

Original article

Mental health, coping mechanism, social support, and the resilience of commercial pilots in Thailand during the period of COVID-19 situation

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Abstract

Background: The daily life of the commercial pilots in Thailand has greatly been affected by the COVID-19 outbreak. These unpredictable situations impacted everyone directly and indirectly, especially, the commercial pilot's mental health.

Objectives: This study aimed to investigate mental health, coping mechanisms, social support, resilience, and the related factors among commercial pilots during the COVID-19 pandemic.

Methods: Data were collected from 380 commercial pilots, including Thai AirAsia and Thai AirAsia X, between May to September 2022. Questionnaires were applied to collect data from samples including: 1) demographic data; 2) work information; 3) negative effects of COVID-19 among commercial pilots; 4) coping strategy; 5) social support; 6) resilience; and 7) mental health.

Results: In all, 202 of the sample had abnormal mental health during the COVID-19 epidemic. Related factors to abnormal mental health that significantly less than 0.01 were lower income after the COVID-19 epidemic, having in debt, having psychiatric disorders, working for Thai AirAsia X, Overall effect from COVID-19 epidemic, e.g., effect on family, relationships, routine activities, work and career, finance and economy, and health, medium to high levels of emotionally focused coping, low level of social support on resource and material, low levels of resilience, e.g., withstand pressure, hope and encouragement, overcome obstacles, and overall of resilience. Single/divorced/widowed and low levels of overall social support were significant ($P < 0.05$). The significant predictors of abnormal mental health were having debt, working for Thai AirAsia X, being affected by routine activities, medium to high levels of emotionally focused coping, low level of social support on resources and material, low levels of resilience on withstand pressure, and hope and encouragement.

Conclusion: In all, 53.2% of the commercial pilots from a recent study had abnormal mental health during the COVID-19 epidemic. The predictor and factors that related to their abnormal mental health were having in debt, working for Thai AirAsia X, medium to a high level of affected by routine activity, medium to a high level of emotionally focused coping, low level of social support on resource and material, low level of resilience on withstand pressure, and hope and encouragement.

Keywords: Coping mechanism, COVID-19 pandemic, mental health, resilience, social support.

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Received: April 4, 2023

Revised: May 26, 2023

Accepted: June 6, 2023

The COVID-19 epidemic is a crisis that affects society and the economy, especially, the restriction of journeys and travel. This caused the business and travel business had closed or minimize business due to a lack of liquidity. The tourism industry impacted inevitably their employee in the service and transportation business. Commercial pilots had impacted directly by the COVID-19 epidemic. They are mainly significant for the airline industry. Whereas, their life and social status had suddenly changed from this pandemic. These factors trigger them to have more stress, anxiety, and various mental health issues among commercial pilots. Moreover, the increase in mental health issues can lower the effectiveness of the operation on their flight or flying.

In 2020, the researchers presented their results at The International Symposium on Aviation Psychology 2021.⁽¹⁾ They investigated the 2,050 American pilots' mental health during the COVID-19 pandemic. The results showed 36.0% of the sample had mild to moderate depression. Furthermore, 63.0% of them reported they had been confronted with lower mental health during the COVID-19 outbreak. It had affected their performance or work efficiency. Additionally, 25.0% reported their efficiency in safety has decreased. The report from the European Pilot Peer Support Initiative (EPPSI)⁽²⁾, showed the impact of COVID-19. It had negatively affected mental health. This affects the safety and ability of flying operations among commercial pilots.

Therefore, the present study aimed to investigate the mental health among Thai commercial pilots and explore the impact on them during the COVID-19 pandemic. Moreover, we explored the related factors and predictors for abnormal mental health by focusing on the impact from the COVID-19 pandemic, coping mechanism, social support, and the resilience. The findings from the study could be the potential data to promote mental health among Thai commercial pilots when they are provoked by a crisis in their life.

Materials and methods

The current study was a cross-sectional descriptive design to investigate the hard situation among commercial pilots on their mental health. The Subjects were recruited through commercial pilots by purposive sampling. The commercial pilots from both Thai AirAsia and Thai AirAsia X were included. No one met the exclusion criteria, they were to participate, or responded to questionnaires.

The 380 commercial pilots, consented to the survey study, including 293 pilots from Thai AirAsia and 87 pilots from Thai AirAsia X. The data were gathered from May - September 2022 by using Google form. The study has been approved by the Institutional Review Board of the Faculty of Medicine, Chulalongkorn University, (IRB) no. 0205/65. Before collecting data, the purposes and the methods of the study were informed to potential subjects. The subjects voluntarily participated the study and gave their written informed consents.

The Google form was used to facilitate the data collection process for all subjects. Earlier, they read the information sheet that included, research objectives, methodology, and their rights, before giving an agreement to participate in the study. Next, a set of seven self-report questionnaires appeared and the subjects were requested to answer the questions by themselves.

The demographic questionnaire asked about their gender, age, marital status, education, average income per month, adequacy of income, family responsibility, and medical history, including physical ailment and psychiatric disease.

The working information questionnaire included job responsibility, number of years in the company, number of flights within three months, flight hours within three months, years of being pilot, total flight hours, and the name of airline company.

The effect on commercial pilots from the COVID-19 pandemic questionnaire was measured by 29 items. They were developed by the authors to measure the six aspects of effects including family (5 items), relationship (4 items), routine activities (5 items), work and career (6 items), finance and economy (4 items), and health (5 items). The content validity of the questionnaire was evaluated by four-specialist psychiatrists. The index of item-objective congruence (IOC) was higher at 0.91. After that, the smaller sample, 30 commercial pilots, were inquired to examine the questionnaires. The results showed that the questionnaires had higher reliability. Cronbach's alpha coefficient was 0.91. Each item had a score range of 1 - 5 points. The subject who had slightly high scores on each aspect meant he had more affected by those aspects. The levels of impacts were divided into the three levels, namely, lower, moderate, and higher; The levels of impacts were based on mean scores and standard deviation (SD), i.e., mean - SD, mean \pm SD, and mean + SD, respectively.

The coping mechanism questionnaire evaluated the method and level of coping. It was developed by Amornpetkul W. ⁽³⁾ according to Jalowiec's concept. ⁽⁴⁾ This instrument contained 40 items and measured coping mechanism components: problem-focused coping (15 items) and emotional-focused coping (25 items). Responded to each item on a 5-Likert scale: 1 (never) and 5 (always). The authors applied this instrument with the small sample as the same as the current sample and the Cronbach's alpha coefficient was 0.94. The total score for each component was 15 - 75 and 25 - 125, respectively.

The Social Support Questionnaire was developed by Lueboonthavatchai P. and Lueboonthavatchai O. based on Schaefer's concept. ⁽⁵⁾ The questionnaire comprised 16 items that were allocated to the three types of perceived social support such as emotional (7 items), informational (4 items), and tangible support (5 items). Responded to each item on a 5 - Likert scale, 1 (least/never) and 5 (most/always) and the total score extended to 80 points. The authors applied this instrument with the small sample as the same as the current sample and the Cronbach's alpha coefficient was 0.93. The levels of social support were divided into three levels, i.e., lower, moderate, and higher; The levels of social support were based on mean scores and standard deviation.

Resilience quotient questionnaire (RQ)⁽⁶⁾ was assessed by 20 - items. The instrument evaluated the ability to recover after confronting the crucial situation, including resistance to pressure (10 items), hope (5 items), and overcoming obstacles (5 items). The Subjects considered their affective and behavior for the last three months on a 4 - Likert scale: 1 (not at all) and 4 (entirely). The authors applied this instrument with the small sample as the same as the current sample and the Cronbach's alpha coefficient was 0.81.

Lastly, abnormal mental health refers to the possibility of having psychological abnormalities or mental disorders which were assessed through the Thai version of the General Health Questionnaire (Thai GHQ - 30). ⁽⁷⁾ It is a general health screening questionnaire with 30 items. They evaluated the general mental health within 2 - 3 weeks ago on four facets, namely; unhappiness, anxiety, social impairment, and somatic symptom disorder. A 4 - Likert scale was applied for each item. If the individual scores 4 or higher on the questionnaire, it indicated a likelihood of abnormal mental health. Cronbach's alpha coefficient on this questionnaire ranged between 0.84 - 0.94.

When applied this instrument with the small sample was the same as the current sample and Cronbach's alpha coefficient was 0.93.

Statistical analysis

The data were analyzed by Statistical Package for the Social Sciences (SPSS) version 28.0. Personal and career information, the impact on commercial pilots from the COVID-19 pandemic, coping mechanisms, social support, resilience, and mental health were presented by descriptive statistics including number, percentage, mean, maximum, minimum, median, mode, and standard deviation. An inferential statistic was applied to examine the association between factors and mental health. The significant factors from Chi-square and Fisher's exact test approved the power of prediction by binary logistic regression. $P < 0.05$ was considered as statistically significant difference.

Results

The subjects were 380 commercial pilots in Thailand. As for demographic information, most of them were male (91.8%) with a few number of female (8.2%). The mean age was 38.7 years old. More than half of them (55.5%) were married and had a Bachelor's Degree (78.9%) in higher education. According to the COVID-19 pandemic, salary data, the average income before the COVID-19 pandemic was $267,461 \pm 97,570$ Bath/month. Unfortunately, the average income per month during the COVID-19 pandemic drastically decreased to 54,251 Bath/month; 40.0% of the subjects had debt and insufficient income in the recent years. Health and ailment information, 16.3% reported physical conditions such as dyslipidemia, hypertension, diabetes, allergies and asthma, gastrointestinal disease, myofascial pain syndrome, and following up on symptoms from cancer treatment, respectively. The marginal sample had a psychiatric illness history such as stress and pressure, and anxiety disorder, respectively (**Table 1**).

The working information according to the COVID-19 pandemic, half of the commercial pilots were Captain, and another was the First Officer. The average number of years in the Company was 8.1 years, and 47.6% ranged between 6 - 10 years. Within three months, the commercial pilots had an average of 22 flights, and 39.6 hours were the average flight hours. 34.7% had been a pilot for 6 - 10 years ago, averaging 11.1 years. The average total flight hours

were 7,553.1 hours. Most of them (77.1%) worked for Thai AirAsia than Thai AirAsia X company (Table 1).

The commercial pilots had influenced by the COVID-19 pandemic in various aspects. Overall, they had been influenced by the unpredictable situation at moderate levels (69.2%). Most of the effects showed moderate levels in every aspect; family (72.6%), relationship (67.1%), routine activities (63.9%), work and career (62.4%), finance and economy (62.9%), and health (68.4%). This pandemic had a higher impact on their finance and economy (22.1%), health (20.3%), family (19.5%), routine activities (19.2%), work and career (19.2%), and relationships (16.8%), respectively (Table 2).

Apart from the negative effects of COVID-19, the psychosocial factors of the present study were

coping mechanisms, social support, and resilience. Problem-focused coping was applied among half of the commercial pilots on moderate levels. However, emotionally focused coping had largely found on lower levels at 56.1%. Nonetheless, individuals who were faced with distress events tend to find some social support. The commercial pilots in the current study, mainly, earned overall social support on moderate levels (71.8%). Mostly, findings from the minor aspects of social support were information support (78.4%), emotional support (68.4%), and resource and material support (63.9%). Furthermore, 73.9% of the sample had moderate overall resilience levels. On the resilience subscales largely found the overcome the obstacles (82.6%), hope and encouragement (71.6%), and withstand pressure (69.7%), respectively (Table 2).

Table 1. The number and percentage of demographic information among the commercial pilots (n = 380).

Demographic/work	(Mean ± SD) (Min, Max) or n (%)	Demographic/work	(Mean ± SD) (Min, Max) or n (%)
Gender		Physical ailment	
Male	349 (91.8)	No	318 (83.7)
Female	31 (8.2)	Yes (choose ≥ 1)	62 (16.3)
Age (years)	38.6 ± 7.9 (26 - 59)	Dyslipidemia	32 (43.2)
Marital status		Hypertension	12 (16.2)
Single	158 (41.6)	Diabetes	9 (12.1)
Married	211 (55.5)	Allergies/Asthma	12 (16.2)
Divorce	11 (2.9)	GI disease	6 (8.1)
Widowed	0 (0)	Chronic Pain	2 (2.7)
Education		Cancer treatment	1 (1.4)
Bachelor Degree	300 (78.9)	Psychiatric disease	
Master Degree	78 (20.5)	No	365 (39.7)
Doctoral Degree	2 (0.5)	Yes (choose ≥ 1)	24 (6.4)
Income before COVID-19 (Baht)		Stress and pressure	23 (44.2)
267,460 ± 97,569 (30,000 - 50,000)		Anxiety	5 (9.6)
Income after COVID-19 (Baht)		Depression	0 (0)
50,421 ± 42,610 (9,000 - 30,000)		Work position	
Earning potential		Captain	190 (50.0)
	52 (13.7)	First officer	190 (50.0)
Sufficient/saving	127 (33.4)	Year in the airline (years)	8.9 ± 4.4 (3 - 19)
Sufficient/no saving	49 (12.9)	Flights in 3 months	22.1 ± 17.6 (0 - 140)
Inadequate/no debt	152 (40.0)	Flight hours (3 months)	39.6 ± 30.3 (0 - 204)
Inadequate/debt		Pilot being (years)	11.0 ± 6.5 (1 - 34)
Work for (Airline)		Total flight hours	7,553 ± 5,014 (420 - 22,500)
Thai AirAsia	293 (77.1)		
Thai AirAsia X	87 (22.9)		

Table 2. The number and percentage of negative effects from COVID-19 epidemic and psychosocial variables among subjects (n = 380).

Negative effects from COVID-19 and Psychosocial variables	High		Medium		Low	
	n	%	n	%	n	%
Negative effects from COVID-19						
Affected on family	74	19.5	276	72.6	30	7.9
Affected on relationship	64	16.8	255	67.1	61	16.1
Affected on routine activities	73	19.2	243	63.9	64	16.8
Affected on work and career	73	19.2	237	62.4	70	18.4
Affected on finance and economy	84	22.1	239	62.9	57	15.0
Affected on health	77	20.3	260	68.4	43	11.3
Overall effect	66	17.4	263	69.2	51	13.4
Coping						
Problem-focused coping	179	47.1	191	50.3	10	2.6
Emotional-focused coping	5	1.3	162	42.6	213	56.1
Social support						
Emotional	54	14.2	260	68.4	66	17.4
Informational	40	10.5	298	78.4	42	11.0
Resource and material	71	18.7	243	63.9	66	17.4
Overall	55	14.5	273	71.8	53	13.7
Resilience						
Withstand pressure	81	21.3	265	69.7	34	8.9
Hope and encouragement	64	16.8	272	71.6	44	11.6
Overcome the obstacles	40	10.5	314	82.6	26	6.8
Overall	70	18.4	281	73.9	29	7.6

Table 3. The number and percentage of mental health among subjects (n = 380).

Mental health	N (380)	Percentage
Normal (Score < 4)	178	46.8
Abnormal (Score ≥ 4) (Abnormal, in this context, refers to the possibility of the presence of psychological abnormalities in the field of psychiatry.)	202	53.2
Mean (SD) = 6.6 ± 6.9 Minimum = 0, Maximum = 30, Med = 4, Mod = 1		

More than half of the sample (53.2%) had abnormal mental health, and 46.8% had normal mental health. Their average score of mental health was 6.6 ± 6.9 (full score was 30) (**Table 3**).

Chi-square and Fisher's exact test were applied to investigate the related factors to abnormal mental health among commercial pilots during the COVID-19 epidemic. Mental health revealed significant relation with numerous factors. For demography information, were marital status as single, divorced, widowed ($P < 0.05$), lower income during COVID-19 ($P < 0.01$), insufficient income and having in debt ($P < 0.01$), having psychiatric diseases ($P < 0.01$), and work for Thai AirAsia X company ($P < 0.01$). For psychosocial factors were the negative effects of COVID-19, facing the overall

effects from COVID-19 ($P < 0.01$) that affected family ($P < 0.01$), relationship ($P < 0.01$), routine activities ($P < 0.01$), work and career ($P < 0.01$), finance and economy ($P < 0.01$), and their health ($P < 0.01$). On coping mechanism was moderate to high on emotionally focused coping ($P < 0.01$). For social support, subjects who had low levels of resources and materials ($P < 0.01$), and lower levels of overall social support ($P < 0.05$) related to abnormal mental health. Moreover, commercial pilots who had difficulty to recover themselves from the crisis include a low level of withstanding pressure ($P < 0.01$), low-level hope and encouragement ($P < 0.01$), low levels of overcoming obstacles ($P < 0.01$), and low level of overall resilience ($P < 0.01$) associated with abnormal mental health (**Table 4**).

Table 4. The number and percentage of psychosocial factor that related to subjects' mental health analyzed by using Chi-square test and Fisher's exact test (n = 380).

Related factors		Mental health				P - value
		Normal (n = 178)		Abnormal (n = 202)		
		n	%	n	%	
Status	Married	109	51.7	102	48.1	0.036*
	Single	69	40.8	100	59.2	
Income (during COVID-19) (Baht)	>265,000	53	61.6	33	38.4	0.002**
	≤265,000	125	42.4	169	57.5	
Income sufficiency	Enough	95	53.1	84	46.9	0.022*
	Not enough	83	41.3	118	58.7	
Debt	With debt	125	54.8	103	45.2	< 0.001**
	Without debt	53	34.9	99	65.1	
Psychiatric disease	Yes	173	48.6	183	51.4	0.008**
	No	5	20.8	19	79.2	
Airline	Thai AirAsia	151	51.5	142	48.5	< 0.001**
	Thai AirAsia X	27	31.0	60	69.0	
Impact to family	Mid to high	154	44.0	196	56.0	< 0.001**
	low	24	80.0	6	20.0	
Impact to relationship	Mid to high	139	43.6	180	56.4	0.004**
	low	39	63.9	22	36.1	
Impact to routine activities	Mid to high	126	39.9	190	60.1	< 0.001**
	low	52	81.3	12	18.8	
Impact to work and career	Mid to high	125	40.3	185	59.7	< 0.001**
	low	53	75.7	17	24.3	
Impact to financial and economic	Mid to high	135	41.8	188	58.2	< 0.001**
	low	43	75.4	14	24.6	
Impact to health	Mid to high	142	42.1	195	57.9	< 0.001**
	low	36	83.7	7	16.3	
Overall impacts	Mid to high	134	40.7	195	59.3	< 0.001**
	low	44	86.3	7	13.7	
Emotional focused coping	Mid to high	59	35.3	108	64.7	< 0.001**
	low	119	55.9	94	44.1	
Social support (resource material)	Mid to high	161	51.3	153	48.7	< 0.001**
	low	17	25.8	49	74.2	
Overall social support	Mid to high	161	49.1	167	50.9	0.028*
	low	17	32.7	35	67.3	
Resilience (withstand pressure)	Mid to high	175	50.6	171	49.4	< 0.001**
	low	3	8.8	31	91.2	
Resilience (hope and encouragement)	Mid to high	173	51.5	163	48.5	< 0.001**
	low	5	11.4	39	88.6	
Resilience (overcome obstacles)	Mid to high	174	49.2	180	50.8	< 0.001**
	low	4	15.4	22	84.6	
Overall resilience	Mid to high	174	49.6	177	50.4	< 0.001**
	low	4	13.8	25	86.2	

* $P < 0.05$, ** $P < 0.01$, a = Fisher's exact

Table 5. The predictors of abnormal mental analyzed using binary logistic regression (n = 380).

Predictors of abnormal mental health	β	P - value	Adjusted odds ratio (OR)	95% CI of adjusted OR	
				Lower	Upper
Insufficient income and debt	0.579	0.033*	1.785	1.048	3.041
Working in Thai AirAsia X (Medium to long haul airline)	0.790	0.011*	2.203	1.196	4.058
Medium-to-high of COVID-19 effect on routine activities	1.288	0.002**	3.627	1.587	8.290
Medium-to-high level of emotional focused coping	0.716	0.008**	2.046	1.209	3.464
Low level of resources and materials support	0.875	0.018*	2.399	1.161	4.960
Low level of withstanding pressure (resilience)	1.684	0.011*	5.389	1.476	19.666
Low level of hope and encouragement (resilience)	1.257	0.018*	3.514	1.237	9.978

* $P < 0.05$, ** $P < 0.01$

Related factors that could predict mental health issues during the COVID-19 pandemic were, namely, insufficient income and debt ($P < 0.05$), working for AirAsia X company ($P < 0.05$), being affected by routine activity on medium to a high level ($P < 0.01$), medium to a high level of emotional focused coping ($P < 0.01$), low level of social support (resources and materials) ($P < 0.05$), low level of resilience (hope and encouragement) ($P < 0.05$), and low level of resilience (withstanding pressure) ($P < 0.05$) (Table 5).

Discussion

In the present study, 380 commercial pilots from Thai AirAsia and Thai AirAsia X companies were our subjects to be investigated on their mental health and psychosocial factors during the COVID-19 pandemic; 53.2% of them met the criteria of abnormal or impaired mental health. According to the systematic review of worldwide commercial pilots throughout COVID-19 found that 40.0 - 66.0% reported degeneration of their mental health since the beginning of COVID-19' outbreak.⁽⁸⁾ This shows that the mental health of commercial pilots in Thailand and around the world were deteriorated in the same direction during the COVID-19 pandemic.

Based on the present results, we found several factors related to abnormal mental health, i.e., marital status. The commercial pilots who were single, divorced, or widowed had more impaired mental health than those who were married. This result was consistent with the previous studies that indicated that marriage or cohabitation was associated with lower depression and anxiety disorders. Also, these statuses diminished the risk of substance abuse and suicidal thoughts.^(8, 9) Moreover, the huge impact after the COVID-19 outbreak was the lower income. The

employment of airlines had a sharp drop in their incomes due to restrictions and lockdown. The pilots felt unstable in their careers which contributed to more depression and anxiety. The unusual situation was not only an impact on their career but also on family responsibility. Insufficient income had inadequate for high expenses on daily life or liabilities. In the present time, this

factor remains a prior trigger to the individual's mental health. These hard situations affected their mental health, e.g., having more stress and low levels of happiness, due to bearing the family' burden.⁽¹⁰⁾

Patients, patients with mental health issues, individuals who have a history of psychiatric disorders, high-risk exposure to the virus, infected people, and those related to the medical group were the vulnerable groups. They were easily exposed to the distress period that could be affected by mental health issues due to the COVID-19 outbreak.⁽¹¹⁾ Additionally, data from the Department of Mental Health, Ministry of Public Health 2020 showed the Thais' suicide rate had increased from 2019 after the COVID-19 outbreak.⁽¹²⁾

Interestingly, we found abnormal mental health among Thai AirAsia X's commercial pilots than those commercial pilots who worked for Thai AirAsia. Both groups were commercial pilots but they work on different routes. Mostly, AirAsia's pilots have short domestic flight routes while AirAsia X's pilots have medium to long international distance flight routes. The results of the COVID-19 lockdown and kept distancing had shaken international routes more than domestic routes.⁽¹³⁾ International routes were restricted and tend to have fewer flights. Thus, the pilots who worked for Thai AirAsia X suffered a direct impact. Some of them suddenly had lower incomes and, in the worst case, they had no income at all

because of the unpredictable situations. Meanwhile, Thai AirAsia's pilots had slightly higher income from domestic routes whereas fewer restrictions than international routes. These unsteady situations made them more anxious and impacted their mental health.

The effect of the COVID-19 outbreak hurts every career, especially commercial pilots. Many of them had more stress and anxiety because of travel restrictions and because their companies were temporarily closed. The systematic review concluded that the negative effect of the crisis could trigger mental health issues among the pilots. Many cases of aircraft accident involved pilots who had abnormal mental health due to their life changes.⁽¹⁴⁾

In a recent study, we found that subjects who had a medium to a high level of emotional-focused coping were involved with abnormal mental health. Consistent with the previous study, stress has a positive relation with emotional-focused coping.⁽³⁾ If individuals cannot manage or control their negative emotions it can lead them to have an aggressive behavior such as venting to others or things, blaming others, or hurting themselves. These behaviors were the approaches to dealing with the temporary emotion or feelings that can cause higher stress and mental health issues.⁽¹⁵⁾ Moreover, having a low level of social support on resources and material influenced abnormal mental health. This result according to the study of Kuandachakupt T. and Lueboonthavatchai P. found that suitable social support was a protective factor for mental health when facing stressful situations in life.^(15,16) On resilience factors, the current results revealed that a low level of resilience, e.g., withstanding pressure, and hope and encouragement, was involved with abnormal mental health among commercial pilots. The pilots who could recover or quickly bounce back to normal life tend to behave more effectively and cope with their crises than others who lack resilience.⁽¹⁷⁾ Moreover, resilience is an important factor to enhance the capability to cope with a crisis in an effective way.⁽¹⁸⁾

The present prediction results found the crucial factors with abnormal mental health among the commercial pilots from both companies, Thai AirAsia and Thai AirAsia X. We found having burden or debt, pilots who work for Thai AirAsia X, having moderate to high affected routine activities, having a moderate to high emotionally focused coping, having a low level of social support on resource and material, having a low level of resilience on withstand pressure, and

hope and encouragement were the important causes that enhance the abnormal mental health among the commercial pilots. Thus, for maintaining the good mental health among the commercial pilot in Thailand, the concerned units need to encourage the necessary psychosocial skill to them. Furthermore, airlines should consider appropriate welfare and provide concrete assistance to their pilots in the event of a crisis. This is to give the pilot confidence and reduce stress and anxiety if encountering unexpected negative situations.

Some limitation should be noted only the commercial pilot in Thailand how to interpret and apply should be in the close context. Secondly, the study was a descriptive study that indicated only the factors related to mental health among the commercial pilots from Thai AirAsia and Thai AirAsia X. Thus, these results cannot inform the causal factors like a causal model and effects.

Conclusion

Due to the COVID-19 epidemic, it has create more changes in our society. Our daily life had changed to a new pattern of behavior, so-called the New Normal. Everyone in society had to adapt to live life. Some people had effectively adapted; unfortunately, some had a tough time to adjustment due to their different lifestyles. These changes might lead to stress and mental health issues. The results from our study revealed that more than half of the commercial pilot from Thai AirAsia and Thai AirAsia X had abnormal mental health in more than half of the sample (53.2%). The related factors and predictors to their abnormal mental health debt, working for Thai AirAsia X, being affected by routine activity at medium to a high level, medium to a high level of emotional-focused coping, low level of social support (resources and materials), low level of resilience (hope and encouragement and withstanding pressure).

Acknowledgements

We are grateful to Asst. Prof. Tana Nilchaikovit, M.D., *et al.*, Assoc. Prof. Oraphun Lueboonthavatchai, Ph.D., and Waraporn Amornpetkul from the Department of Public Health Nursing, Faculty of Public Health, Mahidol University for their permission to use Thai GHQ - 30, the Social Support Questionnaire, and Coping Questionnaire. We are also grateful to the Director of Flight Operations of Thai AirAsia and Thai AirAsia X for their assistance and for facilitating data collection.

Conflicts of interest statement

The authors have each completed an ICMJE disclosure form. None of the authors declare any potential or actual relationship, activity, or interest related to the content of this article.

Data sharing statement

The present review is based on the references cited. Further details, opinions, and interpretation are available from the corresponding authors on reasonable request.

References

1. Cahill J, Cullen P, Anwer S, Gaynor K. The impact of the COVID-19 pandemic on aviation workers and aviation system. In: Wright State University. CORE Scholar: International Symposium on Aviation Psychology - 2021. Corvallis: Wright State University; 2021. p. 164-71.
2. European Pilot Peer Support Initiative. COVID-19 crisis and its effect on aviation mental health. Brussels: European Pilot Peer Support Initiative; 2020.
3. Amornpetkul W. The relationship between stress, social support, personal factors, and coping of traffic policemen in the Bangkok Metropolitan [thesis]. Bangkok: Mahidol University; 2000.
4. Jalowiec A, Power MJ. Stress and coping in hypertensive and emergency room patients. *Nurs Res* 1981;30: 10-5.
5. Schaefer C, Coyne JC, Lazarus RS. The health-related functions of social support. *J Behav Med* 1981;4: 381-406.
6. Inthasit S, Junkhiri S. Turning bad into good: Resilience Quotient. 4th ed. Nonthaburi: Beyond Publishing; 2020.
7. Nilchaiwong T, Sukying J, Silpakit C. Reliability and accuracy of the Thai version of the General Health Questionnaire. *J Psychiatr Assoc Thai* 1996;41:2-17.
8. Bor R, Field G, Scragg P. The mental health of pilots: An overview. *Couns Psychol Q* 2002;15:239-56.
9. Lazarus RS, Folkman S. Stress appraisal and coping. New York: Springer Publishing; 1984.
10. Tawichsri T, Sa-ngiamnet B. COVID-19 crisis and mental health problem in Thailand. Bangkok: Puey Ungphakorn institute for Economic Research; 2021.
11. Kampf G, Todt D, Pfaender S, Steinmann E. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. *J Hosp Infect* 2020;104:246-51.
12. Khamphan K, Srikhruedong S, Ragkhanto S. Deep listening to remedy suffering following Buddhist Psychology path. *JMHR* 2022;8:309-28.
13. The Civil Aviation Authority of Thailand. Annual Report 2020. Bangkok: CAAT; 2020.
14. Mulder S, de Rooy D. Pilot mental health, negative life events, and improving safety with peer support and a just culture. *Aerosp Med Hum Perform* 2018;89:41-51.
15. Kuandachakupt T, Lueboonthavatchai P. Stress and associated factors of students in the Institute of legal education Thai bar association in Bangkok Metropolis. *J Psychiatr Assoc Thai* 2013;54:137-46.
16. Lueboonthavatchai P. Prevalence and psychosocial factors of anxiety and depression in breast cancer patients. *J Med Assoc Thai* 2007;90:2164-74.
17. Sucaromana A. Resilience quotient: RQ. *J MCU Peace Stud* 2016;4:209-20.
18. Yu F, Li X, Yang J. Investigation of pilots' mental health and analysis of influencing factors in China: based on structural equation model. *BMC Public Health* 2022;22:1352.