Quadcare Model for Healthcare Providers

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Abstract

Raising the discussion to participate in the evolution of a healthcare system that reflects the complexity and diversity of the modern integrated healthcare system in alignment with the community is well-documented. However, in this precarious hierarchical environment, there are necessary areas for improvement with respect to progressing the medical professional and key stakeholders beyond a paternalistic or traditional-minded practice. Integral to a synergy that will fuel the U.S. and global healthcare markets, this article aims to raise awareness for the audience through evidence-based materials about a paradigm shift in the operative definition of healthcare providers (ie clinical doctors) that has evolved to embrace four instrumental degrees within their respective fields of expertise, the MD, DO, DMSc (PA), and DNP (NP). Essential systematic changes serve to create parity amongst the aforementioned healthcare providers to maximize workplace diversification, inclusion, collaborative care, and professional satisfaction. All of which may translate to improved team dynamics, offset social determinants of health, and ultimately provide greater access to innovative and affordable quality care.

Keywords: Quadcare Model; DMSc; DNP; DO; MD; social determinants of health; healthcare institutions; healthcare delivery; collaborative care; Optimal Team Practice (OTP); change management; burnout; shared decision-making; patient empowerment; healthcare management; intrapersonal functional diversity; professional parity

Takeaway Points

- Traditional healthcare delivery systems oftentimes are ineffective models for patient care, thus calling for key stakeholders to reexamine a new inclusive healthcare landscape that implements the Quadcare Model.
- The Quadcare Model is poised to diversify the healthcare workplace through a team-based approach to patient-centered care with a framework that is rooted in change management for optimal patient outcomes and the competitive longevity of the healthcare organization.
- Key stakeholders in an integrated managed care business model, recognize the utility of decentralized decision-making of the DMSc (PA) and DNP (NP) with similar scopes of practice to physicians and accomplish fiscally responsible collaborative team-focused multidisciplinary patient care in federally-funded programs.
- Healthcare administrators who identify and reduce implicit biases and inequitable hiring practices within their organizations, position themselves strategically to develop cohesive group and team dynamics allowing them to harness the diverse expertise of each provider that supports strategic profits and high-quality patient care.

- The invaluable nature of the DMSc (PA) and DNP (NP) is made evident by comparable patient care to physicians even when seeing twice the number of patient encounter visits by reducing the utilization of inpatient and emergency medical services, thus effectively improving the system-wide cost of labor and resources.

Discussion

History of Healthcare Providers

Certainly, since the origin of medicine in the hallowed halls of the Hippocratic Medical School of Kos roughly 400 BCE, principles of the physician, such as "primum non nocere" (first do no harm), and "the best physician is the one who is able to prevent and predict," were well documented by Hippocrates and his descendants [1-3]. One of many profound and revolutionary statements made by Hippocrates was the duty for medical practitioners to "teach his/her family the art of medicine, if they want to learn it, without tuition or any other conditions of service" [4]. In the ancient Kosian community where Hippocrates practiced the art of medicine, he was bound by a code of ethics that was gradually shared with people around the world giving rise to modern medicine [2].

To share this healing gift, a formal apprenticeship of medical training necessitated bringing forth physician healers in the U.S. until formal medical school education was implemented at the College of Philadelphia's new medical school within the University of Pennsylvania [5]. The medical school provided two pathways to practicing medicine as either a bachelor's of medicine (MB) or a doctor of medicine (MD). The University of Pennsylvania established the medical school in its name in 1765, and abolished the MB degree in 1792, making the MD the primary medical degree [6]. Initially, this paved the way for German homeopathic physician Christian Hahnemann to coin Western medicine in a pejorative manner with the term "allopathy" in 1810, regarded as a structured and research evidence-based approach to patient care that lacked the fundamental treatment of the etiology instead of the disease it targeted [7, 8]. Nearly 64 years later Andrew Still, MD coined "osteopathy," providing yet another pathway for the Western medical profession to approach patients from a more holistic perspective out of concern the orthodox MD was oftentimes ineffective if not harmful, thus giving rise to the DO (Doctor of Osteopathy) [9].

Hahnemann and Still recognized a single approach to healthcare delivery (patient care) was insufficient to address the complex nature of human medical needs. In a similar light, a cooperative union between Loretta Ford, MSN, EdD, and Henry Silver, MD at the University of Colorado started the first Nurse Practitioner (NP) school in 1965 to increase access to pediatric medical care [10]. Simultaneously, in 1965 Eugene A. Stead Jr., MD at Duke University established the first Physician Associate (PA) school to offset primary care physician shortages [11]. Hence, each of these medical visionaries positions all healthcare providers (HCPs) to lead impactful change by reexamining a new, inclusive healthcare model representative of the diverse clinical landscape.

The PA and NP professions are well-suited to make such contributions as previously defined by these MD visionaries, and have progressed their professions equally by creating terminal doctoral clinical degrees, the Doctor of Nursing Practice (DNP) and Doctor of Medical Science (DMSc) at the University of Kentucky in 2001 and the University of Lynchburg in 2017, respectively [12, 13]. It is this tenet of continually evolving healthcare in modern Western medicine that was not previously defined until now, establishing the Quadcare Model for HCPs [MD, DO, DMSc (PA), and DNP (NP)]as a guideline for institutional and clinical best practices. (See Figure 1) Constructing a mutual set of goals among the four HCPs may demonstrate improved quality of care, minimize harm to patients, and restore confidence in the healthcare system by implementing team collaboration between the key stakeholders, developing technology and advanced research, and drawing upon noteworthy models of organizational change such as Kotter and Cohen's Eight Step Change Process [14, 15].

Figure 1: Evolution of the United States Quadcare Model (QCM) for Health Care Providers (HCPs).
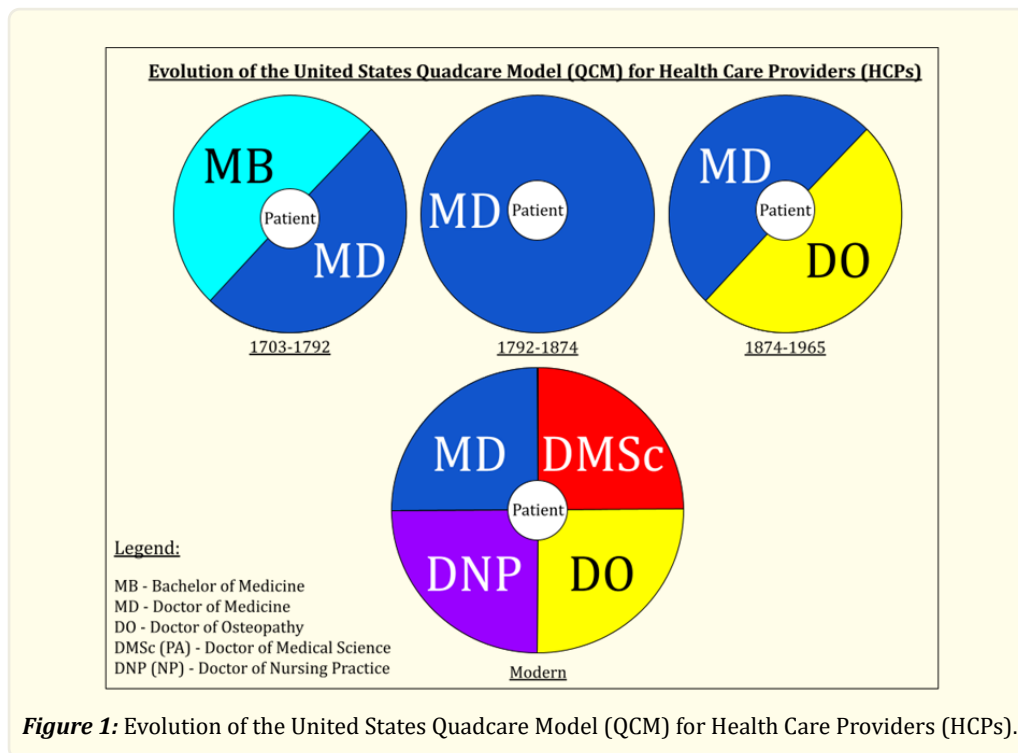
Workplace Diversification and Inclusion

Current literature supports clinical workplace diversification, to which these principles are arguably maximized with the expansion of HCPs from each of the four disciplines of medicine. Moving past the conventional definitions of diversity and inclusion with reference primarily to race, ethnicity, and gender orientation, it is just as vital to incorporate professional areas of expertise or disciplines, for HCPs involved in patient care. This is consistent with the Institute of Medicine's (IOM) findings recommending healthcare education reform to address the complex needs of the modern healthcare system [12, 16]. Acute care and outpatient services already integrate team-based approaches with a combination of MDs, DOs, PAs (DMSc), and NPs (DNP) all working in partnership to achieve optimal patient outcomes. Diversity and inclusion were key ingredients identified in the recent and future models for organizational development (OD) practitioners leading companies during COVID-19 pandemic conditions, demonstrating greater profitability than other similar companies that were not diversified [17]. The impact was measured through patient satisfaction scores, clinical outcomes, and attaining organizational business goals led by the successful interventions of the change movement [14]. Threaded together, these implementations provided a healthy, working, and profitable framework for modern healthcare institutions and leadership to determine guiding principles for their employees and the patients they serve.

Healthcare organizations must be prepared for continuous change management through a proactive organizational culture that rewards a systematic approach, ensuring the organization sustains its competitive longevity [14, 18]. Clinical practice already incorporates the parallel nature of the embodied experiences of the four HCPs in health care delivery. Consideration should be given to formal programs that promote hospital staff participation in patient-centered care. The Patient-Centered Medical Home (PCMH) model implemented in U.S. Army Medical Department Activity (MEDDAC) military treatment facilities, and throughout Federally Qualified Health Centers (FQHC) nationally are model examples [19]. As per federal reimbursement and funding agreements with these clinics, the Affordable Care Act (ACA) that took effect on March 23, 2010, stipulates daily morning team huddles (in-person or virtually) to encourage medical staff to collaborate in establishing patient care plans along with the patient's family involvement [14, 20].

Collaborative Care

It is paramount to recognize that PA (DMSc) & NP (DNP) roles are not a threat to the physician profession, rather, multiple research studies have well-documented the collaborative role of the PAs & NPs in improving access to patient care, providing expert quality care, and achieving optimal outcomes while reducing the patient volume and wait times on physicians, that directly reduces workload, burnout, and moral injury [21, 22]. This is evidenced by the fact the PA and NP professions can be found in 15 & 11 other countries, respectively [23, 24]. This widespread implementation of advanced practicing PAs and NPs addresses similar issues with physician shortages primarily in general practice settings such as family medicine, primary care, pediatrics, women's health, urgent care, and non-urgent emergency medicine (eg fast-track) and reduces the financial burden on patients and the healthcare system overall [22]. Compelling findings from a 2021 systematic review found PAs are not merely "substitutes" for physicians but are a "complement" or "producers of care and activity" to physicians as they collaborate to optimize the quality of medical care and patient services [21]. In the PA Scope of Practice, there is an emphasis placed on physician-PA team practice [25]. Furthermore, recent optimal team practice (OTP) propositions by the American Academy of Physician Associates (AAPA) and advocacy groups call upon the healthcare system to relax onerous administrative constraints and encourage the team-based practice of patient care between PAs, physicians, and all healthcare professionals [26]. In doing so, states may recognize PAs have the greatest impact when practicing at the pinnacle of their scope of practice, based on extensive clinical and surgical training, education, and direct patient experience. In van den Brink et al's systematic review, Canadian hospitals were shown to successfully adopt PA hospitalists or infectious disease consultants who replaced or were added to medical residents or physicians, effectively improving competent patient access to care, length of stay, morbidity, and mortality [21]. To accomplish this, hospital institutions employed organizational changes through their hospital bylaws, PA oversight, on boarding, and staffing practices. Constructively, this permits PAs to receive direct payments from insurers (private or public) for vital medical services rendered, standardizing oversight by PA boards in all 50 U.S. states, consistent with Senate Bill 228 signed June 7, 2022, by the New Hampshire Governor allowing PAs to bill and receive direct reimbursement from insurers [27]. Similarly, the NP Scope of Practice specifies their autonomous practice in conjunction with other healthcare professionals [28]. Neither advocate for PAs or NPs to take over or eliminate the physicians' roles, rather it calls for ongoing collaborative and team-focused efforts through growing the healthcare profession's best practices in a fiscally responsible manner.

Increasingly, hospital management has placed a great deal of responsibility on HCPs which is unique to this environment. There is also a culture within medicine that ingrains a sense of infallibility with pride and purpose amongst its providers. Consequently, across the board, MDs, DOs, PAs (DMSc), and NPs (DNP) all experience burnout, with over half of them working greater than 51 hours per week [29-31]. Accumulatively, these HCPs face a great deal of fear of disclosing medical errors and conflicts that may arise amongst one another. Such admission carries potential liability for malpractice, a tarnished professional reputation, blame, and embarrassment [32, 33]. Following the COVID-19 pandemic, it is estimated that nearly 20% of healthcare workers left the field, 33% of physicians in medical practices retired early or burned out in 2021, and in the most recent survey data released by Elsevier Health, 47% of U.S. clinicians expect to leave their current position, with 39% of these departing from the healthcare profession altogether [34-36].
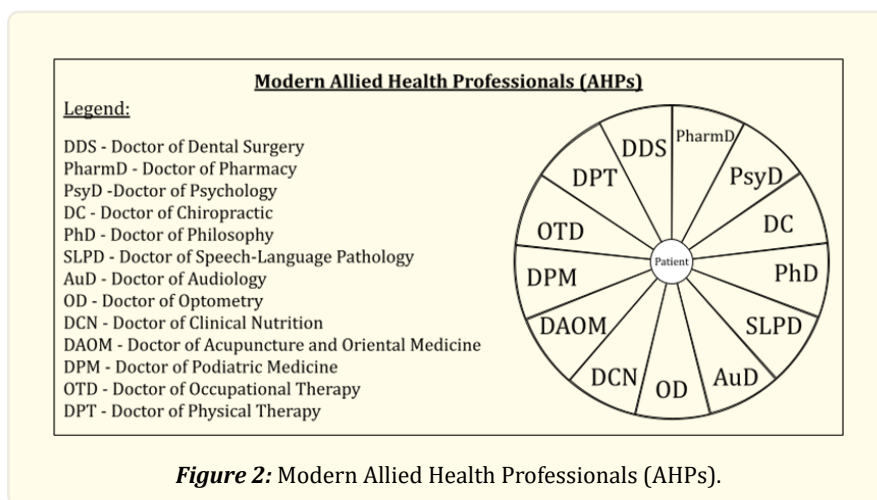
One of the key solutions to transforming the medical profession is to redistribute the clinical responsibilities of clinicians through a mechanism of decentralized decision making, multidisciplinary care teams, utilizing remote technologies, with a patient-centered model to make joint treatment decisions [36]. Healthcare enterprises are finding that their healthy patients (clients) are no longer interested in traditional patient-physician relationships, and prefer convenient on-demand appointments with a clinician that possesses the qualifications to address simple medical or surgical treatments [37]. Research indicates physicians display an insubstantial understanding of the values and beliefs that patients possess for their health [38]. When it came to which treatment options patients valued, physicians harbored significantly different perceptions about what they believed was the chief concern of the patient, indicating a necessity for shared decision-making. So, it's no revelation one may realize the traditional medical model has evolved into an integrated managed care business model that caters to the twenty-first-century consumer looking for intelligent technological, managerial, and clinical solutions to an ever-increasingly complex healthcare system [37]. The Quadcare Model may meet the goals of identifying, testing, evaluating, and scaling new models of care that satisfy section 3021 of the ACA created by the Center for Medicare

and Medicaid Innovation (CMMI) and supported by the Centers for Medicare & Medicaid Services (CMS), to improve health care and related costs [38]. With affordable and convenient electronic mobile phone apps connecting patients to HCPs anywhere in the world, patients are more empowered and focused on their care than ever before.

Notwithstanding these recent developments in the U.S. healthcare market, evidence has identified social determinants of health (SDOH) that appear to impact nearly 50% of patient health outcomes [39]. Achieving health equity and reducing SDOH in at-risk groups requires addressing improved access to HCPs, likely providing a solution to clinical care that has been shown to contribute 16% to undesirable health outcomes stemming from health inequities and disparities. This is consistent with the CMS letter issued to states in January 2021 to address SDOH in Medicaid managed care programs with a list of requirements that included SDOH in care coordination and provider training, to name a few. Simultaneously, as of 2019, Medicare seeks to bridge the gap in health-related benefits by directly addressing SDOH in the Medicare Advantage plans. The Healthy People 2030 initiative implemented by the U.S. Department of Health and Human Services (HHS) strives to reach multiple sectors and garner efforts from the entire government, to implement actions to improve health and well-being by directly tracking and reducing SDOH. Hence, it is reasonable to expand the operative definition of the DMSc (PA) and DNP (NP) autonomy in these federally-funded medical care programs to satisfy the high demand for qualified HCP care.

Concerning these recent developments in the healthcare arena, the principles of OTP serve to develop political and public trust in the autonomous competency of NPs (DNP) and have already brought states like California to adopt NPs into parity with physicians as of January 1, 2023, to fill physician shortages in multiple practice settings that are presently challenging healthcare systems and clinics [40]. Reasonably speaking, it's constructively feasible that PAs (DMSc) will follow in their footsteps, in light of the inception of California law SB 697 (Caballero) which passed on January 1, 2020, that changed the language so that PAs are no longer "delegated or supervised" by physicians, and are now empowered to enter into "collaborative agreements" with physicians in practice, to which the PA owns their scope of medical practice [41].

Thus, PAs (DMSc) and NPs (DNP) will effectively transform the medical profession from a pre-1992 uniquely, and primarily, physician-only model, to a decentralized multidisciplinary care team model that effectively resembles the Quadcare Model, to contribute clinical, administrative, and professional support to physicians, institutions, and the patients in their respective communities where they serve. Rounding out the full spectrum of care, it is essential to re-introduce the peripheral integration of patient care to envelop the services of modern allied health professionals (AHPs), such as a patient's clinical psychologist or physical therapist, who oftentimes do not receive the entire opportunity to contribute to the patient's joint preventive or individualized treatment decisions, where it may be vital to the patient's informed shared decision-making, and subsequent outcome with their HCP. (See Figure 2)

Modern Allied Health Professionals (AHPs)

Legend:

DDS - Doctor of Dental Surgery
PharmD - Doctor of Pharmacy
PsyD - Doctor of Psychology
DC - Doctor of Chiropractic
PhD - Doctor of Philosophy
SLPD - Doctor of Speech-Language Pathology
AuD - Doctor of Audiology
OD - Doctor of Optometry
DCN - Doctor of Clinical Nutrition
DAOM - Doctor of Acupuncture and Oriental Medicine
DPM - Doctor of Podiatric Medicine
OTD - Doctor of Occupational Therapy
DPT - Doctor of Physical Therapy

Figure 2: Modern Allied Health Professionals (AHPs).

Team Dynamics

Currently, PAs (DMSc) and NPs (DNP) still struggle to achieve employment parity with some healthcare organizations and private practices. Delving deeper into the healthcare institutional dynamics, one may find hidden stereotypes have been previously categorized under pygmalion, contrast effect, halo effect, and impression management, in combination with underlying implicit biases which serve to create a great deal of division based on unsubstantiated beliefs, stereotypes, or generalizations [14, 42]. Admixed with personality tests (eg Myers-Briggs Type Indicator, etc.) represents biased psychometric screening tools that interfere with equitable hiring practices of meaningful talent across the spectrum of professions. Addressing these company hiring practices has been shown to contribute to improved unity, productivity, and efficiency within organizations [14].

Presently, staff members have a natural desire to be a part of the primary care group (or analogous clinical care setting) as a whole, through shared values and views with colleagues, to boost self-esteem through a positive social identity, and a common sense of safety [14]. Leadership provides for healthy group norms which strengthen the cultural norms and bonds between employees, reduces conflicts, and expresses a uniformity in patient care under shared responsibilities. Further supported by intrapersonal functional diversity of the individual and groups, whereby the patient benefits from each employee in the care team possessing more diverse and broad experiences within their field of expertise [43]. Additionally, cohesive clinics stand to reduce medical errors, increase operational efficiency, and synergize patient and employee satisfaction scores along with the quality of care when managers invest in both group and team dynamics [14]. Every member of the primary care group (or analogous clinical care setting) [MD, DO, PA (DMSc), NP (DNP)] functions in certain roles, and effective leaders must recognize how each one fits into a schema to bring about common goals, establishing this as the cohesive norm.

Other analytical tools are presently recommended to assess group dynamics and galvanize cohesiveness. One is to perform a sociogram periodically as a litmus test on the direction and intensity of communication among team members [14]. Another example is to perform quarterly Bales' analytical interaction tools to reassess the group's communications with one another. This assists in confirming that individuals accept their roles that conform to the group, utilizing socioemotional positive communication, through solidarity, tension release, and agreeable statements. These are well-balanced with healthy disagreements, opinions, suggestions, and clarifications. Hence, it is necessary to establish an interdependent primary care group (or analogous clinical care setting) with varying qualities of displayed conformity [14]. Reducing groupthink while ensuring a safe work environment to enhance innovative, critical, and shared thinking is the goal of the nonconformist leader.

Collective leadership then aims to disseminate leadership power amongst all members of the team, not necessarily bypassing the hierarchical structure but allowing for people to step up and provide a differing professional perspective and take the lead in their areas of expertise [43]. Just among medical providers, there are varying opinions, interpretations, and applications of evidence-based medicine guidelines, diagnostic studies, and interventions, due to differing training, experience, cultural, and gender backgrounds. In coming to a shared understanding, the entire team will feel a sense of ownership and belonging as they contribute to the progress of the organization, working interdependently in minimizing the clinical perplexity of the patient's presenting medical issue, and instead boosting well-formed, high-quality, and compassionate patient care. Healthy functioning employees build healthy organizations, and the care they provide for the patients in their communities will better serve their needs while meeting strategic profits [14].

Relinquishing the power dynamic between the MD, DO, DMSc (PA), and DNP (NP) would allow the clinicians to engage in open dialogue through normative powers, rather than being concerned with more starkly contrasted perceptions of right, wrong, and zero-sum game [44]. Such an approach serves to alleviate the HCP who rationalizes the necessity to obscure biases for a colleague. At a later time, a collaborative group decision among clinical leadership and/or human resource management may foster or design a supportive remediation process to cultivate meaningful engagement amongst HCPs.

Fiscal and Clinical Benefits

A systematic review from 2021 showed that PAs provided comparable patient care to physicians out of 15 studies, and exceeded physician care in 18 other studies [21]. The study concluded that 29 out of the total 39 studies from North America, Europe, and Africa, revealed that the cost of labor and resources devoted to patient care by PAs was lower than physicians, signaling the cost efficiency of PAs as invaluable on the healthcare team and the institution's overall operational costs. Historically, research from 1981 demonstrated that Nurse Practitioners potentially reduced the overall cost of patient care by one-third, and to a greater degree, in medical practice when performing autonomously as compared to being complementary to a physician [45]. In a landmark systematic review published in 2019, international results indicate advanced practicing nurses (NPs) provided an overall saving in patient care visits and medication expenses. However, researchers found mixed results in cost savings related to diagnostic and laboratory studies, likely attributable to the lack of transparency commonly found in PA and NP incident-to billing and the inability to track care provided by these clinicians due to physician billing overshadowing their involvement [46]. Typically for a PA or NP practicing in tandem with a physician, billing under the physician yields a 100% reimbursement rate as opposed to 85% for PAs and NPs when autonomous [45, 46]. Thus if medical services are accurately billed, this would likely reduce the overall healthcare costs provided by PAs (DMSc) and NPs (DNP) [47].

Furthermore, research performed at the Veterans Affairs Administration (VA) in 2019 determined that autonomously practicing NPs and PAs provided more primary care follow-up outpatient care for diabetic patients with multiple comorbidities, and decreased utilization of inpatient and emergency department visits, which translated to an overall annual healthcare savings of $2005 and $2300 per patient, respectively [48]. Moreover, additional cost savings are anticipated in the Medicare system for both NP and PA providers which are estimated to be at least $194 million in 2018 by simply eliminating indirect billing of services through the physician, further supporting the autonomy of NPs (DNP) and PAs (DMSc) alike within the healthcare system [49].

To better quantify the impact that PAs (DMSc) and NPs (DNP) compared to MD and DO physicians have on the healthcare industry, and to what extent the American people benefit from their professional services, it is worthwhile to glance at current statistical contributions. In 2018, of the total 985 026 MD and DO physicians practicing, they combined for a total of 860 million patient visits, of which, 848 million are attributed to direct physician care [50, 51]. Statistical data from recent reports found the average number of patients seen in a week (73) by 123 089 PAs in 2017 is believed to comprise 449 million patient encounters in the healthcare system as a whole [51-53]. For the 248 000 practicing NPs, this number ballooned to over 1.02 billion patient visits for the same year [54, 55]. The significance of the nearly 1.5 billion patient visits by both PAs (DMSc) and NPs (DNP) is slated to continue growing as more Americans are insured under the ACA [20]. As of 2021 there are 325 million Americans with health insurance, leaving roughly 30 million uninsured that collectively consumed approximately $4.3 trillion in state and federal health care expenditures, and accounted for about 18.7% of the $23 trillion U.S. gross domestic product [56, 57]. Based on these data, PAs and NPs are providing twice as many patient visit encounters compared to physicians at a cost saving to the healthcare system, making this a central focus of fiscal policy and equity, effectively reducing the rising financial burden while bolstering professional parity.

Conclusion

Conclusively, both the DMSc (PA) and DNP (NP) are competent at contributing to a more dynamic, cost-efficient, and in many cases, exceeding clinical managed and responsible healthcare that has a global financial impact which is encouraging the professional expansion of their roles in a decentralized healthcare profession. This evidence supports the parity of the DMSc (PA) and DNP (NP) with MD and DO physicians, and substantiates the Quadcare Model for HCPs of the twenty-first-century healthcare system. Healthcare institutions vesting the MD, DO, DMSc (PA), and DNP (NP) under the same medical umbrella affords a unique opportunity to model a collaborative medical profession that expands its reach and delivers high-quality medical care to Americans and beyond. Key stakeholders in the healthcare system and legislators who hold professional relationships or conduct business with, or on behalf of HCPs may be better equipped to solve matters that pertain to healthcare insurance, institutional, public health, or other related medical, legal, and economic challenges when armed with the Quadcare Model.

References

1. Timmons G. Hippocrates biography. The Biography. comwebsite (2020).
2. Suvajdžić L., et al. "Hippocrates-The Father of Modern Medicine". Vojnosanitetski pregled.2016;73(12):1181–1186.
3. Marketos S. History of medicine. Laboratory of medical physics, school of medicine, University of Athens website (1997).
4. Boylan M. "The Hippocratic oath and professional ethics". Scholarblogs website (2014).
5. McConaghy M, Silberman M and Kalashnikova I. "Penn in the 18th century, School of medicine". Penn University Archives and Records Center webpage (2004).
6. Ludmerer K. Medical education, encyclopedia dictionary of American history. Encyclopedia.com webpage (2018).
7. Martin L. "What to know about allopathic medicine". Medical News Today website (2021).
8. Stoppler M. "Medical definition of allopathic medicine". Medicine Net webpage (2021).
9. American Association of Colleges of Osteopathic Medicine. "A brief history of osteopathic medicine". American Association of Colleges of Osteopathic Medicine (2022).
10. Berg J. "The perils of not knowing the history of the nurse practitioner role". J Am Assoc Nurse Pract 32.9 (2020): 602-609.
11. American Academy of Physician Associates. "PA profession, historical milestones". American Academy of Physician Associates (2019).
12. DeCapua M. "Doctor of nursing practice: An origin story". Healthe Careers website (2015).
13. Lynchburg Magazine. Prepared for leadership - the first doctor of medical science class (2018).
14. Borkowski N and Meese K. Organizational behavior in health care. Jones and Bartlett Learning (2021).
15. Kotter J and Cohen D. "The heart of change". Boston, MA: Harvard Business Review Press (2002).
16. Institute of Medicine (US) Committee on Quality of Health Care in America. Crossing the Quality Chasm: A New Health System for the 21st Century. Washington (DC): National Academies Press (US) (2001).
17. McKinsey & Company. Diversity wins how inclusion matters. McKinsey & Company website (2020).
18. Senge P. The fifth discipline. New York, NY: Doubleday (1990).
19. U.S. Department of Health & Human Services. Defining the PCMH. U.S. Department of Health & Human Services website (2021).
20. Health & Human Services. What is the affordable care act? Health & Human Services website (2017).
21. van den Brink G., et al. "The cost-effectiveness of physician assistants/associates: A systematic review of international evidence". PLoS ONE 16.11 (2021): e0259183.
22. Htay M and Whitehead D. "The effectiveness of the role of advanced nurse practitioners compared to physician-led or usual care: A systematic review". IntJ Adv NursStud 3 (2021): 100034.
23. Pasquini S. "Where PAs and physician associates can work internationally". The PA Life website (2018).
24. Maier C., et al. "Descriptive, cross-country analysis of the nurse practitioner workforce in six countries: Size, growth, physician substitution potential". BMJ Open 6.9 (2016): e011901.
25. American Academy of Physician Associates. "PA scope of practice". American Academy of Physician Associates website (2017).
26. American Academy of Physician Associates. "Optimal team practice". American Academy of Physician Associates website (2017).
27. American Academy of Physician Associates. NHSPA celebrates new law allowing PAs to receive direct payment. American Academy of Physician Associates website (2022).
28. American Association of Nurse Practitioners. Discussion paper: Scope of practice for nurse practitioners. American Association of Nurse Practitioners website (2019).
29. Berg S. As work hours rise, so does physician burnout. American Medical Association website (2019).
30. Blackstone SR., et al. "Depression, burnout, and professional outcomes among Pas". JAAPA 34.9 (2021): 35-41.
31. Kapu AN., et al. "Assessing and addressing practitioner burnout: Results from an advanced practice registered nurse health and well-being study". J Am Assoc Nurse Pract 33.1 (2021): 38-48.
32. Clapper T and Ching K. "Debunking the myth that the majority of medical errors are attributed to communication". Med Educ 54.1 (2020): 74-81.
33. Mansour R., et al. "Disclosure of medical errors: Physicians' knowledge, attitudes and practices (kap) in an oncology center". BMC

Med Ethics 21.1 (2020): 74.

34. Masson G. About 1 in 5 healthcare workers have left medicine since the pandemic began — Here's why. Becker's Hospital Review website (2021).

35. MGMA Stat. Even as COVID-19 pandemic eases, a physician burnout epidemic continues. MGMA website (2021).

36. Elsevier Connect. "Clinician of the future: A 2022 report". Elsevier website (2022).

37. Burroughs J. "Essential Operational Components for High-Performing Healthcare Enterprises". Health Administration Press (2019).

38. Grando M, Rozenblum R and Bates D. "Information Technology for Patient Empowerment in Healthcare". De Gruyter (2015). =

39. Whitman A., et al. "Addressing social determinants of health: Examples of successful evidence-based strategies and current federal efforts". Assistant Secretary for Planning and Evaluation website (2022).

40. California Legislative Information. "AB-890 Nurse practitioners: Scope of practice: Practice without standardized procedures". California Legislative Information website (2020).

41. California Academy of PAs. "Overview of SB 697". California Academy of PAs website (2022).

42. University of Washington Human Resources. "Implicit bias training for hiring managers and interviewers". University of Washington Human Resources website (2022).

43. Frimpong J., et al. "When health care providers look at problems from multiple perspectives patients benefit". Harvard Business Review website (2017).

44. Janusch H. "Normative power and the logic of arguing: Rationalization of weakness or relinquishment of strength?". Coop Confl 51.4 (2016): 504-521.

45. American Association of Nurse Practitioners. "Nurse practitioner cost effectiveness". American Association of Nurse Practitioners website (2013).

46. Abraham C., et al. "Cost-effectiveness of advanced practice nurses compared to physician-led care for chronic diseases: A systematic review". Nurs Econ 37.6 (2019): 293-305.

47. Powe M. "Medicare's "incident to" billing hinders the recognition and assessment of PA value". American Academy of Physician Associates website (2019).

48. Morgan P., et al. "Impact of physicians, nurse practitioners, and physician assistants on utilization and costs for complex patients". Health Aff (Millwood) 38.6 (2019): 1028-1036.

49. Cass A. "Ending indirect billing for PAs, NPs would have saved Medicare $194M". Becker's Hospital Review website (2022).

50. Young A., et al. "FSMB census of licensed physicians in the United States, 2018". Federation of State Medical Boards (2019).

51. Santo L and Okeyode T. "National ambulatory medical care survey: 2018 national summary tables". Centers for Disease Control and Prevention (2018).

52. National Commission on Certification of Physician Assistants. "2017 statistical profile of certified physician assistants by state". National Commission on Certification of Physician Assistants website (2019).

53. Morton-Rias D. "Physician Assistants: Growing in number and scope". HCP Live website (2018).

54. Sarzynski E and Barry H. "Current evidence and controversies: Advanced practice providers in healthcare". Am J Manag Care 25.8 (2019): 366-368.

55. American Association of Nurse Practitioners. "Number of nurse practitioners hits new record high". American Association of Nurse Practitioners website (2018).

56. Cohen R., et al. "Health insurance coverage: Early release of estimates from the national health interview survey, 2021". Centers for Disease Control and Prevention website (2022).

57. The World Bank. "GDP (current US$) - United States". The World Bank website (2022).

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