Critical Review of the Literature: Advanced Practice Nurses and Hypertension Management

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**Abstract**

Purpose: To examine the impact of treatment provided by Advanced Practice Nurses (APNs), compared with treatment provided by other Primary Care Providers (PCPs), upon hypertension management of adults in the primary care setting.

Methods: Review of medical and allied health databases reveals 10 relevant articles: four quantitative studies, two qualitative studies, and four other articles, all published within the past five years, which fit search criteria.

Results: Common themes from the existing literature on adult hypertension management by APNs show positive clinical outcomes, high patient satisfaction, and cost-effectiveness. APNs display particular skills in delivering individualized care, therapeutic communication, patient education. This is part of their training, and is a patient satisfier. The literature shows that APNs can increase cost efficiency. The literature does not cite drawbacks to increased utilization of Advanced Practice Nurses as health care providers.

Implications for Practice: APNs are being called on to ease the projected PCP shortage, but they should make sure that, in the process, they preserve and enhance the most effective aspects of their profession.

*Keywords: hypertension, advanced practice nurse, nurse practitioner, primary care*

**Critical Review of the Literature: Advanced Practice Nurses and Hypertension Management**

**Introduction**

The United States faces an impending scarcity of primary care providers (PCPs); according to Pericak (2011), “[t]hroughout the United States, the shortage of primary care physicians, particularly in rural and low-income areas, stands as a barrier to the goal of delivering adequate health care to all Americans” (p.4). Why this problem? A significant portion of physicians in primary care are greater than 50 years old, and likely to retire within the next two decades. The population of patients is aging commensurately, and therefore requiring more care (Green, 2012). Additionally, the Patient Protection and Affordable Care Act “has compounded this issue. This act promises to “provide insurance to 32 million Americans” (Pericak, p.4).These Americans may currently forego primary care due to lack of insurance.

Researchers and experts propose greater employment of Advanced Practice Nurses (APNs) and physician assistants (PAs), collectively termed mid-level providers, as a solution to this labor shortage: “increased healthcare needs to be addressed not only by more physicians, but also with the help of NPs and physician assistants” (Pericak, p.5). Regarding highly educated nurses, Snow (2012) adds, “We have invested significantly in the role because we are confident that they deliver in terms of number of patients seen, their adherence to guidelines and the fact that they appear, on average, to make fewer mistakes” (p.11). However, controversy abounds, legally and within and between healthcare organizations, about the role of Advanced Practice Nurses (APNs), particularly as providers. Safriet (2011) states,

In many states, the legal framework authorizing APNs’ practices has evolved in step with their expanding skills, education, training, and abilities. In several other states, however, their full utilization is hampered by outdated (or in some cases newly imposed) restrictions on a full range of professional services. Depending on the jurisdiction, these restrictions may preclude or limit the authority to prescribe medications, admit patients to hospitals or other care facilities, evaluate and assess patients’ conditions, order and evaluate tests and procedures, and the like. (p.446-7)

Regulations vary widely between states and between healthcare organizations, and reasons for this also vary:

The principal causes of the existence and continuation of unnecessarily restrictive

practice conditions for APNs can be grouped into three categories: (1)

purposeful or inertial retention of the dysfunctions resulting from the historical

evolution of our state-based licensure scheme, (2) lack of awareness of APNs’

roles and abilities, and (3) organized medicine’s continued opposition to expanding

the authority of other providers to practice and be paid directly for their

services. (p.451)

We can measure the performance of APNs by counting number of patients seen, counting revenue created, and also by measuring the quality of their work. According to Clancy & Lloyd (2011), “[q]uality was defined by the Institute of Medicine as ‘the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge’” (p.234).

To that end, we turn to the topic of hypertension, a major cause of undesired health outcomes in the United States: “Hypertension is a modifiable risk factor for cardiovascular disease. It affects one in three adults in the United States and contributes to one out of every seven deaths and nearly half of all cardiovascular disease–related deaths in the United States” (Vital Signs, 2011, p.103). Hypertension affects mainly adults. Because of hypertension’s prevalence, it would be difficult to find a PCP who doesn’t encounter hypertension; hypertension management can represent a clinical standard by which provider outcomes may be measured. Outcomes can include improved mean systolic and diastolic readings, level of cardiovascular disease, and frequency of adverse events (heart attack, stroke, and cardiovascular-related death). Additionally, successful hypertension treatment demonstrates application of current research-based knowledge, otherwise known as evidence-based practice (Burns & Grove, 2009).

This leads to our topic question: what is the impact of treatment provided by Advanced Practice Nurses (APNs), compared with treatment provided by other Primary Care Providers (PCPs), upon hypertension management of adults in the primary care setting? Again, hypertension management, a common task for PCPs, represents a canvas upon which to compare APNs to other providers, primarily physicians.

**Methods**

This writer performed several searches of EbscoHost/CINAHL, Ovid Medline, and PubMed. The first search was for articles directly pertaining to the topic question above, using keywords *hypertension, advanced practice nurse, nurse practitioner,* and *primary care.* Other search limiters include English language and publication within the past five years. This yielded a total of 147 articles; this author reviewed abstracts to assess relevance to the question. This author further ruled out articles that were not available in full text. The Milwaukee Department of Veterans’ Affairs medical librarian assisted via telephone.

Ten articles were ultimately selected for review. Three additional articles, between five and ten years old, and four articles between ten and twelve years old, all of which met other criteria were identified but not included in this review. Burns and Grove’s (2009) process for critical appraisal of nursing studies guided analysis of selected articles.

A follow up search yielded articles on the upcoming scarcity of primary care providers; this search highlights the thought process behind development of the topic question. Keywords were *primary care* and *shortage.* Nursing textbooks yielded additional informational links between background concepts.

**Article formats**

Article are authored by some combination of nurses, physicians, academics, or pharmacists - with one possible exception, Chummun’s (2011) article, as reported below.

Each article includes an abstract, which summarizes pertinent points, including article purpose and frequently a theoretical framework, data sources or research methods, results or conclusions, and implications for nursing practice.

Each article also provides a more thorough introduction; most articles include their own literature review or background information, which sets the scenario for the study by clarifying the level of current knowledge on the study topic and discussing geopolitical, social, and environmental factors which shape the topic and demonstrate the topic’s significance for study. The articles should thoroughly discuss study methodology. The section on results should include pertinent statistical analysis, which ideally provides enough information for the reader to be able to independently verify the findings. Further discussion should explain findings textually; this section may include recognition of the study’s strengths and limitations. The tone in which authors report results may demonstrate level of confidence in the strength of their results. The section entitled “Implications for practice” should connect the study to “the real world,” and may forecast the study’s findings in relation to the future of nursing. Finally, a through reference list allows the reader to trace concepts and information to their sources.

**Research Methods and Study Findings**

**Quantitative Studies**

1.) Benkert, Peters, Tate, & Dinardo (2007) conducted a descriptive, cross-sectional study to evaluate the levels of trust held by low-income adult African-Americans towards nurse practitioners (NPs) and physicians. They obtained permission from their relevant Institutional Review Board (IRB). Benkert et al. found, in their own literature review, prior to conducting their research, very little previously published literature directly related to their topic. They pieced together information from various studies to form a groundwork for their research question. For example, the authors cite literature related to race-concordant relationships, literature related to loss of trust during shifts to managed care models, and studies on patient trust levels towards physicians (rather than other types of providers). The authors discuss literature on health disparities faced by African Americans, and previous qualitative studies, which reveal beliefs that African-Americans, at times, receive inferior care. However, the authors show that no participant in this study reported a high level of cultural mistrust

Benkert et al. drew a convenience sample from participants of a larger study. No attrition is reported. The authors find higher levels of trust for NPs than for physicians, though no significant difference in cultural mistrust or satisfaction with care. They also find higher levels of trust for NPs at nurse-managed clinics (NMCs) than for either NPs or physicians at jointly-managed clinics (JMCs). Also, level of satisfaction “was trending to be higher for patients seen in the NMC,” thought the P-value was “<0.07” (p.277). The authors demonstrate levels of significance by reporting P-values. Their use of post-hoc analysis is appropriate, because they “determine the location of difference among groups once overall significance of the ANOVA was determined” (p.276). The authors show strength of the study by reporting detailed, individual results for levels of trust, mistrust and satisfaction between and among provider types and clinic types.

A question arises, which point to a possible weakness of the study: on what do patients base their higher levels of trust in NPs, if they have no differences in satisfaction with care? The authors do not explain but they self-report another weakness of the study: lack of provider diversity makes it difficult to compare race-concordant and race-divergent relationships. The authors do not establish causality for the differences in trust levels. The authors conclude that more research is needed into the potential of nurse-managed clinics to maximize trust levels among African-American patients. A future study might recruit a greater diversity of providers to test the effects of race concordance and divergence.

2.) Budzi, Lurie, Singh, & Hooker (2008) compare results from post-care surveys to observe a correlation between NP-delivered primary care and increased satisfaction scores among veterans. They state, “Besides clinical care, NPs focus on health promotion, disease prevention, health education, attentiveness, and counseling. Physicians and PAs should be educated on these characteristics to promote patient satisfaction and expected outcomes” (p.1). As the authors did not conduct an experiment or apply a treatment to patients, but rather performed retrospective study of veterans who received care and responded to satisfaction surveys, no mention was made of IRB approval. In their literature review, Budzi et al. provide further support towards the question of this writer’s literature review: “NPs and PAs provide care that is indistinguishable in quality from care provided by physicians. NP preparation includes a practical emphasis on attention to patient education, individualization of care, active listening, and more” (p.2). The authors report that the VA employs mid-level providers to ensure patient access to care.

Although the sample size is huge (1,601, 828 returned surveys), power is not reported. Still, sample size represents a strength; no other single organization has such a large patient population. “The VA is the largest healthcare system and the single largest employer of NPs and PAs in the country” (p.1). The sample is a convenience sample, in that was drawn from voluntarily-returned surveys, but because returning the survey is a one-time event, attrition is not a factor.

Authors self-report a study weakness being the inability to compare findings to non-veteran, private-sector populations. Also, P values are also not reported in the body of the article; modern authors should be aware that articles are commonly retrieved in electronic format, and integrity of visual aids may not be maintained. Standard 95% confidence interval is used to assess difference. This increases the difficulty of independently verifying the authors’ findings.

Still, the authors end their article by asserting, “Some of the interpersonal skills that NPs possess, including health education, personalized care, counseling, and attentiveness to patients’ concerns should be incorporated into PA and physician education to improve health outcome, patients’ expectation, and satisfaction” (p.4). A future study might research the effects of incorporating these skills into other providers’ practices.

3.) Chenoweth, Martin, Pankowski, & Raymond (2008) analyze the costs of providing NP-led care through a workplace-based employee health clinic. Services include treatment for minor acute illnesses and injuries, management of chronic conditions (including hypertension), medication management, and providing referrals. This program was not implemented with the primary intention of conducting research, but rather as a novel care-provision model; the authors did not discuss IRB approval. The authors call their article a “report” (p.4). Also, no apparent literature search was performed; this makes sense, as this project was not implemented primarily to increase knowledge. Two methods were used to analyze data – “macrolytical” and “microlytical” (p.4), but the methods are not clearly delineated in the text of the article, nor are statistical processes reported. The first method indicated a benefit-to-cost ratio of 8.7 to one, while the latter showed a ratio of two to one; either way, the programs more than pays for itself in health cost savings.

The authors self-report one weakness as the inability to isolate variables, mainly to separate hiring of the nurse practitioner from beginning a company wellness initiative and a nurse help line. A future study might assess the effects of these changes, separate from one another, or perform multivariate analysis to appropriately attribute measured changes.

4.) Wright, Romboli, DiTulio, Wogen, & Belletti (2011) constructed a cross-sectional study to evaluate blood pressure control in patients previously diagnosed with hypertension; the authors compare care provided by NPs with care provided by physicians, reinforcing that “[t]he United states is experiencing a shortage of primary care providers, and this trend is expected to continue in coming years” (p.1). The authors performed retrospective medical record reviews, so, again, neither IRB approval nor attrition were factors. Literature review was not explicitly discussed, however, the authors provide the scenario for their study, supported by references to external literature. The authors also identified samples. 684 patients were ultimately included, though no power analysis is discussed.

A strength of this study is that authors thoroughly delineate their statistical techniques; they calculated both confidence intervals and P values on blood pressure (BP) control, and calculated P values on population characteristics. The authors report performing logistic regression analysis “to assess the robustness of our study” (p.60). The authors self-report a few limitations: first, “[t]he statistical significance of the odds ratio for controlled BP was 0.045. Although statistically significant at P<0.05, this finding may not be clinically significant” (p.63) because the authors could not collect information for all possible baseline comorbidities, nor could they account for patient selection bias in choosing a practitioner; also, the authors cite a small sample size (n=3916). The authors lament the inability to obtain information on baseline characteristics, due to the retrospective nature of the study; they also state that, “[t]he study was not designed to include a population that was demographically representative of the entire U.S. hypertensive population” (p.64). Still, the authors conclude, “while patients treated by independent NP primary care practices may differ significantly from patients treated by primary care physicians, comparable patient outcomes are achievable in both settings…our study lends support to the role of NPs in the primary care setting” (p.65). An experimental design that carefully recruits for similar baseline population features, or otherwise accounts for differences, or maintains a control group, may solve some of the limitations noted in this study design.

**Qualitative Studies**

1.) Hernandez & Anderson (2012) use narrative inquiry to explore the experiences of NPs who manage prehypertension in the primary care setting. The authors do report obtaining IRB approval, and use their literature review discussion to define prehypertension and to discuss its prevalence and treatment. They recruited participants through purposive, network sampling. After complete transcription of the semi-structured interviews, and data analysis, the authors ultimately extract three themes in the NPs’ experiences: practice realities, role identity, and navigating between care and treatment models.

This article elucidates problems, from the APN’s point-of-view, with directly substituting an APN for a physician. Note that the APNs’ concerns are not with quality of care, or costs, but are subjective reports of their desires for clarity of identity and role. The APNs report a desire not just to do what physicians do, but to have more space to utilize their skills in counseling and education: “I think the medical model is taking over and we’re losing our nursing essence…they don’t given us time to develop our art in a more holistic way.” (p.6). The authors summarize, “[a]lthough it takes time, communication was described as the defining difference between NPs and other healthcare providers…[s]uccessful management of prehypertensive patients required NPs to blend medical and nursing models into a unified and eclectic approach bridged by quality patient communication” (p.8).

The authors contextualize this discussion in a rich description of the process of interviewing the NPs; descriptive vividness is one process by which they clearly demonstrate upholding standards for critical appraisal of qualitative studies (Burns & Grove, 2009). Still, a larger sample size could provide further texture to the overarching story of APNs’ experience.

2.) Watts, Gee, O’Day, Schaub, Lawrence, Aron, & Kirsh (2008) use case studies to describe and discuss the skills of NPs in chronic disease management; the NPs employ these skills in the context of the chronic care model (CCM) and shared medical appointments (SMAs). The authors do not explicitly discuss a review of the literature, but do extensively cite other sources; the reference list totals 32 items. IRB approval was not mentioned.

Patient participants were recruited by convenience sample. The authors interviewed all staff and patient participants, apparently on a one-time basis; attrition was not cited as a concern. Study limitations were not discussed, but one apparent weakness is low descriptive vividness; this would elucidate methodology, and provide support for methodological congruence, and analytical preciseness, as well as provide examples to support the authors’ findings. The authors use tables as their primary means to communicate results, rather than using them to clarify or summarize description of findings; modern technology, a primary method by which articles are accessed, may not clearly translate table formats. Overall, this study’s primary weakness is its vagueness; we, the readers, cannot verify the authors’ conclusions due to lack of specificity in results descriptions.

The authors find that NPs have particularly strong skills in supporting patients’ decision-making process, promoting patients’ self-management of health status, and in utilization of the shared medical appointment model. They conclude, “NPs with their unique skills are positioned to foster patient-centered care” (p.8). A future study on this topic would be strengthened by providing greater detail, including textual discussion of the content of visual aids.

**Other research**

1.) Carter, Rogers, M., Daly, Zheng, & James (2009) performed a meta-analysis of 37 articles, and name factors associated with blood pressure reduction: nurse-led interventions, education about antihypertensive medications, pharmacist treatment recommendations, and use of a treatment algorithm. The authors provide cited foundational material, used to develop the research topic. Thoroughness of literature use represents a strength of this study; the reference list cites 58 articles total. Again, IRB approval is not necessary for the meta-analysis process.

The authors independently verify study findings by calculating odds ratios and use the 95% confidence interval to measure BP control; they use stepwise regression analysis and nonparametric analysis (for non-normally distributed data, and control for sample size. The thoroughness with which the authors explain their data analysis forms a strength of this article.

The authors thoroughly explore the strengths and weakness of the included articles. Strength include that “[t]he vast majority of the studies…were randomized, controlled trials….The quality of these studies supports the findings that these interventions are likely to be effective”(p.9). Additionally, “nearly all of the studies adequately described the most important characteristics of the patients, but many did not adequately describe the number, educational background, and training of the intervention pharmacists or nurses” (p.9).

Of course, variability exists between the studies reviewed by the authors; studies were conducted in varying primary care settings, including managed care, the Department of Defense, and the Veterans’ Administration. Twelve studies were conducted outside the United States , and therefore may be affected by the characteristics of these health care systems. Still, the authors conclude that “interventions involving nurses or pharmacists are effective strategies to improve BP control” (p.10). Further study on this topic might account for variation between populations or experimental groups.

2.) Chummun (2011) favorably discusses the trend towards hypertension management occurring at nurse-led clinics: “Given the encouraging research evidence, nurse-led hypertension clinics should get a wider remit to prescribe antihypertensive medications, particularly as the incidence of hypertension is increasing faster than ever before” (p.73).

Chummun does not conduct an experiment; the article’s primary purpose is to provide a succinct digest of current knowledge, treatment, and healthcare delivery practices related to hypertension. The author discusses the physiology of hypertension and reports current treatment recommendations, including pharmacologic and nonpharmacologic approaches. In review of current best treatment evidence, Chummun draws in literature sources to support his recommendations, but does not conduct a literature review *per se.* The author does not perform independent statistical analysis, although he does report current knowledge from other studies. Parts of his article are fairly common knowledge, but we do not know his selection process for his chosen evidence or the strength of evidence upon which his article is based.

Chummun’s article is clearly organized, and complex information is presented clearly and systematically, with an appropriate level of detail. Visual aids augment understanding of the article content. Still, his qualifications are not reported; we do not know if he is a physician, a nurse, a researcher, or some other role entirely. Though implications for nursing practice are not explicitly stated, Chummun’s conclusions echo others found in this literature review: “[t]he Department of Health favors the use of specialist nurses in assuming a more dynamic role to reduce morbidity and mortality from chronic hypertension. Antihypertensive medications, prescribed from an agreed treatment algorithm, by suitably trained specialist nurses, will significantly reduce the incidence of hypertension” (p.73). A future article might expand upon how APNs have been shown to produce desirable outcomes.

3.) Clark, Smith, Taylor, & Campbell (2010) conduct a systematic literature review and meta-analysis in the United Kingdom to name and discuss effective interventions, including nurse prescribing, for hypertension management. Thirty-three articles were ultimately reviewed. IRB approval was not needed, as the authors did not conduct an experiment or apply treatments. As literature review forms the entirety of this project, the authors critique studies for themes, perform statistical analysis, and critique the strength of their own work. Standard 95% confidence intervals were used for dichotomous data. One strength of the study is that the authors account for differences between studies, including comorbidities (diabetes and coronary heart disease) and racial variation of individual participants in the included studies. The authors find that effective hypertension-reducing interventions include stepped treatment algorithms, nurse prescribing, telephone monitoring, and community monitoring. Nurse – led clinics were found not to have a significant impact on achievement of blood pressure targets.

The authors self-report, “[t]his review presents evidence to support structured algorithm driven nurse led care of hypertension, and nurse prescribers” (p.13) and state that, “[e]vidence was found of improved outcomes with nurse prescribers from non-UK healthcare settings” (p.2). The authors do not further pair results with location; a review of the reference list reveals that some of the journals are from the United States. Therefore, a major limitation of the article, for our current purposes, is that focus is based outside of the United States.

4.) Gambino, Planavsky, and Gaudette (2009) describe the transition of The Cleveland Clinic’s Preventative Cardiology and Rehabilitation program from a physician-managed clinic to an APN-managed clinic. The authors did not conduct an independent experiment, but rather performed retrospective analysis of a change in care provision and management. The change was not for the purpose of research. IRB approval was obtained for database tracking and personal information analysis. Background information includes cited discussion of the national evolution of treatment standards.

The authors discuss the functioning of their clinic under the traditional physician model, during the transition period, and with the APN model.

The model evolved to one in which new patients were seen only by the physician and the medical assistant. Advanced practice nurses focused on seeing only follow-up patients, followed the plan of care as established by the physician at the entry visit, and discussed any changes with the physician as necessary. (p.5)

Billing practices were changed to allow independent billing by the APN, in addition to “incident to” billing; the APNs obtained National Provider Identifier numbers. Electronic documentation was initiated at this time, as well.

The clinic assessed effectiveness of the APN model by measuring continuity of care, patient satisfaction, clinical outcomes, and billing charges and volume. The authors state, “Although there is no objective measure for continuity of care, patient satisfaction scores provide some indirect measurement” (p.6) Patient satisfaction was measured by survey. Descriptive vividness is strength of this article. Language and examples convey rigidity and inconvenience in the former system, and fluidity and increased morale in the APN model.

A weakness of the article is that the authors use charts for primary reporting of data, rather than for creating visual aids or summarization; again, visual integrity of these charts do not necessarily translate through electronic format. Quantitative data on clinical outcomes is reported in these charts. Integration of this information into the textual discussion would enhance the strength of conclusions drawn. A future article might not only compare a “before-and-after” of a transitioning clinic, but might also compare the clinic to similar clinics.

The authors conclude that satisfaction with APN-managed care was high, lab test scores improved, and “billing charges were slightly higher compared with the physician model but may be a function of rising healthcare costs” (p.9).

**Tables 1-3**

**Quantitative Studies**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Source | Purpose/Problem | Sample | Concepts | Design | Instruments | Results | Implications for Practice | Comments |
| Benkert, Peters, Tate, & Dinardo (2007). Trust of nurse practitioners and physic-cians among African-Americans with hypertension. | “To examine correlates of low-income African-Americans’ level of trust in healthcare providers” (p.1). | Conven-ience; 145 low-income African-Americans - 51% female, mean age =49.4 years | Hyper-tension, provider type, race, trust, mistrust, patient satisfaction | Des-criptive cross-sectional | 3 questionnaires: Trust in Provider Scale, Cultural Mistrust Inventory, and Michigan Consortium Patient Satisfaction Tool. Chart audits used to collect clinical data. | Signifi-cantly higher trust for NPs, no signify-cant differ-ence in trust by provider type, higher trust toward NMC than JMC Race concord-ance not signifi-cant. | “[T]he high levels of trust in the NMC (nurse-managed clinic) may offer a promising solution to the health disparities of African-Americans; yet, more research is needed” (p.2) | Strengths: multiple survey tools, level of detail.Weaknes-ses: lack of provider diversity. |
| Budzi, Lurie, Singh, & Hooker (2008). Veterans’ perceptions of care by nurse practition-ers, physician assistants, and physicians: a compare-son from satisfact-ion surveys. | “…to examine the differences in patient satisfaction with care provided by nurse practitioner (NPs), physician assistants (Pas), and physicians in the Veterans Health Administration (VHA) system” (p.1) | 1,601,828 satisfaction surveys | Patient satisfaction, Provider type | Descrip-tive, correla-tional design | Statistical packages used: SPSS, ProClarity, regression analysis, logistic regress analysis, SUDAAN PROC | Satisfac-tion score increase more strongly directly correlated with NP staff increase than with MD or PA staff increase  | “a majority of primary care clinic patients prefer to see NPs as compared with PAs and physicians” (p.1). | Strengths: large sample sizeWeaknes-ses: statistics not reported in article text |
| Chenoweth, Martin, Pankowski, & Raymond (2008). Nurse Practitioner Services: three year impact on health care costs. | Analysis of costs to providing work-site occupational health NPs | Southeast-ern US industrial metal/plastics manufacturing firm and Carolinas Health System | Nurse Practitioner, Cost reduc-tion, Occu-pational health, employ-ee wellness program | Two measures used to analyze the effects of the program | Macroly-tical measure-ment, microly-tical measure-ment | The program more than paid for itself. | This could result in greater worksite presence of APNs. | Strengths: clarity of findingsWeaknes-ses: data analysis process unclear |
| Wright, Romboli, DiTulio, Wogen, & Belletti (2011). Hyperten-sion treatment and control within an indepen-dent nurse practi-tioner setting. | “To assess blood pressure (BP) control among patients with hypertension managed by nurse practitioners (NPs) vs. physicians” (p.58) | Adult patients with hyperten-sion diagnosis – 684 treated by NPs, 3232 treated by physicians  | Hypertension, Nurse Practitioner, physician, BP control | Cross Sectional | Standard deviation, frequency distribution, T test, analysis of variance, x² test | “Comparable controlled BP rates were observed among patients with hypertension receiving care from an NP vs. a comparison group receiving care from a physician” (p.58) | “Our findings support the increasingly important role of NPs in primary care” (p.58) | Strengths: through-ness of statistical reporting. Weaknes-ses: lack of data on baseline characteristics, small sample size |

**Qualitative Studies**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Source | Purpose/Problem | Sample | Concepts | Design | Instruments | Results | Implications for Practice | Comments |
| Hernandez & Anderson (2012). Storied experiences of nurse practitioners managing prehypertension in primary care. | “”…to explore the nurse practitioner [NP] experience with caring for prehypertensive patients” (p.1). | Eight primary care NPs  | Nurse practi-tioner, role identity, Care models, prehypertension, semi-structured interview | Narrative inquiry used to analyze semi-structured interviews | Semi-structur-ed inter-views | Themes: realities of practice, ambiguous role identity, and bridging models | “caring for prehypertensive patients is a complex and multilayered experience” | Strengths: descriptive vividness.Weaknesses: small sample size |
| Watts, Gee, O’Day, Schaub, Lawrence, Aron, & Kirsh (2008). Nurse practitioner-led multidisciplinary teams to improve chronic illness care : the unique strengths of nurse practitioners applied to shared medical appointments/groups visits | “…to describe the roles of… NPs in a novel model of healthcare delivery for patients with chronic disease…” (p.2) | Convenience sample of patients from shared medical appointments | Nurse practitioner, provider type, chronic care model (CCM), shared medical appointments (SMA)  | Qualitative case analysis (case studies) | Interviews with all staff participant and a convenience sample of patients | NPs excel in the core compo-nents of CCM | Nurse practitioners have the greatest role in self-management support, decision support, and delivery system design | Strengths: strength of findings Weaknesses: convenience sample, low descriptive vividness |

**Other articles**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Source | Purpose/Problem | Sample | Concepts | Design | Instruments | Results | Implications for Practice | Comments |
| Carter, Rogers, M., Daly, Zheng, & James (2009). The potency of team-based care interventions for hypertension | “to determine the potency of interventions for BP involving nurses or pharmacists” (p.2). | 37 articles met criteria | Team-based care, provider type, hypertension,  | Meta-analysis | MEDLINE search | Associated with BP reduction: medication education, pharmacist treatment recommendations, nurse interventions, use of treatment algorithm | Team-based care is associated with BP reduction, with individual components predicting potency | Strengths:thorough exploration of articles. Weaknesses: variability between article reduces strength of conclusions |
| Chummun, H. (2011). The management of hypertension: the impact of nurse-led clinics. | To present physiology of hypertension, and current best practice for treatment, which includes recom-mendations for nurse-led clinics  | N/A | Hypertension, physiology, drug algorithm, lifestyle thera-pies, nurse led clinics | Synthe-sis of current knowledge | N/A | Recommenda-tions for evidence-based practice | Increased awareness of recommendation for nurse-led clinics may translate into practice  | Strengths: clearly organized and communi-cated, visually appealingWeaknesses: does not explicitly synthesize data from references, author’s qualitifica-tions not stated.  |
| Clark, Smith, Taylor, & Campbell (2010). Nurse led interventions to improve control of blood pressure in people with hypertension: systematic review and meta-analysis | “To review trials of nurse led interventions for hypertension in primary care to clarify the evidence base , establish whether nurse prescribing is an important intervention, and identify areas requiring further study” (p.2) | 33 studies met inclusion criteria  | Provider type, hyper-tension, treatment algo-rithm, tele-phone monitor-ing, commun-ity monitor-ing,  | systematic review and meta-analysis | Data-base search-es | Compared with usual care, a stepped treatment algorithm and nurse prescribing showed greater reduction in blood pressure but not higher achievement of blood pressure target. Telephone and community monitoring improved achievement of BP targets. | A structured treatment algorithm, nurse prescribing, telephone monitoring and community monitoring may improve hypertension management | Strengths: differences between studies accounted for.Weakness: limited applicability of studies from outside the United States |
| Gambino, K.K., Planavsky, L., Gaudette, H. (2009). Transition toward a nurse practitioner-managed clinic | “ to discuss the history and transition of the Cleveland Clinic’s Preventative Cardiology and Rehabilitation Program from a traditional physician-based model to the APN-based model that it is today (p.2)” | APNs – Preventative Cardiology and Rehabilitation |  | Descriptive article | 4 areas evaluated: continu-ity of care, patient satisfac-tion, clinical out-comes, and billing charges and volume | “APN scores were rated higher in all 4 categories….[b]illing charges were equal, if not slightly higher, in the APN model” (p.7). “There we also statistically significant clinical outcomes” (p.8) | Authors conclude that “APNs are an effective and efficient way to provide risk reduction” (p.2). | Strengths: descriptive vividness.Weaknesses: statistics not reported in text |

**Analysis**

Common themes from the existing literature on adult hypertension management by APNs show positive clinical outcomes, high patient satisfaction, and cost-effectiveness. APNs display particular skills in communication and patient education. Existing literature clearly associates positive clinical outcomes with evidence for best treatment, including pharmacologic approaches and lifestyle management (Chummun, 2011). Nurse-led clinic seem to satisfy patients, but data conflicts over their impact on clinical outcomes; more information is necessary.

Qualitative research displays several themes in the APNs’ experience of providing modern evidence-based care: practice realities, role identity, and navigating between care and treatment models (Hernandez & Anderson (2012).

Strengths of this literature review include specificity of topic. The comparison is clearly defined (APNs and other PCPs) and the criteria of comparison is specific (hypertension management effectiveness). Background literature elucidates the nature of the hypertension problem in the United States, and the nature of the evolving PCP shortage. Also, Burns and Grove (2009) provide a strong model for research article critique.

Weaknesses of this literature review include number of articles; conclusions would only be strengthened by more articles ( a larger sample). Research based outside of the United States is of limited utility. Future literature reviews might include analysis of APN-managed care according to other quality indicators, and other clinical and psychosocial factors.

**Impact Upon Nursing Practice**

Increased education and hiring of APNs may help to ease the forecasted shortage of primary care physicians, about which Pericak (2011) observes, “primary care in our healthcare system is in crisis because there are far more people in need of primary care than there are primary care providers” (p.4). The literature shows that APNs perform well when compared to physicians, using hypertension management as a quality indicator. A more comprehensive review of multiple quality indicators may provide a more complete picture of APN performance.

APNs also generate high patient satisfaction scores. The literature highlights skillfulness in communication, education, patient support, and providing individualized care. Therefore, these components should continue to be part of APN-education programs, and part of the profession’s values. However, some efforts may be needed to more seamlessly integrate these components into APN-led care delivery. We should listen to APNs who report the desire to maximally use these skills while concurrently performing the other functions of a PCP.

APNs may be part of the solution to increasing health care cost efficiencies. Pericak (2011) reports, “The cost and time to educate a nurse practitioner (NP) is significantly less than that required to educate a physician. One goal advocated…is to increase usage of mid-level providers, which includes NPs” (p.5).

Other motivations exist to promote advanced practice nursing; Safriet (2011) states, “[b]y professional training as well as by regulatory and financial necessity, they have emphasized coordinated and cost-effective care, and they have tended more than other providers to establish practices in traditionally underserved areas” (p.443).

APNs should be proactive to make the information found in this Literature Review known, and to secure their professional position in the changing landscape of modern healthcare. APNs should advocate for full utilization of their skills, based on the understanding that they provide high-quality, patient-satisfying, cost-effective care. Pericak sates that APNs “can be successful in passing the removal of statutory collaboration is they are persistent, connect with key legislators, join their state NP or nursing associations, and work together toward common goals” (p.6). Safriet agrees that legislative reform is necessary to change the practice landscape for APNs, stating, “with sustained efforts to increase access to care in cost-effective ways, a growing and increasingly diverse chorus of voices is calling for true reform of health care workforce regulations” (p.460).

 How should APNs in PCP roles work to control hypertension? All PCPs bear the responsibility of conducting an evidence-based practice; Kovner (2011) points out, “Hundreds of millions of dollars have been spent on evidence-based medical research in order to identify and promote medical treatments that result in positive, predictable, cost-effective outcomes for patients” (p.310). Several authors of articles reviewed above recommend further research on these topics; further research can clarify our evidence base and inform policy.

**Conclusion**

Nurse Practitioner roles have been developing since the late 1960s; this will continue concurrently with other evolving changes in the United States healthcare system. This creates a climate of opportunity, in which Advanced Practice Nurses can advocate for advancement of their profession and for our healthcare system to include greater emphasis on individualized care, health education, lifestyle management, and cost-effectiveness.

This advocacy may not be easy: “Nurses and NPs need to be more involved in policy making, which influences the delivery of care…NPs in particular need to be consistent in their fight for autonomy” (Pericak, 2011, p.6). However, these studies suggest that both APNs and healthcare consumers (which, ultimately, we all become) reap rewards.

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