

OTDK Thesis

2025

A Comprehensive Study on Healthcare Services and Medication
Affordability and Availability Amidst Economic Challenges in Mount
Lebanon Governorate

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Date: April 17, 2024

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1. Introduction

1.1. Background

Lebanon, the country of peace and development which was once known as the Switzerland of the Middle East, is now known for its unfortunate history of civil unrest and wars which have plagued it to the core. An intricate web of financial difficulties, structural flaws, and geopolitical forces weave together to form the economic catastrophe that has deeply ingrained itself in Lebanon. Although the area has always been praised for its resilience, it is currently dealing with an unprecedented variety of financial challenges that have permanently altered its social and economic structure. Due to its history of political unrest and its fragile economic foundation, the country became vulnerable to external disturbances. The interplay of political conflict, corruption, and mounting public debt has exposed the weaknesses that have gradually undermined the economic foundations. The consequent impact on public resources has restricted the government's ability to properly handle the rising difficulties. Prior to getting into the details of the economic crisis' impact on medicine affordability and healthcare access, it is important to understand how the region's larger economic environment affects people's everyday lives and health outcomes. This thorough investigation lays the groundwork for an in-depth comprehension of the significant influence that financial difficulties have had on Lebanon's healthcare system.

1.2. Rationale of the Study

Lebanon has been dealing with a long-term economic crisis, and the consequences for healthcare access, pharmaceutical supply, and pricing have been well-documented on a national scale. However, there is a significant gap in the literature concerning the impact of the economic crisis on the Mount Lebanon Governorate in particular, given its distinct characteristics. There are no studies about how this crisis has affected the Lebanese population residing in Mount Lebanon which, consisting of mostly rural areas, might have been impacted on a higher scale. Therefore, this study seeks to address this gap by examining any potential impact of the economic crisis on access and affordability of healthcare services and medications in Mount Lebanon, presenting insights that are especially adapted to the socioeconomic and socio-demographic dynamics of this region.

Mount Lebanon Governorate is one of Lebanon's nine governorates. It is considered, along with Beirut Governorate, as being central to Lebanon's social, economic, political,

and cultural activities. While Beirut is mostly urban, Mount Lebanon consists of both urban and rural areas. Mount Lebanon is divided administratively into six districts: Chouf, Aley, Jbeil, Baabda, Keserwan, and Metn, with Baabda as its capital. Moreover, Mount Lebanon is the largest governorate in the country with an area of 1,964.6 km² and a population of around 2 million, accounting for around 42% of Lebanon's total population. This highlights the importance of Mount Lebanon to the country, both in terms of land size and population (UNHCR, 2024).

The socioeconomic dynamics of Mount Lebanon has a significant impact on the region's healthcare services and access. In addition, the mountainous landscape and Mediterranean climate not only influence the population's economic activities and livelihoods, but also the availability and accessibility of healthcare facilities. Accessing healthcare services might be difficult in Mount Lebanon due to its less densely populated area compared to urban areas, particularly in isolated or hilly regions. Due to this, there may be differences in the accessibility of healthcare between urban and rural locations, with urban regions typically having greater access than rural areas (*ACAPS Thematic Report - Lebanon*, 2023). The healthcare system in Lebanon has also been severely strained by the country's economic crisis, which has resulted in financial challenges for hospitals and a reduction in government financing. These difficulties can make it challenging to get necessary medical supplies and services, and they are especially noticeable in areas like Mount Lebanon that have few resources. As a result, knowing Mount Lebanon's specific socioeconomic dynamics is critical for adequately evaluating the effect of the economic crisis on healthcare access and services in the region.

In conclusion, the justification for this study is based on the need to fill in the knowledge gap that is unique to Mount Lebanon, where the effects of the financial crisis on access to healthcare and the availability and affordability of medications are still largely unaddressed. This study seeks to provide locally relevant insights that can guide focused interventions, policymaking, and future research projects, ultimately strengthening the healthcare system's ability to withstand financial hardships in Mount Lebanon.

1.3. Research Questions

Therefore, the following study will address the following research questions:

1. Do people living in Mount Lebanon experience difficulties in accessing healthcare and affording medications as a result of the economic crisis?

2. Which specific socio-demographic groups in Mount Lebanon face the most travel and cost difficulties in accessing healthcare during the economic crisis?
3. Is medication availability independent of people's socio-demographic background in times of economic crisis in Mount Lebanon?
4. What coping mechanisms have resulted from the economic crisis in Mount Lebanon regarding healthcare use and medication consumption?

2. Literature review

2.1. *Overview of the economic crisis*

The series of disastrous events happening in Lebanon have been escalating over the years, making the situation direr. Starting October 2019, Lebanon has been plagued by an economic catastrophe that has worsened over time, driving more than 80% of the population into poverty. The crisis has been ranked by the World Bank as one of the top three most serious economic crises since the middle of the 19th century (Chehayeb et al., 2023; Kronfol & Bashshur, 1989; World Bank, 2021). The drastic economic meltdown was then aggravated by political insecurity, the COVID-19 pandemic and an ammonium nitrate explosion that completely destroyed the Beirut's Port in August 2020. As a result of these calamities, the Lebanese Pound (LBP) has been devalued by more than 95%, where it has previously been fixed to the US dollar at a conversion rate of 1 USD=1,507.5 LBP, and has decreased by almost 63 times in the past three years to become 1 USD= 89,700 LBP as of April 8, 2024, according to the black market exchange rate. In addition to that, Lebanese banks have frozen the majority of depositors' accounts and imposed weekly limits on how much they can withdraw in US dollars or Lebanese Pounds (Guechati & Chami, 2022; Human Rights Watch, 2023).

This liquidity crisis has impacted life in Lebanon on so many levels. Prices for electricity, water, and gas soared, increasing by 595 percent between June 2021 and June 2022 as a result of the Central Bank depleting its foreign reserves and reducing subsidies on the attainment of the most vital goods. This increase in prices made utilities that are necessary for business, health, and food a luxury which people can barely afford. (Human Rights Watch, 2023). Thus, the availability of fuel and provision of electricity became scarce, causing further hurdles to food security and provision, as well as healthcare and drinkable water access. Refrigerators have lost their utility due to typical daily power cuts of 20 hours, ruining any food stored inside (Corriero et al., 2022; Dagher et al., 2022).

In a field survey of 931 Lebanese households across governorates, conducted in August 2022, 29% of respondents lost their job since the beginning of the crisis, 85% bought fewer food items, 75% minimized automobile use due to the rising price of gasoline, 86% turned off heating systems in their homes despite being cold, and 33% skipped meals. In addition, the survey illustrates the impact of the crisis on the healthcare industry, with 59% of respondents switching from private to public healthcare 63% reporting missing or

postponing doctor visits despite being ill, and 31% abandoning prescription medications (Dagher et al., 2022).

2.2. Overview of the Lebanese Healthcare System

Prior to the 2019 crisis, the Lebanese healthcare system was one of the strongest in the Middle East, attracting visitors seeking medical attention in the area. It placed a strong emphasis on empowering private facilities. Approximately 50% of Lebanese citizens were fully or partially covered by a health insurance scheme. A large number of people resorted to public health services, especially those connected to Lebanon's national health insurance program, the National Social Security Fund. As an alternative, some people relied on private health insurance, which was frequently provided by their companies or other programs, such as the Armed Forces health insurance program. Remarkably, there was no evidence of a lack of healthcare professionals in either public or private hospital. In contrast to state hospitals, which occasionally reported resource, facility, and equipment shortages, private healthcare facilities had a more up-to-date and well-equipped infrastructure. Furthermore, it was found that urban areas offered better access to healthcare services as compared to rural locations. (*ACAPS Thematic Report - Lebanon*, 2023; Zahar, 2023).

In comparison with other countries, Lebanon devotes a comparatively small portion of its GDP on healthcare expenses. In 2020, health care expenditure comprised 7.95% of Lebanon's GDP (*World Bank Open Data*, 2023). According to estimates from the World Health Organization, this is less than the global average of 9.2-9.7% of GDP that was spent on healthcare during that time. In most OECD countries, healthcare accounts for 8.8–9.7% of GDP or higher (OECD, 2021). Even the United States, with its enormous healthcare industry, allocated more than 16.8% of its GDP to health in 2020 (Wager et al., 2024). Despite years of effort, Lebanon's low budget has made it difficult to build its health services and infrastructure. The nation's capacity to offer its people comprehensive, high-quality healthcare is restricted by insufficient budget allocation.

Additionally, the healthcare system in Lebanon is characterized by a fragmented and diverse structure with six employment-based social insurance programs, each having its own benefit package and fees, and without any coordination between them. In 2019, the NSSF provided coverage for 44% of the insured population, while the armed forces covered 16%, private organizations covered 21%, mutual funds covered 11%, and the Civil Servants Cooperative covered 6%. The presence of numerous risk pools and purchasing entities led

to the exhaustion of extra resources in order to fund a less sufficient and equitable result. In fact, fragmentation refers to the situation where each of these entities has a smaller risk pool, resulting in greater costs for acquiring medical services for their members compared to when they bargain collectively (International Labour Organization, 2024).

Moreover, the private sector is predominant and emphasizes hospital-based curative care over primary and preventive care. The vast majority of secondary and tertiary healthcare facilities are private, despite the network of public and private hospitals throughout the country. Non-Governmental Organizations (NGOs) primarily operate primary healthcare facilities under contracts with the Ministry of Public Health (MOPH). Nonetheless, the private sector provides 86% of the hospital beds in secondary health care facilities (Abdellatif et al., 2022; Nassar et al., 2022).

However, since the crisis the decrease in value of the Lebanese currency and the hyperinflation made medical care at private institutions too expensive for most individuals. Concurrently, a great deal of hospitals in the private sector have closed due to a shortage of resources, medical personnel as well as medical supplies (*ACAPS Thematic Report - Lebanon*, 2023). The rise in medical treatment costs and the closure of private-sector hospitals has led more individuals to seek treatment at public hospitals which offer fewer services. About 50% of Lebanese people seeking medical care had their medical expenditures paid for by the government before the 2019 crisis. However, in January 2022, the Ministry of Public Health (MoPH) had no more funds to meet the population's medical costs and demands. Due to currency devaluation, the MoPH budget decreased from USD 486 million to USD 37 million between 2018 and 2022 (*ACAPS Thematic Report - Lebanon*, 2023; Amnesty International, 2023). As a result, out-of-pocket expenses continue to be the primary source of funding for the healthcare system. Only those patients who are able to afford it receive equitable medical care under Lebanon's heavily privatized healthcare system (Abdellatif et al., 2022; Nassar et al., 2022).

2.3. *Impact of the Economic Crisis on the Healthcare Sector*

Due to the already fragile structure of the healthcare system in Lebanon, the detrimental effects of the economic crisis have been most prominent in the healthcare sector. For instance, hospitals in Lebanon faced multiple challenges due to the financial difficulties which were exacerbated by the COVID-19 pandemic and the shocking explosion of Beirut's main port in 2020. The coronavirus epidemic has aggravated the burden of

hospitals in Lebanon, which have been unable to handle the resulting increase in patient volume and resource demands. Following the first COVID-19-related death, Lebanon underwent a statewide lockdown on March 10, 2020, and five days later, the country was declared to be in a state of general health emergency. Approximately half of Lebanon's population fell below the poverty line, and various lockdown stages only worsened the country's already dire economic situation (Abdellatif et al., 2022; Bou Sanayeh & El Chamieh, 2023; Fleifel & Abi Farraj, 2022). The situation became disastrous and out of control when the Beirut port explosion happened on August 4, 2020. The explosion displaced about 300,000 people and left behind almost 7,000 casualties, including 218 deaths. It was one of the most seismic nonnuclear explosions ever recorded, with a Richter scale magnitude of 3.3 ml. In the hours following the blast, healthcare facilities became overcrowded with patients resulting in over 1,000 routine ward and intensive care admissions (Abdellatif et al., 2022; Bou Sanayeh & El Chamieh, 2023; Fleifel & Abi Farraj, 2022).

Moreover, electricity cuts have increased in frequency and duration since the economic downturn where the average daily availability of electricity has decreased to one or two hours. Thus, power generators became the main source of electricity for hospitals to run medical equipment, particularly dialysis and supplied-air respirators. However, these power generators relied on diesel, which was in short supply and was getting increasingly expensive, due to the central bank's discontinuation of fuel subsidies in August 2021. Some patients were at a high risk of dying in case medical facilities run out of the fuel required to run generators. This is because diesel can be purchased for as much as five times the average price depending on the country's diesel supply and whether it is purchased at the black market price. The financial strains already experienced by healthcare facilities with tight budgets are exacerbated by these increased expenses, endangering their capacity to deliver critical services (*ACAPS Thematic Report - Lebanon*, 2023; Guechati & Mustapha, 2022).

For instance, the scarcity of fuel and electricity resulted in a shortage of necessary drugs, including antibiotics and chemotherapy (Bou Sanayeh & El Chamieh, 2023). Hospitals were unable to provide victims intravenous acetaminophen and antibiotics for basic care (Nassar et al., 2022). In addition to that, hospitals stopped performing non-life-threatening surgeries in the face of anesthetic shortages (Corriero et al., 2022). Due to a fuel shortage, the American University of Beirut Medical Center was forced to close on

August 14, 2021, which may have resulted in the deaths of 40 adult and 15 child ventilator-dependent patients (Nassar et al., 2022).

It is unfortunate to mention that Joao Martins, the MSF head of mission in Lebanon stated that hospitals are having to prioritize patients and limit their services. It has become possible for people to die from entirely preventable and normally quickly treatable causes simply because hospitals lack the necessary staff, supplies, or electricity (Médecins Sans Frontières, 2021).

Another critical issue the healthcare system has been facing is the migration of healthcare workers and staff shortages in different areas of expertise and healthcare facilities. Hospitals are finding it difficult to attract and keep skilled employees, who are opting to leave the country in search of better prospects abroad due to declining pay and a sense of being underappreciated for their work (Bou Sanayeh & El Chamieh, 2023; Corriero et al., 2022; Nassar et al., 2022). The Lebanese Order of Physicians has reported that between 1,000 and 15,000 registered physicians have already left Lebanon for other nations with more stable political and economic environments and financially attractive offers. As to nurses, their average pay has decreased to \$75 per month, even though they still work for 40 hours a week. While the highly qualified and experienced nurses are leaving the country in search of better career opportunities, others are forced to accept unfair pay cuts or unpaid wages (Dagher et al., 2022; Nassar et al., 2022). This has also been the situation for recently graduated medical professionals who are seeking opportunities abroad in order to improve themselves and their family in the future. In an effort to keep some employees, hospitals have chosen to give contracts with a certain amount of dollars in cash, which is about 25% of what these healthcare professionals received before. Despite these efforts, the country's top private hospital, the American University Beirut Medical Center (AUBMC), reported that almost 40% of its emergency medical staff left for possibilities overseas (Dagher et al., 2022; Fleifel & Abi Farraj, 2022).

These challenges have burdened Lebanon's already frail healthcare system, making it harder for hospitals to meet the rising demand for healthcare services. For instance, not only are hospitals struggling with obtaining foreign currency in order to purchase their necessities from abroad, but they are also facing troubles in collecting payments from insurance companies, dealing with reduced government assistance, and misallocation of funds (Bou Sanayeh & El Chamieh, 2023). The informal capital controls imposed by banks

on enterprises and depositors' funds made it impossible to import medical equipment and pharmaceuticals, and many people were unable to pay for their healthcare expenses. It also further undermined the healthcare sector, which was already deficient in resources, with the Lebanese government owing an estimated 1.3 billion USD debt to private hospitals in 2019 (Abdellatif et al., 2022).

Moreover, the financial crisis has impacted patients' ability to pay for health services, especially that a high percentage of the population lost their jobs or had their income decreased (Bou Sanayeh & El Chamieh, 2023; Chehayeb et al., 2023). Moreover, since half of Lebanon's population lacks insurance, they are unable to pay for private medical care. Even those who have access to private or public insurance via the National Social Security Fund, pay a significant amount of medical expenses out of pocket. This is because medical care facilities bill at a far higher exchange rate than what the NSSF reimburses for medical expenditures and fees, which are paid at the official rate of 1,500 LBP. Thus, the patient's remaining balance has increased dramatically as a result of the depreciation of the currency (Dagher et al., 2022). Consequently, the number of patients who are unable to afford their medical bills has increased, and hospitals are battling to collect payment for the services they provide. This has also exacerbated hospitals' financial challenges, as they are unable to earn enough income to cover their costs (Bou Sanayeh & El Chamieh, 2023; Chehayeb et al., 2023).

2.4. Impact on Pharmaceutical Industry

According to the Ministry of Public Health estimations, Lebanon imports over 80% of its pharmaceutical items, at a cost of over \$1 billion a year. Patented pharmaceuticals account for around half of the market, while over-the-counter (OTC) and generic drugs account for approximately 25% each. Lebanese Customs report that the overall value of pharmaceutical imports into Lebanon in 2021 was \$900 million, with \$106 million coming from the US. The majority of the local manufacturing sector is devoted to producing medications under license for foreign businesses (International Trade Administration, 2022; Watt, 2023). Since the majority of pharmaceutical items in Lebanon are imported, the economic crisis and depreciation of currency have resulted in catastrophic shortages of medications because of a limited capacity to obtain drugs and raw materials from international providers (Chehayeb et al., 2023). It is also worth noting that medications account for more than 25% of annual household spending in Lebanon. As a result, Lebanon has some of the highest per capita pharmaceutical spending in the Middle East, with only

20% of prescription pharmaceuticals being covered by private or state insurance (Hajj et al., 2020).

In order to mitigate the challenges encountered by drug suppliers, a decision to subsidize 85% of the foreign currency required to purchase medications at the official USD exchange rate was made by the Central Bank in November 2019. Because of this, importers had to buy the remaining 15% at the much higher black market exchange rate, incurring significant financial losses. The Central Bank's data shows that the government spent USD 1.8 billion on prescription drug subsidies between January 2019 and July 2021. Even though the government spent a lot of money on these subsidies, people still suffered from a serious lack of vital medications, sometimes to the point of death (Amnesty International, 2023). This persistent shortage was blamed on the smuggling of subsidized drugs out of the nation to be sold for profit, the hoarding of pharmaceuticals, and the delays in processing subsidy requests which consequently reduced the efficacy of this system (Amnesty International, 2023; Chehayeb et al., 2023; Das, 2021). Moreover, regardless of the status of subsidies, Lebanese drug importers' capacity to import medications was further restricted by the rising debt they owed to foreign pharmaceutical corporations. Therefore, due to the system's unsustainability, the Ministry of Public Health declared lifting the subsidies on all medications with the exception of cancer drugs and other certain drugs for chronic conditions on November 9th, 2021. This resulted in the majority of medications' costs to skyrocket (Ahsan, 2021; Amnesty International, 2023; Baggili, 2021; Chehayeb et al., 2023; Fleifel & Abi Farraj, 2022).

The cost of prescription drugs in Lebanon has increased fourfold since the beginning of the economic crisis in 2019. Even though the government has known for the previous year or more that it could be necessary to remove subsidies, they have not implemented a social protection strategy to guarantee ongoing access to required drugs (Amnesty International, 2021).

The Lebanese Pharmaceutical Importers Association issued a warning in early July 2021, stating that if importers cannot resume imports as soon as possible, their stocks of hundreds of medicines to treat chronic and terminal conditions will run out during July. There was no resume of imports, and there have been shortages of a wide range of medications, from over-the-counter painkillers to chemotherapy treatments since then (Ahsan, 2021; Chehayeb et al., 2023; Das, 2021).

Ever since, basic pharmaceuticals and medications, the majority of which cannot be produced or made available locally, are in short supply in Lebanon's pharmacies and distributors. It has also been reported by patients that the medications required for their care are no longer available at public primary health care facilities (Médecins Sans Frontières, 2021). As to medications that were still available to a certain extent, their prices skyrocketed. For instance, drugs for COPD, diabetes, and anticoagulation were found to be especially expensive; their mean monthly costs accounted for 15–20% of an individual's mean monthly income. The cost of monthly insulin easily surpassed the minimum monthly salary which was around a quarter of the average monthly income (2,600,000 LBP) in April 2023 (Chehayeb et al., 2023). Besides, pharmacists have mentioned to Amnesty international that once the subsidy was removed, the cost of a single box containing 28 tablets of a basic blood pressure medication exceeded the minimum monthly wage. People reached their lowest point. They replaced their medication with any other medication they could find at a cheaper price, even if it risked their lives (Amnesty International, 2023). Moreover, some people can no longer afford infant food, vitamins, and antipyretics—all of which were once seen as reasonably priced—due to the unequal double to quadrupling of drug prices in Lebanese Pounds (LBP) (Fleifel & Abi Farraj, 2022). Thus, patients have resorted to reducing their use of drugs or substituting them in order to cut costs, resulting in significant negative health consequences. Hospital admissions have seen an unusual increase in individuals arriving to emergency rooms due to clinical presentations resulting from their inability to purchase diuretics, inhalers, diabetes medications, and other medications (Fleifel & Abi Farraj, 2022; Rezvani, 2022). Furthermore, the lack of vital outpatient cardiovascular medications, such as antiplatelets, antihypertensives, and antiarrhythmics, has led to a rise in the rate of myocardial infarction from stent thrombosis, unstable arrhythmias necessitating emergency care, and decompensated heart failure (Khattar et al., 2022).

In addition to that, even though the Ministry of Public Health (MoPH) still subsidizes cancer treatment, shortages make it difficult for patients to get it. Due to this shortage, Lebanon's cancer patients, whose number ranges between 20,000 and 30,000, turn to buying chemotherapy medications on the black market, a practice that carries significant risks for their safety because of possible contamination and a lack of official supervision. Some choose to import their medical care from overseas or implement cost-cutting strategies like prescription rationing. Nevertheless, despite these initiatives, there are still

delays, with imported medications frequently arriving late. The consequences of these issues include disruptions in the treatment regimens of cancer patients, who report delays in obtaining subsidized medication at hospitals (*ACAPS Thematic Report - Lebanon*, 2023; Rezvani, 2022; Watt, 2023). It has also been reported oncologists have become tempted to take unconventional measures, such as using intermittent prescriptions, alternating between brands within the same class of drugs, using insufficient dosages of medications, or even not following certain drug regimens, in an effort to combat drug shortages and better serve their patients (Kattan & Kattan, 2023).

Consequently, the shortage of medication has led to the loss of confidence in the Lebanese healthcare system, and internationally distinguished graduates are leaving the country. People are no longer able to afford private medical care, and there has been a striking spike in the number of people seeking free medical care and other forms of assistance, including food (Chehayeb et al., 2023). As a conclusion, the economic crisis in Lebanon has severely impacted the country's healthcare system and drug accessibility, creating serious issues that require immediate attention and comprehensive solutions to protect the population's health and well-being.

2.5. Comparative analysis of how economic crises have impacted healthcare access globally

The effect of financial crises on healthcare and pharmaceutical systems is a common problem in the complex field of global public health that goes beyond national borders. The following section undertakes a comprehensive comparison study, delving into the similar experiences of Lebanon and other countries facing economic hardship. Through comparing and contrasting the experiences of Greece, Portugal, Venezuela, Argentina, and Brazil with those of Lebanon, we aim to reveal the common themes that bind these stories together as well as the unique subtleties that influence how economic unrest affects healthcare systems. This is crucial in order to understand the difficulties of managing healthcare resilience in the face of economic hardships, and provide a broad perspective on common obstacles and different approaches to healthcare sustainability.

Similar to the case of Lebanon, the healthcare and pharmaceutical industry have been negatively impacted in cases of economic crises globally. For instance, during the economic crisis in Greece, between 2009 and 2014, there has been a significant drop in pharmaceutical spending due to the severe budget cuts made in health and pharmaceutical

sectors. Greece, which has spent significantly on pharmaceuticals in the past, witnessed an annual decline rate of -8.5%, becoming the European Union's lowest spender. Not only did the crisis result in a decrease in pharmaceutical spending, but also resulted in market withdrawals and shortages of medications, which encouraged supplier induced-demand (Simou & Koutsogeorgou, 2014). Furthermore, during Portugal's economic crisis, copayments rose, forcing many patients to forgo treatment because they were unable to afford it, which is also the case in Lebanon (Recio et al., 2022).

It has also been reported by the Pharmaceutical Federation of Venezuela that the economic crisis, hyperinflation, and food scarcity are the main causes of Venezuela's 85% pharmaceutical deficit. Due to the shortage, Venezuelans have been obliged to search the black market for medication, where they frequently discovered smuggled or outdated drugs. The issue has also resulted in a 90% shortage of various medical supplies and medications used to treat more serious diseases, as well as a shortage of emergency medical supplies. In addition to the government's refusal to accept humanitarian aid, which has blocked the arrival of medical supplies and first aid kits, the cost of drugs has increased dramatically in parallel with the cost of food and other essentials (Raphelson, 2018).

Similarly, Brazil's economic and political challenges have posed a significant risk to the country's Universal Health Coverage (UHC) and health improvements. Since 2015, real public health expenditure per capita has decreased, harming the poorest and most vulnerable populations. The crisis has also been linked to an increase in violent deaths, infectious disease outbreaks, and a decrease in population coverage. In addition, Brazil's shortage of pharmaceuticals has been linked to internal institutional frameworks, economic deregulation, and the nation's reliance on imported inputs, particularly from China (Leal et al., 2023; Silva, 2022). Research has brought attention to the social and economic disparities in Brazilians' access to medications, highlighting the necessity of modernizing and fortifying drug-related public policies in order to lessen health disparities. Despite the availability of universal health care, a fraction of the population in Brazil reported unmet needs for health care services and prescriptions, demonstrating persisting inequities in access to health care (Leal et al., 2023; Silva, 2022).

Furthermore, one of the most prominent consequences of economic crises in the world is adverse health outcomes. A study conducted in Argentina investigated the association between the economic crisis and the rise in mortality rates, specifically in the setting of

cardiovascular diseases since it is the leading cause of death in the country. It was found that Argentina's economic crisis has resulted in higher unemployment rates and a decline in GDP, both of which have had a detrimental effect on the socioeconomic standing of the population. The authors investigate the connection between mortality rates and the economic crisis using a time-series analysis, offering epidemiological proof of how the financial crisis affected the population's health in Argentina (Gurfinkel et al., 2005).

Finally, one of the recommendations given by Amnesty International in Lebanon was to increase funding for primary health care centers (PHCCs) across the country, including underprivileged areas, to allow facilities to meet the demand for low-cost or free medication (Amnesty International, 2023). This is aligned with policies in nations such as Argentina, Cuba and Latvia, which have focused on improving primary healthcare by offering free prescription drugs as a response to the economic crisis (Kheirandish et al., 2015).

3. Methods

In this chapter, the methods used for this study will be discussed and justified in detail. This will comprise of the study design used, the data collection method, including sampling, methods and questionnaire design, in addition to the data analysis.

3.1. Study Design: Cross-Sectional

This research study adopts a quantitative approach to examine if and in what ways has the economic crisis in Lebanon impacted Mount Lebanon's residents' access to healthcare services and medication availability. For this reason, a cross-sectional study was conducted between January 1, 2024 and February 19, 2024 to evaluate the situation.

3.2. Data Collection

The data was collected via an online survey as a primary data source. The software platform Qualtrics was used as a data collection tool to develop and administer the survey. The questionnaire was designed in such a way that it incorporated skip logic functions and ensured the anonymity of responses. A survey URL that was shared via social media platforms as a component of the snowball and convenience sampling strategy. In addition to that, the storage and collection of data was efficient since responses were automatically imported into a downloadable dataset which was later exported for inspection and data analysis.

3.3. Sampling

A combination of snowball and convenience sampling was used to recruit participants in the study. First, the study began by using the snowball sampling technique in January, where the survey was sent online via WhatsApp to 46 contacts in the researcher's personal and professional networks who fit certain eligibility criteria, regardless of other characteristics. The eligibility criteria mainly included that the participant: 1- is a resident of Mount Lebanon, 2- has been living in Lebanon for the past 12 months. There were no age restrictions since the need for medications and healthcare services is an aspect experienced by all age groups. These recipients were then asked to forward the survey link to additional members of their own social networks who fit the eligibility requirements. This snowball sampling method facilitated the data collection process by allowing the prospective responder pool to grow naturally via social media networks. The snowball sampling yielded 139 survey responses. In order to increase the data pool further, the researcher decided to combine the snowball sampling technique with a convenience

sampling technique. Therefore, the questionnaire announcement and link was posted on the researcher's social media accounts (Instagram and Facebook) in February for a greater reach of respondents. After that, the total number of survey respondents reached 162 responses. However, upon further inspection, it was shown that 31 respondents out of 162 did not complete the survey. Because missing responses might bias the survey's results, the researcher decided to include only those who have completed more than 78% of the survey, which were only 2 respondents, since 78% was the highest percentage of completion after 100%. As a result, the 29 respondents who have completed less than 78% of the survey were excluded. Thus, the number of participants who have completed the survey amounted to a total of 133 respondents. After that, respondents who were not residents of Lebanon for the past 12 months (n=6) and not residents of Mount Lebanon (n=2) were also excluded since they did not meet the eligibility criteria. Hence, the final number of participants who were included in the study was 125 participants as shown in the flow chart below (Figure1).

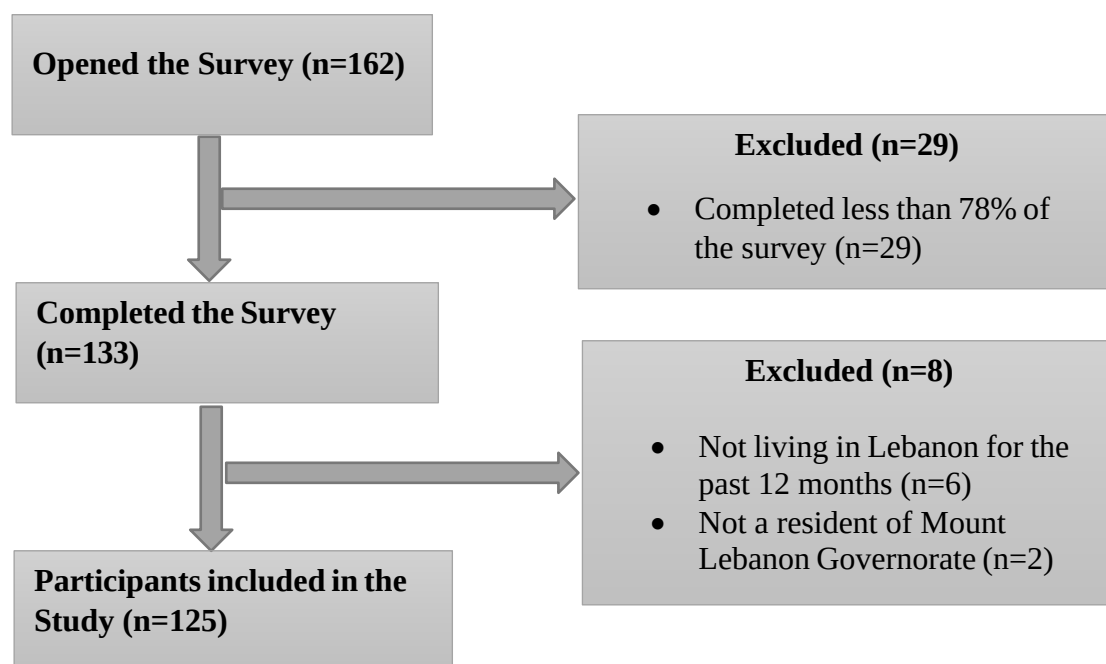


Figure 1. Flow chart representing sampling process of the study

3.4. Questionnaire Design

The questionnaire was administered online in the English language since it is widely known and spoken among Lebanese people, despite it not being the native language. The survey consisted of 24 items and was divided into five sections: A welcome page, screening questions, questions related to access to health care, questions on affordability and

accessibility to medicine and socio-demographic questions. The type of questions which were mainly used were dichotomous (yes/no) questions and single-answer multiple-choice questions.

The welcome page explained the aim of the survey to participants, highlighting the topic and its relevance by stating the following: “This survey aims to examine whether or not the economic crisis in Lebanon impacted medicine affordability and availability in Mount Lebanon and any challenges faced by individuals in accessing essential medications.” The time required to complete the questionnaire, which was about 5 to 6 minutes was also clearly stated. The introductory page also emphasized that the participant’s answers are confidential and will only serve for research purposes. Last but not least, participants were thanked for their contribution and provided the contact email of the researcher in case they had any questions. The survey implied that by moving forward, the participants will be their giving informed consent to complete the questionnaire.

The questionnaire then began with three screening questions which aimed at ensuring that respondents of the survey met the eligibility criteria of the study. The first question was “Have you been living in Lebanon for at least the past 12 months?” with response options of either “Yes” or “No”. A skip logic function ended the survey for those who have answered “No” in order to ensure that respondents of the survey have been living in Lebanon during the economic crisis and are well informed about recent events. The second question was “Are you a resident of Mount Lebanon?” since the study is targeted at residents of the Mount Lebanon district in Lebanon. The third question was about age, however, all age groups were included in the study since health and medications is a relevant issue to all. By utilizing initial screening questions, the researcher was able to eliminate participants who did not fulfill the fundamental requirements for the study prior to them devoting time to finishing the entire survey. As a result, this enhanced the level of accuracy and relevance of the data collected.

As to the section *Access to Care*, a proposed set of questions formulated by the OECD in 2010 was used. These proposed set of questions have been integrated into the CWF International Health Policy Survey, 2010 and have been determined to be appropriate for use internationally after a psychometric analysis of pilot data from 13 different nations was conducted (Fujisawa & Klazinga, 2017). Only the questions in the *Access to care* section of the OECD survey were used. However, these questions were also slightly modified to

be tailored to the Lebanese population and relevant to the topic of research. For instance, the extensive explanation about different types of health care providers and the term “allied” health professional that was used in the original set of questions by OECD was replaced by the following phrase “healthcare provider (ex: doctor, nurse, general practitioner...)” for the sake of simplicity and ease of understanding. Response options were also limited to either “Yes” or “No” for most questions in order to avoid central tendency bias which refers to respondents tending to choose neutral responses and not putting effort or commitment to answer. This is especially since the type of questions asked are about the patient’s own experience rather than facts they might not be familiar with. Another addition to the set of questions by OECD was related to the appointment waiting time where the subsequent question was added “Why was the time you waited for the appointment a problem?” since it would be useful to know if the problem was just a matter of inconvenience or rather a problem of urgency. Besides, it is also significant to mention that a skip logic was integrated for those respondents who indicated that their last visit to a healthcare professional took place more than one year ago, in order to skip the questions related to recent difficulties in access to care since their answers might bias the results.

On the other hand, the section on *Affordability and Accessibility to Drugs* consisted of self-developed questions by the researcher based on the recent events and experiences of Lebanese citizens. This section consisted of 7 questions specifically related to the attainability of medications among Lebanese patients in Mount Lebanon and their experiences with pharmacies. The first question “How often do you take medications?” aimed to identify the subgroup of respondents who are daily or weekly consumers of medicine. Those are the ones who are most likely to have frequent contact with pharmacies considering their need to buy medications on regular basis. These patients were then asked whether they have experienced any problems getting their prescribed medicine at the pharmacy, such as it not being available or out of stock during the past 12 months. Answer options were also restricted to either Yes or No. In case the patients answered Yes, they were then asked whether they were offered any replacement medicine at the pharmacy, consisting of the same medical composition. The relevance of this questions lies in the fact that studies have shown that pharmacies in Lebanon provide generic alternatives to their consumers as a cost-saving strategy. These alternatives can range in price from 20 to 90 percent cheaper than name-brand medications (El-Harakeh & Haley, 2022). In case the respondent indicated that his/her prescribed medicine and its replacement were not

available at the pharmacy, the subsequent question tackled how long the pharmacy told the patient to wait until their prescribed medicine is available again, whether restocked or ordered upon request. In addition to that, participants were asked whether they have voluntarily requested a cheaper replacement for their prescribed medication at the pharmacy due to cost considerations. The 6th question of this section is “How much does your household pay for medicine in one month?” in order to determine medical expenditure ranges among families in Mount Lebanon. The answer options were classified into specific ranges from “less than 500,000 L.L” being the lowest (around 5.57\$ as of April 8, 2024) and “above 20,000,000 L.L” being the highest expenditure (around 2,230\$ as of April 8, 2024). This question was followed by a question inquiring about whether these costs were covered by any private health insurance or the National Social Security Fund (NSSF). The answer choices also included options like “Yes, a large part of them is covered/ a small part of them is covered” to have a better idea about the approximate percentage of medical expenditures the health insurance covers.

Last but not least, a few socio-demographic questions were included at the end of the survey in order to identify the characteristics of respondents and the relation of these characteristics with accessibility and affordability to health care services and medication. In addition to that, analysis between subgroups was made possible by the inclusion of socio-demographic questions. These questions were placed at the end of the questionnaire since they do not form the core of the survey and topic. Moreover, this helps in preventing any drop-outs because of questions that might be perceived as sensitive or personal. The socio-demographics section in this survey contained 5 questions. They were mainly about the following characteristics: gender, level of education, monthly household income, chronic diseases and overall health description. All the questions except the one related to the presence or absence of chronic diseases were also adapted from the OECD proposed questions mentioned above, however, with a few added modifications. For instance, the question related to monthly household income used the same proposed format of the question, but replaced the country-specific data. Therefore, the question was “The average household income of families in Lebanon is around 45,000,000 L.L (around 502\$ as of April 8, 2024) a month. By comparison, is your household income...?” and the answer options were “much above average, somewhat above average, average, somewhat below average, and much below average” rather than indicating specific income numbers.

As to the question related to chronic diseases, it was important and relevant to the study to gather information about any chronic diseases the respondents might be suffering from. This is because it reflects the extent to which they use medicine in their daily lives and therefore makes them credible sources of information through learning about their experiences with obtaining medicine. The answer options included the following prevalent chronic diseases with a few examples: diabetes, respiratory conditions (e.g., COPD, asthma), cardiovascular conditions (e.g., heart attack, heart disease, heart failure), arthritis or joint disorders, mental health conditions (e.g., depression, anxiety), cancer, neurological conditions (e.g., epilepsy, Parkinson's), autoimmune disorders (e.g., rheumatoid arthritis, lupus), gastrointestinal conditions (e.g., irritable bowel syndrome, Crohn's disease), chronic kidney disease, thyroid disorders, allergies, others (with a text option to specify), and none. Finally, the respondents were asked to describe their overall health in general with five different options ranging from excellent to poor. At the end of the survey, participants were thanked for their time and cooperation.

3.5. Statistical analysis

The data collected was exported from Qualtrics to the SPSS statistical software version 29, where the data analysis was conducted. Prior to analysis, the data was cleaned according to the exclusion and eligibility criteria explained above (Figure 1) in order to ensure its quality and reliability which facilitates the process of data analysis and interpretation. Further analysis of certain *Access to Care* questions also excluded those who haven't sought medical care in the last 12 months.

First, descriptive statistics were computed for all variables; that is frequencies and percentages were calculated for all categorical variables. The only continuous variable "Age" was recoded into a new categorical variable with the following age categories: below 18, 18-24, 25-34, 35-44, 45-54, 55-64, and above 64 years. However, since age groups below 18 and above 64 contained a very few amount of participants, they were also grouped with ages 18-24 and above 55 years respectively before conducting chi-square tests. Similarly, in the "Overall Perceived Health" variable, the options Excellent and Very Good as well as Fair and Poor were combined. Then, Chi-square tests were run across each of the categorical socio-demographic variables; gender, age groups, level of education, household income, chronic disease and overall self-perceived health status to examine their relation with the variables: travel difficulties in access to healthcare, cost difficulties in access to healthcare and skipped medical treatment or follow ups due to cost. Similarly,

chi-square tests were also run across the different socio-demographic variables in addition to health insurance coverage and medication intake frequency variables to examine their relationship with medication unavailability and requests for cheaper medication replacements. All tests were two tailed with a p value < 0.05 indicating statistical significance. In addition, the percentages computed were adjusted to valid percentages to eliminate the effect of missing values.

4. Results

This chapter will present the results obtained from the questionnaire and the corresponding analysis of the data.

4.1. Population Socio-demographic Characteristics

Out of 125 respondents, 79 (64.2%) were females, 40 (32.5%) were males, 4 (3.3%) preferred not to reveal their gender and 1 answer was missing. The majority of respondents belonged to the age group 18-24 (29.8%), followed by ages 25-34 (21.8%), 55-64 (14.5%), 35-44 and 45-54 (12.9%) equally, above 64 (6.5%) and below 18 (1.6%) (Table 1). The mean age was 37.47 years, the median was 30 years and the skewness was 0.698 which indicates that the distribution of age was skewed to the right and the majority of respondents fell into younger age groups. As to the level of education, 49.6% of the respondents completed a Bachelor's Degree, 19.5% had a Master's Degree, 17.9% had a high school diploma, 8.1% attained a PhD and 4.9% indicated other forms of education. None of the participants indicated having vocational training. In addition, 35% of the study population indicated that their household income is somewhat above the average (45 million L.L), 22% indicated that it was equal to the average, 19.5% indicated that it was somehow below the average, 14.6% indicated that their household income was much above the average and 8.9% indicated that it was much below the average. Moreover, 60% of the study participants indicated that they do not have any chronic diseases compared to 40% who suffered from one chronic disease or more. The most prevalent diseases among participants were mental health conditions, cardiovascular diseases and respiratory conditions. Last but not least, 39.8% of the survey participants perceived their overall health as very good, while 36.6% indicated good health, 13% indicated fair health, 7.3% indicated excellent health and 3.3% indicated poor health. A summary of these results can be found in Table 1 below.

Table 1: Socio-demographic characteristics of the population

	<i>Variables</i>	<i>Frequency (N)</i>	<i>Valid Percentage (%)</i>
<i>Gender</i>	Female	79	64.2%
	Male	40	32.5%
	Prefer not to say	4	3.3%
<i>Age group (years)</i>	Below 18	2	1.6%
	18-24	37	29.8%
	25-34	27	21.8%
	35-44	16	12.9%
	45-54	16	12.9%
	55-64	18	14.5%

	Above 64	8	6.5%
<i>Level of Education</i>	High School Diploma	22	17.9%
	Bachelor's Degree	61	49.6%
	Master's Degree	24	19.5%
	PhD	10	8.1%
	Other	6	4.9%
<i>Average Household Income</i>	Much above 45 million L.L	18	14.6%
	Somewhat above 45 million L.L	43	35%
	Average= 45 million L.L	27	22%
	Somewhat below 45 million L.L	24	19.5%
	Much below 45 million L.L	11	8.9%
<i>Chronic Disease</i>	Mental Health Conditions	11	40%
	Cardiovascular Conditions	10	
	Respiratory Conditions	9	
	Joint Disorders	7	
	Thyroid Disorders	7	
	Diabetes	6	
	Allergies	5	
	Gastrointestinal Conditions	4	
	Cancer	1	
	Neurological Disorders	1	
	Autoimmune Diseases	0	
	Chronic Kidney Disease	0	
	Others (Total)	8	
	Others (Hypertension)	3	
	Others (Fibromyalgia)	1	
	No Disease	75	60%
<i>Overall Health</i>	Excellent	9	7.3%
	Very Good	49	39.8%
	Good	45	36.6%
	Fair	16	13%
	Poor	4	3.3%

(Missing values for each variable: gender=2, age=1, level of education=2, household income=2, chronic disease=0, overall health=2)

4.2. Access to Care Statistics

Out of the 125 respondents, 81.6% reported that they have consulted a healthcare provider due to medical issues during the past 12 months. Out of these 81.6%, 21.6% reported a time when they could not visit a healthcare provider and access healthcare due to travel difficulties, 34.4% reported the same problem but due to cost considerations and 36.8% reported that they have skipped a medical test, treatment or follow up due to its cost. After adjusting the percentages to valid percentages and eliminating the effect of missing values, the corresponding percentages became 26.5% for travel difficulty, 42.2% for

difficulty in access due to cost and 45.1% for skipped medical treatment due to cost (Table 2).

It has been shown that the highest percentages of inaccessibility to healthcare due to travel difficulties was faced among females (29%), those between ages 35-44 (38.5%), those who have attained a high school diploma as their highest degree (52.9%), participants belonging to household incomes somewhat below average (33.3%) and much below average (30%), those who perceive their overall health status as fair or poor (46.7%) and individuals who suffer from chronic diseases (40.5%). As to difficulties in access to healthcare due to cost, the highest percentages were seen among females (42%), age groups 45-54 (61.5%), those with a level of education labelled “other” which does not refer to any educational degree nor vocational training and which includes uneducated individuals (66.7%), participants having a household income somewhat below average (61.1%), individuals perceiving their health as fair or poor (66.7%) and those who suffer from chronic diseases (52.4%). Finally, the highest percentages of individuals who skipped their medical treatments or follow ups due to cost were observed among females (47.8%), age groups 45-54 (53.8%), other forms of education or no education (66.7%), much below average income groups (60%), individuals with fair or poor health (60%) and participants who suffer from chronic diseases (52.4%) (Table 2).

Results have shown a significant relationship between the level of education of individuals and travel difficulties in accessing healthcare ($p= 0.030$) and between individuals’ self-perceived health status and travel difficulties in accessing healthcare ($p= 0.015$) as well as cost difficulties in accessing healthcare ($p=0.041$). In addition, a significant relationship has also been proven between the presence of a chronic disease and its effect on travel difficulties ($p= 0.005$) (Table 2).

Table 2: Percentages of difficulties in access to care across subgroups

Variables	Total number of participants who have sought medical care in past 12 months (N=125)	Travel difficulties in accessing healthcare (N=102)	Difficulties in access due to cost (N=102)	Skipped medical treatment or follow up due to cost (N=102)
Total percentage	81.6%	26.5%	42.2%	45.1%
Gender				
Female		29% $p= 0.485$	42% $p= 0.972$	47.8% $p= 0.661$
Male		20.7%	41.4%	37.9%

Age Group						
17-24	30.3%	p=0.268	36.4%	p=0.538	48.5%	p= 0.798
25-34	8.7%		34.8%		43.5%	
35-44	38.5%		46.2%		30.8%	
45-54	30.8%		61.5%		53.8%	
Above 55	30%		45%		45%	
Level of Education						
High School Diploma	52.9%	p=0.030	52.9%	p= 0.521	64.7%	p= 0.228
Bachelor's Degree	17%		38.3%		42.6%	
Master's Degree	20%		40%		35%	
PhD	20%		30%		30%	
Other	50%		66.7%		66.7%	
Household Income						
Much above average	13%	p= 0.762	13.3%	p= 0.085	20%	p= 0.215
Somewhat above average	25.7%		40%		42.9%	
Average= 45 million L.L	27.3%		45.5%		50%	
Somewhat below average	33.3%		61.1%		55.6%	
Much below average	30%		50%		60%	
Overall self-perceived health						
Excellent-Very Good	9.3%	p= 0.003	30.2%	p= 0.041	39.5%	p=0.390
Good	35.7%		45.2%		45.2%	
Fair-Poor	46.7%		66.7%		60%	
Chronic Disease						
Have disease	40.5%	p= 0.005	52.4%	p= 0.073	52.4%	p= 0.207
No disease	15.5%		34.5%		39.7%	

4.3.Affordability and Accessibility to Drugs Statistics

When asked about how often they take medications, it was shown that the majority of respondents consume medications in an occasional manner, meaning only in case of sickness or need (48%). The second largest group of respondents consume medications every day (34.4%), followed by those who have never taken any medicine (9.6%), those who take medicine 1 to 2 times per month (4%), 3 to 4 times per week (2.4%) and 1 to 2 times per week (1.6%). 58.4% of respondents reported experiencing problems getting their prescribed medicine at the pharmacy, such as it not being available or out of stock. Out of those who weren't able to get their prescribed medicine, 89.4% were offered a replacement medicine by the pharmacy with the same medical composition. However, 10.6% were not offered any replacement. 57.1% of those who have not been offered a replacement, were not even given a specific time frame until their prescribed medication is available again, whether restocked or ordered upon request. Others have been given a time frame of 1 to 3 days (14.3%) or less than 2 weeks (14.3%) for their medicine to be available again. In

addition, 14.3% of those patients were informed that it was not possible for the pharmacy to procure or attain their requested medicine (Table 3).

Results have also shown that 57.5% of patients have voluntarily requested a cheaper replacement for their prescribed medication at the pharmacy due to cost considerations during the past 12 months (Table 3). As to the monthly medical expenses, the highest percentage of respondents (43.2%) pay between 1,000,000 L.L. and 4,999,000 L.L. for medicine in one month followed by 17.6% of participants who pay between 5,000,000 L.L. and 9,999,000 L.L., 12.8% who pay between 500,000 L.L. and 999,000 L.L., 10.4% who pay less than 500,000 L.L., 5.6% who pay between 10,000,000 L.L. and 14,999,000 L.L., 5.6% who pay above 20,000,000 L.L. and 4.8% who pay between 15,000,000 L.L. and 19,999,000 L.L. The highest percentage (75.2%) of respondents reported that none of these costs are covered by health insurance or the National Social Security Fund (NSSF), 20% of respondents indicated that only a small part of these costs are covered, 4.8% indicated that a large part of these costs are covered and none of the respondents indicated that their medical expenses are entirely covered by health insurance or NSSF (Table 3).

Table 3: Descriptive Statistics related to Medication Availability and Affordability

	Variables	Frequency (N)	Valid Percentage (%)
<i>Medication Intake Frequency</i>	Total	125	
	<i>Missing</i>	12	
	Every Day	43	34.4
	3 to 4 times per week	3	2.4
	1 to 2 times per week	2	1.6
	1 to 2 times per month	5	4
	Occasionally, only when needed or sick	60	48
<i>Problems in Medication Availability</i>	Total	113	
	<i>Missing</i>	0	
	Experiences Problems	66	58.4
	Did not experience problems	47	41.6
<i>Offered replacement in case of Unavailability</i>	Total	66	
	<i>Missing</i>	0	
	Replacement	59	89.4
	No replacement	7	10.6

<i>Waiting time to be restocked or ordered upon request</i>	Total	7	
	<i>Missing</i>	0	
	1-3 days	1	14.3
	Less than a week	0	0
	Less than 2 weeks	1	14.3
	More than 2 weeks	0	0
	They did not provide a time frame	4	57.1
	Not possible for pharmacies to procure/attain the requested medicine	1	14.3
<i>Cheaper Replacement Request due to Cost</i>	Total	113	
	<i>Missing</i>	0	
	Yes	65	57.5
	No	48	42.5
<i>Medical Household Expenses</i>	Total	125	
	<i>Missing</i>	0	
	Less than 500,000 L.L.	13	10.4
	500,000- 999,000 L.L.	16	12.8
	1,000,000- 4,999,000 L.L.	54	43.2
	5,000,000- 9,999,000 L.L.	22	17.6
	10,000,000- 14,999,000 L.L.	7	5.6
	15,000,000- 19,999,000 L.L.	6	4.8
<i>Health Insurance Coverage</i>	Total	125	
	<i>Missing</i>	0	
	All costs are entirely covered	0	0
	A large part of costs are covered	6	4.8
	A small part of costs are covered	25	20
	None	94	75.2

In addition to that, the percentages of individuals who face difficulties with medication availability at pharmacies were almost equal and evenly distributed across subgroups, especially across different age groups and levels of education (Table 4). Despite that, higher percentages of medication unavailability were experienced among females (64.8%), individuals between 45 and 54 years old (68.8%), individuals belonging to a somewhat below average income group (81%), individuals who suffered from chronic diseases (66%), and individuals with no health insurance or NSSF coverage (61.6%). On the other hand, the highest percentages of individuals who have voluntarily requested cheaper replacements for their prescribed medication due to cost considerations were found among females (60.6%), individuals between 45 and 54 years old (81.3%), and individuals who have attained a high school diploma as their highest degree (71.4%). High percentages were also shown among individuals belonging to average household incomes (69.2%), somewhat below average household incomes (66.7%) and much below average household

incomes (60%). In addition, people who suffer from chronic diseases (61.7%) who take medicine 3 to 4 times per week (100%) and 1 to 2 times per week (100%) tend to request cheaper replacements for their medications due to cost considerations more than others. Last but not least, individuals who receive a small coverage for their medical costs from health insurance (59.1%) and those who receive no coverage at all (58.1%) also tend to make the same decisions in requesting cheaper replacements for their prescribed medications (Table 4).

However, it has been shown that none of those socio-demographic and health status characteristics have a significant relationship with medication unavailability at pharmacies. Therefore, socio-demographic characteristics, health status and health insurance do not determine the availability of a prescribed medicine at a pharmacy. Similarly, no significant relationship has been found between socio-demographic and health status and the act of voluntarily requesting cheaper replacements for prescribed medication. However, a significant relationship has been established between the age group of an individual and the individual's tendency to request cheaper replacements for medication due to cost considerations ($p=0.014$), especially individuals belonging to very young and older age groups (Table 4).

Table 4: Percentages of medication unavailability and cheaper medication requests among subgroups

Variables	Percentage of individuals who have experienced medication unavailability		Percentage of individuals who have voluntarily requested cheaper replacements for their medications due to cost considerations	
Total percentage	58.4%		57.5%	
Gender				
Female	64.8%	p= 0.204	60.6%	p= 0.509
Male	47.4%		52.6%	
Age Group				
17-24	48.6%	p=0.533	48.6%	p=0.014
25-34	68.2%		50%	
35-44	53.3%		33.3%	
45-54	68.8%		81.3%	
Above 55	60%		76%	
Level of Education				
High School Diploma	66.7%	p= 0.847	71.4%	p= 0.196
Bachelor's Degree	57.9%		49.1%	
Master's Degree	52.4%		66.7%	

PhD	55.6%		66.7%	
Other	75%		25%	
Household Income				
Much above average	60%	p= 0.128	40%	p= 0.288
Somewhat above average	47.5%		50%	
Average= 45 million L.L	53.8%		69.2%	
Somewhat below average	81%		66.7%	
Much below average	70%		60%	
Chronic Disease				
Have Disease	66%	p= 0.199	61.7%	p= 0.407
No Disease	53.8%		53.8%	
Health Insurance Coverage				
All costs are entirely covered	0	p= 0.170	0	p= 0.718
A large part of costs are covered	20%		40%	
A small part of costs are covered	54.5%		59.1%	
None	61.6%		58.1%	
Medication Intake Frequency				
Every Day	65.1%	p=0.229	55.8%	p= 0.267
3 to 4 times per week	66.7%		100%	
1 to 2 times per week	100%		100%	
1 to 2 times per month	20%		80%	
Occasionally, when needed or sick	55%		53.3%	

5. Discussion

This chapter aims to analyze the key findings and results in context of the existing research and literature. In addition to that, the research questions of this study will be answered and the limitations will be acknowledged.

5.1. *Analysis of Results in Context of Literature*

This study aimed at identifying the impact of the economic crisis on the availability and affordability of health services and medications on different socio-demographic groups in Mount Lebanon. Even though some variables were insignificant, in fact, the survey results have shown that the most disadvantaged socio-demographic groups in accessing healthcare and following up on medications (highest percentages) were females, elderly, individuals with no or low levels of education, individuals of average to low income groups, and people suffering from chronic diseases or poor health status. This is in line with several studies that have shown the effect of reduced income levels on the deterioration in health status as well as limited access to healthcare services (Cherfane et al., 2024; Fitzpatrick et al., 2004; Lazar & Davenport, 2018). Patients who experience financial strain are unable to afford necessary medical care and prescription medications, which exacerbates clinical outcomes and contributes to health inequalities.

In addition to that, the fact that females have shown the highest percentages of inaccessibility to health services also correlates with various studies and reports, including World Economic Forum debates, the British Medical Association's study on health inequities, and articles from ACOG, which have emphasized the gaps in women's access to healthcare. These sources highlight that women are more susceptible than men to having restricted access to healthcare due to factors such as gender norms, power dynamics, socioeconomic status, ethnicity, and gender-specific health requirements (American College of Obstetricians and Gynecologists, 2014; European Institute for Gender Equality, 2024; World Economic Forum, 2023). Furthermore, it has been proposed by a review of several other studies that disparities in healthcare based on gender are not consistently manifested and differ depending on factors such as physical and mental health issues, socioeconomic level, insurance coverage, and race (Manuel, 2018).

Moreover, studies have also confirmed our result regarding the elderly population, especially those aged 55 and above, being more vulnerable in experiencing barriers to healthcare access due to various factors such as lack of insurance, transportation issues,

financial constraints, and age-related discrimination (Fitzpatrick et al., 2004). Moreover, the findings of this study have shown that there is a significant relation between low levels of education and travel difficulties in accessing healthcare. This could be explained by the fact that individuals with lower levels of education frequently encounter difficulties in navigating the healthcare system, comprehending health information, and making well-informed health choices. Insufficient education can result in a low level of health literacy, which can make it challenging for patients to understand medical instructions, handle chronic diseases, and successfully utilize preventive treatments (Raghupathi & Raghupathi, 2020).

Furthermore, the findings of this study confirm that difficulties in accessing healthcare services as well as medications are common among Mount Lebanon's population, with 26.5% of individuals reporting travel difficulty, 42.2% reporting difficulty in access due to cost and 45.1% reporting skipped medical treatment or medicine due to cost. The high percentages of inaccessibility to health care services due to cost (42.2%) can also be explained by the high percentage of out-of-pocket health expenses in Lebanon which has accounted for 44.20% of total health expenditure in 2020 as the latest value (*World Bank Open Data*, 2023). According to the World Bank Open Data (2023) this percentage is higher than the average percentage of the Arab world (31.29%). Besides, in some cases, informal payments and rewards to healthcare professionals may be required which increases the burden of costs related to health services and medications (Hatem & Goossens, 2022).

As to health insurance, results have shown that 75.2% of the participants are non-insured and none have full insurance coverage. In fact, as of January 2022, insurance systems provided coverage for less than 4% of the population, mostly due to the inability of most households to afford private insurance charges. As to public insurance, the value of social security contributions and the budgets of national institutions, including the Ministry of Public Health, significantly diminished. The National Social Security Fund became unable to cover more than 10% of the healthcare expenses (International Labour Organization, 2024). This has also led patients to seek assistance from other support networks such as relatives, friends, or non-governmental organizations. Unfortunately, while the percentage of out-of-pocket expenditures was already high before the economic crisis, it has currently become the main source of financing in healthcare (International Labour Organization, 2024).

Moreover, the survey results have shown a high percentage of patients in Mount Lebanon (58.4%) who have experienced medication unavailability and shortage in pharmacies during the past 12 months. However, none of the socio-demographic characteristics or factors such as gender, age, level of education, household income, chronic disease or health insurance coverage showed a significant relation with medication unavailability at pharmacies in times of economic crisis in Mount Lebanon. This verifies that the underlying cause of the issue is the economic crisis, which has resulted in significant scarcities in all categories of drugs, affecting all pharmacies. It is in line with what has been stated by Amnesty International, that even people who can afford the medications have no access to them (Amnesty International, 2023). Individuals across all socio-demographic backgrounds are unable to obtain specific medications due to drug shortages, which in turn are due to various factors such as financial constraints, limited availability of foreign currency, and debts owed by local importers. It is also worth mentioning that these shortages have occurred in both subsidized and unsubsidized pharmaceuticals (Chehayeb et al., 2023).

Furthermore, the survey results have shown that 57.5% of individuals who consume medications intentionally request cheaper replacements for their prescribed medications at pharmacies due to cost considerations. This aligns with the findings of multiple studies conducted around the rising costs of health services and medications due to the devaluation of the Lebanese currency (Amnesty International, 2023; Chehayeb et al., 2023; Iskandarani, 2021; López-Tomàs, 2023). A graphical representation by Chehayeb et al. (2023) demonstrates the degree to which these necessary outpatient medications have become unaffordable by comparing these price increases to changes in mean income as shown in Figure 2 below.

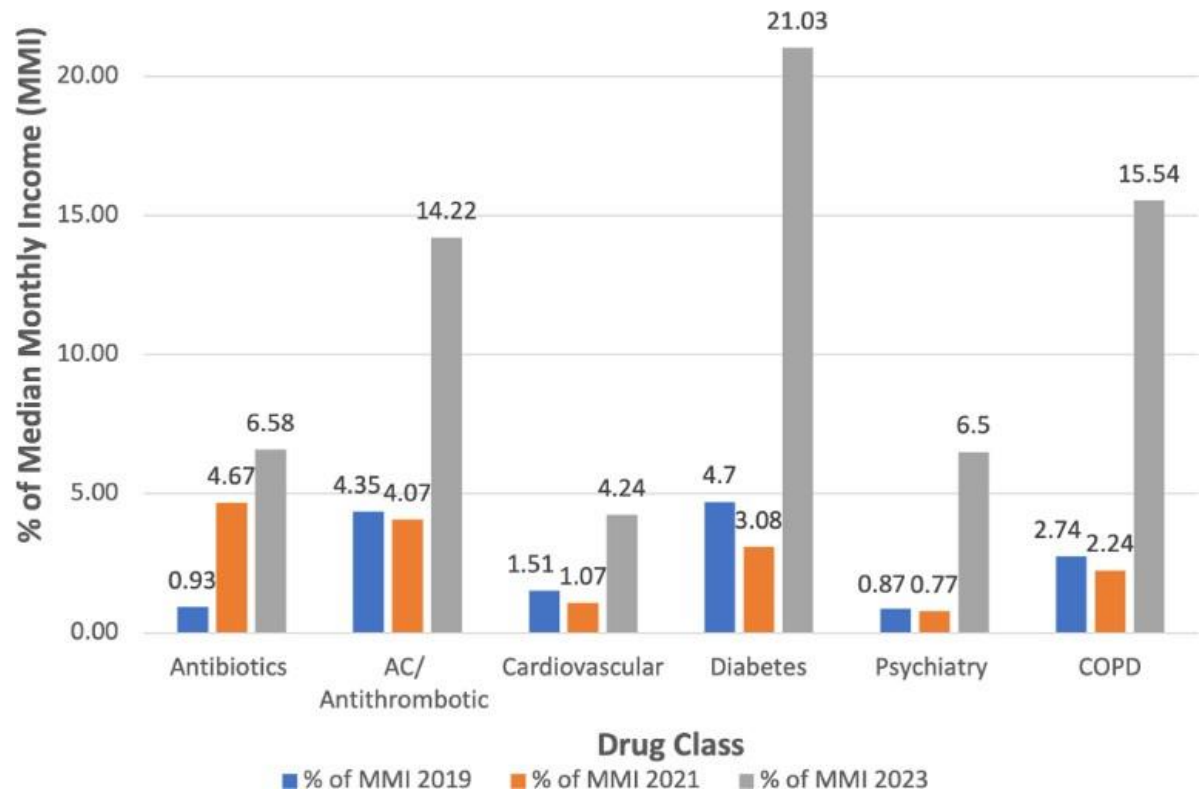


Figure 2. Bar graph showing, for each of the three time points (pre-crisis, August 2019, early crisis, August 2019, and April 2023), the percentage of mean monthly income that the mean monthly medicine price per drug class reflects in Lebanon

doi: <https://doi.org/10.1371/journal.pgph.0002538.g002>

Not only has the economic crisis affected medication availability and affordability in Mount Lebanon, but it has also impacted the choices people make about their health and their coping mechanisms as a result of financial constraint and cost considerations. Results have shown that the majority of patients in Mount Lebanon (57.5%) voluntarily request cheaper replacements for their prescribed medication at the pharmacy due to cost considerations. A percentage of 45.1% have also skipped their medical treatments, medications and follow ups due to cost considerations. This reflects the coping mechanisms that the Lebanese population in Mount Lebanon has adopted, such as noncompliance with treatment and medical follow-up, in order to deal with the drug crisis. Other studies have also shown how the economic crisis has led patients to cease taking their prescribed medications due to their inability to afford either the cost of the medication or the fee for medical consultation to address their health problems (Amnesty International, 2023; Cherfane et al., 2024). Some individuals decreased the dosage or

modified the treatment plan in a way that they extended the duration of using a drug box, to delay the need to purchase another one. There are also a number of patients who have opted for alternate or generic medications, typically those that were accessible and more affordable, similarly to the behaviors seen by participants of this study. What is most concerning is that the majority of patients utilized these adaptive methods while being conscious of the negative impact it could have on their health outcomes (Amnesty International, 2023; Cherfane et al., 2024). In fact, there have been reports of increases in the incidence of decompensated cardiac arrest, myocardial infarction, and unstable arrhythmias necessitating emergency intervention in Lebanon following the shortage of cardiovascular drugs for both inpatients and outpatients (Khattar et al., 2022).

This situation bears similarities to occurrences in other countries, where reductions in pharmaceutical usage as a result of economic difficulties were also noted. For instance, the economic crisis experienced in Portugal has also caused several patients to request more affordable prescriptions from their doctors due to financial constraints, while others independently reduced their medication dosages or stopped their treatment altogether (Rodrigues & Schulmann, 2014). Also, in Venezuela, the scarcity of medications has limited the availability of treatment, consequently resulting in the illicit sale of antimalarial drugs in black markets at high costs, rendering them unaffordable for a significant portion of patients (Page et al., 2019; Raphelson, 2018).

Interestingly, medication unavailability in Lebanon has also been explained by the fact that a significant majority of patients in Lebanon acquire stored medications. Patients have bought excessive quantities of medicines which they have been stocking for months, particularly because to the anticipated rise in Lebanese Liras inflation and the significant increase in medication prices. This behavior has exacerbated the lack and unavailability of medication at pharmacies (Cherfane et al., 2024). Therefore, it can be concluded that the economic crisis has led to negative coping mechanisms that patients in Mount Lebanon have adopted to deal with medication unavailability and unaffordability.

5.2. Health Policy Implications and Mitigation Strategies in Other Countries

Drug shortage is not only a public health concern in Lebanon, but it is also recognized as a problem in many other nations for various reasons such as raw material shortages, manufacturing issues, or financial constraints (Shukar et al., 2021). Therefore, several nations have implemented health policy measures in order to prevent or mitigate these

medicine shortages. For instance, in Poland, distributors are obligated to get authorization before exporting pharmaceuticals that are considered susceptible to shortage. This measure has effectively contributed to the reduction of drug shortages in the country. Both Turkey and Poland employ track-and-trace systems to oversee the delivery of medicine and identify instances of excessive exports. Moreover, Italy, Greece, France, and Poland have a legislation that allows them to impose restrictions on the export of pharmaceuticals. Spain requires the prioritization of local pharmacies and the guarantee of uninterrupted supply of medicines. In 2017, Slovakia implemented regulations that prohibited the simultaneous exportation of nationally reimbursed medications (Bochenek et al., 2018; Musazzi et al., 2020). Although there may be variations in the methods used, the majority of countries acknowledge the significance of promptly informing about imminent shortages, establishing explicit obligations for industry participants, and facilitating collaboration between public and private entities. Collaboration and the exchange of information have enabled certain countries to more effectively predict problems and develop feasible remedies, hence reducing the negative effects on patient access and public health.

Various health policies and strategies have also been globally used to facilitate the availability of essential healthcare services and reduce difficulties in travel and cost. For instance, Bhutan provides direct funding for cancer patient treatment and arranges referrals to hospitals in India due to the restricted availability of hospital facilities within the country (Thinley et al., 2017). Rwanda enhanced the availability of healthcare services by building "health posts" in close proximity to communities. This reduced the travel lengths required for patients to receive necessary medical treatment, while also improving accessibility to specialized care. The country also implemented a system of health insurance that is based on community involvement and has rates that are adjusted according to income levels. This was done in order to increase the number of people who can access healthcare services and provide them with better financial security (WHO, 2022). On the other hand, Canada, France, Germany, Great Britain, and Sweden utilize universal healthcare systems that are funded through general taxation (Schneider et al., 2021).

These nations place a high importance on ensuring that communities have access to primary healthcare and allocating resources to improve public health infrastructure and transit choices in order to effectively address geographical obstacles. Additionally,

implementing targeted subsidies and co-payments can ensure both financial accessibility and long-term sustainability. Allocating funding specifically for disadvantaged populations and essential resources enhances the capacity of healthcare systems to satisfy requirements in a fair and equal manner.

Although healthcare systems vary between nations and such challenges require tailored solutions, a comprehensive policy study can provide valuable insights to policy makers in Lebanon to develop innovative strategies aimed at enhancing healthcare and medicine access.

5.3. *Limitations of the Study*

It is essential to consider these results in the context of a few limitations to the study. First, because the survey was online-administered, those individuals with no access to the internet were unable to participate in the survey. In Mount Lebanon, most of these individuals who have no access to the internet belong to the elderly generation or low income groups. Therefore, the study sample was not representative of the whole population in Mount Lebanon, especially that the highest percentages of respondents were seen among the young generation 18-24 years old (29.8%) and those belonging to somewhat higher than average income groups (35%). Additionally, the survey did not capture the insights of certain types of patients, such as cancer patients, who have been facing the most difficulties in access and affordability of medicine during the economic crisis. The sample size was also small which limited the power of statistical tests and the chance to find statistically significant differences between groups.

Moreover, since respondents of the study were asked to recall their experiences with health care during the past 12 months, it is important to acknowledge the potential recall bias that might have occurred in some cases. Also, since the nature of the questionnaire mostly consisted of closed questions, participants did not have the opportunity to express or elaborate any further. Last but not least, it is essential to acknowledge that the currency exchange rate in Lebanon is continuously changing, and consequently, the drug prices and availability of medicine is also exposed to many fluctuations. Therefore, the results do not represent any fixed medication availability status or cost, but only a specific period in time.

5.4. *Recommendations*

The critical situation in Lebanon necessitates an immediate emergency plan that includes rapid measures to ensure the continuous supply of medications, particularly for chronically ill individuals who are unable to afford any delays.

First, modifying the subsidy framework and fostering local medicine production, Lebanon may establish a reliable and secure source of prescription medications, thereby guaranteeing a more dependable supply chain. Proposed solutions involve subsidizing pharmaceuticals only when there is no locally produced alternative and only subsidizing generic variations when they are available. Simultaneously, it is crucial to enhance the infrastructure for local production by offering local pharmaceutical firms such as reduced taxes, as well as increasing the current subsidies for raw materials (El-Harakeh & Haley, 2022). Other proposed solutions also entail investigating claims of stockpiling and smuggling of subsidized medication, especially cancer drugs, to address shortages and ensure that the quantity of medicine imported is enough to meet patients' needs (Amnesty International, 2023). It has also been recommended that the government enhances its inspection, monitoring, and auditing measures to hinder the illicit trafficking of subsidized drugs and the illegal sale of unregulated drugs in the black market (Khattar et al., 2022). As to unsubsidized medication, it is crucial that the Central Bank promptly pays importers the hard currency it owes them, enabling them to pay off their commitments to overseas suppliers. It is imperative that the Central Bank establishes unambiguous and unified regulations for commercial banks to facilitate the operations of importers of essential commodities such as medicine (Amnesty International, 2023).

Another important measure that has always been recommended is combining the public insurance entities to address the fragmentation of the Lebanese healthcare sector, since this would consolidate most of the insured population into a single public risk pool, leading to cost reduction and enhanced bargaining position. Nevertheless, according to experts, political and sectarian considerations, together with differences in benefits, hinder the likelihood of a successful merger (International Labour Organization, 2024).

At the beginning of 2024, MP Bilal Abdallah put forward a preliminary legislation to increase the funds allocated to the Ministry of Public Health (MOPH) budget, specifically designated for providing health coverage to uninsured Lebanese citizens. This was proposed by introducing additional taxes that would be specifically allocated for this

purpose. The current law is presently being deliberated in parliament. Lebanon's failure to implement necessary changes to its social health protection system has created an opportunity for commercial and political organizations to step in and take control. Due to the state's delay in implementing health coverage changes, various parties have undertaken efforts to offer private health insurance as an alternative to public insurers (International Labour Organization, 2024).

Therefore, it is important to take immediate actions to strengthen the public healthcare system. In fact, Primary Health Care Centers (PHCCs), which are financially supported by the Ministry of Public Health (MOPH) and international funding, currently function as the exclusive provider of cost-free medical services in Lebanon. Hence, in accordance with the suggestions put out by Amnesty International, the necessity of increasing the funding allocated to Primary Health Care Centers (PHCCs) is strongly advocated. It is also essential to enhance the allocation of these financial resources to Primary Health Care Centers (PHCCs) across the country, particularly in underserved regions, in order to meet the growing need for affordable or free medications (Amnesty International, 2023).

To enhance the healthcare system as a whole, the Ministry of Public Health needs to initiate a long-term strategy. Allocating funds for the importation, transportation, and storage of medical supplies and medications, as well as investing in infrastructure and public institutions, should be the primary objectives of this plan. To increase transparency and guarantee the equitable and efficient distribution of funds at the national level, anti-corruption measures including routine audits and investigations must be implemented. Moreover, in order to guarantee that all citizens have equitable access to high-quality healthcare and to prevent recurrences of comparable crises, the strategy should incorporate actions to tackle the particular causes of this dire situation (Bou Sanayeh & El Chamieh, 2023).

6. Conclusion

While numerous nations experienced economic crisis at some point in time, the circumstances in Lebanon are different and exceptional since the Lebanese population have simultaneously suffered from multiple overlapping hardships and adversities. By combining insights from existing literature with the unique aspects of the Lebanese context and collecting primary data through an online survey, this study highlighted the complexities of the economic crisis and its effect on the unavailability and unaffordability

of health care services or medications among people living in Mount Lebanon. More importantly, this study emphasizes the need for evidence-based policies and initiatives specifically designed to address these unique challenges, especially that the unresolved chaotic environment, volatile political scenario, and devaluation of the national currency continue to pose a significant risk to the health and medical outcomes of patients in Mount Lebanon.

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