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Factors associated with fear of COVID-19 among people living with HIV/AIDS in Suphanburi province, Thailand

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Abstract

Aim: To investigate fear of COVID-19 and related factors among Thai people living with HIV (PLHIV).

Methods: This cross-sectional survey was conducted among 204 participants using an online convenience sampling method. Data were collected using a demographic characteristics form, the knowledge, attitudes, and practices toward COVID-19 questionnaire, and the Fear of COVID-19 scale (FCV-19S). Data were analyzed using descriptive and inferential statistics.

Results: The sample consisted of 204 Thai PLHIV (47.1% female and 52.9% male). Knowledge level about COVID-19 in 94.83% of the participants was acceptable, and 85.3% of them had confidence about successful control of COVID-19 in Thailand; and 99.5% wore a mask when leaving home in recent days. Fear of COVID-19 was at a mild level. COVID-19 fear scores were significantly higher in those 60 years old and over, and those who had a family member or close friend who was sick due to COVID-19. Knowledge and preventive practice were significantly related to FCV-19S scores. Age, knowledge, and preventive practice regarding COVID-19 were the influencing factors in fear of COVID-19 (adjusted $R^2 = 0.281$, $F = 6.221$, $p < .05$).

Conclusions: COVID-19 pandemic has significantly influenced fear among PLHIV. Our findings might be useful for healthcare professions to develop effective campaigns to minimize the fear of COVID-19 in potential future pandemics.

KEYWORDS
attitude, COVID-19, fear, knowledge, PLHIV, practice

1 | INTRODUCTION

Thailand was one of the Asian countries hit hardest by the HIV/AIDS epidemic since the late 1980s. HIV/AIDS epidemic has become a public health concern and has globally affected 38 million people, 690,000 of them dying from AIDS-related illness (World Health Organization [WHO], 2020). In 2019, nearly 6 million people were living with HIV (PLHIV) in Asia and the Pacific region. It

has been clear that Asia and the Pacific region is falling behind regions in Africa in its HIV response. In 2019, approximately 160,000 people died due to an AIDS-related illness in Asia and the Pacific region (UNAIDS, 2019). In Thailand, a generalized HIV epidemic trajectory appears to be increasing, and as of 2019, there were 470,000 PLHIV in Thailand and there were 14,000 AIDS-related deaths (Global information and education on HIV/AIDS in Thailand, 2019).

During a global and local effort to end the HIV epidemic, the novel coronavirus disease-2019 (COVID-19) has emerged. As a result, as of June 24, 2021, there were 179,928,730 cases of COVID-19 in over 200 countries and 3,898,531 deaths with a 2.17% case fatality rate (Johns Hopkins University of Medicine, 2021). Toward the end of June 2021, it was reported that Thailand had 232,647 cases of COVID-19, and 1,775 deaths with a 0.76% case fatality rate. The median age of those infected was 40.75 years (1 month to 97 years). The majority of the infected cases were of working age (31–49 years), with 75.01% female, and 38.86% living with diseases such as hypertension, diabetes, and cardiovascular disease (Department of Disease Control of Thailand, 2021).

To control the spread of COVID-19, Thailand has set up the Center for COVID-19 Situation Administration (CCSA) to manage and work with related sectors from society. To get collaboration, the CCSA daily communicates with Thai people via Thai television channels and report on the COVID-19 situation in Thailand (Srisawat et al., 2021). The CCSA has advised the public to seriously take DMHTT (Distancing, Mask wearing, Hand washing, Temperature checking, and Thai Chana) application usage precautions to prevent COVID-19. The Thai government is also urging Thai people to avoid public gatherings and stay at home except for emergency reasons (Srichannil, 2020). Considering the threat of COVID-19 super-spread in Thailand, the Thai Ministry of Public Health (MOPH) has initiated surveillance at public and private hospitals across the country. Subsequently, the Thai government has announced a countrywide lockdown which came into effect from March 26, 2020, and affects all aspects of Thai society including healthcare services.

Effective management and necessary measures to alleviate COVID-19 transmission require serious support from individuals at risk. Knowledge, attitude, and practice (KAP) regarding COVID-19 were discovered to have great impacts on individuals' emotions. Recent studies showed that among the general population, KAP was significantly associated with fear of COVID-19 during the pandemic (Elsharkawy & Abdelaziz, 2021; Ghaderi et al., 2021). Understanding the influence of KAP on fear of COVID-19 levels may help healthcare providers design an appropriate program for better fear management in vulnerable populations, including PLHIV.

Currently, COVID-19 has globally spread and has affected all communities, both physically and psychologically (Roy et al., 2020). The emergence of COVID-19 is assumed to function in a syndemic framework. That is two or more epidemics interacting synergistically to produce an increased burden of disease in the PLHIV population. They will face several health challenges including HIV itself, chronic non-communicable diseases, mental health burden, substance abuse, and other infections (Shiau et al., 2020). Compared to other populations, PLHIV are considered as a high-risk vulnerable population for developing complications attributed to COVID-19 infection (Gatechompol et al., 2021). Generally, mental health burdens among PLHIV are more than twice as common compared to HIV-negative people (Basha et al., 2019). Mental health problems may be exacerbated by fear of COVID-19 due to physical distancing during the rising period of the pandemic; and might have adverse effects on antiretroviral therapy (ART) adherence (Ballivian et al., 2020). The pandemic of COVID-19 can induce fear among PLHIV. It is important to assess the level of fear of COVID-19 among them so that they would be able to successfully cope with this emotion. Although recent literature contains studies on mental health challenges attributed to COVID-19 risk in many groups, literature addressing fear of COVID-19 among PLHIV is limited. To our knowledge, fear of COVID-19 among PLHIV has not been investigated yet in Thailand.

Therefore, this study aimed to examine the relationships between selected demographic variables, knowledge of, attitudes toward, preventive practice regarding COVID-19, and fear of COVID-19. This study also explored the influencing factors of fear of COVID-19 in Thai PLHIV.

2 | METHODS

2.1 | Study design, setting, and participants

A cross-sectional survey was conducted in January 2021 among Thai PLHIV through a web-based survey because it was not feasible to do a clinic-based sampling survey during the government-imposed lockdown in Thailand. A simple random sampling technique was used to recruit participants who had access to an ART clinic housed in Dermbangnangbuach Hospital, Suphanburi province, Thailand. The researchers created a questionnaire link using a Google survey tool and shared it via a social networking site (Line application). Because PLHIV in this clinic have joined a Line group to discuss their health issues with peers, and healthcare providers and nurses working in the ART clinic, hence, participants have an equal chance and likelihood of being selected in the sample. Inclusion criteria included male and female Thai PLHIV who were: (a) 18 years or older; (b) understanding the study purpose; (c) a social media user and be able to access to the internet; and (d) willing to voluntarily participate in this study. Using the G* power program (Faul

et al., 2007) for sample size calculation, effect size of 0.20, alpha of .05, and power of test as 0.80 determined that a sample size of 191 would be sufficient. Out of 310 PLHIV, a total of 204 participants completed the survey questionnaires, and all were taken for final analysis.

2.2 | Instruments

A set of questionnaires employed in this study contained questions assessing demographic characteristics (gender, age, marital status, education, employment status, monthly income, duration on ART, having family member or close friend who got sick due to COVID-19, and source of information regarding COVID-19), KAP regarding COVID-19, and fear of COVID-19.

2.2.1 | KAP toward COVID-19 questionnaire

The KAP toward COVID-19 scale used in the study was initially developed in English by Zhong and colleagues (Zhong et al., 2020) consisting of KAP toward COVID-19. This questionnaire contains 16 items consisting of three distinct subscales: knowledge (e.g., the main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and myalgia), attitude (e.g., do you agree that COVID-19 will finally be successfully controlled?), and preventive practice toward COVID-19 (e.g., in recent days, have you worn a face mask when leaving home?) A COVID-19 knowledge subscale had 12 questions (K1-K12): four regarding clinical presentations, three regarding transmission routes, and five regarding prevention and control of COVID-19. The items on the scale were arranged in a three-category response format (true, false, and do not know). Each correct response was given a point value of 1. The do not know responses were not assigned a value. The total knowledge score was computed from the correct responses ranging from 0 to 12, with a higher score indicating greater COVID-19 knowledge. Based on the total number of correct answers, they were categorized into two groups (sufficient knowledge with 9 or more out of 12; and insufficient knowledge with 8 or less than 8 correctly answered questions). The score of 9/12 was chosen as the fifth percentile of the score range (Biddle, 1993). In the second subscale, we evaluated attitude toward COVID-19 using two questions (A1-A2) regarding the agreement on the final control of COVID-19 and the confidence in winning the battle against COVID-19. In the third subscale, we assessed practices toward COVID-19 using two items (P1-P2): going to a crowed place and wearing a face mask when going out in recent days. The KAP toward COVID-19 scale-Thai

version has been shown to be reliable and valid; the Cronbach's alpha coefficient of this scale was .81, indicating acceptable internal consistency (Taber, 2018).

Fear of COVID-19 scale (FCV-19S)

Fear of COVID-19 scale (FCV-19S) was developed by Ahorsu et al. (2020). It is a seven-item questionnaire that examines only one dimension structure of fear of the COVID-19 pandemic. It is a five-point Likert-type rating scale ranging from 1-strongly disagree to 5-strongly agree. The score on the scale varies between 7 and 35. The higher the score, the greater the level of fear of COVID-19. Fear of COVID-19 was classified into three levels: mild (score < 14), moderate (score 14 to 28), and severe (score > 28) (Malik et al., 2021). The reliability of the FCV-19S in the current study was acceptable (Cronbach's alpha = .78).

For this study, both the KAP toward COVID-19 scale and the FCV-19S complied with the forward and back-translation into Thai by a bilingual Thai researcher and sent to two renowned bilingual Thai nurse scientists to examine the difference and suitability of the questionnaires. Subsequently, a pilot study was conducted before the commencement of the current research.

Data collection

Data collection was conducted via a structured questionnaire. This was developed using a Google survey tool (Google Forms), with a consent form attached to it. A link of online questionnaires was sent through the networks of the participants via Line application, the most popular and mostly used social media in Thailand. Upon receiving and clicking the link, the participants were automatically led to the study information and informed consent. After agreeing to take the online survey, they filled in their socio-demographics characteristics. Then, a set of online questionnaires consecutively appeared, which the participants were supposed to answer and complete. Since this was the online survey study, only the participants with access to the internet either on their smart phones or home use internet would be able to participate in the study.

Data management and data analysis

Data was captured electronically on an Excel sheet. Statistical Package for the Social Sciences (SPSS version 23.0 for Windows) was used for analyzing the data. Descriptive statistics (mean, SD, percentage, and frequency distribution) were performed to describe the variables. Before conducting the analysis, basic assumptions of the regression analysis were computed. To confirm the normality of data, skewness and kurtosis were calculated. Tolerance and variance inflation factor were examined to identify multicollinearity issues. It revealed that multicollinearity was not a serious problem. Then, the

main analyses were conducted. The data with normal distribution were analyzed using independent t test to compare two groups and one-way analysis of variance (ANOVA) for more than two groups. Pearson's correlation coefficient was also used to examine the relationships between the variables. Multivariable linear regression was used to identify factors associated with fear of COVID-19 and the proportion of variance in fear of COVID-19 explained by these variables. All variables that were found to be significantly associated with fear of COVID-19 in ANOVA and correlation analyses were entered into the model as independent variables. All statistical tests were two-tailed, and a statistical significance value was set at $p < .05$. The independent variables of the study were gender, age, marital status, education, employment status, monthly income, duration on ART, having a family member or close friend who got sick due to COVID-19, and resources for information on COVID-19. The dependent variable of the study was FCV-19S scores.

Ethical considerations

This study was approved by the Institutional Review Board (IRB) of the College of Nursing, Suphanburi, Thailand (IRB No. 045/2563). Participants were shown a short paragraph about the study procedures at the beginning of the survey. In this study, all participants provided informed electronic consent to anonymously participate in the study. Then, the participants were invited to complete the survey.

3 | RESULTS

3.1 | Demographic characteristics

Of the 204 PLHIV who completed the survey, 108 (52.9%) were male and 60.3% of the participants were between 30–49 years of age. Approximately 60% were single, and more than half of the participants (55.4%) finished primary school. Most of them (91.7%) were employed. Most of the participants reported monthly income less than 5000 Thai Baht, and nearly 57% reported having been on ART for more than 5 years. About 28.9% of the participants reported they had a family member or close friend who got sick due to COVID-19. About 30.9% reported using social media as the most common source of information toward COVID-19 (Table 1).

3.2 | Distribution of KAP toward COVID-19

Table 2 shows the descriptive analysis of KAP score. The correct answer rates of the 12 questions on the

TABLE 1 Demographic characteristics of study participants ($N = 204$)

Characteristics	n	%
Gender		
Male	108	52.9
Female	96	47.1
Age in y		
18–29	13	6.4
30–49	123	60.3
50–59	50	24.5
≥ 60	18	8.8
Marital status		
Single	122	59.8
Married	77	37.7
Others (divorced, separated, and widowed)	5	2.5
Education		
Primary school	113	55.4
Secondary school	59	28.9
High school	11	5.4
Vocational school	4	2.0
Diploma	5	2.5
Bachelor	12	5.9
Employment status		
Employed	187	91.7
Unemployed	17	8.3
Monthly income (in Bahts, 32 Bahts = $US1)		
< 5,000	108	52.9
5,001-10,000	62	30.4
10,001-20,000	22	10.8
20,001-30,000	8	3.9
> 30,000	4	2.0
Duration on antiretroviral therapy in y		
< 1	28	13.7
1–5	60	29.4
> 5	116	56.9
Having family member/close friend who got sick due to COVID-19		
Yes	59	28.9
No	145	71.1
Resources for information on COVID-19		
Scientific resource	43	21.1
Inner circle	33	16.2
Social media	63	30.9
Visual media	52	25.5
Printed media	13	6.4

TABLE 2 Distribution of knowledge, attitude, and preventive practice toward COVID-19 scores among people living with HIV (N = 204)

Variables Knowledge (K)	Mean	SD	Correct[a]	Incorrect[a]	
K1. The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and myalgia.	0.91	0.29	185 (90.7)	19 (9.3)	
K2. Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus.	0.92	0.27	188 (92.2)	16 (7.8)	
K3. There currently is no effective cure for COVID-19, but early symptomatic and supportive treatment can help most patients recover from the infection.	0.98	0.14	200 (98.0)	4 (2.0)	
K4. Not all persons with COVID-2019 will develop to severe cases. Only those who are elderly, have chronic illnesses, and are obese are more likely to be severe cases.	0.91	0.28	186 (91.2)	18 (8.8)	
K5. Eating or contacting wild animals would result in the infection by the COVID-19 virus.	0.92	0.27	188 (92.2)	16 (7.8)	
K6. Persons with COVID-19 cannot infect the virus to others when a fever is not present.	0.88	0.32	180 (88.2)	24 (11.8)	
K7. The COVID-19 virus spreads via respiratory droplets of infected individuals.	0.96	0.19	196 (96.1)	8 (3.9)	
K8. Ordinary residents can wear general medical masks to prevent infection by the COVID-19 virus.	0.98	0.15	199 (97.5)	5 (2.5)	
K9. It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus.	0.87	0.34	177 (86.8)	27 (13.2)	
K10. To prevent the infection by COVID-19, individuals should avoid going to crowded places such as train stations and avoid taking public transportation.	0.94	0.24	192 (94.1)	12 (5.9)	
K11. Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus.	0.98	0.14	200 (98.0)	4 (2.0)	
K12. People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the observation period is 14 days.	0.98	0.15	199 (97.5)	5 (2.5)	
Total knowledge score	11.38 (1.54)[b]				
Attitude (A)	**Mean**	**SD**	**Agree[a]**	**Disagree[a]**	**Do not know[a]**
A1. Do you agree that COVID-19 will finally be successfully controlled?	0.82	0.38	168 (82.4)	36 (17.6)	0 (0)
			Yes[a]	No[a]	
A2. Do you have confidence that Thailand can win the battle against the COVID-19 virus?	0.85	0.35	174 (85.3)	30 (14.7)	
Total attitude score	1.69 (0.69)[b]				
Practice (P)	**Mean**	**SD**	**Yes[a]**	**No[a]**	
P1. In recent days, have you gone to any crowded place?	0.17	0.38	35 (17.2)	169 (82.8)	
			Yes[a]	No[a]	
P2. In recent days, have you worn a mask when leaving home?	1.00	0.07	203 (99.5)	1 (0.5)	
Total practice score	1.72 (1.83)[b]				

[a]n (%).
[b]Mean (SD).

TABLE 3　Fear of COVID-19 among people living with HIV ($N = 204$)

Items	Average score Mean	SD	Strongly disagree n	%	Disagree n	%	Neutral n	%	Strongly n	%	Strongly agree n	%
1. I am most afraid of Corona.	1.78	0.41	111	54.4	46	22.5	33	16.2	8	3.9	6	2.9
2. It makes me uncomfortable to think about Corona.	1.69	0.97	114	55.9	56	27.5	23	11.3	5	2.5	6	2.9
3. My hands become clammy when I think about Corona.	1.51	0.78	123	60.3	67	32.8	7	3.4	4	2.0	3	1.5
4. I am afraid of losing my life because of Corona.	1.56	0.84	121	59.3	64	31.4	11	5.4	4	2.0	4	2.0
5. When I watch news and stories about Corona on social media, I become nervous or anxious.	1.55	0.85	122	59.8	64	31.4	10	4.9	3	1.5	5	2.5
6. I cannot sleep because I'm worrying about getting Corona.	1.54	0.84	123	60.3	63	30.9	10	4.9	4	2.0	4	2.0
7. My heart races or palpitates when I think about getting Corona.	1.50	0.81	125	61.3	64	31.4	8	3.9	3	1.5	4	2.0
Total score	11.16	5.65										

COVID-19 knowledge questionnaire were 86.8–98%. The overall mean knowledge score was 11.38 ($SD = 1.53$; range $= 0$–12), suggesting an overall 94.83% (11.38 /12*100) correct rate on this knowledge test. The majority (98%) of the participants knew that isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus. Most participants (98.0%) also knew that there currently is no effective cure for COVID-19, but early symptomatic and supportive treatment can help most patients recover from the infection. The overall mean attitude score of the participants was 1.69 ($SD = 0.69$). About 82.4% agreed that COVID-19 will finally be successfully controlled; and 85.3% of them were confident that Thailand can win the battle against COVID-19. The overall mean preventive practice score was 1.72 ($SD = 1.83$). Most participants had not gone to any crowded place (82.8%) and wore a mask when leaving home (99.5%) in recent days.

3.3 | Distribution of fear of COVID-19 among PLHIV

As shown in Table 3, an average score for each question on the FCV-19S varied between 1.50 ± 0.81 and 1.78 ± 1.04 while the average total score was 11.16 ± 5.65.

3.4 | Fear of COVID-19 among PLHIV according to the descriptive characteristics

As shown in Table 4, FCV-19S scores were statistically significantly higher in those 60 years and over, and those who

had a family member or close friend who got sick due to COVID-19 ($p < .05$). There was no significant relationship between FCV-19S scores, gender, marital status, education, employment status, monthly income, duration on ART, and resources for information on COVID-19 ($p > .05$).

3.5 | Relationships between KAP regarding COVID-19 and fear of COVID-19

The correlations between the studied variables are shown in Table 5. There was a negatively significant correlation between knowledge of COVID-19 and fear of COVID-19 ($r = .168$, $p < .05$). Also, preventive practice of COVID-19 was positively significantly related to fear of COVID-19 ($r = .167$, $p < .05$).

3.6 | Factors influencing fear of COVID-19

As shown in Table 6, multivariable linear regression statistics were used to examine the association and predictive ability between the independent variables and the dependent variable, fear of COVID-19. Results revealed that age, knowledge of COVID-19, and preventive practice regarding COVID-19 together explained 28.1% (adjusted $R^2 = 0.281$, $F = 6.221$, $p < .05$) of the total variance regarding fear of COVID-19 scores. Age ($B = 0.15$, $t = 2.46$, $p < .05$), knowledge of COVID-19 ($B = -0.40$, $t = -6.23$, $p < .05$), and preventive practice regarding COVID-19 ($B = 0.23$, $t = 3.64$, $p < 0.05$) were statistically significant factors influencing fear of COVID-19.

TABLE 4 Fear of COVID-19 among people living with HIV according to the descriptive characteristics ($N = 204$)

Descriptive characteristics	Mean (SD) of FCV-19S	p
Gender		
Male	11.12 (5.50)	$p = .93^b$
Female	11.19 (5.83)	
Age in y		
18–29	7.92 (2.28)	$p < .05^{*,a}$
30–49	11.04 (5.30)	
50–59	11.42 (5.82)	
≥ 60	13.55 (7.92)	
Marital status		$p = .06^a$
Single	10.84 (5.73)	
Married	11.29 (5.28)	
Others (divorced, separated, and widowed)	16.80 (6.97)	
Education		$p = .53^a$
Primary school	11.38 (5.26)	
Secondary school	10.50 (5.84)	
High school	9.27 (3.77)	
Vocational school	11.50 (5.44)	
Diploma	13.40 (5.12)	
Bachelor	12.91 (9.13)	
Employment status		$p = .12^b$
Employed	10.97 (5.55)	
Unemployed	13.17 (6.37)	
Monthly income (in Bahts, 32 Bahts = \$US1)		$p = .43^a$
< 5,000	10.86 (5.75)	
5,001-10,000	12.09 (5.87)	
10,001-20,000	10.77 (5.44)	
20,001-30,000	8.62 (3.11)	
> 30,000	12.00 (2.44)	
Duration on antiretroviral therapy in y		$p = .40^a$
< 1	9.82 (4.61)	
1–5	11.30 (6.18)	
> 5	11.41 (5.58)	
Having family member/ close friend who got sick due to COVID-19		
Yes	11.20 (6.11)	$p < .05^{*,b}$
No	11.14 (5.46)	
		$p = .13^a$

(Continues)

TABLE 4 (Continued)

Descriptive characteristics	Mean (SD) of FCV-19S	p
Resources for information on COVID-19		
Scientific resource	12.46 (5.56)	
Inner circle	12.03 (7.58)	
Social media	11.23 (5.44)	
Visual media	9.67 (4.62)	
Printed media	10.23 (3.85)	

$*p < .05$. [a]One-way analysis of variance was performed.
[b]Independent t test was performed.
Abbreviation: FCV-19S, Fear of COVID-19 scale.

TABLE 5 The relationships between knowledge of COVID-19, preventive practice regarding COVID-19 and fear of COVID-19 ($N = 204$)

Variables	Fear of COVID-19 correlation coefficient (r)	p
Knowledge of COVID-19	−0.421	$p < .05^*$
Preventive practice of COVID-19	0.167	$p < .05^*$

$*$Significance level at $p < .05$.

4 | DISCUSSION

Currently, the COVID-19 outbreak has dramatically changed people's lives. With scarce literature on COVID-19 at the beginning of the pandemic, information has gradually been updated and shifting over time with the amount of increased research. The significant results of this study suggested that three factors were important in explaining fear of COVID-19 among Thai PLHIV. These factors included age, knowledge of COVID-19, and preventive practice regarding COVID-19. These variables explained a significant amount of the variance in fear of COVID-19 among PLHIV in Thailand.

About 94.83% of the study participants were knowledgeable about COVID-19. Moreover, the participants showed optimistic attitudes toward the COVID-19 pandemic. As for preventive practice, the participants seriously adhered to precautionary measures to prevent COVID-19 infection, such as not going to crowded places and wearing a mask when leaving home. These findings are consistent with finding of a previous study conducted among Iranians (Ghaderi et al., 2021) using the same

Variables	B	SD	β	t	p	95% CI
(constant)	19.75	4.27	-	4.62	$p < .001$	[11.32, 28.17]
Age	1.19	0.48	.15	2.46	$p < .05*$	[0.237, 2.14]
Knowledge	−1.47	0.24	−.40	−6.23	$p < .05*$	[−1.94, −1.01]
Preventive practice	0.71	0.19	.23	3.64	$p < .05*$	[0.33, 1.10]

TABLE 6 Factors influencing fear of COVID-19 ($N = 204$)

Note: $R = 0.530$, $R^2 = 0.312$, Adjusted $R^2 = 0.281$, F = 6.221, $p < .05$.
*Significance level at $p < .05$.

questionnaire. This finding is also consistent with the study conducted among PLHIV in the ART clinic located in Kigali, Rwanda which found that most participants reported a high knowledge score, good attitude, and appropriate practice regarding COVID-19 (Iradukunda et al., 2021). Compared to the study done in the general population of Thailand during early period of the pandemic (Srichan et al., 2020), our participants reported higher scores of KAP. One explanation is that this study was conducted at the later stage of the COVID-19 pandemic. The COVID-19 pattern of morbidity has been reflected in public media worldwide. This has drawn the participants' attention and has great impacts on their KAP regarding COVID-19. In addition, social media was the most common information source of COVID-19 in the current study. Unsurprisingly, social media (i.e., Facebook, and Twitter) play an important role worldwide in diffusion of information and sensitizing people regarding the potential threat of COVID-19 pandemic (Tang et al., 2018). Hence, social media might be the appropriate platforms for control of the COVID-19 transmission.

Regarding fear of COVID-19, the participants reported a mild level of fear of COVID-19. This finding is congruent with the previous study conducted among an Indian population demonstrating that a significantly high number of the participants reported a low level of fear (Doshi et al., 2020). The finding of the present study could be attributed to a connectivity to regular updates and COVID-19 information distributed daily by the CCSA of Thailand via Thai television channels and social media such as YouTube, and Facebook (Srisawat et al., 2021). This might be the main contributing factor to mild levels of fear of COVID-19 among our participants.

According to the result of our study, older adults who were 60 years and over had higher fear scores. The explanation for this could be due to when the older adults realize that they are more susceptible to infection than their younger counterparts and that the effective treatment for COVID-19 remains limited, they might become fearful of being infected with it. Thus far, the clinical evidence reveals that both COVID-19 mortality and fatality rates are related to older age (Han et al., 2021; Leung, 2020).

This finding is in line with some recent studies indicating that older adults were more fearful of contracting COVID-19 than young people (Gokseven et al., 2021; Mistry et al., 2021; Yadav et al., 2021).

In addition, it was found that the participants who had a family member or close friend who got sick due to COVID-19 were more fearful than their counterparts. This could be explained by the fact that the participants were frightened and likely worried about their family member's or close friend's health status, the COVID-19 transmission to others in their family, and the uncertainty of disease progression. This is consistent with a previous study conducted among older adults in Bangladesh indicating that having a close friend or family member suffering from COVID-19 was significantly associated with fear of COVID-19 (Mistry et al., 2021).

Notably, our result showed a negative significant correlation between knowledge and fear of COVID-19. This was in line with a previous study indicating a negative relationship between knowledge about COVID-19 and fear of COVID-19 (Cerda & García, 2021). This could be explained by the fact that despite the increase of scientific publications related to COVID-19, many aspects of the disease have not yet been obviously determined including the origin of the virus, and the unavailability of the specific antiviral treatment options, leading to various arguments (Elsharkawy & Abdelaziz, 2021).

There is a positive significant association between preventive practice regarding COVID-19 and fear of COVID-19 among our participants. This finding concurs with a study done in Romania which reported that the practice of preventive behaviors regarding COVID-19 had a significant positive association with fear of COVID-19 (Iorga et al., 2021). The explanation might be that fear of COVID-19 may motivate people to engage in behaviors that prevent them from infection. This has been used to modify people's behavior on many topics (Tannenbaum et al., 2015) including preventive COVID-19 infection behaviors during a time of health crisis. Nevertheless, evidence from most studies nowadays came from the general population. Hence, their findings may not be replicable for PLHIV. Further studies are needed to clarify causal relationships between these variables.

5 | LIMITATIONS OF THIS STUDY

Several limitations of this study should be noted. First, this was an online survey and collected data using the Line application. Therefore, Thai PLHIV who participated in this study were only those with internet access. During the data collection period, it was not possible to conduct face-to-face interviews because of the COVID-19 pandemic. The online survey was a vital alternative for the current study. Second, this study used a cross-sectional study design and self-reported measures. Hence, it was difficult to establish the causal inferences. Third, this study was conducted among PLHIV in only one setting so that this might not allow generalizability of the findings to other locations. Lastly, data collection was conducted at the later stage of the COVID-19 pandemic in Thailand so that our findings might be different from the early period of the pandemic. Despite the limitations, findings of the current study have important implications for health care during the COVID-19 crisis. Healthcare providers may formulate and implement response plans to tackle the COVID-19 pandemic among PLHIV. Our study is the first step to define the level of fear of COVID-19.

6 | CONCLUSION

The main significance of this study was to provide preliminary evidence of the level of fear of COVID-19 observed in Thai PLHIV in a selected hospital. Our study revealed that Thai PLHIV possessed adequate knowledge of, demonstrated a positive attitude toward, and practiced appropriate preventive behaviors regarding COVID-19. They also reported a mild level of fear of COVID-19. The results suggest that fear level is high in those 60 years and over, and those who had a family member or close friend who got sick due to COVID-19. There were relationships between knowledge, preventive practice, and fear of COVID-19. Age, knowledge, and preventive practice regarding COVID-19 are predictors of fear of COVID-19. Caring for mental health among vulnerable groups should be a concern in the context of the COVID-19 pandemic.

CONFLICT OF INTEREST
The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS
Natawan Khumsaen contributed to conception and design, data analysis, data interpretation, and manuscript writing. Supannee Peawnalaw contributed to data collection. Both of the authors approved the final manuscript.

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REFERENCES

Ahorsu, D. K., Lin, C. Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. (2020). The fear of COVID-19 scale: Development and initial validation. *International Journal of Mental Health and Addiction*, *18*, 1–9. https://doi.org/10.1007/s11469-020-00270-8

Ballivian, J., Alcaide, M. L., Cecchini, D., Jones, D. L., Abbamonte, J. M., & Cassetti, I. (2020). Impact of COVID-19-related stress and lockdown on mental health among people living with HIV in Argentina. *Journal of Acquired Immune Deficiency Syndromes (1999)*, *85*(4), 475–482. https://doi.org/10.1097/QAI.0000000000002493

Basha, E. A., Derseh, B. T., Haile, Y., & Tafere, G. (2019). Factors affecting psychological distress among people living with HIV/AIDS at selected hospitals of north Shewa zone, Amhara region, Ethiopia. *AIDS Research and Treatment*, *2019*, 8329483. https://doi.org/10.1155/2019/8329483

Biddle, R. E. (1993). How to set cutoff scores for knowledge tests used in promotion, training, certification, and licensing. *Public Personnel Management*, *22*(1), 63–79. https://doi.org/10.1177/009102609302200105

Cerda, A. A., & García, L. Y. (2021). Factors explaining the fear of being infected with COVID-19. *Health Expectations: An International Journal of Public Participation in Health Care and health Policy*. *24*, 1–7. https://doi.org/10.1111/hex.13274

Department of Disease Control of Thailand. (2021). Covid-19 Infected Situation Reports. Retrieved from: https://covid19.ddc.moph.go.th/en.

Doshi, D., Karunakar, P., Sukhabogi, J. R., Prasanna, J. S., & Mahajan, S. V. (2020). Assessing coronavirus fear in Indian population using the fear of COVID-19 scale. *International Journal of Mental Health and Addiction*, *19*, 1–9. https://doi.org/10.1007/s11469-020-00332-x

Elsharkawy, N. B., & Abdelaziz, E. M. (2021). Levels of fear and uncertainty regarding the spread of coronavirus disease (COVID-19) among university students. *Perspectives in Psychiatric Care*, *57*(3), 1356–1364. https://doi.org/10.1111/ppc.12698

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175–191. https://doi.org/10.3758/bf03193146

Gatechompol, S., Avihingsanon, A., Putcharoen, O., Ruxrungtham, K., & Kuritzkes, D. R. (2021). COVID-19 and HIV infection co-pandemics and their impact: A review of the literature. *AIDS Research and Therapy*, *18*(1), 28. https://doi.org/10.1186/s12981-021-00335-1

Ghaderi, E., Mahmoodi, H., Sharifi Saqqezi, P., Ghanei Gheshlagh, R., Moradi, G., Shokri, A., Piroozi, B., Mohamadi Bolbanabad, A., & Ahmadi, A. (2021). Knowledge, attitudes, practices and fear of COVID-19 among Iranians: A quick online survey. *Health & Social Care in the Community*, *29*, 1–9. https://doi.org/10.1111/hsc.13382

Global information and education on HIV/AIDS in Thailand (2019). Retrieved from https://www.avert.org/professionals/hiv-around-world/asia-pacific/Thailand

Gokseven, Y., Ozturk, G. Z., Karadeniz, E., Sarı, E., Tas, B. G., & Ozdemir, H. M. (2021). The fear of COVID-19 infection in older people. *Journal of Geriatric Psychiatry and Neurology*, *34*, 1–7. https://doi.org/10.1177/08919887211002651

Han, M., Mahendran, R., & Yu, J. (2021). Associations between fear of COVID-19, affective symptoms and risk perception among community-dwelling older adults during a COVID-19 lockdown. *Frontiers in Psychology*, *12*, 638831. https://doi.org/10.3389/fpsyg.2021.638831

Iorga, M., Iurcov, R., & Pop, L. M. (2021). The relationship between fear of infection and insomnia among dentists from Oradea metropolitan area during the outbreak of Sars-CoV-2 pandemic. *Journal of Clinical Medicine*, *10*(11), 2494. https://doi.org/10.3390/jcm10112494

Iradukunda, P. G., Pierre, G., Muhozi, V., Denhere, K., & Dzinamarira, T. (2021). Knowledge, attitude, and practice towards COVID-19 among people living with HIV/AIDS in Kigali, Rwanda. *Journal of Community Health*, *46*(2), 245–250. https://doi.org/10.1007/s10900-020-00938-1

Johns Hopkins University of Medicine (2021). Corona virus resource center. In *COVID-19 dashboard by the Center for Systems Science and Engineering (CSSE)*. Johns Hopkins University. Retrieved from:. https://coronavirus.jhu.edu/map.html

Leung, C. (2020). Risk factors for predicting mortality in elderly patients with COVID-19: A review of clinical data in China. *Mechanisms of Ageing and Development*, *188*, 111255. https://doi.org/10.1016/j.mad.2020.111255

Malik, S., Ullah, I., Irfan, M., Ahorsu, D. K., Lin, C. Y., Pakpour, A. H., Griffiths, M. D., Rehman, I. U., & Minhas, R. (2021). Fear of COVID-19 and workplace phobia among Pakistani doctors: A survey study. *BMC Public Health*, *21*(1), 833. https://doi.org/10.1186/s12889-021-10873-y

Mistry, S. K., Ali, A., Akther, F., Yadav, U. N., & Harris, M. F. (2021). Exploring fear of COVID-19 and its correlates among older adults in Bangladesh. *Globalization and Health*, *17*(1), 47. https://doi.org/10.1186/s12992-021-00698-0

Roy, D., Tripathy, S., Kar, S. K., Sharma, N., Verma, S. K., & Kaushal, V. (2020). Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian Journal of Psychiatry*, *51*, 102083. https://doi.org/10.1016/j.ajp.2020.102083

Shiau, S., Krause, K. D., Valera, P., Swaminathan, S., & Halkitis, P. N. (2020). The burden of COVID-19 in people living with HIV: A Syndemic perspective. *AIDS and Behavior*, *24*(8), 2244–2249. https://doi.org/10.1007/s10461-020-02871-9

Srichannil, C. (2020). The COVID-19 pandemic and Thailand: A psychologist's viewpoint. *Psychological Trauma: Theory,* *Research, Practice and Policy*, *12*(5), 485–487. https://doi.org/10.1037/tra0000808

Srichan, P., Apidechkul, T., Tamornpark, R., Yeemard, F., Khunthason, S., Kitchanapaiboon, S., Wongnuch, P., Wongphaet, A., & Upala, P. (2020). Knowledge, attitudes and preparedness to respond to COVID-19 among the border population of northern Thailand in the early period of the pandemic: A cross-sectional study. *WHO South-East Asia Journal of Public Health*, *9*(2), 118–125. https://doi.org/10.4103/2224-3151.294305

Srisawat, N., Iamsirithaworn, S., Tantawichien, T., & Thisyakorn, U. (2021). COVID-19: Lessons from Thailand. *Annals of the Academy of Medicine, Singapore*, *50*(1), 96–98. https://doi.org/10.47102/annals-acadmedsg.2020408

Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, *48*, 1273–1296. https://doi.org/10.1007/s11165-016-9602-2

Tang, L., Bie, B., Park, S. E., & Zhi, D. (2018). Social media and outbreaks of emerging infectious diseases: A systematic review of literature. *American Journal of Infection Control*, *46*(9), 962–972. https://doi.org/10.1016/j.ajic.2018.02.010

Tannenbaum, M. B., Hepler, J., Zimmerman, R. S., Saul, L., Jacobs, S., Wilson, K., & Albarracín, D. (2015). Appealing to fear: A meta-analysis of fear appeal effectiveness and theories. *Psychological Bulletin*, *141*(6), 1178–1204. https://doi.org/10.1037/a0039729

UNAIDS. (2019). *Factsheet: Global AIDS update*. UNAIDS.

World Health Organization (WHO) (2020). HIV/AIDS data and statistic. Retrieved from: https://www.who.int/hiv/data/en/.

Yadav, U. N., Yadav, O. P., Singh, D. R., Ghimire, S., Rayamajhee, B., Kanti Mistry, S., Rawal, L. B., Ali, A. M., Kumar Tamang, M., & Mehta, S. (2021). Perceived fear of COVID-19 and its associated factors among Nepalese older adults in eastern Nepal: A cross-sectional study. *PLoS One*, *16*(7), e0254825. https://doi.org/10.1371/journal.pone.0254825

Zhong, B. L., Luo, W., Li, H. M., Zhang, Q. Q., Liu, X. G., Li, W. T., & Li, Y. (2020). Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: A quick online cross-sectional survey. *International Journal of Biological Sciences*, *16*(10), 1745–1752. https://doi.org/10.7150/ijbs.45221