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Facilitating Teach-Back Use: Factors In Patient-Provider Communication Between Medical Residents And Patients With Limited Health Literacy

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ACCEPTANCE

This dissertation, FACILITATING TEACH-BACK USE: FACTORS IN PATIENT-PROVIDER COMMUNICATION BETWEEN MEDICAL RESIDENTS AND PATIENTS WITH LIMITED HEALTH LITERACY, by PRINCEANNA WALKER, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree, Doctor of Philosophy, in the College of Education & Human Development, Georgia State University.

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FACILITATING TEACH-BACK USE: FACTORS IN PATIENT-PROVIDER COMMUNICATION BETWEEN MEDICAL RESIDENTS AND PATIENTS WITH LIMITED HEALTH LITERACY

by

PRINCEANNA WALKER

Under the Direction of Dr. Daphne Greenberg

ABSTRACT

Many patients have difficulty communicating with their healthcare providers (Aldoory, 2017; Brooks et al., 2020; Watson, 2019). Teach-Back is an evidence-based health literary communication tool that is useful for ensuring patients understand the information they receive; with evidence after exposure to Teach-Back, patients exhibit increased disease-specific knowledge, adherence, self-efficacy, and improved health outcomes (Hong et al., 2020a; Talevski et al., 2020). *Healthy People 2030* endorsed Teach-Back as an intervention for improving patient comprehension of health information in clinical settings (ODPHP, 2020). However, Teach-Back has not been widely implemented in these settings (Brooks et al., 2020). Not much is known regarding the comprehensive factors which predict clinicians' use of Teach-Back. This study is a follow-up to Feinberg et al. (2019) which found medical residents increased their use of Teach-Back after attending an educational presentation. Variables not examined in the original analysis are explored in the following research questions: After an educational intervention, is there a significant relationship between patients' exposure to Teach-

Back by medical residents and patients' highest educational level, perceived health status, diagnoses, reason for visit, new or returning patient status, gender and/or the conversation length during consultation? What are the relationships between the total number of times Teach-Back is used post-intervention and the medical resident's age, gender, race, or main language? Bivariate and Kendall's tau correlations revealed new or returning patient status ($\chi^2 = 5.430$, $p < .05$) and conversation length ($r_t = .307$, $p < .01$), respectively, were significantly associated with patient's Teach-Back exposure after the residents' participation in the training intervention. The subsequent binary logistic regression revealed only conversation length ($B = .061$, $p < .05$) was a significant predictor of Teach-Back exposure. No statistically significant relationships between the total number of times Teach-Back was used post-intervention and medical residents' personal characteristics were found. Findings add to original study results of factors which facilitate Teach-Back exposure. Longer consultations and new patient visits were more likely to involve Teach-Back use than other factors. Given the benefits of Teach-Back for all patients, a universal precautions approach is recommended to facilitate its widespread adoption in clinical settings.

INDEX WORDS: Patient-provider communication, health literacy, teach-back, plain language, universal precautions

FACILITATING TEACH-BACK USE: FACTORS IN PATIENT-PROVIDER COMMUNICATION BETWEEN MEDICAL RESIDENTS AND PATIENTS WITH LIMITED HEALTH LITERACY

by

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DEDICATION

~ To God be the glory for the things He has done. ~

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"Wherefore seeing we also are compassed about with so great a cloud of witnesses, let us lay aside every weight, and the sin which doth so easily beset us, and let us run with patience the race that is set before us." ~ Hebrews 12: 1

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"I can do all things through Christ who strengthens me" ~ Philippians 4:13

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ABBREVIATIONS

AAMC	Association of American Medical Colleges
ACGME	Accreditation Council for Graduate Medical Education
ACSC	Ambulatory Care Sensitive Conditions
AHRQ	Agency for Healthcare Research Quality
C-CAT	Communication Climate Assessment Toolkit
COPD	Chronic Obstructive Pulmonary Disease
DHHS	Department of Health and Human Services
HL	Health literacy
LHL	Limited health literacy
MEPS	Medical Expenditure Panel Survey
NAAL	National Assessment of Adult Literacy
NAMCS	National Ambulatory Medical Care Survey
NCCC	National Center for Cultural Competence
NQF	National Quality Forum
NVS	Newest Vital Sign
ODPHP	Office of Disease Prevention and Health Promotion
OLD	Oral Literacy Demand
REAL – G	Rapid Estimate of Adult Literacy in Genetics
S-TOFHLA	Short Test of Functional Health Literacy in Adults
TB	Teach-Back

FACILITATING TEACH-BACK USE: FACTORS IN PATIENT-PROVIDER COMMUNICATION BETWEEN MEDICAL RESIDENTS AND PATIENTS WITH LIMITED HEALTH LITERACY

CHAPTER 1. STATEMENT OF THE PROBLEM

Navigating the healthcare system can be a complicated, intimidating, and overwhelming experience which involves an interaction between individuals and organizational systems. The *Healthy People 2030* definition of health literacy captures this complexity by addressing both individual abilities necessary for personal agency in healthcare and the responsibility of health organizations to provide health literate information and processes to empower individuals in their pursuit of healthcare. The definition states:

> Personal health literacy is the degree to which individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others. Organizational health literacy is the degree to which organizations equitably enable individuals to find, understand, and use information and services to inform health-related decisions and actions for themselves and others (United States Department of Health and Human Services, 2021).

Nutbeam (2000) asserts that a definition of personal health literacy needs to also include communication, critical thinking, and personal agency. He posits that communicative, also known as interactive, health literacy requires “advanced cognitive and literacy skills, which together with social skills, can be used ... to extract information and derive meaning from different forms of communication, and ...to apply new information to changing circumstances” (Nutbeam, 2000, pp 263-264). Additionally, cultivating the ability to critically analyze and use new information to act over life events and circumstances helps develop critical health literacy

(Nutbeam, 2000). These classifications expand the definition of personal health literacy to include not only basic reading and writing abilities but also speaking, listening and social skills (Aldoory, 2017; Nutbeam, 2000; Rubin et al., 2011; Jagt et al., 2019; Williams et al., 2002). Nutbeam (2002) notes that these classifications do not identify health literacy as merely "a measure of achievement in reading and writing, but more in terms of what it is that literacy enables us to do" (p.263). These classifications facilitate a progressive development of health literacy that allows for greater autonomy and personal agency. Such growth is dependent not only on individual cognitive development but also on exposure to different forms of communication, mediated by social skills, self-efficacy, and criticality (Nutbeam, 2000).

Nutbeam's focus on communication is shared by other health literacy scholars. For example, Chinn (2017) notes the following interactive health literacy components:

1. Expressive language skills: the ability to relay accurate health information and ask questions to aid understanding
2. Receptive language skills: the ability to attend to and understand health talk
3. Cognitive skills: the ability to retain and recall information
4. Health system comprehension skills: the ability to understand and act on health information.

Interactive oral communication between patients and providers may encompass all these elements. In fact, oral communication between a patient and provider has been recognized as "critical to appropriate diagnosis, treatment and management of disease." (Nouri & Rudd, 2015, p. 566). In practicing good oral communication skills, patients and physicians nurture the development of meaningful and trusting relationships benefitting them both (Drossman & Ruddy, 2020; O'Toole et al., 2019; Ranjan et al., 2015). For the patient, this includes creating engagement and establishing trust with the physician; receiving clear information; and participating in a mutual set of goals and treatment plans (Drossman, 2013; Drossman & Ruddy, 2020). For the physician, it includes improved patient satisfaction scores; increased empathy;

reduced emotional exhaustion; and less burnout (Boissy et al., 2016; Drossman & Ruddy, 2020). Oral communication has three components: verbal (i.e., content), non-verbal (i.e., body language) and paraverbal (i.e., tone) (Ranjan et al., 2015). The verbal component is critically important because it contains information about the diagnosis, prognosis, risks and benefits of treatment, and cost of the disease (Drossman, 2013; Ranjan et al., 2015).

In medical consultation with patients, the physician's ability to listen effectively, elicit information using questions, provide information with clear explanations, and counsel on discharge and medication plans is integral to effective communication (Drossman & Ruddy, 2020; Travaline et al., 2005). For individuals with limited health literacy, a doctor's ineffective communication potentially makes understanding health information more difficult (Aldoory 2017, Egbert, 2009; Feinberg et al., 2018; Kessels, 2003; Watson, 2019). Clear communication strategies, such as plain language and Teach-Back, are evidence-based health literacy communication tools that a doctor can use to be more health literate in his/her communication with patients (Coleman, 2023). Yet evidence suggests these strategies are not widely used in clinical settings (Brooks et al., 2020; Castro et al., 2007; Collum et al., 2013; Coleman, 2023; Green et al., 2014; Santana et al., 2021; Schwartzberg et al., 2007; Yin et al., 2015).

Patient-Provider Oral Communication

Patient-provider communication refers to a set of activities involving interpersonal exchanges between healthcare providers and patients targeting the patients' unique needs (Singh et al., 2018). Patient-provider communication is a key element in patient-centered care (Drossman & Ruddy, 2020; Epstein & Street, 2011; Perloff et al., 2006; Robinson et al., 2008; Singh et al., 2018; Timmermans, 2020; Tran, 2021). Patient-centered care requires physicians to provide patients with adequate knowledge to inform and facilitate healthcare decisions. This has

become more apparent in recent years as the relationship between patient and physician evolves from a paternalistic nature to more of a partnership (Cegala & Post, 2009; Timmermans, 2020; Tran, 2021). In this collaborative context, health information is shared, and decisions are negotiated between patient and physician. Information may be shared via written, digital, or oral modes of delivery. For the purposes of this paper, the focus is on oral communication.

Core principles of effective patient-provider communication (e.g., active listening, expressing empathy, addressing patient's agenda and concerns, etc.) may motivate patients to give the physician pertinent clinical information for diagnosis and treatment (Drossman & Ruddy, 2020). Consequently, the physician may get a more complete picture of the nature of the patient's illness. During the interaction, the physician may also begin to assess the patient's understanding of the medical discussion. This may have a significant impact on reducing the patient's emotional distress, symptom severity, treatment non-adherence, hospitalizations, and use of Healthcare services (Drossman, 2013; Roter et al., 1995; Weiland et al., 2012; Yager, 2021).

Low Health Literacy

According to a national assessment of health literacy in the United States, approximately 36% of adults perform at basic and below basic health literacy levels (Kutner et al., 2006). Among the most vulnerable populations are older adults (age 65 and older), African Americans, Hispanics, and Indigenous people; non-native English speakers, individuals with low income and adults with self-reported poor health status (Kutner et al., 2006; United States Department of Education, 2017). When seeking health information, these individuals may be more likely to rely on oral communication and counseling that occurs during clinical visits (McCarthy et al., 2012a; Wolf et al., 2007). Wolf and colleagues (2005) found older patients with limited health literacy

were more likely to solely rely on their physician for medical advice. However, there is also evidence that health literacy status can be fluid depending on the context (Aldoory, 2017; Egbert, 2009; Watson, 2019). Consequently, individuals not among the most vulnerable populations may, at any time, experience low or limited health literacy. Studies have shown poor communication between patient and physician has contributed to misunderstandings and misinterpretation of medical instructions (McCarthy et al., 2012a; Tarn et al., 2006; Wolf et al., 2007). Consequently, people with limited health literacy are most likely to have negative experiences in clinical settings resulting in decreased patient satisfaction (Aldoory, 2017; Drossman, 2013; McCarthy et al., 2012b; Roter et al., 2009).

To be health literate, an individual must be able to find, understand and use health information (written or spoken) to make informed medical decisions for themselves or others (United States Department of Health and Human Services, 2021). Making informed health decisions is hindered when medical information is not clearly understood (Watson, 2019). If physicians do not communicate relevant health information and instructions in a way that enables patients to make informed medical decisions then patients may misinterpret instructions and experience negative outcomes such as increased emergency room visits and hospitalizations (Herald & Alexander, 2012; McCarthy et al., 2012b; Neter & Brainin, 2019).

Universal Precautions and Health Literacy Communication

The Agency for Healthcare Research Quality (AHRQ) states that health literacy should be considered a universal precaution. (DeWalt et al., 2010). A universal precaution is defined as "a specific action that everyone takes to minimize risks to all patients" (Hasselkus, 2011, p. 18). Within the context of health literacy, universal precautions mean "regardless of background or education, professionals should treat all patients as having inadequate health literacy." (Watson,

2019 pp.184-185). The AHRQ developed a multi-pronged Health Literacy Action plan "to develop measures, improve the evidence base and create implementation tools, create and support change, disseminate and transfer knowledge and tools, and practice what we preach" which now includes a *Health Literacy Universal Precautions Toolkit* useful for skills training in health literacy communication strategies (Agency for Healthcare Research Quality [AHRQ], 2021; Brach et al., 2020, p. 2). Universal health literacy precautions increase accessibility of the information people receive from their healthcare provider to facilitate comprehension of medical instructions and ease navigation of a complex healthcare system for all. (Nwanaji-Enwerem et al., 2023). Adopting a universal precautions approach would facilitate greater and widespread use of health literacy communication strategies in clinical settings.

Challenges in Patient-Provider Communication

Challenges in patient-provider communication come in different forms. Just as there are many factors which can contribute to effective oral communication, there are elements which may negatively affect patient-doctor interactions. Poor patient-provider communication has been associated with poor health outcomes, especially for those with limited health literacy (Aldoory, 2017; Bennett et al., 2006; Ivynian et al., 2020; Kaplan et al., 1995; Park et al., 2017; Schilinger et al. 2003; Schoenthaler et al., 2017; Sim et al., 2016). Examples of three factors associated with poor communication between patient and physician during clinical visits include: (a) oral literacy demands; (b) sociodemographic characteristics of the patient and the physician; and (c) systemic factors within the healthcare system.

Oral Literacy Demands

The Oral Literacy Demand (OLD) Framework established by Roter et al. (2007) examines three language elements that potentially complicate communication, especially for

patients with limited literacy skills. These elements include medical jargon (e.g., nodes), general language complexity (e.g., average number of words per sentence), and structural characteristics of dialogue (e.g., speech speed) (Roter et al., 2011). Oral literacy demands weigh on both physicians and patients in the communicative exchange, however, their individual reactions may differ.

Personal Characteristics

There are many personal characteristics that both the patient and the physician bring to the interaction during a clinical visit. Examples of these characteristics include sociodemographic traits (such as gender, race and ethnic origin, age, and educational attainment), cultural traits, and linguistic factors (Aldoory, 2017; Davis et al., 2020; Peek et al., 2010; Sparks & Nussbaum, 2008; White et al., 2016; Wiener et al., 2013; Yager, 2021). In the case of patients, there may also be certain characteristics related to diagnoses (e.g., chronic illness, cancer) that inform their communication with the physician (Aldorry, 2017; Cronin et al., 2020; Ivynian et al., 2020; Okunrintemi et al., 2017; Peimani et al., 2020; Sany et al., 2018; Slatore et al., 2010; Schoenthaler et al., 2017).

Cultural identities help shape our personal biases, language, and beliefs ((Bylund et al., 2012; Feinberg et al., 2017, Lie et al., 2012). Two examples of how culture impacts patient-provider communication is in the areas of language and the patient's self-reported health status. Many clinicians and patients are culturally diverse with native languages other than English. In addition, a patient's self-reported health status may be influenced by cultural health beliefs and impact patient-provider communication (Assari et al., 2016; Singleton & Krause, 2009). Rumsfeld et al. (2013) defines self-reported health status as "the impact of disease(s) and medical treatments on function and well-being as reported by the patient" (p.2235).

Systemic Challenges

There are systemic challenges regarding consultation length and communication skills training for healthcare providers that make effective patient-provider communication difficult to achieve more broadly (Irving et al., 2017; Osborn et al., 2015; Tarn et al., 2008; Tai-Seale et al., 2007). Recent years have brought many changes to the clinical visit experience in healthcare. These changes have impacted providers – physicians, nurses, physician assistants – and patients in different ways that exacerbate existing challenges patient-provider communication. In the current healthcare environment, physicians face greater pressure to see more patients in less time and with decreased reimbursements (Drossman & Ruddy, 2020). Increasing administrative burdens leave physicians with fewer hours for patient visits and the time spent during visits is often facing the computer screen rather than the patient (Drossman & Ruddy, 2020). Patients are left feeling dissatisfied and frustrated by the lack of engagement and poor communication with their doctor (Drossman & Ruddy, 2020). Evidence has linked patient dissatisfaction with worsening of symptoms, increased anxiety, and increased primary and emergency care driving up healthcare costs (Heritage et al., 2007; Summers et al., 2016; Stuart et al., 2019). There is also evidence that consultation length is affected by certain patient and provider characteristics and behaviors (Deveugele et al., 2004, 2002; Doherty et al., 2020; Knesebeck et al., 2019; Ozavci et al., 2021; Tarn et al., 2008; Wilson, 1991).

In 2002, the Accreditation Council for Graduate Medical Education (ACGME) endorsed communication skills as a core competency for medical resident training (Back et al., 2019; Hildenbrand et al., 2020; Swing, 2007). However, evidence suggests the communication skills training provided in medical education is inadequate to meet the needs of physicians treating patients with low health literacy (Ali et al., 2014; Back et al., 2019; Coleman et al., 2016;

Hildenbrand et al., 2020; Saunders et al., 2019). There several reasons proposed in the literature for this inadequacy, such as the transition to medical residency, curricular challenges, and implementation difficulties (e.g., Brennan et al., 2015; Chang et al., 2020; Coleman, 2023; Drossman & Ruddy, 2020; Hurst et al., 2013; Oates & Paasche-Orlow, 2009; Saunders et al., 2019).

Teach-Back Use in Healthcare Settings

Teach-Back is an evidence-based health literary communication tool that is useful for ensuring patients understand the information they receive. It is a "way of checking understanding by asking patients to state in their own words what they need to know or do about their health" (AHRQ, 2021, p.1). Teach-Back allows the physician to confirm that their instructions to the patient were clearly understood and therefore, more likely to be followed and effective (Park et al., 2017; Peimani et al., 2020; Yager, 2021). Research shows that Teach-Back is an effective tool for populations who are vulnerable to low health literacy (DeWalt et al., 2010; Dinh et al., 2016; Griffey et al., 2015; Hong et al., 2020a, 2020b; Kriplani et al., 2006; Liu et al., 2018). However, research also suggests evidence-based health literacy communication strategies, like Teach-Back, are not widely used in clinical settings (Brooks et al., 2020; Castro et al., 2007; Coleman, 2023; Collum et al., 2013; Green et al., 2014; Schwartzberg et al., 2007). This is unfortunate for patients at all health literacy levels but especially for those with limited literacy skills. The research in this area is not abundant; however there are a few studies which explore various personal and systemic factors affecting the uptake of Teach-Back in clinical practice.

Personal Factors and Teach-Back Use

Since Teach-Back is a communication-related strategy, the same factors as potentially challenging within the overall context of patient-provider communication are also explored for

Teach-Back in clinical settings. For example, the personal characteristics of patients and providers within the context of sociodemographic factors, cultural beliefs and linguistic factors, and diagnoses are all considered important to explore when analyzing whether Teach-Back is used in a clinical setting (Feinberg et al., 2019; Jager & Wynia, 2012; Hong et al., 2020a, 2020b; Liang & Brach, 2017). There is also some evidence that Teach-Back is an effective tool for patients who are non-native English speakers (Hong et al., 2019). However, the consensus is not conclusive. Research investigating a link between self-report health status and Teach-Back is also mixed (Hong et al., 2019); Liang & Brach, 2017). As a final example, patients with chronic diagnoses may benefit from exposure to Teach-Back during clinical visits. In fact, there is evidence that exposure to Teach-Back improves self-management behaviors (e.g., medication adherence, diet, foot care, etc.) which directly impact health outcomes (Hong et al., 2019, 2020a; Talevski et al., 2020). Unfortunately, patients who have chronic diagnoses are not always more likely to have a Teach-Back experience than patients who are not chronically ill (Hong et al., 2019; Hong et al., 2020b).

Systemic Factors and Teach-Back Use

Like the challenges seen with overall patient-provider communication, limited consultation time and inadequate communication skill training are also cited as barriers to effective implementation of Teach-Back in clinical practice (Ahrens & Wirges, 2013; Anderson et al., 2020; Kemp et al., 2008; Klingbeil & Gibson, 2018; Marcus et al., 2014; Shersher et al., 2021). Teach-Back is an iterative process that requires the clinician to check for understanding and when necessary, modify explanations of medical information (Kemp et al., 2008; Schillinger, 2003). This exchange potentially lengthens an already time-limited consultation or reduces the amount of time spent on other topics. In contrast, there is also evidence to suggest

that Teach-Back is a more efficient use of time, in the long term, given the time saved from dealing with negative health outcomes (Anderson et al., 2020; Kemp 2008). Studies also indicate patient satisfaction is better with the Teach-Back experience than without; even if it resulted in longer consultations (Jager & Wynia, 2012). Unfortunately, Teach-Back is taught as a part of health literacy communication curricula in some but not all medical education programs (Coleman, 2013; Coleman, 2023).

Purpose of the Study

Feinberg et al. (2019) examined medical residents' perceived efficacy and actual use of Teach-Back before and after a brief instructional intervention on Teach-Back. Additionally, the investigators studied whether the use of Teach-Back by the residents was informed by patient demographics including age, race/ethnicity, gender, native language, or health literacy level. Using recorded transcripts of pre- and post-intervention clinical visits between the residents and patients, the investigators coded the language for Teach-Back use. Results revealed that except for gender, none of the studied demographics was associated with Teach-Back use. However, not all the demographic data collected from patients was examined for associations with Teach-Back use. Neither were the collected medical residents' demographics examined for associations, nor the conversation lengths between the medical residents and patients. Consequently, further research with the unexamined data is warranted to determine whether other unexamined factors were significantly associated with Teach-Back use in clinical settings.

The present study is a follow-up to the investigation done by Feinberg et al. (2019). The purpose is to determine whether medical residents' use of Teach-Back, after exposure to a Teach-Back training intervention, is associated with any of their own personal characteristics or with any of the previously unexamined patient characteristics from the larger study. Feinberg et

al. (2019) evaluated Teach-Back use before and after the brief instructional intervention and found Teach-Back use increased compared to pre-intervention use. A distinction in the current study is its focus on post-intervention Teach-Back use only. Specifically, this investigation asks the following questions:

1. After an intervention administered to medical residents, is there a significant positive relationship between patients' exposure to Teach-Back by medical residents and patients' highest educational level, perceived health status, diagnoses, reason for visit, new or existing patient status, gender and/or the conversation length during consultation?
2. What are the relationships between the total number of times Teach-Back is used post-intervention and the medical resident's age, gender, race, or main language?

Based on previous literature, which will be discussed in chapter 2, our hypotheses for the first research question are that there will be a positive correlation between Teach-Back exposure and each of the patient's demographic characteristics except gender. Gender, which was significantly associated with Teach-Back in the larger study (Feinberg et al., 2019), was included in the current study to evaluate its significance solely in post-intervention clinical visits. Based on the literature, which is inconclusive regarding gender's influence on Teach-Back exposure, no hypothesis was proposed. Finally, we hypothesize that longer consultation length will be positively correlated with Teach-Back exposure (Anderson et al., 2020; Klingbeil & Gibson, 2018).

Regarding the second research question, there were sixteen medical residents in the study. With such a small and nested sample size, the data analysis was exploratory and had no hypothesis. We were interested in describing the relationships between the total number of times

Teach-Back was used post-intervention, as a proportion, and the personal characteristics of the residents. Additionally, a descriptive analysis of the Teach-Back language used by the residents was done to contrast with the instruction provided in the training intervention.

This dissertation has 5 chapters. Chapter 1 (current chapter) presents the problem statement. Chapter 2 presents a review of the literature. Chapter 3 presents the study methodology including participants, data collection procedures, measures, and data analysis approach. Chapter 4 presents the results. Chapter 5 presents a discussion of the findings, study limitations and recommendations for future research.

CHAPTER 2. REVIEW OF THE LITERATURE

The review will cover an overview of (a) patient-provider communication and its association with patient health and limited health literacy; (b) factors contributing to challenges in effective oral patient-provider communication; and (c) factors influencing Teach-Back use by healthcare providers.

Patient-Provider Communication

Patient-Provider Communication and Patient Health

Research has revealed a relationship between effective patient-provider communication and positive health outcomes for patients including better glycemic control, better medication adherence, fewer urgent and emergency care incidents, and fewer hospital readmissions (Aldoory, 2017; Hironaka & Paasche-Orlow, 2008; Park et al., 2017; Peimani et al., 2020; Schoenthaler et al., 2017; Yager, 2021). Further, patients may benefit from getting a clearer understanding of their diagnosis and treatment plan (Ranjan et al., 2015). An interactive and collaborative relationship between physician and patient facilitates these benefits.

Evidence suggests that patients are more likely to actively participate in medical consultations if the physician's communication style encourages shared decision-making or partnership (Sim et al., 2016; Street Jr. et al., 2005). Moreover, effective physician communication skills have been linked to more inquisitive and engaged patients who are less mistrustful and more forthcoming with their health problems (Drossman & Ruddy, 2020; Park et al., 2017; Sim et al., 2016; Street Jr. et al., 2005). Ranjan et al. (2015) notes that this may result in the physician's improved ability to accurately diagnose a patient. Patients are also more adherent to treatment and satisfied with their quality of care when communicating effectively with their physician (Cronin et al., 2020; Park, Chen & Raj, 2017; Schoenthaler et al., 2017; Sim et al., 2016; Street Jr. et al., 2005). It is possible that increased satisfaction comes solely from the patient's perception versus reality of increased physician engagement (Cronin et al., 2020; Park, Chen & Raj, 2017; Schoenthaler et al., 2017; Sim et al., 2016; Street Jr. et al., 2005). For example, among African Americans, being satisfied with one's personal physician, is important for those who have diabetes, who have limited health literacy, and who share a cultural history of medical mistrust (Bhattacharya et al., 2013; Jacobs, et al., 2006; Muvuka et al., 2020; Peek et al., 2010; Politi et al., 2014).

In contrast, a lack of clear communication has been associated with increased risk of poor medication adherence, reduced access to care, frequent emergency room visits, extended hospital stays, post-discharge adverse effects and higher mortality rates (Aldoory, 2017; Bennett et al., 2009; Ivynian et al., 2020; Kaplan et al., 1995; Park et al., 2017; Schilinger et al., 2003; Schoenthaler et al., 2017; Sim et al., 2016). While everyone may have varying degrees of difficulty communicating effectively with their healthcare providers, research has shown that adults with limited health literacy skills may have more difficulty communicating effectively

with healthcare practitioners than those with higher health literacy skills (Aldoory, 2017; Egbert, 2009; Feinberg et al., 2018).

Low Health Literacy

Although over a third of U.S. adults may have limited health literacy, determining whether a patient can be classified as having limited health literacy is not necessarily an easy task. Some adults are quite agile at hiding their struggle understanding complex medical information (Egbert, 2009; Watson, 2019). In fact, even patients with adequate health literacy are capable of misinterpreting health terms and information due to medical jargon, lack of knowledge, and personal or cultural associations (Watson, 2019). Individuals with limited health literacy skills may lack the technical vocabulary to respond appropriately to their provider's questions or to express their own concerns. Further, they are less likely to ask questions during medical visits (Katz et al., 2007; Menendez et al., 2017; Watson, 2019).

Many patients with limited health literacy struggle with retention of the medical information they receive from their doctor (Kessels, 2003; McCarthy et al., 2012a; Phelps et al., 2017; Watson, 2019). In a study unrelated to health literacy, Kessels (2003) found that between 40 and 80% of medical information a patient hears during an office visit is forgotten immediately, and nearly half of what they do remember is incorrect. McCarthy et al., (2012b) found older individuals, aged 55 to 74, were able to recall only half of the medical instructions they heard in a simulated clinical visit. While recall rates were significantly worse for marginal and low health literacy patients, patients with adequate health literacy had rates as low as 31 percent on some items. In times of severe illness or under stress of a new diagnosis, even those with advanced educational degrees may see a decline in health literacy status (Aldoory, 2017; Brooks et al., 2020; Paasche-Orlow & Wolf, 2007; Watson, 2019). In other words, health literacy

status can be complex and fluid over time or dependent on the situation (Watson, 2019). In any case, individuals with limited health literacy may be more susceptible to poor communication with their doctors (Aldoory 2017, Egbert, 2009; Feinberg et al., 2018). One mitigating action taken by the U.S. Agency of Healthcare Research and Quality (AHRQ) has been to adopt the "universal precautions" paradigm (Aldoory, 2017).

Universal Precautions and Health Literacy Communication

Universal precautions mean "regardless of background or education, professionals should treat all patients as having inadequate health literacy." (Watson, 2019 pp.184-185). Universal precautions presume a general deficit of health literacy across populations (Aldoory, 2017) and states, "[Healthcare] professionals should assess understanding throughout the communication process." (Watson, 2019, pp. 184-185). While the most vulnerable benefit the most from universal precautions, these precautions potentially make high-quality care a closer reality for all patients.

Healthy People 2030 expands the idea of universal precautions. It supports improving patient-provider communication and patient understanding of their health information (Office of Disease Prevention and Health Promotion [ODPHP], n.d.) along with the clinician's responsibility to provide clear, culturally sensitive, and appropriate health information to patients (Joseph et al., 2019).To that end, one objective of *Healthy People 2030* is for healthcare providers (i.e., doctors, nurses, medical staff, etc.) to help people understand health information by asking them to describe, in their own words, how they will follow medical instructions (ODPHP, n.d.). However, there are many factors which may make oral communication between patient and provider challenging.

Challenges in Patient-Provider Oral Communication

Effective oral communication is critical for sharing information about diagnoses, treatment, and management of disease (Nouri and Rudd, 2015). Oral communication between patients and providers has been shown to influence "patients' knowledge, motivation, decision making, engagement and empowerment, and even health" (Nouri and Rudd, 2015, p. 566). There are many variables which can impact oral communication between patients and providers (Aldoory 2017; Chui et al., 2016; Cousin et al., 2013; Green et al., 2014; Robbins et al., 2019; Roter 2015; Saunders et al., 2019). In this section, the following factors will be discussed: (a) oral literacy demands, (b) personal characteristics of patients and providers, and (c) systemic factors, specifically consultation length and medical training in health literate communication.

Oral Literacy Demands

The Oral Literacy Demand Framework was constructed by Roter et al. (2007) and identifies three language elements that potentially complicate oral communication for patients with limited literacy including: (a) medical jargon use, (b) general language complexity, and (c) structural characteristics of dialog including speech speed, density, and interactivity.

Medical Jargon Use

There is extensive evidence that medical jargon has been a source of patient confusion going back decades (Chen et al., 2013; LeBlanc et al., 2014; Roter, 2011; Weiner et al., 2013). Castro et al. (2007) studied the use of unclarified medical jargon in 74 audio-taped office visits with patients who had low health literacy and who were diagnosed with diabetes. They also assessed the patients' understanding of the terms which, in this case, involved diabetic treatment recommendations. They found on average four unclarified terms were used per visit, occurring approximately once every five minutes. At least one unclarified term was used in 81% of all

visits. Medical jargon made up 37% and 29% of the words used when making recommendations and during health education sessions, respectively. Overall comprehension of the unclarified diabetes-specific terms was low and was never comprehended by more than 40% of the patients. There is evidence that misunderstanding or confusion around medical jargon negatively impacts treatment adherence and follow-up (Chen et al., 2013; LeBlanc et al., 2014; Wiener et al., 2013).

General Language Complexity

General language complexity is distinguished from jargon by the structure of the language (Roter, 2011) and includes a focus on factors such as word count, the average number of words per sentence and the percentage of sentences in passive voice. For example, McCarthy (2012a) evaluated the general language complexity in transcripts of 26 encounters between Emergency Medicine resident physicians and simulated patient family members in a simulated informed consent discussion. Investigators compared the oral literacy demand of the residents to that of the family members. Results showed residents spoke at a higher-grade level (M=5.9(0.9)), used more words per sentence (M=16.1(2.0)), and used more passive sentences (M=2.8(2.2)) than did the family members (M=1.4(0.6)), 5.7(1.4), and 1.2(1.9)), respectively. Even among individuals with adequate health literacy, recall for some individual items in the post-interview was only 31% (McCarthy, 2012b). This was indicative, the researchers concluded, of the struggle all were having in retaining the residents' spoken communication.

Structural Characteristics of Dialog

Roter (2011) identified three aspects of dialogue structure: (a) speech speed, (b) turn density and (c) interactivity. These aspects are discussed below.

Speech speed. Some research has shown that faster-than normal speech speed negatively impacts comprehension in older patients and patients with low literacy (Bennett et al., 2006;

Roter, 2011). While patients have the option to ask the provider to slow down, patients with low literacy are less likely to make such requests than other patients (Bennett et al., 2006; Roter, 2011). Other studies have shown that speech speed can convey information and may have a role in comprehension (Buelow et al., 2020). For example, how fast a message is spoken may convey its importance or possible sense of urgency (Buelow et al., 2020; Hellier et al., 2002).

Turn Density. Roter et al., (2011) defines turn density as "the amount of uninterrupted speech delivered by speaker at a single speaking turn" (p. 81). This can be measured by the average number of statements within a turn by a speaker (Roter et al., 2009). Roter and colleagues (2007 and 2009) assessed the relationship between the oral literacy demand of genetic counseling sessions and the ability of subjects with low health literacy to learn genetics-related information. Ninety-six simulated genetic counseling sessions were videotaped and shown to 312 simulated patients. The simulated patients were proxies for actual genetic counseling clients. As proxies, they were told to imagine themselves as the client (female subjects) or the client's spouse (male subjects) and to provide outcome measures. Prior to the study an 8-item genetics specific health literacy screen, the Rapid Estimate of Adult Literacy in Genetics, (REAL-G), was administered to all simulated patients. The dialogue in each counseling session was analyzed for turn density and other structural characteristics. Results indicated that the average turn density in the session dialogue was 6.8 statements for the counselors. The simulated patients with low health literacy learned significantly less in sessions with long, dense counselor speaking turns ($b^* = -.35$, $p < 0.01$). Research suggests readers cannot comfortably process more than 5 pieces of information at a time (Doak et al., 1996). The results in the Roter et al. (2007 & 2009) study indicated that the information loads created each time a counselor spoke surpassed the limit of what was cognitively easy to process, particularly for patients with low health literacy. In this

example, the long dense speaking turns of the counselor increased the dialogue turn density and, consequently, increased oral literacy demands on the simulated patients.

Interactivity. Interactivity, the rate of speaker change per minute of the interaction, is the third dimension of Roter's (2011) dialogue structure. Greater interactivity reflects "a more conversational exchange that provides speaking opportunities for patients, as well as a natural break between informational monologues" (Roter, 2011, p. 82). The rate of speaker exchange, whether high or low, demands a level of active engagement on the part of both participants in "a reciprocal process of informational evaluation and response" (Roter, 2011, p. 82). In Roter et al. (2009), among simulated patients with low health literacy skills, greater interactivity and the personalization of information were positively correlated with greater learning ($p < 0.05$).

Patients' and providers' individual reactions to oral literacy demands vary. On both sides of the oral exchange, patients and providers bring personal traits and characteristics through which their interaction is filtered. Next, we will examine the personal factors of patients and providers that impact effective oral communication.

Personal Factors

There are many personal factors that impact patient-provider communication. Both patient and provider bring varied characteristics to their relationship including sociodemographic factors in addition to cultural and linguistic factors. In the case of patients, there may also be biomedical factors that inform communication with the physician. In this section we will discuss what the literature has revealed about these factors and patient-provider communication.

Socio-demographic Factors

Research suggests that the sociodemographic traits of both patients and providers can become barriers to effective oral communication and can inhibit the goal of positive long-term health outcomes (Aldoory, 2017; Davis et al., 2020; Drossman & Ruddy, 2020; Peek et al., 2010; Sparks & Nussbaum, 2008; White et al., 2016; Wiener et al., 2013; Yager, 2021). Critically during consultations, medical providers' and patients' gender, race/ethnicity, age, and education may negatively impact effective communication because in these two-way interactions such characteristics provide context (Drossman & Ruddy, 2020; Yager, 2021). We will now turn to the literature for examples of how various sociodemographic factors can impact patient-provider communication.

Gender. Female primary-care physicians exhibit more patient-centered communication than their male counterparts (Mast & Kadji, 2018; Hall et al., 2015; Roter et al., 2002; Silver et al., 2019). Specifically, female primary care doctors have longer office visits, are more encouraging and empathetic, and engage more in shared decision making than male primary care doctors (Mast & Kadji, 2018; Roter et al., 2002; Silver et al., 2019). In Hall et al. (2015), 192 simulated patients (college students) watched videotapes of simulated male and female physicians communicate in varying levels of patient-centeredness. The patient-centered video, which was scripted, showed the physician speaking directly to the camera with empathy and concern and putting an effort into collaborative decision-making by asking questions and using open-ended questions. The less patient-centered video was scripted with fewer of these behaviors. Consistent with previous research, the simulated patients showed a preference for the more patient-centered style (Gusmano et al., 2019; Jolles et al., 2018; Resnicow et al., 2022; Sheeran et al., 2023; Swenson et al., 2004). However, they did not give credit to female

physicians exhibiting these behaviors. The male physicians were rated higher for having a good communication style while the female physicians seemed to be expected to communicate this way (Hall et al., 2015; Mast & Kadji, 2018; Silver et al., 2019).

In a meta-analysis, Hall et al. (1988) found that male patients received significantly less information and less total communication than female patients. Other studies have reported that male patients in primary care communicate fewer symptoms and less pain than female patients at equivalent levels of illness (Addis & Mahalik, 2003; Cournay, 2003). Also, male patients are more likely to deny the need for care (Springer & Mouzon, 2011; Calasanti, 2004). Hall and Roter (2002) found female patients asked more questions and spoke more with their physicians than male patients did. In addition, females made more statements expressing concern, disagreement as well as positivity than male patients (Hall & Roter, 2002).

Studies in patient-provider communication investigating gender-concordant relationships (i.e., patient and provider share same gender) have been mixed regarding their impact on aspects of care (Bertakis & Azari, 2012; Beran et al., 2007, Crawford et al., 2019; Derose et al., 2001; Lau et al., 2021; Prasad et al., 2021). Consequently, the role of gender concordance is unclear. Among female patients, there is evidence female providers are more strongly associated with positive feedback on elements of patient-centered care (e.g., trust, concern, time-spent, etc.) than male providers (Bertakis & Azari, 2012; Derose et al., 2001; Janssen & Lagro-Janssen, 2012; Lau et al., 2021; Roter et al., 2015). In contrast, one study involving emergency room patients found gender concordance was unrelated to overall male patient satisfaction with care (Derose et al., 2001). More recent studies in primary care and inpatient settings have reported that regardless of patient gender, concordance did not matter to overall satisfaction with care or found

the effects were negligible (Chekijian et al., 2021; Crawford et al., 2019; Lau et al., 2021; Prasad et al., 2021).

Race/Ethnicity. Race/ethnicity has been shown to be very impactful on patient-provider communication and relationships (Meghani, 2009; Thornton et al., 2011; Singh et al., 2018; Shen et al., 2018; Song et al., 2014). Much research in this area has focused on two perspectives The first perspective is whether African American patients report or have experienced less than optimal provider communication than Caucasians. The second perspective looks at the effect of racially concordant (and discordant) patient-provider relationships on communication. In the first perspective there is evidence that providers perceive African Americans as less-effective communicators and therefore, engage less in patient-centered communication with them than with Caucasian patients (Johnson et al., 2004; Street Jr. et al., 2007; Takeshita et al., 2020). In Thornton et al. (2011), healthcare providers were "more verbally dominant with racial and ethnic minority patients and utilized less-positive tones in their clinical interactions" (Thornton et al., 2011, p.2). African American patients more often reported less support, less participation, and less satisfaction with provider communication than Caucasian patients (Gordon et al., 2006; Song et al., 2014; Takeshita et al., 2020).

Empirical results have also shown that patients in racially discordant provider relationships reported receiving less information, and less active participation than patients in racially concordant relationships (Gordon et al., 2006; Song et al., 2014; Takeshita et al., 2020). Johnson et al. (2004) found, in racially discordant relationships, African American patients viewed suboptimal communication as a form of unfair treatment and disrespect by the medical staff. More recent research suggests a more complex picture regarding the impact of racial concordance on patient-provider communication. Specifically, data from the Medical

Expenditure Panel Survey (MEPS) from 2002-2012 suggests that racial concordance does not impact African American's ratings on patient-provider communication in certain situations such as when being hospitalized (Crawford, 2019). Yet, there are disease-specific studies (e.g., diabetes, cardiovascular disease) that indicate racial discordance plays a role in the communication disparities experienced by minorities (Peimani et al., 2020; Schoenthaler et al., 2017).

Among other minorities, evidence suggests that preferences for racially or ethnically concordant providers are mixed. Based on pooled data from the MEPS data (2010-2016), Jetty et al. (2020) found that racial concordance was positively associated with Asian and Hispanic patients who had low income, less education and non-private insurance. Ma et al. (2019) using the MEPS (2014-1025) found racial concordance with providers increased the likelihood of preventive care utilization among Hispanic and Asian patients compared to White patients. They also found racial concordance associated with an increased likelihood of Hispanic and Asian patients seeking treatment for new complaints and for ongoing medical conditions (Ma et al., 2019). Jang et al. (2021) analyzed data from the 2015 Asian American Quality of Life survey. They found Asian Americans who were new immigrants or had a history of poor communication with healthcare providers were more likely to prefer ethnic concordance than those who did not have those experiences (Jang et al., 2021).

In contrast, using MEPS data (2009-2011), Oguz (2019) found racial concordance did not have a significant effect on Hispanic women's satisfaction with patient care. However, Hispanic men with a racially concordant provider did have a significant effect for satisfaction with care albeit in a negative direction. These men were less likely to be satisfied with their provider's listening skills or abilities to explain aspects of their medical care compared to Hispanic men

paired in discordant provider relationships (Oguz, 2019). For Hispanic male patients, dissatisfaction with racial concordance seemed to stem from communication problems with providers (Orguz, 2019).

Chu et al. (2019) analyzed MEPS data from 2007-2016 to examine patient-provider communication and racial concordance experiences of immigrants to the United States. The populations in the study were limited to individuals born outside of the U.S. and who self-identified as Hispanic, non-Hispanic White, non-Hispanic Black, and non-Hispanic Asian. They found almost 60% of the sample felt their providers engaged in patient-centered behaviors (e.g., listening to them, explaining medical information, and engaging in shared decision-making) (Chu et al., 2019). Immigrants who experienced patient-centered communication were also more likely to report satisfaction with care in the previous 12 months than immigrant patients who sometimes or never experienced patient-centered communication (Chu et al., 2019). Findings also revealed having racially concordant providers did not significantly increase the likelihood of being satisfied with care even after controlling for patient-centered communication (Chu et al., 2019). Besides communication, other significant determinants of satisfaction with care for the immigrants were age, limited English-proficiency, and self-report health status (Chu et al., 2019).

Age. Older adults have unique cognitive, language, physiological and social issues that can negatively impact their health literacy levels (Chiu et al., 2016; Jayadevappa, 2017; Sparks & Nussbaum, 2008). Many have difficulty in medical consultations, ask few questions and report little patient-centered communication (Brooks et al., 2017; Chui et al., 2016). Research has shown that older adults tend to prefer tailored health messages that are easily understood over generic messages that are easily understood. (Brooks et al., 2017). Further, more than other

populations, older patients diagnosed with a chronic illness (e.g., cancer) or multiple co-morbidities (e.g., diabetes, obesity, high blood pressure) are likely to experience poor communication with health professionals (Adelman et al., 2000; Day et al., 2014; Keutchafo et al., 2020; Pel-Little et al., 2021; Saneka, 2014; Sparks & Nussbaum, 2008).

Sparks and Nussbaum (2008) argued that older adults have specific language, cognitive, physiological, and social needs which influence communication. For example, age-related vison and hearing loss may contribute to decreased confidence in social interactions and conversational skills including information-seeking behavior (Keutchafo et al., 2020; Saneka, 2014; Sparks & Nussbaum, 2008). Research has shown that age-related problems with word retrieval, name recall and planning what to say can cause delays in cognitive processing (Forsgren et al., 2016; Sparks & Nussbaum, 2008). Potentially, these difficulties cause the competency of the older speaker to be questioned, further eroding effective patient-provider communication (Forsgren et al., 2016; Sparks & Nussbaum, 2008). These age-related changes eventually lead to different communication needs than other age groups (Keutchafo et al., 2020; Saneka, 2014; Sparks & Nussbaum, 2008). Despite these challenges, many older adults desire to understand their diagnoses and actively participate in their Healthcare decisions (Jayadeppa, 2017). Studies in recent years have recommended interventions which support the communicative health literacy needs of older adults (Brooks et al., 2017; Chui et al., 2016, Jayadeppa, 2017; Saneka, 2014).

There is some evidence that biased attitudes and stereotypes exist among patients about doctors based upon the physician's age (Haug, 1996; MacRae, 2015; Takeshita et al., 2020). Some older physicians have been assumed to be not as current on innovative medical treatments while some younger physicians are characterized as ageist by older patients (Haug, 1996; MacRae, 2015). Hall et al. (2020) examined the inferences people make about their doctors

based on their photographs on the walls of medical practice rooms. The researchers found a bias against older looking physicians and expectations of patient-centered communication. There was bias against younger looking physicians and perceptions of unproven competency. These biases were also found in MacRae (2015) where women over 55-years old reported a preference for doctors "not too old and not too young". While younger doctors were perceived as more up to date and open to shared decision-making, experience was also a valued characteristic with some older women rejecting doctors "just out of university" (MacRae, 2015, p.553).

Limited studies on age-concordance between physician and patient suggest that similarities in other personal characteristics such as race and gender resonate more with individuals (MacRae, 2015; Thornton et al., 2011). Further, Thornton et al. (2011) found that the cumulative effect of concordance across multiple characteristics such as, race, gender, and age (i.e., social concordance), is positively associated with patient satisfaction with care. Findings also suggested concordance in age between the patient and the physician potentially affect communication and the affective tone of the medical visit (Thornton et al., 2011). As a research variable, provider age is sometimes confounded with medical experience and years of education (Furnham et al., 2006). Studies show, when it comes to selecting a primary care physician, the provider's level of experience, board certification and psychosocial factors (e.g., compassion) were more important to patients than age (Bornstein et al., 2000; Furnham et al., 2006; Garcia et al., 2003; Otte, 2022). Nonetheless, learning more about how age, among other shared traits, impacts patient-provider communication is an area ripe for further research (Thornton et al., 2011).

Education. Previous studies have shown lower education levels to be associated with limited health literacy which potentially impacts patient-provider communication (Davis et al.,

2020; Singh et al., 2018; Willems et al., 2005). Patients with less education are typically less knowledgeable about healthcare and how the body works so, consequently, may have more difficulties understanding medical information (Ghosh et al., 2020; Sany et al., 2020; Ha et al., 2010). They often perceive their doctors as authoritative experts and are less likely to ask questions (Kirk et al., 2023; Singh et al., 2018; Willems et al., 2005). A systematic review and meta-analysis (Willems et al., 2005) revealed that physicians provided less diagnostic and health information and were less collaborative with patients who had lower education levels.

The literature paints a more complex picture regarding well-educated patients. Patients with higher levels of education have typically been associated with higher health literacy (Tany et al., 2020). They tend to be more engaged and ask more questions in patient-provider consultations (Singh et al., 2018; Willems et al., 2005). They elicit more information from their physicians and often share in decision-making about care (Willems et al., 2005). However, there is also evidence that even well-educated patients can be subject to low or limited health literacy under circumstances of high stress (Agency for Healthcare Research and Quality, 2015; Karl & McDaniel, 2018; Kirk et al., 2023; Watson, 2019). Consequently, they also benefit in having medical information that is plainly stated and easily understood (Agency for Healthcare Research and Quality, 2015; Karl & McDaniel, 2018; Kirk et al., 2023; Watson, 2019).

Cultural and Linguistic Factors

Another aspect of effective health communication is cultural and linguistic needs (Andrulis & Brach, 2007; Lie et al., 2012; Rodriguez et al., 2023; Singleton & Krause, 2009; Wittenberg et al., 2017). Culture informs personal identities including “language, customs, beliefs, values, actions and institutions” (Feinberg et al., 2017, p. 202). Cultural identities help shape personal histories, biases, ideas, and values that provide the foundation for disparate

concepts of wellness and illness (Bylund et al., 2012; Feinberg et al., 2017, Lie et al., 2012; Rodriguez et al., 2023). When there are cultural mismatches between medical providers and patients, miscommunication can lead to poor treatment outcomes (Feinberg et al., 2017, Langer, 2008; Rodriguez et al., 2023). Specifically, cultural and linguistic differences between patient and provider as well as cultural beliefs about personal health status can become barriers to effective communication.

Native Language and Culture. Language differences can present unique linguistic challenges to oral communication. Different meanings and connotations in the English language can change how information from medical providers is interpreted by patients. Miscommunication can occur in the use of words and phrases which can be critical when giving instructions for medication adherence (Feinberg et al., 2017, Langer, 2008; National Center for Cultural Competence [NCCC], n.d.). For example, “once” may be pronounced as “on-say” in Spanish which translates as the number 11, potentially leading to dangerously misinterpreted dosage instructions (Feinberg et al., 2017, p.204). In culturally discordant patient-provider relationships, where patient or provider is a non-native English speaker, language can be a barrier to effective communication. It negatively impacts the health literacy of non-native English patients making it harder to understand and manage their illness (Lambert et al., 2014; O’Toole et al., 2019).

The 2003 NAAL reported that adults who only spoke a language other than English before starting school had lower average health literacy scores than adults who only spoke English before starting school (Kutner et al., 2006). In Wittenberg et al. (2017) nurses expressed challenges with low literacy populations who spoke English as a second language. For example, one nurse discovered a patient’s accompanying family member deliberately mistranslated her

message because he felt the patient "would lose hope if he understood how dire the situation was" (Wittenberg et al., 2017, p.56). In this case, language barriers made it difficult for the nurse to assess her patient's understanding of their illness and care.

As a culture issue, Wittenberg et al., (2017) also reveals the sometimes overlooked right of patients with limited English proficiency to have a qualified medical interpreter during consultations. Established by the Civil Rights Act of 1964, patients with limited English proficiency have a legal right to access health care in their preferred language. From 2009 to 2019, the U.S. population of people aged 5 years and over who speak a language other than English at home increased from 20% to 22% (Dietrich & Hernandez, 2022). Studies have shown patients with limited English proficiency are more likely to experience adverse health events than patients proficient in English (Divi et al., 2007). Access to language services is a fundamental component of care for patients with limited English proficiency (Basu, 2017). The U.S. DHHS and the National Council on Interpreting in Health Care established national standards for medical interpreting and established the role of qualified medical interpreters in providing care (Basu et al., 2017). Qualified medical interpreters are responsible for interpreting "effectively, accurately and impartially, both receptively and expressively, to and from such language (s) and English…" (Jacobs et al., 2016, p. 71). When qualified medical interpreters are not provided for this population, among the most vulnerable for low health literacy, there is the opportunity for misinterpretation of medical information during clinical consultations.

According to the 2003 NAAL report, 48% of American Indian/Alaskan Natives in the U.S. were at basic or below basic health literacy (Kutner et al., 2006). Lambert et al. (2014) studied Indigenous Healthcare services in Australia, Canada and New Zealand and found that providers had limited understanding of the health literacy needs of their Indigenous patients.

Given the providers' limited understanding, the investigators concluded the providers' ability to help Indigenous patients improve their health literacy skills as well as manage their own care was limited. In Taylor's study (2013), 34 healthcare professionals including physicians, nurses, pharmacists, paramedics, and administrators participated in focus groups on their perceptions of caring for ethnic minorities with poor or no English language skills. One of the nurses shared that "Communication is 99% of our job" (Taylor, 2013 p. 37). However, in the focus groups, most of the participants expressed language barriers as the main obstacle to communication when, for example, eliciting medical history information, diagnosing problems, or explaining medication side effects.

In Sentell et al. (2013), focus groups with Native Hawaiian and Filipino women revealed that they would not ask questions because they did not "want to sound stupid" or be viewed negatively by providers (p.5). This confirms findings from previous studies showing that racial/ethnic minority patients, especially those who are non-native English speakers, are more likely to experience barriers to communication with providers than White majority patients who speak English as their native language (Peek et al., 2010; Singleton & Krause, 2009). The literature acknowledges while some patients with limited English proficiency "may know how to seek and participate in healthcare in their native culture, many of these people do not have an understanding of what the U.S. system expects of them as patients…or what they can expect from care providers…" (Singleton & Krause, 2009, p. 6). Knowledge about how to navigate U.S healthcare systems informs patient self-efficacy and empowerment (Singleton & Krause, 2009). For non-native and native-born minorities, such as African Americans, perceptions of racial bias complicate communication with providers and consequently interrupt growth toward shared decision-making (Peek et al., 2010; Singleton & Krause, 2009). For African Americans, this is a

consequence of the complicated history of mistrust and well-documented acts of maleficence by physicians against patients who are ethnic minorities (Bhattacharya et al., 2013; Jacobs, et al., 2006; Muvuka et al., 2020; Peek et al., 2010; Politi et al., 2014). Further, given ongoing inequities in social determinants of health (e.g., income, education, community), perceptions of racial bias in the health care system persist (Bhattacharya et al., 2013; Muvuka et al., 2020; ODPHP, n.d.).

Culture and Self-Reported Health Status. Some researchers theorize cultural beliefs about the origins of health are a factor in how patients perceive their own health status (Assari et al., 2016; Singleton & Krause, 2009). Rumsfeld et al. (2013) defines self-reported health status as "the impact of disease(s) and medical treatments on function and well-being as reported by the patient" (p.2235). According to Jylhä (2009), self-reported health status is one of the most widely used and least understood measures of health in sociological health research since the 1950s. Self-reported heath status differs from other indicators of health in that it originates within a perceptual process that is not bound by fixed formal rules or definitions (Jylhä, 2009). Instead, there are both objective and subjective components (Jylhä, 2009; Goodwin & Engstrom, 2002; Rumsfeld et al., 2013). Rumsfeld et al. (2013) identifies these components as a) symptom burden (i.e., symptoms resulting from disease or medical treatments); b) functional status (i.e., physical, mental/emotional, and social function); and c) health-related quality of life (i.e., the perception of difference between "actual and desired functional status and overall impact...on well-being" (p.2234)). In a way, it is a summative statement about how these components combine to impact the patient's perception of illness or wellness. Another contributor to quality-of-life perceptions are personal health beliefs.

Health information received by patients from their physicians during medical consultations is interpreted through a system of health beliefs which are largely culturally based (Chang & Kelly, 2007; Feinberg et al., 2017; Langer, 2008; Rodriguez et al., 2023; Singleton & Krause, 2009). These beliefs influence not only how information is perceived but also how much is accepted or rejected (Chang & Kelly, 2007; Feinberg et al., 2017; Singleton & Krause, 2009). Beliefs about the origins of wellness and illness are rooted in the values, traditions and informal theories found in cultural histories (Betancourt, 2003; Chang & Kelly, 2007; Feinberg et al., 2017; Rodriguez et al., 2023; Singleton & Krause, 2009). Numerous studies in cultural competence and health recommend that providers take into consideration the health beliefs of their patients to (a) foster better compliance, (b) facilitate shared decision-making, and (c) improve self-perception of health and potentially how it is reported (Betancourt, 2003; Chang & Kelly, 2007; Feinberg et al., 2017; Langer, 2008; Okunrintemi et al., 2017).

Empirical results on the use of self-report of health status to support clinical care have been inconclusive (Axon et al., 2022; Fihn et al., 2011; Moor et al., 2017; Rumsfeld et al., 2013). However, it is thought that self-reported health status in clinical practice may inform and lay the groundwork to support clinical care and healthcare quality (Axon et al., 2022; Moor et al., 2017; Rumsfeld, 2002; Rumsfeld et al., 2013; Spertus, 2008). Self-reported health status can identify ideal patients for prognostic discussions and can encourage collaboration with the physician on treatment plans (Okunrintemi et al., 2017; Rumsfeld et al., 2013; Spertus, 2008). Further, research has widely reported links between self-reported health status and mortality (Assari et al., 2016; DeSalvo et al., 2006; Idler & Benyamini, 1997; Jylhä, 2009; Lorem et al., 2020; Rumsfeld et al., 2013). Some studies have shown that patients who report poor health have two to seven times higher risk of mortality compared to patients who report excellent health (Assari

et al., 2016; DeSalvo et al., 2005; Idler & Benyamini, 1997). Studies have also found that self-reported health status is a weaker predictor of death among African Americans compared to White Americans after adjustments for chronic conditions at baseline (Assari et al., 2016; Ferraro et al., 2001; Lee et al., 2007). Reasons for this are not fully understood. Consequently, more research is needed to determine its impact on patient-provider communication.

Biomedical Factors

Much of the literature around patient-provider communication is centered around specific diagnoses (e.g., hypertension, lung disease, diabetes, cancer etc.), treatment, and self-management (Aldorry, 2017; Cronin et al., 2020; Ivynian et al., 2020; Okunrintemi et al., 2017; Peimani et al., 2020; Sany et al., 2018; Slatore et al., 2010; Schoenthaler et al., 2017). Next, we will look at some disease-specific diagnoses with chronically ill patients.

Following a communication skills training for providers, Sany et al. (2018) found associations with improvements in medication adherence and clinical blood pressure among patients with hypertension. These findings are similar to other studies reporting associations with improved adherence, disease self-efficacy, health literacy skills and clinical results for hypertension patients exposed to better patient-provider exchanges. (Rao et al., 2007; Ha and Longnecker, 2010; Sany et al., 2020; Street, 2013). Studies involving patients with chronic obstructive pulmonary disease (COPD), or other pulmonary nodules have shown the significant positive influence of high-quality physician communication on patient distress, medication adherence, disease self-efficacy and treatment decisions (Slatore et al., 2010, 2014; Wiener, et al., 2013). Improved patient-provider communication has been linked to fewer negative consequences associated with heart disease management including reduced annual specialist visits, fewer hospitalizations and diagnostic procedures, and lower overall medical expenses

(Okunrintemi et al. (2017). Ivynian et al. (2020) found heart failure patients, often susceptible to cognitive impairment, are particularly vulnerable in poor, jargon-filled communications with providers. Research in Type 2 diabetes management has shown effective patient-provider communication to boost adherence and is associated with greater compliance with other medically recommended self-care behaviors (Jones et al., 2016; Peimani et al., 2020; Piette et al., 2003; Schoenthaler et al., 2012). These behaviors altogether help patients achieve better glycemic control (Jones et al., 2016; Parchman et al., 2009; Peimani et al., 2020; Piette et al., 2003).

Systemic Clinical Factors

There are systemic clinical factors which influence patient-provider oral communication and, consequently, patient-centered care. Among them, consultation length and communication skills training for medical staff are two examples of significant factors influencing patient-provider interactions (Irving et al., 2017; Osborn et al., 2015; Tarn et al., 2008; Tai-Seale et al., 2007). In this section, we will address both topics and identify ways each contribute to effective communication between patients and providers.

Consultation Length

Time is a valued and limited resource in medical practice. How physicians use consultation time “has important implications for quality of care, patient trust, malpractice lawsuits and physician payments” (Tai-Seale et al., 2007, p.1871). Further, consultations often involve multipurpose, complex interactions with patients including performing preventive services, taking histories, giving physical exams, and detailing medication and treatment plans (Pankevich, 2014; Tarn et al., 2008).

The World Health Organization uses average consultation length as a quality indicator of time spent promoting the safe and cost-effective use of drugs (Irving et al., 2017). According to a systematic review across 67 countries, the United States ranks second highest in average consultation time with patients (Irving et al., 2017). According to the National Ambulatory Medical Care Survey (NAMCS) in 2016, 32.9% of U.S. physicians spent 11 to 15 minutes in consultation with patients and 41.6% spent between 16 to 30 minutes (Rui & Okeyode, 2016). The average consultation time was 22.5 minutes per patient across all specialties (Rui & Okeyode, 2016).

Patients frequently express dissatisfaction with consultation length and, by extension, patient-provider communication, and quality of care (Cape, 2002; Deveugele et al., 2002; Sim et al., 2016; Sadeghi et al., 2013). Evidence has linked patients' unraised questions or concerns to poor health outcomes including worsening of symptoms, increased anxiety, and the need for additional primary care visits (Heritage et al., 2007; Summers et al., 2016; Stuart et al., 2018). As indicated by a survey of primary care physicians in ten countries (including the U.S.) some physicians are also dissatisfied with the time they spend with each patient (Osborn et al., 2015; Knesebeck et al., 2019; Pankevich, 2014). Specifically, Osborn et al. (2015) found over one-third of physicians were dissatisfied with the time available for each patient. Two factors influencing consultation times are patient-provider characteristics and communication about medication.

Patient-Provider Characteristics. Studies from the United Kingdom report that longer consultation times are associated with older doctors, female doctors, and doctors with positive attitudes about mental health problems (Deveugele et al., 2002; Wilson, 1991). Patient traits associated with longer visits include females, individuals higher in age, and higher in social class (Deveugele et al., 2008, 2002; Wilson, 1991). Further, patients who were new to the doctor or

presenting new problems, and patients with psychosocial or behavioral problems were also associated with longer consultations (Deveugele et al., 2008, 2002; Knesebeck et al., 2019; Wilson, 1991). In a systematic review on the effects of race and race concordance on patient-physician communication in the U.S., Shen et al. (2018) found mixed results between race and length of visit. Some studies found office visits with Black people were significantly shorter while other studies found no significant differences. In the only study on race-concordance in the review, visits were approximately 2.2 minutes longer in race-concordant patient-provider dyads than in race-discordant dyads. (Cooper et al., 2003; Shen et al., 2018).

Medication Communication. Studies show patients ask medication-related questions in less than half of office visits (Amorim et al., 2020; Doherty et al., 2020; Hauser et al., 2017; Hauser & Matthes, 2016; Ozavci et al., 2021; Sleath et al., 1999; Tarn & Flocke, 2011; Tarn et al., 2012; Tobiano et al., 2019). One reason for this may be time pressures experienced by the physician (Ozavci et al., 2021; Tarn et al., 2008). For example, Tarn et al. (2008) found 5% of an average16-minute office visit, nearly one minute, was spent introducing and explaining newly prescribed medications. Tarn et al. (2006) found, under time pressures, doctors may omit significant pieces of prescribing information such as how to take the medication. This was especially noticeable when the amount of time per visit was fixed and physicians were prescribing multiple medications or for physicians with a more direct communication style (Tarn et al., 2006). Further, more time was spent discussing prescribed medication with healthier patients who may have had more questions or concerns (Tarn et al., 2006). Existing patients with prior prescriptions had shorter discussions about newly prescribed medication (Tarn et al., 2006). Longer discussions occurred when patients requested a specific medication although total visit time did not change (Tarn et al., 2006). The investigators concluded that “time pressure and other

competing demands may contribute to inadequate prescribing communication" (Tarn et al., 2008, p. 317).

Health Professionals' Training in Clear Communication

Training in health literacy has been repeatedly recommended by advocate organizations and field experts for over a decade (Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs, 1999; Coleman et al., 2016; Feinberg et al. 2020; U. S. Department of Health & Human Services, 2005). Evidence suggests the communication skills training provided is inadequate to meet the needs of physicians treating patients with low health literacy (Ali et al., 2014; Back et al., 2019; Coleman et al., 2016; Hildenbrand et al., 2020; Saunders et al., 2019). Further, some studies report medical residents' lack of confidence in the use of communication tools designed to support patient-provider communication (Ali et al., 2014; Coleman et al., 2016; Hillenbrand et al., 2020). We will examine this more closely with a brief overview of challenges that contribute to inadequate medical training in effective communication. After that, we will discuss the primary clear communication interventions included in medical education curricula to combat low health literacy.

Medical Residency Transition. Medical training years are peak years of extreme stress, high fatigue, and generalized anxiety for new doctors (Brennan et al., 2015; Chang et al., 2020; Dyrbye et al., 2014; Dyrbye et al., 2016; Hurst et al., 2013). The transition from medical school to residency is filled with tense and unstable moments as students assume new responsibilities in caring for patients (Chang et al., 2020). At this stage in training, medical residents are taking on more independence in their learning and striving to transfer knowledge into practice (Chang et al., 2020; Hurst et al., 2013). Despite taking courses during the last year of medical school designed to prepare them for the transition to residency, medical students may find their learning

needs center more on “situational awareness, professional skills, and identifying the limits of their understanding” (Chang et al., 2020 p. 1421). Further, studies have shown that psychological distress resulting from burnout during these training years negatively impacts the mental health and well-being of residents as well as their interactions with patients (Brennan et al., 2015; Chang et al., 2020; Hurst et al., 2013; Mata et al., 2016; Ripp et al., 2016).

Burnout is defined as a syndrome, “resulting from work-related stress characterized by emotional exhaustion, feelings of cynicism and detachment towards patients and low sense of personal accomplishment” (Dyrbye et al., 2014, p. 443; Rodrigues et al., 2018). Among other symptoms, burnout commonly results in eroded professionalism, increased medical errors, frustration, depression and, potentially, suicidal ideation (Drossman & Ruddy, 2020; Ripp et al., 2016). During residency, physicians develop specific sets of skills in their focus areas to maintain patient quality of care (Rodrigues et al., 2018). In addition to skills training, medical residents experience sleep deprivation, heavy workloads with low compensation, and increased on-call responsibilities (Hurst et al., 2013; Rodrigues et al., 2018). All are factors which contribute to burnout and may interfere with the resident’s ability to establish rapport and express empathy with patients which may contribute to poor patient-provider communication (Dyrbye et al., 2016; Thomas, 2004; Rodrigues et al., 2018).

Overall, studies on the relationship between physician burnout and patient care experiences is a growing area of research. While published literature is inconclusive, there is evidence that patients report more negative experiences in provider communication with physicians who report higher degrees of burnout. (Chung et al., 2019; Ratanawongsa et al., 2008; Robbins et al., 2019). Residents and practicing physicians with burnout syndrome have reported “a reduction in compassion at work, succinct conversations with patients and other suboptimal

patient care experiences" (Rodrigues et al., 2018, p. 13). Burnout syndrome impairs efforts toward positive relationship-building and effective communication between physician and patient (Chung et al., 2019; Rodrigues et al., 2019; Robbins et al., 2019). For medical residents, the outcomes of burnout syndrome create a less than ideal environment for training and confidence-building in effective patient-provider communication (Ayyala et al., 2018; Hurst et al., 2013; Long et al., 2016; Stanley et al., 2015).

Curricular Challenges. Approximately 20,000 new doctors graduate every year from accredited medical schools across the United States (Association of American Medical Colleges, 2021). Nonetheless, many doctors are not exposed to formal training in health literacy and clear communication (Drossman & Ruddy, 2020; Coleman et al., 2017; Coleman, 2011). Further, there is no core health literacy curriculum, with standard competencies, in any of the health professions (Saunders et al., 2019). Neither is there any inclusion of communication skills addressing low health literacy in clinical competencies needed for credentialing (Back et al., 2019). Instead, there is a wide diversity in training approaches to health literacy resulting in diverse levels of competency in healthcare professionals interacting with patients with limited health literacy (Saunders et al., 2019).

Coleman and Appy (2012) surveyed 133 U.S. schools of allopathic medicine on their training for healthcare professionals. Among the 61 that participated, 72.1% reported having a health literacy component in the curricula. Students were exposed to a total of three hours, on average, of health literacy instruction which included various modes of delivery and skill assessment (Coleman et al., 2016; Coleman & Appy, 2012). In a later study, Coleman et al. (2016) surveyed residency directors at 444 U.S. family medicine residencies to assess the status of health literacy training for physicians. Out of 138 respondents, 42% had varied programs

which included health literacy as part of a required curriculum. Most of the health literacy content occurred during the first year of residency. Courses were two to five hours long in the first three years of training. The lack of consistency across a standard set of competencies in health literate communication is problematic for the systematic facilitation of health literacy tools in clinical practice (Coleman, 2023; Coleman et al., 2016; Yin et al.;, 2015).

Communication Interventions. Medical visits can be intimidating for patients of any health literacy level. Health literacy practices are defined as "patient-centered protocols and strategies to minimize the negative consequences of low or limited health literacy" (Barrett et al., 2008; Coleman et al., 2017, p. e90). A common health literacy practice is using clear communication strategies. Clear communication strategies are among those techniques that help patients become better informed and helps them actively partner with health providers in the exchange of health information (Coleman et al., 2017; Oates & Paasche-Orlow, 2009). Many of these strategies are easily implemented while others, require practice, professional training, and the feedback of patients (Oates & Paasche-Orlow, 2009). One well-recommended communication strategy commonly found in health literacy curricula is plain language. In Coleman et al. (2016), 89.5% of programs reported a high degree of skill-based plain language training in oral communication. Next, we will take a closer look at plain language.

***Plain Language*.** The U.S. Department of Health and Human Services (2005) described plain language as communication, written and oral, that is "clear, concise, organized, and jargon -free" (p.3). In other words, it is language that can be easily understood the first time it is seen or heard (Warde et al., 2018). While often used with print literacy and material resource development, plain language is also important in oral communication with patients (Warde et al., 2018). In the clinical setting, many plain language communication principles relate to using

simple sentence structure that avoids jargon and uses terms familiar to the patient (Oates & Paasche-Orlow, 2009). Some literature criticizes the use of plain language as oversimplification or "dumbing down" important medical information (Stableford & Metger, 2007, p.75; Watson, 2019). Additional critiques are its imprecision, dullness, questionable legality, and loss of nuanced technical vocabulary. Most of these critiques have been debunked as myths (Stableford & Metger, 2007; Watson, 2019).

Liang and Brach (2017), using data from the MEPS (2011-2014), tracked the progress of implementing the *Healthy People 2020* recommendation for using plain language in providing patients with instructions that were easy to understand. Eligible participants were over 25 years old, had a usual non-emergency room source of care and had at least one medical visit in the previous 12 months. During the four-year period, patients were asked whether their clinician provided them with instructions that were "easy to understand" (ODPHP, 2020). Patients who responded affirmatively increased from 64% to 70% over the four-year period. Further, they found that disadvantaged groups, (identified via demographic profile), who are typically more susceptible to limited health literacy, were almost equally likely to self- report understanding instructions as other patients typically identified with higher health literacy. Among patients who reported excellent health status, 77% reported having received easy to understand instructions compared to 58% of those who reported poor health status. With over 50% of those who reported poor health status reported having received easy to understand instructions, investigators concluded a significant subset of providers were either accurately identifying patients in need of modified messaging (i.e., plain language) or were employing universal precautions and using plain language with all their patients (Liang & Brach, 2017).

Teach-Back. Another health literacy clear communication intervention commonly found in healthcare curricula is Teach-Back. Coleman et al. (2016) found that 84% of medical education programs had content on the Teach-Back technique. Teach-Back is an evidence-based health literary communication tool that is useful for ensuring patients understand the information they receive. It is a "way of checking understanding by asking patients to state in their own words what they need to know or do about their health" (AHRQ, 2021, p. 18). Teach-Back is also a way to "confirm that you have explained things in a manner your patients understand" (AHRQ, 2021). Teach-Back can be used after any information has been presented to the patient and helps the provider move beyond the typical "Do you understand?" or "Do you have any questions?" where patients, especially those with limited health literacy, can be reluctant to speak. Instead, queries are encouraged which shift the responsibility for clarity to the clinician such as "What questions do you have for me?" (Rudd et al., 2012, p. 24) or "I've given you a lot of information and want to make sure I was clear. Can you tell me in your own words what our plan is?" (AHRQ, 2021, Action section). Teach-Back is not meant to be a test of the patient's knowledge but rather a gauge for how well the clinician explained medical concepts (AHRQ, 2021, Action Section). This method targets the clear communication guiding principle of confirming comprehension. Empirical results report that after exposure to Teach-Back, patients exhibit increased disease-specific knowledge, adherence, self-efficacy, and improved health outcomes (Dinh et al., 2013; Griffey et al., 2015; Hong et al., 2020; Liu et al., 2018; Slater et al., 2017; Talevski et al., 2020).

There is consensus in the field that more training is needed to improve provider health literacy knowledge and communication skills (Coleman, 2011; Green et al., 2014; Joseph et al., 2019; Leslie et al., 2019; Morony et al., 2018; Wittenberg et al., 2015). Studies report challenges

in clinician adoption of clear communication strategies during training, and in accurate implementation post-training, of techniques such as Teach-Back (Green et al., 2014; Joseph et al., 2019). Despite the general acknowledgement by clinicians that training in clear communication strategies has value, the implementation of these strategies remains less than optimal (Coleman et al., 2016; Hong et al., 2020; Morony et al., 2018; Saunders et al., 2019). Without implementation in clinical practice, health literacy training cannot positively impact patient-provider communication. *Healthy People 2030* recommends that more Healthcare providers receive Teach-Back training to help patients better understand health information (U.S. Department of Health and Human Services, 2021). In the next section, we will discuss previous studies on the implementation of Teach-Back in clinical settings and potential factors influencing its use.

Teach-Back Use in Healthcare

Although healthcare professionals are a primary source for health information and facilitation through the healthcare system (Saunders et al., 2019), research suggests that evidence-based health literacy interventions are not widely practiced in clinical settings (Brooks et al., 2020; Castro et al., 2007; Collum et al., 2013; Green et al., 2014; Schwartzberg et al., 2007). Schillinger et al. (2003) is a classic study in the evolution of Teach-Back in clinical practice. This study demonstrated the fundamental comprehension checks that would define the Teach-Back process and contribute to the literature about this health literacy tool. The next section describes this important study.

Closing the Loop

In Schilinger et al. (2003), investigators assessed the extent to which primary care physicians working in public hospitals assessed patient recall and comprehension of new

concepts such as a new piece of health information or advice during outpatient encounters. The audiotaped encounters were visits between 38 physicians and 74 patients with diabetes and low functional health literacy according to the Short Test of Functional Health Literacy in Adults (S-TOFHLA). The investigators hypothesized that patients with low functional health literacy and diabetes would benefit from comprehension checks because of the complex treatment regimens they must follow. Such regimens included "managing visits to multiple clinicians, monitoring themselves for changes in health status and initiating positive health behaviors" (Schilinger et al., 2003, p.84). The results revealed that the physicians assessed recall and comprehension in only 20% of visits and for only 13% of the new concepts. This equated to 15 out of 124 new concepts that were assessed for recall and comprehension. Only 10 out of 38 physicians checked for understanding at least once during the consultation. If the patient did not recall or understand what was said, these physicians modified their explanations of the concepts. After modifying the explanation, none of the doctors asked the patient to state in their own words what was said to them. In other words, they failed to check, a second time, for recall and comprehension of the modified explanation.

Schillinger et al. (2003) described the technique of confirming whether patients understood and remembered health information as an "interactive communication loop" (p. 83). The process begins with the introduction of new health information which may be a diagnosis, advice or a change in the treatment plan or medication. After an initial assessment of the patient's recall and comprehension of the new information, it is not uncommon to find that the patient missed something or there was a lack of understanding or possibly a conflict with the patient's health beliefs that must be addressed. Typically, the physician will then repeat, clarify, or otherwise modify the first message appropriately to help the patient better integrate the new

information. At this point, the physician should check the patient's recall and comprehension of the modified explanation. If the patient responds appropriately, then the loop is complete; however, if the patient still exhibits difficulty, then the technique continues until recall and comprehension is achieved. When a physician fails to follow-up after the first comprehension check then the interactive communication loop is broken.

In the study conducted by Schillinger et al. (2003), the physician's failure to check the patient's comprehension after modifying their explanation represents the breakdown in patient-provider communication. After the first comprehension check failed, the provider modified the explanation and moved on without checking for comprehension. Consequently, for only 8 of the 124 new concepts introduced, could the physician be assured that the patient recalled or comprehended the information communicated during the office visit.

Teach-Back closes the loop in patient-provider communication as modeled in Schilinger et al. (2003) with an emphasis on clarifying and rechecking patient recall and comprehension several times during a visit. It requires the clinician to think about how they will ask patients to teach back the information. For example, "We covered a lot today and I want to make sure that I explained things clearly. So, let's review what we discussed. Can you please describe the three things you agreed to do to help you control your diabetes?" (AHRQ, 2021. Action section). In addition to *Healthy People 2030*, Teach-Back has been endorsed as a "top-safety practice" and unofficial "gold standard" for patient-provider interactions in clinical encounters by numerous public health and medical organizations (AHRQ, 2021; Kemp et al., 2008; National Quality Forum (NQF), 2010; Wittenberg et al., 2017). Next, we will review the literature on personal and systemic factors associated with Teach-Back use and identify areas in need of further examination.

Personal Factors and Teach-Back Use

As previously discussed, there are many personal and contextual factors which impact effective patient-provider communication. As an intervention for more patient-centered communication, it is reasonable to examine the impact of these factors on the uptake of Teach-Back as a clinical practice. With this in mind, we will review studies on the clinical use of Teach-Back within the context of sociodemographic factors, cultural beliefs and linguistic factors, and biomedical factors.

Sociodemographic Factors

Research shows that Teach-Back is an effective tool for populations who are vulnerable to low health literacy (DeWalt et al., 2010; Dinh et al., 2016; Griffey et al., 2015; Hong et al., 2020; Kriplani et al., 2006; Liu et al., 2018). Low health literacy has been commonly associated with racial/ethnic minorities, those with low educational attainment, limited English proficiency and advanced age (Jager & Wynia, 2012; Kutner et al., 2006). Consequently, there is evidence that doctors use Teach-Back selectively, targeting patients with traits matching low health literacy populations (Feinberg et al., 2019; Jager & Wynia, 2012; Hong et al., 2020a, 2020b). However, as already discussed, people with higher educational attainment can also have limited health literacy under certain circumstances (Jager & Wynia, 2012; Nielsen-Bohlman et al., 2004; Paasche-Orlow et al., 2006; Watson, 2019). This would suggest that the selective usage of Teach-Back may overlook many patients who could benefit from the exposure.

Empirical data associating the sociodemographic traits of educational attainment, age, and gender with Teach-Back use is often mixed. Jager and Wynia (2012) examined the characteristics of patients who reported experiencing Teach-Back with their doctor during a medical visit. They used patient survey data from the Communication Climate Assessment

Toolkit (C-CAT). Patients with fewer years of formal education reported they were "always" or "sometimes" asked to Teach-Back the doctor's instructions more often than those with higher education. In fact, each additional year of education lowered the odds of Teach-Back exposure. The inverse association between educational attainment and Teach-Back use has been supported in later studies (Hong et al., 2019; Joseph et al., 2019; Liang & Brach, 2017). However, there is also evidence where no association was found (Hong et al. 2020a, 2020b).

Jager and Wynia (2012) found a small but statistically significant (p=.03) positive association between advanced age (65 years and older) and Teach-Back exposure. Further, in the same study, amongst patients under 65 years old with each 10-year increase in age, the odds of experiencing Teach-Back grew (Jager & Wynia, 2012). However, later studies have not reported significant results for age (Feinberg et al., 2019, Hong et al., 2019; Liang & Brach, 2017). Feinberg et al. (2019) found more exposure to Teach-Back for males while other studies report no significant gender differences (Jager & Wynia, 2012; Hong et al., 2020a).

Empirical results have been more consistent regarding race/ethnicity. Jager and Wynia (2012) found patients who self-identified as African American reported experiencing Teach-Back more frequently that White patients (67% vs 55%). Likewise, Hispanic/Latino patients also reported more frequent exposure to Teach-Back than White patients (62% vs 55%) which was statistically significant (p=.03). Similar results have been reported in numerous later studies (Hong et al., 2019, 2020a; Liang & Brach, 2017).

Cultural and Linguistic Factors

Linguistic Factors. As an intervention, Teach-Back appears to be an effective communication tool for individuals with limited English (Hong et al., 2019). Hong et al. (2020a) examined the association of Teach-Back use with patient-reported health outcomes using data

from the MEPS (2011-2016) among patients with Type 2 diabetes. Within this cohort, regardless of English proficiency status, patients who were not born in the U.S. were more likely to experience Teach-Back than native-born patients. Whether these findings are consistently supported in the literature is unclear. Jager and Wynia (2012) found that individuals self-reporting a preference to speak any language other than English were more likely to experience Teach-Back than patients who preferred English. Yet, other studies have indicated patients' lack of English proficiency as a potential barrier to Teach-Back use or as not significantly associated with Teach-Back use (Goeman et al., 2016; Hong et al., 2020a; Schilinger et al., 2003).

Self-Reported Health Status. Research investigating a link between self-report health status and Teach-Back is also mixed (Hong et al., 2019); Liang & Brach, 2017). Liang and Brach (2017) examined how health literate practices, including Teach-Back, varied across patient characteristics especially among individuals with limited health literary. Using data from the MEPS (2011-2014), they found perceived health status to be positively correlated with exposure to health literate care practices such as Teach-Back and plain language. As patients' perceived health status went from excellent to poor, the likelihood of exposure to Teach-Back decreased, thus patients with poor health status received less Teach-Back. Conversely, in Hong et al. (2019), examining MEPS (2011-2015) patient data on chronic illnesses, a significant association linking self-reported general health status and Teach-Back experience was not found.

Biomedical Factors

There is evidence that exposure to Teach-Back improves self-management behaviors (e.g., medication adherence, diet, foot care, etc.) which directly impact health outcomes (Hong et al., 2019, 2020; Talevski et al., 2020). This suggests Teach-Back would be helpful for patients with chronic conditions (such as diabetes, hypertension, heart disease, and lung disease). For

example, Peter et al. (2015), investigating Teach-Back exposure in a cohort of patients hospitalized with heart failure, found those who experienced Teach-Back were associated with a 12% lower risk of readmission than those who did not experience Teach-Back.

Unfortunately, patients who have chronic diagnoses are not always more likely to have a Teach-Back experience than patients who do not (Hong et al., 2019; Hong et al., 2020b). Hong et al. (2019) examined MEPS (2011-2015) records of 14,110 patients with ambulatory care sensitive conditions (ACSC). ACSCs are "conditions for which hospitalizations could be prevented or reduced through appropriate management in primary care." (Hong et al., 2019, p. 2176). ACSCs observed in this study were (a) hypertension, (b) type 2 diabetes, (c) heart disease, (d) asthma, and (e) chronic obstructive pulmonary disease (Hong et al., 2019). The researchers were interested in the prevalence of Teach-Back and any association between self-reported Teach-Back experience and a reduced risk of hospitalization. Each patient with an ACSC diagnosis and exposure to Teach-Back was matched with a similar patient who did not have a Teach-Back experience (the control group). Results indicated that patients with hypertension, diabetes and obesity were significantly more prevalent among those who experienced Teach-Back than patients in the control group. Further, associations were found between Teach-Back exposure and a reduced risk of hospitalization among the hypertensive and diabetic patients (12% and 23% respectively). There was also a 36% lower risk of re-admission for heart disease patients associated with Teach-Back exposure compared to the control group. There could be alternative explanations for the observed associations including selection bias, confounding variables, or other individual variables that the investigators did not capture (Hong et al., 2019).

Hong et al. (2019) found that, although the overall 30-day readmission rates were not statistically different between the Teach-Back group and the control group, the heart-failure

specific readmissions among the Teach-Back group were a relatively small percentage (12%) of total readmissions. The researchers hypothesized having a Teach-Back experience "improved comprehension of diagnosed conditions, increased adherence to prescribed treatment/medication plans and/or improved self-management care skills" among ACSC patients in the study (Hong, 2019, p. 2182).

Hong et al. (2020a) did not find any significant association between patients with diabetes and Teach-Back experience. However, patients with Teach-Back experience were less likely to develop diabetic complications than those without it. Further, they were less likely to be hospitalized with diabetes-related conditions. Investigators in Hong et al. (2019) and Hong et al. (2020) attributed positive health outcomes to improved self-management behaviors, such as medication adherence and diet, which Teach-Back helped to reinforce (American Diabetes Association, 2019; Hong et al., 2019, 2020a; Negarandeh et al., 2013). While no studies were found linking lung disease to a likelihood of Teach-Back exposure, there are studies which report associations between Teach-Back exposure and self-management behaviors for lung disease (Hong et al., 2019; Kiser et al., 2012; Press et al., 2011; Talevski et al., 2020). For example, Talevski et al. (2020) reported results from two studies which found exposure to Teach-Back was associated with the improved use of inhalers in patients with COPD (Kiser et al., 2012; Press et al., 2011).

Systemic Clinical Factors and Teach-Back Use

Consultation Length

One of the barriers often cited by clinicians in patient-provider communication is limited consultation time (Dugdale et al., 1999; Hong et al., 2020; Miller et al., 2016; Liang & Brach, 2017). Teach-Back is an iterative process that requires the clinician to check for understanding

and when necessary, modify explanations of medical information (Kemp et al., 2008; Schillinger, 2003). Research shows one of the barriers to Teach-Back in clinical practice is the provider's perception that it requires additional time to deliver (Anderson et al., 2020; Ahrens & Wirges, 2013; Kemp et al., 2008; Klingbeil & Gibson, 2018; Marcus et al., 2014; Shersher et al., 2021).

There is evidence that, in the long-term, despite longer consultation times, the Teach-Back approach aids efficient time management (Anderson et al., 2020). In Anderson et al. (2020), investigators offered a four-hour Teach-Back training to all hospital staff (i.e., doctor, nurses, physician assistants, etc.) at a large hospital. After implementation, the staff estimated consultation times were extended compared to encounters without Teach-Back. However, over the long term, patients were less likely to come to appointments unprepared and did not call back as much with follow-up questions which are typically time-consuming. Further, previous studies suggest, the time spent in using Teach-Back would be "more than offset by the time needed to manage complications resulting from a misunderstanding or the potential consequences for a patient who did not get it straight" (Kemp et al., 2008. p.28).

Notably for patients, Jager & Wynia (2012) found, among those who reported receiving Teach-Back, 70% said they "always" had enough time with their doctor. In contrast, only 44% of those who did not experience Teach-Back said the same. The investigators concluded the patients with Teach-Back experience felt their expectations regarding time spent with the doctor were better met than those who did not have that experience. Nevertheless, overcoming the perception of time constraints as a barrier for Teach-Back use is a persistent challenge and an avenue for further research (Hong et al., 2020).

Health Professionals' Training in Teach-Back

Medical students and medical residents often lack the knowledge and skills needed to address limited health literacy challenges (Coleman et al., 2016; Saunders et al., 2019). Further, some medical residents, medical students and other Healthcare workers report very low levels of confidence in their ability to collaborate with patients with limited health literacy (Ali et al., 2014; Green et al., 2014; Coleman et al., 2016; Joseph et al., 2019; Shersher et al., 2021). Specifically, concerns about low competency in facilitating Teach-Back has been cited by healthcare providers as a barrier to the uptake of the strategy in clinical practice (Howe et al., 2017; Joseph et al. 2019; Shersher et al., 2021). Although health-literate communication skills can be taught and used in the field by all Healthcare professionals (Coleman et al., 2016; Feinberg et al., 2019; Green et al., 2014; Heaven, Clegg & Maguire, 2006; Joseph et al., 2019), training alone may not be sufficient for transferring use of the intervention to clinical practice (Green et al., 2014; Feinberg et al., 2019; Heaven, Clegg & Maguire, 2006; Joseph et al., 2019). Implementation may be further complicated by clinician perceptions which overestimate the usage of Teach-Back (Feinberg et al., 2019).

Feinberg et al. (2019) examined medical residents' perceived efficacy and actual use of Teach-Back before and after a brief instructional intervention. In a survey prior to the intervention, medical residents indicated they believed that Teach-Back was an important tool for effective communication and perceived that they used it 60% of the time during clinical visits. However, pre-intervention audio recordings of 80 clinical visits revealed that the residents only used Teach-Back in 2.5% of clinical visits. The residents received a one-hour skills training intervention on Teach-Back. After the training, 78 clinical visits were audio-recorded and transcribed. Results indicated that the use of Teach-Back increased significantly to 53% of

clinical visits. Patient demographic analysis included age, gender, race/ethnicity, native language, and health literacy level from the Newest Vital Sign (NVS) inventory (Weiss et al., 2005). Results revealed that only patient gender had a statistically significant difference in Teach-Back usage. More males, M =.37(.49) than females, M = .21(.41) were exposed to the strategy overall t (156) = 2.16, p =.02 (Feinberg et al., 2019). This study affirmed the enabling ability of training to increase the use of Teach-Back. However, there was still room for growth in the transference of training to clinical practice. Further research is necessary to understand issues such as: what factors limited Teach-Back implementation by the other residents or with all patients; what factors, in addition to training, should we investigate to facilitate the widespread uptake of Teach-Back by Healthcare providers?

Literature Review Summary

In summary, we have discussed the results of a nationwide survey revealing 36% of adults in the U.S. are at basic or below basic health literacy (Kutner et al., 2006). The implications of these findings spurred efforts to establish a definition of health literacy that encompassed the challenges these individuals face. *Healthy People 2030* redefined what it means to be health literate and recommended a universal precautions approach to mitigate the risks. When engaging the healthcare system, there are many factors that make oral communication between patient and provider challenging. In this literature review, three major observations can be seen.

First, individuals with low health literacy may be more vulnerable to poor patient-provider communication than individuals with adequate or proficient health literacy (Aldoory, 2017; Egbert, 2009; Feinberg et al., 2018). To be health literate, by definition, an individual must be able to find, understand and use health information (written or spoken) to make informed

decisions about their health (United States Department of Health and Human Services, 2021). In the absence of the ability to engage in effective oral communication, individuals with limited or low health literacy are less likely to receive quality patient-centered care and may be more susceptible to poor health outcomes (Aldoory 2017; Egbert, 2009).

Second, there are many contextual factors which may negatively impact patient-provider oral communication including cognitive factors, personal characteristics, and systemic clinical factors. Among cognitive factors, there are oral literacy demands (e.g., medical jargon) that may complicate the comprehension of verbal information (Roter, 2011). Among personal characteristics, there are sociodemographic factors (e.g., race/ethnicity), cultural beliefs and linguistic factors (e.g., health beliefs, native language), and biomedical factors (e.g., medical diagnoses) through which oral communication may be filtered by the patient and the provider (Chang & Kelly, 2007; Davis et al., 2020; Lambert et al. 2014; Mast & Kadji, 2018; Okunrintemi et al., 2017; Rumsfeld et al., 2013; Thornton et al., 2011). Among systemic clinical factors are concerns that medical training in health literate communication is insufficient (Ali et al., 2014; Back et al., 2019; Coleman et al., 2016; Hildenbrand et al., 2020; Saunders et al., 2019). Further, there are clinician concerns around time constraints for consultations which may limit the practice of patient-centered communication (Osborn et al., 2015; Tarn et al., 2008).

Third, the literature shows that clear communication tools, such as Teach-Back, are not widely used in clinical settings (Brooks et al., 2020; Castro et al., 2007; Collum et al., 2013; Feinberg et al., 2019; Green et al., 2014; Schwartzberg et al., 2007). Teach-Back is an evidence-based tool which can mitigate some of the negative consequences of low health literacy. *Healthy People 2030* has endorsed Teach-Back as an intervention for improving patient comprehension of health information received in clinical settings. However, there are numerous contextual

factors, both personal and systemic, which impact the use of Teach-Back. According to the literature, personal characteristics including sociodemographic factors (e.g., gender), cultural beliefs and linguistic factors (e.g., health beliefs, native language), and biomedical factors (e.g., medical diagnoses) have been inconsistently associated with Teach-Back use and with mixed results (Hong et al., 2019, 2020a; Jager & Wynia, 2012; Liang & Brach, 2017; Talevski et al., 2020; Watson, 2019).

Among the systemic clinical factors, the literature reveals concerns that medical training in clear communication strategies, such as Teach-Back, may be insufficient to support widespread implementation (Howe et al., 2017; Joseph et al. 2019; Shersher et al., 2021). Research has also revealed clinician concerns of increasing consultation lengths to implement Teach-Back in medical practice (Anderson et al., 2020; Ahrens & Wirges, 2013; Kemp et al., 2008; Klingbeil & Gibson, 2018; Marcus et al., 2014; Shersher et al., 2021). The body of research in this area, while growing, is inconclusive regarding the comprehensive factors which consistently predict clinicians' uptake of Teach-Back. Therefore, more research is needed to determine which factors, beyond medical training, enable clinicians to universally implement this efficacious patient-provider communication intervention.

CHAPTER 3. METHODOLOGY

This study addresses key observations noted in the review by (a) contributing to research on the limited health literate population and their challenges with communicative or interactive health literacy as defined by Nutbeam (2000); (b) expanding knowledge on the use of Teach-Back as a clear communication strategy after exposure to health literacy training, and (c) contributing to research on factors associated with increased use of Teach-Back in clinical practice.

The present study is a follow-up to the investigation done by Feinberg et al. (2019). The major purpose is to determine whether medical residents' use of Teach-Back, after exposure to a Teach-Back training intervention, is associated with personal characteristics of patients and/or conversation length during medical consultation. This study will specifically add to the findings that were reported by Feinberg et al. (2019). Analysis of consultation length was not included in the original study. In addition, patient personal characteristics that were not examined in the original study will be added to this study along with gender, which was the only variable found to be significantly associated with Teach-Back use among pre- and post-intervention visits. Given the present study will only examine post-intervention clinical visits, gender was included to determine if it would remain statistically significant in association with Teach-Back use.

In the original study, the medical residents' demographics were not analyzed, therefore a minor purpose of the current study is to examine whether personal characteristics of the medical residents is associated with their use of Teach-Back during medical consultations. Due to the limited number of residents included in this study, and the quantitative method chosen for the data analysis, this purpose is an exploratory one.

Research Questions

This study examines the following research questions:

1. Patient Factors:

   After an intervention administered to medical residents, is there a significant positive relationship between patients' exposure to Teach-Back by medical residents and patients' highest educational level, perceived health status, diagnoses, reason for visit, new or existing patient status, gender and/or the conversation length during consultation?

2. Medical Resident Factors:

    What are the relationships between the total number of times Teach-Back is used post-intervention and the medical resident's age, gender, race, or main language?

Based on research, the hypothesis for the first research question is that there will be a positive correlation between Teach-Back exposure and patients' (a) lower educational levels (Davis et al., 2020; Singh et al., 2018); (b) excellent or good perceived health status (Liang & Brach, 2017; Rumsfeld et al., 2013); (c) diagnoses of diabetes, hypertension or heart disease (Hong et al., 2019; Peter et al., 2015); (d) 'sick' as the reason for visit (Deveugle et al., 2002; Tarn et al., 2008); and (e) new patient status (Tarn et al., 2008). Gender was found to be statistically significant in association with pre- and post-intervention Teach-Back use in the original study (Feinberg et al., 2019). Consequently, one might hypothesize that gender will be positively associated with Teach use in the present study. However, as stated previously, the present study will examine Teach-Back use only during post-intervention clinical visits. Additionally, previous research has not consistently identified gender as a vulnerable trait among limited health literate populations, therefore, we do not have a hypothesis regarding the correlation between the patient's gender and Teach-Back exposure (Kutner et al., 2006). We also hypothesize that a longer consultation length will be positively correlated with Teach-Back exposure (Anderson et al., 2020; Klingbeil & Gibson, 2018).

Our second research question is exploratory, and we will focus on providing descriptive information; therefore, no hypotheses are associated with it.

Participants

In Feinberg et al. (2019) a total of sixteen medical residents and seventy-eight adult patients participated in the post-intervention phase of the study. All patients were age 18 years old or older and spoke English as their primary language. Each resident saw five patients except for one resident who saw only three patients (Feinberg et al., 2019).

Measures

The present study includes a portion of data collected in a larger study (Feinberg et al., 2019). To answer Research Question 1, the following data was collected:

Demographics. Patient demographics were collected using a 12-item survey administered by Graduate Research Assistants (GRAs) on the research team. The team verbally asked patients the items and recorded their responses in Qualtrics. Patient variables previously defined in Feinberg et al. (2019) include clinic ID, age, race, main language, and health literacy status. Items relevant to this study include:

Gender. "Are you male or female?"

Highest Educational Level Achieved. "What is the highest grade you finished in school?"

Perception of Health Status. *"*In general, how do you rate your health?" Check box responses included "Excellent," "Very Good," "Good," "Fair"

Reason for visit. "What's the reason for your visit here today?" – Check box responses included "Annual Check-up," "Sick visit," "Follow-up" or "Other"

Patient Status. "Are you a new or returning patient?"

Diagnosis. "Do you have, or have you ever been told that you have hypertension or high blood pressure? Diabetes? Heart disease? Lung disease?" – Check box responses included "Hypertension," "Diabetes," "Heart disease" and "Lung disease."

Conversation Length. Measured in minutes.

Exposure to Teach-Back. Yes or No

To answer Research Question 2, the following data was collected:

Demographics. Medical resident demographics were collected using a seven-item online Qualtrics survey. Previously defined medical resident variables in Feinberg et al. (2019) include clinic ID and year of post doc residency. Items relevant to this study include:

Gender.” Are you male or female?”

Age. “What’s your birthdate?”

Race. “Which of these best describes you? Check box responses included “Black or African American,” “White,” “Asian,” “Hispanic” or “Other”

Country of Birth. “Were you born in the US? If no, respondent gave short answers on follow-up questions including:

i. “What is your main language?”

Investigators collected the following data after the consultation between the medical resident and the patient.

Total Number of Times Teach-Back Used (Post). Total number of times Teach-Back used by each resident after the training intervention.

Data Collection

Below is a brief description of the procedures followed in Feinberg et al. (2019).

Patient Recruitment

Feinberg, the original Principal Investigator (PI) of the larger study (Feinberg, et al., 2019) obtained Institutional Review Board approval for the study from both the PI’s university and the medical center where data was collected. Patient recruitment was conducted in the

waiting areas of the internal medicine and family medicine clinics prior to patient visits with the residents. Before the study began, all participants were consented. A guest or spouse accompanying the patient was also consented if they were to be in the examination room with them. Participating patients received a "Healthy Living Kit" which was a reusable grocery bag, reusable water bottle, some coupons from the local grocery store, and recipe cards (Feinberg et al., 2019) to thank them for their participation in the study.

Medical Resident Recruitment

First, second-, and third-year medical residents who provided adult patient care were recruited at a regularly scheduled graduate medical education meeting where the residents were introduced to the study by the research team. Supervisors and instructors left the room during the recruitment. The research team informed the residents that they would be audiotaped during five of their clinical visits before attending a skills training intervention. After the training session, an additional five clinical visits would be audiotaped. Residents who agreed to participate were consented. The participating residents were sent a link to the demographic survey prior to the Teach-Back skills training intervention. Medical residents were not paid for participation. (Feinberg et al., 2019).

Skill Training Intervention

The Teach-Back skills training intervention was a one-hour training session presented by the PI and took place during a regularly scheduled half-day education session for the medical residents. The intervention occurred following the first phase of data collection which consisted of eighty recordings. All residents, whether they were study participants or not, attended the training session. The presentation was a one-hour Power Point session that included discussion of the first-phase results, the importance of Teach-Back, videos of Teach-Back, and examples of

Teach-Back language to use. The presentation was modeled after the "Always Use Teach-Back" training toolkit (Abrams et al., 2012). At the end of the session, time was left to address the concerns and questions of the residents. Among the concerns were the amount of additional time using Teach-Back might take, what to do if a patient was unable to Teach-Back the information, and how to address incorrect responses from the patients (Feinberg et al., 2019).

Medical Consultation Recordings

After the skills training intervention, five patient visits per medical resident were recorded. Once the patient entered the examination room, a graduate research assistant placed a tape recorder on the counter and left the room. Afterwards, the recordings were transcribed and coded for Teach-Back and patient responses using a checklist (See Appendix). Three graduate research assistants independently coded the transcripts for Teach-Back to ensure inter-rater reliability. The PI reviewed all transcripts and coding. Any conflicts were discussed and resolved between the research coordinator and the PI. A total of seventy-eight clinical visits were recorded and transcribed (Feinberg et al., 2019). Forty-one of the transcripts were coded as Teach-Back use.

Post-Intervention Transcript Review. As part of the current study, the transcripts were reviewed to track common themes and document specific phrases used to implement the Teach-Back protocol. Eighty-eight percent of the language coded as Teach-Back included initiating phrases such as "I know we talked about a lot. Can you tell me basically what the plan is?," "So can you recap for me what we talk about?" and "Can you review some of the major points when it comes to your X?." These examples were similar to the open-ended phrases in the checklist and were given credit for using Teach-Back. However, in 12% of transcripts, residents also received credit for other initiating phrases which were much more direct and closed-ended than

the model phrases provided during the skills training. For example, “What kind of medication do I want to put you on?,” “When are you going to make an appointment?,” and “So what are we going to use for it”?

Residents using Teach-Back closed the communication loop in 61% of the transcribed conversations. All but one of those conversations was closed after the first comprehension check when the patient successfully summarized information. The standard process in Teach-Back when the patient fails to summarize medical instructions in their own words is for the physician to rephrase the information and ask the patient to summarize again. There was one transcript, after the patient failed the first check, the resident rephrased and checked comprehension again with success. There was also one case, where the resident accurately followed Teach-Back protocol, and the patient failed both comprehension checks.

In the 40% of cases where the Teach-Back loop was incomplete, the resident abandoned the protocol, or the patient shut down the process. There were five cases where the patient initially failed to recap the resident’s instructions, and in response, the resident abandoned the Teach-Back protocol to quiz the patient with direct questions. For example, see the following exchange:

> Resident: So, can you summarize for me kinda what we talked about so that I know you understand what we talked about?
>
> Patient: Yeah. Um. Well.
>
> Resident: What are we going to do for the shoulder?
>
> Patient: The um exercise.
>
> Resident: Your pain. What are we going to do?
>
> Patient: I’m not sure.
>
> Resident: So, I’m going to give you exercises right?

Patient: Yeah, you right.

Resident: On a paper.

Patient: I mean yeah. I was confused. I said exercises…

Resident: It's okay

Resident: but we're going to do exercises and what else?

Patient: and ibuprofen

Resident: Mhm. How often?

Patient: Three times a day.

Resident: Good.

In the above instance, the resident begins the Teach-Back protocol with the open-ended question, "Can you summarize…what we talked about?." When the patient fails to summarize their instructions, the resident follows up with specific questions before repeating the information. The resident does not ask the patient to summarize the instructions again in their own words. Although the patient was able to correctly answer some questions, the Teach-Back loop was not closed. Here is another example:

Resident: Can you tell me what the plan is? Okay so we can make sure we are on the same page?

Patient: Okay.

Resident: So we are going to send the bloodwork and call you either this evening or tomorrow morning with the results and –

Patient: You will call me with the results?

Resident: Mhm

Patient: Okay

In the above instance, the resident opens with the Teach-Back protocol, an open-ended question, “Can you tell me what the plan is.” When the patient just says, “okay,” the resident follows the protocol and rephrases the information. However, there is no opportunity given to the patient to summarize, in their own words, what they were told the second time around. In the next exchange, a resident again reverts to quizzing the patient:

Resident: See if you can tell me what we’re going to do?

Patient: Okay.

Resident: Could you tell me what you’re going to do for the blood pressure?

Patient: The blood pressure?

Resident: Yeah

Patient: I think it’s good. You said it’s good right?

Resident: Yes blood pressure is good…which medications are you on for blood pressure?

The patient answers correctly and the resident continues the consultation using a question-and-answer format. The patient is not asked to summarize the discussion in their own words again. Despite the patient’s willingness to try to summarize instructions, the resident changed technique when difficulties arose. There were three other instances where patients did not summarize instructions. In one example, the patient responded, “…I’m just gonna stick with the plan and do what I have to do and mostly watch over myself really.” In another instance, the patient responds with “Okay.” In the third instance, the patient says multiple times, “You’re asking me what I am going to be doing?” before attempting to parrot the resident’s words.

Teach-Back places the responsibility for effective communication on the healthcare professional. Consequently, the language should reflect that this strategy is not a test of the

patient's knowledge but rather as a test of how well the healthcare professional communicated the information. For example, medications, a complex topic with unfamiliar words, were discussed in 68% of the transcripts. However, only a third of the transcripts reflected the residents' use of language that took ownership for clear communication with the patient such as "I know we talked about a lot…" or "Just to make sure we're all on the same page…" or "I want to make sure you kinda understood everything….." There was one case that was only partially transcribed because the patient was accompanied by a guest who communicated with the resident. In the original study, any spouse/guest comments were deleted prior to coding (Feinberg et al., 2019).

Data Analysis

The data were analyzed using SPSS 26.0. Descriptive statistics including means and frequencies were run. The sample size for patient data was seventy-eight. The first research question looked for a relationship between exposure to Teach-Back and patient variables including highest educational level achieved, perceived health status, diagnoses, reason for visit, new or existing patient status, gender, and conversation length. Chi-squared test of independence was run to understand the relationship between the categorical patient variables. The Chi-squared test of independence reveals whether the value of one variable is associated with or dependent on another variable. There are two main assumptions for the Chi-squared test which are a) independent observations and b) for two-by-two tables all expected frequencies are greater than five. These assumptions were evaluated for all the categorical variables in the research question.

Conversation length is a continuous predictor; consequently, a different method was needed to determine any potential relationship between conversation length and the categorial variable, exposure to TeachBack. For the Pearson *r* correlation, both variables should be

normally distributed and continuous. However, exposure to TeachBack failed this assumption. Consequently, the more appropriate method to use is nonparametric correlation. Nonparametric correlations make no assumptions about the shape of the distribution of the data. In other words, this method still applies when the normality assumption for other parametric methods is violated.

There are few options to choose from among nonparametric correlations. Among them are Spearman's rho and Kendall's tau. Spearman's rho, also known as Spearman rank correlation, measures the degree association between two variables and is appropriate to use when the variables are at least on an ordinal scale and monotonically related to each other (How2stats, 2011a, 2011b; Janzen, 2019). Kendall's tau is also a nonparametric correlation used to measure the strength of dependence and direction of association between two variables (How2stats, 2011a, 2011b; Janzen, 2019). It can only be used with data that is either continuous or ordinal, and the variables are monotonically related to each other (How2stats, 2011a, 2011b; Janzen, 2019). The conversation length variable and exposure to TeachBack could work with either of the nonparametric methods. However, Kendall's tau tends to be less sensitive to outliers than Spearman's rho with more accurate p values at smaller sample sizes (How2stats, 2011a, 2011b; Janzen 2019). Consequently, Kendall's tau produces a more conservative correlation than Spearman's rho (How2stats, 2011a, 2011b; Janzen, 2019). In these situations, Kendall's tau is a better alternative to the Spearman rank correlation. Given the nature of the variables in this study, Kendall's tau was used for the nonparametric correlation between conversation length and exposure to TeachBack.

If any of the correlations were statistically significant, a logistic regression was conducted for each relevant predictor, individually, to determine which predictors, if any, were statistically significant. After this, a binary logistic regression was run for all the statistically

significant predictors, simultaneously, to look for significant interactions between predictors, if any.

The sample size for medical resident data was 16. The second research question looked at relationships between the total number of times the medical resident used Teach-Back post-intervention and medical resident demographic characteristics including age, gender, race, and main language. The proportion of Teach-Back use was calculated for each resident, combining all the patients they saw in consultation (up to five patients each). Given the small sample size of medical residents, a non-parametric correlation, Kendall's tau, was run to evaluate the association between the predictors and the proportion of Teach-Back use.

CHAPTER 4. RESULTS

Sample characteristics

Feinberg et al. (2019) reported demographic information about the158 patients in the larger study. The present study focused on a subset from that original sample which were the 78 patients involved the post-intervention clinical visits. Most of these patients were female (54%) and African American (44%). The remaining racial groups included White (30%), Hispanic (12%), Asian and Other (10%). Patients' average age was 48 years old. Eighty-six percent listed English as the main language spoken at home. Sixty-four percent of the patients visited the family medicine clinic. According to their NVS scores, 54% of the patients had the possibility or high likelihood of limited health literacy.

Demographic information pertinent to the variables in this study is reported in Table 1. Most patients had some high school education (40%). A similar proportion had some college or a college degree, 28% and 29% respectively. Forty-four percent responded their Perceived Health Status was good while 32% said Fair. The highest reported diagnoses were hypertension (64%)

followed by diabetes (33%). Seventy-four percent of patients were existing or returning patients. Almost half of patients (49%) reported the reason for the clinical visit was for follow-up to a prior visit. Twenty-three percent cited other reasons for the visit and 19% reported an annual check-up as their reason. The average conversation length with the doctor was approximately 24 minutes. Over half (53%) of the patients experienced Teach-Back during their clinical visit with residents.

Feinberg et al. (2019) reported demographic information about the16 medical residents in the larger study. Most of the residents were male (63%) and White (56%). Other racial groups. represented included African American (13%), Asian (19%), Hispanic (6%) and Other (6%). Sixty-three percent of the residents were at family medicine clinics and 37% at internal medicine clinics. Half (51%) were first-year residents and almost a third (31%) were second-year residents.

Table 1

Sociodemographic Characteristics of Patients

N=78	N	%
Gender		
Male	36	46
Female	42	54
Highest Grade Achieved		
6th to 8th grade	2	3
9th to 12th grade	31	40
Some college but no degree	22	28
College degree	23	29
Perceived Health Status		
Excellent	4	5
Very Good	15	19
Good	34	44
Fair	25	32
New or Returning Status		
New Patient	20	26
Returning Patient	58	74
Diagnoses		
Hypertension	50	64
Diabetes	26	33
Heart Disease	4	5
Lung Disease	6	8

Table 1

Sociodemographic Characteristics of Patients Continued

N = 78	**N**	**%**
Reason for visit		
Annual check up	15	19
Sick visit	7	9
Follow up to prior visit	38	49
Other	18	23
NVS Scores		
0 – 1 **(**High likelihood of LHL*)	20	26
2 – 3 (Possibility of LHL*)	22	28
4 – 6 (Adequate HL**)	36	46
Exposure to Teach-Back	41	53

*limited health literacy; ** health literacy

In addition to the variables described by Feinberg et al. (2019), the age of medical residents ranged between 26 and 31 years old with the average age at 28.31 years old. Table 2 shows the other medical residents' demographic characteristics pertinent to the present study. As indicated in the table, 81% percent reported English as the main language spoken at home. Over half (63%) the residents used Teach-Back 41 times, cumulatively, after attending the training intervention.

Research Questions

Research Question I

The first research question asked the following:

After an intervention administered to medical students, is there a significant relationship between patients' exposure to Teach-Back by medical residents and patients' highest

educational level, perceived health status, diagnoses, reason for visit, new or existing patient status, gender and/or the conversation length during consultation?

Table 2

Sociodemographic Characteristics of Medical Residents

N=16	**N**	**%**
Gender		
Male	10	63
Female	6	37
Race		
Black or African American	2	13
White	9	56
Asian	3	19
Hispanic	1	6
Other	1	6
Main Language		
Arabic	1	6
Bosnian	1	6
Chinese	1	6
English	13	81
Residents using Teach-Back Post-intervention	10	63

This question looked at the relationship between exposure to Teach-Back and patient variables including highest educational level achieved, perceived health status, diagnoses, reason for visit, new or existing patient status, gender, and conversation length. A bivariate analysis

using the Chi Square Independence test was run for each patient variable to understand the relationship between the predictors and exposure to Teach-Back. The results shown in Table 3 revealed New or Returning patient status was significantly associated with Exposure to Teach-Back use ($p < .05$) after the residents' participation in the skills training intervention. Notably, gender, which had a statistically significant association with Teach-Back use in the larger study, did not sustain the relationship in the smaller sample targeting only post-intervention clinical use. As shown in Table 4, a Kendall's tau correlation revealed conversation length was also significantly associated with Exposure to Teach-Back ($r_t = .307$, $p < .01$).

A logistic regression was run for both statistically significant predictors individually and the results are shown in Table 5 and Table 6. The results in Table 5 show a positive regression coefficient (B=1.306) and OR > 1 (3.692) associated with the patient's status as a new patient and was statistically significant ($p < .05$). This is interpreted to mean new patients were more likely to be exposed to Teach-Back during the clinical visit than returning patients. Specifically, the odds of a new patient being exposed to Teach-Back (Y=1) were 3.692 times that of the odds of a returning or existing patient being exposed to Teach-Back during the clinical visit. In Table 6, results show the regression coefficient for conversation length (converted to average conversation length) was positive and a statistically significant predictor of probability of exposure to Teach-Back ($B = .067$, $p < .0$). This indicates the likelihood of being exposed to Teach-Back increased with increases in conversation length. The odds ratio for conversation length is 1.070 meaning the odds of being exposed to Teach-Back increased by a factor of 1.070 with every one-minute increase in conversation length.

Table 3

Chi Square Association Test for Patient Variables in Research Question 1

Personal Characteristics	No TeachBack		TeachBack		χ^2	df
	n	%	n	%		
Gender					3.439	1
Male	13	35.1	23	56.1		
Female	24	64.9	18	43.9		
Reason for visit					5.053	2
Annual	10	27.0	5	12.2		
Sick or Follow-up	22	59.5	23	56.1		
Other	5	13.5	13	31.7		
New or Returning Patient					5.430*	1
Returning	32	86.5	26	63.4		
New	5	13.5	15	36.6		
Diabetes					.026	1
Yes	27	65.9	14	34.1		
No	25	67.6	12	32.4		
Hypertension					.115	1
Yes	14	34.1	27	65.9		
No	14	37.8	23	62.2		
Heart Disease					**	**
Lung Disease					**	**
Perceived Health Status					2.588	2
Excellent/Very Good	7	18.9	12	29.3		
Good	15	40.5	19	46.3		
Fair	15	40.5	10	24.4		

Table 3 continued

Chi Square Association Test for Patient Variables in Research Question 1

Personal Characteristic	No TeachBack		TeachBack		χ^2	df
	n	%	N	%		
Highest Educational Level Achieved					.597	2
6^{th} to 12^{th} grade	17	45.9	16	39		
Some College	9	24.3	13	31.7		
College Degree	11	29.7	12	29.3		

*p <.05
** 50% of cells has expected count < 5

Table 4

Correlation Table for Conversation Length and Exposure to TeachBack*

Variable	N	1	2
1. Conversation Length	78	-	.307**
2. Exposure to TeachBack	78	.307**	-

*Kendall's tau_b correlation

**p < .01 (two-tailed)

Table 5

Regression of Associations between Patient's Exposure to Teach-Back and New or Returning Patient Status

Variable	B	SE	Wald	df	Sig.	Exp(B)	95% CI
NewPatient	1.306	.580	5.073	1	.024*	3.692	[1.185, 11,507]
Constant	-.208	.264	.618	1	.432	.812	

*p < .01

Table 6

Regression of Associations between Patient's Exposure to Teach-Back and Conversation Length

Variable	B	SE	Wald	df	Sig.	Exp(B)	95% CI
AvgConvoMin	.067	.025	7.218	1	.007*	1.070	[1.018, 1.123]
Constant	-1.502	.634	.5.619	1	.018	.223	

*p < .01

A binary logistic regression was run using both predictors and the results are shown in Table 7. With both predictors in the regression, only conversation length was a statistically significant predictor of exposure to Teach-Back (B = .061, p < .05). The likelihood of being exposed to Teach-Back rose with increases in the conversation length during consultation. The odds ratio for conversation length was 1.063 meaning the odds for being exposed to Teach-Back increased by a factor of 1.063 with every one-minute increase in conversation length when controlling for new or returning patient status. Longer conversations increased the odds of exposure to Teach-Back. Although the slope for New or Returning patient status is positive, it was not statistically significantly different from zero (B = 1.132, p = .059).

Table 7

Regression of Associations between Patient's Exposure to Teach-Back and Patient Variables

Variable	B	SE	Wald	df	Sig.	Exp(B)	95% CI
NewPatient	1.132	.600	3.556	1	.059	3.101	[.956, 10.055]
AvgConvoMin	.061	.025	5.906	1	.015*	1.063	[1.012, 1.117]
Constant	-1.636	.651	.5.619	1	.018	.223	

*p < .01

In summary, results indicated that new patient status and conversation length showed a significant relationship to patients' exposure to Teach-Back by medical residents. However, when both factors were present in a regression model, only conversation length was a statistically significant predictor. The other variables, including highest educational level, perceived health status, diagnoses, reason for visit, and gender did not show any significant relationship to patients' exposure to Teach-Back by medical residents.

Research Question II:

The second research question asked the following:

> What are the relationships between the total number of times Teach-Back is used post-intervention and the medical resident's age, gender, race, or main language?

This question looked at relationships between the total number of times the medical resident used Teach-Back post-intervention and medical resident's demographic characteristics including age, gender, race, and main language. Table 8 shows the proportion of Teach-Back use for each resident, combining all the patients they saw in consultation (up to five patients each). Table 9 shows the proportion of total residents using Teach-Back during visits. Of the sixteen residents, 63.5% used Teach-Back after attending the skills training intervention. This included 31% of total residents who used Teach-Back with each of their patients (100%). Given that two of the residents were using Teach-Back before and after attending the skills intervention, there was a net increase of eight residents (50%) who began using the strategy after training. Six residents (37.5%) did not use Teach-Back with any of their patients. As shown in Table 10, there were no statistically significant results from the non-parametric correlation test of association. In other words, no significant relationships were found between the total number of times Teach-Back was used post-intervention and the medical resident's age, gender, race, or main language.

Table 8

Proportion of Residents' Patients Exposed to Teach-Back

Resident	Proportion (%)
1	100
2	80
3	40
4	0
5	0
6	60
7	80
8	0
9	0
10	60
11	0
12	100
13	100
14	0
15	100
16	100

Table 9

Proportion of Total Residents Using Teach-Back During Clinical Visits

Proportion Exposed to TB (%)	Number of Residents	Total Residents (%)
0	6	37.5
40	1	6.3
60	2	12.5
80	2	12.5
100	5	31.3
Total	16	100.0

Table 10

Correlation Table Medical Resident Characteristics and Proportion of TeachBack Use*

Variable	n	1	2	3	4	5
1. Age	16	-	-.241	.149	.118	-.301
2. Gender	16	-.241	-	-.372	-.098	.295
3. Language	16	-.149	-.372	-	.101	-.199
4. Race	16	.118	-.098	.101	-	-.327
5. Proportion of Teach-Back use	16	-.301	.295	-.199	-.327	-

*Kendall's tau_b correlation

CHAPTER 5. DISCUSSION

The purpose of this study was a follow-up investigation to the study documented in Feinberg et al. (2019). The first research question asked whether there was a significant positive relationship between patients' exposure to Teach-Back by medical residents, after attending training, and patients' highest educational level, perceived health status, diagnoses, reason for visit, new or existing patient status, gender and/or conversation length during consultation. The results revealed that only two of our hypotheses were supported, namely only new patient status and conversation length during the consultation were associated with patients' exposure to Teach-Back. Gender was included in this study to determine if it would still maintain a statistically significant association with Teach-Back use when only examining the post-intervention visits. It did not; however, the sample size compared to the larger study is almost cut in half. Additionally, there were two fewer post-intervention visits than in the pre-intervention period. Nonetheless there is no guarantee Teach-Back use would have occurred in those visits. Ultimately, none of the other patients' personal characteristics were found to be predictors of exposure to Teach-Back during consultation with the medical residents. Although, the results indicated that new patient status and conversation length showed a statistically significant positive relationship to patients' exposure to Teach-Back by medical residents, when both factors were included in the regression model only conversation length was a statistically significant predictor.

Not only were new patients more likely to experience Teach-Back during their visit than returning patients, but the odds of Teach-Back use were 4 times that of existing patients. As discussed in the literature review, patients who are new to the doctor or who are presenting new complaints are typically associated with longer consultations (Deveugele et al., 2004, 2002;

Wilson, 1991). Physicians may take more time getting to know the patient and what brought them into the doctor's office. They may also spend more time discussing medication with patients who are unfamiliar with the drug (Tarn et al., 2006, 2008). The transcripts from the post-intervention clinical visits support this idea as medication was a major topic in the conversations featuring Teach-Back. Twenty patients were classified as 'new' in this study. Fifteen were exposed to Teach-Back.

The results in this study confirmed that patients with lengthier conversations with residents were more likely to experience Teach-Back than patients with shorter consultations. In fact, the odds of experiencing Teach-Back increased with each extra minute of consultation time. Although inconclusive in the literature, time constraints have been a perceived barrier to patient-centered care approaches and shared-decision making between physician and patient (Caverly & Hayward, 2020; Caverly, Hayward & Burke, 2018; Chung, Juang, & Li, 2019; Légaré & Thompson-Leduc, 2014; Legare, Ratte, Gravel & Graham, 2008; Pieterse, Stiggelbout & Montori, 2019). Previous research supports the finding that Teach-Back potentially lengthens limited consultation time and, consequently, may be a perceived deterrent for clinical use (Anderson et al., 2020; Ahrens & Wirges, 2013; Kemp et al., 2008; Klingbeil & Gibson, 2018; Marcus et al., 2014; Shersher et al., 2021). Teach-Back is an iterative process that requires the clinician to check for understanding and when necessary, modify explanations of medical information before repeating the process (Kemp et al., 2008; Schillinger, 2003). Results for this study revealed the average conversation length for all consultations was approximately 24 minutes. The average conversation length for consultations involving Teach-Back was longer at 27.5 minutes. While a statistically significant finding, whether an additional 3.5 minutes is practically significant may be debatable. It cannot be stated for certain if this were a

consideration in the 37 consultations where Teach-Back was not used; however, this could be an area for future study. Finally, when combining new patient status with conversation length in the binary regression equation, we found only conversation length was the only consistent indicator that the medical resident used Teach-Back with a patient.

The second research question was an exploratory examination of the relationships between the total number of times Teach-Back was used post-intervention and the personal characteristics of the medical residents including age, gender, race, and main language spoken in the home. As previously found in Feinberg et al. (2019), the results showed that 10 out of 16 residents did use Teach-Back after the training, which was an increase compared to the number of residents using it in pre-intervention visits. Almost a third of them used Teach-Back with all five of their patients. However there were no statistically significant correlations between any of the residents' personal characteristics and their proportion of Teach-Back use. Due to the small sample size of residents, an inferential conclusion could not be drawn from the data, and further research is needed.

This study aimed to address key observations in the literature review in several ways. First, it contributes to research on patient-provider communication and the limited health literate population concerning their challenges with communicative or interactive health literacy as defined by Nutbeam (2000). As a follow-up study to Feinberg et al. (2019), this investigation revealed evidence of potential communicative health literacy challenges between the medical residents and their patients who were largely classified as possibly or highly likely having limited health literacy. Observations from the transcripted post-intervention consultations revealed the potential difficulties many of the patients had. Specifically, for reasons undetermined, we know some patients failed to repeat medical instructions in their own words

when asked to do so. More information is needed to determine whether health literacy status may have been a factor in their response.

Second, the study expanded knowledge on the use of Teach-Back, as a clear communication strategy, after exposure to health literacy training. Feinberg et al. (2019) found that after a skills training intervention, Teach-Back use increased among the medical residents. This study expanded on that finding by revealing the medical residents' fidelity to the Teach-Back protocol in execution. In almost 90% of the transcripts coded for Teach-Back, the medical residents used language matching the protocol. In more than half of the transcripts, the residents faithfully executed the steps in the strategy, closing the communication loop. In the remaining cases, the steps were either partially executed or the patient shut down the process after the initial request to repeat instructions. These observations were both indicative of how well the training was translated to practice and insightful regarding opportunities for follow-up training on strategy execution.

Finally, the study contributed to research on factors associated with increased use of Teach-Back in clinical practice. Beyond the findings mentioned previously in Feinberg et al. (2019), this study found that Teach-Back use was associated with new patient status and longer consultations between medical residents and patients. However, results examining associations between patient's (a) highest education level; (b) perceived health status; (c) diagnoses; (d) reason for clinical visit; or (e) gender and exposure to Teach-Back were not significantly related.

Limitations

This study has several limitations. First, as noted in the description of the transcripts, the residents were given credit for Teach-Back regardless of whether the iterative communication loop was closed. In other words, if the resident began Teach-Back with an opening inquiry for

the patient to recall instructions or information in their own words, it counted as full execution of the strategy. If the resident failed to ask the patient to repeat instructions after rephrasing the information, or if the patient was inaccurate following the rephrasing, full credit for Teach-Back was still granted. This differs from the protocol taught for proper execution of Teach-Back during the intervention training because the communication loop was not closed. Consequently, the number of residents who fully executed the Teach-Back protocol may not be accurately interpreted.

Second, the typical analysis for these data is hierarchical linear modeling (HLM). HLM considers the nature of the data being nested. In other words, the observations were not assumed to be independent because up to 5 of the patients were seen by the same medical resident and in the same clinic. Instead, a less complex data analysis, described in the previous section, was employed. The medical resident data was also nested, and the sample size was small. Consequently, a simple exploratory descriptive analysis was conducted limiting the conclusions that could be drawn from the data.

Future Research

There are several implications for future research. First, to get a proper understanding of the relationships between the patient variables in this study, given the nested nature of the data, an HLM study should be conducted with a larger sample size. Second, while new patient status was associated with Teach-Back exposure, it was not a statistically significant predictor in the final regression model when consultation length was included. More research is warranted to further understand this finding. In addition, it was surprising that so many personal characteristics were not associated with Teach-Back exposure. The next step could be to revisit

the study with a larger sample size to ensure enough variability of the personal characteristics to evaluate for associations with Teach-Back exposure.

Third, it would be interesting to learn more about the patients' reactions to their Teach-Back experience. From the literature, we know longer consultations are associated with higher patient satisfaction with the doctor (Cape, 2002; Deveugele et al., 2002; Jager & Wynia, 2012; Sim et al., 2016; Sadeghi et al., 2013). Does Teach-Back contribute to that reaction or does it have no effect? As reported by Feinberg et al. (2019), most of the patients in this study had adequate to limited health literacy. Did experiencing Teach-Back position them for growth in interactive health literacy? In other words, did the exercise empower them to communicate any confusion or boost confidence to execute their doctor's instructions? More qualitative research could shed some light on these questions. Future extensions of this line of research may include examining the long-term effect of Teach-Back exposure on the patient's development of critical health literacy. As Nutbeam (2000) describes it, critical health literacy requires advanced cognitive and social skills which will allow patients to critically analyze health information and use it to increase personal agency.

Fourth, whether Teach-Back significantly extends the length of consultations is still debatable. Given time constraints remain a systemic concern about implementing this tool, more research on the efficacy of Teach-Back may be useful to evaluate the cost/benefit ratio for longer consultation times for patients (e.g., better disease self-management) and medical staff (e.g., fewer time-consuming follow-up phone calls). Finally, after the skills training intervention, 63% of the residents used Teach-Back with 40 to 100% of their patients in the study. There were six who did not attempt to use Teach-Back at all. However, the resident data was nested complicating the interpretation of the data. Consequently, to properly understand the

relationships between the personal characteristics of the physicians and Teach-Back use, next steps would call for an HLM study with a larger sample size of medical residents.

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APPENDIX

Transcription Coding Checklist for Teach-Back (Examples)

1. I gave you a lot of information and I want to make sure I was clear --- what are you supposed to do to take care of X?
2. What will you tell your spouse about today's visit?
3. Can you repeat what I told you about your medicine?
4. We've talked about a lot of things. What is our plan for treating your X?
5. Can you summarize what I've told you?
6. What else are you going to do the next time?
7. If someone asks you, what would you be doing until we follow up again, what would you tell them?
8. Tell me how you understand our plan?
9. So, for the X, can you tell me what you're going to do?

Adapted from "Perception Versus Reality: The Use of Teach-Back by Residents," by I. Feinberg, M. M. Ogrodnick, R. C. Hendrick, K. Bates, K. Johnson, and B. Wang, 2019, *Health Literacy Research and Practice,* 3(2), e117-e126. https://doi.org/10.3928/24748307-20190501-01