



Long Paper

Best COVID-19 Health Management Practices in State Universities and Colleges: A Basis for a Proposed Health Framework

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Abstract

The COVID-19 pandemic posed unprecedented challenges for educational institutions, particularly in managing health concerns and maintaining continuity of learning. This study aimed to identify the best health management practices implemented by State Universities and Colleges (SUCs) during the pandemic, serving as the foundation for proposing a health framework for SUCs and Higher Education Institutions (HEIs). Utilizing a quantitative descriptive research design, data were collected through an online survey from COVID-19 task force members in SUCs across the Mindoro, Marinduque, Romblon and Palawan (MIMAROPA) Region. A total of 142 respondents were selected using purposive sampling. The study identified key challenges such as limited resources (83.7%), insufficient medical facilities and equipment (76.7%), and lack of preparedness (72.1%) as the most pressing issues. Despite these challenges, SUCs demonstrated innovation and adaptability, with health authorities' responsiveness (79.1%) and regular health management meetings (76.7%) highlighted as effective practices. However, the overall satisfaction with health response measures was only moderate (Overall Weighted Mean = 3.28), suggesting that while certain practices were identified as best or exemplary, their practical implementation may have been hindered by systemic limitations. This discrepancy reflects the complex reality where effectiveness is context-dependent and best practices may not fully meet expectations due to operational constraints. Based on these findings, a comprehensive health framework focusing on health information systems, innovation, contingency planning, and facilities is proposed to better prepare SUCs for future health crises. The framework offers practical guidelines for enhancing institutional resilience and ensuring the safety and well-being of academic communities.

Keywords – COVID-19 pandemic, Health management practices, State Universities and Colleges (SUCs), MIMAROPA (Mindoro, Marinduque, Romblon and Palawan) Region, Institutional preparedness

INTRODUCTION

The COVID-19 pandemic, caused by the SARS-CoV-2 virus, emerged in December 2019 in Wuhan, China, and swiftly escalated into a global crisis, disrupting public health systems, economies, and societies worldwide. By March 2020, the World Health Organization (WHO) declared it a global pandemic, affecting over 200 countries, with more than 529 million confirmed cases and at least 6.29 million deaths (WHO, 2020).

In the Philippine context, the first confirmed case was recorded in January 2020, and the government implemented strict lockdown measures across urban and rural areas. A rapid increase in infections placed enormous pressure on healthcare systems and forced government-mandated community quarantines, which impacted numerous sectors, most notably education (ABS-CBN News, 2020; ILO, 2020a).

The education sector, particularly State Universities and Colleges (SUCs), experienced significant disruption due to the abrupt shift from traditional face-to-face learning to remote and flexible learning models. Institutions faced challenges such as limited digital infrastructure, lack of preparedness among faculty, and reduced access to learning tools for students, especially in resource-constrained settings (FAO, 2021). These systemic gaps threatened educational quality and heightened the need for adaptable frameworks to address both health and learning challenges. Noel (2021) highlights the societal implications of the pandemic, including increased xenophobia and cultural biases that exacerbated inequities, particularly among Asian communities. This underscores the need for inclusive strategies that address both public health issues and institutional vulnerabilities.

The MIMAROPA region, composed of island provinces in the Philippines, presented unique challenges in the delivery of both healthcare and education services during the pandemic. Geographic isolation, limited access to medical supplies, and intermittent internet connectivity compounded the operational burdens faced by SUCs in this region.

In response to the crisis, the Commission on Higher Education (CHED) issued guidelines prioritizing the implementation of flexible learning approaches to ensure educational continuity while safeguarding health (Scudellari, 2020). Higher Education Institutions (HEIs), including SUCs, adopted measures such as physical distancing, hygiene protocols, and digital learning solutions to create a safe educational environment (Di Genarro et al., 2020). However, challenges persisted, particularly for institutions in island-based regions like MIMAROPA, where geographical and technological constraints limited the reach and efficiency of these interventions.

While several studies (e.g., Di Genarro et al., 2020; Scudellari, 2020) have examined general health responses of HEIs to the pandemic, there remains a paucity of empirical research focusing on the actual health management strategies employed by SUCs—especially those operating in geographically isolated and resource-limited regions. Existing literature has largely concentrated on pedagogical shifts and infrastructure readiness, with limited focus on institution-specific health protocols, coordination mechanisms, and crisis responses tailored to unique local contexts.

This gap is particularly critical, as SUCs in regions like MIMAROPA face multidimensional vulnerabilities that require context-sensitive strategies to ensure institutional resilience. Without a clear understanding of how these institutions managed health-related challenges, policy and practice will continue to overlook critical elements necessary for future crisis preparedness.

The gaps identified in existing research necessitate a comprehensive analysis of SUCs' health management strategies to address their unique challenges. This study seeks

to document the best health management practices implemented by SUCs in the MIMAROPA region during the COVID-19 pandemic. By analyzing these practices, the research aims to contribute a health management framework that prioritizes educational continuity, institutional resilience, and the well-being of students and staff.

THE CONCEPTUAL FRAMEWORK OF THE STUDY

The study adopts the Input-Process-Output (IPO) Model to systematically assess and enhance COVID-19 health management practices in State Universities and Colleges (SUCs) in the MIMAROPA region. The input stage gathers data on challenges (e.g., limited infrastructure, resource constraints) and effective responses (e.g., remote health services, infection prevention protocols), offering contextual insights into how SUCs maintained safety and educational continuity.

In the process stage, survey data are collected and analyzed to evaluate trends, satisfaction levels, and the effectiveness of health interventions. These insights guide the development of the output—a comprehensive, evidence-based health framework tailored for SUCs. This framework standardizes best practices, addresses identified gaps, and strengthens institutional resilience for future health emergencies. Thus, the IPO model offers a structured approach to improving academic institutions' pandemic preparedness and health management.

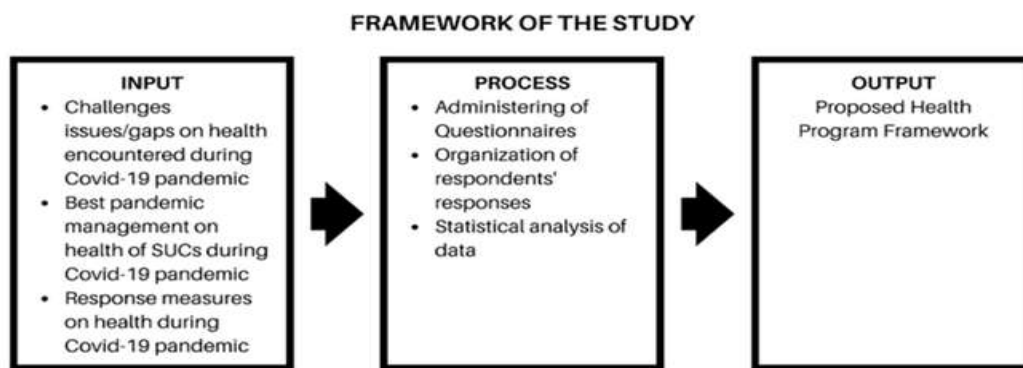


Figure 1. The Conceptual Framework of the Study Using the IPO Model

THE OBJECTIVES OF THE STUDY

General Objective:

The primary objective of this study was to identify and evaluate the best COVID-19 health management practices in State Universities and Colleges (SUCs) across the MIMAROPA region, intending to develop a comprehensive health framework for pandemic response.

Specific Objectives:

Specifically, the study aimed to:

1. Identify the key challenges, issues, and gaps in health management encountered by SUCs during the COVID-19 pandemic.
2. Examine the best practices implemented by SUCs in managing the COVID-19 pandemic.
3. Assess the perceived level of satisfaction of evaluators (those impacted by the responses) with the SUCs' pandemic health management practices.
4. Develop a health pandemic response framework based on the findings of the study.

Scope of the Study

This study examines the health management strategies implemented by State Universities and Colleges (SUCs) in the MIMAROPA region during the COVID-19 pandemic, focusing on the perspectives of institutional COVID-19 task force members. These individuals were directly involved in planning, coordinating, and monitoring health interventions at the institutional level.

"Health management" in this context refers to the structured institutional responses to public health emergencies, including infection control, resource mobilization, coordination with health authorities, and enforcement of safety protocols. The study also identifies "best practices"—health-related interventions perceived to be effective, innovative, and contextually adaptable in mitigating risk and supporting campus well-being during the pandemic.

Further, the study contributes to the development of a health framework aimed at enhancing "institutional resilience," defined as the SUCs' capacity to anticipate, respond to, and recover from health disruptions while continuing to deliver accessible, quality education. This includes adaptive leadership, contingency planning, and sustainable strategies that can be institutionalized post-pandemic.

The scope is limited to institutional health response mechanisms and excludes the academic impacts of flexible learning or students' instructional experiences. Findings are intended to inform a resilience-oriented health framework for SUCs and similar higher education institutions.

RELATED LITERATURE

The COVID-19 pandemic caused major disruptions across health systems, economies, and education, forcing institutions—especially academic ones—to swiftly adapt while ensuring continuity. In the Philippines, State Universities and Colleges (SUCs) faced critical challenges, including limited healthcare infrastructure and crisis

unpreparedness. This literature synthesis draws from global and local studies to highlight the pandemic's health, economic, psychosocial, and educational impacts, while emphasizing the need for health preparedness and presenting a proposed framework to help SUCs build resilient and inclusive crisis management systems.

Introduction to the COVID-19 Pandemic and Its Global Impact

The emergence of COVID-19 in December 2019, caused by the SARS-CoV-2 virus, profoundly impacted global health, economic activity, and education. The World Health Organization (WHO, 2020) initially traced the outbreak to a seafood market in Wuhan, China, with subsequent studies, such as that of Milibari (2020), suggesting a zoonotic origin from bats. Genetic analyses reinforced the virus's natural origin, dispelling theories of laboratory manipulation (WHO, 2020). These findings emphasized the complexity of viral transmission and the urgency of comprehensive public health responses.

The Philippines was among the nations hardest hit. According to ABS-CBN News (2020), the country implemented one of the world's longest quarantine periods and ranked among the top ten globally in COVID-19 cases during the initial phases of the outbreak. This situation led to widespread economic disruptions, with unemployment peaking at 45.5% by mid-2020 and major sectors—including education—facing operational paralysis (JHU CSSE, 2020). Di Gennaro et al. (2020) contributed an extensive review of the pandemic's clinical, diagnostic, and public health dimensions, calling attention to preparedness gaps. Likewise, Scudellari (2020) underscored the critical variables—such as vaccine development, herd immunity, and sustained interventions—that will shape the long-term trajectory of the pandemic.

Collectively, these studies provide a foundational understanding of the pandemic's scope and underline the urgent need for adaptable health systems and evidence-informed decision-making in times of global crisis.

Impact of the COVID-19 Pandemic on Health and Education Systems, Economic and Social Disruptions, and Psychological Well-Being

The global economic impact of COVID-19 was particularly severe for developing countries. The International Labour Organization (ILO, 2020a) estimated the loss of over 400 million full-time jobs in the second quarter of 2020, while UNCTAD (2020) reported widespread GDP contractions. In the Philippines, the unemployment rate rose to 17.7%, affecting over 7.3 million individuals, alongside a 16.5% GDP decline (Philippine Statistics Authority, 2020). These economic setbacks exposed the vulnerability of public institutions, including SUCs, which faced budget limitations and insufficient infrastructure for remote learning—contributing to increased absenteeism and learning inequities. The pandemic also intensified labor market disparities, disproportionately affecting self-employed women and mothers (Kalenkoski & Pabilonia, 2020). In Latin America and the Caribbean,

poverty surges led ECLAC (2021) to advocate for recovery strategies that merge economic renewal with social protection. Simultaneously, food insecurity worsened due to disrupted supply chains and deepening poverty, prompting the FAO (2021) to call for integrated solutions rooted in sustainable agriculture and food policy reform. Collectively, these challenges underscored the urgent need for inclusive, resilient, and multi-sectoral policy responses.

Beyond economic and nutritional implications, the pandemic significantly affected mental health and psychosocial well-being. Widespread anxiety, depression, and stress were reported due to prolonged isolation and uncertainty (Choi et al., 2020), with vulnerable populations experiencing elevated risks of obsessive-compulsive behaviors and PTSD (Dubey et al., 2020; Marroquin et al., 2020). In the Philippines, extended lockdowns and economic hardship further strained mental health, revealing major gaps in service access (Rajkumar, 2020). Higher education institutions were similarly impacted; Leal et al. (2021) found that 90% of respondents across 41 countries reported academic disruptions, with remote learning exacerbating stress and social isolation. Digital analyses, such as Li S. (2020), highlighted a surge in anxiety-related expressions and diminished life satisfaction among Chinese Weibo users. In response, Suarez et al. (2021) recommended innovations like teletherapy, outreach initiatives, and resilience-building strategies. These measures reinforce the need for integrated and responsive mental health systems within broader public health frameworks, ensuring both physical and psychological resilience in future crises.

Health Preparedness and Adaptive Response Strategies in Higher Education Institutions (HEIs)

The onset of COVID-19 exposed critical vulnerabilities in HEIs, particularly within Philippine SUCs. Survey data indicated that 83.7% of respondents cited a lack of medical resources, 76.7% reported insufficient healthcare infrastructure, and 72.1% identified weaknesses in overall preparedness. These findings reflect global observations wherein fragmented systems and limited resources hindered crisis response (Nascimento et al., 2021).

In the Philippine context, the government adopted a securitized pandemic response, implementing strict lockdowns and enforcement mechanisms. Hapal (2021) critiqued this approach for framing the pandemic as a security threat rather than addressing systemic health deficiencies. Furthermore, Ma and Sallis (2022) underscored the need to integrate non-communicable disease (NCD) management into pandemic planning, especially in underserved areas.

Despite these constraints, SUCs exhibited adaptability. Many institutions operationalized Disaster Risk Reduction and Management (DRRM) plans, convened regular health meetings, and adjusted health protocols. These practices align with recommendations from Formica et al. (2024), who advocated for patient-centered and flexible approaches in educational settings. Comparatively, while Sweden emphasized

individual responsibility in its less restrictive response, the Philippines focused on population-level compliance through rigid public health mandates (Galvez, 2021).

International evidence also reveals uneven implementation of non-pharmaceutical interventions (NPIs). Moreland et al. (2023) reported that only 20% of U.S. HEIs applied all CDC-recommended NPIs. The varied strategies—such as hybrid instruction, social distancing, and mask mandates—highlight the importance of contextualized and adaptable institutional responses.

Ultimately, the experience of COVID-19 has shown the value of establishing comprehensive, flexible, and well-resourced health management systems within HEIs. A combination of global insights and local adaptations is essential to strengthen institutional resilience in the face of future public health emergencies.

Global Practices and Innovations in Pandemic Management in HEIs

The COVID-19 pandemic catalyzed innovation across higher education institutions (HEIs), especially in health management and education delivery. Faced with evolving health threats, HEIs adopted agile and collaborative approaches. Andersen et al. (2020) emphasized the value of continuously updated, interactive platforms that support real-time communication and knowledge exchange among researchers and practitioners. These mechanisms enhanced institutional responsiveness and promoted the dissemination of evidence-based practices during critical moments of the pandemic.

Digital health technologies became essential in sustaining healthcare services amid restrictive conditions. Telemedicine, in particular, enabled care delivery while upholding physical distancing. In the Philippines, Maravilla et al. (2022) affirmed telehealth's effectiveness in maintaining healthcare access but noted persistent digital inequities, especially in rural areas. This highlights the need for targeted investments in digital infrastructure and capacity-building to ensure equitable access to healthcare and education within State Universities and Colleges (SUCs).

Simultaneously, educational continuity emerged as a global concern. Reimers and Schleicher (2020) proposed a framework addressing the long-term effects of school closures, advocating inclusive strategies for marginalized learners and flexible instructional modalities. Their approach stresses the importance of responsive policies to mitigate disruptions and reduce inequalities in learning. For many disadvantaged students, the transition to online education exposed pre-existing inequities, reinforcing the need for systemic reforms that promote educational justice and institutional resilience.

Collectively, these international experiences underscore the need for innovation, adaptability, and inclusivity in addressing crisis-related disruptions in HEIs. Sustained collaboration among academic institutions, health sectors, and policymakers—paired with digital transformation and equity-focused strategies—is vital to protecting the

health and learning outcomes of academic communities in both current and future emergencies.

Proposed Health Framework for SUCs

In response to the multifaceted health and operational challenges brought by the COVID-19 pandemic, this study proposes a health framework tailored specifically for Philippine State Universities and Colleges (SUCs). The framework is anchored on four strategic pillars: (1) strengthening health information systems, (2) promoting innovations in health management, (3) enhancing digital equity, and (4) integrating mental health services into institutional practices. These pillars collectively aim to build institutional resilience and ensure that SUCs are better equipped to manage future public health emergencies.

A reliable and well-coordinated health information system is critical for effective health monitoring, decision-making, and emergency response in educational institutions. Formica et al. (2024) emphasized the importance of timely data collection and transparent communication in enforcing health protocols and implementing targeted interventions. By establishing structured partnerships with local health units, SUCs can access technical guidance and real-time epidemiological updates, thereby enhancing their capacity to respond to health crises swiftly and efficiently.

Investing in digital infrastructure is essential to improving the accessibility and continuity of healthcare and educational services. The pandemic has revealed the potential of digital health technologies, such as telehealth, in mitigating service disruptions; however, Maravilla et al. (2022) identified persistent disparities in access, particularly in low-resource environments. Addressing this digital divide by expanding internet connectivity, providing necessary devices, and offering digital literacy programs will help ensure that all students, faculty, and staff can benefit equitably from digital services, especially during emergencies.

The integration of mental health support services into the operational framework of SUCs is another crucial element in safeguarding the overall well-being of academic communities. Leal Filho et al. (2021) highlighted that proactive mental health initiatives—such as counseling, peer support networks, and resilience-building programs—can mitigate the psychological distress experienced during crises. Embedding these services into institutional systems promotes a supportive campus culture that recognizes and addresses the psychosocial needs of both students and employees.

Hence, the proposed health framework provides a strategic, context-sensitive guide to strengthening the health preparedness and crisis responsiveness of Philippine SUCs. By investing in information systems, innovative health practices, equitable digital access, and integrated mental health services, SUCs can build institutional resilience and sustain educational operations during future health crises. This approach underscores the

vital role of health governance in safeguarding the well-being and continuity of the higher education sector.

METHODOLOGY

Research Design and Research Method

This study employed a quantitative, descriptive research design to systematically examine and analyze the health management practices, challenges, and response measures implemented by State Universities and Colleges (SUCs) across the MIMAROPA region during the COVID-19 pandemic. The descriptive research design was appropriate because it allowed for a detailed and systematic portrayal of current conditions without manipulating variables, ensuring an accurate representation of the study's objectives. The survey method facilitated efficient data collection from a geographically dispersed population. This method aligned with the need for broad coverage and representation, particularly during a health crisis. A validated survey instrument served as the primary tool for data gathering, and responses were collected using Google Forms. This digital format allowed for ease of access, secure storage, and efficient data compilation. The quantitative approach ensured that findings were objective, measurable, and reproducible, contributing to a clear understanding of the issues under study.

Research Locale and Time of the Study

The study was conducted during the academic year 2021–2022 within the MIMAROPA region, focusing on Romblon State University (RSU) and other SUCs. This region's distinct geographical setup made it a relevant setting for understanding the unique challenges posed by the pandemic. The RSU Main Campus is located in Odiongan, Romblon, with satellite campuses spread across Tablas, Sibuyan, and Romblon Islands, including municipalities like San Andres, San Agustin, Sta. Maria, and Cajidiocan. These campuses served a diverse and economically challenged student population, making RSU an ideal case study for evaluating pandemic-related logistical and health management challenges. The dispersed locations of the campuses highlighted the need for tailored solutions to address accessibility, digital infrastructure limitations, and health safety protocols.

Population and Samples of the Study, and Sampling Procedure

The study's population consisted of members of COVID-19 task forces from SUCs within the MIMAROPA region. These individuals were directly involved in pandemic-related health management and decision-making processes. The purposive sampling method was used to ensure the inclusion of participants with relevant expertise and experience. From an initial population of 150 individuals, 142 respondents participated in the study, resulting in a 94.67% response rate. The purposive sampling method was

justified as it targeted individuals with direct involvement in the pandemic response, ensuring the quality and relevance of the collected data.

Table 1. Distribution of respondents

Respondents	COVID Task Force Involved		Percentage
	Actual Number of Population	Actual Number of Respondents	
SUC 1	25	23	15.33%
SUC 2	25	23	15.33%
SUC 3	25	24	16.00%
SUC 4	25	24	16.00%
SUC 5	25	24	16.00%
SUC 6	25	24	16.00%
MISSING		8	5.34%
Total	150	142	100.00%

Table 1 presents the distribution of respondents. The data show that, despite a minor loss, the sample size remains representative of the population, ensuring reliable analysis and valid findings.

Development and Validation of the Research Instrument

The survey questionnaire was carefully developed to align with the study's objectives and ensure the comprehensive capture of relevant data. It was structured into three distinct sections to address critical aspects of health management during the COVID-19 pandemic. The first section focused on identifying the challenges, issues, and gaps encountered in health management across SUCs, aiming to uncover the barriers faced in implementing effective health protocols. The second section documented the best practices, innovations, and strategies adopted by SUCs to mitigate pandemic-related health risks. This part provided actionable insights and successful approaches that could serve as models for similar contexts in the future. Lastly, the third section measured the satisfaction levels of respondents regarding the effectiveness of the implemented health responses, offering a quantitative understanding of how well the strategies addressed the concerns of SUC task forces and stakeholders.

To ensure the validity and reliability of the research instrument, the questionnaire underwent a rigorous expert validation process. Experts in health, research, and COVID-19 task force roles from Romblon State University's main campus reviewed the instrument. Their feedback was incorporated to refine the language, relevance, and clarity of each item, ensuring that the questionnaire accurately captured the necessary information aligned with the study's objectives. The validation process also guaranteed that the survey questions were appropriate and applicable to the unique context of SUCs in the

MIMAROPA region. By systematically addressing key areas and undergoing expert validation, the instrument ensured a robust and reliable assessment of health management practices during the pandemic.

Data Gathering Procedure

The data collection process, conducted between April 2022 and May 2022, utilized a validated survey questionnaire transcribed into Google Forms to streamline digital distribution and uphold pandemic health protocols. First, a formal request for participation was communicated to the administrative offices of SUCs in the MIMAROPA region, targeting COVID-19 task force members as respondents. Following this, survey links were distributed via official email channels, providing respondents with convenient access to the instrument. To enhance participation and ensure a comprehensive response rate, follow-up reminders were sent at regular intervals, encouraging timely completion of the survey. Upon submission, all responses were securely stored in Google Drive, safeguarding confidentiality and ensuring efficient data organization for subsequent analysis. This well-coordinated process enabled the successful gathering of relevant data while adhering to safety protocols and maintaining the integrity of the research.

Statistical Tools Used

To analyze the data effectively, the study employed statistical tools to ensure accurate interpretation and provide actionable insights. The Rank Order Scale was used to prioritize and rank the challenges, issues, and gaps in health management practices. This approach facilitated the identification of the most pressing concerns and areas requiring immediate attention, offering a structured method for decision-making in pandemic management. Previous studies, such as Di Genarro et al. (2020) [1], emphasized the importance of prioritization techniques in health-related research for identifying critical focus areas during emergencies. Furthermore, the Weighted Mean was calculated to measure respondents' satisfaction levels regarding the health management responses implemented by SUCs. This tool summarized satisfaction data, helping to evaluate the effectiveness of interventions in addressing stakeholder concerns. Scudellari (2020) [2] highlighted the usefulness of statistical aggregation methods like the Weighted Mean in assessing institutional responses during crises, particularly in resource-constrained environments. These tools provided a structured and reliable framework for analyzing data and generating meaningful recommendations to improve health management practices.

Ethical Considerations

This study complied with ethical research standards, ensuring confidentiality, informed consent, and voluntary participation of all respondents. Participants were informed of the study's purpose and were allowed to withdraw at any point without

consequence.

RESULTS

This section integrates the results and discussion, presenting key findings aligned with the study's objectives and situating them within the existing literature. It also provides interpretive analysis alongside each figure and table to better explain the implications of the data presented.

Table 2 illustrates the challenges, issues, and gaps in health management encountered by SUCs during the COVID-19 pandemic. Among these, the limited resources for health-related concerns emerged as the most pressing issue, ranked first (f=119; %=83.7). This was followed by the limited capacity of medical facilities and equipment (f=109; %=76.7) and health preparedness for the pandemic (f=102; %=72.1). On the other hand, the least ranked item was the infodemic on COVID-19 through mass and social media, which impeded public health responses (f=33; %=23.3; R=14).

These findings highlight the systemic weaknesses in health management within SUCs, particularly regarding resource allocation and infrastructure readiness. Bhutta and Rutter (2021) similarly identified the unpreparedness of many institutions to respond to the shocks of the pandemic, resulting in widespread disruption to essential health services. The study further emphasizes the importance of addressing digital and logistical gaps, as issues like poor digital skills (f=40; %=27.9) and lack of internet connectivity (f=96; %=67.4) were significant barriers to health communication and response efforts.

The ranked data clearly emphasize systemic barriers to health preparedness in SUCs. These findings are consistent with the assertion of Salazar et al. (2008), whose study predated COVID-19 but reflected similar institutional vulnerabilities in health systems that were later magnified by the pandemic.

Table 3 presents the best health management practices implemented by SUCs during the pandemic. The most notable practice was the presence of responsive health authorities to the outbreak, ranked first (f=112; %=79.1), followed by attendance at COVID-19 health management meetings (f=109; %=76.7) and the establishment of COVID-19 health isolation facilities (f=86; %=60.5). These results indicate that proactive leadership and coordination significantly contributed to the effectiveness of pandemic responses.

However, some practices, such as the implementation of technology-based solutions to ensure continuity of health services and provision of health financial aid to vulnerable sectors (both ranked R=9.5; %=39.5), were less frequent, reflecting the challenges faced by institutions in adapting to new technologies and addressing economic vulnerabilities. Adelowotan (2021) observed similar trends, noting that

universities worldwide struggled with the rapid integration of innovative solutions amidst resource constraints.

Table 2. Challenges/issues/gaps in health encountered during the COVID-19 pandemic

Items	f	%	R
1. Health preparedness for the pandemic	102	72.1	3
2. Limited resources for health-related concerns	119	83.7	1
3. Limited capacity of medical facilities and equipment for health-related concerns	109	76.7	2
4. Low health care system/health system capacity for health-related concerns	63	44.2	12
5. Absence of laboratory testing for COVID-19 for health-related concerns	86	60.5	6
6. Inadequate infrastructure for health-related concerns	96	67.4	4.5
7. Lack of digital or inappropriate equipment as needed for health-related issues	76	53.5	7
8. Lack of internet or slow connection to the internet providers for smooth delivery of health-related information	96	67.4	4.5
9. Poor digital skills in accessing and managing information on health issues.	40	27.9	13
10. Infodemic on COVID-19 through mass and social media that impede public health responses	33	23.3	14
11. Lack of evacuation centers that adhere to the minimum design standards, especially in implementing physical distancing protocols for health-related concerns	69	48.8	10
12. Absence of policy measures to guarantee the inclusion of employees under “job order” in pandemic responses.	73	51.2	8.5
13. Increased risk for employees’ mental health problems.	73	51.2	8.5
14. Lack of equipment and expertise in handling hazardous waste – waste that may pose a substantial threat to human health or the environment when improperly managed, such as used face masks and/or face shields.	66	46.5	11

The results demonstrate that while SUCs exhibited resilience through adaptive practices, such as early activation of Disaster Risk Reduction and Management in Health (DRRMH), more comprehensive strategies are needed to address gaps in technology integration and financial support systems. These findings suggest that institutional preparedness and resource mobilization remain critical components of effective health management.

Table 3. Best health management practices during the COVID-19 pandemic

Indicators	F	%	R
1. Early activation of Disaster Risk Reduction and Management in Health (DRRMH)	82	58.1	4
2. Presence of COVID-19 Health Information, Education, and Communication (IEC) material	79	55.8	5
3. Attendance to a COVID-19 health management meeting	109	76.7	2
4. Responsive health authorities to the outbreak	112	79.1	1
5. Health Information Dashboard (COVID-19 Monitoring System) for up-to-date information regarding the COVID-19 status in the municipality – a directory of useful information, data, and resources updated daily as case tracker, health system capacity, case profiles, fund tracker, issuance (executive and legislative), and local government	63	44.2	7
6. Establishment of a Contact Information Center (CIC), a COVID-19 health-help desk	59	41.9	8
7. Implementation of technology-based solutions to ensure continuity of university health services	56	39.5	9.5
8. Establishment of COVID-19 Health Isolation Facilities	86	60.5	3
9. Health financial aid to vulnerable sectors and those whose livelihoods were badly affected	56	39.5	9.5
10. Revision of health fiscal policies and implementation of new university safety regulations	69	48.8	6
11. Others	3	2.3	11

The dominance of leadership-oriented and meeting-based strategies underscores the need for strengthened decision-making and collaboration at the institutional level. However, the relatively lower implementation of financial and technological responses implies existing barriers that must be prioritized in future planning.

Table 4 summarizes respondents' levels of satisfaction with the health response measures implemented by SUCs during the pandemic. The overall weighted mean (OWM) of 3.28 indicates a moderate level of satisfaction, suggesting that while SUCs made significant efforts, there is room for improvement in addressing stakeholders' needs. The highest satisfaction scores were recorded for the procurement of disinfectants, sprayers, and misting equipment (WM=3.87) and the installation of hand-washing stations/facilities (WM=3.75), reflecting the emphasis on preventive measures. Conversely, the lowest score was observed for hazard pay and Special Risk Allowance (SRA) for health workers

and front liners (WM=2.87), indicating a significant gap in addressing the welfare of those on the front lines. These findings align with World Health Organization (WHO) guidelines, which stress the importance of supporting essential workers during health crises. The results also underscore the importance of aligning health responses with both institutional capacities and stakeholder expectations.

Table 4. Level of Satisfaction of the Respondents in the Health Response Measures of SUC during COVID-19 Pandemic

Indicators	WM	Description	Interpretation
1. Distribution of locally available food resources by the LGU	3.47	Moderately Satisfied	MS
2. Information dissemination via traditional and digital platforms for public health action	3.72	Satisfied	S
3. Procurement of rapid antibody testing kits, needed medical equipment, drugs and medicines, and medical, dental, and laboratory supplies	3.31	Moderately Satisfied	MS
4. Operation and maintenance of quarantine facilities	3.4	Moderately Satisfied	MS
5. Provision of basic food, medicines, and non-food items, emergency and medical kits, and other needed logistics for COVID-19 quarantine facilities	3.5	Satisfied	S
6. Food assistance and other relief goods to front liners	3.51	Satisfied	S
7. Hazard pay and Special Risk Allowance (SRA) of health workers and other front liners	2.87	Somewhat Satisfied	SS
8. Distribution of family food packs and other essential provisions to constituents	3.4	Moderately Satisfied	MS
9. Free transport service to locally stranded (during COVID-19)	3.41	Moderately Satisfied	MS
10. Installation of hand-washing stations/facilities	3.75	Satisfied	S
11. Procurement of disinfectants, sprayers, and other disinfecting supplies and misting equipment	3.87	Satisfied	S
12. Implementation of curfew hours	3.56	Satisfied	S
13. Provision of learning materials and equipment to the colleges and campuses	3.47	Moderately Satisfied	MS
14. Enforcement of stricter water disposal rules, especially with hazardous waste coming from facilities used by COVID-19 patients	3.58	Satisfied	S
15. Others	0.43	Not Satisfied	NS
Overall Weighted Mean	3.28	Moderately Satisfied	MS

Legend: 4.50-5.00=VS; 3.50-4.49=S; 2.50-3.49=MS; 1.50-2.49=SS; 1.00-1.49=NS

Overall, the moderate satisfaction level (OWM = 3.28) suggests that while foundational protocols were in place, SUCs struggled to fully meet expectations—particularly in ensuring adequate compensation and support for frontline workers. This aligns with findings by WHO (2021), which emphasize that pandemic responses should not only include structural interventions but must holistically support the well-being of responders and affected communities.

THE PROPOSED SUCARES HEALTH MANAGEMENT FRAMEWORK

SUCARES Health Management Framework for SUCS

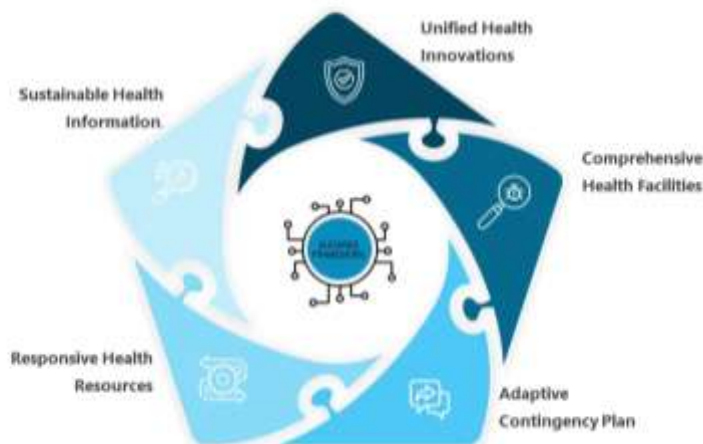


Figure 2. Proposed Study Framework for State University and Colleges

The SUCARE Health Management Framework, inspired by the Romblon dialect term for "sharing," embodies a collective approach to health resilience within State Universities and Colleges (SUCs). Rooted in the shared values of Romblon's three linguistic groups—"Asi," "Sandoki," and "Taw-i"—this framework highlights the importance of shared responsibility and collaboration in addressing health challenges. Developed from the findings of this study, SUCARE focuses on five core components—Sustainable Health Information, Unified Health Innovations, Comprehensive Health Facilities, Adaptive Contingency Plans, and Responsive Health Resources—positioned around the central priority of "Students, Faculty, and Staff." Each component is designed to foster a safe, resilient, and supportive academic environment, equipping SUCs with adaptable strategies for effective health management during crises while promoting the long-term well-being of their communities.

Sustainable Health Information ensures the availability of reliable, real-time data for informed decision-making, while Unified Health Innovations leverage technology and creative solutions to address resource limitations and improve health outcomes.

Comprehensive Health Facilities emphasize infrastructure development and resource expansion to meet routine and emergency health needs sustainably. Adaptive Contingency Plans provide actionable strategies for responding to health crises without disrupting academic continuity, integrating lessons from the COVID-19 pandemic to enhance institutional resilience. Lastly, Responsive Health Resources focus on the agile allocation of supplies, healthcare personnel, and support systems to safeguard the well-being of students and employees. Together, these components bridge critical gaps identified during the pandemic, offering a forward-thinking, evidence-based framework that positions SUCs to address current and future health challenges with efficiency and sustainability. The SUCARE Framework ensures that SUCs remain resilient, adaptable, and prepared to support public health while upholding academic excellence.

DISCUSSION

The study's findings underscore significant challenges in health management within SUCs during the COVID-19 pandemic, particularly in terms of preparedness, resource allocation, and infrastructure adequacy. Insufficient medical facilities, lack of testing laboratories, and inadequate health protocols were among the most pressing issues, reflecting broader systemic weaknesses. These challenges align with the observations of A. Owais et al. (2021), who noted that global health systems, particularly in education, faced severe disruptions due to resource limitations. Similarly, Nascimento et al. (2021) found that educational institutions worldwide struggled with insufficient healthcare capacities and inadequate protocols, emphasizing the need for comprehensive frameworks to sustain institutional health during crises.

Adding to these difficulties, the absence of well-defined health guidelines for employees further hindered the response efforts of SUCs, as also highlighted in the SickKids and UNICEF report (2021). These gaps collectively stress the importance of investing in robust health preparedness strategies to address future crises.

Despite these challenges, SUCs demonstrated resilience through proactive and innovative practices. Measures such as early activation of Disaster Risk Reduction and Management in Health (DRRMH) protocols, regular COVID-19 health management meetings, and responsive health leadership were key strategies. These efforts mirror global trends described by Adelowotan (2021), who emphasized that universities adopted creative solutions to ensure the continuity of health services during the pandemic. The use of COVID-19 Health Information, Education, and Communication (IEC) materials proved crucial in mitigating risks, aligning with Ahmadi's (2021) findings on Sweden's community-centered strategies that emphasized active engagement and early responses. However, some gaps persisted, particularly in implementing technology-based health

solutions and providing financial aid to vulnerable sectors, indicating a need for more comprehensive institutional preparedness.

Stakeholders expressed moderate satisfaction with SUCs' health management responses. While respondents were satisfied with initiatives such as the procurement of disinfectants and the installation of handwashing stations (OWM = 3.28), they reported dissatisfaction with provisions for frontline workers, including hazard pay and Special Risk Allowance (SRA). These findings align with Maravilla et al. (2022), who stressed the importance of financial and logistical support for health workers to maintain morale and effectiveness during prolonged crises. Additionally, satisfaction levels were influenced by the adequacy of psychosocial support, consistent with studies by Eurofound (2020) and Jacobson et al. (2020), which highlight the significance of addressing mental and emotional well-being alongside physical needs.

Drawing from these insights, the SUCARES Health Management Framework proposed in this study incorporates Sustainable Health Information, Unified Health Innovations, Comprehensive Health Facilities, Adaptive Contingency Plans, and Responsive Health Resources. This framework aims to enhance institutional resilience and preparedness, ensuring SUCs can effectively navigate future health emergencies.

PRACTICAL IMPLICATIONS

The findings of this study hold significant practical implications for the development of health management frameworks within academic institutions, particularly in the context of public health crises. The results underscore the necessity for a comprehensive, multi-dimensional approach that integrates effective resource allocation, coordinated leadership, and active stakeholder engagement to strengthen institutional preparedness. The SUCARES Health Management Framework, formulated through this study, introduces a structured model comprising sustainable health information systems, adaptive contingency planning, and responsive health resources. This framework serves as a strategic guide for higher education institutions aiming to address complex health challenges in an organized and resilient manner.

Furthermore, the results emphasize that State Universities and Colleges (SUCs) must prioritize targeted investments in digital infrastructure to facilitate timely access to health-related information and services. Equally important is the enhancement of staff training to ensure institutional agility and the provision of financial support systems that can cushion vulnerable sectors during emergencies. These implications call attention to the urgent need for systemic reforms to build long-term institutional resilience.

RECOMMENDATIONS

Based on the findings and practical implications, the following recommendations are proposed:

1. **Strengthen institutional infrastructure and preparedness** by adopting the SUCARES Health Management Framework, which emphasizes sustainable systems and responsive strategies.
2. **Enhance digital readiness** by allocating resources for technology-based health monitoring systems, virtual communication platforms, and data integration tools.
3. **Provide capacity-building programs** for staff and health task force members focusing on emergency preparedness, digital health tools, and evidence-based health management practices.
4. **Implement inclusive financial aid mechanisms** for both employees and students who are vulnerable to disruptions during health crises, including hazard pay and contingency grants.
5. **Encourage future research** to include longitudinal and comparative studies that assess the sustainability and scalability of institutional health responses, particularly in resource-limited and geographically isolated SUCs.

CONCLUSION

The findings of this study reveal significant challenges faced by State Universities and Colleges (SUCs) in the MIMAROPA region during the COVID-19 pandemic, particularly in areas such as preparedness, resource allocation, and infrastructure. Limited medical facilities, insufficient testing capabilities, and inadequate digital resources emerged as critical barriers to delivering timely and effective health responses. These gaps underscore the need for comprehensive health frameworks that address the unique context of SUCs while ensuring institutional readiness for future crises. Despite these challenges, SUCs demonstrated resilience and adaptability through measures like the early activation of Disaster Risk Reduction and Management in Health (DRRMH) protocols, regular health management meetings, and the use of health information materials. These efforts highlight the potential for resource-constrained institutions to mitigate the impacts of crises through innovation and committed response strategies.

However, moderate satisfaction levels among stakeholders indicate that gaps remain in addressing the full spectrum of health needs, including mental health support,

financial aid, and hazard pay for frontline workers. These findings emphasize the need for a holistic approach to health crisis management, one that extends beyond immediate physical health interventions to encompass financial and psychosocial support. Moving forward, the development of a comprehensive health management framework, such as the proposed SUCARES framework, is essential. This framework should integrate key components, including investment in medical infrastructure, digital health resources, and mental health services, while fostering collaboration with local government units (LGUs) and health organizations. Future research should explore the long-term effectiveness of such frameworks and address unanswered questions about sustaining health initiatives in resource-limited settings. By adopting these measures, SUCs can enhance their institutional resilience, safeguard the well-being of their communities, and ensure the continuity of education and operations during future health emergencies.

LIMITATIONS OF THE STUDY

This study is subject to several limitations that may affect the interpretation and generalizability of its findings. First, the research was confined to State Universities and Colleges (SUCs) within the MIMAROPA region, which may not fully represent the experiences of other higher education institutions in different geographic or socio-economic settings across the Philippines. Second, data collection relied on self-reported responses from members of the COVID-19 task force, which may have introduced response bias or social desirability bias. Third, the study adopted a quantitative descriptive design, which, while effective for identifying trends and frequencies, does not capture the depth of qualitative insights or establish causal relationships. Lastly, the availability of internet access and digital tools during the survey period may have affected the participation and completeness of responses from some SUCs, particularly in remote or resource-constrained areas. These limitations suggest the need for further mixed-methods research involving more diverse institutional samples and in-depth stakeholder interviews to validate and enrich the proposed health management framework.

DECLARATION

Conflict of Interest

No conflicts of interest exist between the authors that are significant to the article's content.

Informed Consent

All participants involved in the study provided informed consent.

Ethics Approval

Approval for conducting the study has been granted. The research protocol was reviewed and approved by the Research Ethics Committee of Romblon State University.

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Hailing from Odiongan, Romblon, Dr. John Fetalsana Rufon stands as a dedicated figure in leadership, education, and cultural advocacy. His early inclinations towards music and student governance paved the way for a distinguished path marked by academic excellence. He received the prestigious “Gerry Roxas Leadership Award,” which underscored his early leadership potential. As a licensed Professional Teacher, Dr. Rufon has been a cornerstone of Romblon State University since 2000, where he began teaching and later advanced to the significant role of Board Secretary V in 2013, a testament to his continued service and administrative capabilities.

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A dedicated academician and administrator born in Odiongan, Romblon on January 9, 1972, Dr. Emelyn Rico-Villanueva has consistently excelled in the field of education. Currently an Associate Professor V at Romblon State University, she has also held significant administrative positions, including Former Vice President for Academic Affairs

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