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Contribution of Nurse Practitioners to Ambulatory Specialty Care

by
Shira Gavriella Winter

DISSERTATION
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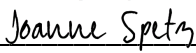
DocuSigned by:

AD02AFFA1F714D0... Susan Chapman
Chair

DocuSigned by:

DocuSigned by:486... Garrett Chan

DocuSigned by:

DocuSigned by:444... Karen Duderstadt

DocuSigned by:

B851E831BF874D7... Joanne Spetz

Committee Members

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Contribution of Nurse Practitioners to Ambulatory Specialty Care

Shira Gavriella Winter

Abstract

The presence of nurse practitioners in ambulatory specialty care is growing, but few studies have systematically examined the role and contribution of nurse practitioners in these settings. This dissertation aims to explore the role and contribution of nurse practitioners in ambulatory specialty care.

Chapter 1 is a qualitative exploration of the role and contribution of nurse practitioners in ambulatory medical and surgical specialties, beyond providing billable visits. This study identified five themes regarding nurse practitioner contribution: care coordination and promoting patient care continuity, promoting departmental continuity, institutional historical and insider knowledge, addressing time-sensitive issues, and participating in leadership and quality improvement activities.

Chapter 2 quantifies non-billable activities performed by advanced practice providers (nurse practitioners, clinical nurse specialists and physician assistants) in ambulatory care settings, in regard to their number and duration. It also includes a brief qualitative exploration of these activities. Findings of this study showed that advanced practice providers spend significant amounts of time on these activities, the majority of which relate to orders, chart review, and documentation.

Chapter 3 identifies some key differences between nurse practitioners in primary care settings and in non-primary care settings in the state of California, in order to better understand how the role of nurse practitioners in these settings differ. This study showed that nurse practitioner practicing in non-primary care settings have lower odds of reporting time as a barrier

to practice, lower odds of reporting practice to full scope, and higher odds of reporting a hierarchical or supervisory relationship with the physician, compared with nurse practitioners in primary care settings.

Further understanding of the role and contribution of nurse practitioners and other healthcare providers in specialty care settings will facilitate optimal use of their skills and training to maximize the provision of high-quality healthcare to patients and populations.

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Introduction

The presence of nurse practitioners (NPs) in specialty care in the United States is growing. In 2016, there were NPs and physician assistants working in approximately 28% of specialty practices nationwide (Martsolf et. al, 2018). Between 2008 and 2016 there was a 32.6% increase of NPs in specialty care. This growth in the presence of NPs and physician assistants in specialty care coincides with a predicted physician shortage in the medical and surgical specialties within the next decade (American Association of Medical Colleges, 2018; U.S. DHHS, HRSA, National Center for Health Workforce Analysis, 2016b, U.S. DHHS, HRSA, National Health Workforce Analysis, 2016a). While the role of NPs in primary care has been well-studied, little is known about the role, contribution, and practice environment of NPs in ambulatory specialty care.

The focus on primary care has been due, in part, to the origins of the nurse practitioner profession. In 1965, the Colorado pediatrician Henry Silver and nurse Loretta Ford co-founded the first nurse practitioner certificate program in order to meet the demand for pediatric healthcare providers, especially in rural areas (Fairman, 2008). Through this program, nurses were taught advanced skills, such as diagnostic thinking, as well as certain procedures, such as suturing (Fairman, 2008). NP scope of practice now includes activities such as taking health histories, performing physical exams, prescribing medications, ordering and interpreting lab test and imaging studies, ordering and administering immunizations, and providing health education (American Association of Nurse Practitioners [AANP], 2019b). Scope of practice legislation and restrictions on NP practice vary by state (AANP, 2019a).

As the nurse practitioner profession grew, various specializations emerged in nurse practitioner training and practice. For instance, the acute care nurse practitioner certification, for

NPs caring for acutely ill individuals, was developed during the late 1990's and early 2000's, fueled by increased demand for healthcare providers in acute care due to the mandated maximum 80-hour work week for physician residents (Howie-Esquivel & Fontaine, 2006). The psychiatric mental health nurse practitioner specialty also emerged in the 1990's, initially from the clinical nurse specialist role, in the context of national healthcare reform measures such as the creation of HMOs and managed care. This policy reform shifted the focus of health services, including mental health counseling, to the primary care setting (Delaney, 2005; Krauss, 1993).

As medical care became increasingly complex and specialized, individual medical and surgical specialty groups started to develop role and practice guidelines for advanced practice providers within their specialty. For example, models for the implementation of advanced practice provider roles in liver transplant in inpatient and outpatient settings discuss the providers' role in direct care, care coordination, procedures, participation in institutional and national programs, quality improvement, teaching, and clinical research (Chaney & Yataco, 2019). Similar guidelines for roles and clinical competencies have been developed for other specialties, including emergency care, dermatology, urology, and oncology among others (Wolf, Delao, Perhats, Moon, & Carman, 2017; Bobonich & Nolen, 2018; Quallich, Bumpus, & Lajiness, 2015; Hoffmann, Klein, & Rosenzweig, 2017). The efforts of individual specialty groups to formalize the clinical competencies and roles for nurse practitioners in various medical and surgical specialties may help improve implementation of these roles in other healthcare settings, and create better understanding of advanced practice provider job function and scope of practice for healthcare provider colleagues and for administrative leaders.

Research shows that nurse practitioners on specialty teams play a distinct role compared to that of other healthcare providers. One study examined over 200 nurse practitioners in

specialty care practices and identified six unique models for how nurse practitioners function in the specialty care environment (Bahouth, Esposito-Herr, & Babineau, 2007). Dower and Christian (2009) compared nurse practitioner roles in six different specialty settings with varying organizational models. This study examined NPs and physician assistants in orthopedics, gastroenterology, and dermatology, and found that their presence improved access to care and reduced wait times by allowing physicians to see more complex cases, increased revenue to practices, and strengthened care coordination and communication (Dower & Christian, 2019). The authors note that NPs and PAs are used in varying capacities by different practices and health systems, such as in terms of what type of provider is assigned to new patients or performs follow up visits or procedures (Dower & Christian, 2009). Other qualitative investigations of the nurse practitioner role in specialty care have uncovered themes including the importance of institutional practice environment, contribution to communication with patients and families, different ways of relating to other healthcare providers, and expertise in care coordination and healthcare system knowledge (Hurlock-Chorostecki et. al, 2012; Motley et. al, 2016; Van Soeren et. al, 2010; Stahlke-Wall & Rawson, 2016).

While these studies show that there are some consistent patterns in the role of nurse practitioners in specialty care, organizational culture and environment are important to consider when examining the nurse practitioner role across settings. The results of a recent U.S. survey of nurse practitioners in primary care found variation in how the nurse practitioner role is implemented in different care settings (Poghosyan & Aiken, 2015). Some of the identified differences in practice environment were: whether the nurse practitioners had a panel of patients, presence of adequate support staff, representation on committees, understanding of the nurse practitioner role by the organization, and satisfaction with communication with the

administration (Poghosyan & Aiken, 2015). An exploration of the nurse practitioner contribution to specialty care will likely show similar variation due to the differences in how organizations, institutions, and personnel design practice environments.

There are several key studies demonstrating the impact of nurse practitioner practice on healthcare quality and cost. It has been shown that the quality of patient outcomes for nurse practitioners in the primary care and specialty settings is comparable to the quality of patient outcomes for physicians. In primary care, several studies, including systematic reviews and a randomized controlled trial, found comparable quality outcomes on physiologic measures, patient satisfaction metrics, prevention of emergency department visits, and hospitalizations (Laurent et. al, 2009; Newhouse et. al, 2011; Mundinger et. al, 2000). For the inpatient setting, studies have shown that nurse practitioners have equivalent or improved outcomes on certain metrics, such as length of stay, mortality, cost savings, patient satisfaction, and staff communication (Kleinpell, Ely, & Grabenkort, 2008; Martin-Misener et. al, 2015). A systematic review of nurse practitioners in the emergency department setting found evidence of equal or superior quality of care, but notes that quality was defined differently in the various studies (using metrics such as missed injuries and unscheduled returns to the emergency department). One study combining quality and patient satisfaction into a single metric called for continued evaluation of quality of care provided by nurse practitioners in the emergency department setting using more widely agreed-upon quality measures (Jennings, Clifford, Fox, Connell, & Gardner, 2015).

For ambulatory specialty fields, there is very little evidence regarding nurse practitioner quality of care. However, the scant evidence that exists indicates that the presence of nurse practitioners in specialty care, alone or with physician collaboration, is on par with physician-

only care in terms of quality and safety. For instance, a systematic review of nurse-led care for patients with rheumatoid arthritis, which included nurse practitioners and clinical nurse specialists, found the quality of nurse-led care was equal to that of physician-led care in terms of safety and effectiveness to physician care, and equal or better in terms of patient satisfaction (Garner, Lopatina, Rankin, & Marshall, 2017). A retrospective cohort study in the neurology setting comparing physician-only care and nurse practitioner-physician joint care for patients with epilepsy found that the nurse practitioner-physician team had equivalent performance on quality measures specific to epilepsy (such as unimproved seizure frequency, emergency department visits, injury from seizure, mortality), and higher rates of assessing side effects, providing safety education, and screening for behavioral health (Hill et. al, 2017). A randomized controlled trial in cardiology to compare NP-led care for patients with atrial fibrillation by Canadian research team is ongoing (Smigorowsky, Norris, McMurtry, & Tsuyuki, 2017). As the presence of nurse practitioners continues to grow in ambulatory specialty care, it will be crucial to perform rigorous evaluations on the quality and safety of nurse practitioner care in these settings.

Few studies have analyzed the cost effectiveness of nurse practitioners providing care in the specialty setting. One systematic review found that while there is modest support for the cost-effectiveness of nurse practitioners in certain settings, cost-effectiveness was inconsistent between studies, and showed stronger evidence in the primary care setting (Martin-Misener et. al, 2015). Another study on cost of care used relative value units (RVUs) and evaluation and management expenditures to measure the amount paid by Medicare for a sample of Medicare beneficiaries' visits to primary care. The study concluded that Medicare payments to nurse

practitioners were 29% lower than those to physicians, partially due to lower reimbursement rates for nurse practitioners (Perloff, DesRoches, & Buerhaus, 2016).

Study Problem

While extensive inquiry has been made into the practice environment for nurse practitioners in primary care, few studies have investigated the dimensions of the nurse practitioner role and practice environment in specialty settings. The majority of research on nurse practitioner contribution in specialty care was performed in the inpatient setting rather than the ambulatory setting, and most frequently included only one or two sites.

This dissertation aims to contribute to the nursing and health services literature by exploring the role, practice environment, and contribution of nurse practitioners in ambulatory specialty care settings. It examines how nurse practitioners envision their role and contribution to care, analyzes non-revenue-generating activities quantitatively and qualitatively through a means of documenting that contribution developed by a large medical center, and explores how certain elements of the organizational environment shape nurse practitioners' contributions to healthcare.

The focus of this dissertation is on the nurse practitioners in ambulatory specialty care, but portions of this dissertation refer to nurse practitioners collectively with physician assistants (PAs) and clinical nurse specialists (CNSs) as advanced practice providers (APPs). APPs, rather than nurse practitioners alone, are discussed as a group only when being evaluated in the context of an institution that identifies as role-agnostic, meaning that nurse practitioners, PAs, and CNSs are hired and utilized uniformly and interchangeably, regardless of professional license. It is worth noting that PAs and CNS's have a separate history and different training from that of nurse practitioners, which will not be discussed in this dissertation.

Theoretical Framework

Two major theories inform this dissertation. The first is Abbott's System of Professions, which argues that professions are shaped by the formulation of abstract knowledge, having jurisdiction over a body of work, maintaining legitimacy to perform that work, having a professional structure to organize individuals in the profession, and being part of a hierarchy external to the profession (Abbott, 1988). This theory is applicable to healthcare professionals in general, and nurse practitioners in particular, whose knowledge, jurisdiction, and legitimacy, and hierarchical status evolve based on patient needs and organizational structures and regulations.

A key idea connected to Abbott's concept of job jurisdiction is that of "task shifting" by which highly skilled professionals on a team delegate tasks that are below their scope of practice to other individuals. Task shifting enables each person works to the greatest extent of legal scope and jurisdiction, thereby maximizing the utilization of their skills and abilities, and creating greater efficiency and effectiveness of the team (World Health Organization, PEPFAR & UNAIDS, 2007; Freund et. al, 2015).

The second major theory that informs this dissertation is the theory of value-based care. Value-based care incentivizes quality of care (through the domains of cost, quality, electronic health use, and practice improvement activities) over volume of care provided, in order to shift health system incentives away from exclusively productivity and toward improved patient outcomes (Hirsch, Rosenkranz, Ansari, Manchikanti, & Nicola, 2017). Value-based care is particularly important in the current national healthcare policy, due to the passage of MACRA (Medicare Access and CHIP Reauthorization Act). In 2015, CMS created the Metric Based Incentive Payment System and other alternative payment systems that incorporate measures of care quality into calculations of reimbursement for Medicare services (Hirsch et. al, 2017).

A key concept related to value-based care that will be discussed in this dissertation is the concept of service-value activities (SVAs). SVAs are defined by Ogunfiditimi et. al (2013) as activities related to healthcare provision that do not generate revenue (Ogunfiditimi, Takis, Paige, Wyman, & Marlow, 2013). SVAs stand in contrast to revenue-generating activities, such as office visits, and procedures. An understanding of the full scope of the contribution made by activities NPs perform requires an understanding both of the revenue-generating and non-revenue generating services they provide.

Purpose and Aims

The objective of this dissertation is to explore the role and contribution of advanced practice providers, and nurse practitioners (NPs) in particular, practicing in specialty care in the context of value-based care.

The specific aims of each chapter in this dissertation are as follows:

1. To explore the role and contribution of NPs to ambulatory specialty care, including the NP role on teams in ambulatory specialty care and activities performed in that role, enablers and barriers to NP contribution, and NP perception of their role and contribution.
2. To explore how advanced practice provider contribution in ambulatory specialty care at an academic medical center is identified, measured, and documented on an institutional level, in the context of value-based payment systems.
3. To examine the role and contribution of specialty care NPs in the State of California, including assessing barriers and enablers to performing the NP role, and exploring the organizational structure of settings where NPs in specialty care are employed.

Dissertation Chapters

This dissertation is composed of three chapters. In the first chapter, I present qualitative

data derived from interviews with NPs in ambulatory specialty care on what specific activities they perform and how they perceive their contribution to their departments and to patient care. The chapter highlights the non-revenue-generating contributions that may improve patient care quality, patient satisfaction and departmental cohesion, but that may not be measurable or visible to healthcare institutions under traditional fee-for-service productivity evaluations. This chapter introduces the role of the NP in ambulatory specialty care and discusses some of the specific ways in which the role of the NP in specialty care – especially in an academic medical center -- may be different from the role of the NP in primary care. It also serves as scaffolding for describing and understanding the non-revenue generating activities that NPs perform in this setting that may contribute to the quality of patient care.

In the second chapter, I take a quantitative approach to the findings discussed in the first chapter regarding non-revenue-generating service value activities (SVAs) performed by advanced practice providers (including NPs, physician assistants, and clinical nurse specialists). This chapter provides insight into how SVAs have been recorded by an academic medical center, and estimates the quantity and amount of time spent on SVAs. Also, it discusses how attention to care quality necessitates an examination of both the revenue-generating and non-revenue generating activities performed by staff. This chapter explores the merits of developing improved understanding of the type and quantity of activities that all providers perform to enhance patient care and increase care value.

In the third chapter, I take a broader approach to examining the role of nurse practitioners in non-primary care settings across the state of California. This chapter explores key differences in role and practice environment between NPs in primary care and in non-primary care settings in California. While the role, contribution, and organizational environment of NPs in primary

care is relatively well-studied, the role and contribution of NPs in the multitude of other settings and specialties in which they practice is still poorly understood. This chapter also serves as a preliminary exploration of some overarching differences between NPs in primary care and in non-primary care settings in the domains of time spent on activities, barriers to practice, scope of practice and skill utilization, physician-NP relationships, and satisfaction.

Significance

A further understanding of the role and contribution of nurse practitioners in specialty care settings influences four areas of health services delivery. First, assessing the quantity and type of activities NPs perform, and how these activities add value to patient care, may provide insights for healthcare administration on how to design roles for NPs that include and encourage these activities. Second, a qualitative understanding of the role of the nurse practitioner in specialty care can assist healthcare systems in designing effective healthcare teams working to the full scope of their knowledge and jurisdiction, and can advise the NP profession on how to further develop education and training specific to the knowledge and skill demands of specialty settings. Third, a deeper understanding of patient care beyond productivity allows further insight into what activities may maximize healthcare quality and value, and how these activities are performed by a team of providers. Lastly, these findings elucidate how NP organizational environment, role, and contribution may positively impact patient access to care, care quality, healthcare efficiency, and satisfaction.

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Chapter 1: Quality- and Efficiency-Enhancing Service Value Activities by Nurse Practitioners in Ambulatory Specialty Care

Abstract

Background: The increase in nurse practitioners (NPs) in ambulatory medical and surgical specialty settings has prompted inquiry into their role and contribution to patient care, especially as health insurance transitions from fee-for-service models to payment for quality of care.

Methods: This qualitative thematic analysis examined interviews from 16 nurse practitioners at a large academic medical center about their role and contribution to patient care quality and departmental efficiency beyond billable visits.

Results: Five themes were identified regarding NP quality and efficiency contributions to ambulatory specialty care: care coordination and promoting patient care continuity, promoting departmental continuity, institutional historical and insider knowledge, addressing time-sensitive issues, and participating in leadership and quality improvement activities.

Conclusion: As the role of NPs in specialty care expands and healthcare systems place increasing emphasis on quality of care, it is appropriate to explore the quality- and efficiency-enhancing activities performed by NPs and other members of the healthcare teams within specialty care.

Background

The prevalence of nurse practitioners (NPs) in medical and surgical specialty care is increasing. According to the 2012 National Sample Survey of Nurse Practitioners (NSSNP), approximately 31% of NPs were providing specialty care (U.S. Department of Health and Human Services, 2012). As of 2016, it was estimated that 28% of all outpatient specialty practices in the United States employed NPs and physician assistants (PAs), signifying a 22% increase since 2008, with 49% of multispecialty practices and 21% of surgical specialty practices

being likely to employ NPs and PAs. (Martsolf et. al, 2018). Possible explanations for the increased prevalence of NPs in specialty care include the increased demand for healthcare services and physician shortages in several geographic regions in medical and surgical specialties (American Association of Medical Colleges, 2018; U.S. DHHS, HRSA, National Center for Health Workforce Analysis, 2016b; U.S. DHHS, HRSA, National Health Workforce Analysis, 2016a). Multiple studies have compared the quality of care provided by NPs and by physicians in primary care, reporting that NPs perform similarly to physicians on a number of quality measures such as blood pressure control and blood sugar management in diabetes (Kurtzman & Barnow, 2017; Laurent et. al, 2009; Newhouse et. al, 2011; Mundinger et. al, 2000). These studies and others indicate that NPs are a safe and viable means to supplement the healthcare provider workforce.

Growth in the presence of NPs in medical and surgical specialty practices has prompted inquiry into the role and contribution of NPs in these settings. One study identified six models of the NP role in specialty care, which included providing episodic care, mentoring residents, serving as agents of continuity, providing consultations, overseeing a unit, and billing independently or jointly in ambulatory care (Bahouth, Esposito-Herr, & Babineau, 2007). The study concluded that NPs are regarded highly by physicians in residency training, as the NPs' role in managing patients' continuity of care allowed residents to focus on their professional training (Bahouth, et. al, 2007). Another multi-site investigation of NP contribution to care in primary care, nephrology, neonatology, and cardiology interviewed patients in these settings and found that patients perceived that NPs contributed to team functioning, were accessible through various methods of communication, involved patients in medical decision making, facilitated care coordination, solved problems, and focused on the patient and family (Kilpatrick, Jabbour,

& Fortin, 2016). Similar themes, such as availability, cohesive patient care, care coordination, and care for the patient and family, were identified in another focus group study of staff working with nurse practitioners at nine medical centers (Hurlock-Chorostecki et. al, 2013).

Other evidence has identified activities NPs perform beyond billable visits that contribute to patient care. A survey of NPs and PAs at 37 practice sites (encompassing almost 1500 advanced practice providers) found wide variation in allocation of time to direct patient care versus other activities (Kapu et. al, 2016). A 2011 study of fee-for-service billing systems at 26 academic medical centers showed that 16 centers identified NPs as filling roles outside of direct patient care (such as case manager or research coordinator), and six centers did not bill for NP or PA services (Moote, Krsek, Kleinpell, & Todd, 2011). Another single-site survey of NPs and PAs showed that these clinicians spent a majority of their time on medication management, symptom management, and coordinating community services (McCorkle et. al, 2012).

Some of the emphasis on care coordination and non-direct patient care activities may be explained through “task shifting” from physicians to nurse practitioners and other health professionals (World Health Organization, PEPFAR & UNAIDS, 2007; Freund, et. al, 2015). The goal of task shifting is for each healthcare professional on the team to fully utilize his or her skills. This process is inhibited by poor role understanding among team members, which decreases team effectiveness, and by fee-for-service payment mechanisms, which may disincentivize task shifting (World Health Organization, PEPFAR & UNAIDS, 2007; Freund et. al, 2015).

The move from fee-for-service to value-based payment models places increased emphasis on non-billable activities performed by all members of the care team, including NPs. These activities have been termed “service value activities,” or SVA’s (Ogunfiditimi, Takis, Paige,

Wyman, & Marlow, 2013). These activities may not generate revenue under traditional fee-for-service models of reimbursement, but may increase the value of care and maximize patient outcomes. With the passage of MACRA (Medicare Access and Chip Reauthorization Act) in 2015, as well as the creation of the Metric Based Incentive Payment System (MIPS) and other alternative payment systems that emphasize the value of care through quality, cost, electronic records use, and practice improvement activities, it is becoming increasingly important to understand the individual contributions of members of the healthcare team to promoting healthcare quality (Hirsch, Rosenkranz, Ansari, Manchikanti, & Nicola, 2017).

Purpose

The purpose of this chapter is to report on a study that explored the role and contribution of nurse practitioners in ambulatory specialty care through service value activities. The aims of the study were to identify unique ways in which NPs function in the context of team-based care in the ambulatory specialty care setting, and how NPs perceived that these service value activities enhance quality and efficiency of patient care and of the healthcare institution.

Methods

This study received human subjects research approval from the university's Institutional Review Board. This qualitative cross-sectional study took place in a large academic medical center in the western United States.

Subject recruitment

Subjects were recruited by convenience sampling. Recruitment occurred in two waves: first, one NP manager in ambulatory care sent a recruitment email to her direct reports. This wave of recruitment yielded 11 participants. In the second recruitment phase, a preliminary recruitment email was sent to NP managers at the medical center who were identified by a

leading administrator. The NP managers forwarded this preliminary email to their direct reports, and those who responded with interest were forwarded the official recruitment email. This second wave of recruitment yielded 5 participants, for a total of 16 participants in the final sample. The inclusion criterion was being employed as a nurse practitioner at the academic medical center in pediatric and adult medical and surgical specialties. Participants were excluded if they did not perform patient care or if they worked exclusively in the inpatient setting.

Data Gathering and Analysis

The interview guide was prepared in consultation with an expert panel composed of two senior health services researchers, a pediatric NP clinical professor, and an NP administrator from a different large academic medical center. Interviews were performed by NP researchers, all of whom were affiliated with the academic medical center. Interviewers conducted semi-structured interviews, each lasting approximately 30-60 minutes. Interviews were recorded and transcribed verbatim by a professional transcription service. The first eleven interviews were coded by hand, analyzed, and discussed by the three interviewers. All of the interviews were then uploaded to Dedoose software and re-coded by the author, and interview transcripts were analyzed using thematic analysis. Thematic analysis is a mode of qualitative analysis that is based in grounded theory, and is particularly useful for research relating to policy and practice because it helps uncover “the way individuals make meaning of their experiences...[and how] the broader social context impinges on those meanings” (Braun & Clarke, 2008, p. 96; Braun & Clarke, 2014). Thematic analysis is particularly appropriate for this study, as the data are derived from the self-reported experiences of the subjects, and have bearing on how the NPs’ relate to broader questions about the NP role in specialty care. The data yielded thematic saturation with some variations among subjects.

Results

Sample characteristics are described in Table 1. Participants included sixteen nurse practitioners at a large academic medical center, working in ambulatory medical and surgical specialties, with a majority in pediatrics. The number of years in their current position ranged from 1.5 years to greater than 20 years, with an average of 8 years. The percentage of time spent in ambulatory clinic sessions, during which billable encounters take place, ranged from 20% to 100%, with an average of approximately 50%. The names of the specialty departments were excluded from the analysis in order to protect subject anonymity. Some subjects had practiced as registered nurses and/or as nurse practitioners prior to their current position, and some had worked at other healthcare institutions in the same or in other specialties prior to their current role. While all of the NPs interviewed had direct patient care responsibilities, some subjects had other formal responsibilities as part of their job description, such as assisting in coordination of research activities. The level to which individual NPs assumed care for a specific panel of patients varied by specialty department.

Five major themes emerged from the data: (1) Care coordination and promoting patient care continuity: NPs enhanced patient care continuity through non-billable patient care coordination activities and supporting other providers in the department; 2) NPs provided departmental continuity, fulfilling a variety of roles required for smooth department-level function; 3) NPs were a source of institutional historical and insider knowledge; 4) NPs had the ability to address urgent or time-sensitive issues that arose across the department; and 5) NPs led or participated in quality improvement activities that are not billable under fee-for-service payment models but that contribute to the process of providing care.

Care Coordination and Promoting Patient Care Continuity

Most of the NP participants interviewed spent many working hours on care coordination activities, including phone calls, laboratory orders, prior authorizations, medication refills, visit scheduling, and coordination with other departments. Some of this work was done for patients the NPs saw for independent visits, while other work involved care coordination activities for the entire department. One NP explained, “I’ve always told my [precepted] students that work with me, ‘The work begins almost after you see the patient.’ If your clinic visit took 30 minutes or 60 minutes, it’s going to be that time matched in case management often, or more.”

This care continuity was seen as an asset for promoting patient satisfaction, as one NP stated: “I think that a tremendous amount of value in my care lies in the continuity that the NPs are able to provide...[and] be paired with a nurse practitioner who sort of shepherds them through their treatment...” Another subject perceived the unique role of the nurse practitioner in promoting holistic, continuous care as “I want to find out where the holes in your care are and how you can feel more cared for. And promote you caring better for yourself.”

In several instances, NPs performed patient care activities and complex care management for their physician colleagues while patients were in the clinic and also by performing tasks such as orders, chart reviews, and telephone calls. NPs’ reactions to this dynamic differed, with some participants viewing it as part of effective team-based care and others feeling that these activities detracted from their own responsibilities, such as documentation and care coordination for patients they saw independently.

One subject discussed how this joint care relationship happens in real-time in the clinic setting, and how she is able to help the attending physician with patient care: “[W]hat’s really nice is that she [the attending] could easily say ‘[Subject name], could you go in for all my patients?’ ...[I]t’s really just if she’s falling behind that she’ll ask me if I’ll be backup support for

her.” The NP, in this case, is meeting a need of the clinic by assisting the physician to stay on schedule, thereby providing effective team care jointly with the attending as the need for assistance arose.

Another subject discussed how she worked with an attending and a fellow: “[The attending] did see patients but he usually had a fellow seeing the patient with him because he's [in] a teaching facility, but I did all the [patient chart] reviews. I did all the ordering...I did all the triaging and then all the appointment scheduling.” This model of team care demonstrates the NP performing a critical function for patient care by doing the wraparound care coordination for the attending physician with whom she worked.

This practice of an attending asking for an NP to follow-through with patients not in their caseload was reported by other subjects. One explained how she took on care of a patient for an attending at the attending's request, speaking to the family of the patient on two separate occasions, “...and they're not a patient that I follow but I'm kind of filling in some gaps.”

Another subject discussed how the NPs cover their colleagues' email inboxes as well as those of the fellows and physicians when they are away. Another recounted that there are patients whom

I've literally never met. I've never put my stethoscope on them...But we have this fabulous phone relationship. [laughter] And I can do it, and I'm comfortable in managing most of the questions, but...this is not my patient. And I'm happy to be a team player, and I love doing that, and I'm okay with that. But it just makes it a little bit hard when I'm saying this is not- this needs to be—you know, I have enough on my plate.

This subject expressed the tension between being a collaborative team member and taking care of others' patients while at the same time trying to manage an independent workload.

One subject commented that sometimes requests for team care can cross the boundary of productive collaboration, and veer into taking away time from caring for patients in the NP's own caseload. This NP explained that she would like to be able to spend more time providing better follow-up for her own patients, but on rare occasions she will be asked to follow up on a patient that is not hers and will think, "Well, you were in the chart. You could have done it. Why...are you asking me to do it?" The majority of subjects were happy to provide assistance to their colleagues but, as is noted above, some admitted that it detracted from time caring for their own patients. Generally, subjects reported that other team members' understanding of, and respect for, their role as nurse practitioners mitigated this frustration and promoted productive team-based care models.

Departmental Continuity: the "spray foam installation"

One subject described the role of being responsible for maintaining the smooth operation of patient care and ensuring that important aspects of patient care are not overlooked: "I think we're the glue, or as I like to call it, spray foam installation. So [we] fill in the cracks..." and reinforce continuity of care for patients across the department. There are various ways in which the NPs reported promoting this continuity, supporting the department to ensure that patient care was being given efficiently and that aspects of care were not being overlooked. For instance, one subject noted that during clinic hours,

I also keep them moving along [attending physicians and residents]...I have them forward me all their notes because I want to be up-to-date on what they're doing. I want to make sure that everything is getting ordered...And I want to make sure that they are entering things properly, that they are doing what they're supposed to, that we don't get 1,000 calls from the infusion center, which is what happens when things are not put in properly.

The above quotation describes how this NP fulfills a practice management role, augmented by her advanced knowledge of what care is necessary for the patients. She takes a

holistic view of the department and is able to promote continuity by eliminating issues before they arise.

Another subject who worked in the outpatient setting and attended inpatient rounds as part of her role discussed how she added to patient continuity by taking a holistic view of patient care, ensuring that aspects of care are not overlooked. She stated she accomplishes this goal by being

...kind of just in the background, and then kind of pipe up to say, 'Has anyone talked about discharge teaching, and what they need for discharge? And let's get her [the patient] [equipment]...And then I spend quite a long time, actually, after rounds, teaching with the family.

In this example, the NP participating in rounds promoted continuity of care for the patient, supporting the seamless transition of care between the inpatient and ambulatory care setting.

This role of promoting continuity in order to increase patient satisfaction was echoed by other subjects. One spoke about the impact of this role on patient care, noting "I do think there's a lot of these little extra things, like being a point person for all sorts of things that come up that aren't necessarily in my job description, but that seem important for the practice to run smoothly and for patients to be happy."

Acting as the central figure responsible for ensuring effective operation of a department can place the NP in a difficult position. One subject said that departments "kind of see the NP as the one in the middle, the one who needs to connect all the pieces and make sure that things happen smoothly. And so when a... person doesn't do their job, then I feel like I'm caught in the middle between the provider who ordered whatever and the patient not getting what they need." While NPs are well-positioned to fill gaps in care, in specialty care they have the added task of thinking holistically about how continuity of care can be maintained for all patients seen by the department.

Historical and Insider Knowledge

NP subjects explained that they can promote continuity of patient care in part because they are a consistent presence possessing historical and institutional knowledge. One subject noted that “I’m kind of a consistent provider presence here. Someone who communicates well with the families. And I guess...viewed as someone who knows things about medication auth[orization]s...and refills, and how to get this medication to the family.”

Others affirmed that insider knowledge promotes patient care, particularly in the case of providing services that are associated with office visits. A subject noted her role in obtaining services for other providers’ patients in the department, and how her knowledge assists in this process: “I’m in touch with the woman who obtains our insurance authorizations about when things are approved.... So all the providers in our practice will ask me to help with basically anything infusion-related or specialty medication-related.”

This kind of historical departmental knowledge was viewed as a resource. Another subject remarked, “I guess it feels like I kind of know what’s going on with a lot more people than anyone else....I always remember patients’ names so everyone’s always like, [subject name], ‘what was that patient who had [disease name] that we saw in 2014?’”

Particularly in an academic medical center with trainees, some of the NPs viewed their historical knowledge and expertise as a resource to assist the trainee fellows in providing care to their patients. One mentioned that part of her role was to teach fellows procedures. Another observed,

...the fellows are training. And they don't know the ins and outs of our division, and what to do, and how to order and who to refer to. I mean, they don't know any of that. And so they depend on the nurse practitioners and the attendings a lot. The nurse practitioners are the ones that have all the knowledge. You know, we know the best referral place. We know [where] there is a home infusion

center...[W]e know what [the department of child services] will pay for and what they will not pay for...

The ways in which NPs use their institutional knowledge helps patients get the care they need, but these processes are not quantifiable or billable as a healthcare service.

Attending to Urgent Matters: “Putting out Fires”

The phrase “putting out fires” was used by several participants to refer to patient care tasks that needed to be performed urgently and that could be performed by the NPs because they were physically present in the clinic at the time the services were needed. As one subject observed,

[T]he NPs are really the providers who are in the clinic most of the time, because the attendings spend one or two days in clinic. We're also the ones that if somebody walks in urgently to the clinic, they might be added on to our schedule. If the nurses have issues with orders for somebody...because we're the ones who are who are...physically there, we're often called over to deal with emergencies or put out fires....if the practice nurses need help with orders for somebody, or if somebody needs their urgent prescription. Or if they're trying to triage a phone call to figure out whether they need to be brought in or go to the ER or just stay at home.

In this case, the physical presence of the NP on site becomes an asset, providing continuity of care and the ability to meet a wide variety of patient care needs.

Another NP used the term “putting out fires” in describing how she worked with a physician colleague:

I think [he] is probably the most NP-friendly in the practice... he just has a lot on his plate, and...sees so he sees a ton...of patients...[H]e treats me like a colleague and...is really supportive, and so...I feel like I end up putting out fires for him, but it's not because he's asking me to. It's just the patient keeps calling, and either admin staff or the LVN [licensed vocational nurse] is like, "Can you please help [laughter]?" And then he's always really gracious and grateful for it.

Leadership and Quality Improvement

The nurse practitioners in this study reported that in addition to direct patient care, they led and participated in quality improvement activities, protocol and program development, and teaching. Some of these activities were directly related to patient care at the medical center, while others related more to improving care of the community of individuals with a particular disease. Some examples of these activities included collaborating with colleagues in the department to develop a outcomes measurement tool, working on process improvement including transitioning pediatric patients into adult care, amending workflows for how patients are most appropriately scheduled, and, in the pediatric setting, working with colleagues to educate community partners on the needs of their patients coping with illness. Others reported developing a medication administration protocol with international colleagues, presenting to the specialty's organization at the local and national level, and being on the speaker's bureau at a pharmaceutical company.

Discussion

Nurse practitioners in ambulatory specialty care in this study contributed to providing patient care in ways that are not billable under a fee-for-service system. They coordinated care outside of clinic visits, both for their own patients and for their departments. They provided continuity of patient care across the department, as well as department continuity across staff, activities which they perceived as promoting patient and family satisfaction. They initiated and participated in leadership and quality improvement activities that improve patient care in the department overall. The time spent performing these activities results in less time that the NP can see patients independently.

Many of the subjects acknowledged that RVU generation and billing influenced how they were utilized by their departments. One subject expressed that while she enjoys doing projects that improve patient care, she does not have protected time to work on them, as her primary role is seeing patients. There was also a tension related to which provider would accrue RVUs. A subject reported that she was placed in more of a care coordination and physician backup role, with the physician performing more RVU-generating activities. The pressure to generate RVUs, which is traditionally associated with revenue generation and sometimes tied to provider compensation, may be a further element informing how the NP role is implemented in ambulatory specialty care.

The role of the NP in providing both historical and insider knowledge is notable for two reasons. First, at an academic medical center where there is significant inflow and outflow of trainees and where physicians may dedicate part of their work hours to teaching and research rather than to patient care, NPs become a continuous presence both for staff and for patients and families, as alluded to by Bahouth et al. (2007). Second, the care coordination activities that are discussed above allow NPs to gain insider knowledge about how to facilitate patient care in the community through their knowledge of community resources. Additionally, their on-site presence enables them to assist other staff at times of excessive work; this role captures the way in which the NP on the team can step in to help the rest of the team restore order to an otherwise overwhelming or urgent situation. These aspects of the NP role are consistent with prior studies, such as Wall and Rawson's 2016 qualitative study on the role of NPs in oncology, which found that NPs provided needed assistance to departments. The study also cited hierarchy and inconsistent role implementation were barriers to clear role definition. Van Soeren, Hurlock-Chorostecki, and Reeves (2011), also note that NPs promote departmental cohesion in a study

analyzing NP roles in hospital settings, reporting that participants noted NPs were the “glue to help bond the team together.” A scoping review on NPs in the hospital setting identified NPs as a consistent presence and as contributors to effective interprofessional communication (Hurlock-Chorostecki, Forchuk, Orchard, van Soeren, & Reeves, 2014).

These service value activities go beyond direct patient care to improve quality, access, and satisfaction, but may not be identified as revenue-generating activities or markers of productivity. NPs are often hired to perform direct patient care visits that are billable by the healthcare institution and thus generate revenue. For instance, this study highlights instances when NPs performed direct patient care jointly with their physician collaborators outside of time allotted to their clinic sessions, or when they served as additional provider backup. The above evidence shows that NPs fill essential roles beyond providing direct patient care, including participating in and leading activities such as quality improvement projects and protocol development, which provide meaningful contribution to patient care but that may not be visible as such to the healthcare institution because they do not directly translate as increased productivity. A recent survey of NPs in a variety of settings designed to quantify and further assess service value activities found that the amount and type of these activities is correlated with type of practice (i.e. private practice or hospital), number of support staff, and designation as a primary care provider (Kippenbrock et. al, 2018). As reimbursement models shift from focusing on volume to quality- based payment, further exploration of how service value activities contribute to patient care quality is likely to become increasingly valuable in understanding the detailed process of patient care and quality enhancement.

In evaluating the role of ambulatory specialty nurse practitioners, it is beneficial to consider these hidden contributions to patient care. In deciding to hire a nurse practitioner in an

ambulatory specialty department, or when evaluating the current function of nurse practitioners in ambulatory specialty care, administrative leadership should consider what share of the NP's role is devoted to direct independent patient care (which may promote patient access and be billable under a fee-for-service system) and what share is devoted to care coordination and other departmental activities (which may also promote patient access while improving quality of care provided by the department overall, but are not billable in a fee-for-service system). These decisions can be weighed by considering both the needs of the department and the needs of the patient population. Additionally, the type of specialty (surgical, medical, etc.) may invest the NP role with varying degrees of autonomy. For instance, in a surgical department, the surgeon may determine the bulk of a patient's plan of care, possibly necessitating less NP role autonomy and more collaboration as tasks are shifted to other care team members.

If NPs are not seeing patients independently, it is worth considering whether an NP is the appropriate person for such coordination and quality-improvement roles, or whether they could be filled by an RN, case manager, or administrator, which could allow NPs to focus on direct patient care. However, data from this study suggest that the NP role in performing case management and care coordination is in many ways distinct from the RN role in these areas, since the NP may use higher scope of practice to change plans of care, through advanced diagnostic reasoning, assessment, and disease management skills. The problem of NP skill underutilization potentially limiting patient access to the healthcare system has been discussed in the primary care context (Poghosyan, Liu, & Norful, 2017). Employers of NPs should ensure NPs are practicing at the highest levels of their skills and scope of practice in specialty care settings. Previously-developed frameworks for successful integration of the full scope of the NP role into hospital settings acknowledge that NPs perform direct patient care and at the same time

are responsible for promoting teamwork, patient care continuity, and communication between team members and families, and that hospitals respect these roles by providing protected time for non-clinical activities (Hurlock-Chorostecki & McCallum, 2016). A Canadian study on the role of advanced practice nurses and nurse practitioners across hospital settings (including inpatient and ambulatory settings) identified similar NP contributions, including being approachable and available for staff, having knowledge of the patient and family, improving safety by ensuring care is not missed, and being a bridge between medicine and nursing (Van Soeren, Hurlock-Chorostecki, & Reeves, 2011).

Finally, studies in the primary care setting have discussed how billing practices may discourage healthcare institutions from having NPs work to full scope of practice (Poghosyan et al, 2013). As payment structures move from fee-for-service to value-based models, it would behoove healthcare institutions, when assessing the overall contribution of an individual healthcare provider, to consider the service value activities performed by departmental staff members that contribute to quality of patient care, rather than focusing heavily on billable activities. This study adds to current knowledge on the role of nurse practitioners in ambulatory specialty care by qualitatively examining specific activities NPs perform and their perspective on these activities, in order to help promote holistic, effective interprofessional patient care within ambulatory specialty care departments.

Limitations

This study took place at one academic medical center, which may limit the applicability of these findings to other settings. However, focusing on one institution allows for more institutional consistency when analyzing data from various departments. Similarly, including multiple types of specialties is both a strength and a limitation of the study. Comparing across

various departments allows for a wider sampling of how NPs are utilized in different medical and surgical specialty areas, facilitating development of both patterns of contribution and variations between departments. On the other hand, cross-departmental comparisons may limit the applicability of this analysis due to differing departmental structures and patient needs depending on disease course. Another limitation is researcher bias: one of the interviewers worked with the subjects of this study and the other interviewers were NPs, which may have biased the interviews. Additionally, interviews of other non-NP providers, who may have different perspectives, were beyond the scope of the study. Further inquiries into the role of nurse practitioners in ambulatory specialty care should be expanded to include multiple sites and interview other providers and patients, in order to better understand and maximize the utilization and contribution of nurse practitioners in the ambulatory specialty setting.

Conclusion

This study qualitatively explored the perceived role and contribution of nurse practitioners in ambulatory specialty care, in light of their growing presence in the healthcare workforce. It identified ways in which they contribute to continuity of care and department functioning. Further inquiry would be valuable to assess how varying roles of nurse practitioners on ambulatory specialty teams impact patient care, cost, and quality of care.

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Appendix

Table 1.1: Sample Characteristics

Pediatric or Adult NPs (n=16)
<ul style="list-style-type: none">• Pediatric: 12 participants• Adult: 4 participants
Years in Current Position (n=16)
<ul style="list-style-type: none">• Mean: 8.28 years• Min: 1.5 years• Max: >20 years• Standard Deviation: 5.43 years
Percentage of Time Spent on Ambulatory Clinic Visits (n=15)*
<ul style="list-style-type: none">• Mean: 40.92%• Min: 20%• Max: 100%• Standard Deviation: 20.51

*data missing from one participant

Chapter 2: Measurement of Non-billable Activities by Advanced Practice Providers (APPs) in Ambulatory Specialty Care

Abstract

Revenue-generating healthcare activities, generally accepted as a measure of productivity, do not account for the full range of healthcare activities that enhance patient care. We analyzed the quantity, duration, and type of “service value activities” performed by advanced practice providers, which are non-billable service activities that contribute to billable service provision, quality of care, and value of care. Data were obtained from ambulatory specialties at one healthcare institution over a 13-month period. Results show that each provider spent an estimated average of between 3.7 and 36.5 hours per month on service value activities, with the greatest number of these activities related to orders, chart review, and documentation. More thorough exploration of the quantity and type of service value activities performed may lead to a better understanding of the role and contribution of advanced practice providers and other healthcare professionals to patient care.

Background

As healthcare payment systems move from fee-for-service to value-based payment, it is becoming increasingly important to account for care activities that may not be reimbursable in a fee-for-service system but that enhance the quality and value of healthcare services. Greater attention to fostering high-value, high quality care in an increasingly complex interprofessional healthcare environment raises the need to examine the role of all members of the healthcare team in promoting positive patient outcomes.

Advanced practice providers (APPs), such as advanced practice registered nurses and physician assistants, are being employed in increasing numbers in medical and surgical specialty

settings. Between 2008 and 2016, nurse practitioners and physician assistants were employed in approximately 28% of all specialty practices in the United States (Martsolf et. al, 2018). The quality of care provided by APPs has been found to be comparable to care provided by physicians in various settings, including acute care, the emergency department, and primary care. (Mundinger, et. al, 2000, Newhouse et. al, 2011, Laurent et. al, 2009, Timmermans et. al, 2017, Kurtzman & Barnow, 2017). These APPs are able to perform direct care for patients, including diagnosis, creating a plan of care, ordering medications and other treatments, performing procedures, and ordering and interpreting laboratory and imaging tests.

Under traditional fee-for service payment models, clinician services are usually compensated through the generation of wRVUs (work relative value units), for performing activities that involve direct patient care (for example, a clinical encounter or performing a procedure) (Luong, Bojansky, & Kalra, 2018). It is often the case that compensation is tied to productivity, as measured by wRVUs. (Luong et. al, 2018).

While the wRVU compensation system rewards clinicians and practices for increased volume of patients and procedures, it is designed to cover the expense generated by seeing a certain number of patients through billable encounters, but it does not account for the non-billable activities that may be integral to patient care. Those activities might include collaboration with other members of the care team, testing follow up, discussing care with patients and families, research, teaching, and quality improvement (Luong et. al, 2018). Additionally, under the Medicare reimbursement system, physician assistants and nurse practitioners billing under their own provider number are compensated at only 85% of the physician fee schedule for the same wRVU generation (Medpac, 2017). Because hospital departments, which are usually directed by physicians, have incentives to maximize revenue, the

15% reduction in compensation for APPs may lead clinical practices to utilize physicians to perform billable services such as procedures and direct clinical encounters and to utilize advance practice providers to perform non-billable patient care activities. Alternatively, it is possible that at individual institutions, APP documentation may support billing at a higher level of service, in which case it would be preferable for the APP to perform revenue-generating activities.

Non-billable activities related to patient care have been termed in the literature as service value activities, or SVA's (Ogunfiditimi, Takis, Paige, Wyman, & Marlow, 2013). Prior studies have measured these activities, including one 1988 study (Dunn et. al,) which measured physicians' pre-service and post-service activities by surveying physicians and mathematically extrapolating time spent. The study found that, on average, physicians spent 25-50% of the workday on pre-service and post-service SVAs. Another small observational study of physicians found that in the surgery and neurology settings, physicians spent an average of only 61% of time on direct patient care (Jacobson et. al, 2011). The study identified multiple non-direct care activities including prescription refills, making referrals and appointments, and interactions with other staff and providers (Jacobson et. al, 2011). A more recent time-and-motion study examined time utilization of physicians in internal medicine, family medicine, orthopedics, and cardiology, and found that 49.2% of time was spent on the electronic health record, including documentation, reviewing test results, and orders (Sinsky et. al, 2016).

A time-and-motion study that quantified the non-billable activities of nineteen advanced practice providers over 44 days found that in inpatient settings about 61.6% of time was spent on revenue-generating activities, and 35.1% was spent on SVAs (Ogunfiditimi et. al, 2013). In the outpatient setting, about 59% of time was spent on revenue-generating activities with 38.2% of time on SVAs (Ogunfiditimi et. al, 2013). The most commonly reported SVAs were reviewing

clinical data, discussions with the healthcare team, and telephone encounters (Ogunfiditimi et. al, 2013).

SVAs that promote higher quality of care, which may have not been billable under a fee-for-service reimbursement system, may now warrant increased attention thanks to recent legislation and payment system changes. The shift toward incentivizing high-value, high-quality care, and away from fee-for-service payment, was facilitated by the 2015 passage of the Medicare Access and Chip Reauthorization Act (MACRA) (Mulvany, 2016). MACRA requires all physicians who are reimbursed by Medicare to take part either in the Metric Based Incentive Payments System (MIPS) or alternative payment models (APMs) (Jones, 2016). MIPS created a subset of criteria that healthcare institutions must meet in the domains of cost, quality, electronic health record use, and practice improvement activities, in order to obtain full reimbursement from the Centers for Medicare and Medicaid (Hirsch, Rosenkrantz, Ansari, Manchikanti, and Nicola, 2017). APMs involve participation in bundled-payment systems for accountable care organizations, patient-centered medical homes, and for treatment of certain conditions. In APMs, the healthcare institution is paid a lump sum and incurs financial risk if it does not perform high-quality, low cost care (Jones, 2016).

Few studies have systematically quantified the amount of time APPs across ambulatory specialty care departments spend on SVAs. Additionally, few health systems have developed mechanisms with which to account for time spent on SVAs. The purpose of this exploratory study is to quantify the amount of time APPs in the ambulatory specialty setting spent on SVAs as recorded by the APPs in the electronic health record and to qualitatively identify these SVAs, in the context of the shift from fee-for-service to value-based payment systems.

Methods

Research Design

This mixed-methods exploratory cross-sectional study was approved by the Institutional Review Board of the academic institution at which it took place.

Data Collection

The administrative leadership of the healthcare institution created a time-based code system to address the problem of not being able to account for non-billable activities performed by advanced practice healthcare providers who bill for their services (including nurse practitioners, physician assistants, certified registered nurse anesthetists, and direct care clinical nurse specialists) to begin to understand and quantify the amount of time APPs spend on non-revenue-generating activities that contribute to quality and effectiveness of care. Four time-based codes were created for various lengths of time spent on non-billable activities: activities lasting 1-15 minutes, 15-30 minutes, 30-45 minutes, and longer than 45 minutes. Advanced practice providers were instructed to document their activities that were not billable to insurance in the electronic health record using these codes, with unique entries for each activity and each patient. These codes did not need to be entered at the time of a billable encounter, but could be entered any time a provider was performing non-billable activities on behalf of a specific patient. There was also an optional free-text section where providers could record the specific activities they performed.

Non-billable in this context meant that the healthcare activities were not directly billable to insurance. It should be noted that there are non-billable encounters that take place under surgical global payment systems. Surgical global payment is when a healthcare institution receives a payment package that encompasses services provided in conjunction with a particular

procedure. This payment covers the immediate pre-operative period, the procedure, and a certain number of post-operative days. Coverage and payments vary based on the type of procedure (Department of Health and Human Services, Centers for Medicare and Medicaid Services, Medicare Learning Network, 2013). Encounters with the CPT code 99024, which is a code used for encounters under surgical global payment packages, were excluded from the analysis.

Human resources data were extracted in order to calculate full time equivalent (FTE) status of APPs included in this study.

Sample Selection

The data used for this study were the non-billable time-based codes that were documented by APPs in all ambulatory specialty departments between November 1, 2017 and December 31, 2018. Inclusion criteria for this study were APPs who billed for their services, worked at this academic medical center, and had documented at least one non-billable code. Physicians were excluded from the analysis, as were individuals who worked in psychiatric specialties, primary care and internal medicine, radiology, and inpatient departments.

Data from ambulatory specialty departments were preliminarily extracted from the electronic medical record by a data analyst at the healthcare center, who removed patient information from the dataset. Data were then cleaned by one researcher familiar with the departmental structure of the healthcare institution. Physicians were removed from the dataset. The remaining APPs were grouped into medical specialties, surgical specialties, hematology/oncology specialties, transplant specialties, and surgical/anesthesia specialties (i.e. pain management and pre-anesthesia), to account for differences in type of patient care activities performed across these respective patient populations.

Statistical Analysis

Data were transferred to Microsoft Excel, and then to Stata IC 15.1 statistical software package for analysis.

For each specialty group developed by the research team, summary statistics were calculated for each non-billable code type, including total number of codes recorded (calculated in Stata), mean, standard deviation, minimum and maximum (calculated in Microsoft Excel). The total number of codes for each group was then divided by number of full time equivalent (FTE) positions in the group to determine the average number of non-billable codes per FTE over the 13-month period. This figure was used to calculate the total number of codes per FTE per month. One subject with missing FTE data was estimated to have an FTE of 1.

The number of hours spent on non-billable activities was calculated. 1-15 minute codes were rounded to 15 minutes, 15-30 minute codes were rounded to 30 minutes, 30-45 minute codes were rounded to 45 minutes, and 45+ minute codes were rounded to 60 minutes. The calculation of average number of non-billable codes per FTE was used to determine approximately how many hours per full-time equivalent position were spent on non-billable activities over the 13-month period. This figure was then used to calculate the total number of hours spent on SVAs per FTE per month.

A word count analysis of the qualitative commentary in the dataset was conducted in Excel using word stems for selective words to indicate activities that have been identified in the literature as SVAs. The words that were selected for analysis, based on relevant prior literature, were “order,” “result,” “document,” “phone,” “letter,” “teach,” “coordinat-,” “refill,” “team,” “family,” “triage,” “medication,” “labs,” “schedule-,” “symptom management,” “med

management,” “medication management,” “chart rev-” “[patient portal name]” and “message” (with “myhealth” and “messages” reported as patient messages).

Results

Table 1 shows results of the summary statistics for each grouping, separated by time-based code, including total codes per grouping over the 13-month period, mean, standard deviation, minimum, maximum, average encounters per FTE, and calculation of average hours per FTE. **Figure 1** is a graphic representation of number of codes per FTE by specialty group. For 1-15 minute non-billable encounters, surgical/anesthesia had the lowest average encounters per FTE per month, with 0.61 codes. Hematology/oncology specialties had the highest number of encounters, with 10.53 encounters per FTE per month, followed by surgical specialties, with 7.30 encounters per FTE per month. For 15-30 minute non-billable encounters, transplant had the lowest number of encounters, with 0.35 encounters per FTE per month, followed by surgical/anesthesia, with 2.21 encounters per FTE per month. Hematology/oncology, surgical, and medical specialties each had between 3.14 and 4.20 encounters per FTE per month. For 30-45 minute encounters, hematology/oncology had the lowest number of encounters per FTE per month, at 0.82; surgical/anesthesia had the highest number of 30-45 minute encounters per FTE per month, at 8.14. For non-billable encounters of greater than 45 minutes, surgical/anesthesia specialties again had the highest number of encounters, at 29.12 encounters per FTE per month, and transplant had the lowest number of encounters, at 0.86 encounters per FTE per month.

Figure 2 is a graphic representation of the calculation of total hours per FTE for each specialty group, separated by non-billable encounter type. Aggregating all time-based encounters for each specialty group, the total time spent on non-billable encounters per FTE was 7.77 hours per month in medical specialties, 6.22 hours per month in surgical specialties, 5.89 hours per

month in hematology/oncology specialties, 36.48 hours per month in surgery/anesthesia specialties, and 3.67 hours per month in transplant specialties.

In total, there were 12,890 qualitative comments entered in conjunction with non-billable codes (**Figure 3**). There were no official definitions for these qualitative comments, and their meaning is subject to the interpretation of the APP that recorded them. The most commonly mentioned terms were “order,” (2116 entries) and “chart rev-,” (1,855 entries), followed by “document” (1,190 entries) “coordinat-” (725 entries) “phone” (520 entries) and “team,” (556 entries).

Discussion

Findings from this study indicate that advanced practice providers in ambulatory specialties are performing many hours of tasks that are relevant to patient care but are not billable under current fee-for-service billing systems. This study showed that in medical, surgical, and hematology/oncology specialties there are greater amounts of shorter duration (1-30 minutes) non-billable encounters, and in surgical/anesthesia and transplant specialties there are higher numbers of longer duration (30+ minutes) non-billable encounters. This stands to reason, as APPs in surgical and anesthesia specialties may perform care for patients whose care is reimbursed under global payment systems, which is not coded under the global payment CPT code. Qualitative results indicate that a significant amount of time is spent on activities that constitute interaction with the electronic medical record, namely chart review and documentation, as well as on placement of orders required for care and communication with other parties in order to coordinate care.

Previous studies have examined the amount of time spent on non-billable activities by physicians in primary care, with estimates ranging from just over 45 minutes per half-day clinic

session to 20% of all activities (Farber, Siu, & Bloom, 2007; Chen, Hollenberg, Michelen, Peterson, & Casalino, 2011). A more recent time and motion study specifically focusing on advanced practice providers also found that the shortest amount of time spent on non-billable activities was in transplant specialties and the bulk of non-billable activities were spent on documentation and analysis of clinical data (Ogunfeditimi et. al, 2013). Those findings correspond to the results of this study regarding the large amount of time spent on accessing the medical record, documentation, and chart review. Other studies to ascertain how practice environment impacts non-billable hours by APPs found that PCP status, amount of support staff, and type of office were associated with amount of non-billable activities (Kippenbrock et. al, 2018).

This study reinforces prior findings from a limited number of studies about the extent and type of non-billable activities performed by APPs. Unlike prior studies, which were either self-report from surveys or observations over a number of days or weeks, this study aggregates non-billable hours and encounters over a period of months. Building on the work of Ogunfeditimi et al. (2013), in this study subjects were separated into practice type groupings in order to assess differences in practice patterns based on specialty type (surgical, medical, etc.). Additionally, this study included a wider range of specialty types across an academic medical center's ambulatory specialty departments, and excludes primary care.

As payment systems move toward value-based care and paying for quality of care, it will be increasingly important for healthcare institutions to recognize the merit of activities that may enhance care beyond billable services such as procedures and visits. This non-billable wrap-around care, such as scheduling procedures, discussing lab results, teaching, and medication management, takes significant amounts of provider time. There have been past efforts to account

for care coordination activities that arise from meeting the needs of patients with chronic conditions, such as the development of CPT codes for management of chronic illness. However, these codes have very specific requirements that must be met in order to be applied, and they may not fully cover the care necessary for complex patient management (Peters & Bunkers, 2015). In surgical settings, it has been shown that an implicit patient expectation in receiving surgical care is communication between providers and patients as patients move through different stages in their care (Brooke, Slager, Swords, & Weir, 2018). Greater visibility of pre- and post-visit activities, and more recognition from healthcare institutions of their importance, may motivate providers to provide more holistic care by financially incentivizing both billable and non-billable activities.

An assessment of clinician productivity should not focus only on the wRVU generation of the clinician. In this study, the thousands of patient care activities that were documented as non-billable care demonstrated that advanced practice clinicians perform many patient care activities that do not result in RVU generation. Using a system of documenting non-billable care activities performed, such as the non-billable time-based code system described in this study, provides a means for healthcare managers and systems to account for and understand how many total hours are spent by clinicians performing patient care. Additionally, value-based care reimbursement systems have created opportunities for new models of specialty care, such as the Patient-Centered Specialty Practice model, which promotes improved coordination between patients and clinicians and focuses on overall quality and safety of care across a population of patients (Ward et. al, 2017).

In this study, documentation and chart review were some of the most frequently reported non-billable activities. This finding is consistent with prior research on the time-intensiveness of

electronic medical record documentation, which has been shown to correlate with provider burnout and decreased career satisfaction (Linzer, et al, 2014; Payne, et. al, 2015; Robertson, Robinson & Reid, 2017, Babbott et. al, 2014). Extensive time spent on documentation may also interfere with direct patient care time, which in turn may indirectly impact access issues such as wait times and patient scheduling (Vahdat, Griffin, Stahl, & Yang, 2018; Read-Brown et. al, 2017). These results underscore the necessity of the growing body of research on how to improve the efficiency of documentation and utilization of electronic medical records, and how to ensure that these activities do not detract from patient care.

Care coordination and team interaction also featured prominently in the qualitative comments on non-billable encounters, demonstrating that teams of professionals are needed to provide care effectively. It has been suggested that value-based payment systems may incentivize team-based care, as payment becomes less tied to individual services and more to outcomes of care (Mose & Jones, 2018). In considering how to incentivize high-quality care, it is important to account for activities such as interprofessional collaboration and discussions with patients and families, that may not directly provide revenue but that may improve quality of care and health outcomes, and reduce costs.

Limitations

This study examines the non-billable activities performed by APPs in ambulatory specialty care. There are several limitations to this study. There were varying degrees to which APPs self-reported their non-billable time, and there was no mechanism by which to ensure that the APPs were correctly documenting time spent on non-billable activities. The codes were attributed to the APP only if the APP was the billing provider. The qualitative data are limited and possibly biased because inclusion of comments about non-billable visits was optional, and

free-text comments were not standardized. APPs in certain specialties may have been more motivated to include comments. Multiple activities could be attached to each non-billable code, even if the codes were for only one patient. The number of encounters may have been underreported due to incomplete uptake by APPs of the new policy of documenting non-billable encounters or due to gradual adoption of this policy. Time calculations may be over-estimated due to rounding up to the nearest 15-minute interval to calculate time based on time-based code type. Several data checks were performed to ensure that only APPs were included in the data, but non-APPs may have been inadvertently included in the analysis. Also, this analysis does not account for attrition or onboarding of APPs included in the study during the 13-month analysis period.

Conclusion

As healthcare moves toward reimbursement systems based on quality, further attention should be paid to the non-billable pre- and post-encounter activities that increase quality of care. Systems of care should allocate time and resources for these activities to take place. Further studies are needed to assess how these service value activities vary in type and in time in different work environments, such as varying clinic structures and diverse types of support and administrative staff. Healthcare systems should support and recognize the contribution of all staff, including advanced practice providers, and recognize the value of their activities beyond RVU generation, and how these activities facilitate and improve care for patients and strengthen the healthcare system.

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Appendix

Table 2.1: Summary Statistics of Non-Billable Encounters, by Specialty Group and by Time-Based Code

Specialty	Medical	Surgical	Hematology/ Oncology	Surgical/ Anesthesia	Transplant
1-15 Minute Encounters					
Total Encounters (13 Months)	3,973	6,851	10,011	45	124
Mean Per Person	49.65	87.83	127.32	6.43	13.78
Standard Deviation	93.20	220.71	316.30	9.78	20.31
Minimum-Maximum	0-484	0-1548	0-2189	0-27	0-62
Encounters/FTE (13 Months)	58.15	94.89	136.88	7.89	13.93
Encounters/FTE/Month	4.47	7.30	10.53	0.61	1.07
Hours/FTE (13 months)	14.54	23.72	34.22	1.97	3.50
Hours/FTE/Month	1.12	1.82	2.36	0.15	0.27
15-30 Minute Encounters					
Hours/FTE (13 Months)	27.27	21.62	20.39	14.39	2.31
Hours/FTE/Month	2.10	1.67	1.57	1.11	0.18
30-45 Minute Encounters					
Total Encounters (13 Months)	2,827	1,160	798	603	365
Mean Per Person	35.33	14.87	9.97	86.14	40.56
Standard Deviation	82.25	27.69	19.34	220.04	11.35
Minimum-Maximum	0-571	0-138	0-110	0-585	0-337
Encounters/FTE (13 Months)	41.39	16.07	10.72	105.77	41.01
Encounters/FTE/Month	3.18	1.24	0.82	8.14	3.15
Hours/FTE (13 Months)	31.04	12.05	8.04	79.33	30.76
Hours/FTE/Month	2.39	0.93	0.62	6.10	2.37
45+ Minute Encounters					
Total Encounters (13 Months)	1,922	1,699	1,048	2,158	99
Mean Per Person	24.03	21.78	12.92	308.29	11
Standard Deviation	52.08	52.28	36.40	416.7	25.88
Minimum-Maximum	0-329	0-355	0-213	0-1195	0-79
Encounters/FTE (13 Months)	28.14	23.53	13.89	378.53	11.12
Encounters/FTE/Month	2.16	1.81	1.07	29.12	0.86
Hours/FTE (13 Months)	28.14	23.53	13.89	378.53	11.12
Hours/FTE/Month	2.16	1.81	1.07	29.12	0.86
Total Encounters					
Total Encounters (13 Months)	12,449	12,832	14,904	2,970	629
Mean Per Person	155.58	164.5	188.15	424.29	69.89
Standard Deviation	222.86	255.82	360.76	463.32	146.55
Minimum-Maximum	1-1337	1-1551	1-2408	1-1226	1-454
Encounters/FTE (13 Months)	182.22	177.71	202.28	520.96	70.67
Encounters/FTE/Month	14.02	13.67	15.56	40.07	5.44
Hours/FTE (13 Months)	100.99	80.92	76.54	474.22	47.69
Hours/FTE/Month	7.77	6.22	5.89	36.48	3.67

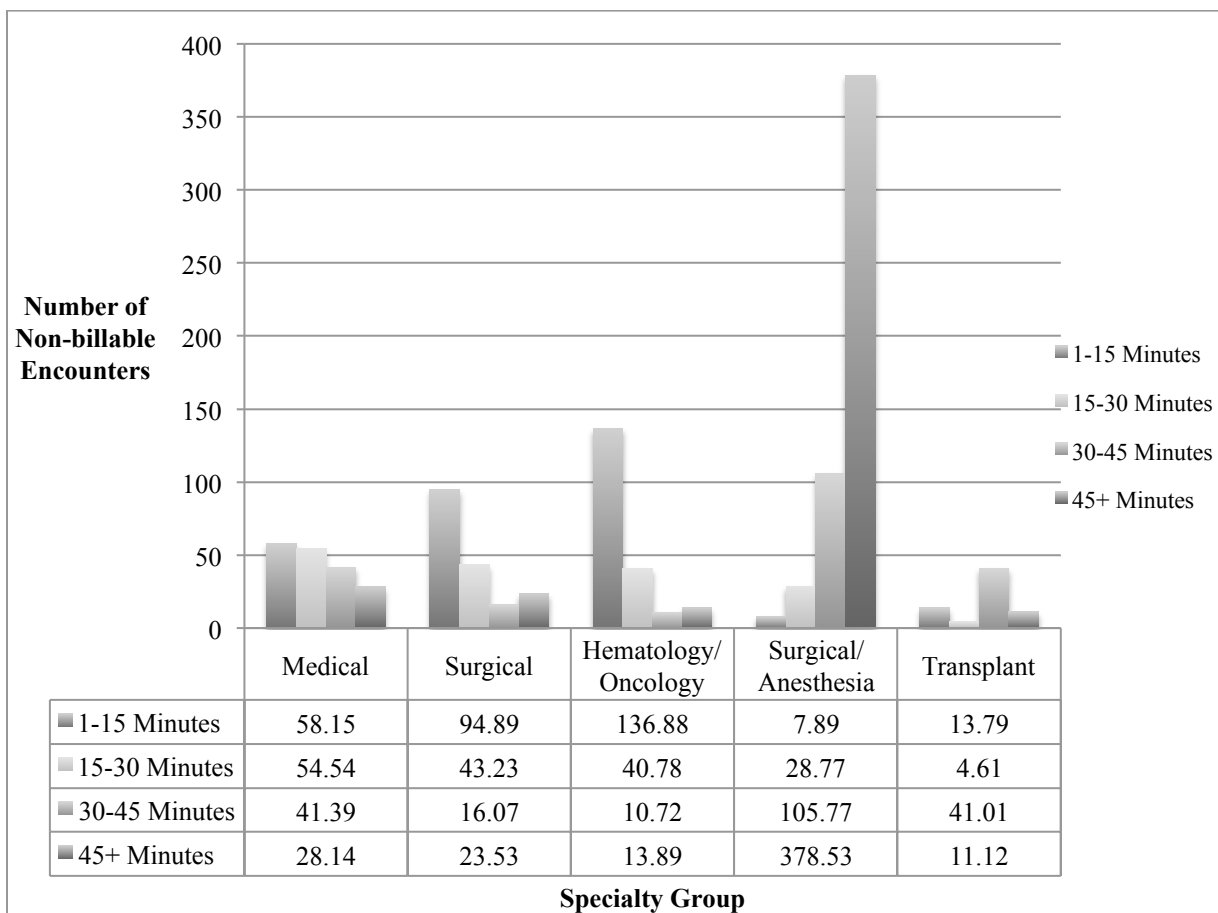


Figure 2.1: Number of Non-billable Encounters Per FTE Over A 13-Month Period, by Specialty Group and Time-Based Code

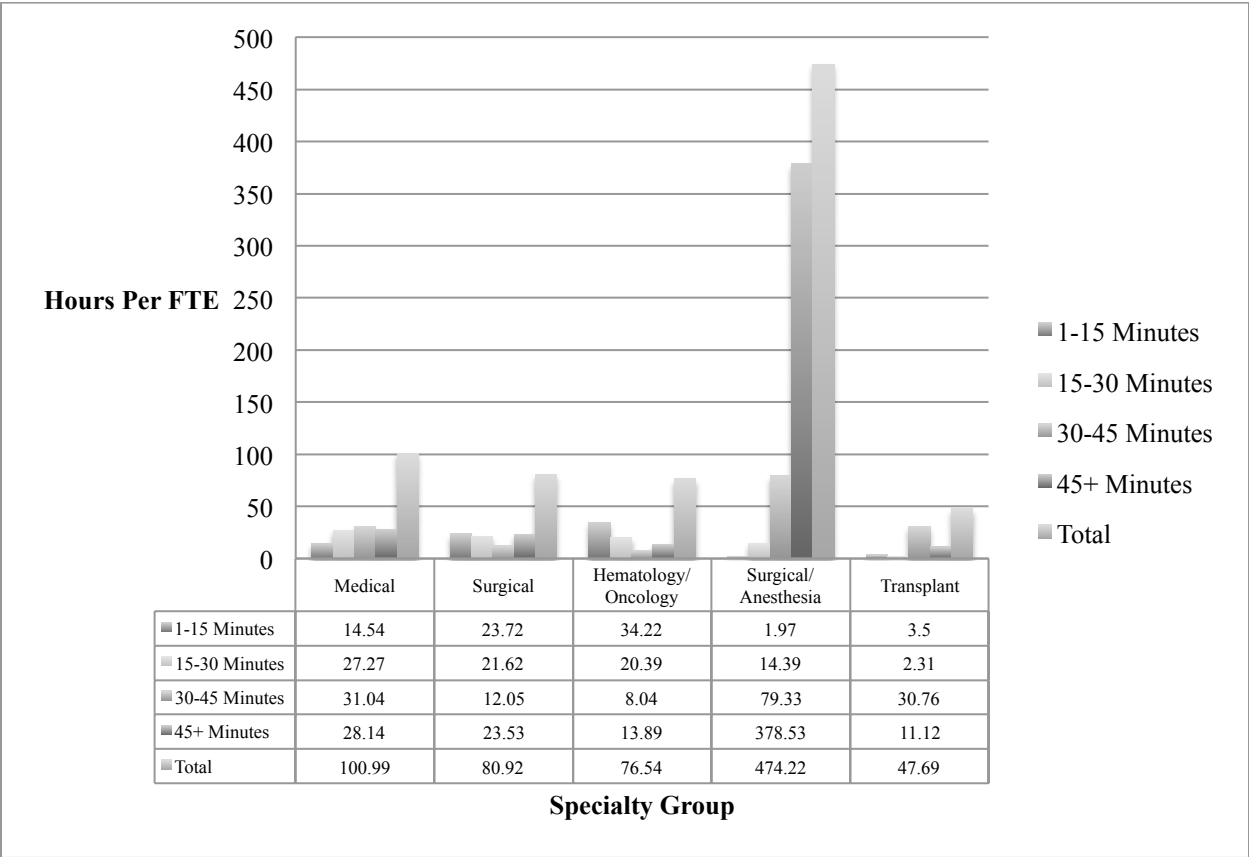


Figure 2.2: Hours of Non-billable Encounters Per FTE Over a 13-Month Period, by Specialty Group and Time-Based Code

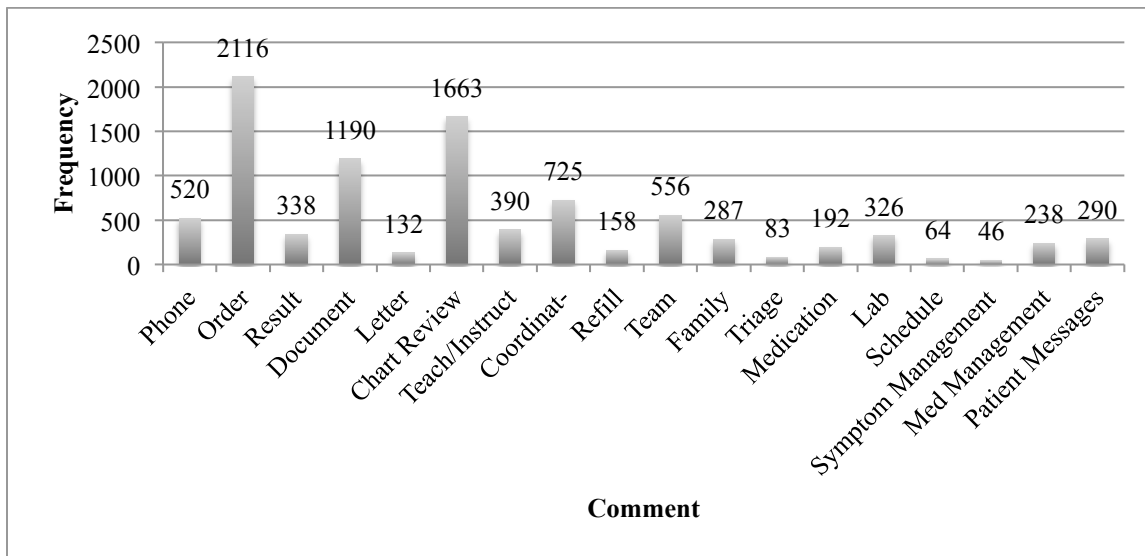


Figure 2.3: Frequency of Qualitative Comments Attached to Time-Based Codes for Non-Billable Encounters Over A 13-Month Period

Chapter 3: Nurse Practitioner Role and Practice Environment in Primary and in Non-Primary Care in California

Abstract

Background: The presence of nurse practitioners (NPs) in specialty care is growing. Between 2008 and 2016 there was a 32.6% increase in nurse practitioners and physician assistants in specialty care. Previous studies have investigated the organizational environment for NPs in primary care, citing factors such as autonomy, institutional policies, practicing to full skill level, and relationships between NPs and other members of the healthcare team and administration as potentially impacting both the healthcare workforce and patient outcomes. This study explores some differences in role and practice environment between primary care and non-primary care NPs in the domains of time spent on activities, barriers to providing care, working to scope of practice, full skill utilization, and satisfaction.

Methods: This cross-sectional quantitative study is based on data from the 2017 Survey of California Nurse Practitioners and Certified Nurse Midwives. 904 NPs were included in this analysis. Data were analyzed using descriptive statistics, multivariate ordinary least squares regressions, and logistic regressions to compare NPs in non-primary care and in primary care.

Results: Nurse practitioners in non-primary care practices have lower odds of reporting time as a barrier to practice, lower odds of reporting practice to full scope, and higher odds of reporting a hierarchical or supervisory relationship with the physician.

Conclusions: This study identifies key differences in role and practice environment between nurse practitioners in primary care and those not in primary care. Future investigation of these differences may shed light on ways to promote non-primary care practice environments to foster more effective collaboration and fewer barriers to providing care.

Introduction

In 1965, the nurse practitioner (NP) role was developed to provide general care to pediatric patients in rural Colorado, where there were not enough physicians to meet the needs of the population (Fairman, 2008). The role eventually expanded to allow NPs to perform health histories and physical exams, treat illnesses, administer immunizations, prescribe medications, interpret lab tests and imaging studies, and provide health education (American Association of Nurse Practitioners, 2019).

The role has evolved substantially since its inception, with NPs increasingly being employed in the medical and surgical specialties. Between 2008 and 2016, NPs and physician assistants, were employed in approximately 28% of all specialty practices in the United States (Martsolf et. al, 2018). This growth is mirrored by the increasing demand for specialty care. At the beginning of the 21st century, it was estimated that one-third of all non-geriatric visits were a result of referrals to specialists, and that specialty care constituted more than half of pediatric ambulatory visits (U.S. Department of Health and Human Services [DHHS], Health Resources and Services Administration [HRSA], Bureau of Health Professions, 2006; Mehrota et. al, 2011).

Today, acute care NPs are widespread throughout the workforce. Results of the national 2016 Nurse Practitioner Sample Survey showed that almost 10% of all NPs were acute care certified; of those, over 25% worked in inpatient settings and 16% worked in hospital outpatient clinics in specialties such as acute care, cardiology, dialysis, and long-term care (Kleinpell, Cook, & Padden, 2018).

In primary care, various aspects of the NP practice environment have been shown in previous studies to be associated with increased job satisfaction, decreased turnover rate, and improvement on certain quality of care measures, such as the rate at which patients receive

recommended screenings (Poghosyan, Liu, Shang & D'Aunno, 2017; Poghosyan, Norful, Liu, & Frieberg, 2018). These studies utilized the psychometrically valid Nurse Practitioner Primary Care Organizational Climate Questionnaire (NP-PCOCQ), which measures five dimensions: NP-physician relationship, organizational support, autonomy and independence of practice, NP-administration relationship, and professional visibility (Poghosyan, Nannini, Stone, & Smaldone, 2013; Poghosyan, Nannini, Finkelstein, Mason, & Shaffer, 2013). Few similar studies have been done regarding practice environment of NPs in acute care, although there is evidence of how the presence of nurse practitioners in acute care settings impacts resource utilization, quality, communication, and staffing (Kilpatrick et. al, 2015; Kleinpell, Ely, & Grabenkort, 2008; Kilpatrick et. al, 2012; Moote, Kresk, & Kleinpell, 2011).

Other studies have highlighted additional NP practice environment characteristics that impact healthcare, including scope of practice, type of pay, amount of time spent on various activities during the clinical day, and percentage of time the physician is on site. These factors have been shown to correlate with rates of healthcare utilization, economic viability of a practice, and clinical productivity (Xue, Ye, Brewer, & Spetz, 2016; Xue & Tuttle, 2017, Kippenbrock et. al, 2018).

There is little information regarding differences in role and practice environment between NPs in primary care versus non-primary care practices. To address gaps in our knowledge on similarities and differences between NPs in primary care and non-primary care, we analyzed of key aspects of role and organizational environment using data from California. California requires that NPs practice under the supervision of a physician through the development of collaborative agreements outlining standardized procedures (California Bus. & Prof Code § 2835.7, 2010; California Bus. & Prof. Code § 2836.1, 2019). The context of legal scope of

practice and state practice environment may also influence NP role and practice environment in individual settings.

The specific objective of this analysis was to determine whether there is a difference between primary care and non-primary care nurse practitioner organizational environment in the domains of 1) time spent on patient care and administrative activities, 2) self-reported barriers to providing care, 3) extent of practice to top of licensure; 4) professional relationship with physician, and 5) satisfaction. This chapter reports the results of this analysis, and discusses how these results contribute to understanding how the NP role and organizational environment may differ between primary care and non-primary care.

Methods

Research Design

This was a secondary analysis of cross-sectional data derived from the California Board of Registered Nursing Survey of Nurse Practitioners and Certified Midwives, conducted in 2017 to better understand the characteristics of the nurse practitioner workforce in California (Spetz, Blash, Jura and Chu, 2017). The survey was developed through collaboration with the California Board of Registered Nursing.

Data Collection:

The survey was sent to 2500 nurse practitioners and certified nurse midwives, with purposeful sampling to represent population density and respondent age. It was administered through both email and first-class mail between December 20, 2016, and May 15, 2017. There was a total 64% response rate, with a 55.8% response rate among nurse practitioners (Spetz et. al, 2017).

Sample

There were a total of 1,430 respondents (Spetz et. al, 2017). The survey included measures on demographic characteristics, education, professional certification, duration of employment, and salary, as well as questions about activities performed in a typical week, practice setting, precepting health professions students, insurance accepted by the practice, physician supervision, and barriers to practice. Post-stratification weighting was performed to adjust for differences in sampling and response rate across age groups and rural-urban commuting areas (Spetz et. al, 2017). The inclusion criterion for this study was actively practicing as a nurse practitioner. After this criterion was applied and respondents not practicing as NPs were excluded, a total of 904 observations remained for analysis.

Measures:

The main predictor variable was derived from a question on the survey asking the subject if he or she worked in primary care, involving common health problems and preventative measures, in his or her current position. Demographic variables included age, race (measured as white/non-white), and gender. Employment variables included urban or rural practice setting, part time or full time employment (measured as 32 hours per week or more), payment scheme (salaried with or without bonus, or hourly, with other options excluded), and years with current employer. All control variables were measured as categorical or dichotomous variables. Missing responses were not included in the analysis.

Outcome measures for this analysis were selected for their relevance to the nurse practitioner role and practice environment. They fell under five categories of organizational environment: (1) time spent on activities, (2) barriers to providing care, (3) practicing to full scope, (4) level of autonomy versus supervision, and (5) job satisfaction.

Within these five categories, 12 outcome variables were selected for analysis (**Table 1**). The two outcome variables related to time spent on activities were percentage of time in a week spent on patient care and percentage of time in a week spent on administrative, management, or organizational tasks.

The following ten outcome variables were recoded into dichotomous variables:

Three outcome variables reflecting self-reported barriers to the NP's provision of care were selected. They were: inadequate time with patients, lack of administrative support, and varying degrees of collaboration. These variables were recoded into "major problem" and "not a problem/minor problem."

Two outcome variables reflecting practicing to "top of licensure" were selected. They were: being allowed to practice to full extent of legal scope of practice in California, and using skills fully. These variables were recoded into "always/almost always," and "to a considerable degree/occasionally/seldom/never."

Four outcome variables reflecting professional relationship with the physician were selected. The first three were: the NP and physician are equal colleagues/no hierarchy, the physician and NP have a hierarchical/supervisory relationship in which the NP must accept the physician's clinical decision about the patients the NP sees, and the physician sees and signs off on patients the NP sees. The fourth variable in this category was percentage of time the physician is present on site to discuss patient problems as they occur, which was recoded as a dichotomous variable, into 50% of the time or less, and greater than 50% of the time.

One outcome variable was selected reflecting career satisfaction. This variable was recoded into "very dissatisfied/dissatisfied/neither satisfied nor dissatisfied" and "satisfied/very satisfied."

Data Analysis

Summary statistics (**Table 2**) were analyzed by primary care and non-primary care, and were tested for significant differences using chi-squared statistical tests. OLS regressions were performed on the continuous dependent variables of percent time spent on patient care and percent time spent on administrative tasks. Logistic regressions were performed on the remaining dichotomous outcome variables. The regressions were controlled for race, gender, urban/rural location, full time or part time work, payment method (salaried or hourly wage), and number of years with employer. These variables were selected to control for demographic and professional variability that may exogenously influence role and practice environment. Statistically significant outcomes at the $\alpha = 0.05$ level are reported.

Results

Sample Characteristics

Figure 1 shows the distribution of NP certification type in the sample. About 62.3% of the NPs were certified in family practice, followed by 25.3% in adult primary care, 18.8% in women's health/gender related health, 15.3% in pediatric primary care and 14.0% in geriatric primary care.

Table 2 shows descriptive characteristics of the weighted sample of NPs. A comparison of NPs in primary care and NPs in non-primary care showed no statistically significant difference with regard to race, gender, payment method, and years with employer. Most NPs practiced in urban areas, with 96.96% of the primary care NPs and 98.71% of non-primary care NPs working in urban areas ($p < 0.01$). The majority of NPs in both the primary care and the non-primary care groups worked more than 32 hours per week ($p = 0.01$).

The OLS regression analyses showed that the percentage of time spent on patient care and percentage of time spent on administrative activities were not significantly different between primary care and non-primary care NPs (data not shown). Non-significant findings from the logistic regression analyses indicated no differences between the primary care and non-primary care NPs in terms of lack of administrative support as a barrier to care, varying degrees of collaboration as a barrier to care, equal relationship between MD and NP, total MD supervision and sign off on all patients, percentage of time the MD is on site, and satisfaction (data not shown).

Table 3 shows the results of the statistically significant logistic regression analyses. NPs in non-primary care compared with those in primary care had lower odds of reporting they were practicing to full scope always or almost always (OR = 0.57, $p=0.03$, CI = 0.34-0.93). They also had lower odds of reporting that time was a major problem than NPs in primary care (OR=0.62, $p=0.04$, CI = 0.40-0.99). NPs not practicing in primary care had almost three times the odds of reporting a hierarchical or supervisory relationship with the physician (OR =2.83, $p<0.01$, CI = 1.69-4.74).

Two of the control variables were found to be statistically significant when controlling for all other variables in the models. Being salaried, rather than paid hourly, was also associated with reporting practice to scope always or almost always (OR=0.46, $p<0.01$, CI=0.27-0.78). Individuals who worked at their current job for 5-11 years had higher odds of reporting that time was a barrier to care always or almost always (OR=2.12, $p=0.02$, CI=1.12-4.02).

Discussion

This study found several key differences between nurse practitioners providing primary care services and nurse practitioners not in primary care. NPs practicing in non-primary care

settings were less likely to report practicing to the full legal scope of practice. They were also less likely to report time as a barrier to providing care than NPs in primary care. Also, NPs not in primary care were more likely to report having a hierarchical or supervisory relationship with the physician.

The impact of scope of practice on patient care, healthcare systems, and nursing practice has long been a topic of debate. The results of this study indicate that in primary care, nurse practitioners more frequently reported practicing to full scope than in non-primary care. Evidence from a 1996 study of nurse practitioners in California identified barriers to practice, including inability to prescribe medications due to scope of practice restrictions, lack of physician support (due to insufficient recognition and respect for the NP role and also to insufficient supervision), difficulties with reimbursement for services rendered, and insufficient public awareness of the NP role (Anderson, Gillis & Yoder, 1996). It is possible that in the past decades many of these issues have been overcome in the primary care setting, but may not have been fully addressed in specialty care. Further research is needed to assess how healthcare environments outside of primary care can support practice to full legal scope.

While in this study there was no statistically significant difference found in self-reported level of skill utilization between primary care and non-primary care settings, prior study comparing nurse practitioners across settings in rural and urban environments found that those in rural settings reported greater skill utilization and greater job satisfaction (Spetz, Skillman, & Andrilla, 2017). The issue of role and scope of practice in specialty care has been addressed by multiple individual specialties. Research and practice groups have developed guidelines for clinical competencies of nurse practitioners in each specialty, including emergency care, dermatology, urology, oncology and others (Wolf, Delao, Perhats, Moon, & Carman, 2017;

Bobonich & Nolen, 2018; Quallich, Bumpus, and Lajiness, 2015; Hoffmann, Klein, & Rosenzweig, 2017). Furthermore, a recent study on credentialing and privileging of NPs and physician assistants in hospitals found that the restrictiveness of scope of practice legislation did not always correlate with restrictions placed on NPs and physician assistants (PAs) in hospitals. NPs and PAs in certain specialties had more restricted practice than the legal scope of practice in their states, indicating that professional role is partially regulated by individual healthcare systems (Pittman, Leach, Everett, Han, & McElroy, 2018). The presence of NPs in specialty care and the determination of what skills NPs need in these settings warrants further investigation, in order to better inform NP education and healthcare delivery models to allow NPs to utilize the maximal extent of their education and training.

This study found that time was a major barrier to care more often in primary care than in non-primary care, even when controlling for age and amount of time in current position. The amount of time a nurse practitioner spends on various activities throughout the workday has been shown to vary by employment setting: for instance, one study found that NPs working in private practices spent more time on non-billable activities, such as prescription refills, but less time on reviewing images or answering emails, than did their hospital-based counterparts (Kippenbrock, et. al, 2018). Because time is a major constraint of clinical productivity, and productivity may influence both healthcare efficiency and patient access to care, it is necessary to further assess what aspects of practice environments promote or diminish productivity.

In this study, more NPs providing non-primary care services reported having a hierarchical or supervisory relationship with the physician than did NPs in primary care. Regarding the presence of ongoing communication between physicians and NPs, a study done in primary care found that most of its NP subjects reported adequate organizational support from

administrators (Poghosyan, Norful, & Martsof, 2017). Evidence from an integrative review of NP-physician collaboration in primary care revealed several factors that influenced the physician-NP relationship, including physician's awareness of NP scope of practice, clinical competency of the NPs, control issues over the practice, liability, communication, and collaboration, as well as the perspective of both NPs and physicians regarding level of supervision versus autonomy of NP practice (Schadewalt, McInnes, Hillier, & Gardner, 2013). It is possible that physician-NP relationship in specialty care is inherently different from primary care due to the nature of the care provided. For instance, in a surgical specialty, the NP may rely on the care plan dictated by the surgeon for an individual patient, while simultaneously incorporating his or her own expertise, which may manifest as a hierarchical relationship by necessity. While collaboration has been studied extensively in primary care, further research is called for in assessing optimal collaboration between physician specialists and nurse practitioners in the specialty care setting in order to promote provider and patient satisfaction, and to maximize health outcomes.

Limitations

Some of the initial limitations in these data were due to sampling and response bias. Outliers in the initial dataset were changed to "missing" and responses were weighted, in order to partially account for these limitations. For subjects with more than one position, only responses regarding the NP's primary position were included in the analysis. There may be other limitations to these data, including reliability of survey items and missing responses that led to exclusion of certain individuals from some of the analyses. While this analysis does control for population density, it does not control for differences between medically underserved and non-underserved areas, a factor that may be associated with role and practice environment.

Furthermore, data were only collected from providers practicing in California, which may limit this study's applicability to other states with different healthcare environments and varying NP practice legislation.

Conclusion

This study demonstrates that there are key differences between nurse practitioner practice environments in primary care and in non-primary care. Nurse practitioners in non-primary may not be working to their full legal scope of practice. Additionally, nurse practitioners in non-primary care report higher levels of physician supervision than do their colleagues in primary care. Research is needed in several areas to further assess how the nurse practitioner practice environment differs between primary care and non-primary care services, to further maximize care quality, efficiency, resource utilization, patient access to care, and provider and patient satisfaction.

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Appendix

Table 3.1: Outcome Variables Relating to Nurse Practitioner Practice Environment

Category	Outcome Variable	Measurement
Time Spent on Activities	Time Spent on Patient Care	<ul style="list-style-type: none"> • % Time (Continuous Variable)
	Time Spent on Administrative Activities	<ul style="list-style-type: none"> • % Time (Continuous Variable)
Barriers to Providing Care	Insufficient Time	<ul style="list-style-type: none"> • Major Problem • Not a problem/Minor problem
	Insufficient Administrative Support	<ul style="list-style-type: none"> • Major problem • Not a problem/Minor problem
	Insufficient Collaboration	<ul style="list-style-type: none"> • Major problem • Not a problem/Minor problem
Scope of Practice	Practicing to Scope	<ul style="list-style-type: none"> • Always/Almost Always • To a Considerable Degree/Occasionally/Seldom/Never
	Full Skill Utilization	<ul style="list-style-type: none"> • Always/Almost Always • To a Considerable Degree/Occasionally/Seldom/Never
Professional Relationship with Physician	Equal Relationship	<ul style="list-style-type: none"> • Yes • No
	Hierarchical Relationship	<ul style="list-style-type: none"> • Yes • No
	Total Supervision	<ul style="list-style-type: none"> • Yes • No
	Physician on Site (% Time)	<ul style="list-style-type: none"> • Greater than 50% of the Time • Less than 50% of the Time
	Satisfaction	<ul style="list-style-type: none"> • Satisfied/Very Satisfied • Very Dissatisfied/Dissatisfied/Neither Satisfied nor Dissatisfied

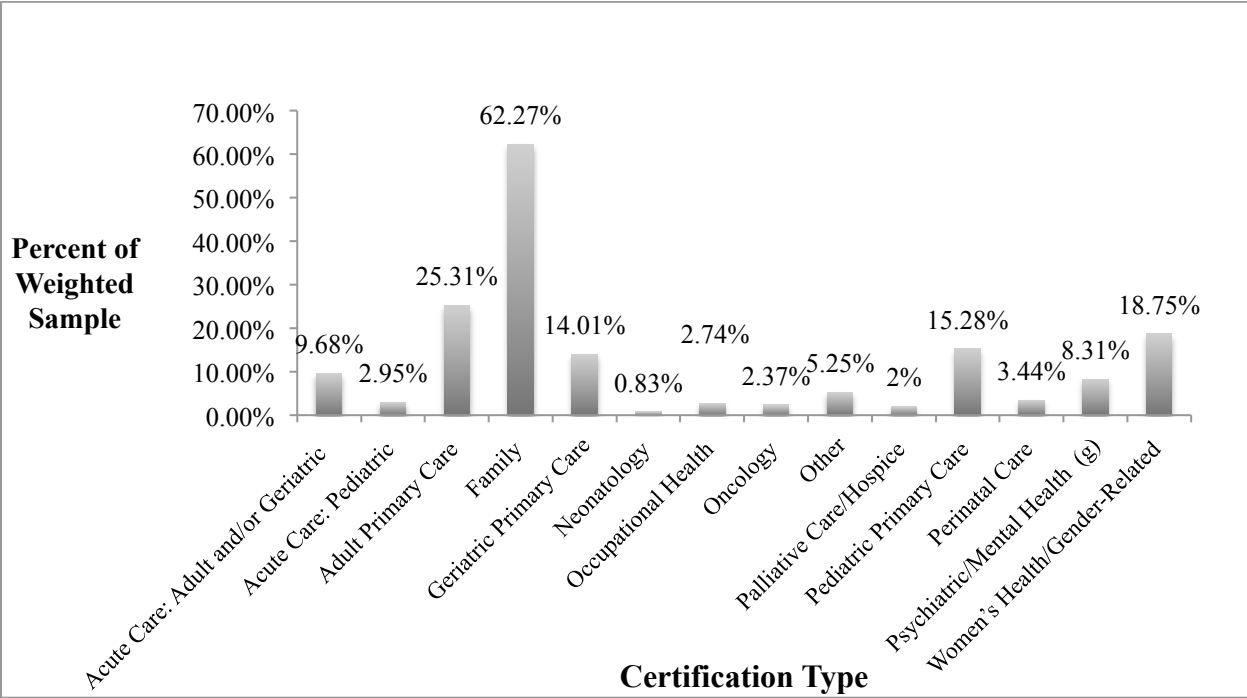


Figure 3.1: Weighted Sample of Nurse Practitioners in California, by Type of Certification

Table 3.2: Weighted Sample of Nurse Practitioners in California by Practice Setting of Primary Care or Non-Primary Care

Variable	Primary Care (%)	Non-Primary Care (%)	Total	P Value
Race (n=797)				0.14
White	61.13	66.99	63.59	
Non-White	38.87	33.01	36.41	
Gender (n=813)				0.23
Female	88.81	85.53	87.45	
Male	11.19	14.47	12.55	
Urban/Rural (n=821)				<0.01
Urban	96.96	98.71	97.69	
Rural	3.04	1.29	2.31	
Full/Part Time (n=813)				0.01
<32 Hours	34.96	25.60	31.07	
32 Hours +	65.04	74.40	68.93	
Payment Method (n=770)				0.25
Hourly	56.88	52.09	54.94	
Salaried	43.12	47.91	45.06	
Years with Employer (n=821)				0.97
0 to 1	24.27	23.21	23.82	
2 to 4	28.67	29.53	29.03	
5 to 11	22.41	21.31	21.95	
12+	24.65	25.95	25.20	

Table 3.3: Results of Logistic Regression Analysis on Extent to Which Nurse Practitioners Report Practicing to Full Scope of Practice, Time as a Barrier to Care, and Have a Hierarchical/Supervisory Relationship with the Physician.

	Dependent Variable: Scope of Practice (OR, p-value, CI)	Dependent Variable: Time as a Barrier to Care (OR, p-value, CI)	Dependent Variable: Hierarchical/Supervisory Relationship (OR, p-value, CI)
N	N = 623	N = 613	N = 620
Model Significance	$p = 0.02$	$p = 0.06$	$p < 0.01$
Non-Primary Care	OR = 0.57* $p = 0.03$ CI = 0.34-0.93	OR = 0.62* $p = 0.04$ CI = 0.40-0.99	OR = 2.83** $p < 0.01$ CI = 1.69-4.74
Race Non-White	OR = 0.84 $p = 0.52$ CI = 0.51-1.42	OR = 1.25 $p = 0.34$ CI = 0.79-1.96	OR = 1.23 $p = 0.46$ CI = 0.71-2.12
Gender Male	OR = 1.96 $p = 0.13$ CI = 0.83-4.65	OR = 0.52 $p = 0.08$ CI = 0.25-1.08	OR = 0.88 $p = 0.73$ CI = 0.42-1.86
Urban/Rural Rural	OR = 1.48 $p = 0.22$ CI = 0.79-2.78	OR = 0.71 $p = 0.17$ CI = 0.43-1.16	OR = 0.52 $p = 0.06$ CI = 0.26-1.02
Full/Part Time 32 Hours +	OR = 0.94 $p = 0.84$ CI = 0.52-1.70	OR = 1.07 $p = 0.80$ CI = 0.63-1.82	OR = 1.83 $p = 0.07$ CI = 0.96-3.48
Payment Method Salaried	OR = 0.46** $p < 0.01$ CI = 0.27-0.78	OR = 0.89 $p = 0.63$ CI = 0.54-1.45	OR = 1.06 $p = 0.82$ CI = 0.63-1.78
Years with Employer 0 to 1 year	OR = 1.11 $p = 0.76$ CI = 0.55-2.27	OR = 1.66 $p = 0.13$ CI = 0.87-3.16	OR = 1.46 $p = 0.32$ CI = 0.69-3.08
2 to 4 years	OR = 1.10 $p = 0.78$ CI = 0.55-2.20	OR = 1.16 $p = 0.66$ CI = 0.59-2.28	OR = 1.35 $p = 0.42$ CI = 0.65-2.78
5 to 11 years	OR = 1.04 $p = 0.91$ CI = 0.51-2.12	OR = 2.12* $p = 0.02$ CI = 1.12-4.02	OR = 0.78 $p = 0.12$ CI = 0.85-3.74
12 to 40 years	Omitted	Omitted	Omitted

* = significant at 0.05 level. **significant at 0.01 level.
OR = Odds Ratio; CI = Confidence Interval

Conclusion

This dissertation addresses specific questions related to the role of nurse practitioners practicing in specialty care. The nursing and nurse practitioner professions are versatile, adapting to fit the healthcare needs of the public in the context of diverse health care delivery systems. Since the establishment of the nurse practitioner role by Loretta Ford and Henry Silver in 1965, the presence of nurse practitioners in multiple settings has grown as the role continues to develop. This evolution demands a better understanding of how nurse practitioners contribute to settings outside of primary care, how to design their professional role for maximal efficiency and patient care quality, and what institutional supports are necessary both from within nursing and in healthcare more broadly to maximize their contribution. With this understanding, medical and surgical specialties will be better equipped to maintain nurse practitioner professional role satisfaction, increase retention, maximize productivity, promote team-based care, determine and design specialized training for nurse practitioners in these settings, and improve quality of care and patient satisfaction.

In the first chapter, I qualitatively explored the role of nurse practitioners in ambulatory specialty care, with a particular focus on the non-reimbursable service value activities they perform. These tasks are not usually appreciable through other institutional metrics of productivity. I identified five themes that emerged from interviews with the nurse practitioner subjects, including promoting patient care continuity and department continuity, providing historical and insider knowledge, addressing time-sensitive issues, and initiating and participating in quality improvement activities. While these activities may not directly generate revenue, I describe how they strengthen quality of care and patient satisfaction.

The content of this chapter raises questions, both for healthcare leadership and for the nurse practitioner profession, regarding the intended and actual contributions of nurse practitioners in specialty care. It is apparent that nurse practitioners in ambulatory specialty care are performing activities on the healthcare team that are non-revenue generating but that may improve quality of care and patient satisfaction and may contribute to department functioning.

The second chapter quantifies service value activities, such as those described in the first chapter, analyzing the amount of time spent by advanced practice providers (nurse practitioners, physician assistants, and clinical nurse specialists) performing these activities in ambulatory specialty settings. This analysis was performed using a system by which advanced practice providers recorded their non-revenue generating activities in the electronic medical record in order for the healthcare institution to better understand their role beyond performing billable encounters. In this chapter, I discussed how quantifying and measuring these activities is relevant to new value-based payment systems developed under MACRA that focus on tying reimbursement to quality. The findings of this chapter demonstrate that a significant amount of time is used to perform these non-billable activities that contribute to quality care, and that billable activities alone may not be a reliable measure of an individual provider's productivity.

The third chapter takes a broader approach to the role of nurse practitioners, quantitatively assessing for key differences in nurse practitioner practice environment between primary care and in non-primary care settings in California. I found that nurse practitioners in specialty care are more likely to perceive that they are not practicing to their full scope, that they are less likely to fully utilize their professional skills, and that they experience more hierarchical supervision by physicians. While this study encompasses nurse practitioners in a variety of settings across the state of California, it highlights the existence of substantive differences in

practice environment between primary care and non-primary care settings that warrant further investigation.

The results of the third chapter regarding scope of practice and skill utilization are supported by the comments made by the ambulatory specialty nurse practitioners that were discussed in the first chapter. For example, the first chapter includes findings indicating that a significant portion of some nurse practitioners' role was in care coordination and promoting departmental continuity, some of which could possibly be performed by other personnel through task shifting. Further inquiry is warranted as to the specific skills utilized by nurse practitioners in ambulatory specialty settings and the extent to which they are practicing to the full extent of their education, training, and legal scope of practice.

Further study in three domains of research is needed to expand the body of knowledge about nurse practitioners practicing in medical and surgical specialty care.

The first is how the presence of nurse practitioners in specialty care affects the healthcare triple aim of improved quality of care, greater access to care, and decreased cost of care.

While multiple studies have been done regarding the quality of care provided by nurse practitioners, most of these studies have not specifically examined quality in ambulatory specialty care, focusing instead on primary care and acute care metrics (Laurent et. al, 2009; Munding et. al, 2000; Kurtzman et. al, 2017, Desroches, Clark, Perloff, O'Reilly-Jacob, and Buerhaus, 2017). Further research is needed on outcomes of patients managed by nurse practitioners and physicians in specific specialties, to ensure that care quality in these settings is equivalent to physician-only care. Future work should also assess the effect of nurse practitioners in specialty care on access, by studying metrics such as wait times for appointments, to provide

evidence bolstering the hypothesis that NPs may help meet the demand for these specialty services.

Models for evaluating nurse practitioner contribution in the acute care setting have been proposed, which could be adapted to studying nurse practitioners in ambulatory specialty care. One notable model, designed by Kapu and Kleinpell (2012) for the acute care nurse practitioner includes evaluation in four areas: 1) competency review, which is measured by patient satisfaction, leadership involvement, resource utilization, and nurse practitioner participation in research and projects; 2) financial productivity, which is assessed by clinical productivity and avoidance of adverse medical events; 3) clinical outcomes, which are measured by unit-specific outcome metrics (infection rates, length of stay, etc.) as well as by direct observation of how nurse practitioners practice; and 4) technical skills, which refers to the frequency and proficiency in performing procedures, and assessment of skills (Kapu & Kleinpell, 2012).

Additionally, as value-based care continues to evolve, new models of care that emphasize higher quality outcomes and lower cost, and that focus less on productivity, will shape the design of health services and healthcare delivery. Discussions about value-based care implementation identify that implementing such a reimbursement system is complex for many reasons. Some of the barriers to adopting value-based payment systems are that they are still evolving, that total cost of care is difficult to calculate due to unforeseen or hidden costs, and that individual patients may have different goals of care and desired outcomes (Ray and Kusumoto, 2016). Furthermore, value may encompass not only objective measures of improved quality at decreased cost, but also an account of hidden costs to patients as well as the subjective measure of striving for improved quality metrics (Tseng and Hicks, 2016). Examples of such metrics include enhancing the patient experience of communicating with healthcare providers in managing one's illness

(Tseng and Hicks, 2016). Nurse practitioners are well-positioned to be at the forefront of improving value-based care from the perspective of patient experience and patient preferences, thanks to the foundational philosophy in nursing that encourages patient-centeredness, patient empowerment, and education.

The second domain necessitating further research is related to the dynamics of team-based care. As has been shown through this dissertation research, there are a variety of methods by which nurse practitioners work with other members of the healthcare team, and different models of what roles they perform on the team. Additional studies should investigate cooperation and collaboration, human factors, efficiency, and provider satisfaction with various models of the nurse practitioner role in the context of team-based interprofessional collaboration.

The American College of Physicians (ACP) defines team-based care as a group of healthcare professionals who work together to provide patient care (Doherty, Crowley, and Health and Public Policy Committee of the American College of Physicians, 2013). According to the ACP, health systems providing patient care should acknowledge that while there is some overlap in the expertise, training, and capabilities of different members of the healthcare team, ideal teams work together to provide patient care and leverage the unique strengths of each healthcare team member; furthermore, billing and reimbursement should be structured to promote team-based care (Doherty, Crowley, and Health and Public Policy Committee of the American College of Physicians, 2013). The anticipated outcomes of team-based care include improved health care quality, such as care plan adherence and reduced hospitalization, increased healthcare professional job satisfaction, and greater healthcare organizational efficiency (Baik, 2016).

The third domain relates to the direction of the nurse practitioner profession. Nurse practitioners in medical and surgical specialty care practice alongside physicians who often have double or triple the years of training in their practice area. As nurse practitioners continue to work in medical and surgical specialties, schools of nursing and continuing education programs should acknowledge that academic scaffolding could be better organized to train these nurse practitioners to enter practice better prepared to care for patients in their specialty area.

This opinion contradicts the Consensus Model for APRN (Advanced Practice Registered Nurse) regulation, which states that advanced practice nursing education and assessment will be developed from within nursing, either through pre-licensure or post-licensure education, but that competence in the specialty will be determined by the specialty professional organization (APRN Consensus Work Group & National Council of State Boards of Nursing APRN Advisory Committee, 2008). Certain specialty groups have created curricula, roles, and core competencies for nurse practitioners in their specialty area. Nurse practitioners interviewed for the qualitative study stated that they did much of their specialty learning “on the job,” with the help of physician and advanced practice provider mentors. This phenomenon was also studied by Dower and Christian (2009), who noted that the post-graduate training opportunities for nurse practitioners and physician assistants in specialty care are limited, and that much of the training occurs after the nurse practitioner or physician assistant is already employed (Dower and Christian, 2009). Physicians in specialty care get many more years of formal education and training, through residencies and fellowship programs; nurse practitioners care for the same patients and make the same types of care decisions without this formal training. Some nurse practitioners said that they felt comfortable with this on-the job training, while others wished there were more formal resources available to help them learn about their specialty area. As the presence of nurse

practitioners and physician assistants in specialty care continues to grow, it will be valuable to examine the formal and informal mechanisms by which nurse practitioners and physician assistants can best obtain the knowledge and skills necessary to treat patients with the highest level of expertise, be it through formal educational programs, on-the-job training, or other modalities.

Analysis of the nurse practitioner practice environment and contribution requires contextualization in the ongoing debates over nurse practitioner scope of practice. Nurse practitioner scope of practice is regulated on a state-by-state basis, with each state regulating the extent to which nurse practitioners may independently perform certain activities related to patient care without physician oversight, such as prescribing medications or ordering durable medical equipment (American Association of Nurse Practitioners, 2019). Evidence shows that state scope of practice legislation is correlated with full skill utilization, management of a patient panel, and independent billing, with stronger correlations in primary care than in specialty care (Park, Athey, Pericak, Pulcini, and Greene, 2018). States with greater practice authority are also positively associated with healthcare utilization (Xue, Ye, Brewer, and Spetz, 2016). Poghosyan, Boyd, and Clarke (2016), have proposed a conceptual model of scope of practice that includes scope of practice regulations, practice environment, organizational policies, and attention to nurse practitioner job satisfaction and job turnover. These elements may be altered in order to promote full utilization of the nurse practitioner workforce in caring for patients and populations (Poghosyan, Boyd, and Clarke, 2016).

This study of nurse practitioner contribution to ambulatory specialty care is limited in that it only examines only a small subset of the nurse practitioner workforce in ambulatory specialty care, drawing samples from the specific environments of two academic medical centers

and one restricted practice state. Research is needed across institutions and in different states to more thoroughly investigate the most efficient and effective models of nurse practitioner practice in ambulatory specialty care. Such research would strengthen the ability of nurse practitioners to contribute to the specialty care workforce and the development and design of nurse practitioner training programs for ambulatory specialty care. Nurse practitioners have the potential to help meet the demand for specialty care services across the country, as well as to improve the value of healthcare more broadly. Efforts to fulfill the potential of the nurse practitioner workforce would be well served by a greater understanding of the best methods for implementing the nurse practitioner role in the specialty healthcare workforce and creating more cogent team-based care that is focused on patients.

The finding of this dissertation regarding non-reimbursable service value activities has implications for all healthcare providers. Activities that promote communication among providers, and between providers and patients, are essential to providing high-quality care, especially as healthcare becomes increasingly complex in terms of healthcare data storage in electronic medical records, new modalities of communication are created and used, and care is increasingly provided by multiple providers at different sites of care. This dissertation discusses one method by which these service value activities were measured by a healthcare institution. It also raises questions about traditional methods of measuring productivity through relative value unit generation, suggesting that this method of productivity measurement does not fully capture total work effort by individual providers. As reimbursement incentives shift from focusing less on volume and more on value, increased attention to service value activities that contribute to patient care, and ways in which to capture and measure that contribution, are integral for examining healthcare delivery.

The nurse practitioner profession has grown and enlarged in scope from its roots in providing primary care to children in rural Colorado. This expansion to different settings and specialties, along with tremendous increases in the sophistication of healthcare knowledge, technology, and infrastructure, warrant further examination of how nurse practitioners in diverse roles and settings may work best among a team of professionals to provide accessible, high-quality, compassionate care.

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