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Effects of social networking sites on strengthening self-protective behaviors after COVID-19 recovery among the working-aged population

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ABSTRACT

This study aimed to investigate the effects of social networking sites (SNS) on strengthening self-protective behaviors after COVID-19 to prevent post-COVID-19 conditions in the working-age population in Thailand. Data were collected through a cross-sectional online survey of 400 working-aged Thais. Multiple regression analysis (MRA) was employed to analyze the data at a 0.05 significance level. The findings revealed that YouTube (beta = .275) and Facebook (beta = .182) positively impact self-protective behaviors while Twitter (beta = .237), Facebook (beta = .198) and Tiktok (beta = .119) influence attitudes towards these behaviors. Additionally, Twitter (beta = .206) and LINE (beta = .145) affect subjective norms. YouTube (beta = .288) and LINE (beta = .165) significantly enhance self-efficacy. This study contributes to the broader understanding of how social networking sites can reinforce self-protective behaviors against long COVID-19 among the working-age population. This study contributes valuable insights into the role of social networking sites in promoting health behaviors after COVID-19. The findings offer practical implications for health communication planning by expanding knowledge on the effectiveness of these platforms. Policymakers, social marketers and health organizations can leverage these insights to design targeted interventions to reduce the risk of COVID-19 and prevent future COVID-19 outbreaks at both national and international levels.

Contribution/Originality: Enhancing self-protective behaviors after COVID-19 is as crucial as initial prevention. This study shows the effectiveness of social networking sites in promoting these behaviors among working-aged individuals. The findings provide valuable insights for health communication strategies that aid governments and health organizations in preventing COVID-19 and future pandemic waves.

1. INTRODUCTION

The COVID-19 pandemic has impacted Thailand for the past three years. When the first official case of COVID-19 was reported in Thailand on January 13, 2020, there have been 4.734 million cases reported there with 33,967 fatalities (World Health Organization (WHO), 2023a). One of the biggest hazards to public health in human history is thought to be the new coronavirus disease epidemic (Islam et al., 2020; Suphanchaimat, Teekasap, Nittayasoot, Phaiyarom, & Cetthakrikul, 2022). The first instance was discovered in Wuhan, China and is caused by the severe acute respiratory syndrome coronavirus-2 (SAR-CoV-2) (Puri, Coomes, Haghbayan, & Gunaratne, 2020; Viwattanakulvanid, 2021). Since then, the virus has spread rapidly worldwide, including Thailand. According to data from the World Health Organization [WHO], as of May 2023, there were 6,927,378 COVID-19 fatalities and

765.903,278 cases worldwide (World Health Organization (WHO), 2023b). This information demonstrates how the COVID-19 epidemic is posing a major global health threat. Therefore, cooperation between governmental organizations, businesses and the general public is required to tackle this new illness. The World Health Organization [WHO] has suggested steps to prevent this pandemic, including 1) masks and face coverings; 2) limits and restrictions on public and private gatherings; 3) school closures or adaptations; 4) restrictions on domestic travel, public transportation, and staying at home; 5) business closures or adaptations; 6) restrictions on international travel; and 7) immunization campaigns (World Health Organization (WHO), 2023c). Thailand has implemented various strategies to deal with the spread of COVID-19 in response to the pandemic. These strategies include travel restrictions (both domestically and internationally), site closures, entry point screening, quarantine, border control, mask wearing, social distancing, using the application "MorChana" for personal health information management and promoting vaccination among the people. These measures are all recommended by the World Health Organization particularly among the most vulnerable populations (Sereenonchai & Arunrat, 2021; Yuduang et al., 2022). In Thailand, these measures proved successful in preventing COVID-19 (Keller, Honea, & Ollivant, 2021; Tsoy, Tirasawasdichai, & Kurpayanidi, 2021; Viwattanakulvanid, 2021). There is no doubt that this year's COVID-19 pandemic scenario in Thailand is far better than it was two years ago. The number of newly diagnosed COVID-19 patients each day remains low. The average number of COVID-19 cases recorded per day as of May 2023 is 336 (Department of Disease Control Ministry of Public Health of Thailand, 2023).

As a result, Thailand can now be recognized as a post-pandemic high-stage country (Department of Disease Control Ministry of Public Health of Thailand, 2023). However, viruses are always variants. A new coronavirus infection caused by a new variant of the virus can trigger a new pandemic wave in Thailand if people stop or even reduce protection especially in people with a rebound case of COVID-19 (Sereenonchai & Arunrat, 2021; Viwattanakulvanid, 2021; Yuduang et al., 2022). Data recently released by Worldometers (2023) revealed that the number of recoveries from COVID-19 in Thailand was 4,692,636 out of 4,726,928 confirmed cases of COVID-19. Based on this information, several cases of recovery of COVID-19 in Thailand have been identified as high-profile. Therefore, if that population feels they've already been cases of COVID-19 and doesn't need to protect themselves, that situation could have led to another wave of COVID-19 outbreaks. In addition, people who have recovered from COVID-19 and do not have accurate self-defense behaviors against COVID-19 often experience a post-COVID-19 condition also known as long COVID. Long COVID refers to a condition in which people have multiple symptoms and health problems for weeks or months after contracting COVID-19, even after the acute phase of the disease has passed. These persistent symptoms and their severity can vary greatly between individuals but some common long-term symptoms of long COVID include: 1) fatigue, 2) shortness of breath, 3) cognitive difficulties, 4) joint and muscle pain, 5) chest pain, 6) sleep disturbances, 7) headache, 8) loss of taste and smell and 9) mood disorders. People with post-COVID-19 illness may experience difficulties in life. Their condition can affect their ability to do daily activities such as work or housework. In some cases, other symptoms may also occur such as gastrointestinal problems, rash, dizziness or palpitations (World Health Organization (WHO), 2023d). Taking steps to avoid contracting COVID-19 is the most effective way to protect yourselves from post-COVID-19. These measures include public health and social measures to reduce your chance of reinfection. The World Health Organization (WHO) (2023d) provides recommendations on how to protect yourselves from post-COVID-19 conditions. These include regular hand washing, social distancing, wearing a mask in crowned, closed or poorly ventilated spaces continuing with vaccinations and booster doses and following respiratory etiquette such as coughing or sneezing into your bent elbow.

Therefore, it is worth noting that strengthening self-protective behaviors from COVID-19 is as important as primary prevention of COVID-19. However, the issue of strengthening self-protective behavior after recovery from COVID-19 has received little attention among researchers in the humanities and social sciences. Rather, most research has focused on the primary prevention of COVID-19. Consequently, this is the existing research gap and it

is an opportunity for researchers in the fields of humanities and social sciences to reduce the post-COVID-19 condition and prevent recurrences of COVID-19 outbreaks. Therefore, research is needed to find approaches to strengthen self-protective behaviors in the working-age population after recovery from COVID-19. Among various approaches, using Social Networking Sites (SNS) in social marketing communication campaigns to change health behaviors is quite interesting. A lot of the last research papers (Kotler & Lee, 2008; McKenzie-Mohr, 2000; Senachai, Julsrigival, & Sann, 2022; Suzuki, Yamamoto, Ogawa, & Umetani, 2023; Vantamay, 2019; Xu & Wu, 2022) showed that Social Networking Sites (SNS) which can quickly disseminate health information to the general public are effective. Consequently, public and private health organizations in several countries use these media in social marketing communication campaigns to promote desirable health behaviors. In Thailand, these social media have been increasingly used in social marketing campaigns to promote self-protective behavior after recovery from COVID-19. However, research on the effectiveness of social networking sites (SNS) in promoting health behaviors after recovery from COVID-19 is still needed.

Therefore, this study aimed to evaluate the effectiveness of these social networks (SNS) in improving self-protective behavior in the working-age population against the post-COVID-19 condition (long COVID). The working-age population is the part of a country's population that is typically considered to be of working age and potentially available for working life. The specific age distribution of the working-age population can vary from country to country or organization to organization but generally includes people who are legally old enough to work and have not yet reached retirement age. In this study, the working-age population of Thailand was defined as 15-60 years old. The working-age population is an important demographic indicator that can provide an overview of the country's labor market, economic potential and maintenance relationships. It is often used in economic analysis, workforce planning and policy making. The size and composition of the working population can affect factors such as labor supply, productivity, consumption patterns and social security systems. If this population has healthy lifestyles, it can effectively increase the productivity of the country. For performance indicators, four variables from the theory of planned behavior (self-protective behavior, attitude to behavior, subjective norm, and self-efficacy) (Ajzen, 1988) were used in the current study because previous studies suggested these indicators as appropriate indicators to evaluate the effectiveness of a social marketing communication campaign (Cottrell & McKenzie, 2005; Kotler & Lee, 2008; Pang, Cai, Jiang, & Chan, 2021). The contribution of this study is to advance and expand our knowledge about the use of social networks (SNS) to strengthen self-protective behaviors against the post-COVID-19 condition at national and international levels.

2. REVIEW OF LITERATURE

2.1. Social Networking Sites (SNS) in Social Marketing Communication Campaigns to Promote Health Behaviors

Social networks are online platforms that allow people to create profiles, communicate with others and share information, interests and media. These sites facilitate social interaction and allow people to connect with friends, family, acquaintances and even meet new people. Here are some well-known social networks: Facebook, Twitter, Instagram, Tiktok, YouTube and LINE (We are Social, 2023). Facebook is the largest social network with billions of users worldwide. It allows users to create profiles, share updates, photos and videos, join groups and stay in touch with friends. Twitter is a platform where users can send and interact with short messages called Tweets. It is widely used to share news, opinions and participate in discussions. Instagram (IG) focuses on sharing photos and videos. Users can post visual content, follow other users, like and comment on posts and use features like stories and reels. Tiktok is a popular video-sharing social network that allows users to create and share short videos often accompanied by music or audio clips. It has gained considerable popularity for its creative and entertaining content. Although YouTube is primarily a video sharing platform, it also includes social networking features. Users can create channels, subscribe to others, comment on videos and interact with creators and other viewers. LINE is a platform for instant communication on electronic devices such as smart phones, tablets and computers. Line users

can exchange text, images, video and audio and even organize free video conferences (Abbas, Wang, Su, & Ziapour, 2021; Benis, Seidmann, & Ashkenazi, 2021; Chuang & Liao, 2022; Lee, 2020; Loss, Lindacher, & Curbach, 2014).

These social networking sites [SNS] can play an important role in preventing the spread of COVID-19 by disseminating accurate information, promoting public health guidelines and encouraging responsible behavior (Dutta, Peng, Chen, & Sun, 2022; Litt, Rodriguez, & Stewart, 2021; Litwin & Levinsky, 2021; Tkáčová, Pavlíková, Jenisová, Maturkanič, & Králik, 2021; Van Dijck & Alinejad, 2020). Their benefits of social media in preventing COVID-19 include information, education and awareness campaigns, real-time updates, influencer engagement, community engagement, debunking misinformation and promoting mental health and well-being (Drouin, McDaniel, Pater, & Toscos, 2020; Kuss & Griffiths, 2017; Pennycook, McPhetres, Zhang, Lu, & Rand, 2020). The use of social networking sites (SNS) in a social marketing communication campaign to promote protective behaviors against the post-COVID-19 condition among the Thai working-age population includes several platforms such as Facebook, Instagram, YouTube, LINE, Twitter and even Tiktok (Senachai et al., 2022; Suphanchaimat et al., 2022; Viwattanakulvanid, 2021; We are Social, 2023). In Thailand, this new media has gained more visibility and attention among the youth and working age (15-60) than traditional media, including television, radio, movies, newspapers and magazines (Sereenonchai & Arunrat, 2021; Tsoy et al., 2021; Viwattanakulvanid, 2021; We are Social, 2023). However, a study of the effectiveness of using these Social Networking Sites (SNS) in social marketing communication campaigns to promote health behaviors especially in the issue of strengthening self-protective behavior after recovery from COVID-19 still receives little attention among researchers.

2.2. Theory of Planned Behavior as the Effectiveness Indicator

The author discovered that all relevant studies proposed that the variables in the theory of planned behavior (Ajzen, 1988) serve as suitable effectiveness indicators (Cottrell & McKenzie, 2005; Kotler & Lee, 2008; Pang et al., 2021; Shi et al., 2021) upon analyzing the literature on social marketing communication effectiveness indicators. Thus, the theory of planned behavior (TPB) variables (self-protective behaviors, attitude towards the behavior, subjective norm, and self-efficacy) were employed in this study as efficacy indicators of online social marketing communication on encouraging self-protective measures against PM2.5 among Thai working-age population. A theory called the theory of planned conduct was created to describe the factors influencing real behavior. Ajzen (1988) was its developer.

The theory of planned behavior (TPB) states that an individual's perceived amount of intent to practice a behavior or intention to execute an action influences their actual conduct. Three factors also influenced the desire to do an action: perceived behavioral control, subjective norm and attitude towards the behavior.

A person's attitude towards an action is how they feel about it whereas subjective norms are the opinions of their reference groups about what the person should do and how important those opinions are to the person's conduct. The last factor is perceived behavioral control often called self-efficacy which is the person's belief in their ability to act. The assessment of one's perceived ability to act was derived from both current abilities and prior experiences. This paradigm helps provide a more accurate explanation for a complex phenomenon. Thus, these factors may be used to assess the effectiveness of social marketing communication campaigns not only in traditional media but also in online media.

The author reviews the aforementioned literature and puts forth the following four hypotheses:

H_1: Social networking sites (SNS) affect self-protective behaviors after COVID-19 recovery.

H_2: Social networking sites (SNS) affect attitudes towards self-protective behaviors after COVID-19 recovery.

H_3: Social networking sites (SNS) affect subjective norms to perform self-protective behaviors after COVID-19 recovery.

H_4: Social networking sites (SNS) affect self-efficacy to perform self-protective behaviors after COVID-19 recovery.

3. METHODS

This study recruited 400 working-age people (aged 15–60) in Thailand between January and March 2023 using online self-report questionnaires. The author used Google Forms to create and design the online survey and posted the survey URL as a link or QR code on various online platforms related to the prevention of COVID-19 in Thailand. The respondents were people of working age who have been infected with COVID-19 at least once and who have already recovered by participating in the Internet. The sample size for this study was calculated using Yamane's (1973) formulation with a 95% confidence level.

Yamane (1973) suggested that if the total population is more than 100,000, a sample of 400 is sufficient to represent that population. All samples were informed about the details of the study and then asked to complete online self-report questionnaires. The subjects were asked to complete the questionnaire after being informed that their online participation was voluntary and that their responses would be anonymous and confidential. In addition, they were told that they could stop answering the surveys at any time. Results are presented in group format only to maintain confidentiality.

These processes are necessary to protect the rights of respondents in accordance with ethical standards for human research. There were six independent variables in this study. They were social networking sites (SNS) promoting self-protective behaviors after recovering from COVID-19 from six platforms: Twitter, Facebook, LINE, Tiktok, Instagram and YouTube. They were measured on a 5-point scale. Each variable had 5 items and the choices were "always", (5) "usually", (4) "sometimes", (3) "rarely", (2) and "never" (1). For the dependent variables which show measures of effectiveness after recovery from COVID-19 to prevent post-COVID-19 status (long-term COVID), there were four variables in this study. These are 1) self-protective behaviors after recovering from COVID-19, 2) attitude towards self-protective behaviors after recovering from COVID-19, 3) subjective norms for self-protective behaviors after recovering from COVID-19 and 4) self-efficacy for self-protective behaviors after recovering from COVID-19. In the operational definitions of each dependent variable, self-protective behavior after recovery from COVID-19 was defined as self-protective behaviors to avoid a post-COVID-19 condition (long COVID). It was measured on 25 items using 5-point rating scales "always", (5) "usually", (4) "sometimes", (3) "rarely" (2) and "never" (1). Attitude towards self-protective behavior is a person's positive or negative evaluation of self-protective behavior after recovery from COVID-19. It was measured with five items on a 5-point Likert scale ranging from "strongly disagree", (1) "disagree" (2) "neutral", (3) "agree" (4) and "strongly agree". (5). Subjective norms for performing self-protective behaviors after recovering from COVID-19 were described as an individual's perception of what their friends, family members and other online influencers think a person should perform self-protective behaviors after recovering from COVID-19. The nine items consisted of measurements using a 5-point rating scale ranging from "very little", (1)"somewhat", (2) "neutral", (3) "a lot" (4) and "very much". (5) Finally, self-efficacy to perform self-protective actions after recovery from COVID-19 is the perceived ability to protect oneself after recovery from COVID-19. It was also measured with six items using a 5-point scale in the same way as subjective standards. These questions were adapted from previous studies (Asnakew, Asrese, & Andualem, 2020; Kwok, Lee, & Han, 2022; Senachai et al., 2022; Vantamay, 2019; Xin et al., (2021); Tsoy et al. (2022); Lieneck et al. (2022); Elbarazi et al. (2022) and Gómez-Galán, Martínez-López, Lázaro-Pérez, and Sarasola Sánchez-Serrano (2020)). A pre-test was conducted with 30 working-aged people in Bangkok. The internal consistency of the summed scale was assessed using Cronbach's alpha to assess the reliability of all variables. The results showed that the alpha values ranged from 0.80 to 0.96 (Twitter = 0.96, Facebook = 0.95, Line = 0.80, IG = 0.94, YouTube = 0.92, Tiktok = 0.90, self-protective behaviors after COVID-19 recovery = 0.96, attitude towards the self-protective behaviors after COVID-19 recovery = 0.87, subjective norm to perform self-protective behaviors after COVID-19 recovery = 0.94 and self-efficacy to perform self-protective behaviors after COVID-19 recovery = 0.92). Scores above 0.70 are regarded as a sufficient indicator of internal consistency (Hair, Anderson, Tatham, & Black, 1992). In

this study, statistical analyses were performed using the mean, standard deviation, percentage and multiple regression analysis (MRA) at the.05 level of significance.

4. RESULTS

4.1. Characteristics of the Study Sample

The samples included 400 working-aged people, aged 15-60 years old. Most samples were female (60.6%). The average age was 29.98 years (SD = 0.92).

4.2. Descriptions of the Studied Variables

Mean and standard deviation (S.D) were used in describing the studied variables. For independent variables, the exposure mean of social networking sites (SNS) to promote self-protective behaviors after COVID-19 recovery among samples were as follows: Twitter (mean = 3.50, SD = 1.03), Facebook (mean = 3.42, SD = 1.04), LINE (mean = 3.21, SD = 1.02), Instagram (mean = 3.17, SD = 1.01), Tiktok (mean = 3.28, SD = 0.98), and YouTube (mean = 3.34, SD = 1.07). For dependent variables, the overall mean of 25-item self-protective behaviors after COVID-19 recovery was 3.64 (SD = 0.54) and details of each item were shown in Table 1.

Table 1. Means and S.D. of self-protective behaviors after COVID-19 recovery.

Items	$\bar{X}$*	SD
1. Wearing a face mask correctly.	4.32	0.88
2. Washing hands correctly.	3.28	0.89
3. Using 70% alcohol in cleaning things before touching.	3.78	0.95
4. Avoiding a crowded place.	3.77	1.01
5. Avoiding an unventilated place.	3.08	1.12
6. Testing COVID-19 by yourself when feeling risky.	4.20	0.91
7. Consult with the doctor timely if feeling any indicative symptoms.	3.13	1.13
8. Quarantining yourself after touching a COVID-19 case.	4.33	0.77
9.Closing the mouth when coughing or sneezing.	4.05	1.13
10.Social distancing	3.02	1.08
11.Wearing a face mask when going outdoor.	4.39	0.75
12. Wearing a face mask when family members become infectious.	2.84	1.08
13. Closing the toilet lid when using the toilet to prevent scatters of virus.	2.98	1.04
14. Avoiding touch of face, eyes and mouth.	3.48	0.99
15. Avoiding using things together with others.	3.84	0.98
16. Cleaning house, room and dormitory frequently.	3.87	0.95
17. Exercising frequently.	3.23	0.94
18. Avoiding social activities.	4.07	0.91
19. Washing hands before eating.	3.92	1.00
20. Vaccinating against COVID-19.	4.72	0.58
21. Following COVID-19 information closely.	2.58	1.23
22. Recommending preventions to your family members.	3.69	0.95
23. Cleaning personal things frequently.	3.46	1.04
24. Avoiding travel to risky areas.	4.07	1.03
25. Searching ways to protect yourself from COVID-19.	3.80	1.02
Overall	3.64	0.54

Note: * 5-point rating scale.

The mean attitude towards the self-protective behaviors after COVID-19 recovery was 4.56 (SD = 0.60). The mean of the subjective norm from friends, family members and influencers to perform self-protective behaviors after COVID-19 recovery was 3.95 (SD = 0.74). Lastly, the mean of self-efficacy to perform self-protective behaviors after COVID-19 recovery was 3.98 (SD = 0.56) as shown in Table 2.

Table 2. Mean and standard deviation among variables.

Variables	$\bar{X}$*	SD
Twitter	3.50	1.03
Facebook	3.42	1.04
LINE	3.21	1.02
Tiktok	3.28	0.98
Instagram	3.17	1.01
YouTube	3.34	1.08
Self-protective behaviors	3.64	0.54
Attitude towards the self-protective behaviors	4.56	0.60
Subjective norm	3.95	0.74
Self-efficacy	3.98	0.56

Note: * 5-point rating scale.

4.3. The effect of Social Networking Sites (SNS) after COVID-19 Recovery

Multiple regression analysis (MRA) was performed to examine the effect of social networking sites (SNS) on strengthening self-protective behaviors after COVID-19 recovery among Thai working-aged populations. The effectiveness of indicators in this study consists of four variables based on the theory of planned behavior [TPB] (self-protective behaviors, attitude towards the self-protective behaviors, subjective norm and self-efficacy). The standardized regression coefficients (β) and *t*-statistic were used for this analysis. Before analysis, checking the problem of multicollinearity was performed by considering all correlations among independent variables. The results found that all correlations in this study were less than 0.60. This range of correlation coefficients was considered an acceptable level without the problem of multicollinearity (Hair et al., 1992).

H_1: Social networking sites (SNS) affect self-protective behaviors after COVID-19 recovery.

After multiple regression analysis had been performed, the results found that there were 2 independent variables affecting self-protective behaviors after COVID-19 recovery significantly. They are YouTube (**β** = .275) and Facebook (**β** = .182) as shown in Table 3. Besides, all social networking sites *(SNS)* can significantly co-predict self-protective behaviors after COVID-19 recovery at 18.1 percent (adjusted R^2 = 0.181).

Table 3. Multiple regression analysis of self-protective behaviors after COVID-19 recovery.

Independent variables	β	*T*
1. Twitter	0.092	1.720
2. Facebook	0.182	3.415*
3. LINE	0.079	1.260
4. Tiktok	0.078	1.168
5. IG	0.004	0.056
6. YouTube	0.275	4.328*
Adjusted R^2= 0.181 ,F= 15.729,Sig.=0.00*		

Note: *Statistically significant at 0.05 significance level.

H_2: Social networking sites (SNS) affect attitudes towards self-protective behaviors after COVID-19 recovery.

After multiple regression analysis had been performed, the results found that there were 2 independent variables affecting attitude towards self-protective behaviors after COVID-19 recovery significantly. They are Twitter (**β** = .237), Facebook (**β** = .198), and Tiktok (**β** = .119). Besides, all social networking sites *(SNS)* can significantly predict attitudes towards self-protective behaviors after COVID-19 recovery at 19.1 percent (adjusted R^2 = 0.191) as shown in Table 4.

Table 4. Multiple regression analysis of attitude towards self-protective behaviors after COVID-19 recovery.

Independent variables	β	*T*
1. Twitter	0.237	3.724*
2. Facebook	0.198	3.629*
3. LINE	0.079	1.302
4. TikTok	0.119	2.105*
5. IG	0.016	0.235
6. YouTube	0.084	1.278
Adjusted R^2 =0.191, F =15.452,Sig.=0.00*		

Note: *Statistically significant at the 0.05 significance level.

H_3: Social networking sites (SNS) affect subjective norms to perform self-protective behaviors after COVID-19 recovery.

The results found that there were 2 independent variables affecting subjective norms from friends, family members and influencers to perform self-protective behaviors after COVID-19 recovery significantly after multiple regression analysis had been performed. They are Twitter (β = .206) and LINE (β = .145). Besides, all social networking sites (SNS) can significantly predict subjective norms from friends, family members and influencers to perform self-protective behaviors after COVID-19 recovery at 21.8 percent (adjusted R^2 = 0.218) as shown in Table 5.

Table 5. Multiple regression analysis of subjective norms to perform self-protective behaviors after COVID-19 recovery.

Independent variables	β	*T*
1. Twitter	0.206	3.648*
2. Facebook	0.119	1.796
3. LINE	0.145	2.204*
4. Tiktok	0.011	0.167
5. IG	0.005	0.093
6. YouTube	0.111	1.671
Adjusted R^2 = 0.218, F=19.543,Sig.=0.00*		

Note: *Statistically significant at the 0.05 significance level.

H_4: Social networking sites (SNS) affect self-efficacy to perform self-protective behaviors after COVID-19 recovery.

After multiple regression analysis had been performed, the results found that there were 2 independent variables affecting self-efficacy to perform self-protective behaviors after COVID-19 recovery significantly. They are YouTube (β = .288) and LINE (β = .165). Besides, all social networking sites (SNS) can significantly co-predict self-efficacy to perform self-protective behaviors after COVID-19 recovery at 20.1 percent (Adjusted R^2 = 0.201) as shown in Table 6.

Table 6. Multiple regression analysis of self-efficacy to perform self-protective behaviors after COVID-19 recover.y

Independent variables	β	*T*
1. Twitter	0.104	1.810
2. Facebook	0.031	0.472
3. LINE	0.165	2.721*
4. Tiktok	0.098	1.423
5. IG	0.125	1.949
6. YouTube	0.288	4.524*
Adjusted R^2 = 0.201, F=17.722, Sig.=0.00*		

Note: *Statistically significant at the 0.05 significance level.

5. DISCUSSION

The author found that self-protective behavior after recovery from COVID-19 to prevent the post-COVID-19 condition (long COVID) in the working population was considered high (mean = 3.64, S.D. = 0.54) based on the

findings. This result showed that the samples were still aware of the problems with COVID-19 that they received during the peak of the pandemic during the last 2-3 years. This new COVID-19 pandemic affects the daily lives and negative health conditions of Thai people and their families. In addition, the top three self-protective behaviors after recovering from COVID-19 were 1) vaccination against COVID-19 (mean =4.72), 2) wearing a face mask outside (mean = 4.39) and 3) quarantine after touching a case of COVID-19 (mean =4.33). This was due to active and continuous social marketing communication campaigns by the Thai governments and several health organizations which often chose these three practices to promote self-protective behaviors both in the primary prevention of COVID-19 and after recovery from COVID-19. Thus, these findings indicated that these health communication campaigns were effective and quite satisfactory. However, it should be noted that the three lowest self-protective behaviors after recovering from COVID-19 to avoid the post-COVID-19 condition 1) carefully monitored the information about COVID-19 (mean = 2.58), 2) using the face mask when family members become infected (mean = 2.84), and 3) closing the toilet when using the toilet to prevent the spread of virus (mean =2.98) based on the results. Therefore, the Thai government and health organization should promote these practices more to strengthen the self-protective behavior of the working-age population after recovering from COVID-19. Additionally, when considering the exposure to social networking sites (SNS) to enhance self-protective behaviors among the Thai working-age population after recovery from COVID-19, the author found that Twitter (Mean=3.50), Facebook (mean = 3.42) and YouTube (mean =3.34) are the three most popular social networks (SNS). Therefore, Thai social marketers or health communication professionals should use more such social networking sites (SNS) to promote self-protective behaviors after recovering from COVID-19. These results were consistent with other previous studies that support the use of social networks (SNS) to improve self-protective behaviors both in the initial phase of prevention of COVID-19 and in the recovery phase of COVID-19 infection (Asnakew et al., 2020; Elbarazi et al., 2022; Gómez-Galán et al., 2020; Kwok et al., 2022; Lieneck et al., 2022; Seiter & Brophy, 2022; Tsoy et al., 2022; Xin et al., 2021). Social networking sites can be used to share accurate and updated information about COVID-19, including symptoms, prevention strategies, vaccination information and testing locations. Health organizations and government agencies can use social media to reach a wide audience and fight misinformation. Social media campaigns can be designed to raise awareness of COVID-19 preventive measures both in the early stages of preventing COVID-19 and in the recovery phase of a COVID-19 infection such as wearing masks, practicing physical distancing, washing hands and vaccination. These campaigns can include online contents such as infographics, videos and testimonials to effectively convey messages. In addition, social networking sites (SNS) allow for real-time updates allowing health organizations and government agencies to share important updates such as changes in guidelines, vaccine availability and local restrictions. This helps ensure that the public receives accurate and timely information. In addition, social media influencers can use their platforms to promote responsible behavior after recovering from COVID-19. Partnering with influencers who have significant followings can help reach different audiences and encourage them. The use of traditional media or offline media to promote health behaviors among the working population may no longer relevant because they do not use or interact with traditional media in their daily lives (Gómez-Galán et al., 2020). In the past, social marketing communication campaigns for health promotion used traditional media, often referred to as offline media such as television, radio, newspapers and magazines (Kotler & Lee, 2008). However, in the era of the Internet of Things (IoT) with the growth of online media, social marketing communication practitioners and health communication practitioners worldwide are using online media in their campaigns to reach more and more target groups (Lee, 2020). Social marketing campaigns have used online media to promote social behavior especially health behaviors (Kotler & Lee, 2008; Lee, 2020; McKenzie-Mohr, 2000; Vantamay, 2019). Therefore, both public and private health organizations in many countries use this media in social marketing campaigns to promote healthy behaviors (Asnakew et al., 2020; Lieneck et al., 2022; Tsoy et al., 2022).

In addition, the author found that most social networking sites (SNS) (Twitter, Facebook, LINE, Tiktok and YouTube) had a significant effect on activity after recovery from COVID-19 as shown in Tables 3-6 based on the results of multiple regression analysis. Therefore, if social marketers want to create a communication campaign to promote self-protective behavior after recovery from COVID-19 to prevent post-COVID-19 (ongoing COVID-19) among the Thai working-age population, they should use YouTube and Facebook more than other social networks (SNS). If they want to change attitudes towards self-protective behavior after recovery from COVID-19, Twitter, Facebook and Tiktok should be a priority. In addition, Twitter and LINE are more suitable social media for communication campaigns or health education to promote a subjective norm in self-protection behavior after recovery from COVID-19. Finally, if a social marketer wants to conduct a communication campaign to promote self-efficacy and protective behavior after recovery from COVID-19, YouTube and LINE are likely to be more effective than other social networks (SNS). This social media can foster a sense of community by facilitating conversations, sharing personal experiences and providing support. Platforms such as Facebook groups or Twitter chats can be used to create communities focused on resources to recover from COVID-19 where members can exchange information, ask questions and support each other. In addition, social networking sites (SNS) can be used to combat the spread of misinformation about COVID-19 known as the infodemic. Health organizations and experts can share accurate information, address common myths and expose false claims through posters, videos and infographics. The author believes that social media can be an effective tool to promote mental health and wellness during a pandemic. Sharing resources, self-care tips and encouraging open conversations about mental health can help people face the challenges of COVID-19. These results are very useful and practical for Thai governments, health policy makers, social marketers, health promoters or even people in health organizations to promote or strengthen self-protective behaviors after recovery from COVID-19 to prevent post-COVID-19 conditions (long COVID) in the working age population. In addition, the author also supports the theory of planned behavior (TPB) variables as effective indicators for the prevention of COVID-19 in the recovery phase (Ajzen, 1988). Finally, the author believes that if Thailand continues to promote resources after recovery from COVID-19 by using social networking sites (SNS) in a social marketing communication campaign for the working-age population in Thailand, the situation of the COVID-19 pandemic will improve and the chance of another wave of outbreaks will decrease, although viruses have always changed.

However, this study had one limitation that must be acknowledged. This can come from an online questionnaire that evaluates the effectiveness of social networking sites (SNS). This limitation may lead respondents to over-report their behavior which may be due to feelings of shame or guilt after recovering from COVID-19. Despite this limitation, the strength of this study was to extend existing knowledge about the use of social networking sites (SNS) in the management of health promotion, health education or health communication, especially in Thailand. For further research directions, the author proposed two possible paths. First, population groups vulnerable to COVID-19, such as children, the elderly and pregnant women should be studied in more detail. Second, further research is needed to develop guidelines for content design on social networking sites as part of a health information campaign to reinforce self-protective behaviors after recovery from COVID-19 on each online platform. This is still more needed in Thailand.

6. CONCLUSION

This study aimed to investigate the effects of social networking sites (SNS) on strengthening self-protective behaviors after COVID-19 recovery to prevent post-COVID-19 conditions (long COVID) in the working-age population after the peak pandemic in Thailand. The effectiveness indicators in this study are composed of four variables based on the theory of planned behavior (TPB) (self-protective behaviors after COVID-19 recovery, attitude towards the self-protective behaviors after COVID-19 recovery, subjective norm to perform self-protective behaviors after COVID-19 recovery and self-efficacy to perform self-protective behaviors after COVID-19

recovery). The samples in this study included 400 working-aged people aged 15-60 years old. Most samples were female (60.6%). The average age was 29.98 years (SD = 0.92). The main findings from analyzing all studied variables by using mean and standard deviation showed that the exposure mean of social networking sites (SNS) to promote self-protective behaviors after COVID-19 recovery among samples were as follows : Twitter (mean = 3.50, SD = 1.03), Facebook (mean = 3.42, SD = 1.04), LINE (mean = 3.21, SD = 1.02), Instagram (mean = 3.17, SD = 1.01), Tiktok (mean = 3.28, SD = 0.98), and YouTube (mean = 3.34, SD = 1.07). Besides, the overall mean of 25-item self-protective behaviors after COVID-19 recovery was 3.64 (SD = 0.54). The mean attitude towards the self-protective behaviors after COVID-19 recovery was 4.56 (SD = 0.60). The mean of the subjective norm from friends, family members and influencers to perform self-protective behaviors after COVID-19 recovery was 3.95 (SD = 0.74) and the mean of self-efficacy to perform self-protective behaviors after COVID-19 recovery was 3.98 (SD = 0.56). Additionally, when effects of social networking sites (SNS) on strengthening self-protective behaviors after COVID-19 recovery to prevent post COVID-19 condition (long COVID) were analyzed by using multiple regression analysis (MRA) at the .05 level of significance, The findings showed that 1) YouTube (β = .275) and Facebook (β = .182) affect self-protective behaviors after COVID-19 recovery, 2) Twitter (β = .237), Facebook (β = .198) and Tiktok (β = .119) affect attitude towards the self-protective behaviors after COVID-19 recovery, 3) Twitter (β = .206) and LINE (β = .145) affect subjective norm to perform self-protective behaviors after COVID-19 recovery, and 4) YouTube (β = .288) and LINE (β = .165) affect self-efficacy to perform self-protective behaviors after COVID-19 recovery significantly.

7. POLICY SUGGESTIONS

The contribution of this research is to increase and expand knowledge of using social networking sites (SNS) to strengthen self-protective behaviors after COVID-19 recovery to prevent post COVID-19 conditions (long COVID) in the working-age population and to give beneficial and practical implications at the policy-level for both practitioners and academics in health promotion planning more effectively.

For practitioners in the health promotion section both at the national and international level including governments, social marketers and health professionals in the community, they can take the findings from this study to utilize for health communication planning. Consequently, they can design a social media plans and strategies for strengthening self-protective behaviors after COVID-19 recovery to prevent the post-COVID-19 conditions (long COVID) more effectively. According to research findings, if they want to promote self-protective behaviors after COVID-19 recovery, YouTube and Facebook should be used in health promotion campaign because these social media affect self-protective behaviors significantly. However, if they want to increase positive attitude towards self-protective behaviors after COVID-19 recovery, communication through Twitter, Facebook and Tiktok should be implemented. Additionally, if they want to change the subjective norm from friends, family members and influencers to perform self-protective behaviors after COVID-19 recovery using Twitter and LINE should be more emphasized. Lastly, they should use YouTube and LINE in social marketing communication campaigns to promote self-efficacy performs self-protective behaviors after COVID-19 recovery. Furthermore, national and local governments or private training agencies should have more short courses in the aspect of using social networking sites (SNS) for social marketers and health professionals. It will help boost skills in health communication for these health promotion practitioners. As a result, these skills have benefits not only for strengthening self-protective behaviors after COVID-19 recovery to prevent post-COVID-19 conditions (long COVID) but also for promoting any other health behaviors as well.

This study was considered multidisciplinary research because it integrates knowledge both in health sciences and social sciences for academics in health sciences, humanities and social sciences. Moreover, it extends knowledge in the field of social marketing for health promotion especially on strengthening self-protective behaviors after COVID-19 recovery to prevent post-COVID-19 conditions (long COVID) in the working-age population. Besides,

the outcomes of the research support the theory of planned behavior (TBB) as an effective indicator of COVID-19 prevention in the recovery stage. For future research, academics who are interested in formative and summative evaluation can also apply the variables in this theory (health behaviors, attitude, subjective norm and self-efficacy) as the effective indicators of other health communication campaigns. It will also help create and disseminate more multidisciplinary and cutting-edge knowledge to academics in the fields of health sciences, humanities and social sciences more effectively.

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Transparency: The author states that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
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