Social Determination of Health in Healthcare Workers: Lessons and challenges post-pandemic in Ecuador

ABSTRACT

The historical and structural dynamics that connect labor and health are examined from a critical perspective based on Latin American critical epidemiology. Critical epidemiology overcomes the restrictive notion of classical epidemiology that focuses on the health-disease phenomenon from "risk factors", with a focus on the influence of economic, social, and cultural models on the health of workers.**Objective:**Examine the social determination of health in the healthcare community, considering working conditions and their effects during and after the SARS-CoV-2 pandemic in Ecuador. **Methods:**A cross-sectional study from April 2020 to December 2021 that includes data from 2398 healthcare workers at Carlos Andrade Marín Hospital in Quito, Ecuador, tested for the COVID-19 virus. **Results:**The social determinants of health in the healthcare collective were examined in this research along with their link to working conditions at a public hospital in Ecuador following the COVID-19 pandemic. We found that women made up 73% of the healthcare workforce. COVID-19 infected 50% of the hospital's medical personnel during the study period, and 20% acquired the virus again. The most frequently affected direct exposure groups were nursing assistants (55%) and nurses (61%).**Discussion** We reconsider the link between work and health in an all-encompassing interpretative framework, considering historical processes about the standard lifestyle forced on employees (labor, consumption, gender, cultural relations, social supports, and organizational settings).**Conclusion:**This

study challenges the dominant and reductionist paradigm of exposure and risk factors operating independently and examines how workers' health is affected by harmful influences and deterioration in a dialectical process across general, specific, and individual dimensions.

Keywords

Critical epidemiology, COVID-19, healthcare workers, social determination of health.

INTRODUCTION

The SARS-CoV-2 outbreak, which started in late 2019, caused an unparalleled health emergency that had a significant impact on health systems globally. Particularly in underdeveloped nations like Ecuador, the virus revealed systemic disparities in the quality and accessibility of healthcare.Ecuador's Ministry of Public Health reported the country's first SARS-CoV-2 (COVID-19) case on February 29, 2020; the disease quickly spread throughout the country, so as of July 27, 2020, Ecuador has an 11% case fatality rate with 8,976 fatalities and 81,161 confirmed cases(1).

Healthcare professionals were under exponentially greater stress globally, which made precarious working conditions worse and brought attention to the lack of preparation for an emergency of this magnitude (2). In Ecuador, the pandemic had a significant effect on its health system, bringing to light pre-existing shortcomings such as a lack of personal protective equipment (PPE), a shortage of hospital resources, and an excessive workload for medical staff. Healthcare workers at hospitals had to deal with long workdays, increased viral exposure, and an increase in both physical and mental fatigue like in other countries.

Global health workers' experiences were documented by Amnesty International. The United States (507), Russia (545), the United Kingdom (540, including 262 social workers), Brazil (351), Mexico (248), Italy (188), Egypt (111), Iran (91), Ecuador (82) and Spain (63) had the highest number of health worker deaths up until January 2021, according to this report (3). Amnesty International firmly said that "Governments must be held responsible for the deaths of health workers and essential workers whom they failed to protect from COVID-19" (7) in response to these concerning statistics (4). This number is most likely substantially higher in the case of Ecuador since some events were not properly recorded, and because it was hard to quantify them like in other countries.

It has been common practice around the world to study the relationship between work and health from a reductionist standpoint. As a result, we have made the mistake of not considering other aspects of the social production of healthcare workers, such as their living and working environments, and their social relationships, in addition to the analysis of individual risk factors. This has resulted in a distorted understanding of the true meaning of health as a vital component of workers' quality of life. In this context, it is essential to carry out a process of breaking the paradigm of positivist thinking, focused solely on analyzing the SARS-CoV-2 pandemic, from the perspective of classical and formal models, to analyze the dynamic and complex processes that have generated this pandemic, observing with a critical eye that we have faced a serious historical problem, but one that encourages us to solve it with proactive and purposeful energy(5).

In this way, it is necessary to take inspiration from one of the great epistemologists, Juan Samaja, when considering the work process of the healthcare group dealing with SARS-CoV-2 in a hospital setting. Samaja points out that human existence carries with it a certain

way in which the health-disease process manifests itself, a certain profile of health and well-being problems characteristic of each group at a certain historical moment (6). In this case, the encounter with the SARS-CoV-2 virus revealed realities that must be evaluated critically.

Therefore, it is important to analyze the phenomenon experienced by healthcare workers in SARS-CoV-2 from a critical epidemiology perspective, which views phenomena as a convergence of parts and the properties of those parts, which in turn determine the behavior of the whole. Looking at the health-work relationship considering the different dimensions of the social production of life and health at work. Determined in turn by the mode of production and the prevailing economic model today, living conditions, gender, social class, ethnicity, and social relations inside and outside of work, are understood and present from the general and singular dimensions of reality in a society in which healthcare workers live. The processes that derive from the relationships of these categories, in the 3 dimensions of reality, are in the determination of the way of life of the workers and their health process expressed in their biological, psychic, and family bodies (7).

The objective of this study is to use a Latin American critical epidemiology approach to examine the social determinants of health in a healthcare community, considering working conditions and their effects during and after the SARS-CoV-2 pandemic in Ecuador to propose recommendations for strengthening occupational health policies and the comprehensive well-being of the healthcare community post-pandemic.

MATERIALS AND METHODS

Study population and design

This cross-sectional study was carried out over 20 months (from April 2020 to December 2021) including 2398 healthcare workers tested by RT-qPCR for COVID-19. at Carlos Andrade Marín Hospital (IESS), Quito, Ecuador. The demographic variables (age, sex), occupational work, COVID-19 RT-qPCRtest, and reinfection, were collected from secondary data.

Statistical analysis

Descriptive statistics summarize the characteristics of a data set (distribution, central tendency, and variability). The Chi-square test was used to compare the categorical variables between groups. Two-tailed p-value < 0.05 was considered significant. SPSS software v29 (IBM) was used for statistical analysis.

Ethic declaration

This study was carried out after obtaining institutional ethical clearance, following the guidelines and regulations of the institutional ethics committee. This study uses existing data (secondary data) that was collected for a different purpose than the current research.

RESULTS

The present study constitutes an exploratory reflection of a qualitative nature based on critical epidemiology(8), whose fundamental characteristic is to overcome the notions of the old functionalist empirical framework of occupational medicine in which the notions of "risk", "burden" and “damage” towards an emancipatory reflection on the health problems of the healthcare community during the confrontation of COVID-19 pandemic.

PCR results to diagnose COVID-19 were documented in 2398 healthcare workers at Carlos Andrade Marín (IESS) hospital, from April 2020 to December 2021. In addition, cases of reinfection during this period were documented. To determine if there was a significant difference in the number of infections among the healthcare workers, we stratified them

into 3 groups. The high-exposition group was composed of healthcare workers who were in direct and close contact with patients at the hospital (Nurses, Auxiliary Nurses, and Stretcher Handlers). The second moderate-exposition group was composed ofmedical staff (Medical Specialists, General Physicians, Postgraduate Doctors, Medical Students, Paramedics, and Physiotherapists). The third low-exposition group was composed of health personnel with indirect exposure to patients (Radiologist, Laboratory, Nutrition, Pharmacy, and Sterilization personnel).

Table 1. DemographicCharacteristics

Group N=2398	**Age** Mean (SD)	**Gender** Female (%) Male (%)
Auxiliary Nurses (n= 363)	42 (24-65)	304 (83.7%) 59 (16.3%)
Stretcher-bearers (n 51)	44 (26-61)	5 (9.8%) 46 (90.2%)
Nurses (n 682)	41 (26-64)	641 (94%) 41 (6%)
Medical Specialists (n 291)	45 (25-72)	148 (50.9%) 143 (49.1%)
General Physicians (n 246)	33 (24-59)	146 (59.1%) 101 (40.9%)
Postgraduate Doctors (n 156)	33 (28-49)	92 (47.4%) 102 (52.6%)
Medical StudentsInternship (n 216)	26 (23-38)	176 (65.9%) 91 (34.1%)
Physiotherapists (n 76)	39 (27-59)	60 (78.9%) 16 (21.1%)
Paramedics (n 24)	31 (28-40)	14 (58.3%) 10 (41.7%)
Radiologists (n53)	40 (30-62)	32 (60.4%) 21 (39.6%)
Laboratory staff (n 53)	40 (29-63)	43 (81.1%) 10 (18.9%)
Nutritionists (n 32)	36 (26-56)	28 (84.8%) 5 (15.2%)
Pharmacy staff (n 43)	37 (26-74)	34 (79.1%) 9 (20.9%)
Sterilization staff (n 21)	42 (29-52)	21 (100%) 0 (0%)

The health professionals in the study ranged in age from 23 to 74 years old, with medical specialists being the oldest group on average at 45 years old (25-72), followed by stretcher-bearers at 44 years old (26-71), nursing assistants at 42 years old (24-65), and nurses at 41 years old (26-64). On the contrary, the youngest groups were medical students 26 years (23-38), followed by paramedics 31 years (28-40), general practitioners 33 years (24-59) and postgraduate doctors 33 years (29-49).

In the Carlos Andrade Marín Hospital, we found that women comprised 73% of the health professionals during the research period; they were most prevalent in the sterilization groups (100%), nurses (94%), nutritionists (85%), nursing assistants (84%), and laboratory staff (81%). Conversely, men were only more prevalent among postgraduate doctors (53%) and stretcher carriers (90%) than among any other category. A 3:1 female/male worker ratio was evident.

Table 2.COVID-19 positivity by gender, contagiousness, and healthcare staff group.

Group n= 2398	**COVID-19** Positivity (%)	**Positivity** Female (%) Male (%)	**Recontagion** n (%)
NursingAssistant (n=363)	220 (60.6%)	181 (82.3%) 39 (17.7%)	90 (40.9%)
Stretcher-bearer (n 51)	25 (49%)	2 (8%) 23 (92%)	5 (20%)
Nurse (n 682)	377 (55.3%)	359 (95.2%) 18 (4.8%)	190 (50.4%)
Medical Specialist (n 291)	122 (41.9%)	55 (45.1%) 67 (54.9%)	57 (46.7%)
General Physician (n 246)	119 (42.8%)	66 (55.5%) 43 (44.5%)	56 (47.1%)
Postgraduate Doctor (n 156)	74 (38.1%)	33 (44.6%) 41 (55.4%)	8 (10.8%)

Medical StudentInternship (n 216)	125 (46.8%)	84 (67.2%) 41 (32.8%)	5 (4.0%)
Physiotherapy (n 76)	35 (46.1%)	28 (80%) 7 (20%)	16 (45.7%)
Paramedical (n 24)	10 (41.7%)	4 (40%) 6 (60%)	7 (70%)
Radiologist (n53)	22 (41.5%)	11 (50%) 11 (50%)	11 (50%)
Laboratory (n 53)	31 (58.5%)	23 (74.2%) 8 (25.8%)	25 (80.6%)
Nutrition (n 32)	9 (27.3%)	8 (88.9%) 1 (11.1%)	7 (77.8%)
Pharmacy (n 43)	18 (41.9%)	23 (92%) 2 (8%)	10 (55.6%)
Sterilization (n 21)	12 (57.1%)	9 (100%) 0 (0%)	3 (25%)

Throughout the study, we discovered that 50% of all staff members had the virus and 20% of the hospital's healthcare staff had re-infected COVID-19. The most often affected groups with direct exposure were nursing assistants (55%) and nurses (61%). The most often affected groups with indirect exposure were sterilizing personnel (57%) and laboratory personnel (58%). Medical specialists (41.9%), radiologists (41.5%), paramedics (41.7%), postgraduate physicians (38%), and nutritionists (27%), were the least infected groups.

Women accounted for 74% of infections, making them the most affected group. The most infected women who had direct contact with the patient were medical students (67%), nursing assistants (82%), and nursing groups (95%). Conversely, pharmacy employees (92%), nutritionists (89%), and laboratory personnel (74%), were the group of women who were infected despite not having direct contact with the patient.

In terms of reinfections, we found that the nursing groups (50.4%), general practitioners (47.1%), and specialized physicians (46.7%) which had direct contact with patients were the most affected. The most often reinfected groups in the indirect exposure categories were laboratory (80.6%) and nutrition (77.8%) groups.

Table 3. COVID-19 exposition.

COVID test n= 2398	**High Exposition** n =1096 n (%)	**ModerateExposition** n= 999 n (%)	**Low Exposition** n =303 n (%)
Positive n =1199	622 (56.8%) *	458 (44.1%)	92 (45.3%)

*P value = <0.001 comparado con exposición intermedia y baja

We categorized nurses, nursing assistants, and stretcher-bearers into groups with high and direct exposure to evaluate the risk of COVID-19 infection. Moderate exposure to paramedics, physiotherapists, general practitioners, postgraduate doctors, specialists, and rotating interns. Low or indirect contact with nutrition, sterilization, radiology, laboratory, pharmacy, and administrative staff.

We confirmed that the groups with the highest exposure and direct patient contact (nurses, nursing assistants, and stretcher-bearers) had a higher probability (p=<0.001) of contracting COVID-19 (56.8%) compared to the medium and low exposure groups.

DISCUSSION

The crucial point of the debate to assess the reality of health workers is the need to describe individual and group specificities and examine them considering the context of gender, social insertion, ethnicity, andoccupationjob. This dynamic requires understanding and acting in this double existence to advance through the morbicentric pattern and identify

concerns and research through individual and social analytical units while maintaining a collective theoretical-methodological framework (2). Several questions have caught our attention in the wake of the SARS-CoV-2 pandemic, multiple extractivism, human exploitation, environmental degradation, the lack of ethical values , and the absence of public policies on health and safety at work. These questions invite us to consider how we can address the work-health relationship and the working conditions of hospital workers by incorporating an epistemological change in the relationship between health and work that allows us to expand our scope of research, intervention, and care for workers' health in the general, particular, and individual dimensions (8).

During the time of confronting the SARS-CoV-2 pandemic, a reality was configured around the regulations that had to be implemented in the hospital workspace and the recommendations made to hospital units regarding the care and protection of workers. Among the most important recommendations were scrupulous compliance with adequate rest periods, food intake spaces that guarantee social distancing, rest spaces for staff leaving high biological risk level areas (level IV), access to healthy food, and access to emotional relief spaces(9).These recommendations were not entirely followed in Ecuador, which exposed a poor health system.During the pandemic, personal protective equipment was a vital component of healthcare operations, however, in our nation, it was nearly always in critical stock. A whole problem of corruption arose around this issue due to its accumulation and exaggerated cost for its commercialization. Many authorities in the health system were involved in corruption scandals for the purchase of medical supplies, masks, gloves, face shields, and all the biosecurity equipment essential for working in biological risk areas(10).

In this study conducted at the Carlos Andrade Marín Hospital, we found that the group of nurses and nursing assistants had the highest rate of SARS-CoV-2 infection (597 cases), exceeding the other direct exposure categories (medical professionals). This phenomenon may be associated with the exposure and the time dedicated by these personnel to patients infected with COVID-19. The Ministry of Public Health of Ecuador reported 2,182 confirmed cases of COVID-19 in nursing professionals and 1,177 in auxiliary workers between March and August 2020. This enables us to demonstrate that there was a substantial impact on nursing personnel across the nation. (1).The epidemic also brought attention to gender inequities among health professionals exposed to the virus because the majority of nurses were women, many of whom are heads of homes and work several jobs to support their families.

Most of the infected nurses were those who were exposed in critical care areas, followed by nursing assistants, a workgroup that exposed a reality that perhaps went unnoticed for a long time, but the pandemic revealed an urgent need to rethink workers' health beyond the classic approach to occupational risks. As a rule, it is recommended that, per shift, the optimal ratio should be 1 nurse for every 2 critical patients and reinforce 1 more nurse for every 4-6 beds at times of maximum workload (prone position, intubation, performance of special techniques, transfers, etc.). The support nurse should be an experienced professional who can make up for the lesser experience and knowledge of other professionals(11).

This recommendation was not followed in Ecuadorian hospitals. Due to institutional necessity, a large number of workers from this group who lacked the necessary training for managing critical patients were placed directly into critical areas of managing and treating COVID-19 patients, increasing worker fatigue and the risk of infection.

Hospital environments frequently experience work overload and emotional stress, with variations across various professional categories and functions. (12). During pandemics, these processes increased in frequency and severity, leading to persistent anxiety and feelings of insecurity. Healthcare workers were afraid of spreading the disease to their immediate family when they got home, also they had trouble in their relationships with their coworkers(13).Additionally, an elevated chance of absence from work had to be expected because professionals in all health sectors are more likely to become infected. This would involve a quarantine lasting around two weeks, with an extended period of sick leave in the event of a major disease(9). Therefore, during a pandemic, it is essential to consider adopting a policy of large, relaxed work groups with available replacement staff, given the existing professional burnout, and the high possibility of unforeseen absences.

Although hospitals provide treatment for those who have lost their health, they are also places of employment with high expectations that have a significant influence on the lifestyles and health of those who work there.In addition to the emotional and psychological stressors they encounter daily, which often lead to feelings of discontent and demotivation, the working environment itself—including instruments personal safety equipment, workspaces, and the availability of sufficient supplies also influences healthy job processes(14).

Undoubtedly, the analysis of the working conditions faced by health careprofessionals determines not only their health condition and consequently the integral well-being of their families, but also directly and proportionally affects their quality of work with patients. The unhealthy processes of these jobs and their intensity depend largely on the policies applied

in hospital work centers and at the level of health systems, directly affecting professional performance profiles(12).

In light of the COVID-19 pandemic, the health status of healthcare professionals worldwide has demonstrated the growing need for a social, gender, and rights-based approach as guiding principles for state operations. ILO statistics show that health issues that cause workers to become temporarily or permanently incapacitated, as well as work and environmental situations that cause health issues and injury to people, groups, and the environment, respectively, are still a problem. (15).

Health workers experience burnout primarily as a result of their work schedules, working at night, not having enough rest areas in their workspaces, not having access to nutritious food, serious substance abuse issues, and gender's continued establishment of a hierarchical relationship that frequently leads to physical, psychological, and sexual abuse.In this regard, the lack of government regulations aimed at creating unambiguous safeguards for healthcare professionals is essentially a serious shortcoming; however, the chronic emergence of these detrimental practices is also significantly influenced by the indifference of the officials in charge of running health facilities at all levels.

After weeks of desperately taking care of patients who were hanging from respirators every day, medical professionals concluded that one of the biggest errors made by Western health models during and after the COVID-19 pandemic was to place too much emphasis on the patients while neglecting basic hospital operations like workforce. Technologized systems impose productivity imperatives and value and qualify health workers based on numbers, such as the number of patients treated, the number of beds per nurse, and the number of procedures performed. Their dimensions as a work collective that develops work processes

in quantity and quality that frequently exceeds the capacity of care result in a persistent state of stress and professional burnout in health workers.

Due to its close association with human nature, the health-work relationship is extremely flexible. In this line of work, people who are in charge of caring for and tending to other vulnerable people are constantly suffering from physical, biological, emotional, and psychosocial burnout. As a result, it is important to view the relationship between work and health from a different perspective. In the case of the SARS-CoV-2 pandemic, which did not only affect the individuals who contracted COVID-19, it was and still is a disease that affects groups of people and the workers who provide care for these sick people simultaneously.

Workers' participation (union, professional organizations, safety, and health committees) has been weakened in Ecuador's political and social context, which has led to the cancellation of participation in decision-making and the lack of a discussion agenda within workers' organizations. Since workers, who are the primary rationale for this group's existence, have been reduced to only instruments of a care service process, this weakness has affected the entire management structure of safety and health at work(16).

Gender relations have historically and culturally evolved by perpetuating a logic of sexual role difference in the traditional family, where the mother is the reproductive caretaker, and the father is the producer-provider "the head of the family"(17). Among other things, the obvious hierarchy of the male group of doctors serves as the basis for this usual gender division of work in the hospital setting. This has allowed a vicious cycle to develop in which nurses are supposed to receive "easier" jobs, resulting in a vertical segregation characterized by the hierarchical division of power. This reinforces the logic of the economy of symbolic commodities in the workplace(18).

CONCLUSIONS

According to the study, health workers experienced unfavorable circumstances, especially during the pandemic, which were the product of broader structural dynamics. These included a lack of labor protection laws, excessive labor exploitation, a lack of appropriate rest areas, and a shortage of basic material resources, like personal protective equipment.It is essential to comprehensively analyze the well-being of healthcare workers as a result of structural, historical, and social conditions; the health of healthcare workers cannot be reduced to the absence of disease or the management of individual risks. Health is built on the interaction between political, economic, social, cultural, and labor factors.

We must approach the challenge of incorporating the theoretical contributions of Latin American critical epidemiology in the process of developing health policies for healthcare workers which consider class, gender, culture, and ethnic relations as key categories of reflexive analysis. In this regard, the lessons learned from the COVID-19 pandemic support the emancipatory approach that integrates the following: the active involvement of workers in decision-making; the redesign of policies that ensure full labor rights, including access to decent working and health conditions; and the implementation of intervention strategies that take intersectional categories like gender, class, and ethnicity into account.

REFERENCES

1. El MSP informa: Situación coronavirus Covid-19 (11-08-2020) – Ministerio de Salud Pública [Internet]. [citado 12 de agosto de 2020]. Disponible en:

https://www.salud.gob.ec/el-ministerio-de-salud-publica-del-ecuador-msp-informa-situacion-coronavirus/

2. Gonçalves RBM. Práticas de saúde: processos de trabalho e necessidades. Práticas Saúde Process Trab E Necess. 1992;53–53.

3. COVID19: Las muertes de personal sanitario ascienden al menos a 17.000. [Internet]. [citado 10 de abril de 2021]. Disponible en: https://www.amnesty.org/es/latest/news/2021/03/covid19-health-worker-death-toll-rises-to-at-least-17000-as-organizations-call-for-rapid-vaccine-rollout/

4. Global: El personal sanitario, silenciado, expuesto y atacado [Internet]. [citado 10 de abril de 2021]. Disponible en: https://www.amnesty.org/es/latest/news/2020/07/health-workers-rights-covid-report/

5. Breilh J. COVID-19: Determinación social de la catástrofe, el eterno presente de las políticas y la oportunidad de repensarnos. Rectorado de la Universidad Andina Simón Bolívar, Sede Ecuador. julio de 2020;2:18–14.

6. Samaja J. Elementos para una teoría de la investigación científica. :400.

7. Jaime Breilh. Nuevos conceptos y técnicas de investigación. Tercera Edición. Quito-Ecuador: Centro de Estudios y Asesoría en Salud, CEAS; (Epidemiología Crítica; vol. 1).

8. Breilh J. Epidemiología Crítica. 1era edición. Buenos Aires: Lugar; 2007. 320 p.

9. Raurell-Torredà M, Martínez-Estalella G, Frade-Mera MJ, Carrasco Rodríguez-Rey LF, Romero de San Pío E. Reflexiones derivadas de la pandemia COVID-19. Enferm Intensiva. 1 de abril de 2020;31(2):90–3.

10. Castro M. Personal médico en Ecuador insiste en la falta de insumos de protección [Internet]. GK. 2020 [citado 10 de diciembre de 2024]. Disponible en: https://gk.city/2020/03/26/falta-insumos-proteccion-coronavirus/

11. Chamizo Vega C. La perspectiva de género en Enfermería: comentarios y reflexiones. Index Enferm. 2004;13(46):40–4.

12. Breilh J. La medicina Ecuatoriana en el siglo XXI. Universidad Andina Simón Bolívar, Sede Ecuador; 2018.

13. Organización Mundial de la Salud. Organización Mundial de la Salud. [citado 23 de septiembre de 2020]. Situación de la enfermería en el mundo 2020. Disponible en: https://www.who.int/es/publications/i/item/9789240003279

14. OIT. El gran problema del empleo en el mundo: Las malas condiciones de trabajo | International Labour Organization [Internet]. 2019 [citado 10 de diciembre de 2024]. Disponible en: https://www.ilo.org/es/resource/news/el-gran-problema-del-empleo-en-el-mundo-las-malas-condiciones-de-trabajo

15. ILO, Oficina Internacional del Trabajo. Igualdad de género y trabajo decente: Convenios y recomendaciones claves de la OIT para la igualdad de género 2012. 3rd ed. Geneva: ILO Publications; 2012. 234 p.

16. Betancourt Ó, Navas M, Velasco JP. LA SALUD Y SEGURIDAD EN EL TRABAJO EN EL ECUADOR Y NUEVAS PERSPECTIVAS4. Med Ecuat En El Siglo Xxi Quito-Ecuad Univ Andina Simón Bolívar. 2018;101–21.

17. Fernández MCS. La interacción trabajo-familia. La mujer y la dificultad de la conciliación laboral. Lan Harremanak Rev Relac Laborales. 2014;(30):163–98.

18. Bourdieu P, Jordá J. La dominación masculina. Anagrama Barcelona; 2000.