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11-21-2019

## Improving Access to Mental Health Care with Nurse Practitioners

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### Recommended Citation

Whelan, Jessica, "Improving Access to Mental Health Care with Nurse Practitioners" (2019).

*Dissertations*. 912.

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IMPROVING ACCESS TO MENTAL HEALTH CARE WITH NURSE  
PRACTITIONERS

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Doctor of Nursing Practice Project Presented to the  
Faculty of Graduate Studies  
University of Missouri – St. Louis

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In Partial Fulfillment of the Requirements  
for the Degree of Doctor of Nursing Practice

by

Jessica Whelan, MSN, APRN, PMHNP-BC

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DECEMBER 2019

### **Abstract**

*Problem:* Over 40% of those with mental illness are untreated since the supply of psychiatrists does not meet the demand. The psychiatric mental health nurse practitioner (PMHNP) may be an adjunct in providing those services. The purpose of this quality assurance study was to evaluate outcomes of care between a PMHNP and a psychiatrist (medical doctor [MD]).

*Methods:* An observational, descriptive design with a retrospective medical record review of adult patients over a six-month period in a suburban, Midwestern, privately owned psychiatric practice.

*Results:* A total of 787 individual patients encountered at least one visit ( $N=787$ ) although 3,679 visits were reviewed. The PMHNP was more likely to care for younger patients while the MD cared for more older patients ( $p<.001$ ). The PMHNPs cared for a more diverse gender spectrum than the MD ( $p = .031$ ). The MD was more likely to care for Caucasian patients; whereas, the PHMNPs cared for a more diverse racial or ethnic population ( $p <.001$ ). The MD was more likely to care for the self-pay patient than the PMHNP who cared for those with a larger range of payor types ( $p < .001$ ). The rate of emergency department (ED) visits and hospitalizations between providers was essentially the same ( $p=0.40$ ) and ( $p=0.31$ ) respectively.

*Implications:* No determination could be made in the key outcome measures of ED visits or hospitalizations between the PMHNPs and MD due to lack of documentation in the record. However, 450 more patients per month were treated for mental healthcare needs when PMHNPs were utilized.

### Improving Access to Mental Health Care With Nurse Practitioners

There are an estimated 43.8 million people with a mental health condition in the US (National Alliance on Mental Illness, [NAMI], n.d.). Of those, approximately 18 million individuals are not receiving mental healthcare services. In addition, Insel (2008, cited in NAMI, [n.d.]) reported serious mental illness costs the US nearly \$193.2 billion in lost earnings per year. This cost does not account for the expenses associated with emergency department (ED) care or hospitalizations. Furthermore, Glaze and James (2006, cited in NAMI, [n.d.]) reported 20% of prison inmates have mental illness; 70% of youth in the juvenile justice system have at least one mental illness (National Center for Mental Health and Juvenile Justice, cited in NAMI, [n.d.]); and 26% of homeless shelters house people with a mental illness (US Department of Housing and Urban Development, 2011, cited in NAMI, [n.d.]).

Access to healthcare includes a visit to an appropriate, licensed provider and is provided in a timely manner to achieve the best health outcome (Agency for Healthcare Research and Quality, [AHRQ], 2014). A significant factor contributing to the decline of mental health in the US is limited access to mental healthcare services; however, there are estimated to be 28,000 psychiatrists in the US with three in five psychiatrists over the age of 55-years (Japsen, 2018). Moreover, the projection for mental health services by 2025 is expected to exceed the supply of psychiatrists and is estimated to be approximately 15,600 psychiatrists (Weiner, 2018). The psychiatric mental health nurse practitioner (PMHNP) may be an adjunct to improve the mental health provider shortage. In fact, Buerhaus (2018) reported three recommendations to overcome the challenges facing the delivery of healthcare: (1) policymakers (e.g., hospital boards and

credentialing bodies) should allow nurse practitioners (NP) to practice to the full extent of their education and training; (2) physicians and NPs need to build a relationship allowing their roles to evolve into building the health of communities; and (3) public policymakers should remove practice restrictions on NPs.

A PMHNP has a graduate academic degree, is licensed or recognized as an advanced practice registered nurse (APRN), and is board-certified to perform the assessment, diagnosis, and health promotion of psychiatric mental health patients while utilizing pharmacologic and non-pharmacologic interventions when treating them (APRN Consensus Work Group & the National Council of State Boards of Nursing APRN Advisory Committee [NCSBN], 2008). To define APRN practice, the American Nurses Credentialing Center (ANCC) collaborated with over 40 nursing organizations to address APRN regulatory requirements for APRN requirements in the US by developing the Consensus Model for Advance Practice Nursing Regulation (ANCC, 2008). According to the Consensus Model, PMHNPs are educated and trained to manage patients with acute and chronic psychiatric illness and disease (ANCC, 2008)

The purpose of this quality assurance (QA) initiative was to examine mental healthcare services provided by a PMHNP and a psychiatrist (medical doctor [MD]) in a suburban, Midwestern privately owned psychiatric practice. There were two aims for this project: (1) prevention of mental illness progression to hospitalization; and (2) provision of evidence to support the PMHNP as an additional provider when providing safe and effective mental healthcare services. The outcome measures of interest were the number of patients treated by either provider, demographic differences, psychiatric diagnoses and any co-morbid medical diagnoses, number of emergency department (ED) visits and

hospitalizations. The following questions guided this study: In psychiatric mental health patients aged 18-60 years treated in a privately owned, outpatient mental health practice between September 15, 2018 through March 15, 2019:

1. how does the number of patients cared for by the PMHNP compare to the number of patients cared for by the MD influence the overall number of patients who received mental health care services?
2. how do the demographics of patients compare between the PMHNP and the MD?
3. are medical and psychiatric diagnoses comparable between the PMHNP and the MD?
4. how does care delivered by the PMHNP compared to the MD affect patient visits to the ED or hospitalizations?

### **Review of the Literature**

Search engines used were Google Scholar, PubMed, CINAHL, PsychINFO and the Cochrane Database. Key search terms were: *mental healthcare access*; *mental health practitioner access*, *psychiatry access*, and *practitioner access* and the Boolean operators AND or OR. The review of literature included all subtypes of mental illness and age ranges to examine barriers to healthcare access, proposed solutions, and relevant studies regarding those solutions. Excluded studies were those not readily accessible through online access or did not examine potential solutions to alleviating healthcare access. In Google Scholar the search terms *mental healthcare access* yielded 2,580,000 publications. Three-hundred titles and abstracts were evaluated, but only one study was selected for this literature review. The search terms *mental healthcare access*, *behavioral*

*health access* and *psychiatry provider access* were used in PubMed, yielding 6,567; 865; and 274 publications, respectively. From PubMed, 11 publications were chosen for this literature review. CINHALL search for *mental healthcare access* yielded 155 articles with five publications selected. PsycINFO yielded 288 articles with *mental healthcare access* and five publications were selected. Last, the Cochrane Database was searched using the term *mental healthcare access*. One publication of 12 was selected for use in this review. Hence, a total of 23 publications were selected for this review.

There are several perceived and actual barriers to access mental healthcare. Ganz, Curry, Jones, Mead, and Turner (2018), explored barriers to mental health care utilization in wards seven and eight in Washington D.C. through semi-structured interviews. They found fear and distrust of the medical system; lack of support; triggering experiences; lack of patient-centered care; stigma; and poverty as potential barriers (Ganz et al., 2018). Sulaberidze, Green, Chikovani, Uchaneishvili, and Gotsadze (2018) also sought to identify barriers through a mixed method study using interview methods and focus groups. They found barriers included difficulties with transportation, purchasing medications, and in assessing what defines ‘quality’ (Sulaberidze et al., 2018). In addition, Sulaberidze et al. (2018) found limited mental healthcare services and a finite number of available psychiatrists affected access.

Likewise, a lack of available mental healthcare providers and payment for services were a barrier to accessing care for a mental health condition. Tumin, Menegay, Shrider, Nau, and Tumin (2018) sought to examine income equality as a potential risk to population health and health services through a cross-sectional design using self-report studies. Tumin et al. (2018) found the lack of available mental healthcare providers was a

key problem and interestingly, countries with higher levels of income had more unmet health needs. Williams, Gilroy, Change, and Seymour (2017) used a secret shopper methodology while making calls to all behavioral health providers in a 20-mile radius in Denver with listings in the Anthem Blue Cross Blue Shield, United Healthcare, and Cigna directories. They found only 9.8-13.6% of calls to psychiatrists yielded appointments (Williams et al., 2017). Furthermore, one-half of psychiatrists had unavailability for more than one month, and only 55% of psychiatrists accepted insurance (Williams et al., 2017).

Mental health services offered through telehealth technologies may be helpful in areas with a mental healthcare provider shortage; however, this does not increase the overall number of mental healthcare providers available for care. Several studies found telemedicine effective in pediatric psychiatry (Saeed, Johnson, Bagga, & Glass, 2017; Gloff, LeNoue, Novins, & Myers 2015; and Nelson, Barnard, & Cain, 2006). Likewise, Neufeld, Case, and Serricchio (2012) studied telemedicine in rural communities and found this was a viable delivery option for mental healthcare for adults. While telehealth technologies expanded teleconsultation services to health provider shortage areas (HPSA), the number of available psychiatrists to provide the service remained limited.

The behavioral health consultant model has been suggested as a reasonable alternative for general primary care practices in providing some mental healthcare services. In this model, mental healthcare services are delivered by the primary care physician in consultation with a psychiatrist. The consultant model has been examined and found to be beneficial to patients who would not otherwise receive mental healthcare services (Kanzler, 2018; Ogbeide et al., 2018). While the consultant model may offer



some utility, especially for mild to moderate mental health conditions, the model does not increase the number of mental healthcare providers available for this consultation. The consultant model also required the primary care provider to consult when they may be overwhelmed with providing care for other specialties equally less accessible, especially in rural areas (Kanzler, 2018; Ogbeide et al., 2018).

The utilization of PMHNPs may actually increase the number of available mental healthcare providers. McCleery, Christensen, Petersen, Humphrey, and Helfand (2014) performed a systematic review of health outcomes in patients receiving care from NPs or physicians in primary care. They found the evidence was low grade, had a high risk of bias, and found insufficient evidence to conclude the feasibility of utilizing NPs for full time care (McCleery et al., 2014). Roots and MacDonald (2014) evaluated outcomes of NPs with a collaborative practice agreement in three rural fee-for-service practices. They used a mixed method study of 25 participants and found patient access to a healthcare provider improved in vulnerable populations, added additional visit availability, utilized a team approach, and improved physician satisfaction (Roots & MacDonald, 2014). The outcomes of care delivery, however, were not measured.

While a PMHNP may increase the number of mental healthcare providers, often the quality of the care is questioned. Munding et al., (2000) sought to compare patient outcomes between physicians and APRNs in primary care. They utilized a randomized control trial with 17 physicians and seven NPs from four community-based primary care clinics to study follow-up care after emergency department (ED) or urgent care (UC) visits (Munding et al., 2000). No differences were found in health outcomes between physician and NP care except in hypertensive patients who were found to have

significantly lower blood pressure when an NP cared for them (Mundinger et al., 2000). Furthermore, the US Department of Health and Human Services (HHS) recently released their recommendation for APRNs to practice to the full extent of their education and training as they too, have concluded patient outcomes were the same or better with care delivery by an APRN (HHS, 2018).

There is a gap in the literature, however, regarding the utilization of PMHNPs. There is clear evidence of many real or perceived barriers when accessing a healthcare provider, especially mental healthcare services due to the limited number of providers; a lack of diversity (physician versus non-physician) for the type of provider; and financial provisions to pay for the care. There has been limited to absent publications studying the effects of the PMHNP providing mental healthcare services.

A structure-process-outcomes (SPO) model was first described by Dr. Avedis Donabedian who recommended medical care be evaluated through three components: the structure of care, the process of care delivery, and clinical outcomes (Girdler et al., 2016). From this, the Plan-Do-Study-Act (PDSA) cycle evolved. The PDSA was developed by Dr. W. Edwards Deming, an electrical engineer, as a method focused on four areas including: examining a given system and understanding the relationships between a system's components, distinguishing between common-cause and special cause variation, application of a theory of knowledge through processes that lead to continual analysis and improvement, and psychology to examine how people in a system relate to one another (Girdler et al., 2016). When applied in general healthcare, the QI process has demonstrated reduced costs, reduced infection rates, and reduced start-time delays (Girdler, Glezos, Link, & Sharan, 2016). Hence, a SPO model was chosen as the

methodological framework for this study to evaluate the system components (i.e., mental healthcare delivery by a PMHNP and MD) and variations between the components.

## **Method**

### **Design**

An observational, descriptive design was used. A retrospective medical record review was conducted to review records between September 15, 2018 - March 15, 2019.

### **Setting**

A privately owned, psychiatric mental health primary care practice located in a large Midwestern, suburban, metropolitan area. The practice is comprised of one MD, one full-time PMHNP, one part-time PMHNP, and six office support staff. Office hours are Monday through Friday from 0900 to 1700 and closed on holidays. The population served are those aged 5- to 100+ years. The metropolitan area has over three million residents with 208 psychiatrists, 69 inpatient geriatric psychiatry beds, 480 adult inpatient psychiatry beds, and 40 inpatient pediatric psychiatry beds within a 25-mile radius (Missouri Department of Health and Human Services, 2015; Missouri Hospital Association, 2016).

### **Sample**

A convenience sample was used to include all adult patients who had a scheduled appointment in the practice between September 15, 2018 and March 15, 2019. Inclusion criteria were age 18-60 years, had at least one mental health diagnosis, and had a mental healthcare visit within the designated study period. Exclusion criteria were those under 18-years, or greater than 60-years of age, did not have at least one mental health

condition, or did not have a visit within the study period. If a patient had more than one visit with a provider within the study period, only the first visit in the period was used.

### **Approval Process**

Approval for this study was obtained from the psychiatry practice, the doctor of nursing practice (DNP) committee, university institutional review board (IRB), and the university graduate program. There were minimum risks to patients because this was a retrospective medical review and personal identifiers were removed. Benefits of this study included acquiring information about patient outcomes based on the type of mental healthcare provider providing the service.

### **Data Collection/Analysis**

Data obtained included the demographic information of age, gender, race/ethnicity, and payor status. In addition, the number of visits, the type of provider (PMHNP or MD), the psychiatric diagnoses, any co-morbid medical conditions, and a documented ED visit or hospitalization were recorded. All personal identifiers were removed and data from each patient was recorded as 1NP-1, 1NP-2, 1NP-3, etc., when primarily treated by the full-time PMHNP, 2NP-1, 2NP-2, 2NP-3, etc., for the part-time PMHNP, and MD-1, MD-2, MD-3, etc., when treated primarily by the MD. Data was stored on a password-protected computer and flash-drive and will be kept for a period of seven years. Data analysis was conducted using descriptive statistics, chi squared analysis, individual *t* tests, and ANOVA using excel & IBM SPSS (2019).

### **Procedures**

A team of key stakeholders was formed to include the primary investigator (PI), practice providers (MDs and PMHNPs), and ancillary staff. A collaborative interest and

verbal approval in the QI study was established. A facility educational meeting was held to educate staff on data needed for the study. The medical record review was determined to be conducted by the PI.

### Results

A total of 3,679 medical records of individual patient encounters were reviewed over a six-month period yielding a total of 787 individual patients that were seen during the time frame ( $N=787$ ). Of the individual encounters, The age range was 18-65 years, specifically: 18-25 years ( $n=141$ ; 17.9%); 26-30 years ( $n=109$ ; 13.8%); 31-35 years ( $n=115$ ; 14.6%); 36-40 years ( $n=96$ ; 12.2%); 41-45 years ( $n=71$ ; 9%); 46-50 years ( $n=59$ ; 7.5%); 51-55 years ( $n=80$ ; 10.1%); 56-60 years ( $n=62$ ; 7.9%); and 61-65 years ( $n=45$ ; 5.7%). There were 454 who identified as female ( $n=454$ ; 57.5%); male ( $n=316$ ; 40.1%); transgender ( $n=13$ ; 1.6%); and genderfluid ( $n=1$ ; 0.1%). The most frequently occurring race/ethnicity was Caucasian ( $n=603$ ; 76.4%); followed by Unknown ( $n=153$ ; 19.4%); Black ( $n=14$ ; 1.9%); Asian ( $n=7$ ; 0.9%); Hispanic ( $n=7$ ; 0.9%); American Indian ( $n=2$ ; 0.3%); and Middle Eastern ( $n=1$ ; 0.1%). There were 578 who had private insurance ( $n=578$ ; 73.3%), followed by those with self-pay ( $n=108$ ; 13.7%); Medicare ( $n=78$ ; 9.9%); and Medicaid ( $n=21$ ; 2.7%) (Appendix A).

All psychiatric and physical diagnoses were recorded. The most frequently occurring mental health diagnosis was Generalized Anxiety Disorder (GAD) ( $n=496$ ; 62.9%); followed by Major Depressive Disorder (MDD) ( $n=383$ ; 48.5%); Attention Deficit Hyperactivity Disorder (ADHD) ( $n=372$ ; 47.1%); Post-Traumatic Stress Disorder (PTSD) ( $n=228$ ; 28.9%); Substance Use Disorder (SUD) ( $n=210$ ; 26.6%); Bipolar Disorder (BD) ( $n=208$ ; 26.4%); Panic Disorder (PD) ( $n=169$ ; 21.4%); Obsessive

Compulsive Disorder (OCD) ( $n=149$ ; 18.9%); Eating Disorder (ED) ( $n=96$ ; 21.4%); Autism Spectrum Disorder (ASD) ( $n=84$ ; 10.6%); Social Phobia (SP) ( $n=52$ ; 7%); Pain Disorder ( $n=51$ ; 6.5%); Marijuana Use ( $n=49$ ; 6.2%); Self-harm ( $n=48$ ; 6.1%); Suicidal Ideation (SI) ( $n=47$ ; 6%); Personality Disorder (PD) ( $n=37$ ; 4.7%); Unspecified Mood Disorder and Pseudobulbar Affect ( $n=32$ ; 4.1%); and Persistent Depressive Disorder (PDD) and Persistent Major Depressive Disorder (PMDD) ( $n=27$ ; 3.4%) (Appendix B).

The most common co-morbid medical conditions were Insomnia ( $n=413$ ; 52.3%); followed by Vitamin Deficiency ( $n=157$ ; 48.5%); Obesity ( $n=141$ ; 17.9%); Metabolic Dysfunction ( $n=103$ ; 13.1%); Hypertension ( $n=99$ ; 12.5%); Respiratory Disorder ( $n=68$ ; 8.6%); Migraine ( $n=63$ ; 8%); Thyroid Disorder ( $n=61$ ; 7.7%); Chronic Pain Syndrome ( $n=60$ ; 7.6%); Head Injury (HI) / Traumatic Brain Injury (TBI) ( $n=57$ ; 7.2%); Gastro Esophageal Reflux Disease (GERD) ( $n=55$ ; 7%); and Diabetes Mellitus (DM) ( $n=51$ ; 6.5%) (Appendix B). There were no patients cared for by the MD who visited the ED ( $n=789$ ; 0%) but the NP had 3 ( $n=3$ ; 0.38%). Those who were hospitalized was 0 ( $n=0$ ; 0%) for the MD and 2 ( $n=2$ ; 0.25%) for the NP (Appendix B).

A paired-samples  $t$  test was performed on the age of the patient between those cared for by the PMHNP and those cared for by the MD. The mean age cared for by the PMHNP was 37.2 years ( $SD=12.9$ ) and 45.2 years ( $SD=13.1$ ) when cared for by the MD. The difference between the two means was statistically significant at the .05 level ( $t=-6.86$ ,  $df = 228.8$ ,  $p<.001$ ). The PMHNP was more likely to care for patients who were younger while the MD was more likely to care for the older patient.

A chi square test of independence was performed for the other demographics for comparing those cared for by the PMHNP with those by the MD. The male, female,

transgender, and genderfluid participants found the relationship between the type of provider and patient gender diversity was statistically significant at the .05 level ( $\chi^2=10.7$ ,  $df = 4$ ,  $p = .031$ ). The PMHNPs cared for a more diverse gender spectrum than the MD. Likewise, the relationship between the race/ethnicity of the patient cared for by the PMHNP was compared to those cared for by the MD. The relationship between the type of provider and patient race/ethnicity was statistically significant at the .05 level ( $\chi^2=26.7$ ,  $df = 7$ ,  $p < .001$ ). The MD was more likely to care for Caucasian patients; whereas, the PHMNPs cared for a more diverse racial or ethnic population. Finally, the relationship between the type of provider and payor status was statistically significant at the .05 level ( $\chi^2=326.6$ ,  $df = 36$ ,  $p = < .001$ ). The MD was more likely to care for the self-pay patient than the PMHNP who cared for those with a larger range of payor types.

A one-way ANOVA was used to determine the significance of the difference between the mean number of ED visits and the mean number of hospitalizations for those cared for by the PMHNP or the MD. Data analysis was adjusted to eliminate new patients directly referred to a provider from the hospital without having been seen previously in the practice, those visiting the hospital or ED for a medical purpose, or for those giving birth. The resulting mean number of ED visits was zero ( $SD=.07$ ) for the PMHNP and zero ( $SD=0$ ) for the MD. The differences among the means were not statistically significant at the .05 level ( $F [1, 785] = 0.72$ ,  $p=0.40$ ). The rate of ED visits between providers was essentially the same. Additionally, the mean number of hospitalizations of those cared for by the PMHNP was .01 ( $SD=.08$ ) and zero ( $SD=0$ ) for those cared for by the MD. The differences among the means were not statistically significant at the .05 level ( $F [1, 785] = 0.96$ ,  $p=0.33$ ). The rate of hospitalizations between providers was

essentially equivalent. Finally, the psychiatric and co-morbid diagnoses by provider were analyzed. The mean number of psychiatric diagnoses of those cared for by the PMHNP was 3.90 ( $SD=1.1$ ) and 3.36 ( $SD=0.12$ ) for those cared for by the MD. The mean number of co-morbid medical conditions was 2.27 ( $SD=0.1$ ) for those cared for by the PMHNP and 3.4 ( $SD=2.98$ ) for those cared for by the MD. The differences between the means were statistically significant at a .05 level ( $F [1, 785] =9.72, p=0.02$ ) and ( $F [1, 783] =19.97, p=0.00$ ) respectively. The MD cared for patients with more co-morbid medical conditions compared to the PMHNPs, however, PMHNPs cared for more co-morbid psychiatric conditions.

### **Discussion**

Mental health is as important as physical health, yet the number of providers available to monitor and treat mental healthcare needs is limited. The addition of PMHNPs in a psychiatric practice enabled more patients with mental healthcare needs to increase their access to care. Each month, the PMHNPs cared for two-times as many patients when compared to the MD who was only able to care for about 150 patients in this privately owned psychiatric practice. The MD had longer visit times scheduled than the PMHNPs and may have accounted for some difference in productivity. Regardless, over 600 patients had access to a licensed mental health care provider each month during this six-month study instead of 150 if only an MD was available.

The demographic evaluations from this study demonstrated the PMHNP treated a more gender, race/ethnicity, and payor diverse array of patients compared to the MD; however, the MD treated more Caucasian and self-pay patients. The addition of the PMHNP may have allowed for more diverse populations to be treated in the practice



simply due to the increased number of patients who could be evaluated and treated. Also, the MD practice was comprised of almost 40% of self-pay patients, and was reimbursed at a higher amount with third party payors. The addition of the PMHNP may have increased practice revenue and patient access to care by accommodating more patients and thus, more third-party payors. The MD also treated more psychiatric patients with co-morbid medical conditions than the PMHNP allowing for some of the PMHNPs in the practice to care more for those with co-morbid psychiatric conditions. While these might be notable changes in the practice, the MD had been in practice for approximately 25-years beginning the practice in a primarily suburban, Caucasian area. Only three years ago did the MD move the practice to a more diverse suburb and added the PMHNP provider to the practice at that time. Many of the MD's original patients continued to be treated at the new location. One PMHNP had an established practice as well, with several patients following to the new practice and location. The other PMHNP was new to practice and did not have established patients. Regardless, diversity and payor status significantly changed when additional providers were available.

Of the sample, all medical and psychiatric diagnoses were recorded; hence, more than one diagnoses per patient was likely. The medical and psychiatric diagnoses were comparable between the PMHNP and the MD, but statistical analysis examining the entire practice revealed the MD treating patients with more medical comorbidities than the PMHNPs. When the data was analyzed further, the full-time PMHNP actually saw patients with more medical and psychiatric comorbidities, while in comparison, the full-time MD and part-time PMHNP saw less co-morbid medical and psychiatric conditions. The differences in practice styles or number of hours worked may have accounted for the

overall difference in the MD treating more patients with a co-morbid medical conditions between the two types of providers.

The finding of essentially zero ED visits or hospitalizations over six-months with either the PMHNP or the MD is highly unlikely. While the private practice utilized an electronic medical record, this software was incompatible with the various software programs utilized by the local hospitals. There was not consistent documentation for ED visits or hospitalizations; therefore, documentation in the primary psychiatric care medical record was essentially dependent on patient self-report. Hence, reliability of these results is low and a conclusion cannot be determined. However, of those who had an ED visit or hospitalization documented, no statistically significant difference was found between the number of ED visits or hospitalization rates between the PMHNPs and the MD, indicating a likelihood of equivalent care between the two types of providers.

Strengths of this study included an evaluation of patient demographics and number of visits (accessibility) between the PMHNPs and the MD. Limitations of this study included the possibility of a type-II error. In addition, non-randomization and failure to account for differences between providers (i.e., longer appointment times for the MD, established patients following the provider to a new practice and/or location, and experience level differences between providers). Based on the limitations of this study, a recommendation would be randomize patients who would be cared for by the PMHNP or the MD, equality of appointment times, and equality of experience levels between providers. In addition, other outcome measures such as patient satisfaction, maintenance of mental health conditions, treatments (e.g., medication management, psychotherapy, or a combination), and quality of life measurements would be prudent considerations.

Location may also be considered to include a comparison of the PMHNP and MD in: community mental health centers, hospitals, intensive outpatient programs, rural communities, and other treatment locations. Future study may also consider examining practice sites with more practitioners available for comparison of the diversity of practice styles. Furthermore, examining the cost savings and improved revenue for health systems utilizing PMHNPs is recommended.

### **Conclusion**

Over two-times (450 compared to 150) as many patients could be evaluated and treated when a full-time and part-time PMHNP were part of an otherwise, one physician, psychiatric primary care practice. While there were some differences in the demographics of patients evaluated, this could be explained by the MD having long-time, previously established patients prior to the location move and the addition of the PMHNP occurring after the location change. In addition, while a self-report of an ED visit or hospitalization was essentially equal between the PMHNP and MD providers, a more consistent documentation is needed to determine if a key indicator of quality has been met. Since the supply of psychiatrists cannot meet the mental health care needs of the population, the addition of PMHNPs may offer an adjunctive solution to a provider shortage, however, more study is needed.

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**Appendix A**

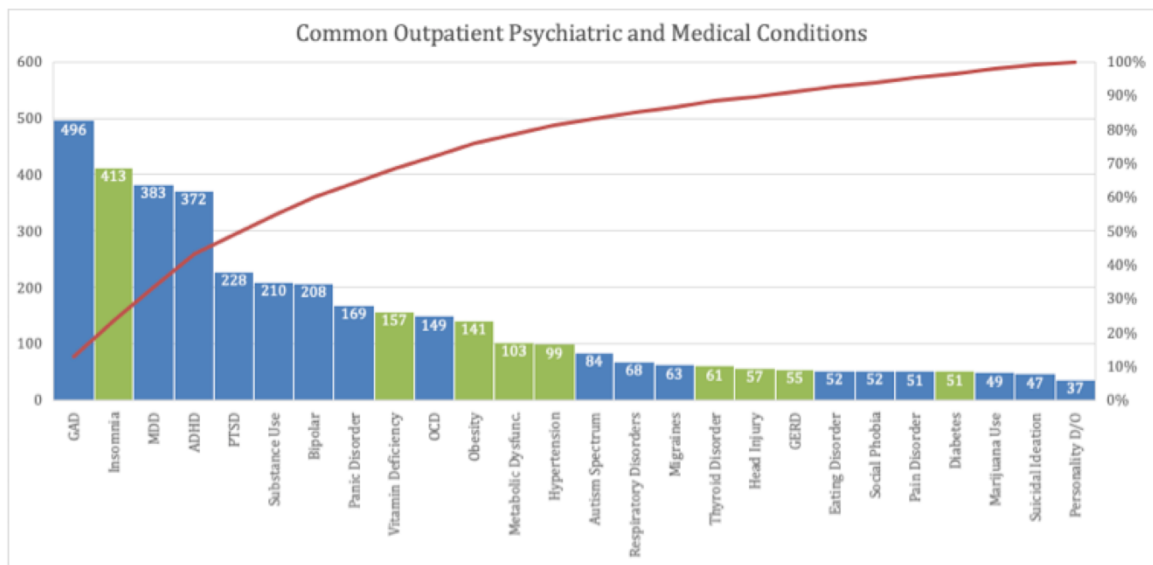
			Practitioner		
			NP	MD	Total
<u>Race/Ethnicity</u>	<u>Caucasian</u>	Count	467	136	600
		% of Total	59.2%	17.4%	76.0%
	African American	Count	14	1	15
		% of Total	1.8%	0.1%	1.9%
	Asian	Count	7	0	7
		% of Total	0.9%	0.0%	0.9%
	Hispanic	Count	4	3	7
		% of Total	0.5%	0.4%	0.9%
	American Indian	Count	1	1	2
		% of Total	0.1%	0.1%	0.3%
	Middle Eastern	Count	1	0	1
		% of Total	0.1%	0.0%	0.1%
	Unknown	Count	142	14	156
		% of Total	18.0%	1.8%	19.8%
<u>Total Race</u>		Count	636	153	789
		% of Total	80.0%	20.0%	100.0%
<u>Gender</u>	<u>Male</u>	Count	244	72	316
		% of Total	30.9%	9.1%	40.1%
	<u>Female</u>	Count	374	80	454
		% of Total	47.4%	10.1%	57.5%
	<u>Transgender</u>	Count	13	0	13
		% of Total	1.6%	0.0%	1.6%
	<u>Genderfluid</u>	Count	0	1	1
		% of Total	0.0%	0.0%	0.0%
<u>Total Gender</u>		Count	636	153	789
		% of Total	80.0%	20.0%	100.0%
<u>Payor Status</u>	<u>Private Insurance</u>	Count	507	75	581

		% of Total	64.3%	9.5%	73.6%
	<u>Medicare</u>	Count	63	15	78
		% of Total	8.0%	1.9%	9.9%
	<u>Medicaid</u>	Count	21	0	21
		% of Total	100.0%	0.0%	2.7%
	<u>Self-Pay</u>	Count	45	63	108
		% of Total	5.7%	8.9%	0.1%
<u>Total Payor</u>		Count	636	153	789
		% of Total	80.0%	20.0%	100.0%
<u>Age</u>	<u>18-25</u>	Count	130	11	141
		% of Total	16.5%	1.4%	17.9%
	<u>26-30</u>	Count	99	14	113
		% of Total	12.5%	1.8%	14.3%
	<u>31-35</u>	Count	102	14	116
		% of Total	12.9%	1.8%	14.7%
	<u>36-40</u>	Count	78	19	97
		% of Total	9.9%	2.4%	12.3%
	<u>41-45</u>	Count	53	19	72
		% of Total	6.7%	2.4%	9.1%
	<u>46-50</u>	Count	42	18	60
		% of Total	5.3%	2.3%	7.6%
	<u>51-55</u>	Count	64	17	81
		% of Total	8.1%	2.2%	10.3%
	<u>56-60</u>	Count	43	20	63
		% of Total	5.4%	2.5%	8.0%
	<u>61-65</u>	Count	25	21	46
		% of Total	3.2%	2.7%	5.8%
<u>Total Age</u>		Count	636	153	789
		% of Total	80.6	19.4%	100%

Appendix B

Figure 1. Top Psychiatric and Medical Conditions in Outpatient Practice

Figure 1. Top Psychiatric and Medical Conditions in Outpatient Practice



Note. All psychiatric and physical diagnoses were recorded for the sample. The most frequently occurring mental health diagnosis was Generalized Anxiety Disorder (GAD) ( $n=496$ ; 62.9%); followed by Major Depressive Disorder (MDD) ( $n=383$ ; 48.5%); Attention Deficit Hyperactivity Disorder (ADHD) ( $n=372$ ; 47.1%); Post-Traumatic Stress Disorder (PTSD) ( $n=228$ ; 28.9%); Substance Use Disorder (SUD) ( $n=210$ ; 26.6%); Bipolar Disorder (BD) ( $n=208$ ; 26.4%); Panic Disorder (PD) ( $n=169$ ; 21.4%); Obsessive Compulsive Disorder (OCD) ( $n=149$ ; 18.9%); Eating Disorder (ED) ( $n=96$ ; 21.4%); Autism Spectrum Disorder (ASD) ( $n=84$ ; 10.6%); Social Phobia (SP) ( $n=52$ ; 7%); Pain Disorder ( $n=51$ ; 6.5%); Marijuana Use ( $n=49$ ; 6.2%); Self-harm ( $n=48$ ; 6.1%); Suicidal Ideation (SI) ( $n=47$ ; 6%); Personality Disorder (PD) ( $n=37$ ; 4.7%); Unspecified Mood Disorder and Pseudobulbar Affect ( $n=32$ ; 4.1%); and Persistent Depressive Disorder (PDD) and Persistent Major Depressive Disorder (PMDD) ( $n=27$ ; 3.4%).

The most common co-morbid medical conditions were Insomnia ( $n=413$ ; 52.3%); followed by Vitamin Deficiency ( $n=157$ ; 19.9%); Obesity ( $n=141$ ; 17.9%); Metabolic

Dysfunction ( $n=103$ ; 13.1%); Hypertension ( $n=99$ ; 12.5%); Respiratory Disorder ( $n=68$ ; 8.6%);  
Migraine ( $n=63$ ; 8%); Thyroid Disorder ( $n=61$ ; 7.7%); Chronic Pain Syndrome ( $n=60$ ; 7.6%);  
Head Injury (HI) / Traumatic Brain Injury (TBI) ( $n=57$ ; 7.2%); Gastro Esophageal Reflux  
Disease (GERD) ( $n=55$ ; 7%); and Diabetes Mellitus (DM) ( $n=51$ ; 6.5%).