

# Enhancing the Awareness of e-Mental Health Messages: The Effects of Narrative, Emoji, and Relevance



Chi-Keung Chan and Kelly Ka-Wai Chan

**Abstract** Computer-mediated communication (CMC) via new digital media has been enriching the forms and modes of human communication. These fast-growing changes have also provided great opportunities for mental health professionals to deliver mental health messages and services more effectively and timely through these new digital media (e.g., mobile apps). Nevertheless, very few research studies have examined the various characteristics of an e-health message on mental health awareness, including the nature of an e-health message, use of emojis in a message, and relevance of a message. The present study conducted an online experimental study with a 2 (Nature of a message: narrative vs non-narrative)  $\times$  2 (Use of emojis: with emojis vs without)  $\times$  2 (Content of a message: relevance vs non-relevance) factorial design. This study recruited 169 university students with moderate mental health status screened by the 18-item Psychological Well-being Scale. After initial screening, the participants were randomly assigned to one of the eight conditions to read an e-mental health message with different combinations of message characteristics. After reading the e-mental health message, the level of mental health awareness (status, message credibility, and personalization) was measured. The results showed that only the main effect of using emojis in e-health messages was significant for mental health status but not for message awareness. The main effects of using narrative and relevant messages were not significant. All two-way interaction effects and the three-way interaction effect were insignificant. This study provides a better understanding of the use of emojis in e-mental health messages for raising awareness of mental health status. Furthermore, the effects among narrative, emoji, and relevance on the awareness of e-mental health messages need to be further investigated.

**Keywords** Narrative · Emoji · Relevance · Awareness · e-Mental health message

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# 1 Introduction

During the Covid-19 pandemic, more e-mental health messages appear via digital technologies. According to Wong et al. (2020), about one in three adolescents met the clinical criteria of anxiety disorder before age 18. For elderly adults who aged over 60, the percentages of feeling lonely (59.5%), with moderate loneliness (42.4%) and severe loneliness (27.7%) after the outbreak of Covid-19, were much higher than the situation before the outbreak of Covid-19 (29.9% for feeling lonely, 31.8% for moderate loneliness, and 8.8% for severe loneliness). These increasing and urging mental health issues during the pandemic have been accelerating the movement for digital communication of mental health messages.

Computer-mediated communication (CMC) via new digital media has been enriching the forms and modes of human communication. Communications of health messages have turned their promotion via mobile phones. These changes have significantly been enhancing the perception of health messages (Hudson et al., 2012), improving motivation for doing exercises among patients with heart disease (Legler et al., 2018), increasing prosocial behaviours and empathetic motivations among young people (Konrath et al., 2015), facilitating engagement in intimate behaviours (Gesselman et al., 2019), and strengthening sex and reproduction intervention (Feyisetan et al., 2015). Furthermore, these changes have also provided great opportunities for mental health professionals to deliver mental health messages and services more effectively and timely through these new digital media (e.g., mobile apps). An experiment by Jini and Prabu (2019) found that people suffering from stress were easier to express their feelings on social networking sites. They also revealed that an online platform is beneficial for stressed people to understand and pay attention to their mental health (Jini & Prabu, 2019).

Online promotion of e-mental health messages has commonly adopted two significant elements in enhancing awareness—narrative and emoji. Narrative stories have been used to enhance the effectiveness of message presentation by creating a feeling of verisimilitude and touch viewers' hearts (Shin & Kang, 2017). Persuasion and transportation are two possible cognitive mechanisms to explain the effectiveness of narrative messages (Willoughby & Liu, 2018). Besides, a variety of emojis provide an alternative way for emotional expressions with facial expression or objects using the new digital media. Thus, Willoughby and Liu (2018) also found that using emojis can significantly increase viewers' attention to health messages. They did not find a significant interaction effect between emoji and narrative on message awareness and suggested that message relevance could be a potential factor (Willoughby & Liu, 2018). Nevertheless, very few research has investigated the effect of message relevance on the awareness of e-mental health messages.

Thus, the main purpose of this experimental study is to investigate the main effects and interaction effects of the nature of a message (narrative vs. non-narrative), the use of emojis in a message (with emojis vs. without), and the content of a message (relevance vs. non-relevance) on enhancing awareness of e-mental health messages. Conceptually, the present study can provide a more in-depth understanding

of whether the use of emojis and relevance in a narrative message could enhance individuals' awareness of the message and their mental health. Practically, the findings of the present study can provide recommendations for designing effective e-mental health messages to arouse target viewers' awareness.

## 1.1 Narrative

The narrative approach is a means for people to express their experience like a story combining emotions, beliefs, and values to create an empathetic feeling to the message. The narrative approach also includes a description of the settings and plots of the situation. It usually provides different perspectives, goals, plans, actions, and consequences of the characters in the scenarios (Kopfman et al., 2009). The use of narrative message not only provides a valuable channel for people to understand their own experience, but it can also facilitate the recovery pathway of people with mental illness as storytelling can enhance empathy from readers and their feelings of empowerment (Kirkpatrick, 2005; Llewellyn-Beardsley et al., 2019).

Willoughby and Liu's research (2018) suggested that persuasion and transportation in a narrative message provide attraction and emotional reaction to the message. There are two types of persuasion from the elaboration likelihood model suggested by Petty and Cacioppo (1986), including central route and peripheral route. Willoughby and Liu (2018) suggested that narrative e-mental health messages can enhance receivers' awareness through emphasizing central-route deep processing. Transportation is an emotional reaction that can provide mental imagery that helps people immerse themselves in the narrative story. Transportation can also provide a mechanism for changing one's attitude, belief, and behaviour (Green & Clark, 2012), and facilitate information acceptance (Green, 2006; Murphy et al., 2013). Persuasion is the information processing mechanism while transportation is the facilitation mechanism. When combining these two mechanisms, this can explain why a narrative message is possible to increase awareness of e-mental health messages. Hence, Willoughby and Liu (2018) found a significant main effect on message processing using the narrative message.

## 1.2 Emoji

Emoji was frequently used in computer-mediated communication (CMC) and instant message (IM). Toksöz (2018) explained the composition of the word "Emoji." Emoji is a Japanese word, e (絵) means picture, and moji (文字) means character. Several research has discovered the benefits of using emojis in text messaging, like providing encouragement and motivation for people with physical illness (Legler et al., 2018), increasing one's prosocial behaviours and empathetic motivations (Konrath et al., 2015), and engaging more intimate behaviours in their daily life (Gesselman et al.,

2019). Several researchers also discovered that emojis could help to simplify the content and intended tone of an instant message to reduce uncertainty and equivocality of the messages (Aldunate & Gomez-Ibanez, 2017; Kaye et al., 2017; Riordan, 2017). Furthermore, a positive message with positive emojis can increase positivity and happiness than not using an emoji (Riordan, 2017). These findings implied that emojis' can provide alternative ways to express emotions, increase happiness in a person, and facilitate one's emotions.

Although the significance of emojis on mental health messages has seldomly been discussed, Phan et al. (2017) discovered that emojis can express emotions of a health message more accurately than words. In the study of Lotfinejad et al. (2020), they found that a message with emojis can also help communicate complex health concepts more effectively and raise awareness of people to adopt healthy behaviours. Besides, Willoughby and Liu (2018) examined the effect of combining narrative with emojis in health text intervention. Nevertheless, they did not find a significant interaction effect between emoji and narrative and suggested that message relevance can be a potential moderator.

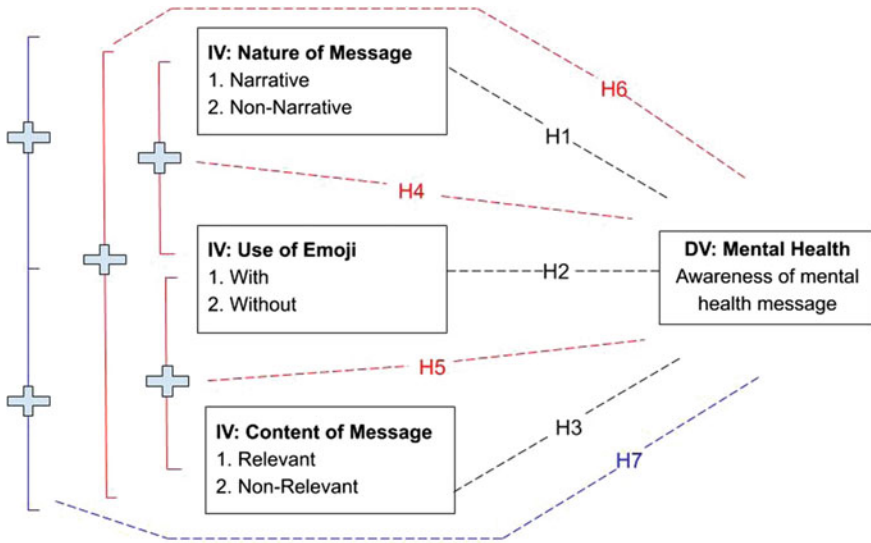
### ***1.3 Relevance***

Cambridge Dictionary defines relevant as “connected with what is happening or being discussed.” (“Relevant,” n.d.a). Merriam-Webster defines relevance as “having a significant and demonstrable bearing on the matter at hand.” (“Relevant,” n.d.b). Thesaurus.com suggested the synonyms of relevant as applicable, influential, and significant (“Relevant,” n.d.c). It is important to note that relevance defines something essential and connected to a person.

Willoughby and Liu's research (2018) discovered a significant main effect on the personalization of an e-health message with emojis. They also suggested that personalization can increase the attentiveness, cognitive involvement, and recall of the message from the readers. Their research did not find an interaction effect between narrative and emojis on the personalization of an e-health message. A key limitation may be due to the differences in personal backgrounds and lifestyles, suggesting the importance of relevance in an e-mental health message. It is interesting to investigate how the relevance of an e-mental health message can enhance the awareness.

### ***1.4 The Present Study, Conceptual Framework, and Hypotheses***

Figure 1 depicts the conceptual framework of the present study based on the above literature review. Seven research questions and hypotheses were derived from this conceptual framework:



Note 1: H1, H2, H3 are the main effects between variables to the DV  
 Note 2: H4, H5, H6 are the interaction effects between variables to the DV  
 Note 3: H7 is the interaction effects among three variables to the DV

Fig. 1 Conceptual framework of the present study

RQ1: Does using a narrative message significantly enhance participants’ awareness of the e-mental health message more than a non-narrative one?

H1: Narrative message significantly enhances participants’ awareness of the e-mental health message more than a non-narrative one.

RQ2: Does the use of emojis in a message significantly enhance the awareness of the e-mental health message more than a message without using emoji?

H2: The use of emojis in a message significantly enhances participants’ awareness of the e-mental health message more than a message without using emojis.

RQ3: Does the relevance of a message significantly enhance participants’ awareness of the e-mental health message more than an irrelevant one?

H3: Relevance of a message significantly enhances participants’ awareness of the e-mental health message more than an irrelevant one.

RQ4: Do the participants reading a narrative message with the use of emojis significantly enhance participants’ awareness of the e-mental health message?

H4: Narrative message with the use of emojis significantly enhances participants’ awareness of the e-mental health message.

RQ5: Does the use of emojis in a relevant message significantly enhance participants’ awareness of the e-mental health message?

H5: The use of emojis in a relevant message significantly enhances participants’ awareness of the e-mental health message.

RQ6: Do participants read a narrative message with relevant content significantly enhances participants’ awareness of the e-mental health message?

H6: Narrative message with relevant content significantly enhances participants' awareness of the e-mental health message.

RQ7: Do participants read a narrative message using emojis and relevant content significantly enhance participants' awareness of the e-mental health message?

H7: Narrative message with the use of emojis and relevant content significantly enhances participants' awareness of the e-mental health message.

## 2 Methods

### 2.1 Participants

The present study examines how the elements of narrative nature, use of emojis, and content relevance influence individuals' awareness of e-mental health messages. Snowball sampling was employed to recruit subjects for this online experiment. At the initial stage, eight potential participants were first recruited at a self-financing university in Hong Kong, and these participants requested to help recruit other potential target participants (college students aged 18–23). The participants were recruited for this study via online instant messaging platforms such as Telegram, WhatsApp, and WeChat. One-hundred sixty-nine ( $n = 169$ ) university students (65.1% females and 34.9% males) with fluent spoken Chinese and moderate mental health status were recruited to participate in this online experiment. After initial screening, participants were randomly assigned to one of the eight conditions and read an e-mental health message. After reading the e-mental health message, their level of awareness of their mental health status and e-health message were measured. During this process, participants were reminded that no identifiable personal data were required for the experiment.

Since the level of psychological well-being of the participants could be a confounding variable, only participants within a moderate level of psychological well-being were selected in this study. An initial mental health status questionnaire was used in screening and selecting participants with moderate mental health status.

### 2.2 Measures and Materials

**Initial Mental Health Status.** A shortened 18-item Psychological Well-being Scale by Ryff and Keyes (1995) was administered to the participants to measure their initial level of mental health status. The participants rated 18 items of six subscales on a 7-Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree).

The mental health status followed the scoring system provided by Ryff et al. (2010) and Ryff and Keyes (1995). Among the 18 questions, Q4, Q5, Q6, Q7, Q10, Q14, Q15, and Q16 are reverse-scored items. Participants with higher scores meant

higher levels of psychological well-being. People who scored 18–45 are classified as having low psychological well-being, those with 46–98 are classified as having moderate psychological well-being, and those with 99–126 are classified as having high psychological well-being. In this study, both scored low and high psychological well-being participants were excluded from the experimental analyses. According to Bayani et al. (2008), the test–retest reliability coefficient of Ryff’s Psychological Well-being Scales was 0.82.

**Message Materials.** There were eight types of e-mental health messages (eight conditions) with various combinations of narrative and non-narrative, with or without emojis, and relevance or non-relevance. All messages were written in traditional Chinese. These different types of messages were used to examine the impact of various combinations on message awareness, including message credibility and message personalization.

For conditions based on the elaboration model, this study included either narrative or non-narrative types of messages. For the narrative message, a story-like e-mental health message showed how the character finds ways to improve his/her mental health. For the non-narrative message, the e-mental health message presented a descriptive storyline with logical and factual mental health prevention information (Lemal & Van den Bulck, 2010). For conditions with the use of emojis, the study included e-health messages with emojis or without emojis. For the message with emojis, the frequency of emoji was one emoji for each sentence. For the message without emoji, the e-health message was shown as plain text only. For conditions related to the relevance of messages, the study included two different scenarios that were relevant and non-relevant to personal differences. For the relevant situation, academic stress in college was used to focus on participants’ current academic difficulties. While the non-relevant situation was about the full-time working stress that might not be totally relevant to the target participants’ current life difficulties because majority of undergraduate students in Hong Kong studied full-time. The various combinations led to eight different types of conditions as follows:

1. Narrative message with emojis and relevance
2. Narrative message with emojis and non-relevance
3. Narrative message without emoji and relevance
4. Narrative message without emoji and non-relevance
5. Non-narrative message with emojis and relevance
6. Non-narrative message with emojis and non-relevance
7. Non-narrative message without emoji and relevance
8. Non-narrative message without emoji and non-relevance.

**Mental Health Awareness.** The effectiveness of various combinations of messages in raising mental health awareness were measured by two dependent variables: Message credibility and message personalization.

Appelman and Sundar (2016) found significant results on discovering message credibility which could be measured by self-rating on three items: accurate, authentic, believable. These three items focus on people’s perception of message credibility on the process of people making a judgment on the message. In this study, the questions on message credibility were assessed to understand participants’ awareness

of different types of messages among participants. Thus, message credibility was measured by participants responses on the three items with a 7-Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree) on the extent they agreed or disagreed that the messages are accurate, authentic, and believable (Appelman & Sundar, 2016; Willoughby & Liu, 2018).

Kreuter and Strecher (1996) proposed that message personalization could be significant in recalling, receiving, and increasing the attentiveness of a piece of information. Willoughby and Liu's research (2018) also found significant main effects of personalization in narrative messages and messages with emojis. It is suggested that personalization can vary people attentiveness to a piece of information. In the present study, the question on personalization also helps to discover participants' level of awareness for different types of messages. So, personalization was measured by participants' responses to a 7-Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree) on the extent they agreed or disagreed that "The message applies to me" and "The message is designed for me." (Willoughby & Liu, 2018).

Overall, people with higher scores on message credibility and personalization represented a higher level of awareness of the mental health message.

### **2.3 Procedures**

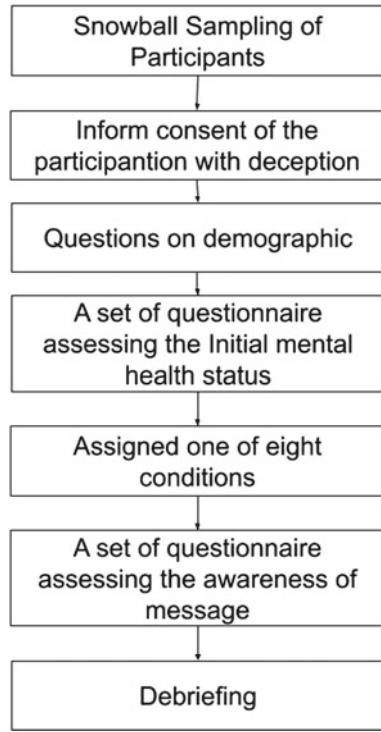
The online experiment was conducted via instant messaging platforms (i.e., Facebook and WhatsApp) and consisted of seven parts (see Fig. 2). Convenient and snowball sampling methods were adopted to recruit participants as mentioned above. First, all the selected participants received an e-consent form prior to the study. Deception procedure was adopted at the beginning of the experiment to hide the real purpose of the study to ensure the internal validity of the results. At the beginning of the online experiment, participants were told that this study was about e-mental health mobile intervention. Then, an initial mental health status questionnaire described above was filled by the participants for selecting those scored 46–98 with moderate psychological well-being. After that, the selected participants were randomly assigned to one of the eight conditions. After reading the assigned e-mental health message (2–3 min), participants were requested to complete a questionnaire regarding the message credibility, message personalization, and mental health awareness. Lastly, an e-debriefing form was shown to the participants for explaining the deception process and the real purpose of the study. The entire online experiment lasted approximately 12 min for each participant.

### **2.4 Pilot Test**

A pilot study was conducted with 17 participants to try out the experimental procedures and materials of the experiment. In the pilot test, there were 2 participants for



**Fig. 2** Flowchart of the experimental procedures in the present study



seven conditions and 3 participants for one condition. After the pilot study, some participants expressed that the experimental procedures were a bit confused because there was inadequate guidance and instruction, especially the purpose of showing the messages. Thus, the researchers made one modification by adding the introduction and guidelines to each part of the online experimental study. A short paragraph was included for more explicit instructions. Data collected in the pilot study were excluded from the final data analysis.

### 2.5 Ethical Considerations

During the online experiment, the conditions might trigger participants' emotions. Such discomfort, however, should be no greater than what they experience in everyday life. Participation in the online experiment was completely voluntary. Participants could stop and withdraw from the online experiment at any time if they felt uncomfortable without negative consequences.

All collected data were saved securely and confidentially. The data can only be accessed and analyzed by the authors. No identifiable information was required in

the online survey; The collected data will be destroyed five years after the completion of the present study.

### 3 Results

The present study adopts a 2 (Nature of message: narrative or non-narrative) × 2 (Use of emojis: with or without) × 2 (Content of message: relevance or non-relevance) factorial experimental design. The nature of the message, the use of emojis, and the message content were the independent variables whereas the mental health status and message awareness (credibility and personalization) of mental health information were the dependent variables. Three-way ANOVA was employed to analyze the data to test the three main effects (H1-H3), three two-way interaction effects (H4-H6), and one three-way interaction effect (H7).

#### 3.1 Descriptive Statistics

Table 1 shows the mean scores and standard deviations of the mental health status and mental health awareness (including message credibility and personalization) across

**Table 1** Descriptive Statistics of mental health status and mental health awareness

Variables	Sample size	Mental health status		Message credibility		Message personalization	
		Mean	SD	Mean	SD	Mean	SD
Condition 1	20	81.50	6.69	14.50	1.82	8.85	1.53
Condition 2	21	78.61	11.60	14.29	2.26	9.24	2.90
Condition 3	24	85.58	9.89	15.04	1.92	8.75	1.82
Condition 4	20	78.35	9.40	15.20	2.26	9.25	2.20
Condition 5	22	80.09	12.41	14.82	2.11	9.09	2.35
Condition 6	21	79.95	19.98	13.67	3.77	8.86	3.47
Condition 7	21	86.29	11.27	14.48	2.62	7.76	3.06
Condition 8	20	86.15	16.20	14.75	2.69	7.75	2.75

*Notes*

- Condition 1 = Narrative message with emojis and relevance
- Condition 2 = Narrative message with emojis and non-relevance
- Condition 3 = Narrative message with no emoji and relevance
- Condition 4 = Narrative message with no emoji and non-relevance
- Condition 5 = Non-narrative message with emojis and relevance
- Condition 6 = Non-narrative message with emojis and non-relevance
- Condition 7 = Non-narrative message with no emoji and relevance
- Condition 8 = Non-narrative message with no emoji and non-relevance

the eight conditions. In this study, 169 participants were recruited. Given the initial screening criteria, the mean scores on the Psychological Well-being scale were within the moderate levels (48–96) for all eight conditions. The results revealed that the mean scores of psychological well-being were from 78.35 to 86.29 and the standard deviations were from 6.69 to 16.20. The one-way ANOVA results showed that there was no significant difference on mental health status across the eight groups,  $F = 1.505, p = 0.169$ .

For message credibility, the highest total possible score is 21. The mean scores of message credibility were from 13.67 to 15.20 between groups. The standard deviations of the message credibility across groups were from 1.82 to 3.77. The one-way ANOVA results showed that there was no significant difference on message credibility across the eight groups,  $F = 1.142, p = 0.340$ .

For the personalization in mental health awareness, the highest total possible score is 14. The mean scores across eight groups were between 7.75 and 9.25. The standard deviations of personalization were between 1.53 and 3.47. The one-way ANOVA results showed that there was no significant difference on message credibility across the eight groups,  $F = 0.788, p = 0.598$ .

### 3.2 Main and Interaction Effects on Mental Health Status

**Interaction effects.** Table 2 shows that the interaction effect between the nature of the message and the use of emojis was not significant,  $F = 1.189, p = 0.277, \eta^2 = 0.007$ . The interaction effect between the use of emojis and the content of message was also insignificant,  $F = 0.306, p = 0.581, \eta^2 = 0.002$ . The interaction effect between the nature of message and the content of message was insignificant,  $F =$

**Table 2** The three-way Anova results on mental health status

Variables	df	<i>F</i>	p	$\eta^2$
Nature of message (A)	1	1.148	0.286	0.007
Use of emojis (B)	1	4.246	0.041	0.026
Content of message (C)	1	1.745	0.188	0.011
Interaction (A × B)	1	1.189	0.277	0.007
Interaction (B × C)	1	0.306	0.581	0.002
Interaction (A × C)	1	1.565	0.213	0.010
Interaction (A × B × C)	1	0.307	0.581	0.002

*Notes*

- Interaction (A × B) = Interaction between the nature of message and the use of emojis
- Interaction (B × C) = Interaction between the use of emojis and the content of message
- Interaction (A × C) = Interaction between the nature of message and the content of message
- Interaction (A × B × C) = Interaction among the nature of message, the use of emojis, and the content of message

1.565,  $p = 0.213$ ,  $\eta^2 = 0.010$ . Moreover, the three-way interaction among the nature of message, the use of emojis, and the content of message were insignificant as well,  $F = 0.307$ ,  $p = 0.581$ ,  $\eta^2 = 0.002$ .

**Main effects.** The three-way ANOVA results show that there was a significant main effect on mental health status for the use of emojis (with or without emoji),  $F = 4.246$ ,  $p = 0.041$ ,  $\eta^2 = 0.026$ . Nevertheless, the main effects were insignificant for the nature of message (narrative or non-narrative),  $F = 1.148$ ,  $p = 0.286$ ,  $\eta^2 = 0.007$ , and for the main effect for the content of message (relevance or non-relevance),  $F = 1.745$ ,  $p = 0.188$ ,  $\eta^2 = 0.011$ .

### 3.3 Main and Interaction Effects on Message Credibility

**Interaction effects.** Table 3 shows that the interaction effect between the nature of the message and the use of emoji was insignificant,  $F = 0.216$ ,  $p = 0.643$ ,  $\eta^2 = 0.001$ . The interaction effect between the use of emoji and the content of message was also insignificant,  $F = 1.369$ ,  $p = 0.244$ ,  $\eta^2 = 0.008$ . The interaction effect between the nature of message and the content of message was insignificant as well,  $F = 0.286$ ,  $p = 0.594$ ,  $\eta^2 = 0.002$ . The three-way interaction among the nature of the message, the use of emoji, and the content of the message were insignificant,  $F = 0.469$ ,  $p = 0.494$ ,  $\eta^2 = 0.003$ .

**Main effects.** For message credibility, Table 3 shows that the main effect for the nature of message (narrative or non-narrative) was insignificant,  $F = 0.734$ ,  $p = 0.393$ ,  $\eta^2 = 0.005$ . The main effect for the use of emojis (with or without emoji) was also insignificant,  $F = 2.045$ ,  $p = 0.155$ ,  $\eta^2 = 0.013$ . Also, the main effect of the

**Table 3** The Three-way ANOVA results on message credibility

Variables	DF	F	p	$\eta^2$
Nature of message (A)	1	0.734	0.393	0.005
Use of emoji (B)	1	2.045	0.155	0.013
Content of message (C)	1	0.369	0.544	0.002
Interaction (A × B)	1	0.216	0.643	0.001
Interaction (B × C)	1	1.369	0.244	0.008
Interaction (A × C)	1	0.286	0.594	0.002
Interaction (A × B × C)	1	0.469	0.494	0.003

*Notes*

- Interaction (A × B) = Interaction between the nature of message and the use of emojis
- Interaction (B × C) = Interaction between the use of emojis and the content of message
- Interaction (A × C) = Interaction between the nature of message and the content of message
- Interaction (A × B × C) = Interaction among the nature of message, the use of emojis, and the content of message

content of the message (relevance or non-relevance) was insignificant as well,  $F = 0.369, p = 0.544, \eta^2 = 0.002$ .

### 3.4 Main and Interaction Effects on Credit Personalization

**Interaction effects.** For message personalization, Table 4 shows that the interaction effect between the nature of message and the use of emoji was insignificant,  $F = 2.186, p = 0.141, \eta^2 = 0.013$ . The interaction effect between the use of emoji and the content of message was also insignificant,  $F = 0.044, p = 0.834, \eta^2 < 0.001$ . The interaction between the nature of message and the content of message was insignificant as well,  $F = 0.510, p = 0.476, \eta^2 = 0.003$ . The three-way interaction among the nature of message, the use of emoji, and the content of message was insignificant as well,  $F = 0.005, p = 0.945, \eta^2 < 0.001$ .

**Main effects.** Table 4 shows that the main effect of the nature of message (narrative or non-narrative) was insignificant,  $F = 2.739, p = 0.100, \eta^2 = 0.017$ . The main effect for use of emoji (with or without emoji) was also insignificant,  $F = 2.527, p = 0.114, \eta^2 = 0.015$ . Also, the main effect for the content of message (relevance or non-relevance) was insignificant as well,  $F = 0.164, p = 0.686, \eta^2 = 0.001$ .

In sum, the three-way ANOVA results showed that the nature of message, the use of emoji, and the content of message did not have any significant main effect or interaction effect on message awareness in terms of message credibility and message personability. For awareness of mental health status, only the main effect of the use of emoji was significant.

**Table 4** The Three-way ANOVA results on message personalization

Variables	df	F	p	$\eta^2$
Nature of message (A)	1	2.739	0.100	0.017
Use of emoji (B)	1	2.527	0.114	0.015
Content of message (C)	1	0.164	0.686	0.001
Interaction (A x B)	1	2.186	0.141	0.013
Interaction (B x C)	1	0.044	0.834	<0.001
Interaction (A x C)	1	0.510	0.476	0.003
Interaction (A x B x C)	1	0.005	0.945	<0.001

*Notes*

- Interaction (A × B) = Interaction between the nature of message and the use of emojis
- Interaction (B × C) = Interaction between the use of emojis and the content of message
- Interaction (A × C) = Interaction between the nature of message and the content of message
- Interaction (A × B × C) = Interaction among the nature of message, the use of emojis, and the content of message

## 4 Discussion

Communications of mental health messages have turned their promotion via an online platform with emerging digital technologies (Hudson et al., 2012). A message could be affected by the nature of the message, the use of emojis, and the content of message (Willoughby & Liu, 2018). Hence, the aim of this study focuses on the main effects of the nature of message, the use of emojis, and the content of message on mental health awareness. The present study also studies the interaction effects of these three factors to determine whether a message combined with the nature of message, the use of emojis, and the content of message can enhance viewer's mental health awareness.

It is hypothesized (H1) that reading a narrative text message has a significant main effect on awareness of mental health information than reading a non-narrative one. The results showed that there was no significant main effect in reading both narrative and non-narrative text. The results were inconsistent with the hypothesis (H1). Hinyard and Kreuter (2007) suggested that a narrative message using a coherent story with a recognizable beginning, middle, and end that gives information about the scene, character, conflict, and determination can change behaviour. This means that the content of the narrative message should have a chronological series of an event. Hong (2011) suggested that a narrative message with a coherent story significantly enhances the level of transportation than a non-narrative message. The narrative message with a complete story may have a stronger effect on attitudes and intentions than the non-narrative message (Murphy et al., 2013).

The findings were partially consistent with the hypothesis (H2) and the main effect of using emojis significantly raised participants' awareness of their mental health status. Several studies found that emojis connected to personal emotions can enhance the understanding of a message (Riordan, 2017; Toksöz, 2018). The use of emojis can help disambiguate the information of the text message and reduce unclarity (Aldunate & Gomzalez-Ibanez, 2017; Kaye et al., 2017; Riordan, 2017). Nevertheless, according to Willoughby and Liu's (2018) research, they found a message without emoji is more helpful than a message with emojis when the text message is clear enough to the viewers and they already trust and engage in the content of the message. The contradictory perspectives suggest that the effectiveness of the use of emojis in raising message awareness depends on the message clarity and intensity.

For the content of message, it is hypothesized (H3) that the relevance of a message significantly enhances the awareness of an e-mental health message than a non-relevant message. The results showed that there was no significant main effect of the relevance of a message. The results were inconsistent with the hypothesis (H3). According to Anghelcev and Sar's (2011) research, they suggested that the effectiveness of raising a participant's awareness of a health message is due to positive mood and high message relevance. They defined message relevance as the degree to how the message is perceived by the recipient, including personal goals, values, and interests. The message can increase persuasion elements by increasing message involvement (Anghelcev & Sar, 2011). In the present study, the relevance of the message should be tailored to personal mental health needs of each participant. The

details of the messages can increase the persuasion of a message when viewers can perceive the relevance of a message (Anghelcev & Sar, 2011).

It is hypothesized (H4) that reading a narrative message with the use of emojis can significantly enhance the awareness of mental health messages. The results showed no significant interaction effect for a combination of narrative message with the use of emojis. The results were inconsistent with the hypothesis (H4). Willoughby and Liu's research (2018) suggested that the processing and attention of a narrative message could be enhanced with emojis. The greater attention also suggested that the recipient is more likely to process the message peripherally (Petty & Cacioppo, 1981). The peripheral processing may influence individuals' attitudes or behaviours by cues (emojis) from messages (Willoughby & Liu, 2018). The use of emojis may strengthen the attention of the narrative message. In the present study, the narrative message (was not tailor-made) with emojis (too few and non-attractive emojis) may not have strong attention and persuasion in influencing the participants. When the message has greater attention and persuasion elements in the narrative message with emojis, the effect of the narrative message with emojis on message awareness may be more explicit.

It is hypothesized (H5) that the use of emojis with more relevance to the message significantly enhance the awareness of mental health message. The results showed that there was no significant interaction effect on emotional awareness in the use of emojis with more message relevance. The results were inconsistent with the hypothesis (H5). Yus (2014) suggested that under the relevance-theoretic perspective, the emojis lead to a more fine-grained interpretation of a message in terms of the underlying attitudes, feelings, and emotions by viewing the message by reducing mental effort. It implies that message relevance with emojis could reduce the mental effort in a perceived message. With lower mental effort in perceiving the message, the overall feeling of verisimilitude could be enhanced. In the present study, the use of emojis with a relevant message has a limited effect on raising awareness. The message should further reduce the mental effort for the individuals in perceiving the message. By reducing the mental effort in reading a relevant message with more use of emojis, the effect on health message awareness would be more explicit.

Furthermore, this study hypothesizes (H6) that reading a narrative and relevant message can significantly enhance the awareness of mental health messages. The results showed no significant interaction effect in reading a narrative and relevant message. The results were inconsistent with the hypothesis (H6). A message with the narrative approach is to contextualize the information in the forms of stories, anecdotes, and cases (Winter et al., 2013). The dialogues in a message under the narrative approach can engage individuals to make personal conceptualization and decision-making on the message content. At the same time, the use of relevance of a message is to provide an authentic feeling to the readers. An authentic feeling felt relevant for the readers to pull information from the back to the front (Petraglia, 2009). It also enables the individuals to understand how the information can relate to their everyday life in an emotional and cognition aspect. The combination of the use of narrative and the feeling of connectedness in a mental health message can enhance the authenticity of a message. In contrast, the narrative and relevant message have

limitation on the content of a message. Winter et al. (2013) suggested that the content of a message should tailor-make the materials based on the heterogeneity and shifting identities to fit the interests of the individuals. In the present study, it is argued that the strength of the message was insufficient to provide feelings of authenticity. The message should be more tailor-made that fit to individualized mental health status and provide a more authentic feeling to the readers.

Finally, the present study hypothesizes (H7) that reading a narrative message with the use of emojis and more relevance can significantly enhance the awareness of mental health messages. The results showed that this three-way interaction effect was insignificant and was inconsistent with the hypothesis (H7). Willoughby and Liu's (2018) research suggested that the effect of using emojis in a health message depends on the objectives and content of a message. Previous research found no significant interaction effect between narrative and emoji use, emoji use and relevance, and narrative and relevance. Nevertheless, future research should further examine the interaction effects among narrative, emojis, and relevance.

## 5 Limitations

This research focuses on the main and interaction effects of three key characteristics in a mental health message (narrative nature, use of emoji, and relevant content) on enhancing mental health awareness. There were several limitations to this study. First, the strength of the narrative messages can be enhanced. The attention and persuasive elements may not be strong enough to draw an individual's awareness of the mental health messages. Thus, the persuasiveness of a narrative message should be strengthened. Second, the relevance of message may be too weak for enhancing the authentic feelings of viewers. Hence, the content of relevant message should be strengthened to enhance the connectedness between the message and the individuals. Third, the difference between the relevant (academic stress) and non-relevant (work stress) messages may not make a significant difference. Both scenarios were relevant to the mental health status of university students (some of them worked part-time). Fourth, variation in message reading time could be a confounding factor. The participants could read the messages several times before they moved to the next session, the longer reading time may provide a further understanding of the message and lead to quite different responses that may affect the results. Thus, the time of reading the message should be manipulated. Fifth, age could be a confounding factor because the younger generation feels more comfortable to read online messages. The target of this study was undergraduates and this might lead to restriction of range. Thus, further studies should cover a wider age range.



## 6 Conclusion

To conclude, few research have investigated the interplays between the narrative, emojis, and relevance on mental health awareness. This study provides some new directions for understanding the influences of the use of narrative (nature of the message), emoji (use of emoji), and relevance (content of the message) and how these three elements influence the awareness of e-mental health messages and individuals' mental health. Although the results did not indicate that narrative, use of emojis and relevant messages significantly enhanced mental health awareness, this study gave a new idea of addressing the importance of the narrative, emoji, and relevance in a message. During the Covid-19 pandemic, online platforms have become a new paradigm for digital communication. The increasing mental health problems due to the pandemic and chaotic social world suggest that proactive e-mental health prevention will be the future trend of intervening these problems. The tailored e-mental message with an authentic narrative story and the use of emojis can provide a way for people to be aware of their mental health status. Thus, future studies should further examine and deeply investigate the effectiveness, efficiency, and fidelity of using narrative, emoji, and relevance of a message in e-mental health promotion and prevention.

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