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The Newest Vital Sign's Impact on Provider Communication

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THE NEWEST VITAL SIGN'S IMPACT ON PROVIDER COMMUNICATION

by

Adam Drent

A Thesis Submitted in

Partial Fulfillment of the

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ABSTRACT

THE NEWEST VITAL SIGN'S IMPACT ON PROVIDER COMMUNICATION

by

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The University of Wisconsin-Milwaukee, 2014
Under the Supervision of Professor Hayeon Song

Despite the growing concern over the issues related to low health literacy there has been little research done on the connection between health literacy screening and patient-provider communication. This study thus explores whether or not reporting scores from the health literacy screening tool the Newest Vital Sign (NVS) increases the use of certain techniques recommended for communicating with patients who have low health literacy.

Data was collected at the Sixteenth Street Community Health Center at Parkway as part of the Health Literacy Performance Improvement Module by the American Board of Pediatrics. Before pre- and post-conditions began, participating pediatricians were given a brief education session on the concerns related to health literacy and the recommended techniques for communicating with patients who have low health literacy. Between the conditions an intervention was administered that consisted of another education session on the NVS and the teach-back technique specifically. NVS scores were not reported to the pediatricians in the pre-intervention condition, while it was reported in the post-intervention condition.

Results indicate the intervention and reporting of NVS scores did increase the use of the teach-back technique. Patient satisfaction also increased after the intervention. On the other hand, the other recommended communication techniques were not used more frequently by

pediatricians, probably because they were already utilized at a high rate, even prior to the intervention.

Though teach-back did increase after the intervention, more research should be done to further investigate the utility of health literacy screening as well as ways to efficiently increase the rate of the teach-back technique.

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Health literacy is defined as, the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions (Ratzan & Parker, 2000). The 2006 report, *The Health Literacy of America's Adults: Results from the 2003 National Assessment of Adult Literacy*, (NAAL), made the case for low health literacy (LHL) as a national problem and the statistics from the report have been cited in numerous publications addressing health literacy concerns. There are serious, negative implications for those individuals identified as having LHL. According to Dewalt and his colleagues (Dewalt , Berkman, Sheridan, Lohr & Pignone, 2004), patients with LHL have poorer health outcomes, become sick or injured more often, use health resources less and have a worse health status in general The report indicates those with LHL are in general, “1.5 to 3 times more likely to experience a given poor outcome” (Dewalt et al., 2004, p.1228).

The Institute of Medicine found that individuals with LHL reported poorer health statuses and were less likely to use preventive care (Nielsen-Bohlman, Panzer & Kindig, 2004). Additionally, results from the NAAL state adults with ‘*Below Basic*’ health literacy are more likely to lack health insurance than adults with ‘*Proficient*’ health literacy (Kutner, Greenberg, Jin & Paulson, 2006). Because of not being insured, not using preventative care and misusing resources one study estimates the cost of LHL to the Nation’s economy to be between \$106 and \$236 billion U.S. dollars (USD) annually (Vernon, Trujillo, Rosenbaum, & DeBuono, 2007).

People with LHL understand illnesses less and are more likely to mismanage their health (Kountz, 2009). People with LHL are less likely to understand written and oral information given by physicians, nurses, pharmacists, and insurers, less likely to act on necessary procedures and directions such as medication and appointment schedules, and are less likely able to navigate the health system to obtain needed services (Baker et al., 2006). According to a Center for

Health Care Strategies Fact Sheets on Health Literacy people with LHL cause higher health care costs. A study of Medicaid patients revealed that the annual health care costs were four times higher for people who had lower than a third-grade reading level as compared to the overall Medicaid population (Center For Health Care Strategies [CHCS], 2013).

The National Action Plan to Improve Health Literacy identifies people with LHL as: adults over the age of 65 years, racial and ethnic groups other than white, recent refugees and immigrants, people with less than a high school degree or GED, people with incomes at or below the poverty level and non-native speakers of English (National Action Plan to Improve Health Literacy, 2010).

Although literacy and health literacy are not synonymous they are intimately connected. According to DeWalt et al. (2004), patients with low literacy have poorer health outcomes, general health status, use of health resources, and measures of morbidity. His study also indicates that patients with low literacy were in general up to three times more likely to experience a poor health outcome (Dewalt et al., 2004).

Despite the critical role of health literacy in patient-provider communication, currently, most medical systems do not assess the health literacy of their patients in order to make practical adjustments to care. Instead, most health systems rely on the Joint Commission's universal approach, in which all patients are to receive the recommended techniques for patients with LHL, although different patients require different care, and communication tailoring is more appropriate than treating all patients the same. Perhaps most health system rely on the universal approach is because there simply isn't enough data on how utilizing screening tools actually impacts communication with patients and specifically those with LHL.

Thus, the current study tests the effectiveness of utilizing a health literacy screening tool in doctor-patient communication. Specifically, two conditions will be compared. In the first condition, the health literacy tool will be used but the scores will not be reported. In the other condition, on the other hand, the health literacy level of each patient will be reported to the participating pediatricians. In addition, before those two conditions the pediatricians become encouraged to tailor toward individuals with low health literacy by more frequently utilizing communication strategies to enhance patients' comprehension. If the screening tool results in higher frequency of the recommended communication techniques as compared to the universal approach, screening tools can be justified as tactics that improve provider communication, specifically for individuals with LHL.

Combating Low Health Literacy

Communication Techniques for those with Low Health Literacy

The burden of LHL is not on patients but providers (Nielsen-Bohlman et al., 2004). Numerous techniques exist for providers to use to improve interpersonal communication with patients such as speaking slowly, using non-medical, jargon-less language and checking for comprehension that can help prevent some of the issues associated with LHL. Other strategies for providers to assist those with LHL are uncovering health beliefs and tailoring communication. Additionally, research suggests providers limit the number of key points discussed with patients to three or less (Kripalani & Weiss, 2006). Providers are often prompted to use specific techniques such as a teach-back, where patients explain medical instructions in their own words. The teach-back allows physicians to check if the patient has comprehended the critical information. Providers are also encouraged to spend more time listening to patients in

order to create an atmosphere of respect and comfort, which builds trust with the patient (CHCS, 2013).

One of the most important components of clear communication involves checking for comprehension. Merely asking if the patient has questions or if they understand is ineffective however for assessing how much the patient actually understands about their medical instruction. Instead, providers should promote questions with language like, “What questions do you have?” because this suggests the patients should have questions and gets them to take a more active role (Kripalani & Weiss, 2006). Checking for comprehension and the other recommended communication techniques such as speaking slower and using non-medical language are encouraged because they increase the likelihood patients will understand their medical instruction. This is essential because when a patient does not understand their medical instruction they are more likely to have poor health outcomes because of simple mistakes like misusing their medication. These preventable mistakes can lead to re-hospitalization, which incur even greater costs to health systems because as previously mentioned those with LHL often lack health insurance (Kutner et al., 2006).

The Schwartzber et al. (2007)’s study expanded the list of patient-provider communication techniques recognized to combat LHL. The study shows how frequently the recommended techniques are used by different health care providers. According to the study 288 of 304 or 94.4% of providers reported routinely using simple language. In the study, 99.2% of the health care professionals reported having incorporated at least one of the identified communication techniques routinely in their clinical practice. Additionally, 70.7% of participants reported using five or more communication techniques most of the time or always (Schwartzberg, Cowett, Vangeest & Wolf, 2007). For the complete list see Table1.

The study indicates using simple language, handing out printed materials, speaking more slowly and reading instructions aloud were the most regularly used strategies. However, certain techniques and strategies recommended were used less routinely and of the more advanced techniques examined; none were used by a majority of those surveyed. For example, only 39.5% of the health care professionals routinely used the teach-back technique (Schwartzberg et al., 2007).

The Teach-back Technique

As mentioned some of the recommended techniques for physicians and medical staff are speaking slowly, using simple language, reading written instructions aloud and explaining them, however only the teach-back technique checks for comprehension. A teach-back is medical term used for a patient comprehension technique, which is used to evaluate a patient's understanding of information and instruction. A teach-back involves a doctor, nurse, pharmacist etc. asking patients to repeat the medical information and instructions they were just given in their own words. The teach-back entails the provider using an open ended question like, "how would you explain the directions/information in your own words?" or "how would you explain the direction/information to a friend?" to replace the close-ended question, "do you understand?" This technique has been reported as being a more effective way of checking for comprehension.

Schillinger et al. (2003) showed that using the teach-back technique to assess comprehension was associated with better glycemic control for patients with diabetes. This study implies teach-back technique is directly related to improved health outcomes. In addition to improving retention of information, the teach-back technique provides an opportunity to correct any misunderstandings and reiterate critical information that was not remembered. However the

study found that physicians rarely checked for comprehension, less than 25% of time for across the board.

In a study on communication techniques for patients with LHL, using simple language was (Schwartzberg et al., 2007) reported as a routinely used technique 94% of the time, speaking slowly was reported 67% of time, reading instruction aloud was reported 59% of the time, but teach-back was only reported as used routinely 39% of the time. According to Jager and Wynia (2012), some physicians are only giving teach-backs to patients from the demographic groups where lower literacy is more common. This study suggests those outside of these demographic groups are not getting the necessary care.

Schwartzberg and his colleagues (2007) show that the biggest discrepancy between a communication technique and its perceived effectiveness was the use of the teach-back technique. Physicians reported using the teach-back technique routinely 35% of the time, Pharmacists and RNs reported 27.7% and 60.5% respectively. The teach-back technique ranked 3rd highest for perceived effectiveness of the communication strategies listed in the study. Simple language was perceived as the most effective at 96.1%, followed by asking if patient would like family member present at 92.9% and teach-back at 92.8%. While the teach-back technique is perceived as effective it is not reported as being routinely used with similar percentages as other techniques. The teach-back technique had 39.5% routine use compared to 92.8% for perceived effectiveness. According to this study the teach-back technique has the greatest disparity among strategies for effectiveness and routine use (Schwartzberg et al., 2007). Because of the disparity between effectiveness and actual usage of the teach-back technique studies testing ways to increase usage of teach-backs are important to combating LHL.

The Joint Commission recommends currently calls for a universal approach to addressing health literacy issues (The Joint Commission, 2007). This approach expects that providers are using the recommended techniques with every patient they see. While it is true all patients would benefit from the recommended techniques including the teach-back technique, some patients need additional care. Also studies show providers are not consistently using the communication techniques therefore finding ways to make sure techniques are used with greater frequency with patients at the LHL levels is essential. The universal approach can break down if physicians are only using the some of the techniques some of the time.

Perhaps this is due to the additional time it teach-back takes to administer; time is cited as one of the greatest barriers to implementing it (Schlichting et al., 2007; Welch, VanGeest & Caskey, 2011). Because of time restraints it may not be possible to use the teach-back with all patients, and while everyone would benefit from receiving a teach-back, those who suffer from LHL would benefit most. Studies also show certain techniques are used regularly when providers become aware of the problems surrounding LHL, except for teach-back (Schwartzberg et al., 2007). As a result, some have called for the implementation of screening of health literacy in primary care to help clinicians better identify at-risk patients and to trigger the teach-back technique (Chew, Bradley & Boyko, 2004; Jeppesen, Koyle & Miser, 2009; Johnson & Weiss, 2008; Nielson-Bohlman et al., 2004; Weiss et al., 2005).

Health Literacy Screening and the NVS

Health Literacy screening to tailor communication

In practice, health providers often use physical characteristics as a quick and dirty way to estimate the health literacy level of the patient. It can be inaccurate to predict an individual's

health literacy level based on demographic trends, and thus healthy literacy screening tools must be implemented to identify individuals with LHL. The main benefit of screening patients individually is to allow staff to tailor messages for those who have the hardest time understanding health information (VanGeest, Welch, & Weiner, 2010).

Tailored messages are defined as those individually crafted based on the unique characteristics of each person (Hawkins, Kreuter, Resnicow, Fishbein, & Dijkstra, 2008). Wolf et al. (2007) suggest that knowing a patient's literacy level leads to the proper, "allocation of health education and care management resources" (p.722). Despite the potential benefits of tailoring communication there is resistance to implement health literacy screening by health professionals. Screening allows for a formal identification of patients at highest risk of having LHL. Health systems that want to go beyond the universal approach can implement health literacy screening tools on a clinical level to determine the health literacy levels of their patients in order to tailor their messages most appropriately. All patients would still receive recommended strategies; however, those patients identified as having most severe levels would receive increased care.

Possible obstacles to screening

Lack of time to screen patients is listed as the main obstacle to formal health literacy programs (Schlichting et al., 2007). Schlichting et al. (2007) reports that sixty five percent of physicians cited lack of time. Another major concern associated with health literacy screening is patients being negatively stigmatized and feeling shame (Johnson & Weiss, 2008). The data produced by Wolf et al. (2007) revealed that 22% of patients would feel embarrassed about low literacy being documented in their medical chart. Additionally, 47.8% of patients at the lowest HL level, below third grade level, acknowledged having felt shame or embarrassment about their

difficulties reading. When asked if they would be embarrassed about that information being documented 35% answered in the affirmative (Wolf et al., 2007).

However, there is research indicating this concern is not realized in all situations. Vangeest et al. (2010) asserts patients welcome health literacy screening and feel their health literacy level is important information for providers to have. In the study more than 90% of patients with LHL reported it would be helpful for the doctor or nurse to know they did not understand some medical words. In this study the NVS was used to assess patient health literacy.

Health Literacy Screening Tools

There are a variety of health literacy screening tools that provide a way in which health care providers can assess the health literacy level of their patients, for instance the Rapid Estimate of Adult Literacy in Medicine (REALM), the Test of Functional Health Literacy in Adults (TOFHLA), the shortened version of the TOFHLA (S-TOFHLA) and the Newest Vital Sign (NVS) are the literacy assessment tools used for health care setting.

The Newest Vital Sign

The NVS was designed by Barry Weiss MD and his colleagues (2005). The NVS consists of six questions that can be answered by ascertaining information from a “Nutrition Facts” label from a pint of ice cream in order to assess the reading and numeracy skills of patients (Weiss, 2005). To administer the screening tool patients are given a full page copy of the label, and an “interviewer” reads the questions and records whether the patients answer correctly or incorrectly on a score sheet. The interviewer then sums the number of correct responses to produce a health literacy score ranging from zero to six. If a patient was not able to answer any or only one question correctly the patient has a high likelihood to have LHL. If the

patient is able to answer two or three questions correctly it indicates that LHL is possible for that patient. If the patient is able to answer four or more questions correctly than the patient almost always has adequate health literacy (Osborn et al., 2007).

To develop the NVS, the creators serially tested potential scenarios and questions on over 1,000 patients (Weiss et al., 2005). The first scenarios tested were developed by a panel of health literacy experts (Weiss et al., 2005). Feedback from patients, interviewers, and data analysts about the clarity and ease of scoring of items were used to refine the scenarios and questions used to assess health literacy. It is based one scenario (i.e. ice cream nutrition label) with six questions. That scenario included six questions that could be answered using the information from an ice cream nutrition label (Weiss et al., 2005). For instance, the first question on the NVS asks if one were to eat the entire container of ice cream, how many calories would the person ingest. This requires the participant to read the label, see there are four servings per container and 250 calories per serving. To answer the question correctly 250 would need to be multiplied by four to give the correct answer of 1,000 calories. The number of correct items on the NVS ranged from 0 to 6. Additionally, the NVS was developed in both English and Spanish.

The NVS was shown to have a good internal consistency in English (Cronbach $\alpha = 0.76$) and criterion validity ($r = 0.59, p < .001$), just as the Spanish NVS (Cronbach $\alpha = 0.69$), ($r = 0.49, p < .001$). And it takes less time to administer NVS compared to other traditional health literacy indices. The average time required to administer the NVS in English was 2.9 minutes ($SD = 1.2$ minutes; range = 1.5-6.2 minutes). The average time to administer the Spanish NVS was 3.4 minutes ($SD = 1.2$ minutes; range = 2.1- 8.2 minutes).

Osborn et al. (2007) created a study to compare the performance of the NVS with REALM and S-TOFHLA screening tools. During the study the NVS and REALM were given to over 100 patients, and the NVS and S-TOFHLA to over 100 patients in public clinics (Osborn et al., 2007). The study concluded that the NVS reliably identified patients at risk for LHL as it correctly identified almost all patients with LHL as determined by S-TOFHLA ($r = 0.61, p < .001$) and REALM ($r = 0.41, p < .001$) (Osborn et al., 2007).

Johnson and Weiss (2008) conducted a study to determine approximately how long the NVS takes to deliver. They administered the NVS to 78 English speaking patients in an outpatient primary care clinic and used a stopwatch to time how long it took to administer the test. According to the study the average time to complete the NVS was 2.9 minutes (95% confidence limit, 2.6-3.1 min). Whereas the TOFHLA takes 18 to 22 minutes and the S-TOFLHA takes seven to ten minutes to administer. The REALM can be administered in less than three minutes but is only available in English and is only a word-recognition test that doesn't assess numeracy skills. The researchers also reported that the NVS's area under the ROC curve for predicting LHL was 0.88 for English and .071 for Spanish. They concluded that was the NVS was brief enough to be considered in primary care practices (Johnson & Weiss, 2008)

Shah et al. (2010) determined the NVS's acceptability and timeliness in various suburban, urban, and rural primary care settings. Results discovered that one's health literacy status can be assessed in less than 3 minutes with the NVS. The NVS was widely accepted by patients and produces results comparable to other literacy tests.

Welch et al. (2011)'s study found that, only small time and cost constraints were associated with implementing NVS screening. However they found that continual training was required to ensure the NVS and best communication practices were being utilized properly. In the study all patients completed the NVS as part their intake procedures under the guidance of nurse coordinators and clinic staff and scores were entered into the patient's medical record. Patients completed the NVS on their own, with clinic staff available if they needed assistance with instructions or clarification. Once the NVS was completed it was returned to the in-take staff, scored and entered into the patient's medical record.

Welch et al. (2011) reported that the time required to hand out and instruct patients how to use the NVS was less than 30 seconds, and scoring the NVS and inputting that score into the medical record took, on average, less than 2 minutes. Once the score had been reported to the physician, they reported an increase between a 2- and 5-minutes during patient office visits because of tailoring communication to the patient's literacy level and assessing patient comprehension.

Physicians also indicated that staff training and implementing the NVS increased their awareness of the importance of health literacy and tailored health communication during physician/ patient interactions (Welch Vangeest & Caskey, 2011). Additionally, the majority of physicians noted their inability to correctly identify individuals with limited health literacy without results from the NVS. 66.7% of physicians reported using the NVS to identify patients with LHL enabled them deliver higher quality care to their patients and helped them tailor their communication by using the recommended techniques that assess comprehension (i.e., teach-back, simple language). However, there was a "significant learning curve in the actual implementation of these techniques" (p. 286) as physicians eventually stopped using these

recommended techniques and reverted back to their normal (pre-intervention) care processes and health communication behaviors (Welch et al., 2011).

In Schlichting et al. (2007)'s study of provider's perceptions of limited health literacy in community health centers of the 321 providers. 71% responded formal health literacy screening, and providing appropriate services based on that screening would be somewhat to very helpful, while only 7% said it would not be helpful at all. Additionally, Seligman et al. (2005) concluded in their study that when physicians were notified of their patients' LHL, by using the S-TOFHLA to assess patient literacy, they used the communication strategies more frequently. Additionally, physicians also felt screening was useful in 64% of their patient visits. However, when physicians were notified of patients LHL the physicians were less satisfied with their visits. Also, results demonstrated that 62% of patients had their health literacy level overestimated by their physician (Seligman et al., 2005).

Vangeest et al. (2010) specifically studied patients' perceptions of the NVS and found patients were accepting of it. According to the study, 95% of patients did not have a problem with screening for health literacy within a primary care setting. Every participating patient responded that screening was not a waste of their time. Additionally, 96% were not upset about having to take the NVS as part of their intake forms. The most important finding was that 100% of patients reported that screening did not elicit feelings of shame. Lastly, 97% of patients answered in the affirmative when asked if they would recommend clinical screening to improve care.

According to the study on the patient's shame associated with the REALM health literacy screening tool, patients remained receptive to having their doctors and nurses aware of they did not understand medical terminology. Data from the study reveals that 95% of patients think it

would be at least somewhat helpful if doctor knew they did not understand some medical words (Wolf et al., 2007). Even after pointing out the potential for causing feelings of shame, Wolf et al. (2007) still suggest, testing for a patients literacy level is justified because patients with LHL ultimately need more than the other patients. Multiple studies corroborate these findings. DeWalt et al. (2011) found their participants were comfortable having their literacy assessed using the REALM and TOFHLA.

For this reason, the NVS can be an efficient and accurate health literacy screening tool that can be used before meeting with the health care providers. This study, thus, uses NVS to assess patient health literacy to first determine how, if at all, provider's tailor their communication. Additionally, it will be investigated how reporting NVS scores impacts patients' satisfaction with and perceptions about provider communication. This study will give insight into how an NVS score aids in tailoring communication for patient need.

Methods

Participants

Participants were 1) pediatricians and 2) parents or recognized guardian of patients from the Sixteenth Street Community Health Centers (SSCHC) in Milwaukee, Wi, where the patient population is largely low-income and Hispanic. The three participating pediatricians were located at the Parkway Health Center, one of several SSCHC locations. For a parent or guardian to be selected for participation their child needed to have an appointment scheduled with one of the three participating pediatricians. In total, 92 parent/guardians participated in the study, 51 parent/guardians participated in pre-intervention conditions and 41 participated in post-

intervention condition. They were recruited in the waiting room upon arriving for their appointment with a physician at the Parkway location of the SSCHC.

Procedures

The study consisted of a pre- and a post-intervention condition. Participating parent/guardians followed the same procedure during both pre- and post-intervention conditions. Once a parent/guardian approached the front desk, to check in with one of the participating pediatricians they were directed to a bilingual research assistant who explained the project. A bilingual research assistant explained that participation would require a health literacy assessment and a short “yes or no” questionnaire after their appointment. The researcher emphasized the health literacy assessment and post-appointment questionnaire were aimed at improving provider care, and would take very little time to complete. After consent was given the researcher assistant administered the NVS. Once the NVS (see *Appendix A* for the score sheet and *Appendix B* for ice cream label) was completed and scored the parent/guardians then proceeded to their appointments. When appointments concluded parent/guardians had to exit through the waiting room where they then completed the questionnaire. This questionnaire targeting parent/guardians asked for instance whether or not their medical provider used plain non-medical language, encouraged questions, showed respect for what they had to say, and whether the provider had spent enough time with the parent/guardian, as well as their satisfaction level of the meeting with the doctor. For the complete questionnaire, see *Appendix C*.

For the three participating pediatricians the following procedure was implemented. Before the pre-intervention condition the researcher met with the pediatricians at the SSCHC. During this meeting the researcher reviewed what the project would require them to do, the

concerns related with LHL, and the recommended communication techniques including teach-back. During the pre-intervention condition the pediatricians were simply alerted which patients required them to answer a short post-appointment questionnaire and patients' NVS scores were not reported to the pediatricians. The intervention was on the information in the Health Literacy Universal Precautions Toolkit. The Agency for Healthcare Research and Quality commissioned the University of North Carolina at Chapel Hill to develop and test the Health Literacy Universal Precautions Toolkit (DeWalt et al., 2010). It allows practitioners to implement and assess how they account for health literacy issues. During the intervention physicians were given the print outs of Tool 4 "Tips for Communicating Clearly" and Tool 5 "The Teach-back Technique." Tool 4 specifically highlights making eye-contact, speaking slowly and using non-medical language, and using a teach-back to check for comprehension among others. Tool 5 specifically explains the teach-back technique purpose and suggestions for using it. See *Appendix D* (tool 4) and *Appendix E* (tool 5) for the print-outs given to the pediatricians as part of the intervention between conditions.

After completing data collection in pre-intervention condition a two-week there was a two-week reflection period as required by the American Board of Pediatrics. During this reflection period the intervention was delivered. The intervention involved health provider education about 1) health literacy & NVS scores and 2) health provider communication techniques including the teach-back technique. First, the participating pediatricians were told that in the next stage of the study, the NVS score of their patients would be reported prior to their meeting. The researcher then explained how to interpret NVS results; explaining that a score ranging from one to three would be written in red on the patients' label that indicates their name,

date of birth, insurance carrier and primary physician. The label is required for patients to leave the waiting room and enter their examine room.

During the second part of the intervention, communication techniques, specifically the teach-back were reemphasized. Once the post-intervention condition began patients' NVS scores were reported to the pediatricians before their interaction with the patient. Similar to the pre-intervention condition, questionnaires were filled out by the pediatricians after the interaction.

Measures

The NVS scores patients' health literacy with a scale from zero to six. Based on the score the patient is determined to in one of three health literacy levels. During the intervention in between conditions the researcher explained a "1" indicated a high likelihood of LHL. If the patient answered two or three questions correctly a "2" would be written on the label, which indicated the possibility of LHL. If a patient answered four or more answers correctly then a "3" is written on the label, which indicates adequate health literacy.

To assess patients' evaluation on doctor-patient communication, patients filled out a questionnaire right after meeting with their doctor. Both parent/guardian and physician questionnaires were provided by the American Board of Pediatrics (ABP). As stated, the questionnaires ask specific yes or no questions about the provider's communication during the appointment. The questionnaires were crafted for the ABPs Health Literacy Performance Improvement Module (PIM). ABP PIMs are web-based tools that enable pediatricians to implement improvements in clinical care using quality improvement methods. PIMs guide pediatricians through the process of collecting and analyzing practice data over time and documenting improved quality of care (see *Appendix C & Appendix F*).

To assess the parents' perception on pediatricians' communication when the appointment with their pediatrician was over they answered a post-examination questionnaire. The bilingual research assistant approached the participant once they left the examination room and were in the lobby. The questionnaire contained several questions about their pediatricians' communication, for instance, "Did this provider use medical words you did not understand?" and, "Did this provider encourage you to ask questions?" (see *Appendix C*).

A 5-point Likert scaled satisfaction scale has been added because patient satisfaction is crucial to consider when adding additional intake procedures, especially ones with potential to induce negative emotions (see *Appendix F*).

To assess the pediatricians' evaluation on their own performance, when the patients' label indicated their parent/guardian as a participant, the pediatrician would answer eight yes or no questions on the provider-targeted questionnaire. For instance, the questionnaire asked "Did you confirm the patient's understanding by using the "teach-back" method during this visit?" and "Did you use plain (non-medical) language when speaking to your patient?" (see *Appendix G*)

Data Analysis

In total, three pediatricians and 92 parent/guardians participated. 51 parent/guardian participants were in the pre-intervention condition and 41 participated in the post-intervention condition. 59 parent/guardian participants completed the NVS in English, while 33 completed it in Spanish.

The mean NVS of all 92 parent/guardian participants was 2.9 ($SD = 1.61$). the mean of NVS scores was 3.00 ($SD = 1.61$) In the pre-intervention condition and 2.78 ($SD = 1.73$) in the post-intervention. An independent sample t-test was run to see if the pre-existing difference in

the level of health literacy between pre- and post-intervention conditions was significant. Results indicate an insignificant difference in the conditions, $t(90) = 0.63$; $p = .531$.

To test the hypotheses, pre-intervention and post-intervention conditions were compared using a chi-squared and t-tests. After the intervention the pediatricians did increase their use of the teach-back technique. In the pre-intervention condition of the 51 parent/guardian participants, pediatricians responded using teach-back method at all with only 5.9% of participants ($n = 3$). Intervention successfully changed doctors' behavior. In the post-intervention condition, of the 41 parent/guardian participants, pediatricians reported using teach-back with 26.8% of parents, $\chi^2(1) = 7.7$; $p = .0025$.

When the pediatricians were asked if they encouraged questions and asked "what questions do you still have" rather than "do you have any questions" in the pre-intervention, pediatricians said yes for 90.2% of parents interaction ($n = 46$). In the post-intervention condition, pediatricians reported yes for 87.8% of parents interaction, $\chi^2(1) = .134$; $p = .48$, suggesting insignificant difference between conditions.

Additionally, after the intervention pediatricians did not increase the frequency with which they summarized important information to be remembered in three to five main points. In the pre-intervention condition, pediatricians responded using this technique with 94% of patients ($n = 48$) and in the post-intervention pediatricians used the technique with 90% of the patients ($n = 37$), $\chi^2(1) = .485$; $p = .379$. When asked if they used plain, non-medical language pediatricians responded yes in all cases, 100% of the time, both in the pre-intervention ($n = 51$) and post-intervention ($n = 41$) conditions.

Parent/guardian participants did not report a significant decrease in pediatrician's using confusing medical jargons from the pre-intervention to the post-intervention condition. During the pre-intervention condition parent/guardian participants were asked if the doctor used any medical jargon they did not understand, 86.3% responded no ($n = 44$). During the post-intervention condition 90.2% of parent/guardian participants responded no ($n = 37$), $\chi^2 (1) = .340$; $p = .401$

Similarly participants did not perceive any significant increase in neither the frequency with which their doctor encouraged them to ask questions, $\chi^2 (1) = .613$; $p = .418$, nor in whether they felt listened to after the intervention, $\chi^2 (1) = 2.49$; $p = .166$. When parent/guardian participants were asked if the doctor encouraged them to ask questions participants responded yes 98% of patients ($n = 50$) in the pre-intervention condition and 95% ($n = 39$) in the post-intervention condition. When asked if they felt the doctor listened carefully to what they had to say, 94.1% responded yes in the pre-intervention condition ($n = 48$) and in the post-intervention 100.0% said yes ($n = 41$).

There was a significant increase in whether the parent/guardians felt the doctor spent enough time with them after the intervention. When parent/guardian participants were asked if the doctor spent enough time with them they responded yes 88% of the time ($n = 45$) in the pre-intervention condition. In the post-intervention condition every participant responded yes ($n = 41$), $\chi^2 (1) = 4.34$; $p = .046$.

Parent/guardian satisfaction also increased after the intervention. The average satisfaction response was 4.65 ($SD = 0.6$) in the pre-intervention condition and 4.9 ($SD = 0.3$) in

the post-intervention. The t-test revealed there was a significant difference between the pre- and post-intervention conditions, $t(77.1) = 2.67, p = .009$.

Discussion

The problems associated with low health literacy have gained considerable attention and are recognized as a legitimate health concern. This thesis investigated whether an intervention and reporting the health literacy levels of patients would increase the use of recommended communication techniques, specifically teach-back and further promote patients' satisfaction.

Results from the current study indicated that the frequency of teach-back increased after the intervention. The teach-back technique operates as an effective means to check patients' comprehension of medical instructions and information and patients' comprehension is essential to avoid the negative consequences associated with LHL. However, while the teach-back technique is recognized as effective, studies indicate rare use (Schillinger et al., 2003; Schwartzberg et al., 2007).

On the other hand, none of the other techniques demonstrated a significant increase. Although further studies are needed, this result may be explained with a ceiling effect. Most of the techniques were used close to, if not over 90% of time even before the intervention. That is, most of the scores in the pre-intervention condition were already too high providing little room for improvement. For the pediatrician's evaluation, three items included encouraging questions, summarizing things to remember in three to five key points and using plain non-medical language demonstrated higher than 90% in the pre-intervention condition already. Similarly for patients' evaluation, the doctor listening carefully, felt encouraged to ask questions, and doctor spending enough time with them were already over 90% in the pre-intervention condition.

The results show that the pediatricians were already using most of the recommended techniques at a high frequency without having the health literacy scores of patients reported or any formal training on health literacy. It can be explained with at least two reasons. First, the health center was located in a community where low-income Latino population is large majority of their patient population. It is possible that a majority of patients in the clinic are at risk for LHL. Perhaps, doctors were already using the communication techniques regularly with patients who likely have LHL. In a way, the universal approach would work fine in these communities where patients are relatively homogeneous in terms of health literacy, where the benefit of tailored communication based on health literacy screening is minimized. Secondly, we may be observing the hawthorn effect. Even in the pre-intervention condition, the pediatricians practiced desirable techniques, perhaps because they knew that their performance was being monitored. However, this would not explain why then the teach-back technique was still used at a low frequency during the pre-intervention condition.

The Joint Commission and others have recommended that health providers use universal precautions, assuming that all patients have LHL instead of testing patient's health literacy levels (*The Joint Commission*). The current study showed that universal approach may work fine with techniques that providers already use frequently. Similarly to Shwartzberg, (2007)'s finding, we also found that using simple language was already frequently practiced (94% in Shwartzberg, 2007; 86.3% as reported by patients in the current study) and did not have enough room for further improvement. However, skills that are not frequently used such as teach-back may be more efficiently encouraged to be utilized when providers are given the health literacy score of each patient. Before the pre-intervention condition, although doctors were specifically educated about teach-back techniques, it was only used with 5.9% of patients. However, when such

education was accompanied by health literacy screening test, the use of teach-back was increased significantly (26.8%). Although using teach-back may be considered time-consuming, knowing which patients are at a high risk of having LHL may encourage providers to use teach-back more often, further resulting in patients feeling more satisfied with their care. Because reporting the NVS score increased the use of the teach-back the authors suggest more research on implementing screening for limited health literacy because it can help providers improve their identification of high-risk patients and further tailor communication to those patients by evaluating patients' understanding with a teach-back.

Additionally results show that patient satisfaction also increased after the intervention. This is an important finding because of the concerns that shaming and isolation (Wolf et al., 2007), which would decrease patient satisfaction, are associated with assessing patient literacy. This study suggests assessing patients' health literacy actually made patients more satisfied with their care. Because satisfaction was not affected negatively by administering the NVS concerns about it stigmatizing patients can be eased.

This study provides several practical implications to the health professionals. First, this study adds empirical evidences of benefits that utilizing health literacy screening tool, specifically NVS can bring. Pediatricians used the teach-back more often and patients were more satisfied with their care. Secondly, this study provides more practical information of practicing health literacy tool in the actual health center setting. The NVS took approximately three minutes to administer and score. Patients seemed very at ease with being assessed and did not complain once they knew it was to improve their pediatrician's communication.

Limitations and Future Studies

This study has some limitations that future studies should address. First, while the pediatricians were made aware of health literacy issues and the teach-back technique before the pre-intervention, future studies should assess the pediatricians' awareness of health literacy related issues and knowledge prior to running any experiments as this was not done in the current study. Future study should replicate this study with various health centers located in various communities, as the current findings may not apply to communities where health literacy levels of patients are more heterogeneous. Future studies should also take into account the reason for the patient visit as the type of medical information provided by health professionals may be different depending on whether the patients has a chronic illness compared to an acute illness. Another limitation of this study was the relatively small sample size. The results would have more external validity if there would have been a larger sample. However, due to restrictions for the research team there was only a limited amount of time to collect data. Lastly, in order to get access to the patient population researchers were required to use the approved ABP questionnaire. The questionnaire was binary as it only allowed for "yes" or "no" responses. While yes no questions made it easier for participants to answer, it made the results less descriptive. Further studies should craft and test their own measures.

Conclusion

In conclusion some indicators demonstrated that the intervention did not make any significant differences. However, it would be too early to conclude that using health literacy screening measure itself is inefficient, because the findings indicate possibility of ceiling effects. Furthermore, during the post-intervention parent/guardian satisfaction and the chance of a teach-

back increased. Because teach-back is such an effective comprehension technique any measures to increase its use are encouraged. Thus, I believe more research should be conducted to create more efficient intervention and screening measures and evaluate them.

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Tables

Table 1. Rank order of communication techniques routinely used by respondents

Technique	Frequency of Use
Using simple language (avoid technical jargon)	94.7%
Handing out printed materials to patients	70.3%
Speaking more slowly	67.3%
Reading aloud instructions	59.1%
Writing out instructions	44.5%
Presenting 2 or 3 concepts at a time and checking for understanding	44.1%
Asking if patient would like family member to be in discussion	39.5%
Asking patients to repeat information, teach-back technique	39.5%
Underlining key points in patient information handout	38%
Having patient follow up with office staff to review instructions	23.6%
Drawing pictures	15.1%
Following up with telephone call to check understanding/compliance	12.4%

Note. Table taken from Schwartzberg, Cowett, Vangeest & Wolf (2007)

Table2. Differences between pre and post intervention condition in terms of doctors report on their own communication with parents

Question	Condition	n	%	χ^2	p
Did you confirm patient's understanding using the "teach back" method?	Pre	3	5.9	7.7	.0025
	Post	11	26.8		
Did you encourage questions and ask "What questions do you still have?" (rather than 'Do you have questions?')?	Pre	46	90.2	.134	.48
	Post	36	87.8		
Did you summarize what you want the patient to remember in three to five key points?	Pre	48	94.1	.485	.379
	Post	37	90.2		
Did you use plain (non-medical) language when speaking to your patient?	Pre	51	100	n/a	n/a
	Post	41	100		

Note. Numbers for "n" and "%" indicate the number (percentage) times the doctors responded "yes" to each question.

Table3. Differences between pre and post intervention condition in terms of parents' evaluation on pediatrician communication

Question	Condition	n	%	χ^2	p
Did this provider use medical words you did not understand?	Pre	7	13.7	.340	.401
	Post	4	9.8		
Did this provider listen to you carefully?	Pre	48	94.1	2.49	.48
	Post	41	100		
Did this provider encourage you to ask questions?	Pre	50	98.0	.613	.418
	Post	39	95.1		
Did this provider spend enough time with you?	Pre	45	90.0	4.34	.046
	Post	41	100		

Note. Numbers for “n” and “%” indicate the number (percentage) of participants who responded “yes” to each question.

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Appendix A – The Newest Vital Sign (NVS)

Score Sheet for the Newest Vital Sign Questions and Answers

READ TO SUBJECT:

This information is on the back of a container of a point of ice cream.

1. If you eat the entire container, how many calories will you eat?
Answer: 1,000 is the only correct answer
2. If you are allowed to eat 60 grams of carbohydrates as a snack, how much ice cream could you have?
Answer: Any of the following is correct: 1 cup (or any amount up to 1 cup), half the container. Note: If patient answers "two servings," ask "How much ice cream would that be if you were to measure it into a bowl?"
3. Your doctor advises you to reduce the amount of saturated fat in your diet. You usually have 42 g of saturated fat each day, which includes one serving of ice cream. If you stop eating ice cream, how many grams of saturated fat would you be consuming each day?
Answer: 33 is the only correct answer
4. If you usually eat 2,500 calories in a day, what percentage of your daily value of calories will you be eating if you eat one serving?
Answer: 10% is the only correct answer

READ TO SUBJECT:

Pretend that you are allergic to the following substances: penicillin, peanuts, latex gloves, and bee stings.

5. Is it safe for you to eat this ice cream?
Answer: No
6. (Ask only if the patient responds "no" to question 5): Why not?
Answer: Because it has peanut oil.

ANSWER CORRECT?

yes	no

Number of correct answers:

Interpretation

Score of 0-1 suggests high likelihood (50% or more) of limited literacy.

Score of 2-3 indicates the possibility of limited literacy.

Score of 4-6 almost always indicates adequate literacy.

Appendix B - Ice Cream nutrition label

Nutrition Facts

Serving Size	½ cup
Servings per container	4

Amount per serving

Calories	250	Fat Cal	120
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%DV

Total Fat 13g	20%
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Sat Fat 9g	40%
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Cholesterol 28mg	12%
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Sodium 55mg	2%
--------------------	----

Total Carbohydrate 30g	12%
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Dietary Fiber 2g	
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Sugars 23g	
------------	--

Protein 4g	8%
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*Percentage Daily Values (DV) are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Ingredients: Cream, Skim Milk, Liquid Sugar, Water, Egg Yolks, Brown Sugar, Milkfat, Peanut Oil, Sugar, Butter, Salt, Carrageenan, Vanilla Extract.

Appendix C – Patient Questionnaire on perception of provider communication

Health Literacy Parent Visit Form

Information in shaded area are not entered into data system	
Patient Name:	Date of Birth (MM/DD/YYYY) ____/____/____
Name of Provider for today's visit:	Date of Visit (MM/DD/YYYY) ____/____/____

We would like your honest feedback. Please answer these questions about today's visit.

1. Did this provider seem to know the important information about your child's medical history?	Yes	No	
2. Did this provider explain things in a way that was easy to understand?	Yes	No	
3. Did this provider use medical words you did not understand?	Yes	No	
4. Did this provider show respect for what you had to say?	Yes	No	
5. Did this provider listen carefully to you?	Yes	No	
6. Did this provider encourage you to ask questions?	Yes	No	
7. Did you talk with this provider about any of your child's health problems or concerns? <i>If YES, please answer these two questions; if NO, answer N/A to Questions 7a and 7b and go to Question 8.</i>	Yes	No	
a. Did this provider give you easy to understand instructions about taking care of these health problems or concerns?	Yes	No	N/A
b. Did this provider ask you to describe how you are going to follow these instructions?	Yes	No	N/A
8. Does your child take medicine regularly? <i>If YES, please answer these two questions; if NO, answer N/A to Questions 8a and 8b and go to Question 9.</i>	Yes	No	
a. Did you bring to this office all of your child's prescription medicines?	Yes	No	N/A
b. Did anyone in this office look at your child's medicine bottles AND talk with you about these medicines?	Yes	No	N/A
9. Were you given any written information today? <i>If YES, please answer Question 9a; if NO, go to Question 10.</i>	Yes	No	
a. Was the written information you were given easy to understand?	Yes	No	N/A
10. Did this provider help you set a personal goal to improve your child's health? <i>If YES, please answer Question 10a; if NO, go to Question 11.</i>	Yes	No	
a. Did you and your provider agree today on at least one action that you or your child plan to take to meet one of your child's health goals?	Yes	No	N/A
11. Did this provider spend enough time with you?	Yes	No	

Tips for Communicating Clearly

Tool 4

Tips for Communicating Clearly

Overview

Patients often need to remember several things when they leave a primary care practice. Communicating effectively with patients is important to ensure:

- Patient safety.
- Patient self-management.
- Efficient use of time.

All levels of communication are important, whether it be for diagnostic purposes, taking medication correctly, preparing for lab work, home care, followup, or scheduling appointments. Clear oral communication strategies help patients feel more involved in their health care and increase their likelihood of accepting recommendations.

Purpose

To introduce effective oral communication strategies and offer suggestions on how to increase staff awareness as they interact with patients. This tool is for the entire health care team.

Testimonial

“Our practice implemented this tool by giving the Communication Self Assessment worksheet to 11 physicians and asking them to complete it and rate their communication skills. It was interesting to note that 80 percent recorded that they had good communication skills with their patients, yet over one-third of them reported that they did not verify that patients understood the directions before leaving the office (e.g., teach-back). We then asked them to fill out the assessment after each of the next few patient visits. The results improved, but what was even more important was that several commented that they liked the tool because it reminded them about skills to use for good communication and consequently they were more aware of them when they went in to see their next patient.”

-MD, family practice teaching facility

Tips for Communicating Clearly

Tool 4

Action

- **Key communication strategies.**
 - ◊ **Warm greeting:** Greet patients with a smile and a welcoming attitude.
 - ◊ **Eye contact:** Make appropriate eye contact throughout the interaction.
 - ◊ **Plain, non-medical language:** Use common words when speaking to patients. Take note of what words they use to describe their illness and use them in your conversation.
 - ◊ **Slow down:** Speak clearly and at a moderate pace.
 - ◊ **Limit content:** Prioritize what needs to be discussed and limit information to 3-5 key points.
 - ◊ **Repeat key points:** Be specific and concrete in your conversation and repeat key points.
 - ◊ **Graphics:** Draw pictures, use illustrations, or demonstrate with 3-D models.
 - ◊ **Patient participation:** Encourage patients to ask questions and be involved in the conversation during visits and to be proactive in their health care.
 - ◆ Refer to [Tool 14: Encourage Questions](#) for guidance on how to encourage your patients to ask questions.
 - ◊ **Teach-back:** Confirm patients understand what they need to know and do by asking them to teach back directions.
 - ◆ Refer to [Tool 5: The Teach-Back Method](#) for more guidance on how to use the teach-back method.

Tips ★

Strategies to Remind Staff About Communication Skills

- **[Key communication strategies poster](#)**
 - ◊ Hang poster in various locations.
- **Staff bulletin board messages.**
 - ◊ Include key points and update regularly.

Appendix E – Intervention Education Materials: The Teach-back

The Teach-Back Method

Tool 5

The Teach-Back Method

Overview


Studies have shown that 40-80 percent of the medical information patients receive is forgotten immediately¹ and nearly half of the information retained is incorrect.² One of the easiest ways to close the gap of communication between clinician and patient is to employ the “teach-back” method, also known as the “show-me” method or “closing the loop.”³ Teach-back is a way to confirm that you have explained to the patient what they need to know in a manner that the patient understands. Patient understanding is confirmed when they explain it back to you. It can also help the clinic staff members identify explanations and communication strategies that are most commonly understood by patients.

Purpose

To provide your practice with examples and helpful advice on performing the teach-back method.

Action

1. Learn the teach-back method.

- [Teach-Back Video](#) : View a 5-minute video that gives two examples of using teach-back with medication changes.



Testimonial

“I decided to do teach-back on five patients. With one mother and her child, I concluded the visit by saying ‘So tell me what you are going to do when you get home.’ The mother just looked at me without a reply. She could not tell me what instructions I had just given her. I explained the instructions again and then she was able to teach them back to me. The most amazing thing about this “ah ha” moment was that I had no idea she did not understand until I asked her to teach it back to me. I was so wrapped up in delivering the message that I did not realize that it wasn’t being received.”

-resident physician, pediatric office

The Teach-Back Method

Tool 5


- **Teach-Back: A Health Literacy Tool to Ensure Patient Understanding:**  This PowerPoint presentation can be used in a group setting or as a stand-alone self-study. It contains 20 slides developed by clinicians at the Iowa Health System.
- **AMA video:**  View a video entitled “Health Literacy and Patient Safety: Help Patients Understand.” The last 5 minutes of the 23-minute video includes an example of a clinician using teach-back.
- **Keep in mind:**
 - ◊ **This is not a test of the patient's knowledge:** This is a test of how well you explained the concept.
 - ◊ **Use with everyone:** Use teach-back when you think the person understands and when you think someone is struggling with your directions.
 - ◊ **Teach to all staff:** All members of the practice staff can use it to make sure their communication is clear.

Tips ★

Suggested Approaches When Using Teach-back.

- “I want to be sure that I explained your medication correctly. Can you tell me how you are going to take this medicine?”
- “We covered a lot today about your diabetes, and I want to make sure that I explained things clearly. So let’s review what we discussed. What are three strategies that will help you control your diabetes?”
- “What are you going to do when you get home?”

2. Try the teach-back method.

- **Start Slowly.** Initially, you may want to try it with the last patient of the day.
- **Plan your approach.** Think about how you will ask your patient to teach-back information based on the topic you are reviewing. Keep in mind that some situations will not be appropriate for using the teach-back method.
- **Use handouts.** Reviewing written materials to reinforce the teaching points can be very helpful for patient understanding. Refer to [Tool 12: Use Health Education Materials Effectively.](#) 

Appendix F – Patient Satisfaction Scale

Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Very satisfied
1	2	3	4	5

Appendix G - Physician Questionnaire on communication with parents of patients

Physician Visit Form			
Information in shaded area are not entered into data system			
Patient Name:	Date of Birth (MM/DD/YYYY) ____/____/____		
Name of Provider for today's visit:	Date of Visit (MM/DD/YYYY) ____/____/____		
1. Did you confirm the patient's understanding by using the "teach back" method during this visit? (Tool 5)	YES	NO	
2. Did you encourage questions by using body language to indicate that you have the time to answer questions and specifically asking, 'What questions do you still have?' (rather than 'Do you have any questions?')? (Tool 14)	YES	NO	
3. Did you summarize what you want the patient to remember in 3 to 5 key points? (Tool 4)	YES	NO	
4. Did you use pictures, drawings, models, or video to explain things to the patient? (Tool 4)	YES	NO	
5. Did you use plain (non-medical) language when speaking to your patient? (Tool 4)	YES	NO	
6. Were you trying to encourage behavioral change(s) with this patient? (Tool 15) IF NO, go to question 7. IF YES:	YES	NO	
a) Did you have the patient pick a specific step that s/he is likely to implement?	6a YES	NO	N/A
b) Did you assess the patient's confidence that they can follow this action plan?	6b YES	NO	N/A
7. Is this patient on one or more medications? (Tool 8) IF NO, go to question 8. IF YES:	YES	NO	
a) Did the patient bring all their medicines to this visit?	7a YES	NO	N/A
b) Did you review the medicines with the patient?	7b YES	NO	N/A
8. Did you give the patient written information at this visit? (Tool 11) IF YES:	YES	NO	
a) Were the materials easy to understand?	8a YES	NO	N/A