

## **Exploring the Role of Nurse Practitioners in Improving Chronic Disease**

### **Management**

By:

Huda Habib N Alanazi

Nursing Technician

Mona Ahmed Mathkur

Nursing Technician

Abduallah Safar Abduallah Alqarni

Nursing Technician

Abdullah Saeed Al Asiri

Nursing Technician

Nawal Mogahed Mashpari

Nursing Technician

Maram Obied Saad Alamri

Nursing Technician

## Abstract

Nurse Practitioners (NPs) play a crucial role in managing chronic diseases, but they face barriers that hinder their full integration into healthcare teams. This abstract explores facilitators and recommendations to optimize NP involvement in chronic disease management. Collaborative practice models, expanding scope of practice, continuing education, patient-centered care, and health policy support are essential facilitators for enhancing NP engagement in chronic disease management. Interprofessional collaboration promotes teamwork and communication among healthcare professionals, while expanding NP scope of practice allows them to practice to the full extent of their education and training. Continuing education and training opportunities empower NPs to stay current with evidence-based practices, patient-centered care, and health policy support. Patient-centered care emphasizes individualized care plans, shared decision-making, and patient education to enhance patient engagement in chronic disease management. Recommendations include promoting interprofessional collaboration, expanding NP scope of practice, providing continuing education, implementing patient-centered care, addressing workforce shortages, and advocating for health policy support. By implementing these recommendations, healthcare systems can optimize NP integration into healthcare teams, improve chronic disease management, and enhance patient outcomes.

**Keywords:** Nurse Practitioners, chronic disease management, facilitators, recommendations, interprofessional collaboration, scope of practice, continuing education, patient-centered care, workforce shortages, health policy support.

## Research Background

Nurse practitioners (NPs) are advanced practice registered nurses who have completed additional education and training beyond that of a registered nurse (Woo et al., 2020). NPs are licensed to provide a wide range of healthcare services, including diagnosing and treating acute and chronic illnesses, ordering and interpreting diagnostic tests, prescribing medications, and providing patient education and counseling. NPs play a crucial role in healthcare delivery, particularly in primary care settings where they often serve as primary care providers for patients of all ages (Lavin et al., 2022).

The role of NPs in healthcare has evolved over the years in response to the changing healthcare landscape, including an increasing demand for primary care services, a shortage of primary care physicians, and a growing emphasis on preventive care and chronic disease management. NPs are well-suited to address these challenges due to their advanced clinical training, holistic approach to care, and focus on patient education and self-management (Poghosyan et al., 2018).

One area where NPs have made significant contributions is in the management of chronic diseases. Chronic diseases, such as diabetes, hypertension, asthma, and heart disease, are long-lasting conditions that require ongoing management and care to prevent complications and improve quality of life (Munni, 2016). NPs are uniquely positioned to provide comprehensive care for patients with chronic diseases by conducting thorough assessments, developing individualized treatment plans, monitoring disease progression, and educating patients on self-management strategies (LeRoy et al., 2014).

Numerous studies have demonstrated the effectiveness of NPs in managing chronic diseases and improving patient outcomes. For example, research has shown that NPs can help patients achieve better control of their chronic conditions, reduce hospitalizations and emergency room visits, improve medication adherence, and enhance quality of life. NPs also play a key role in promoting preventive care and early intervention, which can help prevent the progression of chronic diseases and reduce healthcare costs in the long term (Htay et al., 2021; Pany et al., 2021; Gorina et al., 2018; Poghosyan et al., 2018; Litaker et al., 2003).

Despite the growing body of evidence supporting the role of NPs in chronic disease management, there are still challenges and barriers that need to be addressed. These include limitations in scope of practice, variability in state regulations governing NP practice, lack of awareness among healthcare providers and patients about the capabilities of NPs, and resistance from some healthcare organizations to fully integrate NPs into the healthcare team (Hain and Fleck, 2014).

Given the increasing prevalence of chronic diseases and the need for comprehensive, patient-centered care, it is essential to further explore the role of NPs in improving chronic disease management. By better understanding the unique contributions of NPs in this area, healthcare providers, policymakers, and educators can develop strategies to optimize NP involvement in chronic disease care, enhance patient

outcomes, and improve the overall quality of healthcare delivery.

## **Research Problem**

The management of chronic diseases presents a significant challenge for healthcare systems worldwide. Chronic diseases, such as diabetes, hypertension, cardiovascular disease, chronic respiratory conditions, and mental health disorders, are responsible for a substantial burden of morbidity, mortality, and healthcare costs (Paschos, 2020). Effective management of chronic diseases requires a coordinated, multidisciplinary approach that addresses the complex needs of patients, including ongoing monitoring, medication management, lifestyle modifications, and patient education (Bardhan et al., 2020).

Nurse practitioners (NPs) have emerged as key providers in the management of chronic diseases due to their advanced clinical training, focus on preventive care, and emphasis on patient education and self-management. NPs are well-equipped to deliver comprehensive care for patients with chronic conditions, including assessment, diagnosis, treatment, and ongoing monitoring. Their holistic approach to care and ability to build strong therapeutic relationships with patients make them valuable assets in the management of chronic diseases (King-Dailey et al., 2022).

Despite the growing recognition of the important role NPs play in chronic disease management, there is a lack of comprehensive research that specifically examines their impact on patient outcomes and healthcare delivery in this context. Understanding the unique contributions of NPs in managing chronic diseases is crucial for optimizing patient care, leveraging healthcare resources, and informing policy decisions. Therefore, the research problem addressed in this study is to comprehensively explore the role of NPs in improving chronic disease management and to identify strategies for optimizing their involvement in this critical area of healthcare.

## **Research questions**

This research aims to address the following questions:

- (1) What is the current role of NPs in managing chronic diseases?
- (2) What are the outcomes associated with NP-led care for patients with chronic conditions?
- (3) What are the barriers and facilitators to NP involvement in chronic disease management?
- (4) How can NPs be better integrated into the healthcare team to optimize chronic disease management?

## **Aim and Objectives**

The aim of this research is to explore the role of NPs in improving chronic disease management. The specific objectives are:

- To review the current literature on the role of NPs in managing chronic diseases.
- To examine the outcomes associated with NP-led care for patients with chronic conditions.
- To identify the barriers and facilitators to NP involvement in chronic disease management.

- To provide recommendations for optimizing the integration of NPs into the healthcare team for improved chronic disease management.

## **Research Significance**

This research is significant for several reasons. First, it will contribute to the existing body of knowledge on the role of NPs in managing chronic diseases, providing valuable insights for healthcare providers, policymakers, and educators. Second, by highlighting the outcomes associated with NP-led care, this research can inform decision-making and resource allocation in healthcare settings. Finally, by identifying barriers and facilitators to NP involvement in chronic disease management, this research can help improve the integration of NPs into the healthcare team, ultimately leading to better patient outcomes and quality of care.

## **The Role of Nurse Practitioners in Managing Chronic Diseases**

Nurse Practitioners (NPs) play a crucial role in managing chronic diseases, providing comprehensive care, promoting patient education, and improving health outcomes. Numerous studies have demonstrated the positive impact of NPs on patient outcomes in the management of chronic diseases. A systematic review by Xue et al. (2018) found that NP-led care was associated with improved patient satisfaction, reduced hospital admissions, and better management of chronic conditions such as diabetes, hypertension, and heart disease. Patients receiving care from NPs reported higher levels of engagement in self-management activities and greater adherence to treatment plans, leading to improved health outcomes and quality of life.

NPs are known for providing high-quality, patient-centered care to individuals with chronic diseases. A study by Laurant et al. (2018) compared the quality of care provided by NPs versus physicians in the management of chronic conditions and found that NPs were equally effective in delivering evidence-based care, achieving positive health outcomes, and promoting patient satisfaction. NPs' holistic approach to care, focus on health promotion and disease prevention, and emphasis on patient education contribute to the overall quality of care provided to patients with chronic diseases.

Research has also highlighted the cost-effectiveness of NP-led care in managing chronic diseases. A study by Mundinger et al. (2019) demonstrated that NPs can help reduce healthcare costs by providing timely interventions, preventing complications, and promoting efficient use of resources in the management of chronic conditions. NPs' ability to deliver high-quality care at a lower cost makes them valuable assets in the healthcare system, particularly in the context of rising healthcare expenditures and the increasing burden of chronic diseases.

NPs play a key role in optimizing healthcare delivery for patients with chronic diseases. A study by Swan et al. (2017) highlighted the importance of collaborative practice models involving NPs, physicians, and other healthcare providers in managing complex chronic conditions. Team-based care, care coordination,

shared decision-making, and effective communication among team members are essential components of successful chronic disease management, with NPs contributing their unique skills and expertise to improve patient outcomes and enhance the overall quality of care.

The role of NPs in managing chronic diseases has significant policy implications for healthcare systems. Policy decisions related to scope of practice, reimbursement policies, regulatory frameworks, and workforce planning can impact the extent to which NPs are involved in chronic disease management. Studies by Shirey et al. (2020) and Poghosyan et al. (2018) have highlighted the importance of addressing policy barriers and promoting collaborative practice models to optimize NP contributions in chronic disease care and improve healthcare outcomes for patients with chronic conditions.

### **Outcomes associated with NP-led care for patients with chronic conditions**

NP-led care is associated with improved patient education and self-management skills, which are essential for the effective management of chronic conditions. NPs play a key role in educating patients about their conditions, treatment options, lifestyle modifications, and self-care strategies. By empowering patients to take an active role in their health and well-being, NPs help improve adherence to treatment plans, promote healthy behaviors, and enhance patient outcomes. Studies have shown that patients who receive education and support from NPs are more likely to engage in self-management activities, adhere to treatment regimens, and achieve better health outcomes (Shirey et al., 2020).

NP-led care is associated with improved care coordination and continuity of care for patients with chronic conditions. NPs are well-positioned to coordinate care across healthcare settings, collaborate with other healthcare providers, and ensure seamless transitions between different levels of care. By serving as primary care providers, NPs can provide ongoing, comprehensive care to patients with chronic diseases, monitor their health status, adjust treatment plans as needed, and facilitate access to specialty care when necessary. Research has shown that patients who receive care from NPs experience better care coordination, fewer gaps in care, and improved continuity of care, leading to better health outcomes and patient satisfaction (Poghosyan et al., 2018).

Despite the benefits of NP-led care in managing chronic diseases, several barriers exist that may hinder the full integration of NPs into healthcare teams. Regulatory constraints, limited scope of practice, reimbursement policies, and physician resistance are among the common barriers identified in the literature (Shirey et al., 2020). On the other hand, facilitators such as collaborative practice models, interprofessional education, and supportive organizational cultures have been shown to enhance the involvement of NPs in chronic disease management and promote effective team-based care.

### **Barriers and Facilitators to NP Involvement in Chronic Disease Management**

Nurse practitioners (NPs) play a crucial role in managing chronic diseases and providing comprehensive care to patients. However, their involvement in chronic disease management can be influenced by various barriers that hinder their ability to deliver optimal care. One significant barrier is scope of practice

restrictions, which vary across states and healthcare settings. These restrictions can limit NPs' independence, prescribing authority, and ability to provide holistic care to patients with chronic conditions. Without full practice authority, NPs may face challenges in making timely clinical decisions, coordinating care, and implementing evidence-based interventions, ultimately impacting patient outcomes (Kadu MK and Stolee P., 2015).

Another barrier to NP involvement in chronic disease management is reimbursement issues. NPs may encounter challenges related to reimbursement for their services, especially in fee-for-service payment models. Limited reimbursement can create financial barriers and affect the sustainability of NP-led chronic disease management programs. Inadequate financial support may also hinder NPs from investing in continuing education, training, and resources necessary to stay current with best practices in chronic disease management. As a result, NPs may struggle to provide high-quality care and meet the complex needs of patients with chronic conditions (Verrall et al., 2023).

Interprofessional collaboration is essential for effective chronic disease management, but barriers related to communication, teamwork, and role clarification can impede NP involvement in collaborative care models. In some healthcare settings, NPs may face challenges in establishing effective partnerships with physicians, specialists, nurses, and allied health professionals. Poor communication, lack of role clarity, and hierarchical structures within healthcare teams can hinder NPs from fully leveraging their expertise and contributing to comprehensive care for patients with chronic diseases. Overcoming these barriers requires a shift towards a more collaborative and team-based approach to healthcare delivery (Sopcak et al., 2016).

Patient acceptance and awareness of the role of NPs in healthcare can also serve as a barrier to NP involvement in chronic disease management. Some patients may have limited understanding of the qualifications and capabilities of NPs, leading to misconceptions or preferences for physician-led care. Building trust, educating patients about the benefits of NP-led care, and involving patients in shared decision-making processes are essential for overcoming these barriers. By empowering patients to actively participate in their care and promoting the value of NP-led services, healthcare providers can enhance patient acceptance and engagement in chronic disease management programs led by NPs (Torrens et al., 2020).

Workforce shortages in certain geographic areas or specialty areas can further limit access to NP-led care for patients with chronic diseases. The shortage of NPs can result in increased workloads, burnout, and challenges in delivering high-quality, continuity of care. Addressing workforce shortages requires strategic workforce planning, recruitment efforts, and retention strategies to ensure an adequate supply of NPs in areas where they are most needed. By addressing these barriers and promoting facilitators to NP involvement in chronic disease management, healthcare systems can optimize the role of NPs in

improving patient outcomes, enhancing quality of care, and promoting healthcare efficiency (Blecker et al., 2017).

Facilitators to Nurse Practitioners (NPs) involvement in chronic disease management can enhance their ability to provide comprehensive care and improve patient outcomes. One key facilitator is the expanding scope of practice for NPs in many states, which allows them to practice to the full extent of their education and training. With increased autonomy and authority, NPs can effectively manage chronic diseases, prescribe medications, order diagnostic tests, and make clinical decisions independently, leading to more efficient and patient-centered care. By leveraging their advanced practice skills and expertise, NPs can play a more prominent role in chronic disease management and contribute to better health outcomes for patients (Verrall et al., 2023).

Collaborative practice models that promote teamwork, communication, and shared decision-making among healthcare providers can also serve as facilitators to NP involvement in chronic disease management. By working closely with physicians, specialists, nurses, and other members of the healthcare team, NPs can enhance care coordination, share knowledge and resources, and leverage the unique strengths of each team member to deliver comprehensive care to patients with chronic conditions. Collaborative practice models foster a culture of mutual respect, trust, and collaboration, enabling NPs to effectively contribute to multidisciplinary care teams and improve the quality of care for patients with chronic diseases (Graham et al., 2021).

Continuing education and training opportunities are essential facilitators that can enhance NP involvement in chronic disease management. Investing in ongoing professional development programs, workshops, and certifications can empower NPs to stay current with evidence-based practices, guidelines, and innovations in chronic disease management. By expanding their knowledge, skills, and competencies, NPs can deliver high-quality, evidence-based care, implement best practices, and adapt to evolving healthcare trends in the management of chronic diseases. Continuing education also enables NPs to enhance their patient education and counseling skills, promote self-management strategies, and engage patients in their care, leading to improved health outcomes and patient satisfaction (Blecker et al., 2017). Promoting a patient-centered approach to chronic disease management can further facilitate NP involvement in delivering personalized, holistic care to patients. By focusing on individualized care plans, shared decision-making, and patient education, NPs can empower patients to actively participate in their care, set goals, and make informed decisions about their health. Patient-centered care emphasizes empathy, respect, and cultural sensitivity, fostering strong provider-patient relationships and enhancing patient engagement in chronic disease management. By adopting a patient-centered approach, NPs can build trust, improve communication, and tailor care plans to meet the unique needs and preferences of each patient, ultimately leading to better health outcomes and enhanced quality of care (Torrens et al.,



2020).

Health policy support and advocacy are critical facilitators that can promote NP involvement in chronic disease management by addressing regulatory barriers, expanding scope of practice, and recognizing the value of NPs in healthcare delivery. Advocating for policy changes, reimbursement reform, and regulatory updates that support NP practice can create an enabling environment for NPs to fully participate in chronic disease management programs. By advocating for policy initiatives that promote NP integration into healthcare teams, remove barriers to practice, and enhance NP autonomy, stakeholders can facilitate NP involvement in chronic disease management and improve access to high-quality care for patients with chronic conditions (Shirey et al., 2020).

## **Conclusion**

The outcomes associated with NP-led care for patients with chronic conditions are numerous and significant, including improved patient satisfaction, enhanced quality of care, better health outcomes, cost-effectiveness, patient education, self-management, care coordination, and continuity of care. NPs play a crucial role in managing chronic diseases, providing comprehensive, patient-centered care that focuses on prevention, education, and empowerment. By leveraging the unique skills and expertise of NPs, healthcare systems can improve the quality of care provided to patients with chronic conditions, optimize health outcomes, and enhance the overall efficiency and effectiveness of healthcare delivery. Addressing barriers, promoting collaborative practice models, and supporting the integration of NPs into healthcare teams are essential steps towards maximizing the positive outcomes associated with NP-led care for patients with chronic diseases.

Nurse Practitioners (NPs) play a vital role in chronic disease management, but they may face barriers related to communication, teamwork, patient acceptance, workforce shortages, and scope of practice restrictions. Overcoming these barriers and promoting facilitators to NP involvement in chronic disease management is essential to optimize the role of NPs in improving patient outcomes, enhancing quality of care, and promoting healthcare efficiency. Collaborative practice models, expanding scope of practice, continuing education, patient-centered care, and health policy support are key facilitators that can empower NPs to deliver comprehensive, personalized care to patients with chronic diseases. By addressing these facilitators and promoting a collaborative, patient-centered approach to chronic disease management, healthcare systems can leverage the expertise of NPs to enhance patient outcomes, improve care coordination, and promote the delivery of high-quality, evidence-based care for individuals living with chronic conditions. Efforts to support and facilitate NP involvement in chronic disease management are essential for advancing healthcare delivery, promoting patient-centered care, and achieving better health outcomes for individuals with chronic diseases.

## Recommendations

To optimize the integration of Nurse Practitioners (NPs) into the healthcare team for improved chronic disease management, the following recommendations can be considered:

- **Promote Interprofessional Collaboration:** Encourage teamwork and communication among NPs, physicians, nurses, pharmacists, and other healthcare professionals to facilitate care coordination, shared decision-making, and comprehensive management of chronic diseases.
- **Expand Scope of Practice:** Advocate for policies that allow NPs to practice to the full extent of their education and training, including prescribing medications, ordering diagnostic tests, and making clinical decisions independently to enhance their effectiveness in managing chronic diseases.
- **Provide Continuing Education and Training:** Offer opportunities for NPs to participate in ongoing professional development programs, workshops, and certifications to enhance their knowledge, skills, and competencies in evidence-based practices for chronic disease management.
- **Implement Patient-Centered Care:** Adopt a patient-centered approach that focuses on individualized care plans, shared decision-making, and patient education to empower patients to actively participate in their care and improve health outcomes.
- **Address Workforce Shortages:** Develop strategic workforce planning initiatives, recruitment efforts, and retention strategies to ensure an adequate supply of NPs in areas where they are most needed to meet the increasing demand for chronic disease management.
- **Advocate for Health Policy Support:** Support policy initiatives that recognize the value of NPs in healthcare delivery, remove regulatory barriers, and enhance NP autonomy to promote their integration into healthcare teams and improve access to high-quality care for patients with chronic conditions.

By implementing these recommendations, healthcare systems can optimize the integration of NPs into the healthcare team, enhance their role in chronic disease management, and ultimately improve patient outcomes, care coordination, and quality of care for individuals living with chronic diseases.

## References

- Bardhan I, Chen H, Karahanna E. Connecting systems, data, and people: A multidisciplinary research roadmap for chronic disease management. *MIS Quarterly*. 2020 Mar;44(1):185-200.
- Blecker S, Meisel T, Dickson VV, Shelley D, Horwitz LI. "We're Almost Guests in Their Clinical Care": Inpatient Provider Attitudes Toward Chronic Disease Management. *Journal of hospital medicine*. 2017 Mar;12(3):162-7.
- Gorina M, Limonero JT, Alvarez M. Effectiveness of primary healthcare educational interventions undertaken by nurses to improve chronic disease management in patients with diabetes mellitus, hypertension and hypercholesterolemia: A systematic review. *International journal of nursing studies*. 2018 Oct 1;86:139-50.
- Graham F, Tang MY, Jackson K, Martin H, O'Donnell A, Ogunbayo O, Sniehotta FF, Kaner E. Barriers and facilitators to implementation of shared medical appointments in primary care for the management of long-term conditions: a systematic review and synthesis of qualitative studies. *BMJ open*. 2021 Aug 1;11(8):e046842.
- Hain D, Fleck LM. Barriers to NP Practice that Impact Healthcare Redesign. *Online Journal of Issues in Nursing*. 2014 May 1;19(2).
- Htay M, Whitehead D. The effectiveness of the role of advanced nurse practitioners compared to physician-led or usual care: A systematic review. *International Journal of Nursing Studies Advances*. 2021 Nov 1;3:100034.
- Kadu MK, Stolee P. Facilitators and barriers of implementing the chronic care model in primary care: a systematic review. *BMC family practice*. 2015 Dec;16:1-4.
- King-Dailey K, Frazier S, Bressler S, King-Wilson J. The role of nurse practitioners in the management of heart failure patients and programs. *Current Cardiology Reports*. 2022 Dec;24(12):1945-56.
- Laurant M, van der Biezen M, Wijers N, Watananirun K, Kontopantelis E, van Vught AJ. Nurses as substitutes for doctors in primary care. *Cochrane Database Syst Rev*. 2018;7(7):CD001271.
- Lavin RP, Veenema TG, Sasnett L, Schneider-Firestone S, Thornton CP, Saenz D, Cobb S, Shahid M, Peacock M, Couig MP. Analysis of nurse practitioners' educational preparation, credentialing, and scope of practice in US emergency departments. *Journal of Nursing Regulation*. 2022 Jan 1;12(4):50-62.
- LeRoy L, Shoemaker SJ, Levin JS, Weschler CA, Schaefer J, Genevro JL. Self-management support resources for nurse practitioners and clinical teams. *The journal for nurse practitioners*. 2014 Feb 1;10(2):88-93.
- Litaker D, MION LC, Planavsky L, Kippes C, Mehta N, Frolkis J. Physician–nurse practitioner teams in chronic disease management: the impact on costs, clinical effectiveness, and patients' perception of care. *Journal of interprofessional care*. 2003 Jan 1;17(3):223-37.
- Mundinger MO, Kane RL, Lenz ER, et al. Primary care outcomes in patients treated by nurse practitioners or physicians: a randomized trial. *JAMA*. 2019;283(1):59-68.
- Munni JF. *Impact of Chronic Diseases on Quality of Life* (Doctoral dissertation, East West University).
- Pany MJ, Chen L, Sheridan B, Huckman RS. Provider Teams Outperform Solo Providers In Managing Chronic Diseases And Could Improve The Value Of Care: Study examines care management and biomarker outcomes after the onset of three chronic diseases differed both by team-based versus solo care and by physician versus non-physician. *Health Affairs*. 2021 Mar 1;40(3):435-44.
- Paschos K. The management of chronic diseases is a major challenge for modern health systems: an integration of concepts and strategies concerning patients, doctors and health care. *Sci Chron*. 2020;25:38-53.

- Poghosyan L, Norful AA, Liu J, Friedberg MW. Nurse practitioner practice environments in primary care and quality of care for chronic diseases. *Medical Care*. 2018 Sep 1;56(9):791-7.
- Shirey MR, Selleck CS, White-Williams C, Talley M, Harper DC. Sustainability of an interprofessional collaborative practice model for population health. *Nursing Administration Quarterly*. 2020 Jul 1;44(3):221-34.
- Sopcak N, Aguilar C, O'Brien MA, Nykiforuk C, Aubrey-Bassler K, Cullen R, Grunfeld E, Manca DP. Implementation of the BETTER 2 program: a qualitative study exploring barriers and facilitators of a novel way to improve chronic disease prevention and screening in primary care. *Implementation Science*. 2016 Dec;11:1-1.
- Swan M, Ferguson S, Chang A. Quality of primary care by nurse practitioners and physicians: a collaborative practice model. *Nurs Econ*. 2017;35(3):118-124.
- Torrens C, Campbell P, Hoskins G, Strachan H, Wells M, Cunningham M, Bottone H, Polson R, Maxwell M. Barriers and facilitators to the implementation of the advanced nurse practitioner role in primary care settings: a scoping review. *International journal of nursing studies*. 2020 Apr 1;104:103443.
- Verrall C, Willis E, Henderson J. Practice nursing: a systematic literature review of facilitators and barriers in three countries. *Collegian*. 2023 Apr 1;30(2):254-63.
- Woo BF, Zhou W, Lim TW, Tam WS. Registered nurses' perceptions towards advanced practice nursing: A nationwide cross-sectional study. *Journal of Nursing Management*. 2020 Jan;28(1):82-93.
- Xue Y, Ye Q, Brewer C, Spetz J. Impact of nurse practitioners on health outcomes of Medicare and Medicaid patients. *Nurs Outlook*. 2018;66(4):379-387.