Messenger, 2020 Publication	<1 %
42	Jiacheng Ye, Min Zhou, Congyao Wang, Pengxia Wan. "The Systemic and Ocular Risk Factors for Retinal Vein Occlusion: A Retrospective Study", Research Square, 2021 Publication	<1 %
43	Linda Fitria, Ifdil Ifdil. "Kecemasan remaja pada masa pandemi Covid -19", Jurnal EDUCATIO: Jurnal Pendidikan Indonesia, 2020 Publication	<1 %
44	Retno Sulistiyaningsih, Aldelia Shielda Rasyid, Dillia Nur Amalia, Fiska Fitria Harna, Ali Syahidin Mubarak. "The Anxiety Dynamics amongst the Elderly during the Covid-19 Pandemic", KnE Social Sciences, 2021 Publication	<1 %
45	<a href="https://dspace.akdeniz.edu.tr:8080">dspace.akdeniz.edu.tr:8080</a> Internet Source	<1 %
46	<a href="https://ejournal.uksw.edu">ejournal.uksw.edu</a> Internet Source	<1 %
47	<a href="https://jurnal.unigal.ac.id">jurnal.unigal.ac.id</a> Internet Source	<1 %

48 repository.au.edu  
Internet Source

<1 %

49 Anindya Arum Cempaka, Maria Theresia Arie Lilyana. "A Qualitative Study: Stress Adaptation in Elderly during the COVID19 Pandemic Era", JURNAL KEPERAWATAN SUAKA INSAN (JKSI), 2022

Publication

<1 %

50 Muslimin Machmud, Bambang Irawan, Kisman Karinda, Joko Susilo, . Salahudin. "Analysis of the Intensity of Communication and Coordination of Government Officials on Twitter Social Media during the Covid-19 Handling in Indonesia", Academic Journal of Interdisciplinary Studies, 2021

Publication

<1 %

51 journal.umpo.ac.id  
Internet Source

<1 %

52 Stephanie Howarth, Simon J. Handley, Clare Walsh. "The logic-bias effect: The role of effortful processing in the resolution of belief–logic conflict", Memory & Cognition, 2015

Publication

<1 %

Exclude quotes On

Exclude matches Off

Exclude bibliography On

