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FUNCTIONING OF MEDICAL INSTITUTIONS IN YEREVAN AND THE REGIONS OF ARMENIA DURING THE COVID-19 PANDEMIC

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ABSTRACT

The COVID-19 pandemic, caused by the SARS-CoV-2 virus, brought unprecedented challenges to healthcare systems across the globe, including Armenia. When the World Health Organization (WHO) declared it a pandemic in March 2020, hospitals and medical staff faced immense pressure - reallocating resources, adjusting workflows, and managing surging patient numbers, often with limited infrastructure. This study sought to understand how healthcare institutions in Yerevan and other regions of Armenia adapted during the crisis, examining both resource management and the emotional toll on medical workers.

To explore these challenges, researchers surveyed 196 healthcare professionals - 156 physicians and 40 nurses - working in Armenian hospitals with varying levels of COVID-19 reprofiling (non-reprofiled, partially reprofiled, and fully dedicated facilities). Using a carefully designed questionnaire, the study assessed key issues such as training, workload, protective equipment availability, and psychological stress. Responses were analyzed using statistical methods to identify trends and correlations.

The findings reveal a strained but resilient healthcare workforce. Only about 38.7% of participants received specialized COVID-19 training, and just over a third worked in officially designated COVID-19 centers. Many (21.2%) were reassigned to pandemic-related units, often with heavier workloads. More than half (53.6%) reported heightened stress, strongly linked to increased demands and shortages of critical supplies such as oxygen and medications. While most (73.7%) had sufficient protective gear, over a third faced shortages of essential resources. Financially, salaries remained unchanged for 69.1% of participants, even as concerns about understaffing and burnout grew.

Despite these struggles, Armenia's healthcare system demonstrated adaptability and dedication. The study underscores the urgent need for better pandemic preparedness - ensuring proper resource distribution, adequate mental health support for frontline workers, and stronger infrastructure to handle future health crises effectively.

KEYWORDS: COVID-19, Armenia, healthcare system, operational effectiveness, stress, healthcare workforce, pandemic preparedness.

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INTRODUCTION

Coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was initially identified in Wuhan, China, in December 2019 and rapidly escalated into a global pandemic [Huang C. et al., 2020; Sohrabi C. et al., 2020].

The coordination and regulation of healthcare services during pandemics, disasters, and emergency situations represent a critical global challenge. The primary objectives during this period include mitigating virus transmission and minimizing mortality rates [Pourhosseini S. et al., 2015; Andreasian D. et al., 2020].

The COVID-19 crisis had a substantial and immediate impact on healthcare systems, particularly in terms of service provision for patients not infected with the virus. Individuals with chronic conditions experienced significant setbacks, primarily due to interruptions in their routine follow-up care. A World Health Organization (WHO) survey spanning 155 countries highlighted widespread disruptions in services related to the prevention and treatment of noncommunicable diseases since the onset of the pandemic [Vaishya R. et al., 2021].

Access to healthcare services during the pandemic diminished considerably in comparison to with the pre-pandemic period. This decline affected routine surgical procedures, outpatient consultations, and hospital admissions. Conversely, telemedicine experienced rapid development and expansion during this time [Mehrotra A. et al., 2020; Tuczyńska M. et al., 2021].

During the initial wave of the pandemic, healthcare facilities worldwide reallocated resources from standard care settings and outpatient clinics to meet the escalating demand for COVID-19-related services. Consequently, due to limited resources and widespread apprehension regarding infection, healthcare providers deferred non-urgent appointments, diagnostic procedures, surgical interventions, and therapeutic examinations [Tuczyńska M. et al., 2021; Troisi R. et al., 2022].

Efforts to contain hospital-based transmission of the virus led to a substantial reorganization of medical resources, including the reassignment of physicians and nursing staff across various healthcare sectors, expansion of bed capacity for COVID-19 patients, reduction in services for other pa-

tient groups, and conversion of intensive care units (ICUs) to COVID-19 treatment units. Personnel shortages - resulting from infection or mandatory self-isolation - further necessitated the strategic redistribution of staff to high-priority departments to maintain essential levels of emergency and intensive care [Thomasian N. et al., 2021; Jørgensen L. et al., 2022].

Frequently, the absence of medical personnel due to infection or quarantine frequently resulted in critical staff shortages. This situation required the reallocation of available personnel to departments under increased demand, ensuring continuity in emergency care services [Bayram J. et al., 2011].

Additional emergency interventions included re-engaging retired and inactive physicians, involving medical students in clinical practice, and implementing accelerated and voluntary training programs for healthcare personnel [Blumenthal D. et al., 2020; Kaye A. et al., 2021].

A further significant consequence of the healthcare crisis was the marked rise in hospital mortality among non-COVID-19 patients. Research conducted across various nations revealed statistically significant increases in mortality, attributed to the postponement or cancellation of critical treatments and to public hesitancy in seeking medical assistance. This phenomenon was particularly pronounced among individuals with chronic illnesses and mental health disorders who required ongoing clinical management. Elevated mortality rates were reported among patients with schizophrenia [Boyer L. et al., 2022], oncology patients [Maringe C. et al., 2020], and individuals with other long-term conditions [Bartolomeo N. et al., 2021]. Utilization of essential health services decreased substantially during periods of lockdown [Moynihan R. et al., 2021], with even emergency department visits experiencing significant declines [Santi L. et al., 2021].

Healthcare professionals operated under intense psychological strain due to factors such as excessive workload, professional burnout, uncertainty, emotional fatigue, and other stress-related conditions [Stephenson J., 2021]. Moreover, the pandemic underscored pre-existing health disparities, influencing the equitable service distribution and healthcare accessibility across population groups [Ahmed F. et al., 2020].

The objective of this research is to evaluate the

operational effectiveness of medical institutions in both Yerevan and other regions of Armenia during the COVID-19 pandemic.

MATERIALS AND METHODS

Study Design and Participants: A cross-sectional survey was conducted to assess the perspectives of healthcare personnel working in medical institutions in Yerevan and across various regions of Armenia. The study population included medical staff employed in non-reprofiled, partially reprofiled, and fully reprofiled healthcare facilities during the COVID-19 pandemic.

Data Collection Tool: Data were collected using a semi-structured questionnaire developed by the principal investigator. The instrument consisted of 16 items for physicians and 13 items for nursing staff, and was designed to be completed within 10 -15 minutes. To ensure content validity, the questionnaire was reviewed and tested by a multidisciplinary panel of 10 experts, including public health specialists, sociologists, infectious disease experts, radiologists, intensive care physicians, anesthesiologists, and general practitioners. A pilot study involving five healthcare professionals was subsequently conducted, resulting in the refinement and finalization of the questionnaire.

Data Collection Procedure: The survey was administered through face-to-face interviews conducted by trained interviewers. To maintain participant confidentiality, all questionnaires were pre-numbered and coded. Prior to data collection, all interviewers underwent structured training to ensure standardized administration of the survey instrument.

Statistical analysis: Descriptive statistics were calculated for all study variables. For quantitative variables, measures included the mean, standard deviation (SD), and standard error of the mean (SEM). For qualitative variables, proportions and frequencies were determined.

To assess the statistical significance of differences in proportions for categorical variables, the chi-square (χ^2) test was applied. In instances where expected frequencies were below the acceptable threshold, the χ^2 test with Yates' correction was used. For comparing mean values between groups, Student's t-test was employed. A p-value of less than 0.05 was considered indicative of statistical significance.

All data were examined for normality of distribution prior to analysis. Missing responses comprised less than 5% of the total dataset, and each indicator was calculated based on available responses only. To enhance the clarity and interpretability of the findings, results were presented using a combination of tables and graphical illustrations.

All statistical analyses were conducted using SPSS software version 14.0 (Statistical Package for the Social Sciences, SPSS Inc., USA).

RESULTS

The study included a total of 196 participants, comprising 20.4% (n=40) nurses and 79.6% (n=156) physicians. Among the respondents, 37.8% (n=74) were from re-profiled facilities, 44.4% (n=87) from non-profiled facilities, and 17.9% (n=35) from partially re-profiled medical institutions in the Republic of Armenia.

The breakdown of participating physicians by specialty was as follows: general practitioners made up 17.9% (n=35), pediatricians and surgeons each accounted for 7.7% (n=15), family physicians comprised 6.6% (n=13), cardiologists 5.6% (n=11), and both obstetricians-gynecologists and radiologists represented 4.6% (n=9) each, among others. The participants were generally experienced professionals, with an average service duration of 20.4 years.

Regarding Covid-19 training, 38.7% (n=75) reported having received specific training, while 61.3% (n=119) stated they had not. When asked whether their facility had been officially designated as a Covid-19 center, 36.8% (n=71) confirmed it had, whereas 63.2% (n=122) said it had not. In terms of patient cases encountered, 39.9% (n=73) dealt exclusively with cases confirmed by polymerase chain reaction (PCR) testing, 30.6% (n=56) treated cases not confirmed by PCR despite the presence of Covid-19, and 29.5% (n=54) reported handling both PCR-positive and PCR-negative cases.

Due to the demands of the pandemic, 21.2% (n=40) of healthcare workers were reassigned to different units focused on Covid-19 care, while 78.8% (n=149) continued working in their original departments. A large proportion of physicians - 88.7% (n=125) - reported that they had not personally had to refuse care to patients within their specialty during the Covid-19 pandemic, while 11.3% (n=16) indicated that they had.

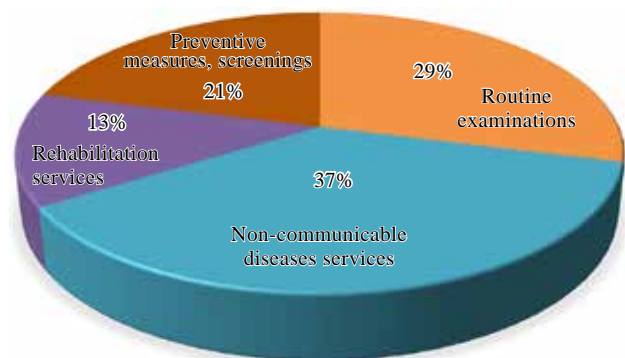


FIGURE 1. Distribution of Documented Refusals in Healthcare Facilities by Type of Care

In terms of staffing issues, 37.5% (n=57) of physicians acknowledged experiencing staff shortages, whereas 62.5% (n=95) did not report such issues. Out of the 156 physicians surveyed, only 68 reported significant instances of care refusal during the pandemic. The causes for these refusals, as recorded by medical institutions, are detailed in Figure 1.

A total of 81.7% of respondents (n = 156) reported an increase in workload associated with coinfection cases, whereas 5.2% (n = 10) indicated a reduction in workload, and 13.1% (n = 25) observed no notable change.

Considering that healthcare professionals were operating under conditions of heightened tension and psychological strain during the COVID-19 pandemic, an assessment was conducted to evaluate changes in their psycho-emotional stress levels. The findings revealed that 26.8% (n = 51) experienced a marked increase in psycho-emotional stress, 19.5% (n = 37) reported a moderate increase, and 26.8% (n = 51) indicated no change in their stress levels.

As illustrated in Table 1, minimal or no change in psycho-emotional stress levels was observed among respondents who reported no variation in their workload. The analysis revealed a statistically significant association between workload changes and stress levels ($\chi^2 = 14.268, P = 0.03$).

A statistically significant relationship was found between reported shortages in oxygen or medication and the psycho-emotional status of healthcare workers ($\chi^2 = 9.699, P = 0.021$). As shown in Table 2, respondents who reported no deficiencies in oxygen supplies or necessary medications were more likely to experience no change in stress levels.

TABLE 1.

Levels of Psycho-Emotional Stress Among Medical Specialists

Stress level changes*	Change in workload				Total	
	Increased due to Covid-19		Unchanged or decreased		N	%
	N	%	N	%		
No change	33	64.7%	18	35.3%	51	100%
Slightly increased	30	81.1%	7	18.9%	37	100%
Increased	46	90.2%	5	9.8%	51	100%
Significantly increased	44	89.8%	5	10.2%	49	100%

NOTES: (*) - All study participants were asked the following question: "How did the level of stress and psycho-emotional state vary in relation to workload?"

Regarding financial conditions during the COVID-19 pandemic, 69.1% (n = 132) of healthcare workers indicated that their salaries remained unchanged, 6.3% (n = 12) experienced a reduction, and 24.6% (n = 47) reported an increase. Concerning the provision of personal protective equipment (PPE), 73.7% (n = 140) of participants stated that they were fully supplied, 18.9% (n = 36) were partially supplied, and 7.4% (n = 14) reported not being provided with personal protective equipment.

In terms of resource availability, 64.8% (n = 125) indicated that there was no shortage of oxygen or medications, 23.3% (n = 45) experienced partial shortages, and 11.9% (n = 23) reported significant shortages. Regarding administrative policies aimed at improving staff safety, 62.6% (n = 109) reported that at-risk personnel had limited pa-

TABLE 2.

Changes in Psycho-Emotional Status Among Medical Specialists Based on Resource Availability

Stress level changes*	Drug or oxygen deficiency				Total	
	Substantial or partial deficiency		No deficiency		N	%
	N	%	N	%		
No change	10	19.6%	41	80.4%	51	100
Slightly increased	16	43.2%	21	56.8%	37	100
Increased	24	47.1%	27	52.9%	51	100
Significantly increased	17	33.3%	34	66.7%	51	100

NOTES: (*) - All study participants were asked the following question: "How were the stress level and psycho-emotional status changed based on workload?"

TABLE 3.

Assessment of protective measures and resource availability during the Covid-19

Questions	Answers	N	%
In your opinion, were you fully provided with appropriate protective equipment?	yes	140	73.7
	no	14	7.4
	partially	36	18.9
Did the administration implement any policies for additional staff safety?	limited patient contacts for at-risk staff	109	62.6
	created a special work schedule	54	31.0
	other	11	6.3
Did you experience a shortage of oxygen or medications?	yes	23	11.9
	no	125	64.8
	Partially	45	23.3

tient contact, 31.0% (n = 54) indicated that a special work schedule had been established, and 6.3% (n = 11) noted other strategies (Table 3).

DISCUSSION

The COVID-19 pandemic imposed substantial challenges on healthcare systems globally, including hospitals in Yerevan and regional areas of Armenia. Addressing the pandemic necessitated extensive reorganization and resource redistribution to accommodate the elevated demand for medical services, particularly within the context of constrained healthcare infrastructure.

One major challenge was the need to prioritize care for COVID-19 patients while maintaining services for individuals with chronic and non-communicable diseases. This dual burden led to widespread disruptions in routine healthcare delivery, affecting elective procedures, outpatient services, and diagnostic care. Consequently, the delay in non-urgent services raised concerns regarding potential long-term public health outcomes [Gertz A. et al., 2022; Afkar M. et al., 2022].

In response, healthcare facilities reallocated medical and nursing staff to high-demand units, such as intensive care, and expanded capacity to accommodate increasing patient loads. Additional strategies included mobilizing retired or non-practicing healthcare professionals and involving medical students to strengthen staffing [Shreffler J. et al., 2021]. However, these strategies posed new challenges, such as the need for rapid training and the integration of less-experienced personnel into critical care environments [Binda F. et al., 2021].

The pandemic also had considerable psychological impacts on healthcare workers. The increased workload, risk of exposure, and inadequate resources contributed to elevated stress and emotional fatigue. Mental health support for healthcare workers thus became a critical aspect of pandemic management [Tong F. et al., 2022]. Although counseling services and peer-support systems were introduced in several facilities, limitations in coverage and accessibility remained [Smallwood N., Willis K., 2021].

Despite the challenges encountered, healthcare facilities in Armenia and its regions demonstrated resilience and adaptability in responding to the COVID-19 pandemic. The implementation of training programs, the adoption of infection control measures, and the provision of personal protective equipment helped mitigate the spread of the virus within healthcare settings [Sinha M. et al., 2020]. However, there were also concerns raised regarding the adequacy of protective measures and the availability of essential medical supplies, such as oxygen and medications, highlighting areas for improvement in pandemic preparedness and response.

CONCLUSION

This study provides insight into the operational and psychological challenges faced by healthcare providers in Armenia and its regional hospitals during the COVID-19 pandemic. While efforts to mitigate the impact of the virus were significant, disruptions to regular medical services and stress among healthcare workers were evident. The findings emphasize both the strengths and vulnerabilities of the healthcare system, underscoring the necessity for enhanced preparedness and a fortified healthcare infrastructure.

To better prepare for future public health emergencies, investments should be directed toward improving healthcare infrastructure, ensuring adequate medical supply chains, and prioritizing the mental well-being of healthcare personnel. Strengthening these domains will enhance the resilience of Armenia's healthcare system and safeguard public health during future crises.

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