ความรู้ ทัศนคติ และการปฏิบัติเกี่ยวกับการติดเชื้อโควิด-19 และปัจจัยที่เกี่ยวข้องในกลุ่มประชากรในเมืองท่าขี้เหล็ก ประเทศเมียนมา

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บทคัดย่อ

ความเป็นมา : การระบาดใหญ่ของโรคโควิด-19 ไปทั่วโลกได้สร้างความท้าทายที่ไม่เคยเกิดขึ้นมาก่อนต่อระบบสาธารณสุขทั่วโลก จึงเป็นความท้าทายในพื้นที่ชายแดนที่มีการอพยพเคลื่อนย้ายข้ามแดนไปมาระหว่างพื้นที่สองฝั่งประเทศที่ไม่เข้มงวด การศึกษาวิจัยนี้ได้สำรวจความรู้ ทัศนคติ และการปฏิบัติ (KAP)ที่สัมพันธ์กับการติดเชื้อโควิด-19 ในประชากรที่อยู่อาศัยในเมืองท่าขี้เหล็ก รัฐฉานตะวันออก ประเทศเมียนมา ข้อมูลเชิงลึกที่ได้รับจากงานวิจัยนี้มีความสำคัญอย่างยิ่ง เนื่องจากจะเป็นแนวทางในการดำเนินการเฝ้าระวังควบคุมป้องกันโรคอย่างเหมาะสมในบริบทพื้นที่ชายแดน

วัตถุประสงค์ : เพื่อศึกษาความรู้ ทัศนคติ และการปฏิบัติ (KAP) ที่เกี่ยวข้องกับโควิด-19 ในประชากรที่อาศัยอยู่ในเมืองท่าขี้เหล็ก ประเทศเมียนมา และเพื่อค้นหาและวิเคราะห์ปัจจัยที่เกี่ยวข้องกับการติดเชื้อโควิด-19 ในกลุ่มประชากรที่ศึกษา

วิธีการศึกษา : เป็นการศึกษาวิจัยเชิงพรรณา โดยกลุ่มตัวอย่างคือประชาชนที่อาศัยอยู่ในเมืองท่าขี้เหล็กประเทศเมียนมา โดยใช้วิธีการสุ่มตัวอย่างอย่างง่าย จำนวน 364 คน รวบรวมข้อมูลระหว่างเดือนพฤศจิกายนถึงธันวาคม 2565 โดยใช้แบบสอบถามที่มีโครงสร้างสัมภาษณ์แบบตัวต่อตัว การวิเคราะห์ข้อมูลโดยสถิติเชิงพรรณนาและการวิเคราะห์เชิงเดี่ยวและพหุคูณถูกนำมาใช้เพื่อสำรวจปัจจัยที่เกี่ยวข้องกับการติดเชื้อโควิด-19

ผลการศึกษา : บุคคลที่ติดเชื้อโควิด-19 มีแนวโน้มที่จะเป็นกลุ่มชาติพันธุ์พม่า มีการศึกษาระดับอุดมศึกษา สมรสแล้ว และได้รับวัคซีนโควิด-19 ไม่เกินหนึ่งเข็ม การวิเคราะห์ถดถอยลอจิสติกพหุคูณที่ปรับตามปัจจัยต่างๆ เน้นให้เห็นถึงความสัมพันธ์ที่มีนัยสำคัญกับการติดเชื้อโควิด-19 โดยเพศชาย บุคคลอายุระหว่าง 18-50 ปี ผู้ที่มีระดับการศึกษาต่ำกว่า และผู้ที่แต่งงานแล้วมีโอกาสติดเชื้อสูงขึ้นอย่างมีนัยสำคัญ นอกจากนี้ สถานะการฉีดวัคซีนเป็นปัจจัยสำคัญ โดยผู้ที่ได้รับวัคซีนจำนวนน้อยกว่ามีโอกาสติดเชื้อสูงกว่า

สรุปและข้อเสนอแนะ : ผลการศึกษานี้เน้นย้ำถึงความสำคัญของการแทรกแซงสาธารณสุขที่มุ่งเน้นไปที่การแก้ไขความแตกต่างในระดับ KAP และลดการแพร่ระบาดของโควิด-19 ในพื้นที่ชายแดน กลยุทธ์ที่มีประสิทธิภาพต้องคำนึงถึงลักษณะทางประชากรและสถานะการฉีดวัคซีนเพื่อปรับมาตรการป้องกันและเสริมสร้างความเข้มแข็งของชุมชนในการรับมือกับการระบาดใหญ่

คำสำคัญ : พื้นที่ชายแดน โควิด-19 ความรู้ ทัศนคติ และการปฏิบัติ (KAP) เมียนมา

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KNOWLEDGE, ATTITUDE, AND PRACTICE REGARDING COVID-19 INFECTION AND ITS ASSOCIATED FACTORS AMONG PARTICIPANTS IN TACHILEIK TOWN, MYANMAR

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ABSTRACT

BACKGROUND: The global COVID-19 pandemic has posed unprecedented challenges to public health systems worldwide. The border regions, such as Tachileik town, presented unique challenges due to their geographical proximity to neighboring countries and porous borders. This study investigates the knowledge, attitudes, and practices (KAP) related to COVID-19 infection in residents of Tachileik Town, Eastern Shan State, Myanmar. The insights gleaned from this research hold paramount importance as they will guide evidence-based interventions customized to address the specific needs of the communities studied.

OBJECTIVE: To assess the knowledge, attitudes, and practices (KAP) related to COVID-19 among the population of Tachileik town, a border area between Myanmar and Thailand and find the associated factors of COVID-19 infection.

METHODS: Data were collected from 364 participants between November and December 2022 through random sampling and face-to-face interviews using structured questionnaires. Descriptive statistics and univariate and multivariate analyses explored factors associated with COVID-19 infection.

RESULTS: The results reveal that individuals who contracted COVID-19 were more likely to belong to the Burmese ethnic group, have tertiary education, be married, and receive no more than one dose of the COVID-19 vaccine. Adjusting for various factors, multivariate logistic regression analysis underscores significant associations with COVID-19 infection. Males, individuals aged 18-50, those with lower education levels, and married individuals faced significantly higher odds of infection. Furthermore, vaccination status emerged as a crucial factor, with individuals receiving fewer doses exhibiting higher odds of infection.

CONCLUSIONS AND RECOMMENDATIONS: These findings underscore the importance of targeted public health interventions to address disparities in KAP levels and mitigate the spread of COVID-19 in border regions. Effective strategies must consider demographic characteristics and vaccination status to tailor preventive measures and enhance community resilience against the pandemic.

KEYWORDS: Border Region, COVID-19, KAP, Myanmar

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Introduction

The emergence of the novel coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), marked a pivotal moment in global health. Originating in Wuhan, China, this disease swiftly transitioned from a localized outbreak to a pandemic, with profound implications for public health systems worldwide[1]. Characterized by its rapid transmission and significant morbidity and mortality rates, COVID-19 prompted an urgent response from governments, healthcare professionals, and researchers alike. Despite efforts to contain its spread, the virus infiltrated borders and transcended geographical boundaries, impacting communities across continents. As of April 14, 2024, the global toll stood at over 775 million confirmed cases and more than 7 million deaths, underscoring the magnitude of the challenge [2].

While high-income countries with robust healthcare infrastructure bore a significant burden, low- and middle-income nations faced unique challenges exacerbated by socioeconomic disparities. Countries like Myanmar confronted the dual task of combating the virus while navigating resource constraints and systemic vulnerabilities[3].

In response to the pandemic, Myanmar swiftly implemented preventive measures and mobilized resources to address the evolving crisis. Establishing the National-Level Central Committee on Prevention, Control, and Treatment of COVID-19 demonstrated a proactive approach to pandemic management[3]. Despite resource limitations, the government allocated funds and leveraged international assistance to bolster healthcare capacity and mitigate the impact of COVID-19 [4].

However, the border regions, such as Tachileik town, presented unique challenges due to their geographical proximity to neighboring countries and porous borders. Understanding the factors influencing COVID-19 transmission and response in these areas is crucial for targeted interventions and containment strategies [5].

This study aims to fill this gap by investigating the factors associated with COVID-19 infection among the population of Tachileik town, located in the border area of Thailand and Myanmar. By examining variables such as vaccination rates, knowledge, attitudes, and practices related to COVID-19, this research seeks to provide valuable insights into the dynamics of the pandemic in this context.

There is limited research focusing on how border regions like Tachileik, where Myanmar meets Thailand, manage the spread of infectious diseases such as COVID-19. This study fills a critical gap by providing empirical data on how local communities understand and react to the pandemic. Insights from this research will not only inform COVID-19 control measures but will also serve as a basis for addressing future public health crises in similar cross-border settings.

The insights gleaned from this research hold paramount importance as they will guide evidence-based interventions customized to address the specific needs of the communities studied. For instance, in a study examining the factors influencing knowledge, attitude, and practices regarding COVID-19 in Bangladesh, the findings were utilized by various stakeholders, including governmental bodies, to enhance their preparedness and responsiveness to future pandemics [6]. This underscores the practical utility of our findings in informing policy formulation, resource allocation, and community engagement strategies aimed at combating the spread of COVID-19 and bolstering resilience against similar health crises in the future.

As the world continues to grapple with the challenges posed by COVID-19, understanding the localized dynamics of the pandemic is essential for mitigating its impact and safeguarding public health. This study contributes to this collective effort by unraveling the complexities of COVID-19 transmission and response in border regions, ultimately guiding targeted interventions to protect vulnerable populations and stem the tide of the pandemic.

Objective

To assess the knowledge, attitudes, and practices (KAP) related to COVID-19 among the population of Tachileik town, a border area between Myanmar and Thailand and find the associated factors of COVID-19 infection.

Method

Study Design and Population

This cross-sectional study was conducted in Tachileik Town, Eastern Shan State, Myanmar, from November to December 2022. Tachileik Town is the most populated city in eastern Shan State and is situated on the border with Thailand. The sampling technique employed in this study was simple random sampling. The study encompassed both urban and rural populations of Tachileik Town, Eastern Shan State. The target participants were adults aged 18-75 who had been residing in Tachileik for at least six months. Participants admitted as in-patients at Tachileik Hospital during the research time were excluded from the study.

The sample size was calculated using the formula $n = \frac{Z^2pq}{e^2}$, with assumptions based on the findings of a study conducted by Nhu et al. (2020), which reported a knowledge level of 68.6% regarding COVID-19 prevention measures (p = 0.686). Considering a 10% margin to account for potential non-response or incomplete data, the final sample size required for this study would be approximately 364 participants.

Measurement Tool

We employed a structured KAP questionnaire administered via Google Forms as our primary research instrument. Before data collection, the questionnaire underwent a rigorous development process. Three independent reviewers, experts in public health and survey design, pre-validated the questionnaire. Their feedback was incorporated to enhance clarity, relevance, and appropriateness. A pre-test study was conducted with ten respondents from Tachileik town to ensure the questionnaire's feasibility and comprehensibility. This instrument's reliability index was Cronbach's alpha coefficient of 0.872.

The final version comprised two main sections: Section A has ten items focused on gathering participants' general characteristics, including demographic details such as gender, age, ethnicity, religion, education, employment, family income, and marital status. It also included inquiries about COVID-19 infection and vaccination history to assess the town's infection and vaccination rates. Section B has 22 items to evaluate participants' knowledge, attitudes, and practices (KAP) concerning COVID-19. Questions assessed the knowledge by 13 items on their understanding of the virus, its transmission, symptoms, incubation period, and preventive measures. Attitudes were assessed on four items related to hand hygiene, mask-wearing, and social distancing. Additionally, practices and perceptions of five items regarding global and community responses to the pandemic, emphasizing prevention strategies for future outbreaks, were addressed. All questionnaire items should be aligned with the latest recommendations and guidelines from the World Health Organization (WHO), ensuring that data collection is per international standards and reflecting the most current understanding of COVID-19 and its prevention.

Individuals in the infected group may have been infected either before receiving the vaccine or during the vaccination period. Our data include both possibilities, as vaccination timing relative to infection was not controlled in the study.

In this study COVID-19 infection status among study participants was determined through rapid diagnostic tests (RDTs) conducted in fever clinics and private clinics, where individuals presenting with COVID-19 symptoms were routinely tested. While this approach was effective for detecting symptomatic cases, it is acknowledged that some asymptomatic infections may have been missed. Consequently, the non-infected group could include individuals who were asymptomatically infected but did not seek testing or did so outside the optimal testing window.

Data Collection

Two trained research assistants collected data by administering the questionnaire to the participants through face-to-face interviews. We used the Burmese language. Final version of questionnaire was Myanmar (Burmese) language. All participants in this study were proficient in Myanmar language. The study was conducted with permission from Mae Fah Luang University, Eastern Shan State Health Department, and Tachileik District authorities. All participants provided informed consent, and their privacy and confidentiality were ensured.

Data analysis and statistics

Descriptive statistics, including frequency and percentage, were used to summarize the data. Inferential analysis was carried out, including Fisher's exact probability test and univariate and multivariate logistic regression. A p-value < 0.05 was considered statistically significant.

Ethical Considerations

The Eastern Shan State Health Department authorities obtained the study's approval by date 17.5.2023. Also, under the grant funding and ethical approval from Mae Fah Luang University Communicable Disease Control Systems and Mechanisms of Management of Cross Border Health at Maekong Sub-region EC number REH-62162 on 4th July 2019(4 years program). Informed consent was sought from all participants, and their participation was anonymous and voluntary. The study adhered to the ethical principles of the World Medical Association Declaration of Helsinki. Data security and confidentiality were maintained throughout the research process. The study's findings were intended to benefit the Eastern Shan State Health Department and the Thailand-Myanmar border area.

Results

This study was designed to evaluate the Knowledge, Attitude, and Practice (KAP) related to COVID-19 among the population of Tachileik, a town located at the border between Myanmar and Thailand. The findings provide insights into the community's understanding of COVID-19, their perception of the virus and its prevention, and their adherence to protective practices.

The study compared socio-demographic characteristics between participants who were infected with COVID-19 and those who were not. The study included 364 participants, with 236 having a confirmed history of COVID-19 infection, comprising 147 males and 139 females. Across various variables, significant differences were observed between individuals based on their COVID-19 infection status. These variables encompassed ethnicity, marital status, education level, and COVID-19 vaccination history, exhibiting statistically significant disparities with p-values less than 0.05.

Specifically, the group of individuals who had contracted COVID-19 showed a higher proportion of participants from the Burmese ethnic group (n=138, 48.25%), those with tertiary level education (n=139, 48.60%), individuals who were married (n=171, 59.80%), and those who had received no more than one dose of the COVID-19 vaccine (n=66, 23.08%). However, no significant differences were observed between infected and non-infected individuals concerning other demographic and work-related characteristics, as indicated by p-values exceeding 0.05. (Table 1)

Table 1 Differences in socio-demographic features between COVID-19 infected and non-infected participants

Variables	Frequency (%)		p-value
	The COVID-19 infected status		
	Infected (n=286)	Non-infected (n=78)	
Gender			
Male	147 (51.40)	30 (38.50)	0.055
Female	139 (48.60)	48 (61.50)	
Age (years)			
18-50	160 (55.90)	48 (16.50)	0.439
51-75	126 (44.10)	30 (38.50)	
Ethnic			
Shan	86 (30.07)	36 (46.15)	<0.001*
Burmese	138 (48.25)	23 (29.49)	
Akha	26 (9.10)	9 (11.50)	
Lahu	25 (8.74)	1 (1.28)	
Lisuu	11 (3.85)	9 (11.54)	
Religion			
Buddhism	190 (66.40)	57 (73.10)	0.556
Muslim	21 (7.30)	5 (6.40)	
Christian	75 (26.20)	16 (20.50)	
Education level			
Primary	28 (9.80)	9 (11.50)	0.017*
Secondary	119 (41.60)	19 (24.40)	
Tertiary	139 (48.60)	50 (64.10)	
Employment status			
Present	206 (72.00)	60 (76.90)	0.472
Absent	80 (28.00)	18 (23.10)	
Family income			
Under 100,000 Ks (Under 33.3 US$)	92 (32.20)	20 (25.60)	0.138
100,000-300,000 Ks (33.3-100 US$)	124 (43.40)	30 (38.50)	
Over 300,000 Ks (Over 100US$)	70 (24.50)	28 (35.90)	

Table 1 (Cont.)

Variables	Frequency (%)		p-value
	The COVID-19 infected status		
	Infected (n=286)	Non-infected (n=78)	
Marital status			
Married	171 (59.80)	21 (26.90)	<0.001*
Unmarried	115 (40.20)	57 (73.10)	
History of COVID-19 Vaccination			
None to one dose	66 (23.08)	28 (35.90)	0.049
Two doses	110 (38.46)	21 (26.92)	
Booster doses	110 (38.46)	29 (37.18)	

*Significant level at α=0.05 a Fisher's exact test

The participants were presented with a series of statements addressing various aspects of COVID-19. They were tasked with indicating their level of knowledge regarding thirteen statements by selecting options denoting correctness, incorrectness, or uncertainty (i.e., "do not know") for each statement. Additionally, respondents were presented with four statements related to their attitudes toward COVID-19, with response options of "yes," "no," or "do not know." Furthermore, five statements concerning COVID-19 practices were presented to the participants, with response options for each statement including "follow," "not follow," or "not applicable." (Table 2)

In our study, we inquired about thirteen statements about COVID-19 knowledge. We sought to gauge participants' understanding by requesting them to categorize their responses as either "correct," "incorrect," or "do not know" for each statement. The outcomes, depicted in Figure 1, offer insight into individuals' knowledge of COVID-19. Based on the respondents' knowledge, a high level of awareness was observed regarding certain aspects of COVID-19. Specifically, 97% of respondents demonstrated an understanding of the importance of wearing masks.

Additionally, 95% of respondents correctly identified significant symptoms associated with COVID-19 infection, such as the Loss of taste and smell, and they also accurately recognized fewer common symptoms, including sneezing, runny nose, stuffy nose, and headache. Furthermore, respondents were knowledgeable about common symptoms of COVID-19, which encompassed fever, dry cough, difficulty breathing, and fatigue (95%). A majority (95%) agreed that Lockdown is an effective measure to slow the spread of the virus. Also, 92% recognized that someone with COVID-19 and a fever can infect others. On the positive side, 91% understood that suspected COVID-19 patients should be quarantined. People seem to know the importance of keeping a 6-meter distance (89%).

Table 2 Statements relating to knowledge, attitude, and practice regarding the COVID-19 infection.

Category	Statement No.	Statement
Knowledge	Statement-1	Fever, dry cough, difficulty in breathing, and tiredness are the common clinical symptoms of COVID-19
	Statement-2	Sneezing, runny nose, stuffy nose, and headache are less common in persons infected with COVID-19
	Statement-3	Loss of taste and smell are also features of COVID-19 infection
	Statement-4	Currently, there are some proven treatments for COVID-19 infection, but early symptomatic and supportive treatment can help most patients recover from this infection.
	Statement-5	The majority of COVID-19 infective patients will not develop severe illness, but elderly patients having chronic illness, DM, and COPD are likely to develop severe illness.
	Statement-6	COVID-19 infected person with fever can infect other people.
	Statement-7	COVID-19 virus spread via respiratory droplets.
	Statement-8	Ordinary people should wear general masks.
	Statement-9	People maintain a 6-feet distance in public places.
	Statement-10	Lockdown is an effective measure to slow the spread of infection.
	Statement-11	People infected with COVID-19 should immediately be placed in proper isolation.
	Statement-12	Suspected COVID-19 patients should be sent to a quarantine center or home quarantine.
	Statement-13	Health care professionals with direct contact should take tablet hydroxychloroquine as a prophylaxis.
Attitude	Statement-14	Can Myanmar win the battle against COVID-19?
	Statement-15	Are you confident you can go outside of your home, to your work, and to the hospital's OPD during the pandemic?
	Statement-16	Does your family support you with COVID-19 infection prevention ways while you are going outside of your home when you go to your work and the OPD of the hospital during the pandemic?
	Statement-17	Do you experience anxiety and fear while you are going outside of your home when you go to your work and the OPD of the hospital seeing suspected COVID-19 patients during the pandemic?

Table 2 (Cont.)

Category	Statement No.	Statement
Practice	Statement-18	Do you know about COVID-19 practices for suspected patients?
	Statement-19	Have you followed social distancing?
	Statement-20	Have you been wearing masks and gloves during your daily routine lifestyle and during coming to hospital practice?
	Statement-21	Do you regularly follow infection protection measures?
	Statement-22	Do you want to see and attend to people or patients suspected of COVID-19 by proper disease prevention practices by WHO?

*The statements were created using the author's constructions and modifications. The information for this instrument's reliability index was Cronbach's alpha coefficient of 0.872.

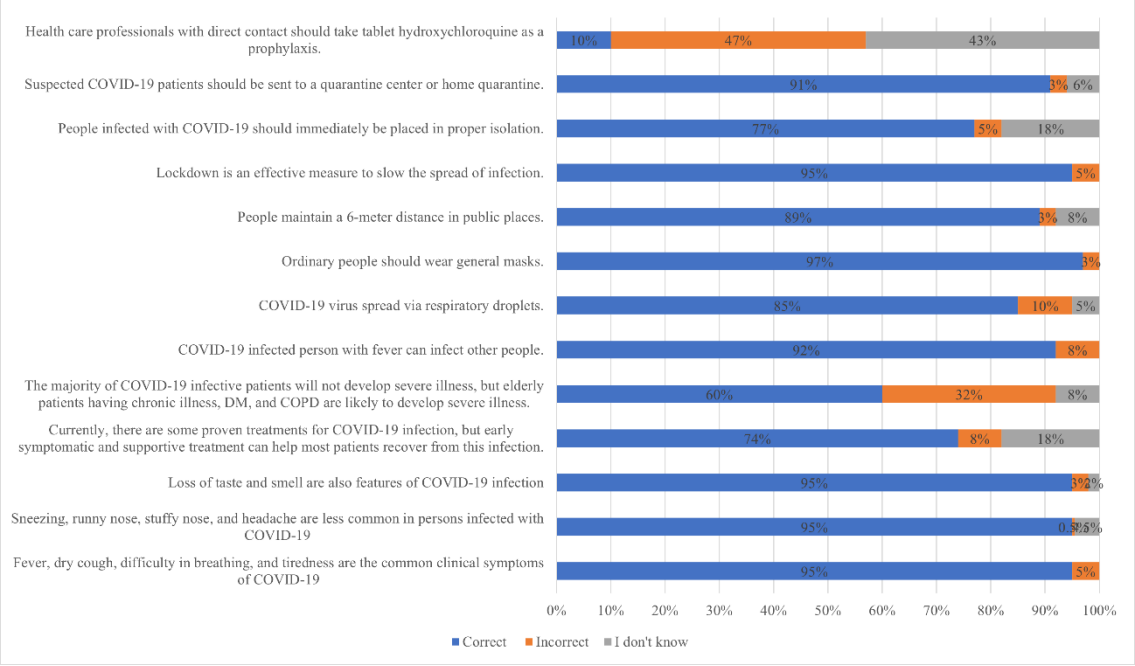

Figure 1. Respondents' Knowledge regarding COVID-19

Regarding how COVID-19 spreads, 85% said it happens through respiratory droplets. About 77% knew that people with COVID-19 should be isolated. In terms of treatments, 74% knew there were some proven treatments, but 18% did not. Among the respondents, 60% correctly answered that older adults with chronic illnesses might get severely sick. Only 10% knew that healthcare workers with direct contact should consider taking hydroxychloroquine as prophylaxis. The evidence was supported in a recent study [15]. This study assessed healthcare workers' knowledge of hydroxychloroquine (HCQ) rather than its efficacy.

Participants were asked to respond yes or no or not knowing about the four attitude statements. Figure 2 shows the answered percentage. Family support in adhering to COVID-19 prevention measures while going out with the same condition was widely acknowledged, with 84% affirming this support, 11% indicating otherwise, and 5% expressing uncertainty. 75% of respondents believe that Myanmar can win over COVID-19, while 10% answered no, and 15% are still determining the country's ability to overcome the pandemic. When asked if they experience anxiety and fear while going outside for work and to the hospital OPD visitation for suspected COVID-19 patients during the pandemic, 60% responded yes, and 30% responded no. Confidence in outdoor activities during the pandemic varied, with 44% expressing confidence and 56% expressing hesitancy.

In examining respondents' practices concerning COVID-19, as shown in Figure 3, we observed a high level of awareness and adherence to recommended guidelines. Remarkably, 92% affirmed familiarity with COVID-19 practices for suspected patients, showcasing a robust understanding of protocols designed to mitigate transmission risks. Social distancing measures were widely embraced, with 87% confirming compliance, while 13% admitted to not consistently adhering to this practice. A significant majority (82%) reported regularly following infection protection measures. Regarding personal protective equipment (PPE) usage, 71% indicated consistent use of masks and gloves in their daily routines and hospital practices, with 24% abstaining and 5% unsure. When asked about their willingness to see and attend to individuals suspected of COVID-19 while practicing proper disease prevention measures outlined by the WHO, 64% expressed positive responses. In comparison, 8% declined, and 28% were uncertain.

A comparison of knowledge, attitude, and practice levels between individuals with and without COVID-19 infection. Notably, three of these comparisons did not yield statistically significant differences. However, it is intriguing to observe that individuals with high and moderate levels of knowledge exhibited infection rates of 41.9% and 42.3%, respectively,

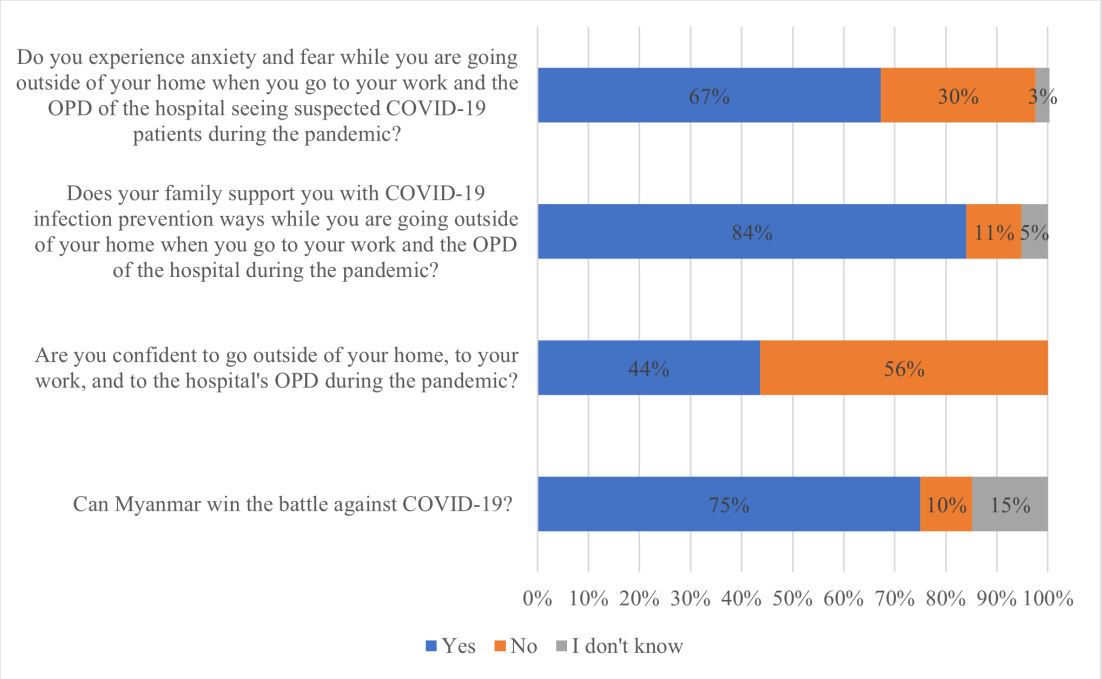

Figure 2. Respondents' Attitude regarding COVID-19

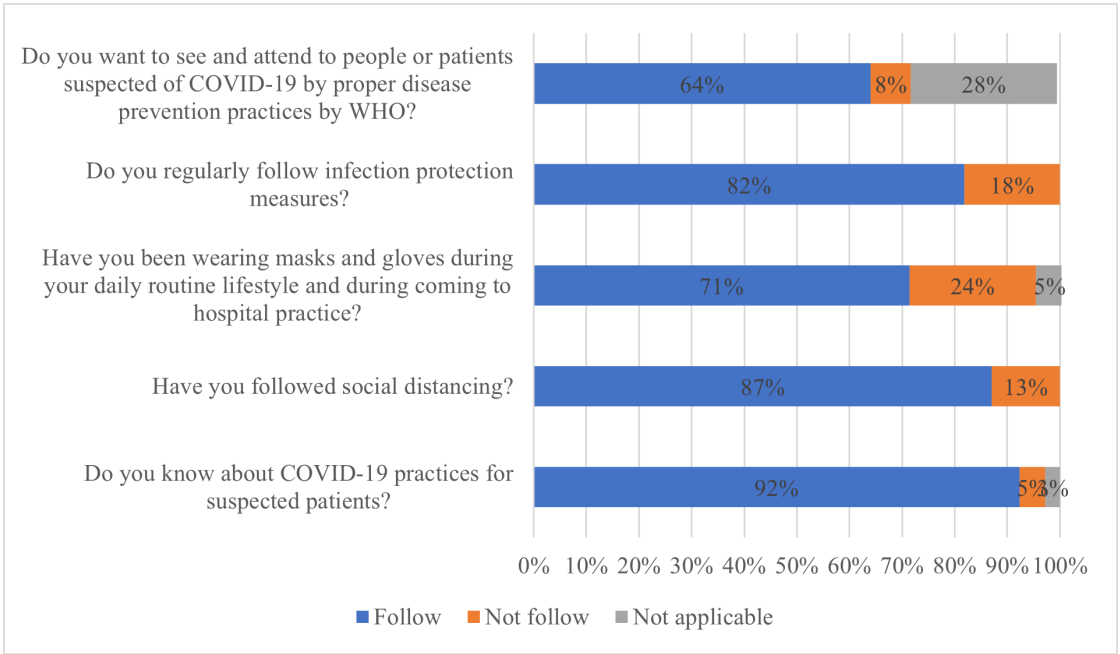

Figure 3. Respondents' Practice regarding COVID-19

surpassing those with low knowledge levels. Likewise, concerning attitude levels, individuals expressing a high degree of concern regarding COVID-19 demonstrated a higher proportion of infections (54.2%) than those with a low level of concern (45.8%). Regarding COVID-19-related practices, individuals exhibiting high adherence to preventive measures (80.4%) were more likely to be infected with COVID-19. (Table 3)

The outcomes of both univariate and multivariate logistic regression analyses. After adjusting for gender, age, education level, marital status, and history of COVID-19 vaccination, the results revealed significant associations with COVID-19 infection. Specifically, males exhibited markedly higher odds of being infected, with a staggering 11.98-fold increase compared to females (Adjusted Odds Ratio [AOR] 11.98, 95% Confidence Interval [CI] 4.95-29.01, p<0.001). Furthermore, individuals aged 18-50 faced an astonishing 100.53 times higher likelihood of infection than those aged 51-75 (AOR 100.53, 95% CI 17.32-583.48, p<0.001). In terms of education, individuals with only primary education had 7.19 times higher odds of infection, while those with secondary education had 8.41 times higher odds compared to individuals with tertiary education (AOR 7.19, 95% CI 1.56-33.15, p=0.011; AOR 8.41, 95% CI 3.02-23.45, p<0.001, respectively). Additionally, married individuals were substantially more susceptible to COVID-19, with odds 56.52 times higher than unmarried individuals (AOR 56.52, 95% CI 10.44-305.96, p<0.001). Regarding COVID-19 vaccination status, individuals who had received none to one dose had 13.05 times higher odds of infection. In comparison, those who had received two doses faced 6.66 times higher odds compared to those who had received a booster dose (AOR 13.05, 95% CI 3.88-43.88, p<0.001; AOR 6.66, 95% CI 2.43-18.31, p<0.001, respectively).

In the univariate analysis, Muslims exhibited 1.26 times higher odds of infection (OR 1.26, 95% CI 0.45-3.49, p=0.657), while Christians showed 1.41 times higher odds (OR 1.41, 95% CI 0.76-2.60, p=0.278). Regarding employment status, individuals with employment demonstrated 1.29 times higher odds of infection than those without (OR 1.29, 95% CI 0.72-2.33, p=0.388). In terms of family income, individuals earning under 33.3 USD or between 33.3-100 USD displayed higher odds of infection compared to those earning over 100 USD (OR 1.84, 95% CI 0.96-3.53, p=0.067; OR 1.65, 95% CI 0.91-2.99, p=0.096). Regarding knowledge level, individuals with moderate or low knowledge levels exhibited lower odds of infection (OR 0.94, 95% CI 0.53-1.67, p=0.836; OR 0.52, 95% CI 0.27-1.02, p=0.059) compared to those with high knowledge levels. Regarding attitude level, individuals with low attitude levels demonstrated 0.89 times lower odds of infection than those with high (OR 0.89, 95% CI 0.54-1.47, p=0.647). Additionally, individuals with low practice levels exhibited 0.76 times lower infection odds than those with high practice levels (OR 0.76, 95% CI 0.42-1.34, p=0.356). (Table 4)

Table 3 Differences in respondents' knowledge, attitude, and practice regarding COVID-19 between COVID-19 infected and non-infected participants.

Variables	Frequency (%)		p-value
	The COVID-19 infected status		
	Infected (n=286)	Non-infected (n=78)	
Knowledge level			
High	120 (41.96)	28 (35.90)	0.141
Moderate	121 (42.31)	30 (38.46)	
Low	45 (15.73)	20 (25.64)	
Attitude level			
High	155 (54.20)	40 (51.28)	0.701
Low	131 (45.80)	38 (48.72)	
Practice level			
High	230 (80.42)	59 (75.64)	0.348
Low	56 (19.58)	19 (24.36)	

Table 4 Univariate and multivariate analysis of factors associated with COVID-19 infections (n=364) (continue).

Factors	OR	95% CI	p-value	AOR	95% CI	p-value
Marital Status						
Married	4.04					
Unmarried	1					
History of COVID-19 vaccination						
None to one dose	2.22	1.17-4.23	0.015	13.05	3.88-43.88	<0.001
Two dose	1.61	0.88-2.94	0.122	6.66	2.43-18.31	<0.001
Booster dose	1			1		
Knowledge level						
High	1					
Moderate	0.94		0.53-1.67		0.836	
Low	0.52		0.27-1.02		0.059	
Attitude level						
High	1					
Low	0.89		0.54-1.47		0.647	
Practice level						
High	1					
Low	0.76		0.42-1.34		0.356	

Discussions and conclusions

This study aimed to estimate the prevalence of COVID-19 infection and evaluate the knowledge, attitudes, and practices regarding COVID-19 within the border community of Tahcileik Town in Eastern Shan State, Myanmar. The population's socioeconomic characteristics and vaccination status were also investigated to inform the development of a targeted health campaign. Additionally, the study aimed to determine whether there were variations in people's knowledge, attitudes, and practices toward COVID-19 based on specific demographic characteristics of the target population. Overall, the findings revealed that most participants demonstrated satisfactory knowledge, positive attitudes, and appropriate practices concerning the virus. Numerous studies underscore the critical role of community knowledge, attitudes, and practices in mitigating the spread of infectious diseases during epidemics and pandemics [6–9] Our study observed significant disparities among individuals based on their COVID-19 infection status, aligning with findings from similar studies conducted in Iran. These disparities were notably associated with variables such as ethnicity, marital status, education level, and COVID-19 vaccination history, echoing findings from studies conducted in the United States [10]. Specifically, individuals who had contracted COVID-19 exhibited a higher representation of participants from the Burmese ethnic group, attributed mainly to migration patterns from the central region of Myanmar, where infections were prevalent. Similar patterns were reported in studies examining the disproportionate impact of COVID-19 in the USA and UK [11].

Regarding education, Individuals with primary and secondary education may lack access to vital health information, resources, and preventive measures, which can contribute to higher infection rates. Additionally, educational disparities can affect individuals' understanding of health guidelines, leading to less adherence to preventive behaviors such as social distancing, mask-wearing, and vaccination. Similar findings from study conducted in Italy [12], our study revealed an increased likelihood of infection with lower levels of education. Additionally, marital status emerged as a significant factor, with married couples exhibiting higher rates of COVID-19 infection, likely due to cohabitation and increased potential for intra-household transmission. This finding corroborates similar observations reported in numerous other studies [13]

A commendable level of knowledge among respondents regarding various aspects of COVID-19 was observed in our study, indicating the success of information dissemination efforts led by the Ministry of Health Myanmar. Public health education campaigns effectively convey crucial information about preventive measures, symptoms, and transmission pathways. This finding is consistent with research conducted in Northern Thailand border towns, which also reported a high level of knowledge among participants [8].

Despite generally high levels of awareness, there are areas where knowledge gaps exist. For example, a relatively small percentage of respondents were aware of the potential severity of COVID-19 in elderly individuals with chronic illnesses. Similarly, awareness of specific prophylactic measures among healthcare workers was limited. Addressing these knowledge gaps through targeted education and outreach efforts could further enhance public understanding and response to the pandemic.

The study revealed a positive attitude towards COVID-19 prevention measures and a belief in Myanmar's ability to overcome the pandemic. Respondents attributed this optimism to their trust in government efforts, particularly those led by the Ministry of Health Myanmar, and a sense of community unity. However, the study also identified significant mental stress related to COVID-19, likely stemming from the novel nature of the disease and the uncertainty surrounding it. This finding resonates with similar observations in existing literature [14]. Therefore, policymakers and healthcare professionals should prioritize mental health support programs, utilizing online teaching and other practical measures to alleviate stress and reassure citizens, particularly in border towns.

One limitation of this study is its focus solely on Tachileik Town, a border region of Myanmar, which presents unique challenges due to its population's migratory nature. This limits the generalizability of the findings to other regions of the country. Future research endeavors should extend to central regions and other border areas of Myanmar to capture potential variations in factors associated with COVID-19 infection. By broadening the scope of investigation, a more comprehensive understanding of the pandemic's dynamics across diverse populations and geographical contexts can be achieved.

Our study revealed a high level of awareness and adherence to recommended guidelines among the residents of Tachileik town, encompassing various COVID-19 preventive practices for suspected cases. These include social distancing, infection control measures, and the consistent use of personal protective equipment (PPE), including masks and gloves, in daily and hospital settings. Moreover, respondents expressed a willingness to engage with suspected COVID-19 individuals while adhering to proper disease prevention measures outlined by the World Health Organization (WHO) online. This indicates a robust understanding of preventive protocols designed to mitigate transmission risks. Such commendable practices should be sustained and encouraged even as the infection rate of COVID-19 declines, reflecting the community's commitment to public health measures.

Conclusion

This study aimed to evaluate the knowledge, attitudes, and practices (KAP) related to COVID-19 within the border community of Tachileik Town in Eastern Shan State, Myanmar. The findings indicated a generally satisfactory level of knowledge, positive attitudes, and appropriate practices among participants. Additionally, addressing mental health challenges remains a critical area for improvement. The positive attitudes and preventive practices observed among Tachileik residents reflect the effectiveness of public health education campaigns, underscoring the need to sustain and expand these efforts. Looking ahead, policymakers and healthcare professionals must focus on closing knowledge gaps, enhancing mental health support, and reinforcing the importance of continued adherence to preventive measures. A proactive approach in these areas is vital for safeguarding the well-being of communities not only in Myanmar but also in other regions facing similar challenges.

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Conflict of interest

No potential conflict of interest was reported by the Author (s).

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