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The Role of Big-Five Personality and Types of Social Media on Perceived Risk

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Abstract. *The infodemic spread during the last pandemic situation, and each individual's perceived risk varies based on the dominance of his/her personality. This study, therefore, aims to examine the effect of the Big-Five Personality and social media on the perceived risk in the vulnerable group. The number of subjects was 267 respondents from adolescence to late adulthood, with inclusion criteria: (1) active users of social media, (2) over 19 years old, and (3) approved informed consent. The research consisted of two study stages: quantitative and qualitative. The instruments used in the quantitative stage were (1) the social media questionnaire, (2) the Big-Five Inventory (BFI) scale, and (3) the perceived risk scale, while the instrument employed in the qualitative stage was an interview guideline with an open questionnaire. Then, quantitative data analysis used regression techniques, whereas qualitative ones utilized content technique analysis. As a result, the Big-Five Personality and the types of social media simultaneously and significantly affected perceived risk ($p < 0.05$). According to the qualitative method results, the information topic "Covid-19 Data Case" became a popular theme (37.83%), and the majority of respondents considered Covid-19 "very risky" (35.33%). In conclusion, neuroticism, YouTube, and WhatsApp have a role in perceived risk in vulnerable groups. On the other hand, YouTube posed the highest perceived risk compared to other social media. In addition, although the intensity of social media use did not affect perceived risk, the content about "Covid-19 Case Data" gave rise to the perception that Covid-19 was "very risky."*

Keywords: *big-five personality; infodemic; perceived risk; types of social media.*

INTRODUCTION

In the pandemic, various problems have posed challenges for every aspect of human life. One issue also highlighted was the rise of the infodemic among the wider community. The World Health Organization (WHO) defines infodemic as an abundance of information in offline or online media, including the intentional dissemination of disinformation (Verdiana, 2020). Quoted from the statement by Harry Sufehmi, founder of the Indonesian Anti-Defamation Society (Mafindo), the term infodemic has gone global since it has contributed to the worsening of the situation during the pandemic; besides, the consequences of this infodemic can be quite fatal, causing fatalities

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(Annisa, 2020). In line with that opinion, Rovetta & Bhagavathula (2020) stated that since the beginning of the Covid-19 outbreak, fake news and misleading information have been circulating worldwide, dramatically affecting public health communication and reducing the taking of preventive measures.

One of the media that can be an intermediary for the spread of the infodemic on the broader community is social media. Based on data obtained from the Ministry of Communication and Information (Kominfo), as of August 8, 2020, 1028 hoaxes had been spread on various social media regarding Covid-19 (Viska, 2020). Amid the Covid-19 pandemic complexity, the infodemic spread in social media has also become a genuine concern for the emergence of a perceived risk. It is proven that if individuals tend to focus more on negative information, it can encourage the formation of the perceived risk of infectious diseases (Choi et al., 2017). In addition, concerning the media, the perceived risk can be influenced by the media through availability (more information gives a more substantial effect) (Wahlberg & Sjoberg, 2000). Moreover, the perceived risk of the possibility of exposure and the socio-economic impact of the Covid-19 outbreak increase individual protective behavior by implementing health protocols (Wise et al., 2020). For example, the presence of fear and anxiety due to Covid-19 contributes to protective actions (Harper et al., 2020).

Apart from social media, personality can predict perceived risk. In this case, each individual can be described with the five personality types by the Big-Five Personality theory. However, some individuals will have extreme values for one of these types, so it can be said that each individual tends to their personality type (Friedman & Schustack, 2008). The difference in personality dominance in each individual also can allow individuals to feel a different level of perceived risk (Wang et al., 2016). Aside from having a direct effect on perceived risk, the study's results found that personality also affected the use of social media, obtained from dominance in one of the dimensions of the Big-Five Personality (Kircaburun et al., 2020). Still, in personal terms, different levels of perceived risk felt by individuals who experience distress will differ from those who do not experience it (Orte et al., 2020).

Currently, in Indonesia, the age group of 19 to 45 years is 50%, with the highest positive rate at 54.1% (Satuan Tugas Penanganan Covid-19, 2021). Regarding the literature explored that the researcher conducted, no further discussion regarding the perceived risk as an infodemic impact during the Covid-19 pandemic has been studied through the role of the Big-Five Personality and types of social media. In fact, it is essential to juxtapose perceived risk with the Big-Five Personality, considering that five factors generally stand out in humans and can describe individual differences. The perceived risk as an impact of the infodemic should also be juxtaposed with diverse types of social media to obtain information about which social media types influence the most on perceived risk during the Covid-19 pandemic. Therefore, this study was conducted with the aim of (1) knowing the role of the Big-Five Personality and types of social media in influencing perceived risks and (2) knowing the pattern of Covid-19 perceived risks due to the infodemic.

METHOD

This research used two stages of research. In the first stage, a quantitative study aimed to determine the role of the Big-Five Personality (VI1) and types of social media (VI2) in influencing perceived risk (VT). The second stage was a qualitative study aimed at knowing the pattern of the perceived risk of Covid-19 due to the infodemic.

Population, Sample, and Sampling Techniques

The population of this study was individuals belonging to the age group susceptible to being exposed to Covid-19. It is because different levels of perceived risk felt by individuals who experience distress will differ from those who do not experience it (Orte et al., 2020). From the existing population, subjects were then determined using a convenience sampling technique, i.e., selected according to availability and specific criteria (Gravetter & Forzano, 2019).

The inclusion criteria used were: (1) active users of social media and (2) over 19 years of age (Satuan Tugas Penanganan Covid-19, 2021). In addition, all respondents who participated in this research had consented to informed consent. Each of these respondents participated in a quantitative and qualitative study in this research. Then, the selection of those over 19 years was based on the age group with high mobility and was the highest Covid-19-positive group in Indonesia (Elviani et al., 2021; Satuan Tugas Penanganan Covid-19, 2021). Thus, the sample in this study was 267 subjects ($M_{age} = 27.56$; $SD_{age} = 10.476$). In detail, there were 198 female subjects and 68 male subjects (see Table 1).

Table 1.
Subjects Description (N= 267)

Subjects Characteristics	N
Gender	
Male	69
Female	198
Age range	
19 to 21 years old (teenagers)	127
22 to 39 years old (early adulthood)	90
40 to 59 years old (middle adulthood)	48
Above 60 years old (late adulthood)	2

Research Instruments

At the quantitative study stage, three types of instruments were used: 1) Social media measurement, the instrument used closed-ended questions based on similar social media research by Bafadhhal & Santoso (2020) and Anggarani & Amalia (2021); 2) Measurement of the Big-Five Personality, the instrument employed the Indonesian version of the Big-Five Inventory (BFI) scale by Ramdhani (2012), and this scale was chosen since it has undergone an adaptation process; and 3) Measurement of perceived risk, the instrument was adapted from the scale of Dryhurst et al. (2020). This scale was selected because it has been used in many contexts.

Then, the trial was conducted on a minimum of 30 respondents to test the scale's validity and reliability used in this study (Gravetter & Wallnau, 2013). The scale was then tested with the following validity and reliability stages: (1) Item discrimination power test. According to Azwar (2011), the criteria for selecting items are based on corrected items with a limit of > 0.30 . However, if the number of valid items does not meet the desired number, it can be considered to reduce the criteria limit to > 0.25 . Items with discriminatory power below the criteria limit may be dropped. Based on the results of the item discrimination power test, there were four valid items for the perceived risk scale, 38 valid items for the Big-Five Personality scale, and two for the social media scale.

Validity Test

Every research instrument in this study had been validated by the professional judgment of psychology and communication expert. The technique used was the individual judgment by three raters with a rating scale of 1 to 4. The results obtained from this stage were then quantified and expressed as a validity index with Aiken's V statistics (Azwar, 2020). Based on the validity test results in this study, the V -value for the Big-Five Personality scale was obtained at 0.82 ($p < 0.05$), the perceived risk scale had a value of $V = 0.81$ ($p < 0.05$), and the media scale got a value of $V=0.83$ ($p<0.05$).

Reliability Test

The technique used was the reliability coefficient analysis technique's alpha (α). The reliability values generated on each research scale were then grouped into Cronbach's Alpha categories according to Hair et al. (2011). Based on the reliability test results in this study, the reliability value for the Big-Five Personality scale was 0.63-0.84, the perceived risk scale was 0.82, and the social media scale was 0.58. In the qualitative study stage, preparing interview guidelines with an open questionnaire model amounted to three items. The guidelines' questions were based on the theory of perceived risk expressed by Sjöberg in Bodemer & Gaissmaier (2015). Therefore, the key questions were related to subjective assessments of risk and content on social media. In qualitative studies, the validity test is referred to as the credibility test, and the reliability test is referred to as the dependability test (Emzir, 2018). The credibility test used in this study was source triangulation, by checking sources obtained from several sources and involving colleagues. Meanwhile, the dependability test was carried out by conducting an audit of the entire research process by the accompanying lecturer.

The entire instrument of the two studies was compiled using SurveyMonkey, and the survey distribution was carried out with the help of features available on social media, such as WhatsApp, Telegram, and Instagram. The survey was distributed from June 30, 2021, to July 17, 2021.

Data analysis

At the quantitative stage, data analysis was done using regression analysis techniques through SPSS software version 25. In addition to testing the main hypothesis, additional analytical tests, such as inferential analysis with different test analysis techniques, were also carried out. At the qualitative stage, the data were analyzed using a content analysis technique with stages (Creswell, 2014): (1) open coding, axial coding, and selective coding. The categorization of data was then processed with the help of Microsoft Excel. For additional analysis, calculations were performed using the chi-square analysis technique. Besides, the answer model obtained in this stage was multi-response, in which each subject could provide more than one answer.

RESULTS AND DISCUSSION

Quantitative Stage Analysis Results

Personality type and the types of social media had a significant simultaneous role in perceived risk ($F=4.803$; $SE=0.16923$; $p=0.000$ [$p<0.05$]). In this model, the magnitude of the simultaneous role owned was 14.4% ($R^2=0.144$). However, only neuroticism personality type ($Beta=4.602$; $p<0.05$; effective contribution=9.7%); social media YouTube ($Beta=2.037$; $p<0.05$; effective contribution=1.5%); WhatsApp ($Beta=2.607$; $p<0.05$; effective contribution=3.3%) had

a significant partial role on perceived risk (see Figure 1).

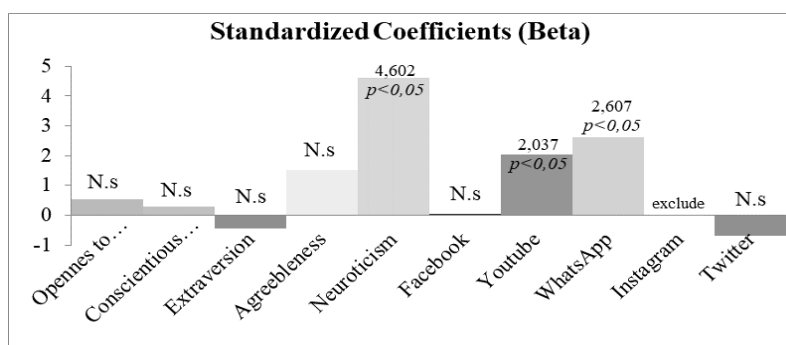


Figure 1.

Regression test of big-five personality and types of social media on perceived risk

In this study, there were differences in perceived risks regarding the types of social media users. Here, YouTube users had the highest perceived risks and were significantly different compared to Instagram and Twitter (see Figure 2).

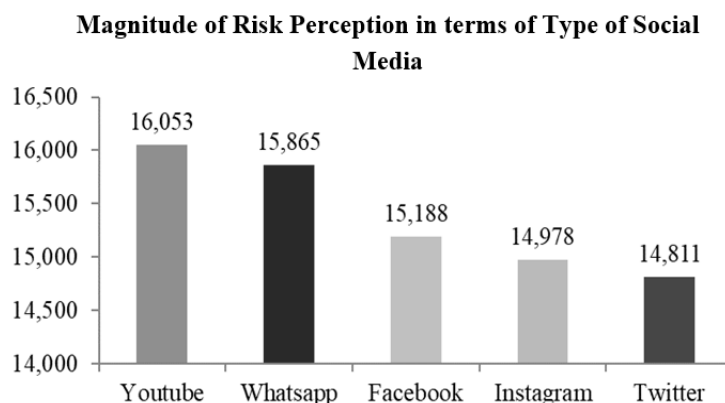


Figure 2.

The magnitude of perceived risk in terms of social media

The one-way ANOVA analysis of the types of social media on perceived risk showed a significant difference ($F = 4.262$; $p = 0.002$ [$p < 0.05$]). Based on the data in Figure 2, it can be seen that the type of social media with the highest perceived risk was YouTube ($M = 16.053$; $SD = 0.20303$). When compared with other types of social media, there were significant differences between YouTube social media and Instagram, and Twitter ($p < 0.05$) (see Table 2).

Table 2.

Multiple comparisons of social media

Type of social media	Mean Difference	SE	Sig.
Facebook	0.0865	0.06107	0.158
WhatsApp	0.0205	0.04817	0.670
Instagram	0.1070	0.04532	0.019
Twitter	0.1163	0.04976	0.020

Qualitative Stage Analysis Results

In this research, "Covid-19 Case Data" was the exposure to information content through

social media most often obtained by the subject (37.83%), and "very risky" was the perceived risk of Covid-19 that appeared the most in the subject (35.33%) due to exposure to information topics through social media (see Table 3, Table 4).

Table 3.
 Content analysis of qualitative data

Social Media Contents	Responses	%
Covid-19 cases data	227	37.83
Covid-19 cases fatality rate	51	8.50
Positive Covid-19 cases	40	6.67
Covid-19 cases cure rate	16	2.67
Covid-19 cases data distribution	11	1.83
Covid-19 cases increase	52	8.67
Covid-19 cases data	57	9.50
Covid-19 pandemic effects	113	18.83
Information effects	9	1.50
Pandemic effects	96	16
Distrust	8	1.33
Health prevention behavior	78	13
Foods and vitamins	2	0.33
Maintain immune	7	1.17
Covid-19 tests	3	0.50
Vaccination	45	7.50
Health protocol	21	3.50
Covid-19 prevention transmission	67	11.17
Independent isolation	5	0.83
Covid-19 prevention of transmission	43	7.17
Covid-19 treatment	19	3.16
Danger of Covid-19	61	10.17
Covid-19 life-threatening	12	2
Covid-19 violence	7	1.17
General explanation regarding Covid-19	42	7
Government policies and advice regarding Covid-19	28	4.67
Health protocol advice	3	0.50
Covid-19 managements	13	2.17
Government rules	2	0.33
Covid-19 community activity restrictions (PPKM)	10	1.67
Covid-19 patient needs	1	0.17
Health facility needs	14	2.34
Financial needs	1	0.17
Oxygen needs	8	1.33
Blood plasma requirements	2	0.33
Funeral necessities	1	0.17
Total of responses	600	100

Table 4.

Content analysis of perceived risk

Perceived Risk	Responses	%
Very risky	212	35.33
Risky	124	20.67
Quite Risky	135	22.50
Little risky	67	11.17
Quite risky	13	2.17
Quite not risky	31	5.17
Little not risky	10	1.67
Very not risky	8	1.33
Total of responses	600	100

Subject answers in multiple responses were analyzed using Creswell's (2014) content analysis technique. After all, a chi-square test was conducted to determine the relationship between social media content and perceived risk. The analysis results showed a correlation between social media content and perceived risk ($X^2[42;600] = 86.925; p=0.000 [p<0.05]$).

In this study, the fear the individual feels allows the assumption that the pandemic, in this context, Covid-19, was riskier for him/her. According to Slovic (2000 in Hassan et al., 2022), perceived vulnerability and severity are generally influenced by emotions when understanding risk (Slovic, 2000). This feeling of risk could shape the perception of a higher risk of Covid-19. The analysis results revealed that the Big-Five Personality and the types of social media played a joint role of 14.4% on perceived risk. Meanwhile, the rest were influenced by other factors, including (1) cognition, (2) emotional and experience, (3) socio-cultural, and (4) relevant individuals (Dryhurst et al., 2020). Supported by previous research, individuals more knowledgeable about a disease will have a low-perceived risk (Homko et al., 2008). However, each individual has a different level of perceived risk when viewed from the dominance of his personality type (Wang et al., 2016).

Among the five personality types, neuroticism had a partial role in perceived risk. It can be explained by looking at the neuroticism characteristics, i.e., being easily anxious, nervous, tense, and sensitive (Friedman & Schustack, 2008). Individuals with the neuroticism type personality tend to show emotional immaturity, as opposed to the extraversion type. It can be seen from how they give over perceptions to the stimuli around them (Gul et al., 2016), including, in this case, the news on social media. Information aimed at educating the public about a pandemic, such as an increase in cases, the development of the virus, or a policy change, tended to be highlighted as something threatening and often made them feel hopeless. In addition, the magnitude of the negative emotions felt like an automatic response of individuals with the type of neuroticism, making them no longer able to wisely sort out what is misinformation, disinformation, or only a hoax. Here, emotions labeled in memory will continue to be embedded in the brain, generate emotions, and encourage similar behavior as before when the memory reappears (Bookbinder & Brainerd, 2016).

Moreover, the main aspects distinguishing how each individual perceives and makes decisions on practical solutions to problems are related to personality, creativity, and intelligence

(Jung & Chohan, 2019). Personality is a picture of an individual's thinking, feeling, and behavior pattern. In this respect, brain function works according to patterns adapted from the environment always to be able to achieve a balance in a person's behavior and psychology. This balancing effort is related to the serotonin hormone in the brain, which affects a person's mood or emotional patterns. It is why individuals with extraversion personalities tend to have high resistance to stressors, are open to logically current information, and have a high tendency to avoid danger as a result of their brain's ability to control the hormone cortisol well. High cortisol levels are also influenced by perceived stress levels, which impact decreasing serotonin levels in the brain (Tafet et al., 2001). The high cortisol hormone then activates the limbic system in the brain, which encourages feelings of alertness and pessimism (Carhart-Harris & Nutt, 2017). However, a high serotonin hormone will reduce the reaction of the limbic system so that emotional conditions tend not to dominate behavior and thoughts. Thus, it can support individuals in achieving adaptive behavior and well-being in their psychological conditions.

Aside from the individual personality type, the types of social media also played a role in influencing perceived risk. From the analysis results, it was uncovered that YouTube's social media was the type that could play the highest and most influential role in perceived risk. YouTube, as a social media, is a type of media that contains audio and visual material affecting cognitive, affective, and psychomotor, such as (1) showing examples and ways of behaving or behaving, (2) an excellent medium of information intermediary in the affective domain, and (3) being an excellent medium for influencing attitudes and emotions (Fitria, 2014; May & Bigham, 2013). In addition, audiovisual material can influence a person's judgment or the general impression of an object, so it is likely to affect risk more than text alone (Pfau et al., 2000). It aligns with the research results by Vivianne et al. (Visschers et al., 2008), by which video text strongly influenced cognitive processes related to perceived risk, while sound/recording strongly influenced people's perceived risk. Besides, WhatsApp social media could also influence the perceived risk. It is because the information is given to other people privately. The impact allows individuals to perceive the information posted as relevant information for themselves (Matthes et al., 2019).

Nevertheless, the analysis results did not find any role in the frequency and duration of social media use in forming perceived risks. It might be because, basically, during the Covid-19 pandemic, individuals used social media to learn about this disease and make recommendations to prevent infection (Hong & Kim, 2020). Individuals also often access social media to deal with uncertainty during the Covid-19 pandemic. In addition, by accessing social media, individuals become aware of the risks they currently face. However, for some individuals, the more and longer they access information on social media, the lower their perceived risk (Matthes et al., 2019).

Furthermore, the availability of information containing risky content (e.g., Covid-19 transmission) is processed to form the importance of risk, affecting the public's perceived risk (Chong & Choy, 2018). Social media users are also likely exposed to Covid-19-related emotional content, which results in an intense emotional response, thereby eliciting the perceived risk (Oh et al., 2021). For example, content about fluctuating "Covid-19 case data," which frequently appears on social media, was capable of causing fear or anxiety, leading to perceived risk (Covello, 1998). It is because subjects "often" exposed to information about "Covid-19 Case Data" through social media would form a perceived risk that Covid-19 was "very risky." Referring to the previous research results, the perceived risk could impact the attitudes and behavior of prevention (Zeballos Rivas et al., 2021). This finding clearly illustrates that information from social media was a stimulus for individuals to form certain perceived risks about Covid-19.

In this regard, YouTube is a social media that combines more than one stimulus: auditory

and visual. The combination of several types of stimuli is also considered more effective in the learning process (Shams & Seitz, 2008) since it does not only activate one sensory in understanding information. In addition to pushing the information into awareness more quickly, visually presented information attracts more attention. Thus, information can be understood holistically by individuals.

Based on the social cognitive view (Bandura, 1999), individual behavior is the result of individual interaction with the environment, where the infodemic that occurs in the individual's environment intersects with the character of each individual. Different personalities also respond differently to the environment, reflected in how they think, feel, and behave. Besides, individuals with this type of neuroticism tend to prioritize the emotional side in dealing with change. The neuroticism type, described as an anxious personality, is also driven to access social media more often than other personality types. As depicted in this study, the most accessed site was YouTube, an audiovisual-based media. The learning process based on cognitive and social theory occurred through observation. Individuals then studied response patterns and formed perceptions about the risk of Covid-19 with various information obtained through social media. Information captured through social media was then interpreted and managed for later reuse, which in individuals with neuroticism was used to anticipate the threat caused by Covid-19. In addition, the characteristics of the information displayed on YouTube tend to be considered more attractive than other media so that they can attract attention. Information is also more attractive, easier to remember, and easier to recall for later use (Bandura, 1999; Feist & Feist, 2010). Likewise, it is the case with information about Covid-19 on YouTube.

Further, the high number of individuals with the type of neuroticism who accessed social media could be seen from the percentage of selected types of information, including the Covid-19 case fatality rate, the number of Covid-19 cases, the increase in the number of Covid-19 cases, and the effects of the pandemic. The selected information was information that tended to encourage alertness and strengthen the anxiety felt by the type of neuroticism. It is also related to how the brain chooses information matching the emotions that arose when the individual accessed social media about Covid-19. In the study of Stieger et al. (2020), it tended to have a positive effect. The high perceived risk of transmission in individuals with neuroticism personality also encouraged them to perform healthier behaviors than other personality types.

Generally, a neurotic personality tends to have a high-perceived risk (Fyhri & Backer-Grondahl, 2012). Intuitively perceived risk due to the influence of information from social media (Slovic, 2000) also appeared in the results of this study. However, the clauses between neurotic personality and perceived risk due to content on social media, which were implicit in the results of this study, require further study. The answer to this limitation study can be a fundamental intervention design to increase the mental health system in an online context. It is also vital since many studies have shown certain personality traits based on social media content (Akhtar et al., 2018; Gaddis & Foster, 2015). Thus, the next question from this research is whether the text will also affect the subject's perception because of its personality.

CONCLUSION

It can be concluded that there was a simultaneous role of the Big-Five Personality types and the types of social media in influencing the perceived risk in vulnerable groups. Of the five Big-Five Personality types and the type of social media, it can be seen that only the neuroticism personality

type and YouTube and WhatsApp social media had a partial role in perceived risk. When viewed from social media, YouTube was the social media with the most substantial influence on perceived risk. In addition, compared to Instagram and Twitter, it was uncovered that there were differences in perceived risk levels. It was not the frequency and duration of social media use that affected the perceived risk but rather the social media content.

Furthermore, the impact of exposure to information about Covid-19 from social media raised perceptions about the risk of Covid-19. The perception formed from social media information about Covid-19 was "very risky" as the subjects were exposed to information about "Covid-19 Case Data" through social media, which then formed a perceived risk that Covid-19 was "very risky."

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