

## Stress and quality of life among susceptible Thai people during COVID-19 pandemic

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### ABSTRACT

People with underlying disease (diabetes mellitus, and hypertension) could be stressed during COVID-19 pandemic. This study was investigated stress levels and quality of life among diabetes mellitus and/or hypertension patients, and factors related to quality of life in Khon Kaen during COVID-19 pandemic. This cross-sectional analytical study was conducted 270 samples. Multilevel logistic regression was performed to identify the influence of stress level and quality of life (QoL). The results showed that most of the samples had a moderate level of stress (78.5%), and a high level of stress (3.3%). For overall QoL, it was found that most of them had moderate level (77.8%), and poor level (7.8%). The likelihood of poor QoL was 5.5 times (adj. OR=5.5; 95% CI: 1.6 to 18.1) of income decreasing due to economic downturn, no impact to moderate impact and not COVID-19 immunized had 3.4 times the likelihood of poor QoL (adj. OR=3.4; 95% CI: 1.2 to 9.2) with statistical significance at 0.05 level. It could be concluded that nearly 2.5–3 times, samples had a poor to moderate quality of life, due to stress and economic issues that affected people's quality of life during the COVID-19 pandemic.

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## 1. INTRODUCTION

COVID-19 is an emerging disease that has a global impact, whether it affects both physical and mental health as well as the global economy. The first infected person was found in Wuhan, China, at the end of 2019. After that, the COVID-19 spread worldwide, causing infected people and death in large numbers. A global situation according to the COVID-19 Situation Report by the COVID-19 Information Centre Public Relations Department Ministry of Public Health Information as of November 2021, 254,100,453 cases, and 5,116,546 deaths were confirmed. Thailand is the 24th largest number of infected cases globally, cumulatively since 2020. A total of 2,018,410 cases from all three outbreaks of the COVID-19 in Thailand were as follows: the first outbreak was on January 1st – December 14th 2020; the second outbreak was on December 15th, 2020 – March 31st, 2021; and the third outbreak was from April 1st, 2021, until November 2021. The total number of deaths was 20,677 [1]. Data from 1,590 laboratory-confirmed hospitalized patients in 31 Chinese regions were investigated by Djaharuddin *et al.* [2], the composite endpoints—admission to an intensive care unit, invasive ventilation, or death—were assessed. Patients with any comorbidity had worse clinical outcomes among COVID-19 instances that were confirmed in the lab. After controlling for age and smoking history, cancer,

COPD, diabetes, and hypertension were risk factors for achieving the composite endpoints. Poorer clinical outcomes also related with having more comorbidities. In patients with at least one comorbidity, the hazard ratio (95% CI) was 1.79 (1.16-2.77), and in patients with two or more, it was 2.59 (1.61-4.17). According to research by Karyono and Wicaksana [3], older COVID-19 patients and COVID-19 patients with hypertension, diabetes, and other cardiovascular illnesses had a greater mortality rate. That is in line with [4] reported on their research that hypertension (55.4%), diabetes (37.3%), and hyperlipidemia (18.5%) were the three most common comorbid conditions among COVID-19 deaths in NY, USA. According to Richardson *et al.* [5], this study showed that the most prevalent comorbidities among the 5,700 patients were hypertension (56.6%), obesity (41.7%), and diabetes (33.8%).

The Department of Disease Control and Ministry of Public Health surveyed the impact of COVID-19 on chronic non-communicable disease risk behaviors during the COVID-19 outbreak among people between April 27th and May 3rd, 2020. The samples were found to be more stressed than before, 38.2% [5]. Some studies also found that 16-28% of people had symptoms of anxiety and depression, and 8% of them were stressed. It also affected sleep disturbance by 38.9% [6]–[8]. The outbreak of COVID-19 has, in addition to affecting physical, mental, economic, and social health, caused higher levels of stress, depression, and suicide. The Department of Mental Health provided information on the early stages of the COVID-19. People previously had low suicidal thoughts at 0.7-0.8%. According to systematic review of [9], experts mentioned that the COVID-19 epidemic, severe economic hardships, and several psychosocial stressors, may cause a spike in suicidal tendencies. This phenomena reflects the increasing stress and mental health problems that must be monitored. The problem of patients with the congenital disease is still a risk factor for contracting COVID-19 easily and is also a factor that causes greater severity of the disease than those without the congenital disease. As shown in the study of Dubey *et al.* [10] mentioned that elderly and those with severe comorbidities are especially susceptible to COVID-19's worst consequences might cause a great deal of worry in the elderly. Anxiety, impatience, and an excessive amount of stress are examples of other psychological effects. The special requirements of older persons call for specific care since they may become significantly more irritated, worried, and socially withdrawn.

Moreover, during the COVID-19 outbreak in Thailand, the mortality rate from COVID-19 with the underlying disease was higher than those without the underlying disease. In light of this, there is an inequity in the health of people with underlying conditions. This should be regarded as the impetus for revising strategies to prevent premature death for people with underlying diseases if infected with COVID-19. People with underlying disease could be stressed during COVID-19 pandemic. This condition may impact their quality of life, facing that they are susceptible to COVID-19 infection. The study's objectives were to investigate stress levels and quality of life among diabetes mellitus and/or hypertension patients and factors related to the quality of life studied in Khon Kaen during COVID-19 pandemic.

## 2. RESEARCH METHOD

The population used in this study was people with diabetes mellitus and/or hypertension in Khon Kaen city, Thailand, from a simple random sampling. Calculating the sample size was based on the formula method simplified for multiple logistic regression in analysis [11]. Formula was also adjusted for the influence of correlation between independent variables by variance inflation factor (VIF). The research instrument was a questionnaire for the samples. The Perceived Stress Scale (PSS) was a 20-item assessment questionnaire based on feelings and thoughts during the last month [12]. Quality of life level using the WHO quality of Life abbreviation scale [13] was an assessment with 26 questions, consisting of: i) physical aspects, ii) psychological aspects, iii) social relationships, and iv) environmental aspects. Reliability of the questionnaire was checked by the questionnaire try-out and then the analysis of reliability. Using the Cronbach's coefficient method, the Cronbach's Alpha coefficient of the QoL Assessment Scale was 0.84 and the Stress Assessment Scale was 0.81. Regarding research ethics, this research protocol was reviewed by the Sirindhorn College of Public Health Institutional Review Board (SCPHKKIRB). The ethical number was HE642010 granted on September 9th, 2021.

## 3. RESULTS AND DISCUSSION

### 3.1. General information

The study consisted of 270 samples, mostly female, 68.9%. 61.8% of all samples aged equal or over 60 years. Many respondents had an overweight body mass index (40.4%), and their family status was as a couple, 65.9%. Most of them had an educational level below bachelor's degree (91.5 %). 35.7% of the samples had diabetes mellitus for less than six years and 44.8% of them were with hypertension. They mostly did not smoke (86.3%), and did not drink alcohol (84.4%). The samples had decreased income due to the economic situation at a moderate level, 80% and they received services from the hospital with the satisfaction level at a reasonable level, 62.6%.

### 3.2. Risk factors for COVID-19

Most of the 270 samples had no risk behavior (92.2%). They resided in a high-risk area (92.6%) and had not been met the criteria for investigation (98.9%). They had been vaccinated for the prevention (99.2%).

### 3.3. Stress

From the data analysis, it was found that the stress of the 3.3% samples was high (95%CI: 1.5-6.2), 78.5% moderate (95%CI: 73.1-83.2), and 18.1% low (95%CI: 13.7-23.2). The median was 19 points out of 80 points, a minimum of 24 point and a maximum of 72 points, as shown in Table 1. Referring the individual stress of diabetic and/or hypertensive patients in Khon Kaen city during the COVID-19 pandemic, the samples were found to have issues or indications of stress, most commonly due to financial difficulty and fear of COVID-19 infection and least commonly due to common cold infection.

Table 1. Stress levels in patients with diabetes mellitus and/or hypertension (n=270)

Stress Levels	Number	percentage	95 %CI
(low stress) 1–32	49	18.1	13.7–23.3
(moderate stress) 33–65	212	78.5	73.1–83.3
(high stress) 66–100	9	3.3	1.5–6.2
Mean (Standard Deviation)	(42.4) ± 9.9		
Median (Min : Max)	42 (24: 72)		

Regarding the overall quality of life, the analysis found that the samples had 29.3% good (95%CI: 23.9-35.1%), 69.3% moderate (95%CI: 62.9-74.4), and 1.5% poor (95%CI: 0.6-4.4) quality of life in a physical health aspect, with an average score of 23.9±3.6 points (out of a full 35 scores), the lowest 11 points, and the highest 31 points. Their psychological quality of life was 11.8 percent good (95%CI: 8.2-16.3) 87% moderate (95%CI: 82.4-90.8) and a poor level of 1.1% (95%CI: 0.2-3.2), with an average score of 19.4±2.5 points (out of a 30-point scale), the lowest 13 points and the highest 27 points. The quality of life in social relations was 2.6% good (95%CI: 1-5.3), 82.2% moderate (95%CI: 77.1 - 86.6), and 15.2% poor (95%CI: 11.1-20.0), with an average score of 9.9±1.4 points (out of a full 15 points), a minimum of 5 points and a maximum of 14 points. The environmental quality of life of was 4.4% good (95%CI: 2.3-7.6), 88.5% moderate (95%CI: 84.1 - 92.1), and 7.0% poor (95%CI: 4.3-10.2), with an average score of 25.2±3.4 points (out of a full 40 points), a minimum of 13 points and a maximum of 37 points. Categorizing the quality of life by item, it was found that the samples mostly had the quality of life issues, which included the meaningful living and the quality of life according to your current thinking. The least common part is satisfaction of sex life. Sex life means that once sexual sensations arise, you can manage to relax them, including masturbation or sex.

### 3.4. Quality of life and factors related to the quality of life

From the analysis of overall quality of life situation, it was found that 14.4% (95% CI: 10.5-19.2) of samples had a good quality of life. 77.8% of them had moderate (95% CI: 72.3-82.6) and 7.8% had poor quality of life (95% CI: 4.9-11.6), with a mean score of 68.1±14.7 points (out of a total score of 130), with a minimum of 50 and a maximum of 117 points, as detailed in Table 2.

Table 2. The overall quality of life level of patients with diabetes mellitus and/or hypertension.

Quality of life levels	Number	Percentage	95 %CI
Good quality of life (96-130)	39	14.4	10.5-19.2
Moderate quality of life (61-95)	210	77.8	72.3-82.6
poor quality of life (26-60)	21	7.8	4.9-11.6
Mean (Standard deviation)	(84.4) ±10.5		
Median (Min:Max)	84 (50:117)		

The relationship between factors with poor quality of life in people with diabetes mellitus and/or hypertension in Khon Kaen during COVID-19 pandemic. The analysis of other factors that were associated with poor quality of life when controlling for intergroup effects determined district scale as the variables that were in the equation for random effects. To control the effect between multilevel groups using a generalized linear mixed model (GLMM) logistic regression analysis, it was found that the relationship between stress factors and poor quality of life was found highly correlated. Opportunity to have a poor quality of life was up to 100%. Considering the economic aspect, the samples' income was reduced due to the economic situation. Poor quality of life was likely to increase 5.5 times as a result of economic impact (adj. OR=5.5, 95%CI: 1.7 to 18.1 p-value=.005). However, not received vaccination of COVID-19 was likely to have no/moderate impact

on poor quality of life 3.40 higher than received COVID-19 vaccination (adj. OR=3.40 95%CI: 1.2 to 9.2, p-value=.01) of those vaccinated as detailed in Table 3.

Table 3. Results of the GLMM logistic regression analysis between various factors and the level of poor quality of life (n=270)

Category	Numbers	Poor quality of life	Crude OR	Adjusted OR	95%CI	p-value
1. Economic impact						
Low – moderate	243	6.2	1	1	1	.005
High	27	22.2	4.3	5.5	1.7 to 18.1	
2. Vaccination of COVID-19						
Received	176	5.1	1	1	11	.01
Not received	94	12.7	2.7	3.4	1.2 to 9.2	

### 3.5. Discussion

Stress level and quality of life in patients with diabetes mellitus and/or hypertension in Khon Kaen city, Thailand during the COVID-19 outbreak, it was found that the stress of the samples was mostly at a moderate level. The overall quality of life of the samples was found at a moderate level too, as Liddle *et al.* [14] indicated this was due to chronic congenital disease. These illnesses could affect the quality of life which is consistent with some research of [15], [16]. Those were found that quality of life of diabetes patients decreased up to the first reopening phase and people who aged 44 and above, and people living with chronic diseases often reported lower health-related quality of life than ones without. In addition, the study of [17] revealed that the spread of the pandemic had a significant impact on sleep quality regarding anxiety of diabetes patients, which anxiety levels and mental stress were also high and disrupt their psychosocial life.

Furthermore, some studies of [18], [19] illustrated the situation of COVID-19 pandemic affected occupation and income based on the occupations of the sample group, 95.2% were housewives, farmers, and traders, and only 4.8% were civil servants, which was a permanent position. When the COVID-19 pandemic occurred, there was a limitation in life or occupation. As same as the study of Hansel *et al.* [20] discovered during the outbreak of COVID-19, increased anxiety, depression, and alcohol misuse and that the pandemic were found. This situation could result in stress and quality of life. Moreover, the studies of [21], [22] also showed that the factors associated with higher emotional burden in first COVID-19 outbreak peak were being female, younger, unemployed, living in high socioeconomic level sectors, having previous medical problems, encountering more individuals, and struggling physiological symptoms. Environmental context and social context were importance in minimizing and coping stress during the pandemic.

Factors related to the quality of life revealed that experiencing high stress increased an opportunity to have a poor quality of life. Considering the economic aspect, income was reduced from the economic situation. This could cause problematic consequences. Moreover, the effect of patients' stress as a result of type 2 diabetes was investigated. The quality of life of diabetes patients was found to be at a poor to moderate level, increasing during the COVID-19 outbreak as shown in the previous studies of [23]–[25]. Poor economic conditions were also associated with poor quality of life, type 2 DM patients living with poor economic status and could not afford medical fees had a poorer QOL than those who had a better economic status. It is in line with previous studies [26]–[30], they indicated that family monthly income, education level and co-morbidities were the most important factors affecting the quality of life of type II diabetes and the absence of income indicating severe mental disorder in these patients. Worldwide job loss and/or wage's reduction were common since the beginning of the economic downturn leading to psychological distress, and anxiety.

The results of this study showed the likelihood of poor quality of life as 5.5 times (95% CI: 1.66 to 18.1 p-value =.005) of lower income due to economic conditions. The decline in income was associated with stress and quality of life. It is in line with Tamornpark *et al.* [26] stated that almost half of diabetic patients in the northern Thailand were reported to have a low-to-moderate quality of life, which could be improved by focusing on socioeconomic factors, family support, and improving knowledge about diabetes mellitus prevention and care, including medical fee support. If the stress is in a high state and continues to accumulate for a long time, it can result in depression in the end. There is also a critical condition that affects the quality of life as shown in studies of [31], [32]. The individuals who did not receive vaccine for COVID-19 preventing, the likelihood of poor quality of life was 3.40 times (95%CI: 1.25 to 9.22, p-value .01), compared to those who were vaccinated. This is because vaccination could increase immunity and reduce the severity of the infection preventing serious illness and reducing mortality of those who were not vaccinated. This could be due to worries were primarily focused on the vaccine's perceived unpleasant experience, such as the vaccine's side effects, adverse reactions, allergic reactions, glucose fluctuations, and the potential for immunizations to cause other diseases [33].

According to [34], [35] revealed that type 2 diabetic patients had a low quality of life due to the COVID-19 outbreak. In Consistent with Peimani *et al.* [36] indicated that worries relating to the COVID-19 pandemic were highly prevalent. Female gender, older age, presence of diabetes-related problems, longer duration of diabetes, loneliness, higher levels of diabetes-related distress, and changes in self-management behavior were all significantly linked to COVID-19-specific diabetes worries and Moura *et al.* [37] also informed that the COVID-19 outbreak had an impact on quality of life of hypertensive patients had higher stress, and depression, it is in line with [38], [39] discovered the main findings in their study, during the COVID-19 pandemic, the majority of patients with DM experienced poor physical and mental quality of life. The higher levels of COVID-19 related fear were found to be associated with poor health-related quality of life. Additionally, Mukhtar *et al.* [40] has shown that related psychological distress (negative emotions and burden of self-management of diabetes patients) could aggravate during the psychological stress in the crisis of COVID-19 outbreak.

Hence, policies that provide effective care and attention during a global pandemic like COVID-19 must be emphasized. This greatly aids policymaking. Including the health care of the population with an underlying disease may require additional emotional support because they were more easily infected with severe respiratory infection than those without. It is consistent with the discussion of Peimani *et al.* [36] that the results of this study may be advantageous for efforts to boost the emotional and educational support available to persons with type 2 diabetes so they can deal with their anxiety and suffering throughout the outbreak. Finally, they suggest that type 2 DM including diabetes complications, people with longer duration of diabetes and people on insulin.

#### 4. CONCLUSION

Public health personnel or related person's emphasis should be placed on creating an understanding and proper way to manage stress. In particular, stress management was found to have high-stress scores, such as insufficient funds to spend due to the COVID-19 pandemic, followed by fear of contracting COVID-19. To reduce stress in people with diabetes and/or hypertension. During the situation of the COVID-19 pandemic, with goals to promote a good quality of life and to create an appropriate process, the outputs of this research can be used in the process planning of building and promoting the quality of life, efficiently and effectively for extensive benefits.

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