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RESEARCH ARTICLE

Impact of COVID-19 on Primary Care Access among Diabetes and Hypertension Patients: A Five-Year Panel Study in Thailand

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ABSTRACT

The COVID-19 pandemic has significantly disrupted healthcare systems worldwide, particularly affecting patients with non-communicable diseases (NCDs). This study investigated the impact of COVID-19 on primary care access for patients with diabetes and hypertension in Thailand's Health Region 2. A five-year panel study design was employed, analyzing data from 47 districts across five provinces from 2018 to 2022. Data were collected from the Health Data Center, National Health Security Office, and Department of Disease Control databases. The study utilized generalized estimating equation (GEE) analysis to assess the relationship between COVID-19 cases and primary care visits. Results revealed that primary care screening rates for diabetes and hypertension remained high (91% and 93%, respectively) from 2018–2022, with peak rates in 2021 (92.64% for diabetes and 92.91% for hypertension). Annual primary care visits averaged 1.2 per person, showing slight declines over the period (6.2% decrease for diabetes, 5.7% for hypertension). COVID-19 cases were positively associated with screening rates for both conditions ($p < 0.001$) but showed no significant impact on diabetes visit frequency. A minor negative association was found between COVID-19 cases and hypertension visits ($p=0.009$). These findings highlight the differential impact of the pandemic on healthcare access between chronic disease groups and emphasize the need for targeted interventions in primary care service delivery during public health crises. This research provides valuable insights for healthcare policy development and service adaptation strategies in similar healthcare settings.

INTRODUCTION

The onset of the COVID-19 pandemic affected global healthcare systems, significantly affecting the provision of services, especially for patients with non-communicable diseases (NCDs). The pressing requirement to tackle the COVID-19 pandemic prompted a reallocation of resources, encompassing healthcare staff, equipment, and financing, diverting focus from standard healthcare services (Solberg et al., 2023; Pujolar et al., 2022), which consequently imposed considerable pressure on primary care systems responsible for managing non-communicable diseases (NCDs). The enforcement of lockdowns, social distancing protocols, and anxiety around infection The COVID-19 pandemic compelled numerous patients with non-communicable diseases to postpone or forgo routine examinations, screenings, and treatment visits (Pujolar et al., 2022; Ojewale and Mukumbang, 2023; Xiao et al., 2021).

The COVID-19 pandemic has profoundly affected access to primary care globally. Numerous research studies have highlighted the difficulties and transformations arising during this crisis, impacting not

only individuals with chronic diseases such as diabetes and hypertension but also access to preventative treatments and disease screening. Sopcak et al. (2023) revealed that the COVID-19 pandemic disrupted preventive and screening services, depriving numerous patients of essential services like annual health examinations, vaccinations, and cancer screenings, potentially leading to delayed diagnoses and subpar treatment outcomes. Chudasama et al. (2020) discovered that the outbreak significantly impacted chronic patient care, as healthcare professionals globally encountered challenges in delivering routine services, including follow-up appointments, blood glucose monitoring, and medication adjustments, which could result in patient deterioration and complications.

The COVID-19 pandemic has induced substantial alterations in global access to primary care. Numerous studies have emphasized the reduction in in-person medical consultations and the rise in virtual appointments during the outbreak, impacting healthcare delivery for the general populace, especially those with chronic illnesses. Research by Glazier et al. (2021) in Ontario, Canada, indicated a significant reduction in in-person primary care visits during the initial phases of the COVID-19 pandemic, aligning with findings from other nations that exhibited comparable trends. Multiple variables, including infectious apprehensions, lockdown protocols, and healthcare service limitations, contributed to this drop. The decline in in-person consultations may affect healthcare in various manners, such as postponed diagnoses and treatments, insufficient symptom monitoring and prescription modifications, decreased immunization rates, and deficiencies in preventive care. Simultaneously, the surge in virtual consultations transpired swiftly throughout the outbreak, as in-person visits diminished, illustrating healthcare institutions' endeavors to sustain continuity of patient care. Nevertheless, virtual consultations include specific constraints, including the absence of direct physical assessments and communication challenges for particular patient demographics. Alterations in primary care accessibility substantially impacted people with chronic ailments such as diabetes and hypertension. Abbas (2022) and Nozato et al. (2023) conducted research revealing a tendency among these individuals to reduce their medical visits during the outbreak, potentially jeopardizing illness management and increasing the risk of consequences such as heart disease, stroke, and renal disease (Abbas, 2022; Nozato et al., 2023).

Although numerous studies have concentrated on the immediate disruptions caused by COVID-19 during the pandemic's peak, prior research has primarily concentrated on high-income countries, resulting in a deficit in information regarding the situations of NCD patients across various healthcare settings (Gertz et al., 2022). Furthermore, these elements have not been thoroughly examined in extensive research covering the pre-pandemic, pandemic, and post-pandemic phases, especially concerning the distinct obstacles faced by NCD patients in accessing primary care services. The objective of this study is to address this critical gap by examining the following question: In what ways has the COVID-19 pandemic affected the accessibility of primary care services for patients with diabetes and hypertension? This study will offer helpful perspectives into the challenges faced and propose potential solutions for guaranteeing that NCD patients receive sufficient treatment during public health crises as well as by examining these aspects of primary care.

MATERIALS AND METHODS

Study design and setting

This study utilized a 5-year panel design, covering the period from fiscal years 2018 to 2022, based on secondary data obtained from public healthcare facilities, including hospitals and primary care centers, across 47 districts in five provinces within Health Region 2 of the northern region. All public healthcare institutions were regulated by the Office of the Permanent Secretary (OPS) and the Ministry of Public Health (MOPH).

Data sources and collection

The data for this study were sourced from several key databases, including the Health Data Center (HDC) of the Ministry of Public Health (MOPH), the outpatient medical and health database of the National Health Security Office (NHSO), as well as the COVID-19 patient database from the Department of Disease Control, MOPH.

Definition and measurement of study variables

Access to primary care services was evaluated by calculating the average number of service visits per person annually.

Statistical data analysis

Descriptive statistics were used to summarize the access to primary care services. Given the longitudinal nature of the 5-year panel data, a generalized estimating equation (GEE) method was employed to assess the relationship between number of COVID-19 patients and the average yearly visit. The continuous outcome resulted in the selection of the Gaussian family and identity link function, alongside the independent working correlation matrix. The model was adjusted for further analysis using covariate variables such as the total population numbers, number of Village Health Volunteers (VHVs). The study considered a p-value of <0.05 to be statistically significant.

Ethics approval

The study protocol was approved by the Institutional Review Board at Sirindhorn College of Public Health, Phitsanulok, Faculty of Public Health and Allied Health Sciences, Praboromarajchanok Institute in Thailand. The reference number is SCPHPL 3/2566/1.1.

RESULTS

The study evaluates access to primary care services by examining the proportion of screenings conducted for at-risk populations aged 35 and above, as well as the average number of annual visits per individual from 2018 to 2022. According to the study, the percentage of screening for at-risk patients with diabetes and hypertension was around 91% and 93%, respectively. The study demonstrated fluctuations in the screening percentages for both diabetes and hypertension from 2018 to 2022. In 2018, the rate of diabetes screening was 91.63%. It then slightly decreased to 91.13% in 2019, prior to increasing to 92.43% in 2020. The rate obtained its peak at 92.64% in 2021, before declining to 91.52% in 2022. The initial rate of hypertension screening was 91.06% in 2018, which increased to 91.65% in 2019. However, the rate continued to rise to 92.91% in 2021 (the highest point) and subsequently decreased to 91.22% in 2022 (Figure 1). Patients with diabetes and hypertension, on average, visited primary care services almost 1.2 times annually per person. The analysis of healthcare utilization patterns from 2018 to 2022 revealed a decline in the average number of annual visits per individual for both diabetes and hypertension patients. The number of diabetes-related visits decreased slightly, from 1.29 visits per year in 2018 to 1.21 visits in 2022—a 6.2% decrease over the five-year period. Similarly, hypertension-related visits showed a consistent decreased trend, with a decline from 1.23 visits per year in 2018 to 1.16 visits in 2022, which represented a 5.7% decrease (Figure 2).

Table 1 illustrates the impact of COVID-19 on the accessibility of primary care services for patients with diabetes and hypertension. There was a positive association between the number of COVID-19 cases and the percentage of screenings for at-risk populations for both diabetes (p-value < 0.001, 95% CI; 0.004-0.010) and hypertension (p-value < 0.001, 95% CI; 0.004-0.009). The number of COVID-19 cases had no significant impact on the average annual number of primary care visits per diabetic patient, whereas there was a slight negative association between the number of COVID-19 cases and the number of annual visits per hypertensive patient (p-value = 0.009, 95% CI: -0.0000098, -0.0000014).

DISCUSSION

This study revealed a consistently high level of access to primary care services for chronic disease screenings, with both diabetes and hypertension screening rates remaining above 91% throughout 2018–2022, despite showing minor fluctuations and a slight decline in 2022. Interestingly, the finding showed a significant positive association between COVID-19 cases and screening rates for both conditions (p < 0.001). However, the decreasing trend in the average number of annual visits per individual for both conditions over the five-year period is coupled with a slight negative association between COVID-19 cases and hypertension visits (p = 0.009).

Contrary to earlier studies, our findings indicated a positive relationship between COVID-19 cases and diabetes and hypertension screening rates. This surprising finding is inconsistent with previous studies, which found that COVID-19 profoundly impacted routine care and reduced access to care, including preventive care, screening, and lifestyle counselling (Sopcak et al., 2023; Chudasama et al., 2020). Our findings show that primary care service access remained robust during the outbreak. This resilience can be attributed to the activities of village health volunteers (VHVs). Although VHVs mostly helped to prevent and control COVID-19 at the community level (Kaweenuttayanon et al., 2021), they also continue to support the management of chronic diseases (Bezbaruah et al., 2021). Furthermore, VHVs were crucial mediators between communities and healthcare facilities, guaranteeing uninterrupted access to care for people with chronic conditions (Kowitt et al., 2015; Sukhampha et al., 2023). This might explain our observation of higher rates of diabetes and hypertension screening even throughout the epidemic.

The impact of the pandemic on primary care visits revealed that patients with diabetes and hypertension experienced a variety of differences in their outcomes. Patients with diabetes showed no change in the frequency of their visits, but patients with hypertension exhibited a modest drop in the number of visits they made annually as the number of COVID-19 cases increased. Glazier et al. (2021) also observed this phenomenon, suggesting that variations in the perceived urgency of care or shifts in healthcare delivery models towards telemedicine could explain this disparity. Furthermore, a variety of factors, including the fear of contracting COVID-19 in healthcare settings, the implementation of self-measured blood pressure monitoring, the modification or adoption of medication management services, or the over-routine management of hypertension, could potentially influence the number of recorded visits (Abbas, 2022; Nozato et al., 2023).

CONCLUSION

During the COVID-19 peak (2020-2021), screening rates reached their highest levels for both diabetes (92.64%) and hypertension (92.91%). Despite increased COVID-19 cases showing positive correlation with screening rates ($p<0.001$), annual visits exhibited different patterns: diabetes care visits remained unchanged while hypertension visits decreased slightly ($p=0.009$). The different patterns in diabetes and hypertension underscore the necessity for targeted therapy. A comprehensive examination of the distinct roles of Village Health Volunteers (VHVs) and health professionals, such as nurses, public health technical officers, and public health officers, in maintaining primary care services during the pandemic, using a mixed-methods approach, would be essential for comprehending and potentially enhancing this essential aspect of Thai healthcare.

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APPENDIX 1: FIGURES AND TABLES

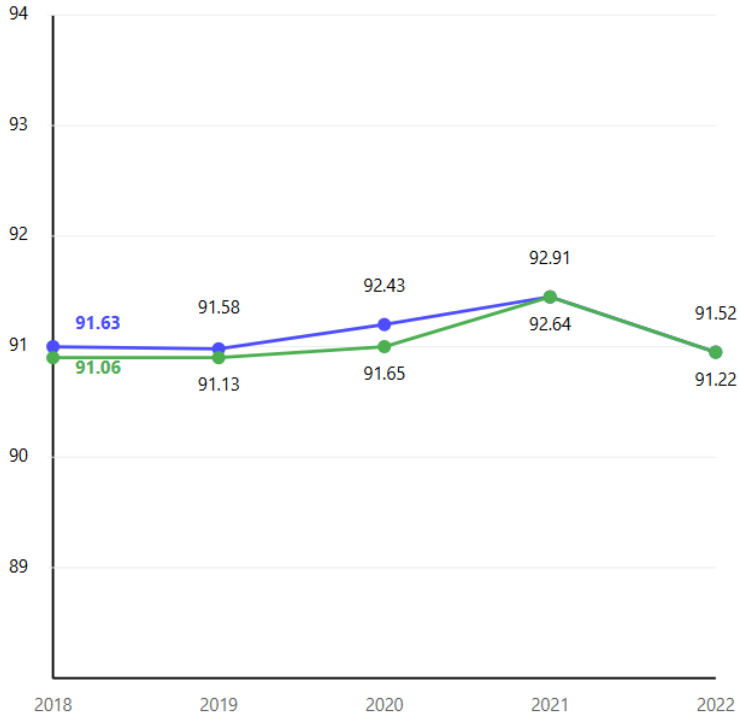

Figure 1: Access to Primary Care Services: % of screenings

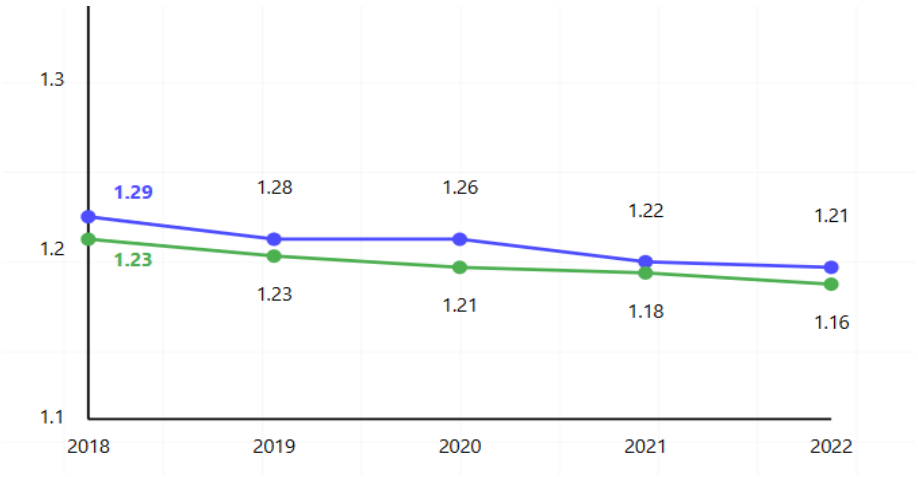

Figure 2: Access to Primary Care Services: average yearly visit

Table 1: The impact of COVID-19 on access to primary care in patients with diabetes and hypertension

Variables	$b_{Unadjusted}$	$b_{Adjusted}$	95%CI of $b_{Adjusted}$	P-value
Screenings in at-risk populations				
Diabetes				
Number of COVID-19	0.007	0.007[a]	0.004 – 0.010	<0.001
Hypertension				
Number of COVID-19	0.007	0.007[a]	0.004 – 0.009	<0.001
Number of visits to primary care/person/year				
Diabetes				
Number of COVID-19	-0.0000009	-0.0000003[b]	-0.000002, -0.000002	0.811
Hypertension				
Number of COVID-19	-0.0000061	-0.0000056[b]	-0.0000098, -0.0000014	0.009
[a] Adjusted for total district population; [b] Adjusted for total district population and total VHV				