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Drug use patterns in COVID-19 patients: A retrospective survey 2021–2022

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ABSTRACT

This retrospective survey examines drug use patterns in COVID-19 patients from 2021 to 2022 with 81 participants, who reported 13 symptoms between March and May 2023. Application of the *k*-means clustering method led to identification of three distinct symptom severities, severe (Cluster I), moderate (Cluster II), and mild (Cluster III), with respective average scores of 3.67±0.87, 3.20±0.98, and 1.87±0.81. In Clusters I and II, myalgia was the most notable symptom, while in Cluster III, sore throat was predominant. On average, individuals in Clusters I–III used 2.00–2.34 types of drugs, with use of a single drug having the highest frequency. Notably, *Andrographis paniculata* capsules were highly utilized across all clusters (51.85%), while favipiravir was less often used. Furthermore, one in five participants in the combined Clusters I and II employed substantial pharmaceutical interventions for COVID-19 treatment, whereas in Cluster III, this use remained below 10%. This research provides valuable insights into drug use patterns for managing COVID-19. The findings offer crucial information about symptoms from each cluster, tailoring treatment approaches to specific symptom severity clusters as well as overlapping medications.

Keywords: cluster analysis; COVID-19; drug use patterns; severity; symptoms

1. INTRODUCTION

The COVID-19 crisis triggered a spike in demand from patients for beds and drugs, which the government-run healthcare systems had to address (Alves, 2021; Saberian et al., 2020). In 2021, the public and private sectors in Thailand worked to alleviate the load on healthcare services and assist individuals who were in crisis resulting from morbidity and financial difficulties due to lock down measures (National Health Commission Office, 2020). Numerous organizations arose in response to the pandemic's impact, such as the "Help Society", which was formed in the middle of 2021. This network was established by a volunteer club at Mahamakut Buddhist University, Sirindhorn Rajavidhayalaya Campus (known as Bundit Asa in Thai) and 37 other existing organizations to assist those having difficulty acquiring vital medical supplies and oxygen tanks, as well as providing food security (HS.Helpsociety, 2022). The Help Society used Facebook fan pages and the official LINE accounts of Bandit Asa and the Help Society as communication channels (HS.Helpsociety, 2023), which played a critical role in supporting COVID-19 patients.

COVID-19 symptoms can be categorized into four stages, infection-related symptoms, acute post-COVID symptoms, long-lasting post-COVID symptoms, and persistent post-COVID symptoms (Fernández-de-Las-Peñaset et al., 2021). Throughout the wide range of symptoms, cough, weakness, taste anomalies, myalgia, and fever were the most typical presentations of COVID-19

(Çalıca Utku et al., 2020). Among the wide range of symptoms, cough, weakness, taste anomalies, myalgia, and fever were identified as the most typical presentations of COVID-19 (Çalıca Utku et al., 2020). Investigations by Akram et al. (2021) and Shafique et al. (2021) both highlighted the significance of cough and fever as primary markers, supporting this general consensus. Furthermore, loss of taste and smell were identified as additional prominent symptoms in subsequent research, indicating that these findings are associated with COVID-19 (Struyf et al., 2020).

As the COVID-19 pandemic emerged, there was a diversity of information sources and individual beliefs influencing the understanding of medication and self-treatment. Self-medication is common among COVID-19 patients (Kazemioula et al., 2022; Zheng et al., 2023), accounting for 41.7% of all cases from a systematic review and meta-analysis (Zheng et al., 2023). An earlier study conducted at King Chulalongkorn Memorial Hospital in Thailand revealed that adverse reactions and unnecessary product use exceeded 60%, underscoring the critical need for well-informed self-treatment practices (Sungsana et al., 2023). A noteworthy drug, favipiravir, gained prominence for its direct role in treating COVID-19, representing a significant advancement in drug-based interventions (Ceramella et al., 2022; Siripongboonsitti et al., 2023). It is widely believed that the herbal mixture from Wat Khiriwong may strengthen the body's defenses against COVID-19 (The Government Public Relations Department, 2022). Moreover, the Thai government extended authorization for the use of *Andrographis paniculata* capsules in alleviating early symptoms of COVID-19 and mitigating their severity (The Nation Thailand, 2020). As a result, three different types of drugs, favipiravir, an herbal remedy from Wat Khiriwong, and *Andrographis paniculata* capsules, were widely used in Thailand during the COVID-19 outbreak.

Cluster analysis, a method for categorizing similar entities depending on various requirements, can be employed in a wide variety of contexts (Scutariu et al., 2022; Ullah et al., 2021; Yang et al., 2022). It assists in determining the effectiveness of medications in examining conventional medical practices (Jayathavaj et al., 2022) and in categorizing provinces based on population and COVID-19 characteristics (Jayathavaj, 2023). Earlier investigations employed a symptom-based classification system for COVID-19 patients that defined Cluster I as having predominant symptoms of myalgia and headache, Cluster II as having primary symptoms of chest pain and shortness of breath, and Cluster III as characterized by a less severe symptom profile (Kenny et al., 2022). Notably, in the context of long-term COVID, these identified symptom clusters, especially Clusters I and II, exhibit a higher degree of functional impairment. Furthermore, considering the framework of COVID-19, it is possible to classify patients based on the severity of symptoms and relate their self-medication behaviors to specific symptom clusters.

Individuals with COVID-19 symptoms may have difficulty accessing the public health system through traditional means, necessitating self-care. The implications of these findings in the current study are crucial for increasing patient care in the context of COVID-19. The current study aims to retrospectively analyze drug use patterns in COVID-19 patients from 2021 to 2022 through a survey conducted from March to May 2023. It seeks to identify symptom severity using the *k*-means clustering method, with support from Bundit Asa and the Help Society.

2. MATERIALS AND METHODS

2.1 Study design

A cross-sectional survey research study was employed to cluster drug use patterns based on symptom severity levels in COVID-19 patients via broadcast through the official LINE accounts of the Help Society from March to May 2023. This research received ethical approval for human participation from Walailak University under Certificate No. WUEC-23-077-01.

2.2 Participants and procedures

Individuals aged 18 and older who sought COVID-19 medicine from Help Society between 2021 and 2022 and who provided an online questionnaire response within a three-month period were eligible to participate. The questionnaire was distributed via the organization's official LINE account, which was accessed by those who registered for medical assistance from the Help Society. The study recruited 134 participants out of 363 registered individuals, with 81 people completing the survey. Sample sizes ranging from 20 to 30 per designated subgroup are often acceptable for cluster analysis calculations (Dalmaijer et al., 2022).

A tool was developed to collect data from the World Health Organization's COVID-19 symptoms list (WHO, 2023), a pre-hospital risk assessment for COVID-19 infection from Rajavithi Hospital (n.d.) and Bangkok Dusit Medical Services (2020). This questionnaire included sections covering personal information such as sex, geographical location of the patient's home, chronic diseases (unspecified through open-ended queries), and age demographics. It also explored details about administered medications, drug use for managing COVID-19 symptoms, and the severity of 13 symptoms at the onset of the condition and after a five-day interval. Questions regarding drug use involved both multiple-choice options and open-ended responses.

The drug codes and names were obtained from an online multiple-choice option and open-ended COVID-19 drug use questionnaire, illustrated in Figure 1. To designate the codes based on the type of drug, the researchers employed capital English letters.

Codes	Drug names and formulations
A	*Andrographis paniculata* capsule
C	Cough herbal drug
G	Ya Khiao-Hom Powder (Ancient herbal drug)
K	Wat Khiriwong drug formula
T	Sore throat herbal drug
O	Boiling water infused with shallots
P	Paracetamol
Q	Antiviral drugs for COVID-19 (such as favipiravir)
J	Generic herbal medicine capsules
N	Generic medicine

Figure 1. Drug codes, names and formulations used in the current study

2.3 Data analysis

Statistical analysis was executed using two software tools, specifically Jamovi 2.3.18 (Jamovi, 2022) and the snow Cluster Module for Cluster Analysis (Seol, 2022). Symptom severity levels were measured on an ordinal scale and were classified into five distinct levels: absence of symptoms = 1, mild symptoms = 2, moderate symptoms = 3, severe symptoms = 4, and very severe symptoms = 5. Three experts conducted a comprehensive review and assessment of the questionnaire, employing the index of item-objective congruence (IOC) to ascertain its validity. Each question within the questionnaire demonstrated an IOC value of not less than 0.60. Furthermore, a reliability test was administered to 30 direct contact questionnaires obtained from the target population. Cronbach's alpha was 0.63, which is within the acceptable range of 0.6 to 0.8 (Hajjar, 2018; Shi et al., 2012; Cronbach, 1951).

The *k*-means clustering algorithm was used to analyze the data, treating all 13 variables as a multidimensional data geometry in a 13-dimensional space. This analytical strategy initiates by establishing cluster centers, denoted as centroids, defined by a set number of *k* points, where *k* signifies the expected number of clusters arising from the segmentation procedure. Subsequently, the method calculates distances between each data row (representing individual COVID-19 cases) and the corresponding central point (centroid), thus facilitating grouping of data items. The metric employed is Euclidean distance, computed based on the symptom levels encompassing the 13 variables.

The classification process involves applying the *k*-means clustering method to categorize the 81 participants into three clusters, Cluster I (severe symptoms), Cluster II (moderate symptoms), and Cluster III (mild symptoms), which is demonstrated in Figure 2. This classification is based on the mean severity scores obtained for 13 symptoms. Symptoms are indicated as a for fever, b for cough, c for weakness, d for myalgia, e for sore throat, f for diarrhea, g for conjunctivitis, h for headache, i for taste or smell disturbances, j for rash of toes/COVID toes, k for difficulty breathing, l for chest pain, and m for fatigue. For each of these symbols, 1 denotes the absence of symptoms, 2 indicates minor symptoms, 3, moderate symptoms, 4, severe symptoms, and 5, very severe symptoms. Figure 2 demonstrates that three distinct symptoms were rarely encountered in moderate and mild clusters (diarrhea, conjunctivitis, and rash of toes/COVID toes).

During the data grouping process that encompasses all the COVID-19 cases in the current study, the centroids within each cluster were subjected to iterative recalibration. This process continued until a predefined stopping condition was satisfied, at which point the centroid of each cluster aligned with the center of its constituent data points. This essentially means that every data point establishes a close association with the centroid of its corresponding cluster, and individuals within the same cluster exhibit similarity to the cluster's centroid in relation to their symptom levels across the 13 variables. Each distinctive cluster is characterized by its unique average symptom level profile (Sarapat, 2020).

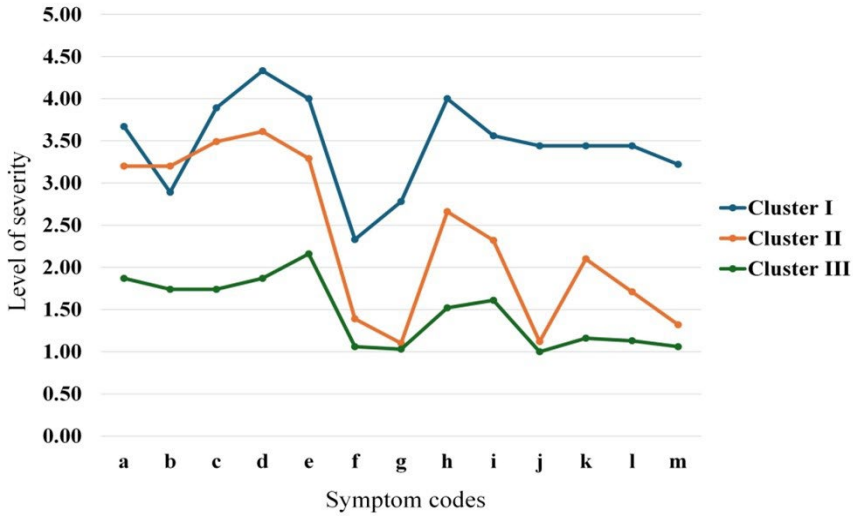

Figure 2. Means of the 13 symptom levels of the clusters by the *k*-means clustering method
Note: a = fever, b = cough, c = weakness, d = myalgia, e = sore throat, f = diarrhea, g = conjunctivitis, h = headache, i = taste or smell disturbances, j = rash, k = difficulty breathing, l = chest pain, m = fatigue

3. RESULTS

There were 81 participants infected with COVID-19 during 2021–2022 who completed online questionnaires via the official LINE accounts of Bundit Asa and the Help Society (Table 1). The participants were predominantly adult females with a mean age of 39.3 years. Notably, the majority resided in the central region of Thailand and reported the absence of chronic illnesses. Noteworthy prevalent conditions included diabetes and hypertension.

The mean severity and standard deviation of the 13 symptoms identified in the clustering process are presented in Table 2. Clusters I and II exhibited the highest severity levels for myalgia, with scores of 4.33±0.71 and 3.61±0.67, respectively. In Cluster III, sore throat demonstrated the highest severity, with a score of 2.16±1.04. Within Cluster I, the three most severe symptoms were myalgia (4.33±0.71), sore throat (4.00±0.71), and headache (4.00±0.71), while diarrhea (2.33±0.87) was the least severely reported symptom. In Cluster II, the three

most severe symptoms included myalgia (3.61±0.67), weakness (3.49±0.84), and sore throat (3.29±0.90). Conversely, conjunctivitis (1.10±0.30) and rash of the fingers or toes (1.12±0.40) were either rarely observed or entirely absent. In Cluster III, the three most severe symptoms were sore throat (2.16±1.04), fever (1.87±0.81), and myalgia (1.87±0.81). In contrast, symptoms such as difficulty breathing (1.16±0.52), chest pain (1.13±0.43), fatigue (1.07±0.25), diarrhea (1.07±0.25), conjunctivitis (1.03±0.18), and rashes on the fingers or toes (1.00±0.00), were rarely or not at all reported.

Upon analyzing the data in Table 3 and grouping the number of drugs used by clusters, a noteworthy pattern emerged. It was observed that all three clusters exhibited the highest frequency of patients who used only one drug type. The average number of drug types used was lowest in Cluster III (2.00±1.27), followed by Cluster I (2.33±1.25) and Cluster II (2.34±1.60). However, it is noteworthy that in Cluster I, characterized by severe symptoms, the maximum number of drugs used was four, whereas in Clusters II and III, the maximum number of drugs used reached five. In Cluster I, a prevailing trend was observed, where most individuals primarily utilized a single type of drug, followed by three types. In Cluster II, most individuals primarily utilized a single type of drug, with an equal prevalence of two and four types of drugs as the next most prevalent. In Cluster III, use of a single drug was the most frequent decision, followed by a total of three types. This pattern is consistent with the overarching trend across all clusters, where the most prevalent mode of drug use involved a single type, followed by three and four types, in that order.

In the context of COVID-19 treatment in Thailand, the primarily recommended drugs include *Andrographis paniculata* capsules, the Wat Khiriwong drug formula, and favipiravir. Table 4 provides a detailed breakdown of their use, indicating the number and percentages of participants in each cluster. Notably, participants who used drug combinations (*Andrographis paniculata* capsules, Wat Khiriwong drug formula, and favipiravir) in Clusters I–III were 2 (22.22%), 11 (26.83%), and 3 (9.68%) individuals, respectively.

Table 1. Baseline characteristics of the participants (n = 81)

Variable		Number	%
Sex	Female	64	73.13
Chronic diseases	yes	13	36.11
Region	Central	52	64.20
	Southern	8	9.88
	Northeastern	12	14.81
	Others	9	11.11
Age (mean±SD)		39.3±11.27	

Table 2. Severity levels (mean±SD) of 13 symptoms classified by clusters

Code	Symptoms	Cluster I (n = 9)	Cluster II (n = 41)	Cluster III (n = 31)	Total (n = 81)
a	Fever	3.67±0.87	3.20±0.98	1.87±0.81	2.74±1.14
b	Cough	2.89±1.05	3.20±0.93	1.74±0.82	2.60±1.13
c	Weakness	3.89±1.05	3.49±0.84	1.74±0.73	2.86±1.21
d	Myalgia	4.33±0.71	3.61±0.67	1.87±0.81	3.02±1.18
e	Sore throat	4.00±0.71	3.29±0.90	2.16±1.04	2.94±1.13
f	Diarrhea	2.33±0.87	1.39±0.83	1.07±0.25	1.37±0.77
g	Conjunctivitis	2.78±1.09	1.10±0.30	1.03±0.18	1.26±0.69
h	Headache	4.00±0.71	2.66±1.09	1.52±0.72	2.37±1.21
i	Taste or smell disturbance	3.56±0.88	2.32±1.37	1.61±1.20	2.19±1.38
j	Rash of fingers or toes	3.44±0.53	1.12±0.40	1.00±0.00	1.33±0.82
k	Difficulty breathing	3.44±0.88	2.10±0.10	1.16±0.52	1.89±1.08
l	Chest pain	3.44±0.88	1.71±0.75	1.13±0.43	1.68±0.95
m	Fatigue	3.22±0.97	1.32±0.69	1.07±0.25	1.43±0.88

Table 3. Drug types and use classified in three clusters (n = 81)

Drug types	Cluster I (n = 9)		Cluster II (n = 41)		Cluster III (n = 31)	
	n	Drugs used	n	Drugs used	n	Drugs used
0	-	-	6	-	-	-
Subtotal (%)	0 (0.00%)		6 (14.63%)		0 (0.00%)	
1	2	A	1	A	3	A
	2	K	6	K	6	K
	-	-	3	Q	2	Q
	-	-	-	-	1	N
	-	-	-	-	4	P
	-	-	-	-	1	J
Subtotal (%)	4 (44.44%)		10 (24.39%)		17 (54.84%)	
2	-	-	1	AC	1	KP
	-	-	2	AP	-	-
	-	-	2	AQ	-	-
	-	-	1	AT	-	-
	-	-	1	KO	-	-
	-	-	1	KQ	-	-
Subtotal (%)	0 (0.00%)		8 (19.51%)		1 (3.23%)	
3	1	AGP	3	ACP	2	ACP
	2	APQ	1	ATQ	1	ACT
	-	-	1	KTP	1	APQ
	-	-	-	-	1	ATQ
	-	-	-	-	1	CTP
	-	-	-	-	1	KOP
Subtotal (%)	3 (33.33%)		5 (12.20%)		7 (22.58%)	
4	2	ACTP	1	ACPQ	3	ACTP
	-	-	5	ACTP	1	KCOP
	-	-	1	ACTQ	1	KCTP
	-	-	1	AKCP	-	-
Subtotal (%)	2 (22.22%)		8 (19.51%)		5 (16.13%)	
5	-	-	2	ACTPQ	1	AKCTO
	-	-	2	AKCTP	-	-
Subtotal (%)	0 (0.00%)		4 (9.76%)		1 (3.23%)	
Total by cluster	9 (100.00%)		41 (100.00%)		31 (100.00%)	
Drug usage by cluster ($\bar{x}$±SD)	2.33±1.25		2.34±1.60		2.00±1.27	

Note: A = *Andrographis paniculata* capsule, K = Wat Khiriwong drug formula, Q = favipiravir or molnupiravir, N = generic medicine, P = paracetamol, J = generic herbal medicine capsules, C = herbal cough drug, T = herbal sore throat drug, G = ya khiao-hom powder, O = boiling water infused with shallots

Table 4. Number and percentage of drugs used for COVID-19 treatment

Drug names	Cluster I (n = 9)	Cluster II (n = 41)	Cluster III (n = 31)
A: *Andrographis paniculata* capsule	7 (77.78)	23 (56.10)	12 (38.71)
K: Wat Khiriwong drug formula	2 (22.22)	13 (31.71)	11 (35.48)
Q: Favipiravir or molnupiravir	2 (22.22)	10 (24.39)	4 (12.90)
G: Ya khiao-hom powder	1 (11.11)	N/A	0 (0.00)
C: Herbal cough drug	2 (22.22)	16 (39.02)	10 (32.26)
T: Herbal sore throat drug	2 (22.22)	12 (31.71)	8 (25.81)
O: Boiling water infused with shallots	N/A	1 (2.44)	3 (9.68)
P: Paracetamol	5 (55.56)	17 (41.46)	15 (48.39)
J: Unspecified herbal medicine capsules	N/A	N/A	1 (3.23)
N: Generic medicine	N/A	N/A	1 (3.23)

4. DISCUSSION

This study included 81 participants who had COVID-19 between 2021 and 2022. Primarily, the respondents were adult females with an average age of 39.3, the majority of which reside in the central region of Thailand. They actively took part by responding to a survey distributed online via the official LINE accounts of the Bundit Asa and Help Society. Data analysis incorporated a response rate of 39.07% (134 out of 363 registrants) and a subsequent participation rate of 60.45% (81 out of 134). Within this framework, COVID-19 respondents were classified into groups utilizing the available data, and the cluster analysis organized them according to the closest geometry of severity levels related to symptom variables. The demographic data in this study aligns with previous research conducted in Thailand, which identified the general public and younger demographics as the primary groups affected by COVID-19 during the final wave (Jindahra et al., 2022).

COVID-19 symptom severity was divided into three distinct clusters. Cluster I denoted the severe symptoms group (3.46±0.86), Cluster II encompassed the moderate symptoms group (2.35±0.76), and Cluster III represented the mild symptoms group (1.46±0.60). Myalgia, sore throat, weakness, cough, and fever were the symptoms reported with the highest severity in the study (Table 2). This is consistent with studies in Pakistan in which cough and fever were highlighted as the most common symptoms (Akram et al., 2021; Shafique et al., 2021). This observation suggests that both cough and fever were not only prevalent but also presented high severity in COVID-19 cases. Within Cluster I, the most severe symptoms included myalgia, sore throat, headache, weakness, and fever. These findings are in alignment with a previous investigation by Çalıca Utku et al. (2020), which similarly identified weakness, myalgia, and fever as predominant symptoms. Notably, one symptom emerged consistently indicative of differentiation: loss of smell (Smith et al., 2022). While the loss of taste or smell can serve as a distinctive indicator of COVID-19, it is important to note that not all patients exhibit this symptom. Hence, if other manifestations, such as myalgia and sore throat, are employed to posit a potential COVID-19 infection based on the findings of this research or drawing from internationally conducted studies, it is reasonable to consider fever and cough as primary indicators for a preliminary diagnosis. Nevertheless, it is crucial to acknowledge that mutations or emergence of new COVID-19 strains may lead to alterations in symptoms presented in the future.

The distribution of various drug types among the clusters is detailed in Table 3. It is evident that Cluster I encompass individuals using 0–4 distinct drug types, while Clusters II and III encompass those using 0–5 different types of drugs. Notably, Table 3 highlights that 14.63% of individuals in Cluster II who experience moderate symptoms opted not to employ any medication. Upon examination of the data presented in Table 3, the choice of medication may not always align with the prevailing symptoms or immediate requirements. This discrepancy could arise from factors such as the assortment of available medications or potential anxiety (Chopra et al., 2021). Consequently, there is a heightened concern for errors in dosage regimens, along with the risks of medication duplication and inadequate reporting of drug-related information (Alwhaibi et al., 2021). In our research, individuals affected by COVID-19 sought assistance from various providers and employed diverse treatments, emphasizing the need for careful consideration of potential dosing inaccuracies.

This highlights the need for patients to judiciously consider their medication regimens, which can potentially expose them to risks associated with drug–drug interactions (Conti et al., 2022). Simultaneous use of multiple prescriptions often heightens the likelihood of such interactions. Consequently, a thorough evaluation of potential drug–drug or disease–drug interactions becomes imperative when devising the most effective regimens for specific patients, recognizing that one drug may not consistently outperform another (Kumar and Trivedi, 2021). According to the data in Table 3, individuals who used *Andrographis paniculata* capsules also used the Wat Khiriwong drug formula, which has *Andrographis paniculata* as its main component. Previous research has shown that *Andrographis paniculata* extract and its principal compound, andrographolide, may have pharmacokinetic and pharmacodynamic interactions with numerous drugs (Sundhani et al., 2022).

Herbal medicines were used as immune modulators during home quarantine in response to the COVID-19 pandemic (Das, 2022). In Thailand, three principal medications have been utilized for alleviating COVID-19 symptoms, the Wat Khiriwong drug formula, *Andrographis paniculata*, and antiviral drugs like favipiravir, remdesivir, molnupiravir, and paxlovid (The Government Public Relations Department, 2022; The Nation Thailand, 2020 and 2023). The prominence of *Andrographis paniculata* is noteworthy. While this study found that all clusters of participants used *Andrographis paniculata* capsules, which emerged as the most frequently utilized drug, it is essential to recognize that their use may not solely be based on patient demand or healthcare professional recommendations. This is primarily attributed to prevailing drug shortages for direct COVID-19 treatment (The Lancet Regional Health-Western Pacific, 2023; Tuesuwan et al., 2023). Consequently, the choice of drugs during that period may have been contingent upon availability rather than what is specifically indicated for the patient's condition.

To address the aforementioned challenge, a multifaceted network has emerged, involving both the public and private sectors, working in unison to support Thailand's response to this crisis (Sarai and Onopas, 2022; Srichampa and Lochan, 2022). Additionally, a dedicated herbal medicine network directly acquires medicines from Wat Khiriwong, effectively enhancing the accessibility of crucial treatments from the network of the Bundit Asa and Help Society.

In an evaluation of the efficacy and safety of *Andrographis paniculata* extract for treating COVID-19 patients with mild symptoms, Nakhon Pathom Hospital concluded that the duration of symptoms can be reduced and this extract exhibits efficacy in alleviating rhinorrhea, the severity and frequency of cough, as well as loss of smell. Nevertheless, adverse events were observed in the groups receiving 180 mg of *Andrographis paniculata* daily, including diarrhea and abdominal discomfort, as well as in the groups receiving 60 and 180 mg of *Andrographis paniculata* extract daily (Rattanaraksa et al., 2021).

Similar concerns have been noted in Peru, where self-medication has emerged as a significant health issue, especially during the COVID-19 pandemic (Quispe-Cañari et al., 2021). Additionally, both anti-COVID-19 drugs and traditional Chinese medicine formulas have the potential to interact with herbal remedies (Ye et al., 2023). It is essential to consider that while herbal remedies have a longstanding history in traditional medicine, their effectiveness in treating specific diseases, including COVID 19, has not been empirically shown. Therefore, seeking advice from a healthcare professional or a qualified herbalist is crucial, especially for serious conditions like COVID-19.

The self-medication practices observed in individuals during the COVID-19 pandemic varied based on the severity of symptoms and the number of drugs used, exhibiting no discernible pattern. Promoting rational drug use is crucial to mitigating the risks associated with drug overload and potential interactions. Volunteer agencies equipped with knowledge about drugs play a pivotal role in supporting vulnerable populations.

To the best of our knowledge, this study represents the first attempt to cluster the severity of COVID-19 symptoms and analyze drug use patterns. However, it is essential to acknowledge several limitations of this research. These involve a small sample size, potential bias resulting from self-reported symptoms and their severity, and the survey's limited access to individuals seeking assistance through the network of the Bundit Asa and Help Society.

5. CONCLUSION

This study makes significant contributions to our understanding of drug use patterns and the clustering of symptom severity among COVID-19 patients who registered through the Help Society. Notably, the most severe symptoms reported by respondents in this study were myalgia and sore throat.

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