Bridging Perspectives: Interdisciplinary Insights into Social Sciences and Health

A publication of the East Coast Colleges Social Science Association
Volume 22, Summer 2025

The ECCSSA Journal

Founded in 1986

The ECCSSA Journal is a peer reviewed academic journal published annually. The journal provides articles written by qualified professionals in the area of Social and Behavioral Sciences and related areas, based on conference themes.

ISSN 0896-1360

Volume 22 - Summer 2025

Contents

Preface

To our esteemed readers, contributors, and advocates of interdisciplinary research,

It is with great pleasure that we present Volume 22 of the ECCSSA Journal. This edition underscores our commitment to exploring the intersection of economics, social sciences, technology, and health through interdisciplinary lenses. In a time marked by rapid change and complex global challenges, the articles in this volume bring forward timely discussions that deepen our understanding of the human experience and institutional transformation.

This volume highlights our 49th conference theme: Bridging Perspectives — Interdisciplinary Insights into Social Sciences and Health.

We open with Allison Millward's compelling examination of healthcare workers' experiences during mass casualty events, weaving together narratives and data to shed light on the human side of crisis response. Babita Srivastava then addresses the escalating issues of workforce turnover, burnout, and economic strain within healthcare systems—challenges that continue to demand urgent policy and organizational solutions.

Finally, the discussion of safety and systemic inefficiencies continues with Anjita Singh, Luman Zhao, and Jia Yu, whose collaborative work analyzes the often-hidden causes of medical errors and the interventions necessary to bring these issues to the surface for prevention and reform.

Collectively, these articles reflect the journal's mission to bridge disciplines, generate dialogue, and encourage actionable insights. Whether in the context of healthcare or digital innovation, the challenges discussed here call for both critical inquiry and compassionate leadership.

We thank our contributors for their rigorous and meaningful work, and our readers for your continued support of ECCSSA's vision. We hope this volume stimulates reflection, dialogue, and innovation in your fields of practice and study.

With sincere appreciation,

Dr. Sushma Shukla

Editor-in-Chief, The ECCSSA Journal

Behind the Numbers, Between the Lines: Interdisciplinary Approaches to Understanding Healthcare Workers' Experiences in Mass Casualty Events

Allison Millward

Assistant Professor of History
Division of Humanities, Business, and Social Sciences
Rowan College at Burlington County
Mount Laurel, New Jersey

Abstract

During and after the global pandemic of 2020, medical workers within all levels of the healthcare system dealt with burnout, trauma, stress from the politicalization of their professions, and fear of their future of their careers and the world in general. Amongst the varying factors of stress is a sense of silencing, or, a powerlessness to make their voices heard admist social, economic, and political norms and expectations about how healthcare workers should practice their professions during crisis. To demystify these silences amongst such intersecting expectations, scholars can apply the social science method of narrative inquiry to healthcare research to explore the lived experiences of healthcare workers during this era. In addition to applying narrative inquiry, scholars would benefit from applying the historical methodology of analyzing past life writings of healthcare workers in similar world crises to explore how they both expressed their trauma and were silenced by the society in which they lived. Doing so will allow scholars to understand how caregivers throughout history have contributed to the evolution of their professions and how they bear witness to crisis through their profession. This paper will use a comparative analysis of past and present narratives to argue that modern healthcare can be improved and understood in the context of its time when it uses cross-disciplinary methods to reveal the experiences of people who worked on the front lines. It will explain

how silencing occurs in both modern and historical records, and the case for using interdisciplinary studies in conversations about healthcare and global crises.

Keywords: *narrative inquiry, interdisciplinary methods, life-writings, crisis, mass casualty events*

Introduction

In modern healthcare and resource management, quantitative data have been standard in understanding the experiences of workers, patients, and stakeholders. Indeed, with modern technology and the emergence of AI, identifying patterns to gather information. However, more healthcare scholars are currently promoting narrative inquiry, the study of experience interpreted by and through stories of practice, in research (Connelly & Clandinin, 1990, p. 2). Indeed, its use is advocated in mixed methods research to analyze data while respecting the subjects' dignity and experiences. According to Green (2013):

> Narrative knowing is far more complex than simply setting stories to text (Bruner, 1990 via Green, 2013, p. 63). For nursing researchers, narratives not only help to explore issues such as personal identity, life-course development and the cultural and historical worlds of narrators, they also help to illuminate the intricacy of specific phenomena along with the inter-sectionality paradigms that posits people's experiences as products of how they identify themselves (Chow et al., 2009 via Green, p. 63).

According to Wang and Geale (2015), "Rather than attempting to categorize research data, viewing the data from an objective stance, or generalizing the data to develop 'laws', the narrative approach acknowledges human experiences as dynamic entities that are in a constant state of flux," (p. 196). This idea of the 'dynamic' experience allows researchers to understand the multi-faceted ways critical issues in healthcare work, such as work and burnout, deeply affect different individuals. Indeed, numbers can ascertain healthcare workers experience trauma, but exploring the how and the forms that trauma takes can serve as a means to provide more outreach and care to critical caretakers. Within in healthcare research, an interdisciplinary approach using mixed methods is beneficial to uncovering the major lived-experiences of healthcare workers during traumatic times, specifically through the use of analyzing memoirs and published journals.

Narrrative Inquiry: A Discussion of Literature and Terms

Indeed, narrative inquiry serves as an important way in which healthcare workers serving during times of mass casualty situations such as during war or pandemic can articulate their experiences, giving further insight into how

healthcare workers processed their work and their bearing witness to war and disease, among other major casualty situations. Though it has been long established that workers in combat-ridden zones have spoken about their trauma and suffered from PTSD, little has been studied on their lived experiences in these situations. Recently, Beresford (2023) contended little was studied on healthcare workers, focusing mostly on paramedics in conflict zones, leaving opportunities for researchers to engage in interdisciplinary studies which combine data; medical, military, and personnel records; and historical. Likewise, Dishman and Smith (2023) and Flegg (2023) undertook early studies in life-writings of COVID medical workers using semi-structured art-based research approached. In both conflict and pandemic studies, more modern narrative inquiry approaches are required to reveal key themes of experiences that provide insight in the impact of trauma on such staff.

However, when it comes to understanding how the practice and practitioner change as a result of a crisis, much of it relies on quantitative data such as migratory studies and personnel files. Quantitative data, when possible, relies on surveys with a heavy emphasis on numbers to explain phenomena. This isn't new: for example, studies examining the experiences of Vietnam-era war nurses weren't undertaken seriously until the 1980s, and this began with surveys on whether or not they felt heard as a group and as a subculture of the personnel at war (Scannell-Desch, 2000). Similarly, women in World War I were at first lauded but then buried in the historical record (Millward, 2025 [Manuscript in Preparation]). Indeed, in general, World War II gave women a voice in American society because of the era's popularity.

The distinct separateness between numbers and voices have, until recently, driven a wedge between qualitative and quantitative research when the two types have the potential to supplement one another. Indeed, when there is a lack of cohesion between the two, they can create silencing of healthcare workers. This research applies Jay Winter's definition of silencing to discuss the potentially harmful impact of omitting lived experiences from social science research. Ben-Ze'ev, et. al. (2010) provide a social definition to silencing to war which also explains the culture surrounding caregivers in their bearing witness to trauma:

> A socially constructed space in which and about which subjects and words normally used in everyday life are not spoken. The circle around this space is described by groups of people who at one point in time deem it appropriate that there is a difference between the sayable and unsayable, or the spoken and unspoken, and such a distinction can be made and should be maintained and observed over time (p. 4).

Though there are many reasons for silencing, exploring human experiences without adding their experiences risk losing the complexity of their subjects. Indeed, participants in crisis can self-silence for reason of censorship laws, consideration or friends and family, and the preservation of memory. Concurrently, there are things that they want to say that can't always be captured in simple snapshots. Another issue with healthcare workers in crisis situations is that they are usually seen as the helpers, not the heroes, they are in the background whereas the war, politicians, leaders are in the foreground. In terms of war, they do not have what is called the combat gnostic, which says that those who fight hold the narrative (Millward, 2025, [Manuscript in Preparation]). While the same is not said about their fighting diseases, there is a sense they are used to saving lives in the background. However, silencing can also be caused by a lack of voice behind critical data that is taken.

While many forms of narrative inquiry that exist and can amplify the voices of caregivers is that of life-writings. Life-writings serve as an umbrella term to characterize memoirs, autobiographies, and other records of the self, including unpublished letters and journals (Summerfield, 2019). Though typically utilized in the historical and humanities realm, the combination of life writings and social science research can give 'written opportunities… to pursue questions framed in terms of consciousness and emotion (Summerfield, 2019). In fact, disciplines such as history are informed by life-writings which should be extensively investigated when possible. Personal accounts have regularly been a crucial part of the historical research process to the extent that they provide "written opportunities… to pursue questions framed in terms of consciousness and emotion" (Summerfield, 2019, pp.28-29). They provide both cultural and historiographical value by acknowledging the critical role of letter-writing and diary-writing throughout history, especially in commemorating the war and memorializing major world events such as pandemics. Indeed, in eras when standardized data lacked, personal writings allowed for de facto data collection. Set in archives and libraries for future researchers and public interest, their preservation allowed for later investigation and interrogation of themes that could connect the past and present. That is, a close examination of a spectrum of life-writings allow for a future study of the transformation of the role of healthcare workers, their proximity to conflict and mass casualties, and their responses (Summerfield, 2019). This transformation needs to be examined to appreciate the nuances of letters and diaries of the time, and published autobiographies, especially when considering the era's reliance on letter writing for communicating and chronicling an event. Alistair Thomson argues that letter writing allows the writers to explain their new lives, make sense of change, and

"record momentous experiences," allowing historians to examine the transformation of individuals and societies which are communicated in private writings, and which provides a solid framework to explore the nurses' lives and the context surrounding their experiences (Millward 2025 via Thomson, 2012, p. 105).

Consequently, memoirs and published journals are as important as the other elements of narrative inquiry because unlike letters or quotes from interviews, they can give us a fuller breadth of an experience. Indeed, in the instance of Vietnam War nurses, the surveys at first spoke a little, but it was difficult to get nurses to answer them. Despite the glacial pace at which the women were identified as a subculture within the Vietnam veteran community, memoirs emerging around the same time gave voice to the little data that was gathered about them (Roads and Freeman, 1987; Scannell-Desch, 2000). Additionally, memoirs allow the author a sense of ownership over knowledge, they are not limited to the questions asked or the pressure of the interviewer. Memoirs and published journals can also serve as official histories of an event and how healthcare evolves as a result.

Narrative Inquiry in Practice: Examples from the Past

Comparing the writings of healthcare workers who dealt with World War One and the Spanish Flu with those who served during the COVID-19 pandemic offer important insights on change and continuity of caregiving during crisis. COVID-19 was often compared to the Spanish Flu, offering a logical link between viruses and the scope of which society was impacted. However, during both the Spanish Flu and COVID-19 eras, Western societies widely used language that equated to war. Indeed, the logic was that virology can capture the public's mind for a while, but, the accepted social narrative is traditionally war's lasting power on the public. Having that sense of a common enemy and that sense of a united, patriotic fight. Both conflict and pandemic have been chosen because they have both been rhetoricicalized as war and battles. While war propaganda may be a more obvious fit, both the Spanish Flu and COVID-19 eras provided language which placed healthcare workers in combat and war mode, newspapers such as *The Ogden Standard* printed front page titles such as 'When Gen. La Grippe Declares War on the USA' [see Fig. 1]. In modern times, CNN provided a headline that 'Trump Sees Himself As A Wartime President' [See Fig. 2]. Given examples from different show that there was an expectation to 'fight' and 'defeat' this disease, placing on the shoulders of healthcare workers the added stress of

acting as the main combatants of such conflict because they served on the front lines of disease. Just as with traditional warfare, epidemics require medical teams to work and adjust in ways they don't typically see in civilian life and civilian hospitals. In fact, many of the nurses in this study observed that both before and after the war they struggle to adjust to civilian nursing again because even ER/trauma units are not the same as war.

In one example from WWI, nurses described needing training to understand how to be trained in warfare, changing the very practices of their position, showing the impact traumatic events had on the nursing profession. Canadian nurse Katharine (VanBuskirk) Woodbury, who served with the British Expeditionary Forces under the Harvard Medical Unit, Base Hospital No. 5, emphasized that her civilian nursing training was important, but insufficient for war, recalling, "my surgical training [was most valuable as an army nurse] because I never would have the interest in going up the back of all these pushes every spring if I hadn't had it—if I hadn't been operating with Col. Cabot (Murtaugh, 1980, p. 36)." That there was a difference between civilian and military was clear, she explained: "I did operating just the same as I did, only it wasn't civilian operating, it was the greatest good for the greatest number" (Murtaugh, 1980, p. 36). The 'greatest good' required her to forego individualized care and practice her profession in overwhelming waves, causing her to mechanize nursing rather than invest time and energy in the caretaker role that previously characterized the nursing profession. Indeed, Woodbury's testimony is one of several examples that show crisis in nursing is not the same as daily nursing, and how these workers were required to shift their skills and talent, which couldn't be found in enrollment data or military files.

Similarly echoing Woodbury's challenges in the war, medical workers of her era also dealt with war and flu at once, showing the same shift and transitions in practicing their professions as a result of the pandemonium that they experienced. Dr. Victor Vaughn, who served on the US government's communicable disease division of the medical review board, observed the traumatic cases that hit the US Army hospitals. He wrote about the critical conditions in the medical wards:

> I see hundreds of young, stalwart men in the uniform of their country coming into the wards of the hospital in groups of ten or more. They are placed on the cots until every bed is full and yet others crowd in. The faces soon bore a bluish cast; a distressing cough brings up the blood stained sputum. In the morning the dead bodies are stacked about the morgue like cord wood. This picture was painted on my memory cells at the division hospital, Camp Devens, in 1918, when the deadly influenza

> demonstrated the inferiority of human inventions in the destruction of human life. This infection, like war, kills the young, vigorous, robust adults … The husky male either made a speedy and rather abrupt recovery or was likely to die (Vaugh, 1929, Chapter XI, para. 26).

As with Woodbury, he emphasized the masses, the men appearing the same with similar results. He also noted who it impacted, pointing to the suspicious demographic of the sufferers, allowing historians and health researchers to pinpoint the flu's impact, but also the surprise of workers as disease itself changed because of its severity and its targets. Nurse Helen Dore Boylston, Woodbury's colleague also noted the mental and physical toll of the flu, describing the same type of transformation of the disease and surprise of workers. According to Boylston (1927), the flu exposed several trends of the hospitals and hospital workers:

> The flu is back again and everybody has it, including me. I've run a temperature of one hundred and two for three days, can hardly breathe, and have to sleep on four pillows at night. But I'm not talking about it, because I don't want to be sent to Villa Tino. Kitty thinks I have a cold on my chest-not knowing about the temperature though I think she suspected something last night, when I sat up in bed till four, breathing asthmatically...The hospital is overrun with flu. We've had it every year, of course, but nothing like this. The boys are dying like flies. Those of us who have been here so long and have had it before aren't very sick, but the new unit which has just come over is knocked out. We hear, vaguely, that it is spreading all over the world (pp. 83; 169).

Her comments that 'we've had it every year' juxtaposed with 'nothing like this,' brings that sense of realization that she was on the cusp of transformation in medicine to life. But she also touched on the sense of devotion to patients: she feigned well so that she could keep serving the boys. Anne Donnell (1920), Australian Army Nursing Sister serving in the No. 3 General Hospital in France where she observed the bustling hospital system:

> During our busiest time. too, the influenza swept over us, involving extra work for those who kept well. When the worst was over more help came, but I shall always think that it came too late and at the price of life; for Sister Dickenson-a dear comrade who was with us on Lemnos and who felt she couldn't give in died, one might say at her post, for she was

> on duty the day previous and died of pneumonia. She is now buried in the gardens (p. 259).

Donnell's comment that the influenza "swept" over the hospitals, creating "extra work" showed the strain on hospitals as they tried to balance the two wars without a substantial, if any, increase in staff to accommodate the fight.

To understand the experiences of hospital staff throughout the eras and their shared experiences along with their similarities, later pandemics such as COVID-19 provide crucial narratives of the war against this new novel virus. In an excerpt from her 2023 memoir *Everybody Just Breathe*, Amanda Peterson, a nurse in a Minnestoa-based Intensive Care Unit imagines a conversation with a patient, hinting at her coping with mass trauma. Interestingly, Peterson provides medical data throughout her book juxtaposing them with her interactions with patients, showing the humanity behind each medical file [See: Figure 3]. Peterson (2022) described the conversation:

> Jack, in my head I am considering you already dead. Is that wrong? I think it is a coping mechanism. You are just a body now, albeit one that I watch very closely. There are so many of you that we pour our hearts into, just to end up like this. So, I can't think of you as a person right now. I am sorry about that. That is my confession. I am too busy trying to save you (Chapter XIVIII, para. 6).

Nurse Peterson's conversation to a dying Jack is reminiscent of Vanbuskirk Woodbury's commentary that she cannot nurse the way she would at home, that it was for the greatest number. This idea of bedside nursing in compromised because in an epidemic/pandemic world, it is about procedure and saving lives as opposed to all of the other elements nursing encompasses in addition to saving lives. In other words, these comparisons are not only unique to the era in which they are born, but one can do a cross-sectional study of how healthcare shifts into crisis mode throughout the past century and the consistencies and changes over time.

Meanwhile, a Long Island-based, COVD-19-era nurse, Linda Guglieri Downing wrote in her 2023 memoir, *Lockdown: A Pandemic Experience & Tribute to Nurses During the COVID-19 War* about dealing with the business of a hospital impacted by COVID-19, and dealing with another possible outbreak, that of measles, showing the idea of a duel war without extra staff, much as Anne Donnel described. Guglieri wrote in a similar way to others to show how outsiders may see one event concurring in isolation when reality, for hospital workers, several crises happen concurrently:

> Meanwhile, Jenny was back at the hospital and was dealing with an outbreak of measles in the ER. A child infected with the disease was brought in and immediatley isolated. He was five years old. The parents admitted that they never had him immunized as a baby. Once again, the hospital had another crises on their hands. The parents were questioned as to where they have been in the last few days and officials started making calls to the elementary school the child had been to the few days before. The Center for Disease Control and Prevention (CDC) was called in, and there was a lockdown of the school so that all children and teachers could be questioned and checked. Jenny suited up along with several of the doctors who were now in the boy's room to care for him. His parents had to reveal there, as well (Chapter VIII, para. 1-4).

Linda is telling the story as her memoir, but provides a multiple point of view where she talks about several things happening at once. Like Donnell's two-front war description, Guglieri's type of memoir is reminiscent of Mabel Clint's 'Our Bit' which explores, in part, her role in WWI through the context of the politics and history of the war, giving researchers a sense of her story within the larger history of the war. Indeed, Clint removed herself from the story to show that these lived experiences ran across a spectrum of hospital divisions that were already overworked. It wasn't solely Clint, rather, a shared experience which impacted the hospitals:

> Later too the Influenza epidemic almost filled every hut with medical cases, and the daily work became more like that of a civilian city hospital, with the greater proportion of the patients in bed for days. Infected wounds and gas gangrene were the most serious and difficult cases to treat for months in 1918, amputations being more numerous than at any other period, and tetanus prevalent. Surgical and nursing skill were united in effort to save life and limb amid the appalling wastage of war (Chapter VI para. 11).

Indeed, by intermixing flu and war injuries in detail, Clint, like Gugliari showed how nothing happens in a vacuum. Indeed, adding life-writings adds value to history because it emphasizes historical arguments by showing, not *telling* about the experiences of the past. Therefore, even within personnel studies that examine events like COVID from a historical perspective, life-writings place theory into action, allowing researchers and students to experience the complex interplay of situations as the personnel experienced it.

Conclusion

Indeed, these life-writings serve as guides to healthcare in the world as they serve as both history books and human case studies case studies that tell us about the trauma of high-crises nursing. Just as the healthcare providers in the aforementioned examples looked passed numbers and saw the humanity in their patients, so should any researcher studying the same providers who could potentially suffer from occupational physical, mental, and emotional conditions. In conclusion, along with usual data sets and current types of narrative inquiry, memoirs can tell us a lot about someone's full experience and the context of that experience.

References

Ben-Ze'ev, E., Ginio, R., and Winter, J. (2010) *Shadows of war: A social history of silence in the Twentieth Century.* Cambridge University Press.

Beresford, C. (2023). *Narrative inquiry into emergency medical services organizational culture and traumatic experiences*. (Doctoral dissertation, Royal Roads University (Canada)).

Boylston, H.D. (1927). *Sister: diary of a war nurse*. Ives Washburn.

Clint, Mabel. (1927). *Our bit: Memories of war service by a Canadian nursing-sister.*

Collins, K. (2020). Trump sees himself as a wartime president. *CNN* [Media Clip]. Retrieved 1 September 2024 from https://www.cnn.com/videos/tv/2020/03/18/lead-4p-kaitlan-collins-dnt-live-jake-tapper.cnn.

Connelly, F.M., Clandinin, D.J. (1990). Stories of experience and narrative inquiry. *Educational Researcher*. 19(5): 2–14. doi: 10.3102/0013189x019005002.

Dishman, L. and Smith R.J (2023). How COVID-19 changed frontline healthcare workers' experiences: A narrative inquiry into the impact of chronic burnout on a surgical physician assistant's wellness. *Patient Experience Journal*, 10(2):124-132. doi: 10.35680/2372-0247.1817.

Downing, L. G. (2023). *Lockdown: A pandemic experience & tribute to nurses during the COVID-19 war*. Independently Published, Amazon Kindle.

Flegg, C. A. (2023). Understanding Nursing Resilience During the COVID-19 Pandemic Through Narrative Inquiry and Art. A Feminist Exploration in Educational Research (Doctoral dissertation, Mount Saint Vincent University).

Hughes Spence, S., Khurshid, Z., Flynn, M. et al. (2023). A narrative inquiry into healthcare staff resilience and the sustainability of quality improvement implementation efforts during COVID-19. *BMC Health Services Research* (93)195. https://doi.org/10.1186/s12913-023-09190-4.

Millward, A.R. (Anticipated 2026). *A Comparative study of lived experiences of Anglo-Allied*

nurses on the Western Front. [Unpublished doctoral dissertation, University of Southern
Queensland].

Murtaugh, J. (1980). *Interview: Katharine (VanBuskirk) Woodbury, Margaret Allemang Papers.* University of Toronto Archives and Records Management Services.

Peterson, A.(2023). *Everybody just breathe: A Covid nurse memoir of Stamina and swear words*. Beavers Pond Press.

Rhoads, J. and Freeman, D (1987). Nurses in Vietnam: The forgotten veterans. *Monthly Press*, 1987.

Scannell-Desch, E. (2000). The Culture of War: A Study of Women Military Nurses in Vietnam.
Journal of Transnational Nursing, 15(3): 87-95.

Summerfield, P. (2019). *Histories of the self: Personal narratives and historical narrative.* Routledge.

Thomson, A. (2012). Life Stories and Historical Analysis. In Simon Gunn and Lucy Faire (Eds.),
Research Methods for History, (2nd ed.). Edinburgh, Edinburgh University Press.

Vaughan, V. C. (1929). *A doctor's memories*. Bobbs-Merrill.
Self-Published.

When Gen. La Grippe Declares War on the USA. (1916). *The Ogden Standard*. Chronicling America [pdf]. Retrieved September 1, 2024, from https://tile.loc.gov/storage-services/service/ndnp/uuml/batch_uuml_indurain_ver01/data/sn85058396/print/19160
901/0280.pdf

Appendix A: Figures

Figure 1

When Gen. La Grippe Declares War on the USA, *The Ogden Standard*


MAGAZINE SECTION THE OGDEN STANDARD MAGAZINE SECTION

OGDEN, UTAH, SATURDAY, JANUARY 29, 1916.

When Gen. La Grippe Declares War on the U.S.A.

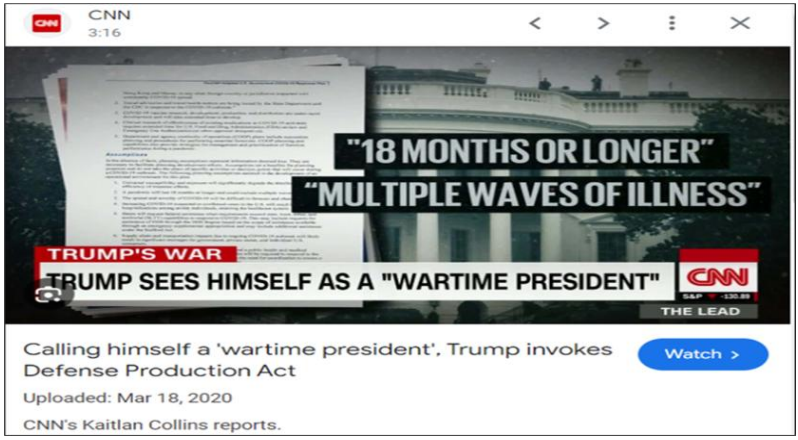
First a Scout Germ Lodges in Your Throat, Then if You Are Weak and Hospitable an Army Quickly Gathers, Just as It Did in the Days of the Imperial Caesar.

B

Note. This figure shows how the rhetoric and language of war was used to raise awareness and call to action measures to fight the disease. From When Gen. La Grippe Declares War on the USA. (1916). *The Ogden Standard*. Chronicling America [pdf]. Retrieved September 1, 2024, from https://tile.loc.gov/storage-services/service/ndnp/uuml/batch_uuml_indurain_ver01/data/sn85058396/print/1916012901/0280.pdf

Figure 2

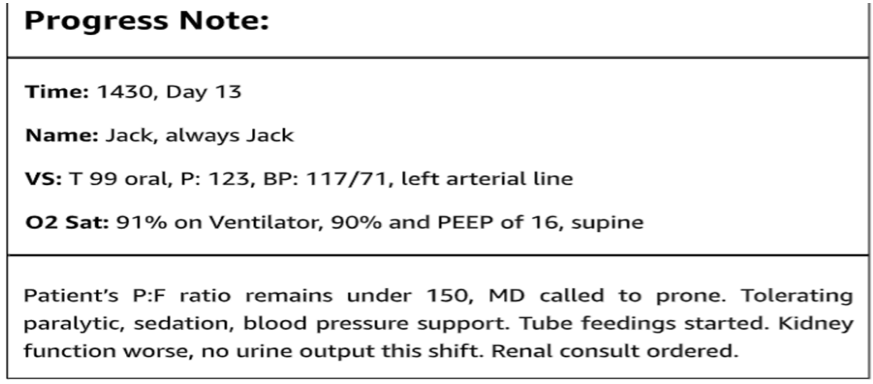
Trump Sees Himself as a "Wartime President," CNN Online Clip



Note. A modern example of the language of war being placed in the broader conversation of disease. Collins, K. (2020). Trump sees himself as a wartime president. *CNN* [Media Clip]. Retrieved 1 September 2024 from https://www.cnn.com/videos/tv/2020/03/18/lead-4p-kaitlan-collins-dnt-live-jake-tapper.cnn.

Figure 3

Patient 'Data' in the Personal Memoir



Progress Note:

Time: 1430, Day 13

Name: Jack, always Jack

VS: T 99 oral, P: 123, BP: 117/71, left arterial line

O2 Sat: 91% on Ventilator, 90% and PEEP of 16, supine

Patient's P:F ratio remains under 150, MD called to prone. Tolerating paralytic, sedation, blood pressure support. Tube feedings started. Kidney function worse, no urine output this shift. Renal consult ordered.

Note. Though Nurse Peterson protects the privacy of the patient by not using a last name, she shows progress notes which combine the medical side of healthcare research with the personal narrative. Peterson, A.(2023). *Everybody just breathe: A Covid nurse memoir of Stamina and swear words.* Beavers Pond Press.

Challenges in Healthcare Workforce Management: Addressing Turnover, Burnout, and Economic Strain

Babita Srivastava, Ph.D.

Cotsakos College of Business

William Paterson University

Wayne, New Jersey

Abstract

Healthcare systems globally experience persistent workforce challenges including rising employee departure rates alongside burnout which leads to mental illnesses, like depression. Healthcare organizations also face fiscal strains from limited budget allocations. This study investigates healthcare's complex issues involving staff turnover, worker burnout and financial challenges. It will also present evidence-based solutions for healthcare workforce management. Through its focus on employment practices, digital technology and cultural dynamics, this study creates a comprehensive framework for healthcare administrators to optimize staffing resources without compromising clinical care standards. A rising need for healthcare services, particularly among the aging population in need of long-term care, demands fresh approaches to workforce development and sustainability. By adopting technological advancements and creation of supportive work environments, healthcare organizations can reduce employee turnover and enhance operational efficiency while improving positive patient outcomes.

Introduction

Today's modern healthcare system faces a critical need to effectively manage its healthcare workforce. The combination of pressing healthcare demands alongside minimal professional staffing and limited financial resources has created an unmatched global health crisis that risks impairing medical care efficiency. This study investigates the impact of medical staff burnout, turnovers and economic limitations that lead to instability in healthcare facilities. The healthcare industry already experiences persistent workforce deficits. This is also exacerbated by recent global health crises such as pandemics. The COVID-19 pandemic fueled substantial increases in healthcare worker burnout rates between 2020 and 2022 (Shah et al., 2021). Hospitals experienced a 258% rise in labor expenditures from 2019 to 2022 due to staffing shortages (American Hospital Association, 2023). Spetz et al. (2019) documented rising healthcare service requirements emanating from population aging, which poses significant challenges due to long-term care facilities. The healthcare sector faces workforce challenges through both aging population trends and rising operational expenses, which limit organizations' ability to address staffing issues solely through financial incentives. This research delivers an extensive review of healthcare workforce management obstacles while presenting data-backed solutions that merge financial limitations with enhanced patient care quality.

The Scope of Workforce Challenges in Healthcare

Employee Turnover: Causes and Consequences

Factors that lead to employee turnover are defined through push and pull dynamics. Push factors such as job dissatisfaction, poor working conditions, low salary, limited development opportunities and lack of supportive management drive employees to seek new positions (Brook et al., 2019). Employees move between jobs through pull factors as they seek for increased compensation, enhanced work-life balance and better working conditions in healthcare settings (Hayes et al., 2012). High rates of staff turnover result in impacts that extend past simple recruitment expenses. According to Griffiths et al. (2019) reduced availability of experienced staff leads to interrupted patient care continuity and potential deterioration of treatment results.

Burnout: A Growing Epidemic

The burnout epidemic among the health care workforce has intensified, with recent studies showing that approximately 35% to 54% of nurses and doctors experience burnout (Shah et al., 2021). The effects of burnout are immense, extending from individual health care providers to the health care system as a

whole. At an individual level, burnout is linked with mental illness, including depression, substance use and abuse, and suicidal tendencies (West et al., 2018).

At the system level, burnout is associated with decreased organizational productivity, heightened medical errors, and impaired patient satisfaction levels (Dewa et al., 2017). The costs of burnout, such as productivity losses as well as turnover cost increments, have been approximated at a total of $4.6 billion annually in the United States alone (Han et al., 2019).

Economic Strain: Rising Costs and Limited Resources

Healthcare organizations have serious financial concerns that hinder effective workforce management strategies. Labor costs generally constitute the single largest expenditure item for healthcare institutions, representing about 50-60% of the overall operating budget according to Bai & Anderson (2020). Various factors contribute to these overhead labor expenditures, such as the compulsory requirements for minimum nurse-to-patient staffing ratios, adherence to healthcare laws necessitating more administrative staff, and shift premiums demanding workers to be paid more for evening, night, and weekend work.

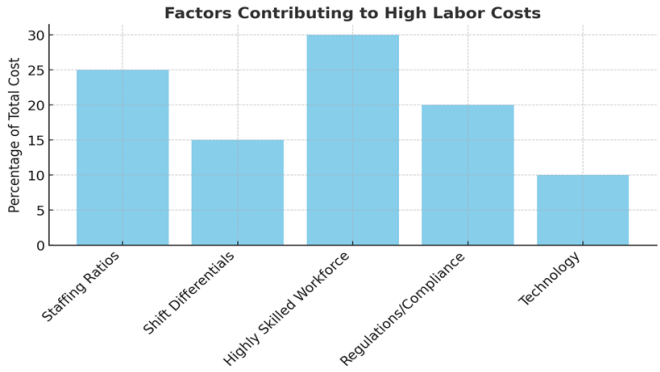


Fig 1.0: Factors leading to high labor cost

Labor Allocation: A Strategic Approach to Workforce Optimization

Defining Effective Labor Allocation in Healthcare

Labor allocation involves the strategic assignment of staff according to their skills, expertise, and individual requirements of the healthcare organization. By strategically placing employees where they excel, organizations can optimize

employee morale, improve workflow, and increase profitability (Ridgewise, 2025). Effective labor assignment in healthcare facilities guarantees that the right specialists are present at the required moments to deliver effective patient care. It demands an advanced comprehension of patient requirements, employee skills, and organizational procedures. The basic pillars of effective labor allocation include: matching skills, balancing workloads, maximizing time, and creating flexibility measures.

Advantages of Strategic Labor Allocation

Utilization of strategic labor allocation practices generates various advantages to healthcare organizations, employees, as well as patients. At an organizational level, effective labor allocation generates cost savings through the creation of optimal deployment schedules and lessening of excessive dependency on high-priced temporary staffing channels, such as agency nurses or locum tenens doctors (Auerbach et al., 2018). Healthcare organizations have been indicated to make significant labor cost savings through streamlined allocation processes and continuing to provide high-quality care. For healthcare providers, the strategic distribution of labor enhances job satisfaction by enabling manageable workloads, decreasing the necessity for overtime, and making schedules more predictable (Dyrbye et al., 2021). Through this practice, burnout is prevented, and intentions to leave practice are potentially decreased.

Implementing Strategic Labor Allocation Systems

An effective labor allocation system needs a structured process of data analysis, stakeholders' collaboration, and continuous improvement. Some of the key processes are needs analysis, defining competency, demand planning, schedule optimization, real-time adjustment mechanisms, and performance monitoring. Analysis of needs entails review of patient population, acuity, and care requirements so as to set baseline staffing needs (Harper, 2005). The second step is to map the needed competencies to develop a human resource inventory. Third, demand forecasting is done using historical data to forecast future staffing needs (Devapriya et al., 2015). In the new era of the Internet of Things (IoT), the use of predictive analytics has proved essential in improving staffing. Predictive analytics has the ability to examine complex patterns relating to patient flow, staff productivity, and care outcomes, thereby enabling the development of more efficient allocation. The next step is schedule optimization so as to ensure staff allocation aligns with demand while considering workers' preferences, legal constraints, and organizational capability (Capan et al., 2016). The next step is real-time adjustment meant to reallocate employees in anticipation of unexpected changes. Last, monitoring sets benchmarks for evaluating staffing effectiveness

and areas of improvement. This contributes to the overall workforce management and patient care effectiveness.

Analysis: These workforce allocation tactics respond directly to the thesis by offering a solution to manage turnover and burnout while maximizing resources during economic limitations. Through matching staff expertise to patient requirements and using predictive analytics, healthcare facilities can maximize operational effectiveness and staff satisfaction, lowering the risks of turnover. In addition, real-time modification and performance tracking guarantee flexibility amidst dynamic healthcare needs, facilitating sustainable staff management. Future studies must examine the long-term effects of such systems on patient outcomes and cost-effectiveness, especially across heterogeneous healthcare environments, in order to advance and validate these approaches.

Addressing Recruiting and Retention Challenges

Recruitment Strategies for a Competitive Market

Current labor market is replete with stiff competition as organizations seek to hire the most qualified candidates. Miseda et al. (2017) noted that healthcare industry, the scarcity of some healthcare professionals has created an environment where these professionals have several career options. Healthcare organizations can improve their recruitment by setting up inclusive organizational culture that nurture career development prospects, promotes work-life balance relations, and seeks to care for the employee's well-being (Brook et al., 2019). Some innovative recruitment strategies involve:

a. Return-to-practice programs that invite former healthcare professionals to resume work through refresher courses regimentation (Auerbach et al., 2018).
b. Pipeline development programs that establish partnerships with schools and develop programs for students.
c. International-based hiring that seeks to tap skills, knowledge and attitude from a worldwide pool of skillset.

Retention: Building a Supportive Workplace Culture

Healthcare organizations are putting emphasis on retention strategies aimed at minimizing dissatisfaction and burnout (Aiken et al., 2018). Center to retention of employees is the establishment and promotion of organizational culture. Organizations that have cultures characterized by psychological safety, respect for one another, open communication, and joint decision-making tend to experience lower employee turnover than organizations with more structured or blame-driven cultures (West et al., 2018). Leaders at all organizational levels are important in instilling cultural norms through their behavior, policies, and

explicitly stated priorities. Certain cultural elements that can foster retention include but are not limited to:

a) Recognition programs aimed at rewarding employee contributions and celebrating their hard-won achievements.
b) Psychologic safety in which error, concern, and opportunities for improvement can be discussed openly without reprimand or embarrassment.
c) Interprofessional collaboration in support of teamwork and shared responsibility for patient outcomes.
d) Policies of work-life integration that respond to personal and family needs include flexible scheduling, job sharing, and paid family leave.
e) Wellness programs that enhance physical and mental well-being through resources, programs, and a culture that prioritizes self-care.

Professional Development and Career Progression

Limited career development and professional advancement opportunities are among the reasons frequently cited for dissatisfaction and turnover among healthcare employees (Brook et al., 2019). Organizations that develop clear career pathways and invest in employee training are more apt to experience higher levels of retention while building more capable workforces. Some effective strategies for professional growth include:

a) Clinical ladder programs that serve to identify and reward the growing levels of knowledge and responsibility exhibited by certain clinical personnel, offering both status promotion and financial remuneration (Dols et al., 2017).
b) Preceptorship and mentorship programs that pair experienced staff members with less experienced colleagues to facilitate knowledge transfer and professional socialization.
c) Leadership development programs that recognize and develop future leaders from within the organization, thereby minimizing dependence on external hiring for managerial roles.
d) Special training programs that allow employees to develop a specialty in an area of interest, such as wound care, palliative care, or quality improvement.

Analysis: These employee development approaches are directly linked to the thesis in lowering turnover by way of job satisfaction and career development, as well as in lowering burnout. By investing in employees' competencies and leadership, healthcare organizations develop a sustainable workforce that is capable of meeting rising care demands without resorting to costly external hiring. Return on investment in these types of programs and their feasibility in

different healthcare positions and environments need to be addressed in future research to ensure extensive application and sustainability.

The Role of Technology in Workforce Management

Electronic Health Records and Operational Efficiency

Technology is being utilized more and more to address healthcare workforce challenges, and one of the most effective technological interventions in healthcare settings has been the use of Electronic Health Records (EHRs) (Srivastava, 2014). While early EHR implementation has a tendency to increase clinical staff workload, well-optimized EHR systems can enhance administrative efficiency and reduce the burden on paper use (Adler-Milstein & Huckman, 2013). Effectively designed EHRs systems enhance organization's processes by: abolishing duplicate data entry, enabling information sharing between healthcare teams, automating routine documentation chores, offering decision support that lowers errors and enhances care quality, and allowing remote access to patient information access.

Automation and Workforce Augmentation

Apart from EHRs, healthcare organizations are becoming more receptive to automation technologies that reduce the burden of repetitive tasks on healthcare professionals. Such technologies include:

a. Automated medication dispensing systems for the storage, selection, and dispensing of medications, reducing pharmacist and nurse workload with improved accuracy (Almalki et al., 2023).
b. Computerized inventory level monitoring and reordering systems, which remove the necessity for procurement and manual counting.
c. Continuous patient monitoring technologies that track vital signs and alert staff to significant changes, thus allowing nurses to focus their efforts where they are most needed (Areia et al., 2022).
d. Scheduling computer programs that optimize staff assignments according to patient acuity, staff preferences, and institutional requirements (Capan et al., 2017).
e. Natural language processing software that transforms spoken narratives into structured records, thereby minimizing the time clinicians devote to documenting notes (Sarella & Mangam, 2024).

These technological efficiencies are designed to enhance the capabilities of the healthcare workforce and not replace it, so that highly skilled professionals can

concentrate on activities needing human judgment, emotional intelligence, and complex clinical skills.

Workforce Planning with Predictive Analytics

Data analysis is an important tool that can be used to address workforce challenges with better forecasting and planning strategies. Healthcare organizations are now utilizing predictive analytics to:

a. Predict patient volumes and acuity levels at different times and places to enable improved staffing plans.
b. Determine trends in employee turnover that can signal deeper issues that need to be addressed, such as overload in certain departments.
c. Schedule more effectively by taking into account complexities like staff preference, skill mix, continuity of care issues, and regulatory requisites.
d. Project long-term staffing needs based on population demographics, disease prevalence patterns, and technological advancements and use this to guide recruitment and training initiatives.

Analysis: Predictive analytics supports the discussion by facilitating proactive workforce management that reduces turnover and burnout, and optimizes resources to the greatest extent. By forecasting the organization's staffing requirements and comprehending turnover patterns, organizations can handle root causes prior to their aggravation, thus maintaining employee wellness and fiscal sustainability. Future research must involve the development of predictive models that control for regional and demographic differences so that they continue to be relevant across varied healthcare environments.

Long-Term Care: Special Issues and Challenges

Increasing Demand for Long-Term Care Services

The need for long-term care (LTC) services is growing at an alarming rate as a result of demographic changes, most notably the aging of the baby boomer cohort (Consumer Affairs, 2024). All of the baby boomers will be age 65 or older by 2030, and the number aged 85 and older, those most likely to require intensive long-term care, is expected to more than double by 2040.

.

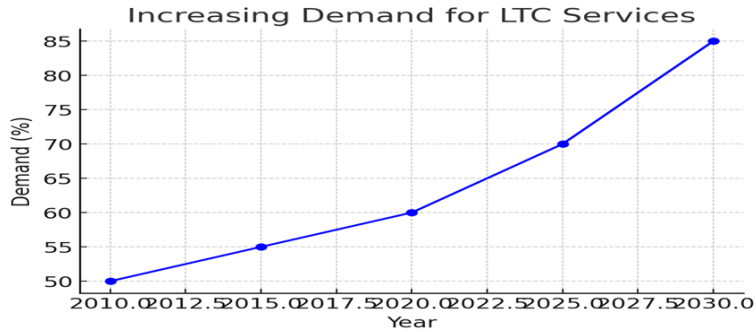


Fig 2.0 Increasing demand for LTC services over the years

Demographic change is accompanied by a rise in the number of chronic diseases that frequently demand chronic care management, such as dementia, diabetes, cardiovascular disorders, and mobility impairment (Gaugler et al., 2018). In addition, family structure changes, marked by rising divorce rates, falling birth rates, and geographical separation of family members, have decreased access to informal carers who would otherwise supply unpaid care to ageing family members (Bott et al., 2017).

Specific Workforce Challenges in Long-Term Care

The LTC sector is faced with labor challenges that, while similar to those that confront acute care settings, have a greater intensity due to structural and economic factors. The aforementioned challenges are: lower wages and benefits, increased turnover, low prospects for advancement among direct care staff, high physical demands of helping residents with activities of daily living, overwhelming regulatory requirements, and emotional demands involved in working with residents who have cognitive impairment and in developing attachments to residents who may deteriorate or pass away (Bott et al., 2017).

Innovative Approaches to LTC Workforce Management

Fixing the long-term care workforce challenges requires innovative solutions that are sensitive to the unique conditions of the industry. Some promising approaches include:

a) Careers that are aimed at supporting career progression among direct care workers by creating specialized job roles, for example, dementia care specialists, restorative aides, and mentor roles (Dols et al., 2017).
b) Universal worker models that cross-train staff to perform a range of tasks (e.g., dietary, housekeeping, and personal care), creating more varied work experiences and increasing scheduling flexibility.
c) Stable labor allocation practices and work groups that place the same staff with the same residents on a consistent basis, thereby permitting relationships and enhancing continuity of care.

Analysis: These LTC workforce management solutions augment the thesis by addressing turnover and burnout through personalized responses that support job satisfaction and operational effectiveness in a resource-constrained setting. Through the creation of career development and flexible positions, LTC facilities can increase retention and care quality, particularly in older populations with intense levels of needs. These solutions also alleviate economic burdens by optimizing existing staff resources. Future research must assess the efficacy of such models in various long-term care environments and their possible fusion with technological advancements to improve workforce sustainability and patient outcomes.

Economic Factors and Management of Expenses

Balancing Labor Costs and Quality of Care

Healthcare organizations face the challenge of controlling labor costs, which are usually their highest cost category, while concurrently delivering high-quality care (Bai & Anderson, 2021). Studies consistently demonstrate that under-staffing is linked to poor patient outcomes, such as increased mortality, a rise in adverse events, and increased lengths of hospital stay (Griffiths et al., 2019). Strategic solutions to balancing quality care with labor costs include:

a. The implementation of acuity-based staffing models that adjust staff levels in accordance with the needs of the patients rather than rigid and firm ratios, and then optimizing available resources.
b. Reduction of non-value-added tasks through workflow redesign, reduction of duplicative documentation, and automation of routine tasks to free up employees to focus on direct patient care.
c. Decreasing premium pay by increasing predictability of schedules, developing internal pools of resources, and creating more effective ways of handling vacations, leaves, and other scheduled time off.

Organizations that are successful in these strategies usually realize that investment in proper staff and workflow optimization yields returns in terms of

decreased complications, decreased length of stay, and decreased turnover expenses.

Supply Chain and Operations Efficiency

Besides labor costs, healthcare providers must also contend with numerous other operating expenses that affect their bottom-line financial sustainability. Effective supply chain management represents one such significant area for potential cost reductions without compromising the quality of care. The main strategies for improving supply chain efficiency are:

a. Standardization of initiatives to reduce the variety of products used for similar applications to enable volume discounts and simplifies inventory management.
b. Just-in-time inventory systems that reduce carrying costs by maintaining lower on-site inventories and initiating reliable resupply systems.
c. Product evaluation committees that assess new products both for clinical effectiveness as well as cost effectiveness before clearance for adoption (Gardner et al., 2019).

Analysis: These supply chain initiatives are likewise consistent with the thesis in that they resolve economic concerns that intensify workforce problems, while ensuring the efficient utilization of resources without affecting the quality of care. By lowering operational expenditures, organizations are able to allocate greater resources towards workforce support, thus indirectly resolving turnover rates and burnout. Future research needs to investigate the long-term financial and clinical effects of such initiatives, especially in small or rural healthcare settings, to ascertain their relevance to various healthcare environments.

Conclusion and Future Directions

Solving the multifaceted problems of handling healthcare employees' needs comprehensive solutions that tackle employee turnover, burnout, and budget limitations concurrently. Those organizations that try single-pronged interventions may attain partial success because these problems are interrelated. Rather, long-term workforce management needs coordinated strategies on;

a. Organizational culture that fosters psychological safety, teamwork, and shared purpose, creating environments where healthcare professionals feel appreciated and supported.
b. Operational systems that optimize workflow, reduce administrative burden, and ensure sufficient staffing levels to allow healthcare professionals to practice at the top of license and focus on high-value patient care.

c. Career development pathways that provide opportunities for growth and development, meeting healthcare workers' demands for continuous learning and career progression.
d. Technology efficiencies that leverage digital solutions to augment the ability of workers, remove tedious tasks, and allow for more flexible work arrangements.

Though various healthcare organizations can adopt different strategies outlined here, some of the workforce challenges necessitate policy reforms and system-wide changes (Spetz et al., 2020). Key areas to consider for policy review are:

a) Pipeline growth in education through increased funding for healthcare education programs, faculty development, clinical training sites, and student financial aid.
b) Regulatory frameworks that balance safety requirements with operational flexibility, avoiding uniform mandates that can fail to address the diverse conditions of healthcare delivery.
c) Immigration policies that facilitate the efficient recruitment of foreign healthcare professionals, while also ensuring ethical standards and successful integration.
d) Technology infrastructure investments that facilitate increased connectivity, sharing of data, and virtual care possibilities across various healthcare environments and geographical locations.

Advocating for these policy reforms is a valuable complement to organizational efforts, with the understanding that sustainable workforce solutions necessitate change at various levels of the healthcare system. Although extensive literature exists for healthcare workforce challenges, there are still important areas of knowledge to be filled and researched. Some key research priority areas include:

a. Comparative effectiveness research evaluates various workforce management approaches and determines which interventions achieve the most improvement in employee retention, wellbeing, and patient outcomes.
b. Predictive modeling to forecast future workforce needs based on population health trends, technological innovation, and evolving models of care delivery.
c. Qualitative studies of the lived experiences of healthcare workers from diverse backgrounds that inform motivations, barriers, and potential solutions for retention beyond quantitative findings.
d. Interdisciplinary research that integrates knowledge from healthcare, organizational psychology, economics, technology, and other fields to develop more comprehensive solutions to workforce problems.

References

Adler-Milstein, J., & Huckman, R. S. (2013). The impact of electronic health record use on physician productivity. *The American journal of managed care*, *19*(10 Spec No), SP345-52.

Aiken, L. H., Sloane, D. M., Barnes, H., Cimiotti, J. P., Jarrín, O. F., & McHugh, M. D. (2018). Nurses' and patients' appraisals show patient safety in hospitals remains a concern. *Health Affairs*, *37*(11), 1744-1751.

Almalki, A., Jambi, A., Elbehiry, B., & Albuti, H. (2023). Improving inpatient medication dispensing with an automated system. *Global journal on quality and safety in healthcare*, *6*(4), 117-125.

American Hospital Association. Hospital Vitals: Financial and Operational Trends https://www.stratadecision.com/sites/default/files/2023-03/AHA%20Q2_Feb%202023.pdf

Areia, C., King, E., Ede, J., Young, L., Tarassenko, L., Watkinson, P., & Vollam, S. (2022). Experiences of current vital signs monitoring practices and views of wearable monitoring: a qualitative study in patients and nurses. *Journal of advanced nursing*, *78*(3), 810-822.

Auerbach, D. I., Buerhaus, P. I., & Staiger, D. O. (2020). Implications Of The Rapid Growth Of The Nurse Practitioner Workforce In The US: An examination of recent changes in demographic, employment, and earnings characteristics of nurse practitioners and the implications of those changes. *Health Affairs*, *39*(2), 273-279.

Bai, G., & Anderson, G. F. (2020). COVID-19 and the financial viability of US rural hospitals. *Health Affairs Forefront*.

Bott, N. T., Sheckter, C. C., & Milstein, A. S. (2017). Dementia care, women's health, and gender equity: the value of well-timed caregiver support. *JAMA neurology*, *74*(7), 757-758.

Brook, J., Aitken, L., Webb, R., MacLaren, J., & Salmon, D. (2019). Characteristics of successful interventions to reduce turnover and increase retention of early career nurses: A systematic review. *International journal of nursing studies*, *91*, 47-59.

Capan, M., Hoover, S., Jackson, E. V., Paul, D., & Locke, R. (2016). Time series analysis for forecasting hospital census: Application to the neonatal intensive care unit. *Applied clinical informatics*, *7*(02), 275-289.

Consumer Affairs. (2024). Long-term care statistics 2025. https://www.consumeraffairs.com/health/long-term-care-statistics.html#:~:text=Baby%20boomers,%20whose%20births%20sparked%20massive

Devapriya, P., Strömblad, C. T., Bailey, M. D., Frazier, S., Bulger, J., Kemberling, S. T., & Wood, K. E. (2015). StratBAM: a discrete-event simulation model to support strategic hospital bed capacity decisions. *Journal of medical systems*, *39*, 1-13.

Dewa, C. S., Loong, D., Bonato, S., & Trojanowski, L. (2017). The relationship between physician burnout and quality of healthcare in terms of safety and acceptability: a systematic review. *BMJ open*, *7*(6), e015141.

Dols, J. D., Hernández, C., & Miles, H. (2017). The DNP project: Quandaries for nursing scholars. *Nursing Outlook*, *65*(1), 84-93.

Dyrbye, L. N., West, C. P., Hunderfund, A. L., Sinsky, C. A., Trockel, M., Tutty, M., ... & Shanafelt, T. (2020). Relationship between burnout, professional behaviors, and cost-conscious attitudes among US physicians. *Journal of general internal medicine*, *35*, 1465-1476.

Gardner, R. L., Cooper, E., Haskell, J., Harris, D. A., Poplau, S., Kroth, P. J., & Linzer, M. (2019). Physician stress and burnout: the impact of health information technology. *Journal of the American Medical Informatics Association*, *26*(2), 106-114.

Gaugler, J. E., Jutkowitz, E., Peterson, C. M., & Zmora, R. (2018). Caregivers dying before care recipients with dementia. *Alzheimer's & Dementia: Translational Research & Clinical Interventions*, *4*(1), 688-693.

Griffiths, P., Ball, J., Drennan, J., Dall'Ora, C., Jones, J., Maruotti, A., ... & Simon, M. (2016). Nurse staffing and patient outcomes: Strengths and limitations of the evidence to inform policy and practice. A review and discussion paper based on evidence reviewed for the National Institute for Health and Care Excellence Safe Staffing guideline development. *International journal of nursing studies*, *63*, 213-225.

Han, S., Shanafelt, T. D., Sinsky, C. A., Awad, K. M., Dyrbye, L. N., Fiscus, L. C., ... & Goh, J. (2019). Estimating the attributable cost of physician burnout in the United States. *Annals of internal medicine*, *170*(11), 784-790.

Harper, P. (2005). Combining data mining tools with health care models for improved understanding of health processes and resource utilisation. *Clinical & Investigative Medicine*, *28*(6).

Hayes, L. J., O'Brien-Pallas, L., Duffield, C., Shamian, J., Buchan, J., Hughes, F., ... & North, N. (2012). Nurse turnover: a literature review–an update. *International journal of nursing studies*, *49*(7), 887-905.

Miseda, M. H., Were, S. O., Murianki, C. A., Mutuku, M. P., & Mutwiwa, S. N. (2017). The implication of the shortage of health workforce specialist on universal health coverage in Kenya. *Human resources for health*, *15*, 1-7.

Ridgewse. (2025). Understanding Labor Allocation: Global Perspectives and Modern Practices. https://ridgewise.com/labor-allocation/

Sarella, P. N. K., & Mangam, V. T. (2024). AI-driven natural language processing in healthcare: transforming patient-provider communication. *Indian Journal of Pharmacy Practice*, *17*(1).

Shah, M. K., Gandrakota, N., Cimiotti, J. P., Ghose, N., Moore, M., & Ali, M. K. (2021). Prevalence of and factors associated with nurse burnout in the US. *JAMA network open*, *4*(2), e2036469-e2036469.

Spetz, J., Stone, R. I., Chapman, S. A., & Bryant, N. (2019). Home and community-based workforce for patients with serious illness requires support to meet growing needs. *Health Affairs*, *38*(6), 902-909.

Srivastava, S., Gupta, R., Rai, A., & Cheema, A. S. (2014). Electronic health records and cloud based generic medical equipment interface. *arXiv preprint arXiv:1411.1387*.

West, C. P., Dyrbye, L. N., & Shanafelt, T. D. (2018). Physician burnout: contributors, consequences and solutions. *Journal of internal medicine*, *283*(6), 516-529.

Icebergs to the Surface: Understanding and Prevention of Medical Error

Anjita Singh, MBA

Southern Connecticut State University

New Haven, CT, USA

singha11@southernct.edu

Luman Zhao, PhD

Assistant Professor of Finance

Hebei University of Economics and Business

Shijiazhuang City, Hebei Province, China

lumanzhao91@hotmail.com

Jia Yu, PhD

Associate Professor of Economics

Southern Connecticut State University

10 Wintergreen Ave

New Haven, CT, USA 06515

yuj4@southernct.edu

Abstract

Introduction

Medical error is a difficult problem as it is challenging to uncover a coherent cause of the errors. Evidence from different sources indicates a significant number of medical errors. There are many research has been completed to identify the statistics and reasons of medical errors. Our paper overviewed several research articles and would like to discuss about the inconsistency of the statistics and the possible causes of medical errors.

Methodology

We reviewed 52 literatures, discussing about the definition and types of medical errors and statistical debate about medical errors.

Results

The review paper demonstrated the categorization of medical errors and the related causes and prevention, including surgical errors, diagnostic errors, and medication errors. In the last part of the review, we elaborate on the role of medical reporting and accountability in the prevalence of medical errors.

Discussion

To better understanding the current situation of medical errors in the US, a common understanding and recognition of medical error reporting and statistic method is needed. The research supports there are at least 200,000 medical error deaths each year in the US. For each type of medical errors, the prevention methods should be implemented based on the analysis of causes.

Therefore, to reduce and control medical errors, additional efforts on data collection, causation analysis, AI application and integration, and collaboration among healthcare organizations, providers, and patients are needed.

Keywords: *Medical errors; Statistics debate; Causes; Preventions; Medical reporting*

Introduction

Recent studies conducted to identify the number of deaths caused by medical error presented an astonishing estimate of 250,000 deaths per year., Makary and Daniel (2016) estimated the number of 250,000 deaths based on four related peer-reviewed studies claiming to estimate the actual number of deaths accounting for medical errors (Makary & Daniel, 2016). However, data on

leading causes of death in the United States in the year 2020, which was published by the Centers for Disease Control and Prevention (CDC), does not list medical error as one of the leading causes of death in the United States. According to CDC's parameters, medical errors either go unreported or indirectly categorized under the broader category of unintentional injuries/accidents. And the category of unintentional injuries/ accidents (5.9%) was number four on the CDC's list of leading causes of death in the year 2020. The third cause was COVID-19 (10.4%), the second was Cancer (17.8%) and the first was imputed to heart diseases (20.6%) (National Center for Health Statistics, 2020), whereas Makary & Daniel (2016) shows death from medical errors was around 9%.

Some research indicated including a medical error in the general category of accidental deaths could obscure the severity of the cause if the numbers estimated by private research studies are on the accurate side. Makary and Daniel (2016) further mentioned that the CDC's data-collecting processes from death certificates on which medical errors are not mentioned separately as a cause of death brings inconsistency in the numbers. Hence, medical errors could be a prevalent hidden cause of death in the US (Graber & Carlson, 2011) which is why it is important to understand and debate medical errors.

This paper discusses the statistics on deaths attributed to medical errors. This discussion includes arguments for and against the research indicating that medical errors are much higher in the United States than the published statistics, containing the exhaustive review of medical error, its definition, and types. This paper then discusses the causes and prevention of prevalent medical errors, such as surgical, diagnostic, and medication errors. Further, the role of medical reporting and accountability in the prevalence of medical errors is examined.

Medical Error: Definition and Types

To analyze the state of medical errors and their outcomes, it is important to understand the concept. Medical errors are essentially preventable adverse outcomes of medical care, which is an unintended act that does not achieve the intended or required outcome (Makary & Daniel, 2016). The unintended act can be of omission or commission. The error resulting from the actions not taken is the error of omission, such as not administering the prescribed drug to a patient by the nurse (Rodziewicz, Houseman, & Hioskind, 2022; Makary & Daniel, 2016) On the other hand, the result of the wrong action taken is the error of commission, such as prescribing the wrong medication because of illegible handwriting, or a short form use (Rodziewicz, Houseman, & Hioskind, 2022).An adverse event is another form of error of commission. It is an event where an

unintended injury is caused by a medical or surgical treatment error (Rodziewicz, Houseman, & Hioskind, 2022).

Further medical errors can also be understood in terms of planning. There are two categories under errors of planning. One is an error of execution when a planned process was not executed properly, resulting in unintended outcomes (Reason, 1990), such as treatment failure due to faulty equipment. Negligence is a form of error of execution when the healthcare worker is negligent in executing the proper treatment, for example, injecting the wrong site or puncturing a nerve while looking for an artery (Rodziewicz, Houseman, & Hioskind, 2022). The second is an error of planning when a faulty plan is formed to achieve a specific outcome, for example, providing treatment or care for a misdiagnosed illness (Reason, 1990; Makary & Daniel, 2016; Rodziewicz, Houseman, & Hioskind, 2022).

Lastly, there are latent and near-miss errors. Errors that might happen in the future because of faulty systems are latent errors (Rodziewicz, Houseman, & Hioskind, 2022). For example, a hospital has a sophisticated surgical equipment system, but none the surgeons were trained to operate it. This might cause an error in the future when the practitioner is required to operate the equipment (Rodziewicz, Houseman, & Hioskind, 2022).

Near miss errors are the ones that were stopped due to timely intervention. Such errors that can be of omission or commission and bring out flaws in the system may trigger changes that are required to be made to reduce repetition (Rodziewicz, Houseman, & Hioskind, 2022).

Medical Error: Statistics Debate

In 1949, The United States started using the International Classification of Diseases (ICD) billing code to collect data on deaths and their causes in the United States. ICD was an international method to count the number of deaths in a country. However, the ICD system in 1949 did not identify medical errors as a causal factor for deaths (Makary & Daniel, 2016). Specifically, ICD was designed to account for the physician billing system, which was devised to increase billing for services provided by healthcare providers (Makary & Daniel, 2016). The parameters to collect data for causes of death by government agencies in the United States, which includes ICD, or the cause of death mentioned on the death certificate do not include medical error and it provides an argument in the favor of discrepancies associated with the data of deaths by medical error.

In the year of 1999, Institute of Medicine published the number of 44,000-98,000 deaths due to medical errors (Kohn, Corrigan, & Donaldson, 2000), which is far less than Makary and Daniel's estimation in 2016. The lowest estimated number of deaths caused by medical errors in 2010 is 134,581 from the analysis of ten hospitals in North Carolina (Landrigan, et al., 2010), whereas the highest estimation is 400,201 medical error deaths after analyzing three tertiary care hospitals (Classen, et al., 2011). Additionally, the inspector general of Health and Human Services (HHS) analyzed the Medicare data of 2008 and found that approximately 180,000 deaths happened because of medical error or negligence among Medicare beneficiaries (Levinson, 2010). Meanwhile, the evidence-based estimate of deaths due to medical error is at least 100,000 each year (James, 2013).

The above statistics show that at least 100,000 deaths can be attributed to medical errors. This conservatively estimated number would still put medical errors in the top ten list of leading causes of death in the US, which would place medical errors in ninth place, below diabetes (102,188 deaths, 3%), and above influenza (53,544 deaths, 1.6%) (National Center for Health Statistics, 2020).

Various arguments have been presented against the above statistic. The prime argument emphasizes the weak link between deaths and causation, i.e., the link between the cause of death is not presented clearly in these studies (Shojania & Dixon-Woods, 2016). Attributing the death to medical error wasn't counted when a patient died from organ failure after one-week treatment even though he/she experiences a preventable adverse event. The death is possibly caused by the prescribed medicine which the person only had a mild and past allergic reaction, which is not a sufficient basis to claim that the error is the cause of death (Shojania & Dixon-Woods, 2016). In another word, Shojania & Dixon-Woods (2016) also argued that the variation in the estimated death numbers in Markary & Daniel's 2016 study was close to three times, from the lowest 134,581 to the highest 400,201. A more accurate number was proposed to be around 3.6% (Shojania & Dixon-Woods, 2016), which is much less that the 9% (Makary & Daniel, 2016). In addition, the estimation of medical errors can be used for various purpose. Because the approaches used to estimate deaths were methodologically questionable, making the exact number of deaths highly controversial (Bates & Singh, 2018). Some research explored the negative effects and pointed out that various political and non-political entities used the medical errors to target people's trust in the healthcare system (Rocke & Lee, 2013; Fernandez, 2006) .

On the other hand, the impacts of medical errors are prevailing in the US, with a varying number from as high as 400,000 (James, 2013) to as low as 44,000 (Kohn, Corrigan, & Donaldson, 2000). The famous Purdue Pharma case from 2007 further warranted the scrutiny of the issue. Purdue Pharma plead

guilty to the charges of falsely advertising their opioid drug with less addiction and promoting it to practitioners to prescribe the drug to both cancer and non-cancer patients (Office of Public Affairs, 2020). It directly increased drug abuse and overdose in the country, causing an opioid epidemic and increasing the death rate from opioid overdoses almost sixfold between 1999 and 2017 (Jones, Bruera, Abdi, & Kantarjian, 2018; Deweerdt, 2019). This was an error of commission, where the wrong action was taken due to the omission of information that Purdue Pharma's drug is less addictive. Therefore, based on the estimation of HHS analysis in 2008, 180,000 medical error deaths of the Medicare beneficiaries 15 years ago. There're currently at least 200,000 medical error deaths happening in the US each year. Further the review focuses on several essential prevalent errors such as surgical errors, diagnostic errors, and medication errors.

Medical errors: Categorization

According to the FDA, over 100,000 incidences of medical errors are reported in 2019 (U.S. Food & Drug Administration, 2019). These errors are not just responsible for erroneous deaths, they also affect various aspects of a person's life. Predominant medical errors are surgical (inpatient care) errors, diagnostic errors (outpatient care), and medication errors (Reid, Estacio, & Albert, 2009). A national survey released by the National Opinion Research Center (NORC) in 2017 shows, 59% of people who experienced medical error claimed that their medical issues were caused by misdiagnosis, 46% said that their issues arose from surgical and treatment errors, and 28% of people said medication error was the cause.

Surgical errors: Causes and Prevention

Surgical errors are not only prevalent in the US but also highly life-threatening and life-altering. There have been many cases of wrong site surgeries, for example, accidental incisions on the wrong body site (DeVine, Chutkan, Norvell, & Dettori, 2010). Other types include wrong surgical procedures, surgeries on wrong patients, and negligence during the surgery (e.g., leaving surgical equipment inside the body) (Seiden & Barach, 2006). Surgical errors have resulted in several adverse events, causing unintended injuries to patients (Rodziewicz, Houseman, & Hioskind, 2022). There are approximately 4,000 surgical errors every year in the US (Seiden & Barach, 2006).

One of the causes of surgical errors is incompetence, such as inadequate skills and training. The likelihood of error increases if the surgeon is poorly skilled, less experienced, and in properly trained (Sarker & Vincent, 2005).

Another cause is inadequate planning and insufficient preparation for the surgical treatment, as each step of the surgery is crucial and should be in order (Rodziewicz, Houseman, & Hioskind, 2022). Human error (Suliburk, Buck, & Pirko, 2019), fatigue (McCormick, et al., 2012), and miscommunication (Gawande, Zinner, Studdert, & Brennan, 2003; Suliburk, Buck, & Pirko, 2019) are also responsible for surgical errors such as accidental incisions, incorrect dose administration, miscommunication in the following direction, and misunderstanding instructions. The Utah Colorado Medical Practice Study demonstrated among all surgical and operative events, 54% were preventable (Thomas & Petersen, 2003). Lastly, medical practitioners are often overworked and fatigued. In the state of fatigue, surgeons can be negligent in both planning and adhering to the process (Sarker & Vincent, 2005; Rodziewicz, Houseman, & Hioskind, 2022). Taking the example of the lead surgeon, who was constantly checking and re-checking documentations, salient communications, reappraising the clinical and theatre setting, and constantly re-evaluating the patients' care and the progress of operation, to reduce the error rate to minimum, but errors still happen (Sarker & Vincent, 2005).

Surgical errors can be prevented by implementing certain standard operating procedures. For example, to prevent the incidences of wrong patient surgery, surgeons and nurses need to confirm the identity of the patient on multiple occasions, especially before making any incision (Sarker & Vincent, 2005). Meanwhile, checklist implementation significantly decreased in-hospital mortality, surgical site infections and reoperation rates (Haynes, et al., 2009; Birkmeyer, 2010). The checklist should be utilized by practitioners, nurses, and other staff to avoid errors of wrong surgery, incisions on the wrong body site, and negligence. The standard process of confirming the type of surgery, location of the surgery, and identity of the person is imperative. Additionally, a process of verbal counting of surgical equipment such as surgery instruments, pieces of cotton, and sponges should be followed to avoid incidence like leaving surgical equipment inside the surgical site (Seiden & Barach, 2006). Following these steps can significantly reduce the incidences of surgical errors (Haynes, et al., 2009).

Diagnostic Errors: Causes and Prevention

As previously mentioned, 59% of people who experienced medical errors said that the cause of their issues was a misdiagnosis or a diagnostic error. The study on emergency medicine closed claims also showed that misdiagnosis was responsible for the majority of the medical error issues (Royce, Hayes, & Schwartzstein, 2019; Carver, Gupta, & Hipskind, 2022). The most common misdiagnosed conditions include cardiac issues, cancer issues, urological issues, and issues related to neurology (Carver, Gupta, & Hipskind, 2022). Diagnostic

errors include failure to diagnose, incorrect diagnosis, or late diagnosis (Carver, Gupta, & Hipskind, 2022; Rodziewicz, Houseman, & Hioskind, 2022).

The major cause of diagnostic errors is the complexity of the condition. For example, timely diagnosis of malignant cell growth in cancer is frequently missed since it might not present many symptoms in the beginning, causing the error rate to be 15% for cancer misdiagnosis (Rodziewicz, Houseman, & Hioskind, 2022). Another cause is a failure to understand and address the inconsistencies in diagnostic tests leading to incorrect diagnosis or late diagnosis (Carver, Gupta, & Hipskind, 2022). Failure to accurately assess medical records, and miscommunication among healthcare providers or between providers and patients may cause diagnostic errors as well (Campione, Mardon, & McDonald, 2019; Carver, Gupta, & Hipskind, 2022).

To prevent diagnostic errors, healthcare providers must be aware of most misdiagnosed conditions and take extra precautions when diagnosing such conditions (Rodziewicz, Houseman, & Hioskind, 2022). Additionally, patient records and documents should be thoroughly read and assessed. Perception-based diagnosis should be avoided, and clear communication practices should be followed during any diagnostic process (Carver, Gupta, & Hipskind, 2022).

Medication Error: Cause and Prevention

According to a 2019 U.S. Food and Drug Administration (FDA) report, medication error is responsible for more than 100,000 reports in the US, leading to death, disability, hospitalization, and even birth defects. Medication errors start from writing a wrong prescription, such as dose, name, type, or illegible handwriting. Errors can also happen while dispensing and administrating a drug (Fontan, Maneglier, Nguyen, Loirat, & Brion, 2003) (Anacleto, Perini, Rosa, & César, 2005; Aronson, 2009). For instance, incorrect dose and incorrect drug can be dispensed, a patient can take more than/less than the prescribed amount due to either an inability to understand instructions or desiring addictive/quick effects of medications (Aronson, 2009), a desire to support their addiction, or a desperation for the medicine to work quickly.

Medication errors can be prevented by creating a system such as electronic prescription to reduce the incidence of providing wrong prescription drugs due to illegible handwriting, and an electronic database containing a well-maintained bar-codes system to reduce the incidences of wrong drugs and dosages (Fontan, Maneglier, Nguyen, Loirat, & Brion, 2003; Rodziewicz, Houseman, & Hioskind, 2022). E-system can also help in establishing the prescription timeline and when the prescription refills are due or unnecessary (Aronson, 2009). For example, the capsule clinic in China, developed in 2020,

conducted the entire medical services process, from diagnosis to prescription services, which improved the efficiency significantly (Li, et al., 2023).

Prevention strategies discussed above are error specific and include parameters specific to either a condition or a process. However, it has been debated that the correct form of accountability and error reporting in the healthcare system can ultimately reduce the number of medical error incidences (Anderson, Kodate, Walters, & Dodds, 2013; Riga, Vozikis, Pollalis, & Souliotis, 2015). As error reporting can allow timely intervention with early formation of policies to mitigate current situations and prevent future incidences (Uribe, Schweikhart, Pathak, & Marsh, 2002; Abimanyi-Ochom, et al., 2019).

Medical Error: Accountability and Reporting

Error reporting and accountability could be important tools to bring intervention and reduce repetition. However, the data shows that the majority of errors are unintended and the fear of reprimand or a bad reputation reduces self-reporting of errors (Dennison, 2005; Soydemir, Intepeler, & Mert, 2017). Previous research show that reprimand, legal liabilities, and humiliation might reduce reporting errors (Kalra, Kalra, & Baniak, 2013; Soydemir, Intepeler, & Mert, 2017; Vrbnjak, Denieffe, O'Gorman, & Pajnkihar, 2016). If errors are not reported, timely intervention and improvement will be unlikely. A study completed by McKaig and his group in 2014 shows significant improvement in error prevention when anonymous reporting was increased. Hence, placing blame and holding practitioners accountable specifically for errors that are out of the physician's hands might only increase the likelihood of errors (Dennison, 2005).

Besides, hiding the error over time may contribute to moral dilemmas and regret. Such regret could cause continued non-reporting of errors and long-term moral distress (Pavlish, Brown-Saltzman, Hersh, Shirk, & Nudelman, 2011; Gordon, 2005). Moral residue over a long period can damage healthcare providers' mental well-being, affecting providers' performance. Previous research has established health professionals as secondary victims of medical error (Wu, 2000; Ozeke, Ozeke, Coskun, & Budakoglu, 2019), with the identification of a range of emotional and psychological repercussions (Wu, 2000; Waterman, et al., 2007; White, Waterman, McCotter, Boyle, & Gallagher, 2008).

However, when the medical errors were not reported by practitioners, there were positive changes in the approach of practitioners likely stemming from the guilt (a correlation, not causation) (Bari, Khan, & Rathore, 2016). Hence, accountability and blame culture might be effective only up to a certain extent.

Even though increased medical error reporting could prevent future errors (McKaig, Collins, & Elsaid, 2014), blame culture might not be a very effective tool to tackle the issue.

Conclusion and Discussion

In conclusion, the reported high number of medical error deaths is up for debate. The estimated number of 250,000 (average) deaths (Makary & Daniel, 2016) might not be accurate, which may require reliable reporting and data collection mechanism. We believe the estimated medical error deaths in the United States is at least 200,000 per year currently. It is also important to note that medical errors are responsible for various inconsistencies and issues in the medical system. Nevertheless, the adverse effects and adverse events due to medical errors cannot be overlooked. Hence, it is important to discuss the statistics of all the available studies to understand the severity of the issue. Additionally, the government system of data collection also needs to be updated to identify the correct number of deaths from medical errors. The severity of the issue will prompt quick and effective resolutions to protect people's lives and improve life quality.

From all the articles we have summarized above, the causes of medical errors are complicated and multifaceted. Medical error could include many system-related factors, such as inadequate protocols and communication breakdowns. It might contain various individual-related factors, such as fatigue and lack of expertise.

To prevent medical errors, it is important to learn and understand the causes and consequences and adopt a systematic approach to ensure safe and effective medical care. The surgical errors can be prevented or decreased by implementing a systematic operation room checklist and procedure. With the rapid technology improvement, the application of artificial intelligent (AI) may be effective to prevent the incident of surgical errors dramatically. To prevent the diagnostic errors, rich clinical and practical experiences are highly needed to conduct correct diagnosis for patients. Additional training and oversea medical practices might be an option to help physicians enhance their experiences. To reduce the medication error, electronic system of prescription identification and distribution are applied to decrease the possible errors already. Meanwhile, the discussion about the implementation of AI on pharmaceutical industry also have been paid more and more attention recently.

For different types and causes of medical errors, there should be different approaches to reduce or prevent them. In today's era of AI application,

the future research direction may focus on how to better integrate AI with medical services to reduce the medical errors and affiliated costs and improve the quality of care and life. Ultimately, reducing medical errors requires a commitment for healthcare organizations, providers, and patients to prioritize patient safety and continuously strive for improvement.

Reference

Abimanyi-Ochom, J., Mudiyanselage, S. B., Catchpool, M., Firipis, M., Wanni Arachchige Dona, S., & Watts, J. J. (2019, August). Strategies to Reduce Diagnostic Errors: A Systematic Review. *BMC Medical Informatics and Decision Making, 19*, 174.

Anacleto, T. A., Perini, E., Rosa, M. B., & César, C. C. (2005, August). Medical Errors and Drug-Dispensing Systems in a Hospital Pharmacy. *Clinics, 60*(4), 325-332.

Anderson, J. E., Kodate, N., Walters, R., & Dodds, A. (2013, April). Can Incident Reporting Improve Safety? Healthcare Practitioners' Views of the Effectiveness of Incident Reporting. *International Journal of Quality in Health Care, 25*(2), 141-150.

Aronson, J. (2009, August). Medication Errors: What They are, How They happen, and How to Avoid them. *Quarterly Journal of Medicine, 102*(8), 513-521.

Bari, A., Khan, R. A., & Rathore, A. W. (2016). Medical Errors; causes, consequences, emotional reponse and resulting behavioral change. *Pakistan Journal of Medical Services, 32*(3), 523-528.

Bates, D. W., & Singh, H. (2018). Two Decades since To Err is Human: An Assessment of Progress and Emerging Priorities in Patient Safety. *Health Affairs, 37*(11), 1736-1743.

Birkmeyer, J. D. (2010). Strategies for Improving Surgical Quality - Checklists and Beyong. *The New England Journal of Medicine, 363*, 1963-1965.

Campione, J. R., Mardon, R. E., & McDonald, K. M. (2019, December). Patient Safety Culture, Health Information Technology Implementation, and Medical Office Problems That Could Lead to Diagnostic Error. *Journal of Patient Safety, 15*(4), 267-273.

Carver, N., Gupta, V., & Hipskind, J. E. (2022). *Medical Error.* Treasure Island, Florida: StatPearls Publishing.

Classen, D. C., Resar, R., Griffin, F., Federico, F., Frankel, T., Kimmel, N., . . . James, B. J. (2011, April). 'Global Trigger Tool' Shows that Adverse Events in Hospitals may be Ten Times Greater than Previously Measured. *Health Affairs, 30*(4), 581-589.

Dennison, R. D. (2005, March). Creating an Organizational Culture for Medication Safety. *Nursing Clinics, 40*(1), 1-23.

DeVine, J., Chutkan, N., Norvell, D., & Dettori, J. R. (2010). Avoiding Wrong Site Surgery: A Systematic Review. *35*(Supplememt), S28-S36.

Deweerdt, S. (2019, September 12). The Natural History of an Epidemic. *Nature, 573*, S10-S12.

Fernandez, B. (2006). *Medical Malpractice: The Role of Patient Safety Initiatives.* Congressional Research Service. Congressional Research Service.

Fontan, J.-E., Maneglier, V., Nguyen, V., Loirat, C., & Brion, F. (2003, June). Medication Errors in Hospitals: Computerized Unit Dose Drug Dispensing System Versus Ward Stock Distribution System. *Pharmacy World and Science, 25*, 112-117.

Gawande, A. A., Zinner, M. J., Studdert, D. M., & Brennan, T. A. (2003, June). Analysis of Errors Reported by Surgeons at Three Teaching Hospitals. *Surgery, 133*(6), 614-621.

Gordon, G. H. (2005). Disclusing Error to Patient: Physician-to-Patient Communication. *AMA Journal of Ethics, 7*(8), 537-540.

Graber, M. L., & Carlson, B. (2011). Diagnostic Error: the Hidden Epidemic. *Physician Executive, 37*(6), 12-14, 16, 18-19.

Haynes, A. B., Weiser, T. G., Berry, W. R., Lipsitz, S. R., Breizat, A.-H. S., Dellinger, E. P., . . . Reznick, R. (2009, January 29). A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population. *The New England Journal of Medicine, 360*, 491-499.

James, J. T. (2013, September). A New, Evidence-based Estimate of Patient Harms Associated with Hospital Care. *Journal of Patient Safety, 9*(3), 122-128.

Jones, G. H., Bruera, E., Abdi, S., & Kantarjian, H. M. (2018, November 15). The Opioid Epidemic in the United States-Overview, Origins, and Potential Solutions. *Cancer, 124*(22), 4279-4286.

Kalra, J., Kalra, N., & Baniak, N. (2013, September). Medical Error, Disclosure and Patient Safety: A Global View of Quality Care. *Clinical Biochemistry, 46*(13), 1161-1169.

Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (2000). *To Err is Human: Building a Safer Health System.* Washington DC: National Academies Press.

Landrigan, C. P., Parry, G. J., Bones, C. B., Hackbarth, A. D., Goldmann, D. A., & Sharek, P. J. (2010, November 25). Temporal Trends in Rates of Patient Harm Resulting from Medical Care. *The New England Journal of Medicine, 363*, 2124-2134.

Levinson, D. R. (2010). *Adverse Events in Hospitals: National Incidence Among Medicare Beneficiaries.* Office of Inspector General, Department of Health and Human Service. the US Department of Health and Human Service.

Li, D., Zhang, R., Chen, C., Huang, Y., Wang, X., Yang, Q., . . . Shui, L. (2023). Developing a Capsule Clinic-A 24-hour Institution for Improving Primary Health Care Accessibility: Evidence from China. *11*, e41212.

Makary, M. A., & Daniel, M. (2016). Medical Error-the third leading cause of death in the US. *the British Medical Journal*, *353*(i2139).

McCormick, F., Kadzielski, J., Landrigan, C. P., Evans, B., Herndon, J. H., & Rubash, H. E. (2012, May). Surgeon Fatigue: A Prospective Analysis of the Incidence, Risk, and Intervals of Predicted Fatigue-Related Impairment in Residents. *The Archives of Surgery, 147*(5), 430-435.

McKaig, D., Collins, C., & Elsaid, K. A. (2014, September). Impact of a Reengineered Electronic Error-Reporting System on Medication Event Reporting and Care Process Improvements at an Urban Medical Center. *The Joint Commission Journal of Quality and Patient Safety, 40*(9), 398-407.

National Center for Health Statistics. (2020). *Leading Causes of Death*. Retrieved from Centers for Disease Control and Prevention: https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm

NORC at the University of Chicago, & IHI/NPSF Lucian Leape Institute. (2017). *Americans' Experiences with Medical Errors and Views on Patient Safety.* Institute for Healthcare Improvement and NORC at the University of Chicago, Cambridge.

Office of Public Affairs. (2020, October 21). *Justice Department Accounces Global Resolution of Criminal and Civil Investigations with Opioid Manufacturer Purdue Pharma and Civel Settlement with Members of the Sackler Family*. Retrieved from The United States Department of Justice: https://www.justice.gov/opa/pr/justice-department-announces-global-resolution-criminal-and-civil-investigations-opioid

Ozeke, O., Ozeke, V., Coskun, O., & Budakoglu, I. (2019, August). Second Victims in Health Care: Current Perspectives. *Advances in Medical Education and Practice, 10*, 593-603.

Pavlish, C., Brown-Saltzman, K., Hersh, M., Shirk, M., & Nudelman, O. (2011, March). Early Indicators and Risk Factors for Ethical Issues in Clinical Practice. *Journal of Nursing Scholarship, 43*(1), 13-21.

Reason, J. (1990). *Human Error.* Cambridge University Press.

Reid, M., Estacio, R., & Albert, R. (2009). Injury and Death Associated with Incidents Reports to the Patient Safety Net. *American Journal of Medical Quality, 24*(6), 520-524.

Riga, M., Vozikis, A., Pollalis, Y., & Souliotis, K. (2015, April). MERIS (Medical Error Reporting Informationa System) as an Innovative Patient Safety Intervention: A Helath Policy Perspective. *Health Policy, 119*(4), 539-548.

Rocke, D., & Lee, W. T. (2013, December). Medical Errors: Teachable Moments in Doing the Right Thing. *Journal of Graduate Medical Education, 5*(4), 550-552.

Rodziewicz, T. L., Houseman, B., & Hioskind, J. E. (2022). *Medical Error Reduction and Prevention.* Treasure Island, Florida: StatPearls Publishing.

Royce, C. S., Hayes, M. M., & Schwartzstein, R. M. (2019, February). Teaching Critical Thinking: A Case for Instruction in Cognitive Biases to Reduce Diagnostic Errors and Improve Patient Safety. *Academic Medicine, 94*(2), 187-194.

Sarker, S. K., & Vincent, C. (2005). Errors in Surgery. *International Journal of Surgery, 3*(1), 75-81.

Seiden, S. C., & Barach, P. (2006). Wrong-Side/Wrong-Site, Wrong Procedure, and Wrong-Patient Adverse Events. *The Archives of Surgery, 141*(9), 931-939.

Shojania, K. G., & Dixon-Woods, M. (2016, September). Estimating Deaths due to Medical Error: the Ongoing Controversy and Why it Matters. *BMJ Quality and Safety, 26*, 423-428.

Soydemir, D., Intepeler, S. S., & Mert, H. (2017, October). Barriers to Medical Error Reporting for Physicians and Nurses. *Western Journal of Nursing Research, 39*(10), 1348-1363.

Suliburk, J. W., Buck, Q. M., & Pirko, C. J. (2019). Analysis of Human Performance Deficiencies Associated with Surgical Adverse Events. *JAMA Network Open, 2*(7), e198067.

Thomas, E. J., & Petersen, L. A. (2003). Measuring errors and adverse events in health care. *Journal of General Internal Medicine, 18*(1), 61-67.

U.S. Food & Drug Administration. (2019, August 23). *Working to Reduce Medication Errors*. Retrieved from https://www.fda.gov/drugs/information-consumers-and-patients-drugs/working-reduce-medication-errors

Uribe, C. L., Schweikhart, S. B., Pathak, D. S., & Marsh, G. B. (2002, July). Preceived Barriers to Medical-Error Reporting: An Exploratory Investigation. *Journal of Healthcare Management, 47*(4), 263-280.

Vrbnjak, D., Denieffe, S., O'Gorman, C., & Pajnkihar, M. (2016, November). Barriers to Reporting Medication Errors and Near Misses among Nurses: A Systematic Review. *International Journal of Nursing Studies, 63*, 162-178.

Waterman, A. D., Garbutt, J., Hazel, E., Dunagan, W., Levinson, W., Fraser, V. J., & Gallagher, T. H. (2007, August). The Emotional Impact of Medical Errors on Practicing Physicians in the United States and Canada. *The Joint Commission Journal on Quality and Patient Safety, 33*(8), 467-476.

White, A. A., Waterman, A. D., McCotter, P., Boyle, D. J., & Gallagher, T. H. (2008, May). Supporting Health Care Workers After Medical Errors: Considerations for Health Care Leaders. *Journal of Clinical Outcomes Management, 15*(5), 240-247.

Wu, A. W. (2000, March). Medical Error: The Second Victim. *The BMJ, 320*(7237), 726-727.

About The Contributors

Prof. Allison Millward is the assistant professor of history at Rowan College at Burlington County in New Jersey, United States, where she currently holds the rank of Instructor of History. She is currently a PhD candidate at the University of Southern Queensland where she is researching the lived-experiences of Allied nurses on the Western Front. She previously earned her M.A. from the State University of New York at Albany and her B.A. in government and international politics. With an academic background in war and society, her research interests include women's experiences in war, life-writings of participants in conflict, wartime art and media and design history.

Dr. Babita Srivastava is an Adjunct Professor at William Paterson University. She has earned her Ph.D. degree from the prestigious University of Allahabadand a postdoctoral fellowship from the William Paterson University, NJ. Dr. Srivastava is also certified on Sustainable Business Strategy, Entrepreneurship in Emerging Economies and US Public Policy: Social, Economic, and Foreign Policies from the Harvard Business School. Dr. Srivastava's research focuses on resource management, energy economics and sustainability. Dr. Srivastava's teaching interests includes microeconomics, macroeconomics, business management, business statistics. Dr. Srivastava has taught various college-level courses in economics. She is the recipient of several awards of recognition for her creative and innovative teaching style. Dr. Srivastava encourages their students to apply economic principles to real-world problems.

Dr. Jia Yu is an Associate Professor of Economics at School of Business at Southern Connecticut State University. Her research field is Health Economics and Applied Microeconomics. She is currently the faculty affiliated member at CT Association of Healthcare Executives. Dr. Yu has published many research articles in several selective academic journals and presented many of her research in various regional, national, and international conferences. Before she joined SCSU, she was a lecturer in economics at Christopher Newport University. Dr. Yu graduated from Suffolk University with her Ph.D. in economics. She completed her M.A. in economics at SUNY Albany and her bachelor's degree in China.

Dr. Sushma Shukla serves as an associate professor of Economics at Piedmont Virginia Community College in Charlottesville, Virginia, and is also a visiting faculty member at the University of Virginia. Before her current role, she imparted her expertise across Northern Virginia Community College and Virginia International University. A distinguished alumna of Ravi Shankar University in Raipur, India, Dr. Shukla holds B.A., M.A., and Ph.D. degrees in

Economics. She further pursued her M. Phil. in Economics from Devi Ahilya University, Indore, securing gold medals for her outstanding achievements in both her M.A. and M. Phil. programs. Always eager to expand the boundaries of knowledge, her research primarily delves into economic growth, innovation, macroeconomics, economic development, the dynamics of emerging economies, and the economics of India. Dr. Shukla's impactful work has been showcased at numerous conferences and has found its place in both national and international journals**.**

Statement of Editorial Body

The ECCSSA Journal is the authorized publication of the East Coast Colleges Social Science Association. Published annually, The Journal is primarily a service to the membership, constituency, and related professions of ECCSSA. Manuscripts will be accepted from all scholars who submit articles of professional or pedagogical interest in the various fields of the social and behavioral sciences. Acceptance of a manuscript for publication may give priority to those scholars participating or presenting in the annual conference roundtable or related research symposia. However, every professional or group is considered highly.

Manuscripts for consideration should (1) adhere to the policies and guidelines of *the ECCSSA Journal*; (2) be submitted in a Microsoft Word Document electronically; and conform to the American Psychological Association (APA) style and format as outlined by APA and it's Publication Manual.

The Journal Editor's office is located on Piedmont Virginia Community College, 501 College Drive, Charlottesville, VA. 22902. Please attention all inquiries to the attention of Dr. Sushma Shukla, Editor-in-Chief, *The ECCSSA Journal*, or send them to chair@eccssa.org. All communication, including submitted manuscripts and change of address, should be sent to this office.

Disclaimer

The publisher East Coast Colleges Social Science Association (ECCSSA) cannot be held responsible for author errors, broken links, or consequences arising from the use of the information contained in this Journal; the views and opinions expressed by authors do not necessarily reflect those of the publisher, editors or association. However, all articles do contribute to academic discussion or scholarship in the social and behavioral sciences. The association's opening commentary reflects the research findings on themes adopted and explored by ECCSSA in search of solutions per its mission.

ECCSSA is an association of professional social and behavioral scientists, scientists, and related professionals devoted to advancing research, practice, knowledge, and understanding in the social and behavioral sciences for the progression of humankind.

The Association covers most of the Eastern United States and the Gulf Coast States, including Alabama, Connecticut, Delaware, the District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Mississippi, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Texas, Vermont, Virginia, and West Virginia, as well as the Atlantic Provinces of Canada.

East Coast Colleges Social Science Association

Attention Dr. Sushma Shukla, Chair, ECCSSA Board of Directors

Piedmont Virginia Community College,

501 College Drive,

Charlottesville, VA 22902

Visit our website at www.eccssa.org.