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COVID-19 Infection Rate and Cofactor in Non-Patients under Investigation: Rethinking the COVID-19 Screening Policy

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ABSTRACT

OBJECTIVE: To determine the infection rate and cofactors of coronavirus disease (COVID-19) in individuals who are not patients under investigation (non-PUIs) at a tertiary hospital.

METHODS: In this cross-sectional descriptive study conducted between October 2022 and April 2023, the infection rate of COVID-19 in non-PUIs was determined, and the general characteristics, underlying diseases, occupations, number of vaccinations, and signs and symptoms were studied.

RESULTS: The infection rate in non-PUIs was 9.9% (n = 31), and 90.1% (n = 282) were negative. The signs and symptoms significantly associated with COVID-19 positivity were fever (odds ratio (OR) 22.32, 95% confidence interval (CI) 5.26-94.68), malaise (OR 19.10, 95% CI 8.10-45.06), myalgia (OR 16.61, 95% CI 6.14-44.95), sore throat (OR 11.71, 95% CI 4.62-29.67), tiredness (OR 10.00, 95% CI 4.26-23.42), headache (OR 7.94, 95% CI 3.55-17.77), diarrhea (OR 7.42, 95% CI 3.02-18.23), cough (OR 7.39, 95% CI 3.17-17.21), rhinorrhea (OR 6.40, 95% CI 2.82-14.49), phlegm (OR 3.94, 95% CI 1.81-8.58), and vaccination with 0-2 shots (OR 2.22, 95% CI 1.01-4.90). Anosmia (OR 1.67, 95% CI 0.54-5.18), rash (OR 1.86, 95% CI 0.72-4.92), and dizziness (OR 1.08, 95% CI 0.36-3.28) were not significantly associated (p > 0.05).

CONCLUSION: Symptom-based screening among pre-admission patients not meeting PUI criteria may help detect overlooked COVID-19 cases. Key symptoms associated with infection included fever, cough, sore throat, phlegm, and myalgia. Additionally, individuals who received fewer than three vaccine doses had higher infection rates. These findings support the need to refine screening protocols to include clinical and vaccination risk factors in non-PUI populations.

KEYWORDS: COVID-19, infection, screening, symptoms, Thailand, vaccine

INTRODUCTION

Coronavirus disease 2019 (COVID-19), defined as enigmatic viral pneumonia, was first identified in December 2019 in Wuhan, China, from where it subsequently transcended national boundaries, effectuating global dissemination[1]. By March 2020, the World Health Organization formally acknowledged the outbreak as a pandemic[2]. In Thailand, the emergence of COVID-19 among the population was initially noted in January 2020[3], and a resurgence was observed in December 2020. The number of confirmed cases increased incrementally, recording 1,651 cases with a mortality rate of 0.6%

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by March 2020[4]. By April 2020, the number of cases had risen to 2,907 with a mortality rate of 1.8%[5].

A notable and steady surge in case numbers was observed during the 3rd and 4th waves that began in April 2021, with 50,189 cases and 121 deaths reported in the same month[6]. Further, the B.1.1.7 variant emerged in May and June, accounting for 40%-70% of new cases. This variant is characterized by increased virulence and prolonged presence within the host and also displays a propensity for transmission across age groups. Typically, affected individuals present with symptoms similar to those of influenza, making this outbreak a significant health concern in Thailand.

Patients under investigation (PUIs) are those who present with symptoms of COVID-19 and have been in close contact with individuals with confirmed infection. PUIs may present with a variety of symptoms, each with a different prevalence. The most common symptoms among PUIs were coughing (73.6%), fever (58.5%), sore throat (39.6%), and muscle aches (37.4%)[7]. In Thailand, respiratory symptoms were the most common clinical manifestations in PUIs (69.8 %), followed by common cold-like symptoms (15.1%) and pneumonia (11.3%), whereas a small percentage of PUIs were asymptomatic (3.8%)[7]. In an alarming statistic from Italy, approximately 45% of asymptomatic individuals were found to be carriers of the infection, potentially spreading the virus without knowing[8]. Both symptomatic and asymptomatic carriers can transmit the virus, with the infectious period lasting up to 14 days[9,10].

Notably, unlike symptomatic patients, asymptomatic patients do not present with a level of viral material that can be detected using real-time polymerase chain reaction (RT-PCR); this make it challenge to identify asymptomatic carriers through standard nasopharyngeal swab screening alone[11].

In Thailand, the rapid SARS-CoV-2 antigen detection assay demonstrated sensitivity and specificity comparable to those of RT-PCR assay[11]. Consequently, this rapid and straightforward antigen detection test was used as a screening tool. Nasal swabs were selected for the antigen test to aid in diagnostic procedures and in adherence to hospital policy and for convenience[11]. However, screening was typically performed on PUIs. Thus, data on non-PUIs in Thailand are limited. This group may include patients with asymptomatic infections who can contribute to the undetected and rapid spread of COVID-19. Therefore, it is important to investigate this cohort more thoroughly.

Diagnostic imaging, particularly computed tomography (CT), plays a crucial role in identifying infections. Pulmonary abnormalities were identified in 47.6% of asymptomatic individuals, with ground-glass opacities (GGO) being the most prevalent finding, reported in 94.8% of asymptomatic patients who had positive chest computed tomography (CT) findings in a study conducted by Meng et al[12]. These finding suggest that even in the absence symptoms, imaging may reveal early pulmonary involvement, highlighting the potential for undetected disease progression and transmission. These opacities were more commonly present in the periphery of the lungs (75.9%) than in unilateral locations (58.6%) and involved the lower lungs more than the upper lungs[13,14]. Chest radiography was not typically conducted for non-PUIs unless they exhibited symptoms of dyspnea. Moreover, abnormalities on pulmonary CT could be due to respiratory pathologies other than COVID-19. These findings highlight the complexity and variability of disease presentation, the significant role of diagnostic imaging in identifying pulmonary manifestations, and the challenges in identifying asymptomatic carriers and controlling the spread of the virus.

In this study, we focused on individuals who were scheduled for hospital admission or preoperative procedures but did not meet the official criteria for PUIs as defined by national guidelines. These individuals, henceforth referred to as “pre-admission patients not meeting PUI criteria”

(or "non-PUIs" for brevity), were screened per hospital protocol using antigen testing. Despite lacking epidemiologic risk factors or a clear contact history, many presented with mild, non-specific symptoms such as phlegm, cough, or myalgia, which may not trigger PUI classification under standard criteria—especially during overwhelming surges. This raises concerns that such patients might represent a reservoir of undetected transmission, necessitating further investigation into their infection rate and associated factors.

METHODS

This cross-sectional descriptive study was conducted at Vajira Hospital, Navamindradhiraj University, a tertiary care center in Bangkok, Thailand, between October 2022 and April 2023 and included non-PUIs aged 18-90 years. Pregnant women were excluded from the study. According to Bruminhent et al.[7], PUIs are individuals exhibiting specific combinations of symptoms and epidemiologic risk factors (e.g., known contact with confirmed cases, travel to outbreak areas, or working in high-risk settings). In contrast, non-PUIs in this study were defined as patients scheduled for hospital admission or elective procedures who did not meet PUI criteria at the time of evaluation. While some participants exhibited mild respiratory symptoms, they lacked contact history or epidemiologic risk factors required for PUI classification. This reflects real-world scenarios where mildly symptomatic or asymptomatic patients may not be identified as high-risk but could still contribute to viral transmission. For clarity, these individuals are hereafter referred to as "pre-admission patients not meeting PUI criteria." The criteria for PUIs, based on Bruminhent et al., include individuals with at least one of the following: (1) Fever (> 37.5°C) and respiratory symptoms (e.g., cough, sore throat, nasal congestion, dyspnea) along with a history of travel to outbreak areas, exposure to crowded settings, or contact with confirmed COVID-19 cases; (2) Pneumonia with a history of COVID-19 exposure, unknown etiology unresponsive to treatment within 48–72 hours, or suspected COVID-19 pneumonia; (3) Fever and respiratory symptoms in high-risk individuals as determined by clinicians or public health authorities; (4) Association with a defined community cluster during an outbreak.

Non-PUIs included in this study were patients requiring hospital admission or pre-admission for surgery without contact history with patients with a confirmed COVID-19 diagnosis, patients with respiratory symptoms, or those not fitting the PUI criteria. An antigen testing kit (ATK) was used to test for COVID-19 via nasal or nasopharyngeal swabs at the Acute Respiratory Infection Clinic and the Otolaryngology Department for outpatients and inpatients. Written informed consent was obtained from all participants. All nasal swab procedures were performed by an otolaryngology resident and a trained research assistant using the Food and Drug Administration-approved ATKs. This study was approved by the Research Ethics Review Committee for Research Involving Human Subjects of the Vajira Hospital Faculty of Medicine (COA 222/2564).

The initial number of index cases with documented comprehensive contact tracing was 319. The analysis included 313 cases after excluding 6 with incomplete data. The collected data included demographics (gender, age, body mass index (BMI), underlying diseases, occupation, vaccination details, smoking, and alcohol consumption history) and clinical features during admission (fever, cough, phlegm, headache, malaise, sore throat, rhinorrhea, tired, myalgia, anosmia, diarrhea, rash, and dizziness). These measures were used to evaluate the infection rate and potential cofactors of COVID-19.

Using a reference from Bruminhent et al.[7], the previously determined COVID-19 infection rate of 13.1% ($p = 0.13$) with $D = 0.04$ was used to achieve a 95% confidence interval. Nevertheless, we increased the number to include > 300 patients to enhance the robustness of the results.

Statistical analyses were performed using IBM SPSS® version 23.0 (IBM Corp Armonk, NY). Using a significance level of 0.05, Chi-squared tests were applied to evaluate the association between categorical variables and COVID-19 positivity. Furthermore, multivariable logistic regression analysis was performed to identify independent cofactors associated with COVID-19 infection.

RESULTS

A total of 313 individuals were tested for COVID-19 during the study period, including 41.9% men (Table 1). The average age of the participants was 53.63 ± 17.85 years (range 18–90), and the average BMI was 24.39 ± 4.92 (range 14.90–49.12). Approximately 38.3% of the participants did not have any underlying diseases. Among those with underlying diseases, the most common comorbidities were hypertension (58.1%), dyslipidemia (28.0%), diabetes (23.8%), allergy (14.5%), thyroid disease (11.4%), and kidney disease (9.3%). Of the 313 individuals, 114 (36.4%) were unemployed, 180 (57.5%) were employed (government officer, business owner, or employee), and 17 (5.4%) were students. Additionally, 283 patients (90.4%) were non-smokers, and 264 (84.3%) did not consume alcohol.

Table 1 Characteristics of the patients who were not classified as PUI for COVID-19

Variable		Number	Percentage
Age (± SD, min-max)		**53.63 ± 17.85, 18-19**	
Sex	Male	131	41.9
	Female	182	58.1
Underlying diseases	None	120	38.3
	Hypertension	101	58.1
	Hyperlipidemia	54	28.0
	Diabetes	46	23.8
	Allergy	28	14.5
	Thyroid disease	22	11.4
	Kidney disease	18	9.3
Occupation	Unemployed	114	36.4
	Government officer	42	13.4
	Private officer	41	13.1
	Owner business	33	10.5
	Student	17	5.4
	Employee	64	20.4
Smoking history	Non-smoker	283	90.4
	Smoker	30	9.6
Alcohol consumption	None	264	84.3
	Drinks alcohol	17	15.7
Vaccination (No. of shot)	0	14	4.5
	1	5	1.6
	2	48	15.3
	3	133	42.5
	4	96	30.7
	5	16	5.1
	6	1	0.3

Table 1 Characteristics of the patients who were not classified as PUI for COVID-19 (continued)

Variable		Number	Percentage
Age (± SD, min-max)		**53.63 ± 17.85, 18-19**	
Vaccination details (Type of vaccine and no. of shot)	Sinovac	64	20.4
	1	18	28.1
	2	46	71.9
	Sinopharm	19	6.1
	1	5	1.6
	2	14	4.5
	AstraZeneca	249	79.6
	1	49	15.7
	2	185	59.1
	3	15	4.8
	Moderna	64	20.4
	1	40	12.8
	2	22	7.0
	3	2	0.6
	Pfizer	182	58.1
	1	102	32.6
	2	68	21.7
	3	12	3.8

Abbreviation: SD, standard deviation

The number of vaccination shots the participants received ranged from 0 to 6, with the majority having received 3 shots (42.5%) followed by 4 shots (30.7%). The participants received varying combinations of vaccines, with AstraZeneca being the most common (79.6%). Of these, 15.7%, 59.1%, and 4.8% received 1, 2, and 3 shots, respectively. Additionally, 58.1% of the participants received Pfizer vaccine, whereas 20.4%, 20.4%, and 6.1% received Moderna, Sinopharm, and Sinovac vaccines, respectively.

Of the 313 participants, 217 (69.3%) reported experiencing at least one symptom potentially associated with COVID-19, while 96 participants (30.7%) were asymptomatic at the time of screening. Among the 31 COVID-19-positive cases, 29 were symptomatic (93.5%) and only 2 (6.5%) were completely asymptomatic. The most common symptoms in positive cases were phlegm (n = 20, 64.5%), cough (n = 19, 61.3%), sore throat (n = 18, 58.1%), myalgia (n = 17, 54.8%), tiredness (n = 16, 51.6%), and headache (n = 15, 48.4%).

Symptomatic individuals demonstrated a significantly higher COVID-19 positivity rate (13.4%) compared to asymptomatic individuals (2.1%) ($p < 0.001$). These findings support the association between the presence of symptoms and a higher likelihood of infection. However, the presence of two asymptomatic positive cases underscores the potential role of this group in silent transmission.

Our analysis also revealed that 9.9% of the non-PUIs tested positive for COVID-19 (Table 2), with commonly observed symptoms being phlegm in the throat (34.8%), cough (32.6%), rhinorrhea (31.9%), sore throat (31.6%), myalgia (29.7%), tiredness (27.5%), and headache (25.6%). In contrast, rash, dizziness, anosmia, diarrhea, and fever were less common (2.9%-12.1%).

Table 2 Frequency of signs and symptoms among non-PUI patients and overall COVID-19 positivity rate

Signs and symptoms	Number	Percentage
Fever	9	2.9
Cough	102	32.6
Phlegm	109	34.8
Headache	80	25.6
Malaise	54	17.3
Sore throat	99	31.6
Rhinorrhea	100	31.9
Tiredness	86	27.5
Myalgia	93	29.7
Anosmia	27	8.6
Diarrhea	27	8.6
Rash	38	12.1
Dizziness	38	12.1
Infection rate		
Negative	282	90.1
Positive	31	9.9

Using the Chi-squared test, the symptoms found to be significantly correlated with a positive COVID-19 test were fever, cough, phlegm, headache, malaise, sore throat, rhinorrhea, tiredness, myalgia, and diarrhea ($p < 0.001$). Additionally, a vaccination history of 0, 1, or 2 shots was significantly associated with COVID-19 positivity ($p < 0.05$). Conversely, sex, age, BMI, underlying disease, history of smoking and alcohol consumption, anosmia, rash, and dizziness were not significantly associated with COVID-19 positivity ($p > 0.05$; Table 3).

Table 3 Association between clinical factors and COVID-19 positivity on Chi-square test

Cofactors	Positive		Negative		P-value*
Demographic	n	%	n	%	
Sex					0.449
Male	11	8.4	120	91.6	
Female	20	11	162	89.0	
Age					0.202
< 60	20	11.9	148	88.1	
≥ 60	11	7.6	134	92.4	
Body Mass Index					0.366
< 25	17	8.7	178	91.3	
≥ 25	14	11.9	104	88.1	
Underlying disease					0.410
Yes	17	8.8	176	91.2	
No	14	11.7	106	88.3	
Smoking history					0.056
Yes	0	0	30	100	
No	31	11	252	89	

Table 3 Association between clinical factors and COVID-19 positivity on Chi-square test (continued)

Cofactors	Positive		Negative		P-value*
Demographic	n	%	n	%	
Alcohol consumption					0.601
Yes	6	12.2	43	87.8	
No	25	9.5	239	90.5	
Covid-19 vaccine					0.048
0-2 shots	11	16.4	56	83.6	
> 2 shots	20	8.1	226	91.9	
Signs and symptoms					
Fever					< 0.001
Yes	6	66.7	3	33.3	
No	25	8.2	278	91.8	
Cough					< 0.001
Yes	23	22.5	79	77.5	
No	8	3.8	203	96.2	
Phlegm					< 0.001
Yes	20	18.3	89	81.7	
No	11	5.4	193	94.6	
Headache					< 0.001
Yes	21	26.3	59	73.8	
No	10	4.3	223	95.7	
Malaise					< 0.001
Yes	22	40.7	32	59.3	
No	9	3.5	250	96.5	
Sore Throat					< 0.001
Yes	25	25.3	74	74.7	
No	6	2.8	208	97.2	
Rhinorrhea					< 0.001
Yes	22	22.0	78	78.0	
No	9	4.2	204	95.8	
Tiredness					< 0.001
Yes	23	26.7	63	73.3	
No	8	3.5	219	96.5	
Myalgia					< 0.001
Yes	26	28.0	67	72.0	
No	5	2.3	214	97.7	
Anosmia					0.324
Yes	4	14.8	23	85.2	
No	27	9.4	259	90.6	
Diarrhea					< 0.001
Yes	10	37.0	17	63.0	
No	21	7.3	265	92.7	
Rash					0.240
Yes	6	15.8	32	84.2	
No	25	9.1	250	90.9	
Dizziness					0.778
Yes	4	10.5	34	89.5	
No	27	9.8	248	90.2	

Abbreviations: n, number; *, significant

After evaluating all cofactors in Table 3, we identified the variables that showed a statistically significant association with COVID-19 positivity. These significant variables were then included in a multivariable logistic regression analysis, the results of which are presented in Table 4.

Moreover, multiple logistic regression analysis revealed a correlation between multiple cofactors (signs and symptoms and vaccination status) and COVID-19 positivity. Symptoms such as fever, malaise, myalgia, sore throat, tiredness, headache, diarrhea, cough, rhinorrhea, and phlegm were significantly correlated with COVID-19 positivity, whereas anosmia, rash, and dizziness were not ($p > 0.05$). Additionally, vaccination with 0-2 shots was significantly correlated with COVID-19 positivity (Table 4).

Of the 31 patients positive for COVID-19, 5 underwent chest radiography based on clinical concerns from the physicians. The first case was of a 73-year-old woman presenting with symptoms of cough, headache, and tiredness. Her chest radiograph revealed ground-glass opacity in the peripheral left lung, resulting in the diagnosis of COVID-19. The second case was a 68-year-old obese male patient (BMI > 30) with symptoms of cough, sore throat, and diarrhea. His radiograph revealed poorly defined GGO in the bilateral lower lungs. Both patients were prescribed molnupiravir. The third case was a 61-year-old woman with symptoms of sore throat, myalgia, and fever. Her chest radiograph revealed no recent focal or diffuse lung opacities. Despite this, she received paxlovid after testing positive on ATK. The fourth case was of a 67-year-old woman who presented with mild tiredness. Her chest radiograph revealed cardiomegaly and mild pulmonary congestion. The remaining case was a 57-year-old woman complaining of phlegm in her throat and rhinorrhea. Her chest radiograph was normal. Symptomatic treatment was administered to both patients.

Table 4 Adjusted odds ratio for multiple cofactors associated with COVID-19 positivity from multivariable logistic regression analysis

Cofactors	OR (95%CI)	P-value
Fever	22.32 (5.26-94.68)	< 0.001
Cough	7.39 (3.172-17.206)	< 0.001
Phlegm	3.94 (1.81-8.58)	< 0.001
Headache	7.94 (3.55-17.77)	< 0.001
Malaise	19.10 (8.1-45.06)	< 0.001
Sore throat	11.71 (4.62-29.67)	< 0.001
Rhinorrhea	6.40 (2.82-14.49)	< 0.001
Tiredness	10.00 (4.26-23.42)	< 0.001
Myalgia	16.61 (6.14-44.95)	< 0.001
Anosmia	1.67 (0.54-5.182)	0.376
Diarrhea	7.42 (3.02-18.23)	< 0.001
Rash	1.86 (0.72-4.92)	0.201
Dizziness	1.08 (0.36-3.28)	0.891
Vaccination 0-2 shots	2.22 (1.01-4.90)	0.048

Abbreviations: CI, confidence interval; OR, odds ratio

DISCUSSION

COVID-19 remains a considerable public health issue, underscoring the necessity to examine its impact on not only PUIs and high-risk populations but also non-PUIs and asymptomatic populations. High-risk individuals are those who have had unprotected close contact with confirmed patients with COVID-19. Such individuals who test negative for COVID-19 should be isolated, and symptoms should be monitored for 14 days[9]. Conversely, low-risk individuals are those exposed to high-risk contacts but not directly exposed to confirmed cases. These individuals should undergo symptom observation rather than testing or quarantine. Although these individuals are not identified as potential COVID-19 cases, they remain susceptible to infection and can act as carriers. Therefore, implementing a standard screening protocol for non-PUIs is important to ensure prompt treatment and curtail virus transmission.

Identifying COVID-19 cases is challenging because of asymptomatic or non-specific symptom presentations. Although these symptoms indicate potential cases, they also contribute to the complexity of effectively identifying COVID-19 cases. The variability in testing capacity and strategies for different groups further compounds this difficulty, affecting the accuracy and completeness of reported cases. The current protocol at out hospital does not include screening non-PUIs for COVID-19 as a standard practice. Asymptomatic patients also usually do not exhibit nasal swab abnormalities associated with COVID-19[14], necessitating additional screening, such as ATK, which is not a standard test for non-PUIs or asymptomatic individuals. Furthermore, testing every patient in the lower-risk group is impractical owing to budget constraints. Therefore, random testing of untested patients is conducted to estimate the rate of infections that are not identified through the standard screening process. Nevertheless, research focusing on patients in the low-risk category with COVID-19 is limited, warranting further research in this area. Additionally, incorporating asymptomatic COVID-19 cases into the non-PUI cohort could lead to a higher detection rate than the conventional approach that screens only PUIs. Identifying and promptly treating asymptomatic patients with COVID-19 is expected to curtail viral transmission, resulting in fewer complications. This approach allows patients to access earlier treatment compared with the standard screening methods of RT-PCR, thereby offering potential benefits that are significant to this study.

The infection rate among non-PUIs in this study was 9.9%, and they presented with common symptoms such as cough, phlegm, headache, malaise, sore throat, rhinorrhea, tiredness, and myalgia that are significantly associated with COVID-19. Moreover, despite the fewer presentations in this cohort, fever and diarrhea were highly associated with COVID-19 positivity. In contrast, symptoms such as anosmia, rash, and dizziness were not significantly associated with COVID-19 positivity. These findings indicate that these symptoms can serve as indicators for screening and reporting in all patients. These findings highlight that patients undergoing pre-admission screening, many of whom do not meet standard PUI criteria, may still harbor and potentially transmit COVID-19. This suggests a need to reassess current hospital screening policies to ensure early detection and prevention of viral spread, even among individuals not considered high-risk by conventional definitions. Conversely, chest radiographs in non-PUIs with COVID-19 showed a range of findings, from normal appearances to evident lung abnormalities. Despite the high sensitivity of chest CT in detecting COVID-19, CT abnormalities may be caused by viral diseases other than COVID-19[13]. Therefore, chest CT should not be considered a first-line screening method for COVID-19.

This study reported a correlation between a complete vaccination regimen and a reduced incidence of COVID-19. Particularly, receiving

more than two vaccination shots offered protective benefits against the infection. This finding indicates that the administration of COVID-19 vaccines decreases the risk of severe disease, ultimately lowering morbidity and mortality rates. Furthermore, the 9.9% COVID-19 positivity rate among non-PUIs underscores the importance of more rigorous screening of asymptomatic individuals. These findings are consistent with those of a previous study[15], which reported that 1.8% of healthy asymptomatic individuals tested positive for serum anti-SARS-CoV-2 Immunoglobulin G antibodies, indicating that the number of asymptomatic individuals is 6-24 times higher than that of symptomatic cases in the study area.

As the virus and disease symptoms continue to evolve, public authorities and researchers must remain vigilant in monitoring infection rates not only among high-risk populations but also within specific cohorts such as non-PUIs. This ongoing surveillance is vital for developing effective response strategies and safeguarding public health. Given the dynamic nature of the disease, updates and guidance from reputable health organizations are essential to keep the public informed about the latest developments and recommendations. Additionally, the situation may have changed since the last update, underscoring the importance of consulting up-to-date, trustworthy, and authoritative sources for the most current information and guidance.

This study has several limitations. First, the classification of participants as "non-PUIs" was based on national screening guidelines, which may have excluded individuals with mild or atypical symptoms who could meet evolving definitions of PUIs during periods of high transmission, potentially introducing misclassification bias. Second, data on symptom onset, duration, and severity were not collected, limiting the ability to evaluate clinical progression and potential infectiousness. Third, the study was conducted at a single center, which may limit the generalizability of the findings to other healthcare settings. Fourth, unmeasured demographic and behavioral factors not included in the multivariable analysis may have influenced the results. Fifth, the use of ATKs as the sole diagnostic tool—despite their convenience—carries lower sensitivity compared to RT-PCR, particularly in asymptomatic or early-stage infections. This may have led to an underestimation of the true infection rate. Lastly, as a pioneering study on COVID-19 prevalence among non-PUI individuals, there was no prior reference data specific to this population. As such, we referenced available data on asymptomatic infection rates in the general population as a surrogate, which may not fully capture the risk profile of the hospital-based non-PUI cohort.

CONCLUSION

This study found a 9.9% COVID-19 positivity rate among individuals not classified as PUIs, indicating a potential gap in current screening protocols. Significant symptoms associated with infection included fever, cough, phlegm, headache, malaise, sore throat, rhinorrhea, tiredness, myalgia, and diarrhea. Notably, individuals who received more than two vaccine doses were less likely to test positive. These findings suggest that symptom-based screening among pre-admission patients—regardless of PUI classification—could improve early detection. Policymakers should consider refining screening criteria and promoting complete vaccination coverage to reduce undetected transmission.

CONFLICT OF INTEREST

There's no conflict of interest.

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DATA AVAILABILITY STATEMENT

Data are available upon reasonable request.

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