

Health Literacy, Resilience, and COVID-19 Fear Among Indonesian Survivors: Does Age Matter?

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Abstract. Research on COVID-19 survivors is an emergent issue to be discussed since comprehensive knowledge needs to be obtained. Hence, investigating aspects related to health information management and psychological constructs among survivors is necessary. The main objective of this study is to explore the relationship between health literacy, resilience, and COVID-19 fear among survivors. 245 COVID-19 survivors aged 14 to 67 (M=30.22; SD=12.707) completed the Health Literacy Scale, Brief Resilience Scale, and Fear of COVID-19 Scale in this study. Results of statistical analysis using PROCESS showed that resilience fully mediates the relationship between health literacy and COVID-19 fear among Indonesian survivors. Furthermore, participants were then divided into three age groups. It was found that each age group presented different conditions regarding the relationships between those three variables. This study shows important findings about considering age in developing healthcare policy.

Keywords: *health literacy, resilience, COVID-19 fear, age groups, Indonesia*

Abstrak. Penelitian mengenai penyintas COVID-19 mulai bermunculan dan menjadi pembahasan penting untuk memperoleh pengetahuan yang komprehensif. Penelitian terkait aspek-aspek mulai dari manajemen informasi kesehatan hingga kondisi psikologis menjadi layaknya sebuah keharusan. Tujuan dari studi ini untuk mengungkap hubungan antara literasi kesehatan, resiliensi, dan ketakutan akan COVID-19 pada para penyintas. Data dari 245 penyintas COVID-19 berusia 14 sampai 67 tahun (M=30.22; SD=12.707) diukur dengan *Health Literacy Scale*, *Brief Resilience Scale*, dan *Fear of COVID-19 Scale*. Hasil dari analisa menggunakan PROCESS menunjukkan bahwa pada penyintas di Indonesia resiliensi memediasi secara penuh hubungan antara literasi kesehatan dengan ketakutan akan COVID-19. Selain itu, analisa juga dilakukan dengan membagi seluruh partisipan ke dalam tiga grup berdasarkan usia. Ditemukan hasil bahwa masing-masing kelompok usia menunjukkan kondisi yang berbeda terkait hubungan antar variabelnya. Temuan pada penelitian ini menunjukkan pentingnya mempertimbangkan faktor perkembangan usia dalam penyusunan kebijakan terkait kesehatan.

Kata kunci: *literasi kesehatan, resiliensi, ketakutan pada COVID-19, kelompok usia, Indonesia*

Introduction

Since the first outbreak in 2019, COVID-19 has been a huge healthcare issue that attracts researchers from many scientific backgrounds. World Health Organization (2020) defined COVID-19 as an infectious disease caused by the SARS-Cov-2 virus. Its first case was detected in Wuhan on December 2019. Several symptoms keep developing as the virus keeps mutating. The most common symptoms of the disease are fever, dry cough, and fatigue. The Indonesian president officially announced the first case in Indonesia on March 2nd, 2020 (World Health Organization Indonesia, 2020). Since then, government programs, budget allocation, psychological care, medical care, and research have focused on helping people survive the pandemic. Being the main concern of public healthcare, waves of services that have been developed in recent years and new information sources about COVID-19 have been developed to an extent that might lead to fear and anxiety (Ng, 2022).

Fear of COVID-19 then becomes a new construct that emerges due to this pandemic, while fear is defined as unpleasant emotional states that occur in the face of danger (Ahorsu et al., 2022; Wang et al., 2022). A literature study on COVID-19 fear initially conducted by Abdullah (2020) stated that the main factors of fear eliciting among Indonesian people related to individual and collective unpreparedness. Abdullah (2020) also mentioned that the assumption of unpreparedness caused by many factors from accessibility toward healthcare system, facilities, and sources of information. Another meta-analysis study supported the idea that access to healthcare facilities and information was the main factor influencing fear in many countries (Wang et al., 2022).

Considering the importance of accessible information and healthcare service as factors influencing COVID-19 fear, health literacy should be considered. During the COVID-19 pandemic, health literacy becomes an important skill, which is the skill set to obtain, comprehend, and communicate health information to engage with appropriate health decisions (Berkman et al., 2010). However, since most health information was shared online during the pandemic, digital health literacy should

also be considered, especially regarding a healthy diet (Choukou et al., 2022; Vrdelja et al., 2021).

Though previous studies have proven that health literacy affects the level of COVID-19 fear (Moussa et al., 2022; Yağar, 2021), there is still a lack of research focusing on how psychological constructs such as resilience might take the role in the relations in between. This research question is elicited based on the previous finding that resilience plays a valuable role in supporting knowledge and educational intervention during COVID-19 (Morales-Rodríguez, 2021). Hence, investigating the roles of psychological constructs might help psychology practitioners and government stakeholders to develop a more holistic policy for Indonesian respectively (Pillay & Barnes, 2020).

This research investigates the relationship between health literacy, resilience, and COVID-19 fear among Indonesian survivors. In addition, the current study also investigated the mediating role of resilience in the relationship between health literacy and COVID-19 fear among Indonesian survivors in different age groups. The results of this study would be beneficial to collect a deeper overview of Indonesian COVID-survivor following the pandemic outbreak phase so that government and healthcare stakeholders could develop a more integrated approach to promoting national readiness for facing massive diseases outbreaks that might happen in the future

Method

Before the data collection, this study was approved by the Ethical Committee of Psychology Faculty at Soegijapranata Catholic University. This study used a cross-sectional study design to capture the recent condition among Indonesian COVID-19 from all ages. This study was part of a research project on COVID-19 survivors. However, in the current article, the data analyzed were taken from only three measures: the Health Literacy Scale, Brief Resilience Scale, and Fear of COVID-19 Scale.

The instruments used in this research were originally in English and then translated into Bahasa Indonesia for research purposes. First, the Health Literacy Scale used in this research was a combination of two instruments: the Health Literacy Short-Form Scale (12 items) and the Digital Health Diet Literacy (4 items). This measure is a 4-point scale, and a higher score could be interpreted as a higher level of health literacy. Secondly, the Brief Resilience Scale, initially developed by (Smith et al., 2008), was used to measure the ability to bounce back after stressful life events. BRS was a 5-point scale consisting of three favorable and three unfavorable items. A higher total score means higher resilience. Lastly, the third measure was the Fear of COVID-19 scale (Ahorsu et al., 2022), which was used to measure the level of fear experienced concerning COVID-19. This measure consists of seven favorable items, which are all 5-point scales.

A series of statistical analyses using SPSS statistics were conducted to present the descriptive reports and hypothetical testing results. The collected data were analyzed in the initial phase using the assumption test and descriptive analysis. Furthermore, to investigate further the relations among variables, Pearson's Correlation Test was also conducted. To test the hypothesis, PROCESS Macro (Hayes & Rockwood, 2017) investigates the model in which resilience is the mediator between health literacy and COVID-19 fear. In addition, path analysis using PROCESS was conducted for each age group to capture more intriguing insight.

Result

Firstly, validity and reliability tests were administered to ensure that the instruments used in the current study have adequate psychometric properties. Results (details will be presented in another article) showed that all three instruments have good reliability based on the Alpha Cronbach reliability test result. Concerning validity, the issue was only found in the Brief Resilience Scale, and it was decided to remove one item (item no. 4) from the measure. In addition, it was decided that the data distribution was assumed normal since data were collected from 245 COVID-19

survivors across Indonesia. The complete report on validity and reliability will be presented in a separate article.

Secondly, descriptive analysis was conducted to present the demographical data of the participants. More female respondents participated in this study (N=181; 73.9%). Concerning age, participants varied from 14 to 67 years old (M=30.22; SD=12.707) and were divided into three categories which are adolescents (10-19 years old), early adulthood (20-34 years old), middle and late adulthood (35 years old and above). The categorization was initially based on WHO. However, since only seven participants were included in late adulthood/ elderly, it was merged with middle adulthood, becoming only one category. The percentage of each age group are mentioned in Table 1. Regarding educational background, most of the participants had a Senior High School background (N=87).

Table 1.
Demographic Data

Variable	Category	N	Percentage
Gender	Male	64	26.1
	Female	181	73.9
Age Group	10 – 19 years old	46	18.8
	20 – 34 years old	135	55.1
	35 and above	64	26.1
Education Background	Elementary	1	0.4
	Junior High School	2	0.8
	Senior High School	87	35.5
	Diploma	10	4.1
	Bachelor	119	48.6
	Master	24	9.8
Marital Status	Doctorate	2	0.8
	Single	166	67.8
	Married	72	29.4
	Widowed/Divorced	7	2.9

Furthermore, the level of each variable was tested, and results from current testing were presented in Table 2. Pearson's correlation reveals that all three variables were correlated to each other significantly. Health literacy was positively correlated to resilience ($r=.186;p=.002$) and negatively correlated to the level of COVID-19 fear ($r=-.116;p=.035$). Besides, resilience presented a statistically negative correlation with COVID-19 fear ($r=-.321;p=.000$).

Table 2.
 Means, Standard Deviations and Correlations

Variable	Mean	SD	Health Literacy	Resilience	COVID-19 Fear
Health Literacy	47.322	7.816			
Resilience	16.041	2.859	.186**		
COVID-19 Fear	16.906	5.147	-.116*	-.321**	

Note: ** = significant at the 0.01 level; * = significant at the 0.05 level.

To test the hypothesis of whether resilience plays a mediating role in the relations between health literacy and COVID-19 fear, model 4 of path analysis using PROCESS was conducted. Data from all participants showed no significant direct effect of health literacy on the level of COVID-19 fear among Indonesian survivors ($\beta = -.058$; $p = .349$; LLCI = $-.118$; ULCI = $.042$). However, after resilience is introduced in the path, health literacy indirectly significantly affects the level of fear regarding COVID-19 ($\beta = -.058$; LLCI = $-.107$; ULCI = $-.017$), as presented in Table 3 and Figure 1. Therefore, it can be concluded that resilience fully mediates health literacy's effect in managing COVID-19 fear.

Table 3.
 Path Analysis on all age groups

	β	SE	T	p	R ²	F (df)	LLCI	ULCI
a	.186	.023	2.949	.004	.035	F(1) = 8.696	.023	.113
b	-.310	.111	-5.017	.000	.106	F(2) = 14.398	-.778	-.339
c'	-.058	.041	-.938	.349	-	-	-.118	.042
Total Effect	-.116	.042	-1.815	.076	-	-	-.159	.007
Indirect Effect	-.058	.023	-	-	-	-	-.107	-.017

Note: a = HL → Resilience; b = Resilience → COVID-19 Fear; c' = HL → COVID-19 Fear

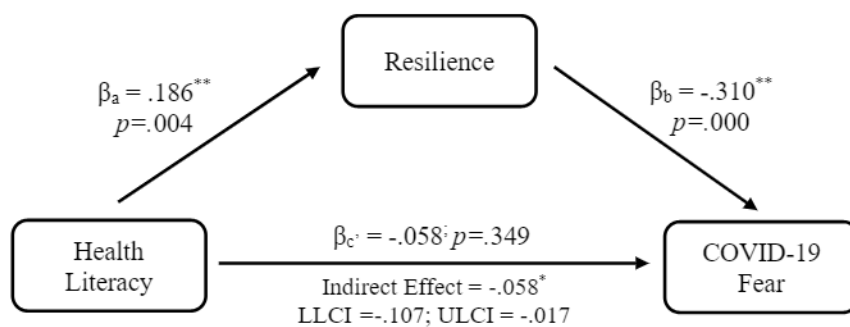


Figure 1. Path Analysis on all age groups

Advancing the previous finding about mediating effect of resilience, path analysis was also conducted for each age group. The first age group is adolescents aged from 10 to 19 years old. Number of unique findings was revealed in this category. First, there was no statistically significant effect of health literacy on resilience ($\beta=.019$; $p=.897$; LLCI=-.118; ULCI=.134). However, both resilience ($\beta=-.517$; $p=.000$; LLCI=-1.388; ULCI=.498) and health literacy ($\beta=-.312$; $p=.014$; LLCI=-.419; ULCI=.051) separately showed negative significant effect toward COVID-19 fear.

Table 4.
 Path Analysis on Age 10-19

	β	SE	T	p	R ²	F (df)	LLCI	ULCI
a	.019	.062	.131	.897	.000	F(1) = .017	-.118	.134
b	-.517	.221	-4.273	.000	.371	F(2) = 12.669	-1.388	-.498
c'	-.312	.091	-2.577	.014	-	-	-.419	-.051
Total Effect	-.322	.108	-2.256	.029	-	-	-.460	-.026
Indirect Effect	-.010	.074	-	-	-	-	-.164	-.133

Note: a = HL → Resilience; b = Resilience → COVID-19 Fear; c' = HL → COVID-19 Fear

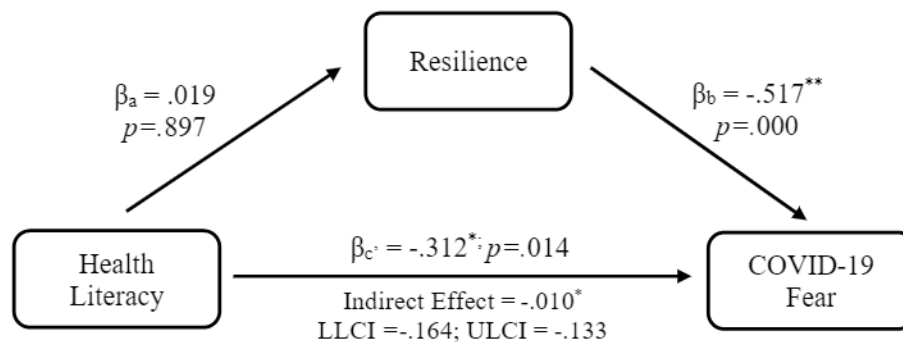


Figure 2. Path Analysis on Age 10-19

As presented in Table 5, it was found that among individuals aged from 20 to 34 years old, which classified as early adulthood, health literacy did not show any significant effect on resilience ($\beta=.135$; $p=.119$; LLCI=-.013; ULCI=.109) and COVID-19 fear ($\beta=.013$; $p=.878$; LLCI=-.105; ULCI=.135). Negative statistical significance was only found in the effect of resilience toward COVID-19 fear ($\beta=-.184$; $p=.035$; LLCI=-.663; ULCI=-.025).

Table 5.
 Path Analysis on Age 20-34

	β	SE	T	<i>p</i>	R ²	F (<i>df</i>)	LLCI	ULCI
a	.135	.031	1.569	.119	.018	F(1) = 2.462	-.013	.109
b	-.184	.161	-2.134	.035	.034	F(2) = 2.286	-.663	-.025
c'	.013	.058	.153	.878	-	-	-.105	.123
Total Effect	-.012	.058	-.134	.894	-	-	-.122	.107
Indirect Effect	-.025	.019	-	-	-	-	-.069	.004

Note: a = HL → Resilience; b = Resilience → COVID-19 Fear; c' = HL → COVID-19 Fear

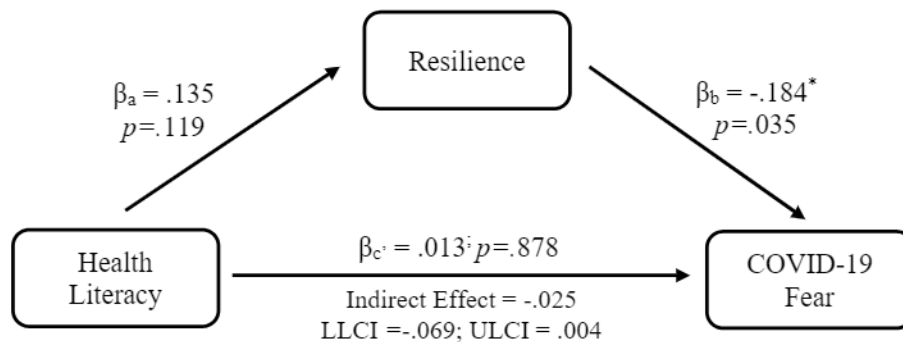


Figure 3. Path Analysis on Age 20-34

Middle and late adulthood (aged 35 and above) have the most similar pattern to the overall cases. Resilience was found to have a full mediating effect on the relationship between health literacy and COVID-19 fear. Moreover, health literacy showed a significant positive effect on resilience ($\beta = .347$; $p = .005$; LLCI = .034; ULCI = .182), and resilience showed a significant negative effect on COVID-19 fear ($\beta = -.402$; $p = .035$; LLCI = -.663; ULCI = -.025).

Table 6.
 Path Analysis on age 35 and above

	β	SE	T	<i>p</i>	R ²	F (<i>df</i>)	LLCI	ULCI
a	.347	.037	2.914	.005	.121	F(1) = 8.491	.034	.182
b	-.402	.241	-3.238	.035	.034	F(2) = 2.286	-.663	-.025
c'	-.036	.075	-.287	.775	-	-	-.171	.128
Total Effect	-.175	.075	-1.401	.166	-	-	-.256	.045
Indirect Effect	-.139	.069	-	-	-	-	-.297	-.021

Note: a = HL → Resilience; b = Resilience → COVID-19 Fear; c' = HL → COVID-19 Fear

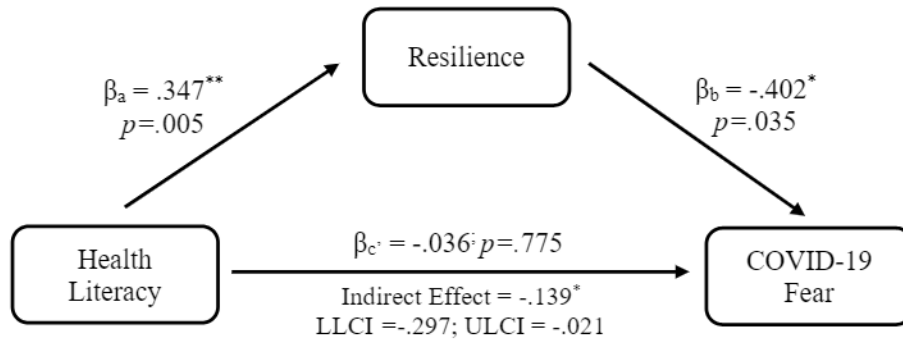


Figure 4. Path analysis on age 35 and above

Discussion

As mentioned, previous studies have found that health literacy is correlated to an extent with COVID-19 fear (Moussa et al., 2022; Yağar, 2021). However, the findings of the current study show that resilience plays a fully mediating role which explains more about the path of psychological dynamics among Indonesian COVID-19 survivors. Despite the significant correlation between variables, this new proposed model explains better dynamics where resilience can enhance health literacy which in turn will affect the level of COVID-19 fear among survivors in general. This finding supports the idea proposed by previous studies (Albott et al., 2020; Morales-Rodríguez, 2021), which presented that healthcare stakeholders should not only provide literacy related to COVID-19 but also provide resilience promotion-based intervention to help patients cope with unpleasant emotions caused by uncertainty during the pandemic.

Likewise, among middle and late adults in Indonesia, data showed that resilience plays full mediation between health literacy and COVID-19 fear. This insight gives additional information on the mechanism of how older people show lower stress related to COVID-19 (Bisht et al., 2021). Another study explains this phenomenon better by explaining that mention with the aging process and resilience comes along (Wister et al., 2022). The unified Model of Resilience and Aging proposed the idea that the older people get, the more they have great potential to be resilient, influenced by their past experience of handling crises throughout life

(Wister et al., 2022). This resilience maturity, in turn, enhances the effects of health literacy during COVID-19 and helps adults manage their fear levels.

Exploring age differences, it was found that health literacy does not significantly affect resilience but somehow negatively affects COVID-19 fear among adolescents. This finding might be better explained by the social-emotional learning process of adolescents' resilience (Grazzani et al., 2022; Neelam & Aynah, 2019). Grazzani's (2022) study stated that resilience progresses with age and is not fully developed yet, and this condition is causing health literacy only affects resilience to a small extent. Consequently, most adolescents with adequate health literacy can manage their level of COVID-19 fear regardless of their level of resilience.

Findings about the relationships of these three variables among Indonesian of different age groups are unique since each group presented a different pattern. Although there are some previous studies mentioned that enough exposure to education supported by adequate cognitive functions influences the effect of health literacy (Kobayashi et al., 2016; Ozdemir et al., 2010), this study found that among aged 20-34 (early adulthood) health literacy showing no effects on both resilience and COVID-19 fear. This specific condition might be related to the readiness level of Indonesia's healthcare system back in the early phase of the Pandemic. Spring (2020), in the previous study, found that health literacy in nature will affect resilience. However, due to unpreparedness, Indonesian survivors found that the experience of COVID-19 was unhandled, which resulting low resilience and even higher fear, respectively.

Conclusion

This study investigates the relationship between health literacy, resilience, and COVID-19 fear, in which resilience is hypothesized as a mediator. Among Indonesian COVID-19 survivors, overall, data in this study presented that resilience plays a mediating role between health literacy and COVID-19 fear. However, this study also proposed considering age or development factors when it comes to health-related behavior in Indonesia.

The ongoing progress of resilience among adolescents resulting in health literacy should be enhanced to help this age group manage COVID-19 fear regardless of their resilience level. In contrast, among middle and late adults, intervention should focus on the patient's health literacy and promoting resilience. Furthermore, health literacy and healthcare services readiness were found interrelated, specifically among early adults who mostly experience information overload. Healthcare information might help people in their early adulthood with help-seeking behavior. However, the unpreparedness of healthcare facilities might increase fear.

Suggestion

Despite some limitations, this study presents intriguing findings and promotes lessons learned from previous pandemics, which should direct future policy-making in Indonesia. This article is expected to help government and healthcare services stakeholders in Indonesia be more prepared to handle similar health challenges. Finally, further studies on possible aspects associated with health behavior and comparative studies across countries are suggested to obtain more comprehension of the pandemic phenomenon.

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