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COVID-19 Pandemic's Economic Impact on the Healthcare Sector: A Case Study of Guaranda Basic Hospital (IESS) from 2020 to 2022

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Abstract

The COVID-19 pandemic has had a significant impact on the healthcare system worldwide, necessitating the reorganization of staff and the implementation of preventive measures to mitigate the spread of the virus. In this context, several studies have examined the clinical and financial impact of COVID-19 in different medical specialties and in different countries, approached from various perspectives. In this research, an efficiency analysis of Guaranda Basic Hospital (GBH) was conducted using data collected from 2020 to 2022. Information was obtained from official sources and analyzed using spreadsheets. The results showed continuous losses, with a negative profit margin and cost efficiency below optimal levels. The impact of the COVID-19 pandemic on the economy and healthcare systems was discussed. Solutions such as the implementation of digital health technology and the need to improve bed turnover, optimize resource management, and ensure adequate financing for sustainability were suggested.

Keywords: COVID-19, Economic Impact, Public Health, Hospitals, Ecuador.

Introduction

The COVID-19 pandemic has had a profound and far-reaching impact on the global healthcare system, leading to the imperative need for staff reorganization and the implementation of preventive measures to effectively control the transmission of the virus. Within this framework, numerous studies have extensively investigated the clinical and financial ramifications of COVID-19 across diverse medical disciplines and in various nations, employing multifaceted approaches to gain comprehensive insights.

Economic and social impact

The research conducted by N. Shrestha et al. (2020) and Santos (2020) delves into the ramifications of the COVID-19 pandemic on the process of globalization, encompassing aspects such as

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mobility, the implementation of measures to suppress and mitigate the spread of the virus, and the resultant economic losses, impact on the economy, and strain on healthcare systems, with the objective of evaluating the vulnerability of public health across different nations. Employing an input-output analysis approach, these studies construct models to assess the impact of these measures on the workforce, highlighting the critical role played by the timing of implementation and the severity of the outbreak in determining their efficacy. The significance of adopting mitigation and suppression measures to minimize the projected number of fatalities is underscored.

In an article titled "Assessment of COVID-19 Social Distancing Guidelines for Urban Poor in Ghana," the authors (Yeboah et al., 2020) shed light on the imperative for policymakers to adopt innovative strategies in addressing the living conditions of vulnerable urban populations. The article emphasizes the significance of addressing the socioeconomic factors affecting the urban poor as a key approach to effectively mitigate the impact of future pandemics.

Teslya and colleagues conducted a comparative analysis (Teslya et al., 2020) to assess the efficacy of self-imposed prevention measures versus government-imposed social distancing in the mitigation, delay, or prevention of a COVID-19 epidemic. The findings demonstrated that self-imposed measures can yield a substantial reduction in the attack rate and a decrease in the peak number of diagnoses, underscoring their effectiveness. Furthermore, the study highlighted the economic implications for healthcare management arising from these measures.

As stated in the "Report on the economic impact of coronavirus disease (COVID-19) on Latin America and the Caribbean," the Latin America and Caribbean region faced an unprecedented crisis in 2020, with a projected GDP contraction of 5.3%. This decline is comparable to major historical events such as the Great Depression and World War, signifying the magnitude of the economic downturn experienced (Naciones Unidas et Comisión Económica para América Latina y el Caribe, 2020).

The collaborative report by the Economic Commission for Latin America and the Caribbean (ECLAC) and the Pan American Health Organization (PAHO) offers a comprehensive update on the progress of the COVID-19 pandemic within the Latin America and Caribbean region, while also addressing its ramifications for health, society, and the economy. The publication outlines potential short-term scenarios for control and evolution, alongside long-term recommendations to enhance the capacity of the state in addressing both the health requirements of the population and their underlying determinants, with an emphasis on achieving a transformative recovery. Furthermore, the report underscores the critical importance of successfully completing the mass vaccination campaign and providing robust primary care support to fortify the vaccination plan (Comisión Económica para América Latina y el Caribe et al., 2021).

These documents and their conclusions offer a comprehensive and in-depth assessment of the COVID-19 pandemic situation in the Latin America and Caribbean region. They effectively underline the array of economic, social, and health challenges confronted by the region, while also

providing essential guidance on the necessary actions and measures required to surmount the crisis and advance towards a transformative recovery. Together, they present a holistic overview that encompasses the multifaceted dimensions of the pandemic's impact and provides a roadmap for effectively addressing the situation and fostering positive change.

Economic impact on the healthcare sector

The studies conducted by Lin et al. (2021), (Higginson et al., 2020), (Flynn et al., 2020), and (Seshaiyer et McNeely, 2020) offer a comprehensive and wide-ranging perspective on the effects of the COVID-19 pandemic across various domains. These studies delve into areas such as hospital pricing, economic readiness, the impact on healthcare systems and the economy, as well as the challenges and opportunities that emerge within the framework of the Sustainable Development Goals. The insights gleaned from these studies are invaluable for informing effective policies and strategies in response to the ongoing pandemic, while also enhancing preparedness for future health crises. Their findings play a crucial role in guiding decision-makers in their efforts to navigate and address the multifaceted implications of the pandemic.

The COVID-19 health emergency has posed a multitude of financial challenges for hospitals. As highlighted in a study conducted by Lin et al. (2021), hospitals globally have faced a substantial decline in revenue primarily resulting from the suspension of non-essential services and a decrease in healthcare demand. In the case of HBG (insert specific hospital name or acronym), it is anticipated that this decrease in revenue has significantly impacted its financial sustainability.

The article titled "Clinical and Economic Impact of COVID-19 on Vascular Surgery in a Tertiary University Hub Hospital in Italy" provides a focused analysis of the effects of the pandemic on the Vascular Surgery Department of a Tertiary University Hub Hospital located in Northeast Italy (Veraldi et al., 2022). The primary aim of this study was to examine both the clinical and financial repercussions of COVID-19 specifically within the field of vascular surgery.

Additionally, it has been observed that patients diagnosed with COVID-19 have a relatively low occurrence of surgical diseases (Kraft et al., 2021). However, among those patients who did require surgical consultation and treatment for such conditions, there was a higher mortality rate, prolonged hospital stays, and an increased incidence of postoperative complications. These factors consequently led to elevated associated costs.

The COVID-19 pandemic has had an unparalleled impact on global health, disrupting healthcare systems and the global economy at large. Hospitals, in particular, have encountered substantial challenges related to capacity, resources, and financial strain during this critical period. Guaranda Basic Hospital (HBG), which is part of the Ecuadorian Institute of Social Security (IESS), has not been immune to these challenges and has faced significant economic implications as a result of the pandemic.

The worldwide COVID-19 pandemic has had a profound and devastating effect on various facets

of society, encompassing the global economy and healthcare systems. Among the sectors severely impacted is healthcare, with hospitals and medical centers grappling with unparalleled challenges in upholding the standard of care while managing the surging demands for healthcare services. This article seeks to examine the economic implications endured by Guaranda Basic Hospital, affiliated with the Ecuadorian Institute of Social Security (IESS), from 2020 to 2022 throughout the COVID-19 pandemic. Furthermore, it aims to draw comparisons with similar cases in other countries to gain a comprehensive understanding of the actual economic impact and explore potential strategies for resolution.

Methodology

Information for this study was collected from Guaranda Basic Hospital (HBG) using official sources, including the PERC 2.0 system developed by the Pan American Health Organization (PAHO) and the Medical Information System (MIS-AS400). The study period encompassed from January 2020 to December 2022. Throughout this period, comprehensive data on the costs associated with the operation of HBG were gathered, including both detailed and overall expenses. Additionally, production data relating to the various services provided by the hospital were collected for analysis.

For the analysis of the collected data, Microsoft Excel LTSC Professional Plus 2021 was employed as the data analysis tool. This particular software provides advanced capabilities for data analysis and calculations, which facilitated the processing of the gathered information and ensured the generation of more precise results.

The collected data were systematically organized and subjected to various analytical techniques. Measures of central tendency, including mean, median, and mode, were utilized to identify the central characteristics of the costs incurred in the hospital's operation. These measures offer valuable insights into the distribution and central values of the data.

Furthermore, key financial ratios were calculated to assess the financial position and operational efficiency of HBG. These ratios provide a quantitative assessment of the hospital's financial health and performance, enabling a comprehensive evaluation of its financial situation. By employing these data analysis methods and utilizing the advanced features of Microsoft Excel LTSC Professional Plus 2021, a thorough and accurate analysis of the collected data was achieved.

Results and Discussion

The COVID-19 pandemic has had a significant impact on various aspects, including healthcare, population health, economic and social areas, as well as healthcare systems. Several studies have analyzed these repercussions, providing valuable information on the consequences of the pandemic.

Indeed, studies conducted by Florin et al. (2020) and Patel et Patel, (2022) have shown that the COVID-19 pandemic has had significant consequences on economies worldwide, healthcare

personnel, and consequently, healthcare facilities, experiencing negative socioeconomic impacts. These findings underscore the need to provide adequate support and resources for robust strategies and financial resources to combat future calamities and support vulnerable countries and individuals. The assessment of the effects of the pandemic on population health, economic and social areas, as well as government interventions and healthcare systems, conducted by Clemente-Suárez et al. (2021), highlighted the need for swift and coordinated responses from public institutions, the private sector, and non-governmental organizations to address the impacts on society. An analysis of the situation in emerging economies such as Turkey, Egypt, Ukraine, Kazakhstan, and Poland revealed the weaknesses of healthcare systems during the pandemic. The importance of early response, including individual isolation measures, was emphasized to mitigate the impacts on both health and the economy (Kitamura et al., 2022). In the study by Synhorst et al. (2021) conducted in pediatric hospitals, a significant decrease was observed in the number of medical consultations, hospitalizations, emergency visits, and surgeries during the pandemic period compared to the previous year. Furthermore, data presented by Tonna et al. (2020) and Binder et al. (2021) corroborate those elective procedures represent a significant portion of gross hospital revenues and contribute to maintaining bed occupancy capacity. It can be concluded that the cancellation of elective surgeries during the pandemic has had a substantial impact on hospital bed capacity and ICU utilization. The study conducted in the southeastern United States by Farrell et al. (2020) reveals that the pandemic had a significant impact on surgical practice, with the cancellation of elective cases and a drastic reduction in staff, highlighting the need to consider the financial and emotional implications for healthcare professionals during a health crisis like the COVID-19 pandemic. According to Al Mutair et al. (2022), the cost of treating patients with COVID-19 is associated with significant economic burdens, which vary depending on the severity of cases and the presence of comorbidities. On the other hand, Ramponi et al. (2021b) and Seringa et al. (2022) indicate that evaluating the cost-effectiveness of interventions solely from a limited healthcare perspective may underestimate their overall impact and lead to inefficient funding decisions. They also suggest that the estimated average cost per admission is significantly higher than the base price for hospitalized patients. The COVID-19 pandemic has had a significant impact on patients admitted to the intensive care unit (ICU). According to a recent study, healthcare-associated infections (HAIs) were diagnosed in 26.2% of ICU-treated COVID-19 patients (Despotović et al., 2023). It is crucial to rigorously implement antimicrobial management and surveillance efforts in a multidisciplinary manner, involving public health institutions and the government, especially during a global health emergency like the COVID-19 pandemic. Regarding the macroeconomic impact of the pandemic in Spain, the retrospective analysis by Pinilla et al. (2021) demonstrates a dramatic decrease in the gross domestic product and the business turnover indicator. Additionally, a significant increase in the unemployment rate was recorded, particularly in autonomous communities that are more economically dependent on the service sector. On the other hand, the study by Cai et al. (2021) examined the mobilization of healthcare personnel and the construction of temporary hospitals during the pandemic, highlighting the importance of

adapting strategies such as the construction of temporary hospitals to prevent overload on existing healthcare systems and to preserve necessary resources for other patients. In conclusion, the studies discussed shed light on various aspects of the impact of the COVID-19 pandemic on surgical practice, the economy, and population health. It is imperative to view these findings as a warning sign and a call to action in addressing the financial challenges faced by the hospital. To gain a more comprehensive understanding of the financial situation, it is recommended to conduct a thorough financial analysis, exploring additional financial metrics and conducting a detailed evaluation of costs, revenues, and internal processes.

Furthermore, it is suggested to implement corrective measures aimed at improving operational efficiency, reducing unnecessary expenses, and seeking opportunities to increase revenue. These actions can help mitigate the financial strain experienced by the hospital and enhance its overall financial sustainability.

Figure 1 depicts the relationship between the costs generated by HBG operations and the revenues obtained through billing. Notably, the graph demonstrates that the hospital fails to reach the breakeven point in any given year, resulting in continuous financial losses. This emphasizes the urgent need for strategic interventions to address the financial deficit and work towards achieving a financially sustainable operation.

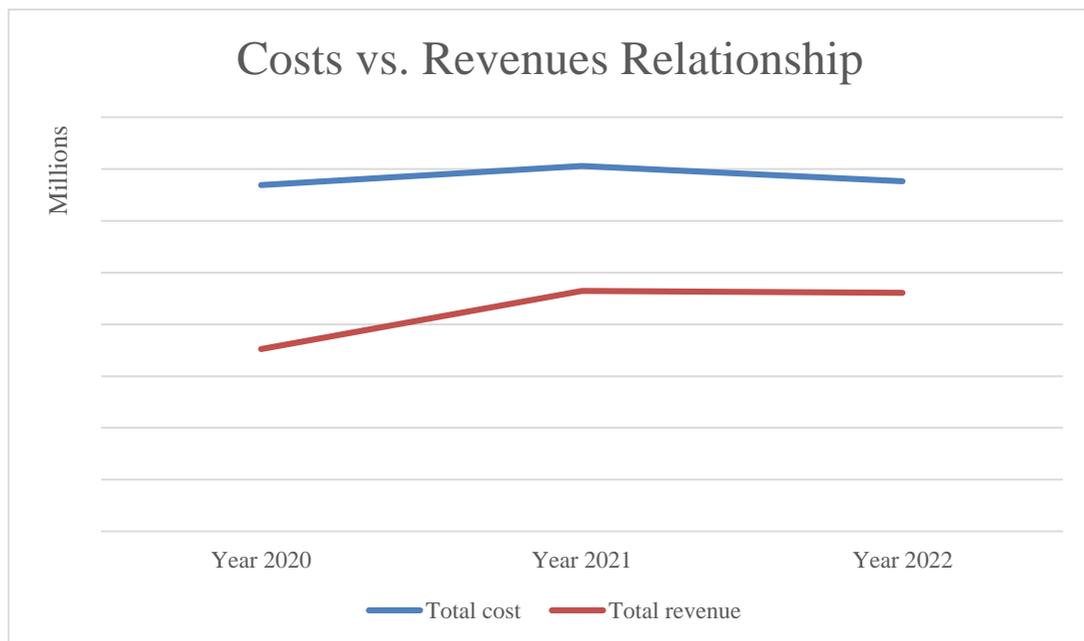


Figure 1 Relationship between costs and revenues from January 2020 to December 2022.

Source: Prepared by the authors.

Table 1 Measures of central tendency

	Mean	Median
Total cost	\$6875916	\$6765223
Incomes	\$4,259,476	\$4,610,490

Source: Prepared by the authors.

Table 1 presents an overview of the average total costs and average incomes of the hospital throughout the analyzed period. However, it is crucial to take into account the differences between the mean and the median values, as this indicates the potential presence of outliers or variations in the data. The dispersion observed in the data may be attributed to the impact of the COVID-19 pandemic, which has introduced significant fluctuations and uncertainties in financial performance.

By examining the mean and median values, we can gain insights into the distribution and central tendency of the data. If there is a notable difference between the two measures, it suggests the presence of extreme values or skewed distributions that may influence the overall financial picture. Exploring these discrepancies and understanding the underlying factors contributing to the dispersion is essential for a comprehensive analysis of the financial impact caused by the pandemic on the hospital.

Table 2 Financial Analysis

Year	Profit Margin	Profitability	Liquidity	Cost efficiency
2020	-0.9001	0.5257	0.5257	0.5257
2021	-0.5197	0.6574	0.6574	0.6574
2022	-0.4665	0.6814	0.6814	0.6814

Source: Prepared by the authors.

The financial indicators presented in Table 2 offer an overview of the hospital's financial status during the years 2020, 2021, and 2022. Notably, the results demonstrate a negative profit margin in all three years, highlighting substantial financial losses. This implies that the hospital's ability to generate profits from its operations is insufficient.

Moreover, the indicators of profitability indicate inefficiency in utilizing assets to generate profits, pointing towards a need for improvement in this area. The negative profit margin suggests that costs are outweighing revenues, impacting the hospital's overall financial performance.

In terms of liquidity, the indicators suggest some difficulty in meeting short-term financial obligations. This emphasizes the importance of closely managing cash flow and ensuring adequate resources are available to fulfill immediate financial responsibilities.

Furthermore, the cost efficiency indicator reveals that the hospital's management of operational costs falls below optimal levels. This indicates the need for implementing measures to enhance cost control and management practices, with the goal of reducing unnecessary expenses and improving overall financial efficiency.

Taking into account these financial indicators, it is evident that the hospital faces significant financial challenges and requires strategic interventions to address the underlying issues and work towards financial sustainability.

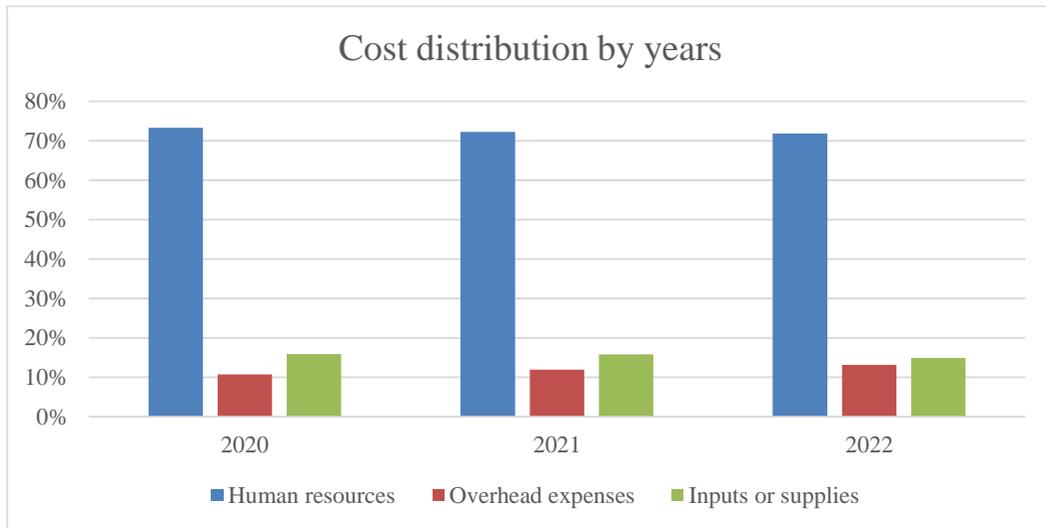
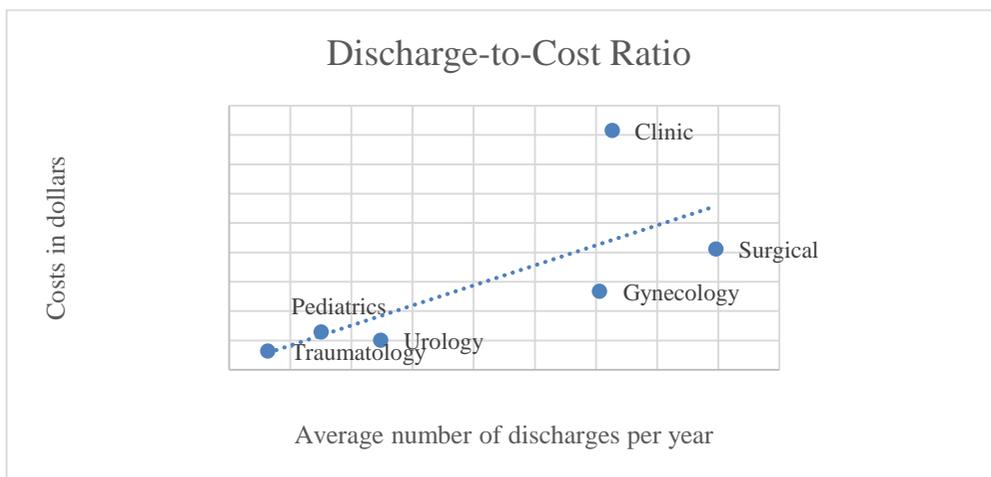


Figure 2 Percentage Distribution of Costs from January 2020 to December 2022.

Source: Prepared by the authors.

Figure 2 illustrates the allocation of expenses in different categories during the period from 2020 to 2022. The analysis shows that human resources were the most substantial expense category, indicating that staffing costs constituted a significant portion of the hospital's expenditures. Following human resources, general expenses ranked second, while supplies ranked third in terms of expenditure.

Notably, there was a progressive increase in general expenses over the analyzed period, suggesting potential areas for cost management and optimization. It is important to closely examine the factors contributing to the rise in general expenses and explore opportunities to mitigate any unnecessary or excessive expenditures in this category. On the other hand, supplies experienced a slight decrease in 2022. This could be attributed to various factors such as changes in procurement strategies, renegotiated contracts, or fluctuations in demand. Further investigation into the underlying reasons for this decline can provide insights into potential areas for cost savings or process improvements. By analyzing the allocation of resources in different areas, the hospital can identify potential areas for adjustments or improvements based on its specific needs and objectives. This information can guide decision-making processes aimed at optimizing resource allocation, enhancing cost-efficiency, and aligning expenditures with the hospital's strategic goals.



Source: Prepared by the authors.

In Figure 3, the relationship between the average number of discharged patients in different specialties at HBG and the trend line of costs generated during the study period is presented. It can be observed that the clinical, surgical, and gynecology specialties significantly deviate from the equilibrium in terms of average costs, resulting in economic losses for the hospital. This indicates that these specialties have higher average costs compared to other specialties in the hospital. The discrepancy between the costs generated by these specialties and the trend line indicates an imbalance in terms of economic performance and suggests the need to assess and improve financial efficiency in these areas. On the other hand, in Figure 4, the relationship between the average number of days of hospital stay for patients in the clinical, surgical, and gynecology specialties at HBG and the trend line of costs generated during the study period is depicted. It can be observed that as the number of days of stay increases, the costs in these specialties also increase. This indicates a low bed turnover rate in relation to the number of hospitalized patients. Prolonged hospital stays are associated with an increase in the costs of care, which has a significant economic impact on the hospital.



Figure 4 Relationship between average length of stay and costs from January 2020 to December 2022.

Source: Prepared by the authors.

By analyzing the measures of central tendency of the financial data from HBG in the years 2020, 2021, and 2022, and comparing them with studies conducted by other authors, we can obtain relevant information about the overall performance and financial stability, highlighting fluctuations in total costs and generated revenues by the hospital. These fluctuations can be attributed to factors such as changes in the demand for medical services due to the pandemic. This analysis provides a basis for a more detailed evaluation of the factors influencing the costs and revenues of the hospital, which will enable more informed and strategic decision-making to improve financial efficiency and ensure long-term sustainability by developing effective strategies to optimize financial performance.

In terms of solutions and improvements in the healthcare system, Jin et Wang (2022) concluded that the implementation of digital health technology, especially during the COVID-19 pandemic, can reduce costs and increase patient satisfaction in the healthcare system. Additionally, Farrenkopf (2022) states that the lack of vaccination has also had a significant impact on healthcare systems, the economy, and global health. It has been demonstrated that unvaccinated individuals impose a burden on healthcare systems, generate considerable economic costs, and pose a risk to global health.

Conclusions

The multiple effects of the COVID-19 pandemic on healthcare, population health, economic and social areas, as well as the decrease in medical care, costs associated with disease treatment, the need for coordinated and rapid responses, and the importance of vaccination to mitigate negative impacts, are fundamental findings to understand and address the challenges posed by the pandemic and to better prepare for future similar situations.

The low bed turnover in relation to the number of hospitalized patients at HBG suggests the need to improve care processes, expedite patient discharges, and optimize resource management to reduce length of stay and, consequently, associated costs. It is important to implement strategies to identify and address the causes of these prolonged stays due to the effects of the pandemic and patients' comorbidities, which directly contribute to increased healthcare costs. These findings highlight the importance of implementing measures to improve bed turnover and reduce length of stay, aiming to optimize efficiency in hospital care and decrease associated costs.

Through a strategic approach and effective measures, it is possible to reverse this financial situation and achieve long-term sustainability for the hospital. Collaboration among interdisciplinary teams, including finance, administration, and operations professionals, is encouraged to develop and implement a comprehensive action plan that addresses these challenges and overcomes these obstacles, moving towards a healthier financial future.

The COVID-19 pandemic has had a significant economic impact on the healthcare sector,

particularly in terms of treatment costs, bed capacity, and resource allocation.

The economic situation of Hospital Básico Guaranda has been aggravated by the lack of financial resources and government support. Previous research has highlighted the importance of government investment in the healthcare sector during health crises such as the COVID-19 pandemic. According to the study by Ramponi et al. (2021), inadequate funding can negatively impact hospitals' ability to respond to healthcare demand and ensure the quality of services.

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