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Message fatigue on social media and Covid-19 health intentions: Indonesian case study

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ABSTRACT

Continuous health messages regarding Covid-19 are disseminated via social media platforms, covering essential protocols such as mask-wearing, hand hygiene, physical distancing, crowd avoidance, limited mobility, and social interactions. These messages aim to encourage the adoption of health behaviors among the public. However, persistent exposure to these messages lead to message fatigue, potentially causing resistance to health recommendations. Despite numerous studies on message fatigue, none specifically address its occurrence in Covid-19 health messages on social media and its mediation by attitudes toward messages. Given Indonesia's collectivist cultural inclination, responses may vary. Through an online survey, this study collected quantitative data to explain the level of message fatigue experienced by social media users and the mediating role of attitudes toward messages in contributing to intention in health behaviors related to Covid-19. Meanwhile, qualitative data identified message characteristics that cause and mitigate fatigue for social media users. This study reveals that among 204 respondents selected using purposive and convenience sampling techniques, the majority experienced moderate levels of fatigue toward Covid-19-related health messages on social media. Message fatigue plays a role in attitudes toward messages and intentions regarding Covid-19 health behaviors, with attitudes toward messages mediating between message fatigue and behavioral intention. The study underscores the theoretical and practical implications for addressing message fatigue in health communication campaigns, offering insights into effective strategies for mitigating its impact.

Keywords: Message fatigue; health behavior intention; health communication; social media; Covid-19

Kelelahan pesan media sosial dan perilaku kesehatan terkait Covid-19: Studi kasus Indonesia

ABSTRAK

***Pesan** kesehatan terkait Covid-19 terus disampaikan melalui platform media sosial, mencakup penerapan protokol Kesehatan seperti penggunaan masker, kebersihan tangan, menjaga jarak fisik, menghindari kerumunan, pembatasan mobilitas, dan interaksi sosial. Pesan ini bertujuan mendorong perilaku Kesehatan di kalangan public. Namun, terpaan pesan berulang dapat memicu kelelahan pesan yang dapat menyebabkan resistensi terhadap rekomendasi pesan kesehatan. Kelelahan pesan juga dapat berdampak pada sikap terhadap pesan dan niat mengadopsi perilaku kesehatan yang direkomendasikan. Sejumlah studi mengenai kelelahan pesan telah dilakukan, namun belum terdapat studi spesifik membahas kelelahan pesan pada pesan kesehatan yang disampaikan melalui media sosial dan peran mediasi dari sikap terhadap pesan. Selain itu mengingat budaya kolektivistik di Indonesia diasumsikan akan memiliki respon berbeda. Melalui survei online, penelitian ini mengumpulkan data kuantitatif untuk menjelaskan tingkat kelelahan pesan yang dialami pengguna media sosial serta peran mediasi dari sikap terhadap pesan dalam kontribusinya pada niat perilaku kesehatan terkait Covid-19. Sementara data kualitatif digunakan untuk mengidentifikasi karakteristik pesan yang menyebabkan dan memitigasi kelelahan pengguna media sosial. Penelitian ini menunjukkan sebanyak 204 responden terpilih melalui teknik purposive dan convenience sampling mayoritas mengalami kelelahan pada pesan kesehatan Covid-19 di media sosial pada tingkat sedang. Kelelahan pesan berperan pada sikap terhadap pesan dan niat perilaku kesehatan terkait Covid-19 serta sikap tersebut terbukti memediasi peran antara kelelahan pesan dan niat perilaku kesehatan. Studi ini mendiskusikan implikasi teoritis dan praktis dalam rangka memitigasi kelelahan pesan pada kampanye komunikasi kesehatan.*

***Kata-kata kunci**: kelelahan pesan; niat perilaku kesehatan; komunikasi kesehatan, media sosial; Covid-19*

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INTRODUCTION

Message fatigue refers to the exhaustion experienced from repeated exposure to messages on a specific theme. This phenomenon is increasingly prevalent in health communication, where repeated promotion of similar health behaviors contributes to a growing sense of weariness (So et al., 2016). When health messages on specific topics are disseminated over an extended period, they may produce unintended consequences beyond the communicator's expectations. Persuasive health messages can trigger reactance or resistance when the audience experiences message fatigue (Ball & Wozniak, 2021). As a result, message fatigue from overexposure to health messages is positively associated with passive disengagement (inattention and avoidance) and active resistance (counterarguments) (So & Alam, 2019).

Message fatigue can also influence recipients' attitudes toward message recommendations and their intentions to adopt recommended health behaviors. It has been associated with various negative outcomes in persuasive messaging, including an increased tendency to avoid messages, as well as diminished attitudes and behavioral intentions (S. Kim & So, 2018; Reynolds-Tylus et al., 2020; So & Alam, 2019).

The Covid-19 outbreak quickly gained global attention as a major public health issue, prompting official health agencies and governments to continuously research, update, and disseminate guidelines to minimize transmission (Ball & Wozniak, 2021). Data also show that, as of July 2020, the Indonesian Ministry of Health had published the fifth revision of the Covid-19 Prevention and Control Guidebook. Messages from agencies such as WHO and CDC suggest prevention strategies related to personal hygiene (for instance, practices like handwashing with soap and water and wearing masks in public, in addition to measures pertaining to social distancing such as minimizing outings and keeping a safe distance from individuals outside one's (Ball & Wozniak, 2021). In Indonesia, Covid-19 health promotion has rapidly evolved, expanding recommendations from 3M (mask-wearing, handwashing, and distancing) to 5M (adding crowd avoidance and reduced movement). Mask guidelines have also changed, including recommendations on mask type and layering for better protection. The high frequency and intensity of health messages over the past two years have contributed to public fatigue.

Studies that investigate this phenomenon indicate that message fatigue might be especially pertinent for health issues that have garnered excessive public attention over several decades

(So et al., 2016). Frequent Covid-19 messages stressing safety measures and daily updates through media can lead to message fatigue (Koh et al., 2020). Moreover, resistance to Covid-19 guidance can partly stem from message fatigue, as repeated exposure to the same messages may lead individuals to avoid or resist health-related information (Ball & Wozniak, 2021). This, in turn, diminishes individuals' intention to adopt protective behaviors during the pandemic, making message fatigue a significant barrier to effective risk communication (Sun & Lee, 2023).

Many individuals and communities exhibited non-compliance, partly because Covid-19 recommendations restricted their daily activities (Ball & Wozniak, 2021). For instance, policies such as PSBB (Large-Scale Social Restrictions) and PPKM (Community Activity Restrictions) in Indonesia limited social interactions during the Covid-19 pandemic, which may lead to objections due to their restrictive nature.

Although there is growing concern about public fatigue from frequent exposure to health messages, most communication research has overlooked the long-term consequences of such campaigns, and their side effects remain under-studied (So et al., 2016). The concept of message fatigue is a valuable aspect in the progression of health communication research, highlighting the growing prevalence of health-related messages in communication settings (S. Kim & So, 2018). In contrast to the widespread occurrence of message fatigue in daily life, this research topic is relatively new and emerging (So et al., 2016). As research on message fatigue progresses, reviewers' understanding of the role of receiving and responding to health messages still needs improvement (S. Kim & So, 2018). Although it has the potential to impede the efficacy of health communication, the outcomes of excessive exposure to health messages have not been extensively explored in scientific research (So & Alam, 2019).

The limited research on message fatigue in communication can be attributed to two main factors: 1) previous studies have primarily focused on the impact of encountering a single message on one occasion, and 2) many communication experts assume that greater message exposure is inherently more effective than limited exposure, often overlooking the potential drawbacks of excessive message saturation (So et al., 2016). Several studies have examined message fatigue, including So et al. (2016) who explored its conceptual and operational aspects in the context of safe sex and anti-obesity messages. proposed and tested a model explaining individual pathways to message fatigue, which contribute to non-compliance with weight management recommendations.

So and Alam (2019) investigated the predictors and effects of message fatigue related to anti-obesity messages, finding that physical health message frames generate more fatigue than mental health frames. Reynolds-Tylus et al. (2020) studied message fatigue in the context of sexual violence intervention efforts for male students in higher education. So (2022) found that over familiar anti-tobacco message frames can increase message fatigue and resistance to persuasion. Ball and Wozniak (2021) examined Americans' reluctance to engage in Covid-19 preventive measures and their fatigue with Covid-19-related messages. Additionally, Guan et al. (2023) explored the impact of message fatigue during the Covid-19 pandemic and what contributes to individuals' exhaustion.

Research on message fatigue is evolving, and this study focuses on health communication, specifically message fatigue in Covid-19 health messages on social media in Indonesia. While several studies have addressed message fatigue, few have explicitly examined it in the context of health messages delivered via social media. During the Covid-19 pandemic, social media was widely used by government agencies, NGOs, media outlets, and individuals to disseminate health messages. Health communication through social media is considered more cost-effective, particularly when it has the potential to reach a broad audience (Fawzian et al., 2023). However, the constant exposure to repetitive and similar messages likely contributed to the emergence of message fatigue among social media users in Indonesia.

Ball and Wozniak (2021) examine the reactance of Americans and their non-adherence to Covid-19 preventive health messages, as these messages are perceived as a threat to the freedom of individuals with individualistic cultural values. The characteristics of Indonesians differ from those of Americans, as shown in previous studies. It is assumed that Indonesians, with their collectivistic cultural values, may also react to health messages related to Covid-19, particularly to those addressing restrictions on social or community activities. Additionally, there may be fatigue from social distancing and other risk mitigation measures over extended periods during the pandemic (MacIntyrea et al., 2021).

Health messages about Covid-19 on social media often rely on repetition to reinforce recommendations and promote behavior change. However, repeated exposure can lead to message fatigue among social media users, potentially triggering reactance, counterarguments, and disregard for health guidelines. Evidence suggests that the use of forceful language—common in Covid-19 messaging through directives for routine behaviors (e.g., washing hands for at least 20 seconds) and mandatory

actions (e.g., wearing a mask in public)—can further intensify reactance (Ball & Wozniak, 2021). Given our understanding of message fatigue, an important question arises from a health campaign perspective: How do individuals who are weary of health messages respond when exposed to similar content? (S. Kim & So, 2018). Therefore, this study aims to assess the extent of message fatigue experienced by Indonesian social media users in response to Covid-19 health messages. Additionally, it examines the impact of message fatigue on attitudes toward these messages and behavioral intentions, as well as the mediating role of attitudes in shaping intentions toward Covid-19 health behaviors.

Individuals experiencing greater message fatigue toward certain health messages tend to seek health information less frequently and are more likely to avoid further exposure (S. Kim & So, 2018; So et al., 2016). Higher levels of message fatigue are associated with reduced attention to related messages, lower cognitive engagement in message processing, and a greater tendency to challenge the messages (So et al., 2016; So & Alam, 2019). While frequent exposure to a novel stimulus can initially lead to more favorable attitudes toward it (Reinhard et al., 2013), repeated exposure to health messages that trigger message fatigue may have the opposite effect, reducing positive attitudes or even fostering unfavorable attitudes toward the message recommendations (So & Alam, 2019). Based on the definition of attitudes presented in the study by Arora and Agarwal (2019)which examines the impact of the identified predictors such as entertainment, informativeness, irritation, credibility, incentives and personalization on social media advertising value (SMAV, attitudes toward a message in the context of health communication can be understood as the audience's evaluative and affective responses to the message content. These attitudes, influenced by the level of message fatigue, subsequently mediate behavioral intentions. Research on the effects of message repetition suggests an inverted U-shaped relationship between the number of message repetitions and attitudes toward the message content, where excessive repetition of the same persuasive message can lead audiences to develop less favorable evaluations (Keating & Galper, 2021; Reinhard et al., 2013). Consequently, message fatigue has been shown to predict more unfavorable attitudes toward message recommendations (So & Alam, 2019). Based on this explanation, this study proposes the following hypothesis:

H1: Message fatigue related to Covid-19 health messages on social media significantly influences attitudes toward these messages. Higher levels of message fatigue are associated

with more negative attitudes toward the messages.

Persuasive messages are designed to change health-related beliefs, attitudes, or behaviors (Nan et al., 2017). According to Ajzen, persuasive communication can alter attitudes, which in turn increases behavioral intention (Tessier et al., 2015). Changes in beliefs, attitudes, intentions, and behaviors are key indices or outcomes of persuasion (Braddock & Dillard, 2016; Keating & Totzkay, 2025). The intention to engage in health-related behavior serves as a predictor for actual health behaviors (Yan et al., 2018). In the case of multiple health behavior changes, the intention to adopt one behavior may depend on beliefs about other behaviors (Forestier et al., 2020). Behavioral intentions describe a person's decision to either take or avoid a particular action (Braddock & Dillard, 2016). Therefore, it is crucial to consider the role of intention in predicting behavior, as it may differ significantly from the initial affective and cognitive evaluations, which have typically been the focus of previous research (Richardson et al., 2012). While intention plays a crucial role, it remains insufficient to fully predict actual behavior, thereby rendering the existence of an intention-behavior gap understandable, particularly in the context of physical activity during infectious disease outbreaks, including the Covid-19 pandemic (Ahn et al., 2024) longitudinal survey design was adopted, with participants assessed in two waves (T1 and T2. Given that cognition and emotion can influence behavior, message fatigue potentially can directly impact behavior. Furthermore, prior studies have identified a link between message fatigue and behavioral intentions in various contexts (Guan et al., 2023). Based on this explanation, this research presents the following hypothesis:

H2: Message fatigue related to Covid-19 health messages on social media significantly influences health behavior intentions. Higher levels of message fatigue are associated with lower intentions to engage in Covid-19-related health behaviors.

H3: Attitudes toward messages significantly influence health behavior intentions related to Covid-19. The more positive the attitude toward a message, the stronger the intention to engage in Covid-19-related health behaviors.

H4: Attitudes toward messages mediate the relationship between message fatigue and health behavior intentions related to Covid-19.

RESEARCH METHOD

This study employs an online survey method to collect both quantitative and qualitative data. Quantitative data assess the extent of message fatigue related to Covid-19 health messages on social media and its impact on attitudes toward

these messages and health behavior intentions. Meanwhile, qualitative data explore the characteristics of messages that trigger fatigue and boredom among social media users, as well as messages that help mitigate message fatigue from their perspective.

The sampling technique used in this research combines purposive and convenience sampling, with the following criteria: a) active social media users, and b) individuals who have received and/or read health promotion messages related to Covid-19 through these platforms. A total of 204 respondents completed the questionnaire, most of whom followed at least one social media account related to health institutions, NGOs, news portals, Covid-19 data and information platforms, or personal accounts of healthcare professionals or health-related influencers. Some respondents, however, reported not following these accounts but had still encountered health promotion messages related to Covid-19 via social media. The research team distributed the questionnaire link through the WhatsApp messaging platform, leveraging their networks via both group chats and personal messages.

Regarding the number of respondents, Rahman (2023) referring to Kline's general guidelines that a sample size of 100 to 200 is sufficient for a simple research model with a normal data distribution, while a sample size of more than 200 is recommended for complex models with non-normal data distributions. Therefore, a sample size of 204 is considered sufficient. The researchers analyzed data from all respondents who completed and submitted the questionnaire via Google Forms.

The sample was selected based on specific criteria relevant to the study and accessibility rather than through random selection. As noted by Etikan et al. (2016), this approach often leads to highly non-representative samples. Consequently, the sampling techniques used in this study may introduce bias, as the sample may not accurately reflect the broader population, limiting the generalizability of the findings (Ahmed, 2024).

Message fatigue is a state of exhaustion individuals experience when exposed to repetitive messages beyond their preferred frequency (So et al., 2016). According to several researchers, message fatigue consists of four key dimensions: 1) perceived overexposure, the feeling of being repeatedly exposed to messages more frequently than expected; 2) perceived redundancy, the perception that messages are repetitive and overly similar; 3) exhaustion, the sense of emotional fatigue or burnout caused by message saturation; and 4) tedium (boredom), a lack of interest or engagement due to excessive repetition (So et al., 2016). Message fatigue is measured using 16 items on a seven-point

Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

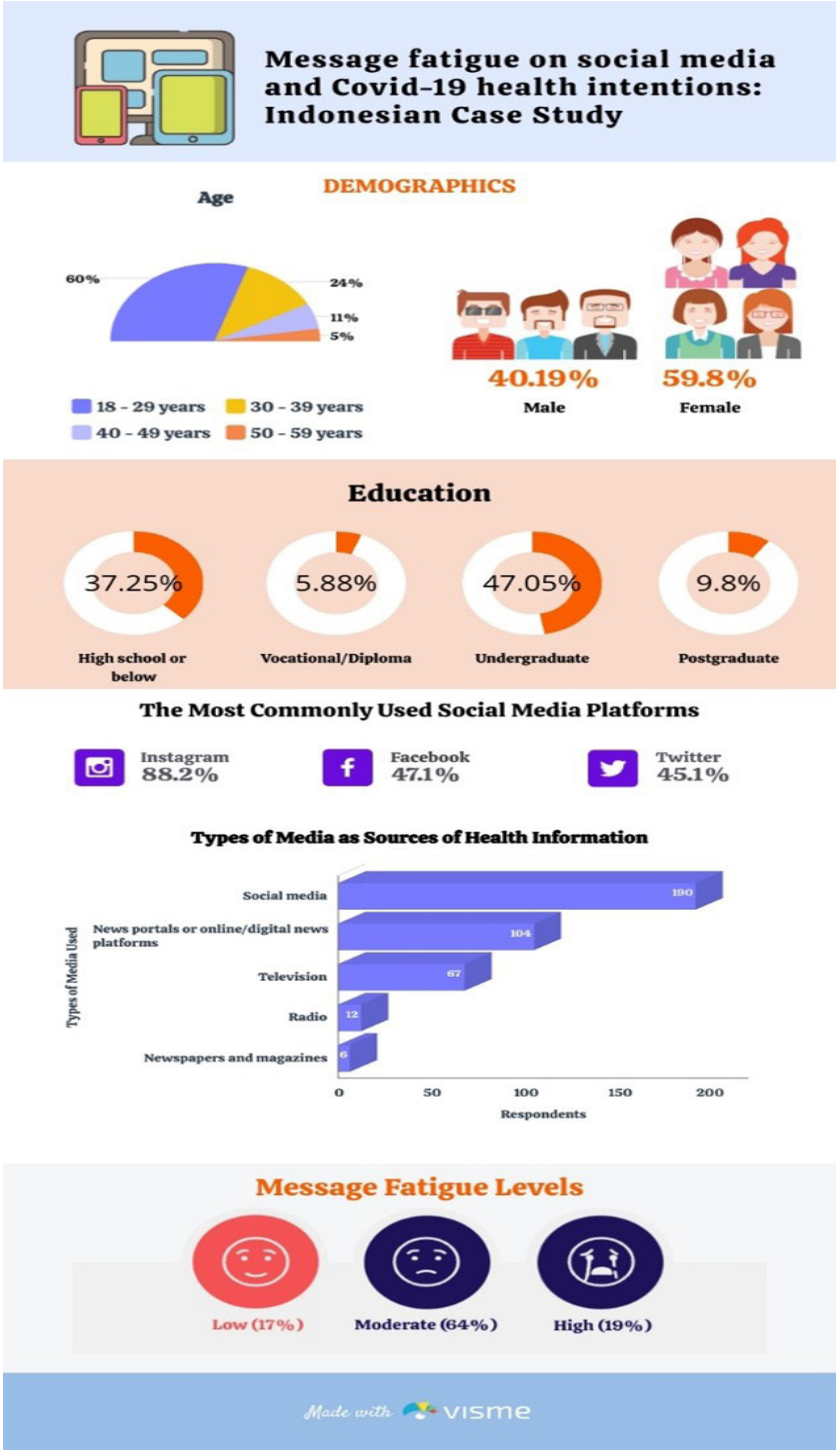
The data were analyzed using linear regression and mediation analysis through JASP 0.16.4 software. Based on the reliability test results, three items from the perceived overexposure indicator were removed due to an item-rest correlation below 0.3. These items were: 1) "I cannot count how many times I have heard through social media that Covid-19 is a serious health problem at this point" (0.258); 2) "I have heard more about health issues related to Covid-19 through social media than I need to know" (0.284); and 3) "I have heard enough through social media about how important it is to implement health behaviors related to Covid-19 to prevent its spread" (0.201). As a result, Cronbach's α value, which was initially 0.887, increased to 0.901 after removing these three items.

Attitudes toward the message were defined operationally as the degree to which respondents experienced favorable or unfavorable feelings in response to the message they received (Kang & Lee, 2018). Attitudes toward the message are measured using 12 statement items on a seven-point semantic differential scale, adapted from Dillard and Shen (2005); Pope et al., (2004); and Reinhard et al. (2014). Within Icek Ajzen's Theory of Planned Behavior (TPB), behavioral intention represents the motivations that shape the probability of an individual engaging in a particular behavior (Sun & Lee, 2023). Health behavioral intention is measured using three statement items adapted from S. Kim and So (2018) a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The reliability test for the variables of attitudes toward the message and health behavioral intention yielded highly reliable results, with a Cronbach's α value of 0.945.

RESULTS AND DISCUSSION

Figure 1 shows the demographic data of the respondents, with the number of female respondents (122, or 59.80%) larger than the number of male respondents (82, or 40.19%). The majority of respondents were aged 18-29 years (123 respondents or 60.3%). In terms of education, the largest group held an undergraduate degree (96 respondents or 47.05%), followed by those with a high school education or below (76 respondents or 37.25%).

Based on the data, the three most commonly used social media platforms among respondents were Instagram (180 respondents or 88.2%), Facebook (96 respondents or 47.1%), and Twitter (92 respondents or 45.1%). In addition to these platforms, respondents also mentioned using other social media, including TikTok, WhatsApp, Pinterest, Quora, and YouTube.



Source: Research Result, 2022

Figure 1 Infographic of Respondents' Demographics and Message Fatigue Levels

Respondents identified six types of media as sources of health information, with social media being the most frequently used (190 respondents or 93.1%). News portals or online/digital news platforms ranked second, cited by 104 respondents (51%). Television followed with 67 respondents (32.8%), while radio was mentioned by 12 respondents (5.9%). Newspapers and magazines were the least commonly used sources, with only six respondents (2.9%).

All respondents reported having read social media posts about Covid-19 health messages. Regarding the frequency of exposure per day, 75% of respondents (153 individuals) stated that they read such posts 1–3 times daily. The second most common frequency was 4–6 times per day, reported by 33 respondents (16.3%). Additionally, 9 respondents (4.4%) mentioned reading Covid-19 health messages more than 9 times daily. Lastly, 3 respondents (1.5%) indicated that they read such posts 7–9 times per day.

Table 1 shows that the overexposure indicator has the highest average value of 5.574, while the exhaustion indicator has the lowest. The findings indicate that most of respondents experienced a moderate level of message fatigue (131 respondents or 64%), followed by a high level (39 respondents or 19%), and a low level (24 respondents or 17%).

Message fatigue related to Covid-19 health messages on social media significantly impacts attitudes toward these messages (H1 is accepted), as indicated by a p-value of <0.001, which is below the 0.05 threshold. The regression coefficient of -0.295 suggests a negative relationship, meaning that as message fatigue increases, attitudes toward the message become more negative. Based on the R^2 value, message fatigue accounts for 11.5% of the variance in attitudes toward Covid-19 health messages on social media. Consistent with prior assumptions, the regression analysis confirms that higher message fatigue leads to more negative attitudes toward the message. Previous studies have shown that when fatigued individuals encounter messages they are tired of, they perceive them as intrusive or disengage from them to avoid redundant and unfulfilling information (S. Kim & So, 2018). Message fatigue responses can predict a less favorable attitude toward message recommendations, whereas lower fatigue responses may lead to a more positive attitude toward the message recommendations (So & Alam, 2019).

This study reveals that most of respondents experience a moderate level of message fatigue regarding Covid-19 health messages on social media. However, they continue to evaluate these messages positively. Respondents described Covid-19 health messages on social media as unobtrusive, interesting, informative, objective, accurate, wise, beneficial, and helpful. They also expressed an ongoing need for such messages, emphasizing the importance of up-to-date information during health crises like the Covid-19 pandemic.

The continuous demand for Covid-19-related information stems from the evolving nature of the virus and its prevention strategies. Recommendations for protective behaviors are frequently adjusted based on case developments

Table 1 Descriptive Statistics Mean and Standard Deviation of Message Fatigue, Attitudes toward Messages, and Health Behavioral Intention

No		Variables, Indicators, and Items	Mean	Std. Deviation
1		Message fatigue (So et al., 2016)		
1.1		Perceived overexposure		
	1	Currently, there are too many health messages related to Covid-19 on social media to prevent the spread of Covid-19.	5.574	1.317
	2	The importance of implementing health behavior related to Covid-19 to prevent the spread of Covid-19 is too much on social media or has been conveyed excessively on social media.	5.314	1.492
1.2		Perceived redundancy		
	3	Health messages related to Covid-19 on social media rarely provide new information.	4.417	1.621
	4	After all this time, health messages related to Covid-19 on social media are repeated.	5.216	1.314
	5	For me, health messages related to Covid-19 on social media are starting to sound the same.	5.368	1.304
	6	I can predict the health messages related to Covid-19 that will be posted on social media.	4.990	1.502
1.3		Exhaustion		
	7	I am tired of hearing through social media that Covid-19 is a serious health problem.	4.809	1.701
	8	I am sick of hearing in social media about the consequences of health problems related to Covid-19.	4.088	1.847
	9	I am tired of hearing on social media about the importance of adopting health behaviors related to Covid-19 to prevent the spread of Covid-19.	4.211	1.862
	10	Health messages related to Covid-19 on social media make me want to sigh.	4.422	1.730
1.4		Tedium		
	11	Health messages related to Covid-19 on social media are boring.	4.284	1.832
	12	I see that health messages related to Covid-19 on social media are boring and monotonous.	4.417	1.781
	13	Health messages related to Covid-19 on social media are not attractive and repetitive.	4.451	1.798
2		Attitudes toward messages (Dillard & Shen, 2005; Pope et al., 2004; Reinhard et al., 2013)		
		Health messages related to Covid-19 on social media		
	1	Disturbing/not	5.127	1.412
	2	Boring/interesting	4.260	1.596
	3	Bad/good	5.074	1.275
	4	Not informative/informative	5.260	1.312
	5	Subjective/objective	4.961	1.259
	6	Not accurate/accurate	5.162	1.199
	7	Unwise/wise	5.098	1.271
	8	Negative/positive	5.270	1.317
	9	Unexpected/expected	4.936	1.411

	10	Unnecessary/necessary	5.358	1.261
	11	Harmful/beneficial	5.368	1.223
	12	Not helpful/helpful	5.515	1.226
3		Health behavioral intention (S. Kim & So, 2018)		
	1	I intend to continue implementing the health behavior recommendations regarding Covid-19 shortly.	5.446	1.291
	2	I will likely continue to implement the health behavior recommendations regarding Covid-19 in the near future.	5.569	1.212
	3	I will continue to prioritize implementing health behavior recommendations related to Covid-19 in the near future.	5.510	1.250

Source: Research Result, 2022

and ongoing research. This aligns with previous studies indicating that Covid-19-related information is constantly evolving (e.g., new variants and vaccine updates), with some aspects awaiting further confirmation and verification (Guan et al., 2023).

Although social media users experience message fatigue, the high level of uncertainty surrounding the virus and related information sustains their need for updates. As a result, despite feeling fatigued by repetitive health messages, individuals continue to perceive them as valuable and maintain positive attitudes toward them.

The clarity of the source can also contribute to positive attitudes toward health messages related to Covid-19 on social media, particularly when the source is clearly identifiable. It can be seen from the social media accounts mentioned by respondents, such as the Twitter and Instagram accounts of the Ministry of Health, WHO, BNPB, local governments, specific Covid-19 data and information platforms, and news media outlets. These diverse social media accounts represent health institutions, media organizations, and specialized data-driven platforms, which are seen as credible sources for producing and disseminating health promotion messages related to Covid-19. As a result, respondents rated these health messages as informative, objective, and positive.

Message fatigue resulting from health messages related to Covid-19 on social media significantly influences health behavioral intention related to Covid-19 (H2 is accepted), as indicated by a p-value below 0.05 ($p = 0.016$). The regression coefficient of -0.042 suggests a negative or inverse relationship between message fatigue and health behavioral intention. According to the R^2 value, message fatigue on social media accounts for 2.8% of the variance in health behavioral intention related to Covid-19. Consistent with prior predictions, the regression results show that as message fatigue increases, health behavioral intention decreases. This aligns with previous studies

indicating that message fatigue can reduce the intention to engage in the health-related behaviors promoted (S. Kim & So, 2018). Research has shown that message fatigue is associated with various negative persuasive outcomes, including increased avoidance of the messages and decrease in both attitudes and behavioral intentions (Reynolds-Tylus et al., 2020).

This study supports previous research suggesting that reactance, driven by message fatigue, positively predicts non-adherence to behavioral recommendations. For instance, resistance to messages advocating regular flossing, as studied by Dillard and Shen (2005), resulted in more negative attitudes toward the recommended behavior, which, in turn, reduced motivation to engage in that behavior. Similarly, Rhodes and colleagues found that smokers who opposed anti-smoking public service announcements (PSAs) showed decreased intention to quit smoking, aligning with the concept of cognitive reactance (S. Kim & So, 2018). Furthermore, message fatigue may lead to insufficient processing or evaluation of the message, with inattention preventing the message from achieving the desired outcome (S. Kim & So, 2018). As a result, inattention is expected to predict lower intention to follow the recommended behavior. In short, reactance and lack of attention, both driven by message fatigue, are assumed to negatively predict intention to implement the recommended behavior (S. Kim & So, 2018).

This research shows that, despite feeling fatigued by health messages on social media, individuals still maintain an intention to adopt health behaviors related to Covid-19, such as the 3M recommendations, which have expanded into the more comprehensive 5M approach. This can be attributed to the fact that Covid-19-related health behavior recommendations are often enforced as mandatory policies for the public. As a result, people perceive these health behaviors as obligations, whereas in other health matters, such actions are more voluntary. Therefore, individuals remain inclined to embrace these behaviors.

Additionally, these results can be explained by the Covid-19 health crisis, which has posed a significant threat to public health, prompting individuals to perceive adherence to health behavior recommendations as essential. The adoption of these behaviors has become a new habit of the two-year pandemic, making it easier for people to continue with practices that have already become ingrained.

Another explanation for these results is that many people have been engaging in hygiene behaviors (such as frequently washing hands with soap and water or avoiding touching their faces with unwashed hands) even before

the pandemic to maintain their health (Ball & Wozniak, 2021). This is further supported by Indonesia's long-standing health communication campaign promoting handwashing with soap.

Moreover, the willingness of respondents, who are assumed to embrace a collectivist cultural value, to comply with Covid-19 recommendation messages and demonstrate behavioral intention may be driven by collectivist and altruistic motives. These motives encourage individuals to make personal sacrifices for the greater good, such as wearing masks, out of concern for the well-being of others (M. Y. Kim & Han, 2022).

The health communication literature provides empirical evidence supporting similar findings. For instance, Cho et al. found that the anger smokers experienced—an element of reactance triggered by graphic health warning labels on cigarette packages—was positively associated with their efforts to quit smoking, possibly due to the cognitive elaboration that often accompanies counterarguing (S. Kim & So, 2018).

Even individuals experiencing message fatigue can still recognize the benefits of the recommended behaviors. However, fatigued audiences may also attempt to avoid the message altogether, resulting in minimal cognitive elaboration (S. Kim & So, 2018). Although this study did not identify active (reactance) and passive (disengagement) resistance, the literature review suggests that message fatigue may encourage individuals to disengage from the messages. When individuals disengage, their cognitive elaboration remains low or absent, making them more likely to accept persuasive messages without resistance. Therefore, message fatigue related to Covid-19 health messages on social media can serve as a predictor of individuals' intentions to adopt the recommended health behaviors.

As predicted in the third hypothesis, attitudes toward the message play a significant role in health behavioral intention related to Covid-19 (H3 is accepted), as the p-value is less than 0.05, specifically <0.001. The regression coefficient of 0.181 suggests a positive or direct relationship between attitudes toward the message and health behavioral intention. According to the R^2 value, attitudes toward messages on social media contribute 40% to predict health behavioral intention related to Covid-19. Furthermore, the findings indicate that individuals tend to have positive attitudes toward health messages related to Covid-19, which, in turn, influences their intention to adopt the recommended health behaviors.

This study supports the fourth hypothesis, which states that attitudes toward the message mediate the relationship between message fatigue and health behavioral intention related

to Covid-19. This is shown by a p-value of <0.001 for the indirect effect between message fatigue, attitudes toward the message, and health behavioral intention. Additionally, the direct effect is insignificant, with a p-value of 0.362, indicating no direct influence of message fatigue on health behavioral intention. Therefore, there is full mediation, meaning that message fatigue does not directly affect health behavioral intention when attitudes toward the message are included as a mediator. Consequently, attitudes toward the message fully mediate the relationship between message fatigue and health behavioral intention related to Covid-19 (H4 is accepted).

Individual attitudes toward health messages can be predicted by message fatigue, which in turn can predict health behavioral intentions. The results of this study support previous research, including that of S. Kim and So (2022), which shows that reactance mediates the relationship between message fatigue and the rejection of anti-obesity messages. Additionally, Reynolds-Tylus et al. (2020) explained that reactance mediates the role of message fatigue in shaping perceptions of message effectiveness.

Although it may appear somewhat different from previous studies where reactance served as the mediator, in this research, attitudes toward the messages act as the mediator. However, the researchers believe that attitudes toward the message are a component of reactance, which represents negative cognition. This view is supported by the use of three items that assess adverse cognitive responses when the audience is exposed to Covid-19 messages, including aspects such as (positive/negative, favorable/unfavorable, and good/bad) (Ball & Wozniak, 2021). In this study, these three items are also part of measuring attitudes toward messages, with the interpretation that negative attitudes toward messages indicate negative cognition.

In a previous study by Guan et al. (2022), 18 categories of information that people find monotonous were identified, and these categories were further grouped into Covid-19 prevention messages, Covid-19 knowledge, Covid-19 denial, and Covid-19 news. This study builds upon earlier research by highlighting various characteristics of health messages on social media that respondents perceive as potentially inducing boredom and fatigue. These characteristics include health messages presented in unattractive visual forms, the use of complex medical terms, repetitive or monotonous messaging.

Previous studies have assessed and modeled the role of message fatigue in relation to active resistance or reactance (such as anger, negative cognition, or counterarguments in response to messages), passive resistance or disengagement/inattention, perceptions of threat to freedom,

perceived message effectiveness, attitudes toward recommended actions, behavioral intentions, and interest in seeking information (Ball & Wozniak, 2021; Guan et al., 2023; S. Kim & So, 2018; Reynolds-Tylus et al., 2020; So & Alam, 2019). This research expands on these studies by examining attitudes toward messages as a mediator between message fatigue and health behavioral intention related to Covid-19.

This study reveals that message fatigue plays a significant role in shaping attitudes toward messages and health behavioral intentions related to Covid-19 on social media. Message fatigue potentially trigger audience resistance to messages, ultimately reducing the intention to adopt health behaviors. As predicted, the research findings show that message fatigue influences attitudes toward messages and behavioral intentions, particularly due to the emergency nature of the pandemic, which heightened the audience's urgent need for information to address the ongoing situation. Additionally, the integration of behavioral recommendations into regulations has led to their adoption as habits or the "new normal." In contrast, when promoting other health issues, behavioral recommendations may not have been incorporated into regulations or established as habits among the audience. Therefore, health communication campaign practitioners must design health messages that minimize message fatigue and help reduce resistance to the health messages and behaviors being promoted.

Researchers reaffirm previous studies, such as those by Ball and Wozniak (2021), which emphasize the need for novel approaches to reduce message fatigue caused by constant Covid-19 updates. Moyer-Gusé and Nabi suggest that using narratives can mitigate resistance by lowering perceptions of persuasive intent, reducing repetitive messages like "stop the spread" or "stay at home," and tailoring content to audiences who are more susceptible to message fatigue (Ball & Wozniak, 2021; Guan et al., 2023). To overcome disengagement, message should incorporate fresh and appealing visual elements to draw audience's attention. For example, McDonald demonstrates that Covid-19 health campaigns using animation received positive responses (Guan et al., 2023). These studies align with the findings of the current research, which indicates that respondents are more engaged with health messages that feature humor, attractive visual animations, and lack fear-based appeals.

According to previous research, future messages during a pandemic or health crisis could focus on promoting social responsibility to reduce reactance. Gardner and Leshner clarified that messages highlighting the consequences of health behaviors on friends or family members

(known as other-referencing) result in less resistance and greater compliance compared to messages focusing on the individual (self-referencing) (Ball & Wozniak, 2021). These recommendations are particularly relevant in a collectivist culture, where individuals are motivated to achieve common goals, and other-referencing aligns with the concept of altruism, which emphasizes personal sacrifice for the benefit of others.

Although this study examines message fatigue related to Covid-19 health messages on social media, as well as attitudes toward those messages and intentions to engage in recommended health behaviors, it remains highly relevant in the post-Covid-19 context. This is due to the continued dissemination of health messages via social media that encourage the public to maintain health protocols, even though the pandemic has been officially declared over. Furthermore, the study offers valuable insights into message fatigue, attitudes toward the messages, and behavioral intentions among social media users—particularly in response to health communication concerning future pandemics, potential health crises (public health emergencies), and other long-term public health issues that remain a priority on the agenda of health communicators.

CONCLUSION

The respondents, who are social media users, predominantly experience moderate levels of message fatigue. Message fatigue plays a significant role in shaping attitudes toward Covid-19-related messages on social media and influencing behavioral intentions. Furthermore, attitudes toward these health messages have been shown to mediate the relationship between message fatigue and the intention to adopt Covid-19-related health behaviors.

This research was conducted among social media users in Indonesia, a population presumed to embrace a collectivist cultural orientation. The prior assumption that a collectivist community would hold unfavorable views toward Covid-19 health messages, due to their association with restrictions on social or community activities, was not supported. In fact, the respondents tended to exhibit positive attitudes toward Covid-19 health messages.

Despite experiencing moderate message fatigue, individuals continue to exhibit positive attitudes and a strong intention to maintain health behaviors related to Covid-19. This can be attributed to: a) the urgent nature of the pandemic, which creates a critical need for information to navigate the crisis, and b) the integration of these behavioral recommendations into regulations, which have become new habits

that are easier to sustain.

This research has several limitations. First, it focuses on testing health behavioral intentions related to Covid-19 in a general sense, without delving into specific behaviors such as handwashing, mask-wearing, social distancing, vaccination, and others. Future studies could investigate specific health behavioral intentions in relation to Covid-19. Furthermore, it is important to consider that some health behaviors, such as maintaining social distance, restricting mobility, and avoiding crowds, are interconnected and influenced by the cultural values of collectivist societies. Given this, it can be inferred that different health behavior recommendations may provoke varying attitudes and responses in individuals with collectivist cultural orientations.

While this research assumes that social media users in Indonesia adhere to collectivist cultural values, it did not measure the individual-level dimensions of these values among respondents. Future studies could incorporate the collectivist/individualist cultural value dimensions as key variables. Additionally, future research could explore the impact of message fatigue on two types of active resistance: reactance (including anger, negative cognitive responses, or counterarguments) and passive resistance (such as disengagement or inattention) toward health messages related to pandemics and other health issues. Lastly, future studies may examine the influence of perceived threats to personal freedom, specifically among individuals with collectivist cultural backgrounds.

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