ORIGINAL ARTICLE

Predictive factors for resilience quotient among village health volunteers in Northern Thailand post-COVID-19

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ABSTRACT

Village Health Volunteers (VHVs) played an important role during the COVID-19 virus outbreak by coordinating with the public health team and closely engaging with community members. This study aimed to assess the resilience quotient levels of VHVs in Northern Thailand post-COVID-19. The research involved a random sample of 416 VHVs and utilized various tools such as questionnaires. Data analysis employed descriptive statistics and stepwise multiple regression. The study revealed that most of the sample group were women (81.3%), with an average age of 55.03 years ($\bar{X}$ = 55.03, SD = 10.44). Most were in a relationship (79.3%), and 49.0% had completed primary education. Additionally, 47.8% were employed in agriculture, and 54.3% reported having sufficient income. A significant portion of them, 70.7%, had no history of chronic illnesses, whereas 53.1% had previously tested positive for COVID-19. The overall resilience quotient level of VHVs was high ($\bar{X}$ = 61.88, SD = 9.14). The study identified the following four significant predictor variables: mental health, anxiety, depression, and mental health literacy, accounting for 40.30% of the variance. These findings were statistically significant at 0.05 (R = 0.639, Adjusted R^2 = 0.403, F = 71.071, P-value < 0.001). In conclusion, this study provides valuable insights for developing targeted interventions and support systems to enhance the resilience quotient of VHVs, particularly in the post-COVID-19 landscape and similar situations.

Key words:
resilience quotient; anxiety, mental health literacy; depression; mental health; village health volunteers; post- pandemic COVID-19.

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INTRODUCTION

Coronavirus Disease 2019 (COVID-19) is an infectious disease that has contributed to a severe increase in the number of patients. It has spread rapidly across almost every continent, affecting every race. Even Thailand has declared a state of emergency, rendering it a matter of international public health concern. This has resulted in widespread unemployment, income loss, financial instability, and socio-political and economic impacts that are likely to negatively affect mental health and well-being.[1,2,3,4]

In this context, Village Health Volunteers (VHVs) play a crucial role as operations leaders in the healthcare system, striving to improve people's health and quality of life in villages and communities.[5] Thailand currently boasts a network of over 1,040,000 VHVs.[6] These individuals represent a dedicated force of volunteers who commit themselves to safeguarding the well-being of their communities, families, and personal health. Recognized and accepted by society, they ascend to the roles of VHVs and resident doctors, assuming vital responsibilities in disease monitoring, prevention, and control in their regions. Furthermore, they emerge as leaders in healthcare delivery at the family and community levels by employing medical communication technology, telemedicine, and health applications. As essential social capital within the health system,[6] VHVs are pivotal during health crises, such as the current spread of COVID-19 in Thailand. The analysis of the outbreak characteristics reveals economic and mental health impacts,[7] which stem from prolonged efforts to combat the epidemic and implement disease control measures. Individuals endure heightened stress, anxiety, and mental health issues, even facing emotional exhaustion and burnout at work.[8] VHVs, serving as frontline public health personnel, wield significant influence in the surveillance and control of COVID-19 within communities. They organize a comprehensive system by following guidelines, including home visits, self-health surveys, public education on symptom recognition, and coordination with public health officials. However, the demanding context of densely populated areas[8] contributes to fatigue, depression,[9] anxiety, and stress[10]. Considering a broader perspective at the ASEAN regional level, Thailand, in 2006, once held the highest suicide rate among the 10 Southeast Asian countries at 14.4 suicides per 100,000 people.

However, the latest data from 2019 reveals a shift to the second-highest suicide rate in ASEAN, with 8.8 suicides per 100,000 people (6,147 deaths, including 1,045 women and 5,102 men). In this regard, Singapore now leads with a suicide rate of 11.2 per 100,000 people.[11] Over a year has passed in the aftermath of infectious disease outbreaks, particularly COVID-19. The Department of Mental Health reported a suicide rate of 7.37 people per 100,000 in 2020. An analysis of the statistical graph shows a gradual increase over the past two to three years. Specifically, in 2020, 100 suicide attempts occurred in the Phayao Province,[12] with a rate of 21.04 per 100,000 population. In addition, Pong District had the highest rate at 34.14 per 100,000 population, reflecting the challenges faced by VHVs in urban societies with a rising workload, especially concerning chronic diseases.[13]

VHVs are integral to the goal proposed by the Declaration of Astana, namely achieving sustainable development by 2030.[14] Therefore, they have to bear additional roles and increasing responsibilities. However, this increased workload has led to stress, burnout, decreased mental strength, and resignations, impacting community health

operations and budgets. The need for training new volunteers further worsens the situation. Consequently, the mental well-being of VHVs in Thai society is in decline. To address this issue, strengthening the physical and mental health of VHVs involves building mental strength or mental immunity. This practice, directed toward oneself and society, shields the mind from the damage caused by life's hardships and challenges. It emphasizes how mental immunity equips individuals to navigate the inevitable changes invoked by life—a universal aspect of the human experience.[15]

Promoting resilience to reduce the undesirable emotional impact of stressful events is crucial. Emotional resilience is a key preventive factor for individuals to adapt to stressful situations. On the other hand, emotional strength, or mental well-being, is defined by an individual's ability to adjust and recover after encountering crises or challenging situations. It is considered a vital attribute that aids individuals in overcoming obstacles and moving forward with their lives.[6,7,16] Moreover, emotional strength helps individuals cope with adversity and mitigate the negative impact of adverse events on their mental health,[17] such as stress-induced conditions, including depression, anxiety, or psychological illnesses.[8,9]

Additionally, it plays a significant role in preventing ongoing health problems stemming from stress,[18] such as gastrointestinal issues, heart conditions, and high blood pressure.[10] Furthermore, research indicates a positive correlation between emotional strength and mental health status. The ability to endure and bounce back from difficulties is a protective factor against mental health challenges, contributing to overall well-being.[11,12,19]

Therefore, the objectives of this study were to examine the resilience quotient levels of VHVs in Northern Thailand following the COVID-19 outbreak, as well as explore the predictive factors for the resilience quotient. The findings shaped policy recommendations for enhancing the resilience of VHVs. Fostering the emotional resilience quotient is a crucial aspect of maintaining mental health and preventing psychological and physical health issues that may arise from stress.

METHODS

Study design and population

A cross-sectional study was conducted with the population of VHVs in Phayao Province, Thailand, from April to June 2023. The population under scrutiny in this research comprised 15,063 VHVs.[20] The inclusion criteria encompassed the following aspects: (1) aged 18 years and above, (2) working as a VHV during the COVID-19 outbreak, and (3) consent to participate in the research. The exclusion criteria involved VHVs who were suffering from any physical or psychiatric disease that made it difficult to respond to all questions in the questionnaire.

The sample size was determined using the formula from the n4Studies program.[21] Consequently, 338 was ascertained to be the minimum required sample size. The sample size was adjusted to 416 participants, factoring in a 23% attrition rate. The potential participants were selected using a multistage sampling approach.

In the initial step, the province was divided into nine districts, including Mueang Phayao District, Chiang Kham District, Chun District, Chiang Muan District, Dok Khamtai District, Pong District, Mae Chai District, Phu Kam Yao District, and Phu Sang District. The second step involved a simple random sample, which resulted in the selection of the following three districts—Mae Chai District, Mueang Phayao District, and Pong District.

The third step consisted of a simple random sampling of sub-districts in each

district, choosing one subdistrict per district—Mae Chai Subdistrict in Mae Chai District, Mae Na Ruea Subdistrict in Mueang Phayao District, and Oi Subdistrict in Pong District. In the fourth step, a simple random sampling approach was employed to select villages from the sampled sub-districts, choosing five villages. Data collection occurred during the specified period, including 27 to 28 people per group, as illustrated in Figure 1.

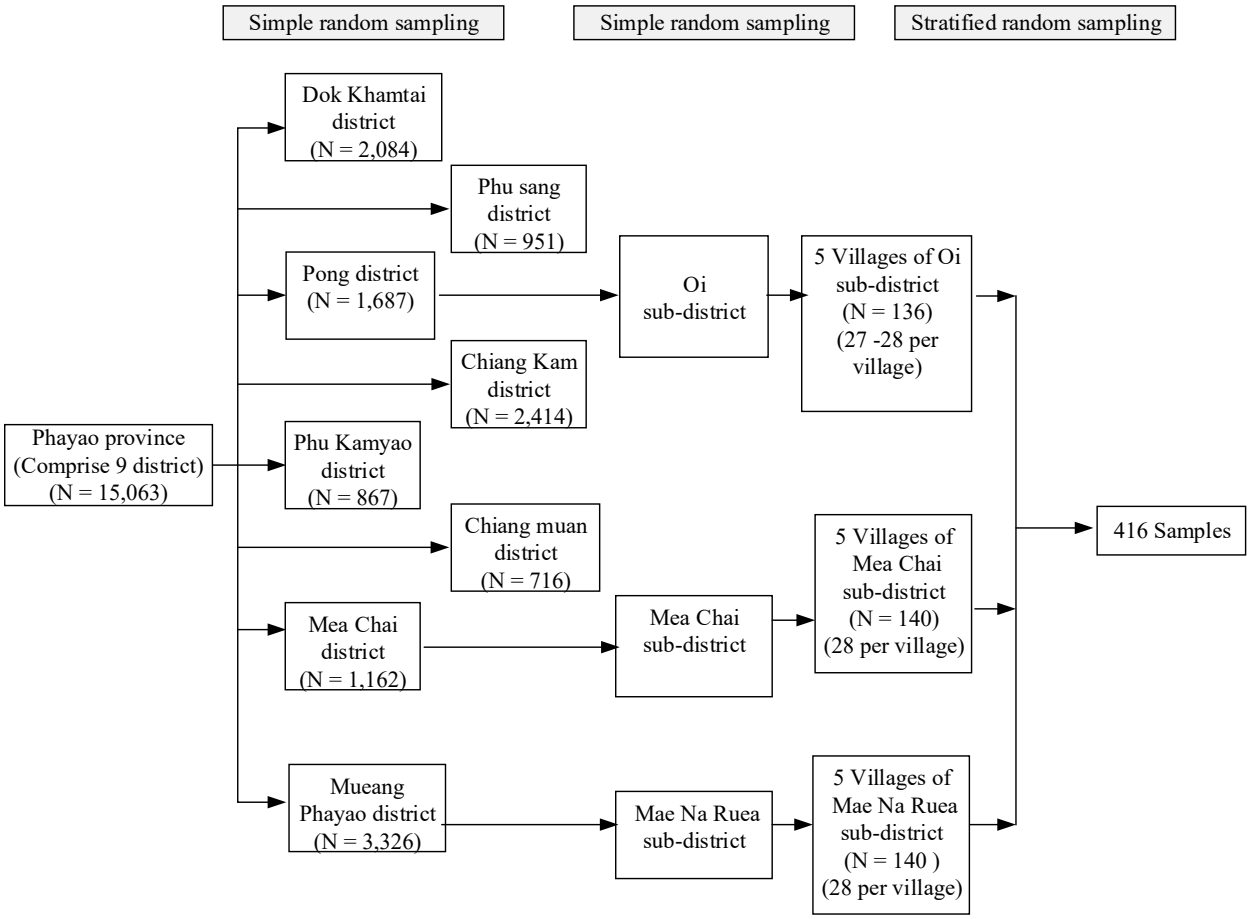

Figure 1. Flow chart for study selection

Research instrumentation

A questionnaire, divided into the following two parts, was used for data collection:

Part 1: Demographic data questionnaire, with seven items was developed by the investigator. This form was used to gather personal information such as participants' gender, age, marital status, education level, occupational status, family income, medical condition, and COVID-19 infection history.

Part 2: Mental health questionnaire measures six variables using the following instruments as follows:

1) The Suan Prung Stress Test 20-item (SPST-20) assessed stress experienced by VHVs in the previous six months. This instrument was developed by Mahatnirunkul et al.[22] The questionnaire consisted of 20 items, each scored on a Likert-type scale from "1" (no stress) to "5" (very high stress), with a total score ranging from 20 to 100. The total scores were divided into the following four groups: 1)

mild stress (0–23), 2) moderate stress (24–41), 3) high stress (42–62), and 4) severe stress (63–100).

2) General Anxiety Disorder-7 (GAD-7) assessed anxiety experienced by VHVs in the past two weeks.[23] This seven-item scale featured a Likert-type scale ranging from "0" (not at all) to "3" (nearly every day). The overall scores, ranging from 0 to 21, were divided into the following three groups: 1) low anxiety (0–9), 2) moderate anxiety (10–14), and 3) high anxiety (15–21).

3) The Mental Health Literacy Questionnaire (MHLQ) assessed MHL.[25] This questionnaire included 48 items across the following three dimensions: (1) knowledge of mental health problems, (2) belief in mental health problems, and (3) ability to recognize, prevent, and manage mental problems. Based on the knowledge of the dimension of mental health problems (comprising 15 items), each item is composed of phrases about mental health, which require respondents to choose "True" (1), "False" (2), or "Do not know" (3). The scores were divided into the following three groups: 1) low level of knowledge (0–7), 2) moderate level of knowledge (8–11), and 3) high level of knowledge (12–16). In reference to belief in mental health problems (comprising 12 items), each item was rated on a four-point rating scale, ranging from "1" (strongly disagree) to "4" (strongly agree). The scores were divided into the following three groups: 1) low level of belief (12–23), 2) moderate level of belief (24–35), and 3) high level of belief (48–36). In terms of the ability to recognize, prevent, and manage mental problems dimensions (comprising 21 items), this dimension is divided into the following three categories: 1) recognize, 2) prevent, and 3) manage mental problems. Each category contained seven items, and each item was rated on a four-point rating scale, ranging from "1" (did not engage in that behavior) to "4" (behave regularly). The scores were divided into the following three groups: 1) low level of ability (7–14), 2) moderate level of ability (15–21), and 3) high level of ability (22–28). The overall scores of MHL, ranging from 48 to 147, were divided into the following three groups: 1) low MHL (48–80), 2) moderate MHL (81–113), and 3) high MHL (114–147).

4) The Thai Mental Health Indicator Version 2007 (TMHI-15) assessed mental health of VHVs. The Department of Mental Health within the Ministry of Public Health developed this questionnaire[25]. The 15-item short version of TMHI consisted of four items, each scored on a four-point rating scale, ranging from "1" (strongly disagree) to "4" (strongly agree). The total scores, ranging from 15 to 60 points, were divided into the following three groups: 1) low level of mental health (15–43), 2) moderate level of mental health (44–50), and 3) high level of mental health (51–60).

5) The Thai Resilience Quotient Screening Test (20-item Thai RQ) assessed RQ of VHVs. This questionnaire was developed by the Department of Mental Health, Thai Ministry of Public Health.[26] It comprised three domains, namely emotional stability, encouragement, and problem management. Each item was scored on a four-point Likert scale, ranging from "1" (disagree) to "4" (strongly agree). The overall score ranged from 20 to 80. The total scores were divided into the following three groups: 1) low RQ (20–40), 2) moderate RQ (41–60), and 3) high RQ (61–80).

6) The 9 Questions (9Q) assessed Thai's depression symptoms in the past two weeks.[27] This questionnaire comprised nine items, each scored on a Likert-type scale, ranging from "1" (not at all) to "4" (every day). The possible total scores ranged from 0 to 127. The total scores were divided into the following three groups: 1) mild depression (7–12), 2) moderate depression (13–18), and 3) severe depression (19–27).

Three experts measured the questionnaire for content validity. The

questionnaire's index of item objective congruence (IOC) ranged from 0.63 to 1.00. In total, 30 people with similar characteristics pretested the questionnaire. The reliability of the questionnaire was measured by Cronbach's alpha coefficient as 0.96 for SPST-20, 0.77 for GAD-7, 0.77 for MHLQ, 0.77 for TMHI-15, 0.75 for Thai RQ, and 0.80 for 9Q, respectively.

Data collection process

The researcher introduced herself to the participants, providing information on the research objectives, the data collection process, participants' data protection rights, and the advantages of participating in the research project. Subsequently, the participants were asked to read the participation sheet. Furthermore, the researcher asked them to sign a consent form once they had expressed their willingness to participate in the study. Thereafter, the researcher guided the participants to complete the questionnaires, dedicating approximately 30–45 minutes to questionnaire completion.

Statistical analysis

The data analysis was done using statistical computer programs according to the study assumptions. Descriptive statistical analysis examined the demographic data, anxiety, stress, mental health, MHL, and RQ of VHVs in the Phayao Province. Descriptive statistics were used to calculate percentages, means, standard deviations, minimum values, and maximum values. Stepwise multiple regression analysis was utilized to assess the predictive capacity of each variable in relation to the RQ of the study participants. All assumptions related to the normality of metavariables were satisfied. The significance level was set at $\alpha = 0.05$ for all analyses.

Ethical considerations

Ethical approval was provided by the University of Phayao Human Ethics Committee under Certificate No. UP-HEC 1.2/049/66, dated February 22, 2022.

RESULTS

Characteristics of the participants

The demographic characteristics of the 416 participants who completed the questionnaire have been presented in Table 1. Most participants were female (81.3%), with an average age of 55.03 years ($\bar{X}$ = 55.03, SD = 10.44), were married (79.3%), had primary education level (49.0%), were agriculturists (47.8%), had sufficient income (54.3%), had no underlying disease (70.7%), and had a history of COVID-19 infection (53.1%).

Table 1. Demographic characteristics of the participants (n=416)

Demographic characteristics	n	%
Gender		
Male	78	18.7
Female	338	81.3
Age (years) ($\bar{X}$ = 55.03, SD = 10.44, Min = 25, Max = 86)		
Marital status		
Singer	40	9.6
Marriage	330	79.3
Widowed	36	8.7
Divorced / Separated	10	2.4

Demographic characteristics	n	%
Education level		
Uneducated	16	3.8
Primary School	204	49.0
Junior High School	172	41.4
Senior High School	14	3.4
Bachelor or higher degree	10	2.4
Occupational		
Government officer / State enterprise employee	1	0.2
Agriculturist	199	47.8
Employee	136	32.7
Entrepreneur / Merchant	33	7.9
Unemployed	47	11.4
Income		
Sufficient	226	54.3
Insufficient	190	45.7
Medical condition		
None	294	70.7
Hypertension	93	22.5
Diabetic Mellitus	21	5.0
Stroke	1	0.2
Heart disease	6	1.4
Cancer	1	0.2
History of COVID-19 infection		
Never	195	46.9
Ever	221	53.1

Level of mental health, anxiety, depression, stress, MHL, and RQ of the participants

As shown in Table 2, most participants had a moderate level of mental health ($\bar{X}$ = 47.38, SD = 5.84), with a low level of anxiety ($\bar{X}$ = 3.84, SD = 3.59), had a mild level of depression ($\bar{X}$ = 12.06, SD = 3.13), and had a moderate level of stress ($\bar{X}$ = 41.17, SD = 13.15).

Most participants had an overall moderate level of MHL ($\bar{X}$ = 94.25, SD = 14.63). MHL was divided into the following different aspects: 1) knowledge about mental health was at a low level ($\bar{X}$ = 12.01, SD = 2.37), 2) beliefs about mental health were at a moderate level ($\bar{X}$ = 30.32, SD = 5.50), 3) ability to recognize mental problems was at a low level ($\bar{X}$ = 14.86, SD = 4.45), 4) ability to prevent mental problems was at a moderate level ($\bar{X}$ = 18.27, SD = 3.73), and 5) ability to manage mental problems was at a moderate level ($\bar{X}$ = 18.78, SD = 5.27).

The overall aspect of RQ was high ($\bar{X}$ = 61.88, SD = 9.14). In addition, emotional stability ($\bar{X}$ = 30.41, SD = 5.01) and problem management ($\bar{X}$ = 15.02, SD = 2.93) were at moderate levels. However, encouragement was at a high level ($\bar{X}$ = 16.45, SD = 2.48)

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Table 2. Mean, standard deviation, and level of mental health, anxiety, depression, MHL, and resilience quotient of the participants. (n=416)

Variables	Mean	SD	Level
1. Mental Health	47.38	5.84	Moderate
2. Anxiety	3.84	3.59	Low
3. Depression	12.06	3.13	Mild
4. MHL	94.25	14.63	Moderate
4.1 Knowledge	12.01	2.37	High
4.2 Belief	30.32	5.50	Moderate
4.3.1 Recognition	14.86	4.45	Low
4.3.2 Prevention	18.27	3.73	Moderate
4.3.3 Management	18.78	5.27	Moderate
5. RQ	61.88	9.14	High
5.1 Emotional stability	30.41	5.01	Moderate
5.2 Encouragement	16.45	2.48	High
5.3 Problem management	15.02	2.93	Moderate
6. Stress	41.17	13.15	Moderate

Predictors of the RQ among VHVs in the Phayao Province

The current study used stepwise multiple regression to examine the factors that might predict RQ among VHVs in the Phayao Province. The following five variables were entered into the equation: mental health, anxiety, depression, stress, and MHL. As shown in Table 3, four variables, namely mental health, anxiety, depression, and MHL, had a predictive capability for the RQ with 40.30% statistical significance (R = 0.639, Adjusted R^2 = 0.403, F = 71.071, P-value < 0.001).

Mental health can be positively predicted (B = 0.764, P-value < 0.001). Groups with a high level of mental health have higher levels of RQ than those with a low level of mental health.

Anxiety was negatively predicted (B = -0.389, P-value < 0.001). Those with high levels of anxiety had lower levels of RQ than those with low levels of anxiety.

Depression was negatively predicted (B = -0.390, P-value = 0.002). Those with high levels of depression had lower levels of RQ than those with low levels of depression.

Mental health literacy was positively predicted (B = 0.060, P-value = 0.015). Those with high levels of depression had higher levels of RQ than those with low levels of depression.

Therefore, the forecasting equation can be written in raw score form as follows:

$$\hat{y} = 26.254 + 0.764 (X_1) - 0.389 (X_2) – 0.390 (X_3) + 0.060 (X_4)$$

$$\hat{y} = 26.254 + 0.764 (\text{Mental Health}) – 0.389 (\text{Anxiety}) – 0.390 (\text{Depression}) + 0.060 (\text{MHL})$$

Furthermore, the forecasting equation can be written in standard score form as follows:

$$Z = 0.488 (X_1) – 0.153 (X_2) – 0.133 (X_3) + 0.096 (X_4)$$

$$Z = 0.488 (\text{Mental Health}) – 0.153 (\text{Anxiety}) – 0.133 (\text{Depression}) + 0.096 (\text{MHL})$$

Table 3. Multiple regression analysis of factors predicting RQ.

Predictors	B	S.E.	β	t	Sig.	95.0% CI for B	
						Lower	Upper
(Constants)	26.254	3.966		6.621	< 0.001***	18.459	34.050
Mental Health (X_1)	.764	.066	.488	11.654	< 0.001***	.635	.892
Anxiety (X_2)	-.389	.109	-.153	-3.574	< 0.001***	-.603	-.175
Depression (X_3)	-.390	.125	-.133	-3.111	0.002**	-.636	-.144
MHL (X_4)	.060	.024	.096	2.453	0.015*	.012	.108
R = 0.639, Adjusted R^2= 0.403, F = 71.071, P-Value < 0.001							

Abbreviations: SE, standard error; CI, confidence interval
*p-value < 0.05, ** p-value < 0.01, *** p-value < 0.001

DISCUSSION

Due to the widespread impact of the COVID-19 pandemic on a global scale, every sector has been significantly affected. The aftermath of the virus outbreak continues to exert continuous repercussions. Post-COVID-19, a notable influence has been observed on family incomes, serving as an indicator of economic stability. The economic fallout from the spread of the COVID-19 virus has particularly affected most of the sample group, which mostly comprises women engaged in agricultural occupations, aligning with the findings of Aldwin et al.[29] regarding the correlation between occupation and the impact on income stability.

Mental health was positively predicted (B = 0.764, P-value < 0.001). Those with a high level of mental health had higher levels of RQ than those with a low level of mental health, consistent with the findings of the study conducted by Rehman et al.[30]. Furthermore, the research performed by Apiphon et al.[31] found that RQ is an important factor in human life, which helps an individual maintain a state of emotional and mental stability in their daily lives.

Anxiety can be negatively predicted (B = -0.389, P-value < 0.001). The group with high levels of anxiety has lower levels of RQ than the group with low levels of anxiety, consistent with the findings of the studies conducted by Sophin et al. [32] and Prapasri et al. [33]

Depression can be negatively predicted (B = -0.390, P-value = 0.002). In other words, individuals with high levels of depression are expected to have a lower emotional resilience quotient compared to those with lower depression levels. This result aligns with the findings of the study conducted by Paijit et al.[34]

MHL can be positively predicted (B = 0.060, P-value = 0.015). This means that individuals with a higher level of MHL are expected to have higher emotional resilience compared to those with lower MHL. This finding is consistent with the findings of the research conducted by Sriwichai and Kuwiwatchai[35], indicating that individuals with a heightened MHL tend to exhibit a higher emotional resilience quotient than those with lower levels of MHL.

In summary, the study results have revealed that, in the post-COVID-19

pandemic period, the RQ can be predicted through multiple regression analysis using the stepwise method, incorporating the following five variables: mental health, anxiety, depression, stress, and MHL. The analysis led to the identification of the following four significant variables: mental health, anxiety, depression, and MHL, accounting for 40.30% of the variance. This finding is statistically significant at the 0.05 level ($R = 0.639$, Adjusted $R^2 = 0.403$, $F = 71.071$, P-value < 0.001). Therefore, relevant organizations should consider these factors while formulating policies and activities to enhance the population's emotional resilience. These findings can serve as a guideline for preventing other mental health issues and promoting well-being, especially within the context of the organization in question.

RECOMMENDATIONS

Health and social welfare agencies should provide holistic information to establish healthcare policies and guidelines for VHVs, considering the characteristics of demographic and social variables such as gender, occupation, and number of people in the family. Academically, related organizations and agencies should develop guidelines for strengthening the RQ of VHVs.

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CONFLICT OF INTEREST

All authors declare no conflicts of interest.

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