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Retrospective Analysis: Most Common Diagnoses Seen in a Primary Care Clinic and Corresponding Occupational Therapy Interventions

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Retrospective Analysis: Most Common Diagnoses Seen in a Primary Care Clinic and Corresponding Occupational Therapy Interventions

Abstract

Background: The literature supports occupational therapy (OT) on primary care (PC) interprofessional teams; however, due to uncertainty regarding the role of, and reimbursement for, OT in PC, few occupational therapists practice in PC. This study addressed the first barrier by identifying the 15 most common diagnoses in a specific PC practice and determining how many of them have evidence-based OT interventions appropriate for their treatments.

Method: A retrospective analysis of the ICD-10 codes used by one physician during a 12-month period was completed. These codes were reviewed and categorized using a functional classification system to determine the 15 most frequently occurring diagnostic categories. These diagnostic categories were compared to evidence-based industry standard OT interventions.

Results: We reviewed 1,769 distinct ICD-10 codes and condensed them into 58 thematically grouped diagnostic categories. The 15 most frequent categories comprised 64% of the codes used. Evidence-based OT interventions to treat conditions directly, or address related underlying issues and common comorbidities, were identified for 100% of these categories.

Discussion: Evidence-based OT interventions exist to treat aspects of 100% of the 15 most common conditions seen in PC. The findings support the growing body of literature that demonstrate the use of occupational therapists as interprofessional PC team members.

Comments

The authors report that they have no conflicts of interest to disclose.

Keywords

primary care, interprofessional team, occupational therapy, integrated, behavioral health, needs assessment

Cover Page Footnote

We would like to thank Arrowhead Health Centers for providing the codes for this project.

Credentials Display

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Medical conditions do not occur in isolation; rather, they occur in the context of a patient's life. According to the American Psychological Association (APA) (2015), there are mental or behavioral health issues underlying approximately 70% of all primary care (PC) visits. These issues include behaviors that affect health, such as insufficient physical activity, unhealthy tobacco and alcohol use, and poor diet choices. All of these issues can increase the risk of chronic illness seen in PC (Dahl-Popolizio, Doyle, & Wade, 2018). With their focus on the habits, routines, occupations, and general functional status of patients across the life span, occupational therapists have a broader, more complete view of an individual patient than that of the typical medical provider. Through their unique lens, occupational therapists consider patients in the context of their daily life roles as members of their families and communities (American Occupational Therapy Association [AOTA], 2013; Dahl-Popolizio, Manson, Muir, & Rogers, 2016), and work in the patients' routines to facilitate necessary lifestyle changes and ensure self-management of medical conditions and overall wellness (Dahl-Popolizio et al., 2018). Viewing patients through this lens, occupational therapists, as members of the interprofessional integrated PC team, can address underlying behavioral health issues, as well as other issues, such as depression, anxiety, autism, attention deficit hyperactivity disorder, and obesity, that commonly occur comorbid with the presenting medical complaints being treated by the PC practitioner (PCP) (Dahl-Popolizio, Rogers, Muir, Carroll, & Manson, 2017).

PC is an emerging practice setting for occupational therapists, and there is increasingly more information in the literature regarding the role of occupational therapy (OT) in PC (Donnelly, Brenchley, Crawford, & Letts, 2014; Metzler, Hartmann, Lowenthal, 2012; Muir, 2012; Roberts, Farmer, Lamb, Muir, & Siebert, 2014). Some authors detail OT interventions for specific conditions (Dahl-Popolizio et al., 2017; Hart & Parsons, 2015; Mackenzie & Clemson, 2014), while others focus more generally on the supportive role of OT in the provision of PC services, such as chronic care management and addressing mental or behavioral health needs in an integrated care model (Dahl-Popolizio et al., 2016; Donnelly et al., 2014; Metzler et al., 2012).

There is also information that supports the cost effectiveness of having an occupational therapist providing services as a member of the PC team (Hart & Parsons, 2015; Killian, Fisher, & Muir, 2015; Metzler et al., 2012; Rexe, Lammi, & von Zweck, 2013). Despite all of the support in the literature regarding the role of an occupational therapist as a member of the PC team, PC is still an emerging practice setting for occupational therapists, and there are still relatively few occupational therapists currently practicing in PC settings in the United States. The actual number of occupational therapists working in this setting is unknown, as there are not yet statistics available that track this information. Some of the barriers to occupational therapists working in PC include uncertainty regarding the role of OT in PC and uncertainty regarding reimbursement for OT services in PC (Dahl-Popolizio et al., 2017; Muir, Henderson-Kalb, Eichler, Serfas, & Jennison, 2014). Adding to the uncertainty are variations among organizational structures, payment models, payer types, and specific services provided in each setting (Muir et al., 2014). As a result, consistency among OT practices in a PC setting has not been established. This study addressed the barrier of uncertainty regarding the role of OT in PC by identifying the 15 most common diagnoses seen in a specific PC practice and determining whether an occupational therapist, as a member of the interprofessional PC team, can contribute to the treatment of these conditions using evidence-based practices. This is an important step toward the inclusion of OT in PC services, since detailed information regarding the most common conditions that present to a typical PC practice, and whether evidence-based OT interventions exist for each of these conditions, has not yet

been explored. The specific research questions addressed by this study were: (a) What are the 15 most common diagnostic conditions presenting to a typical PC practice, and (b) How many of the 15 most common diagnostic conditions presenting to a typical PC practice have evidence-based OT interventions that have been developed for their treatment?

Method

Design

The study design was a retrospective analysis using a de-identified data set of International Classification of Diseases (ICD-10) diagnostic codes. ICD-10 codes are a classification system used by health care providers to code diagnoses, symptoms, and procedures for patient encounters. Use of these codes is industry standard practice in the United States, and providers assign at least one code to each patient at each visit. As such, these codes were used to determine the frequency of medical conditions presenting to a PC practice. A retrospective analysis was conducted, since this is a common method for analyzing medical data, including the frequency of visits for certain medical conditions (St. Sauver et al., 2013). We consulted the Arizona State University Institutional Review Board, who determined that this study did not constitute human subjects research.

Participants

Setting. The PC practice used for the study had 23 practitioners located in four offices across the Phoenix, AZ, metropolitan area. The clinics provided PC services, physical rehabilitation, chiropractic, and pain management services. The patient population analyzed for this study was drawn from a single PCP's patient panel at one of the practice locations.

Materials

Diagnostic categories. A de-identified database grouped by physician and containing ICD-10 codes, billing descriptions for the codes, and the number of times each code was used during a 12-month period spanning 2015-2016, was obtained from this practice in the Phoenix, AZ, metropolitan area. The information contained in the database was all in aggregate and did not include data on individual patients or office visits.

Occupational therapy resources. The OT resources used for identification of existing OT interventions were industry standard textbooks and practice guidelines commonly used by occupational therapists in the field and in academia. These specific resources were chosen not because they are superior to other sources, but because they are evidence-based resources that are commonly used to address the diagnoses identified. These resources, as well as a description of each, are depicted in Table 1. Determining the best interventions for specific conditions that may be seen in PC was beyond the scope of this research project; rather, the focus was on demonstrating whether OT interventions are available for the top 15 most frequent conditions identified.

Table 1*Occupational Therapy Reference Materials Used*

Lead Author	Title	Date	Description
Clark	<i>Lifestyle Redesign: The Intervention Tested in The USC Well Elderly Studies</i>	2015	Practical treatment guidance for occupational therapy programs designed to facilitate independent living in older adults. Based on the Well Elderly Studies.
Hall	<i>Occupation Therapy Toolkit</i>	2013	Occupational therapy treatment guide for physical disabilities, chronic conditions, and geriatrics. Treatments are based on current research and best practices.
MacRae	<i>Sexuality and The Role of Occupational Therapy</i>	2013	Practice guidelines regarding the role of occupational therapy in addressing sexuality and sexual health published by the American Occupational Therapy Association (AOTA).
Reed	<i>Quick Reference to Occupational Therapy</i>	2014	Evidence-based practice guide for occupational therapy; includes conditions and causes, assessment tools, precautions, areas of functional limitations, and evidence-based intervention approaches.

Procedures

Diagnostic categories. The practice manager provided a de-identified database grouped by physician containing ICD-10 codes, billing descriptions for the codes, and the number of times each code was used during a 12-month period spanning 2015-2016. There was an aggregate total of 476,335 codes present in the database. Because of the sheer volume of codes, we consulted with clinic management, and the clinic management identified the PCP most representative of the general scope of conditions seen at the practice. We then extracted the 15,952 aggregate ICD-10 codes pertaining to patient encounters for this specific practitioner. These 15,952 aggregate codes represented 1,770 distinct codes that had been used multiple times during the study period. On review, we determined that one of the codes was not an ICD-10 code, but instead an internal practice code used to indicate that a referral had been made. Since this code was not an ICD-10 code, it was excluded from further analysis. The remaining 1,769 distinct ICD-10 codes were then reviewed and coded using a functional classification system to determine the most frequently occurring diagnostic categories. A functional approach was chosen, as this is more relevant to the treatment of conditions, which is the focus of PCPs and occupational therapists. The Agency for Healthcare Research and Quality (AHRQ) has developed a clinical classification system based on ICD codes (AHRQ, 2018). However, this clinical classification system contains 259 categories, which is too many categories to be useful in determining frequency of visits and treatment approaches. In addition, ICD-10 codes are primarily used for billing information, and similarities in codes do not necessarily correlate to similarities in treatment. Functional classification systems take a more holistic approach that is focused on patient functioning and treatment. They have been developed for specialized conditions (Bednarczyk & Sanderson, 1993). However, a functional approach has not been described for general conditions presenting in a PC setting. As no functional

classification system for general ICD-10 codes exist, we developed a functional classification system based on similarities in the systems of the body affected, or by their functional implications and treatment methods. For example, the diagnostic category of neck and back issues comprised 59 separate ICD-10 codes ranging from 724.2 low back pain, to 847.2 lumbar sprain, to M54.5 low back pain. The ICD-10 codes for these conditions are very disparate; however, from a functional perspective, they will be treated similarly, so these diagnoses were classified in the functional category neck and back issues (including pain), as the PCP and occupational therapist approach to treatment will be similar for all diagnoses in this functional category. A team-based coding approach was chosen, as the inclusion of researchers with different backgrounds and perspectives can help to refine the coding system and produce more robust results (Berends & Johnston, 2005). The initial diagnostic categories for the functional classifications were developed by two OT student researchers (MV and LM), an experienced occupational therapist with knowledge and experience working with ICD-10 codes in a clinic setting (SDP), and an epidemiologist with experience working with medical data (FT). During the coding process, additional categories were added as needed to classify codes. To ensure reliability in the classification of the ICD-10 codes, MV and LM independently reviewed each ICD-10 code and assigned it to a diagnostic category. SDP then reviewed the results and served as arbitrator where there was disagreement. This coding method is a common practice to ensure reliability in research that uses a team-based coding approach. In addition, after the classification was complete, SDP and FT reviewed the results for accuracy and condensed similar categories for a final of 58 diagnostic categories. This iterative process, with researcher-developed coding schemes evolving during analysis, is commonplace in coding research (Saldaña, 2015).

Data analysis. Once classification of the ICD-10 codes was completed, pivot tables were created in Microsoft Excel™ to determine the frequency of each diagnostic category. The frequencies were then compared to determine the top 15 diagnostic categories.

Occupational therapy interventions. The top 15 most common diagnostic categories were compared to current OT evidence-based resources to determine whether evidence-based OT interventions have been developed either to treat these conditions directly, or to address other issues that may occur when a patient experiences these medical conditions. The top 15 diagnostic categories were chosen to be compared to existing OT treatments because we thought 15 categories was a manageable number to conduct a crosswalk with existing OT interventions while still representing a comprehensive enough list to demonstrate whether occupational therapists can meaningfully contribute to the treatment of patients in a PC setting.

Results

Individual diagnoses for 1,769 distinct ICD-10 codes were reviewed and condensed into 58 thematically grouped diagnostic categories. The workflow for this process is represented in Figure 1.

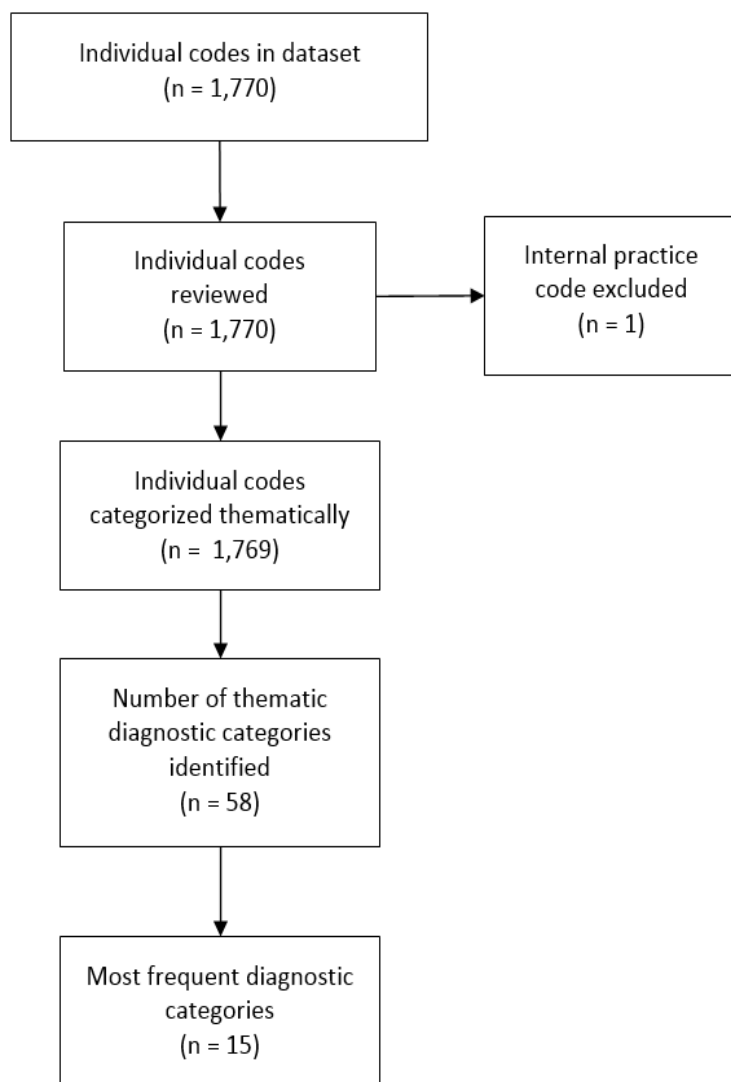


Figure 1. Workflow process for review and classification of individual ICD-10 codes.

These 1,769 distinct ICD-10 codes were applied by the PCP 15,950 times during the 12-month study period. The top 15 most frequent diagnostic categories identified are presented in Table 2.

Table 2

Top 15 Most Frequent Diagnostic Categories

Order	Diagnostic Category	Frequency
1	Diabetes	1,271
2	Hypertension	1,084
3	Abdominal pain/GI discomfort	872
4	Thyroid issues/disorders	808
5	Respiratory issues (including flu)	784
6	General illness/follow up encounters	689
7	Mental/behavioral issues	678

8	Neck and back issues (including pain)	594
9	Neoplasms/mass/lump	576
10	Cholesterol/lipid issues	575
11	Lower extremity pain or injury	538
12	Reproductive system	471
13	Upper extremity pain or injury	458
14	Skin disorders	439
15	General malaise/fatigue/weakness	438
Total		10,275

The top 15 diagnostic categories comprised 10,275 of the 15,950 ICD-10 codes, which represents 64% of the total. The remaining 36% of ICD-10 codes comprised 43 diagnostic categories that ranged from neurodegenerative diseases to fungal infections. The proportion of the top 15 diagnostic categories compared to all other diagnostic categories is presented in Figure 2.

Percentage of Total ICD-10 Codes Utilized

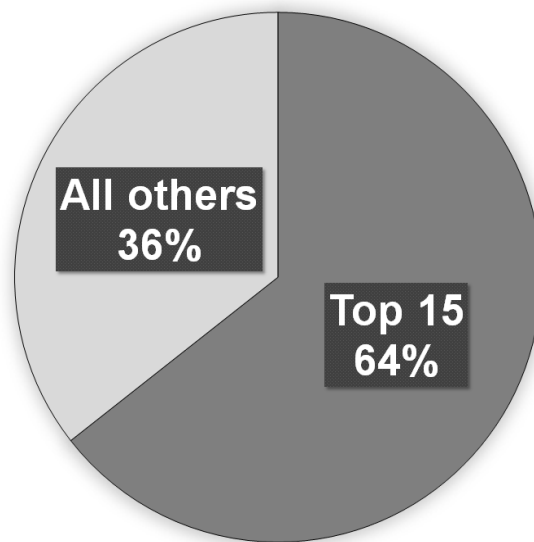


Figure 2. Frequency of the top 15 diagnostic categories compared to all other diagnostic categories. There were 58 diagnostic categories.

Evidence-based OT interventions to treat these conditions directly, to address underlying issues that can cause or result from the conditions, and/or to address comorbid issues that often occur when a patient experiences these conditions, have been developed for 100% of the top 15 most frequent diagnostic categories evaluated in a PC setting. Considering the variation in presentation and needs among individual patients, the possible intervention options are vast. The top 15 diagnostic categories and examples of some of the existing evidence-based OT interventions are presented in Table 3.

Table 3

Top 15 Diagnostic Categories and Some of the Available Occupational Therapy Interventions

Diagnostic Category	Sample Occupational Therapy Interventions	Reference Material
Diabetes	<ul style="list-style-type: none"> • Medication management strategies • Schedule and routine management • Lifestyle modification • Recommend adaptive equipment • Instruct in diabetic foot care and safety • Assess sensation • Compensatory techniques and safety measures for sensory deficits, low vision, fall risk/prevention • Instruct in pacing and energy conservation strategies • Incorporate physical activities into daily routine to manage glucose levels • Perform home assessment and make recommendations for adaptations 	Hall, 2013
Hypertension	<ul style="list-style-type: none"> • Medication management strategies • Educate on precautions for exercise, activity pacing, and energy conservation techniques • Teach stress management and relaxation techniques 	Hall, 2013
Abdominal pain/ Gastrointestinal discomfort	<ul style="list-style-type: none"> • Teach stress management and relaxation techniques • Education about diet and lifestyle modifications 	Hall, 2013 Clark et al., 2015
Thyroid issues/disorders	<ul style="list-style-type: none"> • Medication management strategies • Education about diet and lifestyle modifications • Teach stress management and relaxation techniques • Provide resources for social supports 	Clark et al., 2015 Hall, 2013
Respiratory issues (including flu)	<ul style="list-style-type: none"> • Provide graded upper extremity and trunk activities and progressive resistive therapeutic exercises that incorporate breathing techniques • Instruct in self-monitoring of heart rate and dyspnea • Teach patient safe use of oxygen during ADL and mobility • Educate on respiratory panic and alleviation techniques, fatigue management, and energy conservation • Recommend home and activity modifications, adaptive equipment, activity pacing 	Hall, 2013
General illness/ follow-up encounters	<p>As indicated by diagnosis and presenting complaints:</p> <ul style="list-style-type: none"> • Medication management strategies • Schedule and provide routine case management • Education about activity and lifestyle modifications • Provide educational sessions on relevant behaviors, personal safety, and social relationships for improved health and health behaviors, as well as psychological independence and well-being 	Hall, 2013 Clark et al., 2015 Reed, 2014
Mental/behavioral illness	<ul style="list-style-type: none"> • Medication management strategies • Set realistic daily schedule to create safe/independent self-care, work, and leisure balance • Complete standardized assessments to measure levels of depression and anxiety • Teach stress management and relaxation techniques • Spend sufficient time with patients to build a trusting relationship, provide support, and provide opportunities to succeed 	Hall, 2013

	<ul style="list-style-type: none"> • Address and challenge cognitive distortions • Instruct in good sleep habits • Encourage therapeutic exercise and meaningful activities • Educate patient and caregivers about the diagnosis and community resources 	
Neck and back issues (including pain)	<ul style="list-style-type: none"> • Provide postural education and adapted techniques during ADLs • Recommend adaptive equipment to reduce pain during functional activities • Address fears to engage in work, leisure, and social participation • Provide chronic pain management 	Reed, 2014
Neoplasms/mass/lump	<ul style="list-style-type: none"> • Training in ADL, IADL, work, and leisure participation • Instruct in pacing and energy conservation strategies • Encourage performance of activities during medication peak times • Instruct in good sleep hygiene • Provide individualized, gentle exercise program • Instruct in compensation techniques for complications related to the cancer and/or treatment • Instruct in pain management techniques • Coordinate medication regimen with exercise and activity levels • Assist in developing positive coping strategies and mental health • Educate patient and caregivers about cancer and community resources 	Hall, 2013
Cholesterol/lipid issues	<ul style="list-style-type: none"> • Medication management strategies • Education about diet and lifestyle modifications • Assist in developing positive coping strategies 	Hall, 2013
Lower extremity pain or injury	<ul style="list-style-type: none"> • Teach modification strategies for self-care, balance, transfers, mobility, and ADLs • Assess and treat any sensory loss or hypersensitivity • Educate and recommend home modifications for safety and independence in the home • Mirror therapy for chronic fatigue or amputations in lower extremities • Recommend adaptive devices 	Reed, 2014
Reproductive system	<ul style="list-style-type: none"> • Assess and treat psychosocial needs of client, including depression, anxiety, fears, social participation, and relationships • Educate client on sexual health, factors affecting sexual function, behavior modification, and safety issues • Assist client in establishing and maintaining positive roles and routines 	Clark et al., 2015 MacRae, 2013
Upper extremity pain or injury	<ul style="list-style-type: none"> • Educate on lifestyle modifications to prevent further illness or overuse injuries • Teach modification strategies for self-care, transfers, and ADLs • Assess and treat any sensory loss or hypersensitivity • Educate and recommend home modifications for safety and independence in the home • Mirror therapy for amputations, burns, or chronic pain in upper extremities • Construct or recommend orthoses for increasing functional use, protecting healing structures, or preventing deformation • Design home exercise program to increase strength, range of motion, and function 	Reed, 2014
Skin disorders	<ul style="list-style-type: none"> • Assess and treat related depression, anxiety, or embarrassment • Wound management 	Hall, 2013 Reed, 2014

- Wound care and education for self-management

General malaise/ fatigue/weakness	<ul style="list-style-type: none"> • Assess using the Modified Fatigue Impact Scale • ADL, IADL, work and leisure training • Teach stress management and relaxation techniques • Provide education about fall risk and prevention strategies • Train in safe and efficient functional mobility during ADL and IADL tasks • Teach strategies to avoid and manage fatigue, such as planned rest periods and pursed lip breathing • Provide client-centered program for diet and exercise to increase energy • Educate client on healthy habits, routines, activity modification, and adaptive equipment 	Hall, 2013 Reed, 2014
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Discussion

In the current health care climate, physicians are under pressure to deliver higher quality care at lower costs. One of the strategies suggested to achieve these aims is the establishment of interprofessional care teams (Bodenheimer & Smith, 2013; Hall & Weaver, 2001). An ideal interprofessional care team includes health care professionals from diverse backgrounds, each practicing at the top of their license and scope of practice (Bodenheimer & Smith, 2013; Dahl-Popolizio et al., 2016; Hall & Weaver, 2001). Although the concept of interprofessional teams is gaining popularity and is becoming more common, there are no specific guidelines regarding which professionals should be included on the team. It stands to reason that the needs of the patient population should be the primary driving force for determining who should comprise the health professional team. After considering the needs of the patients, health care managers should use the skills of their team members to create a team-based, whole patient treatment approach in the most effective and cost-efficient manner to optimize patient care and outcomes and to maximize productivity.

This study addressed the barrier of uncertainty regarding the role of OT in PC by evaluating whether an occupational therapist, as a member of the PC interprofessional team, can use evidence-based interventions to contribute to the treatment of the most common conditions presenting in PC. The specific questions addressed were: (a) What are the 15 most common diagnostic conditions presenting to a typical PC practice; and (b) How many of the 15 most common diagnostic conditions presenting to a typical PC practice have evidence-based OT interventions that have been developed for their treatment? Findings demonstrated that OT interventions exist to treat either the medical condition directly, and/or the other physical and mental/behavioral health issues that commonly co-occur with the given medical condition for 100% of the top 15 diagnostic categories evaluated in a PC setting. Analysis of the interventions for the top 15 diagnostic categories demonstrated several reasons why occupational therapists should be included on an interprofessional team. First, as a member of a PC team, an occupational therapist adds another dimension to PC treatment, since the treating physician focuses on the medical management of the presenting condition and the occupational therapist focuses on addressing patient behaviors in the context of the patient's habits and routines (Dahl-Popolizio et al., 2017; Muir, 2012). Specific contributions of OT include identification of patient behaviors that inhibit treatment compliance and success (Roberts et al., 2014). For example, if a patient has diabetes, the PCP will diagnose the medical issues and prescribe treatment, while the occupational therapist can educate the patient regarding specific medication adherence strategies, work with the patient to adopt

manageable lifestyle modification strategies, such as diet and physical activity, and address comorbid depression or anxiety by providing effective coping strategies (Dahl-Popolizio et al., 2016; Dahl-Popolizio et al., 2017). Sample conditions and examples of the roles of PCPs and occupational therapists are presented in Table 4.

Table 4

Sample Conditions and Examples of the Roles of Primary Care Practitioners and Occupational Therapists

Condition	Physician Role	Occupational Therapist Role
Hypertension	<ul style="list-style-type: none"> • Order and evaluate test results • Prescribe medication • Monitor patient's progress 	<ul style="list-style-type: none"> • Assist patient with medication management • Educate on precautions for exercise • Instruct in pacing and energy conservation strategies • Teach stress management and relaxation techniques
Back and neck issues	<ul style="list-style-type: none"> • Evaluate for fractures or other serious injuries • Prescribe medication or other therapies • Refer to specialists as needed 	<ul style="list-style-type: none"> • Provide postural education and adapted techniques during ADLs • Recommend adaptive equipment to reduce pain during functional activities • Address fears to engage in work, leisure, and social participation • Provide chronic pain management strategies
Mental/behavioral illness	<ul style="list-style-type: none"> • Evaluate cause of illness • Prescribe medication or other therapies • Refer to specialists as needed 	<ul style="list-style-type: none"> • Assist patient with medication management • Set realistic daily schedule to create self-care, work, and leisure balance • Teach stress management and relaxation techniques • Challenge/address cognitive distortions • Educate patient and caregivers about the diagnosis and community resources
Fatigue	<ul style="list-style-type: none"> • Order and evaluate test results • Examine patient • Diagnose cause of fatigue • Prescribe medication or other therapies 	<ul style="list-style-type: none"> • Assess using the Modified Fatigue Impact Scale • ADL, IADL, work and leisure training • Provide education about fall risk and prevention strategies • Teach strategies to avoid and manage fatigue

Second, regardless of disease etiology, effective treatment of all of the top 15 most common diagnostic conditions requires elements of behavioral health, including behavioral choices, such as medication management, lifestyle modifications, stress management, coping strategies, and/or modifications of activities of daily living (ADLs). This finding is supported by the American Psychological Association (2015) statement that approximately 70% of PC visits have an underlying behavioral health issue. With their mental health and behavioral health training, occupational therapists can assist with treatment of the behavioral aspects of these presenting conditions (Dahl-Popolizio et al., 2016; Dahl-Popolizio et al., 2017). Because occupational therapists focus on the treatment of conditions in the context of a patient's lifestyle, habits, and routines, they are well poised to assist in the management of these treatment aspects that occur across diagnostic categories.

Third, the literature supports the cost-effectiveness of including occupational therapists as part of an interprofessional PC team (Dahl-Popolizio et al., 2017; Hart & Parsons, 2015; MacDonald, 2006; Roberts et al., 2014; Waite, 2014). As the population ages in the United States and other nations, issues related to aging, such as declines in cognitive skills, social functioning, and mental health, and increases in falls and fall risks, chronic pain, and chronic illness, cost the health care systems billions of dollars annually (Hart & Parsons, 2015; Rexe et al., 2013). This population is typically managed in PC, and occupational therapists are well equipped to address these issues via lifestyle changes, prevention strategies, and improvement of self-management skills. As members of an interprofessional team, occupational therapists provide a reimbursable service that focuses on patient issues related to roles and routines, lifestyle choices, and self-management skills. When the PC visit is because of these issues and an occupational therapist is available to work with the patient, this allows the other team members to focus on patients with more acute needs that require their distinct medical expertise, ensuring that the appropriate care is provided by the most appropriate team member (Dahl-Popolizio et al., 2016; Muir, 2012). This ensures efficient and cost-effective use of human resources. The cost-effectiveness of occupational therapists is especially supported in regard to addressing the needs of patients with chronic illness (Hart & Parsons, 2015; MacDonald, 2006; Metzler et al., 2012; Rexe et al., 2013; Roberts et al., 2014; Waite, 2014). This is significant, since chronic illness is a major driver of health care costs (Buttorff, Ruder, & Bauman, 2017). In addition, almost all of the top 15 most common diagnostic categories identified in this study include chronic illnesses. Considering this, including an occupational therapist as a member of the interprofessional primary care team makes financial as well as practical sense.

As organizations look to build interprofessional care teams, they need to consider that there are areas of overlap among the scopes of practice for many health care professionals. For example, a physician or a nurse could sit down with a patient to develop a daily schedule that includes dietary modifications and medication management strategies; however, in most practice settings, the patient volume and workload preclude this type of care. Occupational therapists can assist with case management in many of the areas where there is overlap among health care professionals. In addition, occupational therapists have unique skills in areas such as assessing habits and routines and identifying barriers to health and functional independence and overcoming these barriers in the context of the patient's lifestyle, habits, and routines (Dahl-Popolizio et al., 2016; Muir, 2012; Roberts et al., 2014).

Occupational therapists are also extensively trained in group interventions and group dynamics. Group interventions are appropriate population health management strategies, and are also an excellent way to increase access to care in a cost-effective manner, as one occupational therapist can provide intervention for multiple patients simultaneously (Dahl-Popolizio et al., 2016; Dahl-Popolizio et al., 2017; Dahl-Popolizio et al., 2018). The composition of an interprofessional care team should be determined based on the needs of the patient, as well as the cost-efficient use of the skills of the team members. Since occupational therapists have a wide scope of practice and can provide cost-effective care for many of the most common conditions seen in a PC setting, where appropriate to the needs of the clinic and patient population, occupational therapists should be considered for inclusion on an interprofessional PC team.

Limitations

The main limitation of the study is the format in which the information was available. The practice manager extracted the ICD-10 diagnostic codes used by each physician from the record

management system. The only information available was aggregate data for each treating physician showing the individual ICD-10 codes used, the billing description for each ICD-10 code, and the number of times the physician used that code. No other data were present to allow the identification of which ICD-10 codes were applied to which patient. This means that even though multiple codes were likely applied to a single patient during a visit, we were unable to identify which individual codes were applied to which patients. In addition, with chronic disease management, it is likely that a patient was seen by his or her PC doctor multiple times during a 12-month period. Again, because there were no individual identifiers, we were unable to determine whether individual patients were seen multiple times during the period analyzed. The inability to analyze ICD-10 codes at the individual patient level is a constraint of the patient management electronic record system used in this practice, and it illustrates the challenges that researchers face in obtaining and analyzing data from a real-world practice setting. Electronic health systems can store large amounts of information, but may not be capable of providing output of the information in the most meaningful format for research. The second limitation is that although efforts were made to select a PCP whose conditions were reflective of those seen in a typical PC practice, it is possible that there were unidentified practice differences that somehow make this population of patients different from other patients.

Implications for Future Research

Future research should seek to repeat these results with other individual physicians, physician groups, and various types of PC practices to ensure that these findings translate to other practice settings and organizational models. The demographic make-up of patient panels varies across regions; replication of this study across regions will provide a more comprehensive picture of the diagnoses seen, and the patient's needs, in all primary care settings across the country. Since pediatricians provide PC services for the pediatric population, the inclusion of OT as a member of the pediatric interprofessional team should be researched as well. Future studies can be done with more robust and complete data sets, including information regarding the reason for specific patient visits and the number of repeated visits for one condition, so the interprofessional team can focus their efforts on reducing overuse of medical services and increasing self-management of conditions. The role of OT in addressing the specific issues that are identified and fall in the OT scope of practice can then be researched as well to determine best practices for each condition. Research should also focus on the mechanics of inclusion of an occupational therapist as part of an interprofessional team, including incorporating occupational therapists into the clinic workflow and obtaining reimbursement for OT services in a PC setting. Adequately addressing these barriers is crucial to the inclusion of occupational therapists on an interprofessional PC team.

Conclusion

The primary barriers to inclusion of OT in a PC setting are uncertainty regarding the role that occupational therapists fill, and uncertainty regarding reimbursement for OT services provided in a PC setting. This study addressed the first of these barriers by (a) demonstrating that evidence-based OT interventions exist to treat aspects of all of the top 15 most common diagnostic conditions seen in a typical PC practice and (b) describing the role that OT can play in the treatment of those conditions. The findings support the growing body of literature that demonstrates the value of occupational therapists as part of an interprofessional PC team (Dahl-Popolizio et al., 2017; Hart & Parsons, 2015; Killian et al., 2015; Metzler et al., 2012; Rexe et al., 2013).

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