INSTRUCTIONAL DESIGN AND ASSESSMENT

Active-Learning Strategies to Develop Health Literacy Knowledge and Skills

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Objective. To implement active-learning exercises in a required pharmacy course and assess their impact on students' knowledge and confidence in identifying and communicating with patients with low health literacy, as part of a required course in cultural competency, health literacy, and health beliefs.
Design. Active-learning activities including administering health literacy assessments, identifying informal signs of low health literacy, conducting mock patient counseling sessions, rating the readability of drug information, analyzing information in drug advertisements, and writing patient education materials were incorporated into the 6-sesssion health literacy portion of the course.
Assessment. A pretest and posttest showed that students' knowledge of health literacy increased, and a retrospective pretest found improvement in students' confidence in their ability to care for patients with low health literacy. In-class discussions provided informal evidence that students gained new knowledge from the active-learning activities.
Conclusion. The addition of active-learning activities was effective in teaching health literacy concepts to pharmacy students.

Keywords: health literacy, active learning, pharmacy curriculum

INTRODUCTION

Low health literacy is recognized as a serious public health problem due to its widespread prevalence and significant impact on patient outcomes. More than a decade of research has established beyond doubt the varied deleterious consequences of low health literacy.[1-6] Publication of the Institute of Medicine (IOM) report, "Health Literacy: A Prescription to End Confusion," further sparked attention to this problem.[7] Health literacy is 1 of the goals of Healthy People 2010, the federal government's initiative to improve the health of populations.[8] In addition, health literacy is included in Healthy People 2020 that has been drafted by the US Department of Health and Human Services.[9]

Health literacy, a set of skills necessary to function adequately in the health care environment, has been defined as the "capacity to obtain, process, and understand health information and services needed to make appropriate health decisions."[7] The National Assessment of Adult Literacy conducted by the US Department of Education determined that 90 million Americans have limited health literacy skills.[10] Despite this widespread prevalence, health care practitioners continue to overestimate the literacy levels of their patients[11-13] and routinely fail to use clear health communication techniques when interacting with patients.[14] One survey of pharmacies in the Atlanta, Georgia, area concluded that pharmacies infrequently attempt to identify and assist patients with limited literacy skills.[15] The growth in outpatient care has placed the onus on patients to be able to manage their health appropriately. Patients retain approximately 50% of the information shared with them during a doctor visit,[16] and because low health literacy cannot be identified easily by means of a blood test or other clinical markers, health care professionals must take an active role in identifying and assisting such patients. Also, these patients often are ashamed about their low literacy level and do not reveal it to others.[17] Furthermore, most health care materials are written at a grade level too high for patients with low health literacy.[18] Pharmacists, the most accessible health care professionals for patients, are in a unique position to enhance health literacy by recognizing the signs of low health literacy and tailoring their message to the patient's literacy level.

The IOM report on health literacy recommended that professional schools incorporate health literacy into

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their curricula and areas of competence.[7,19] Furthermore, Guideline 9.1 in the 2007 Accreditation Council for Pharmaceutical Education (ACPE)Accreditation Standards requires colleges and schools of pharmacy to include health literacy training in curricula.[20] While many colleges and schools of pharmacy may be in the process of incorporating health literacy instruction into their curricula, little published evidence exists about this topic in the field of pharmacy education. One doctor of pharmacy (PharmD) program reported giving a health literacy presentation and active-learning activities to first-year students as part of a communications course,[21] and another report examined the involvement of pharmacy students in a project about patient comprehension of consumer-directed nonprescription medication information.[22] While published abstracts about elective courses on health literacy were found,[23,24] no report of a required course on health literacy was found.

The Southern Illinois University Edwardsville (SIUE) School of Pharmacy has been proactive in developing cultural competence and health literacy by establishing a required course in the third professional year (P3) to address ACPE requirements, as well as to develop students who possess the tools and abilities to deliver optimal pharmaceutical care to all patients.[25] This paper describes the education and evaluation of third-year pharmacy students on the topic of health literacy during this required course. This educational approach used active-learning techniques to enhance not only students' knowledge, but more importantly, to examine their confidence in their abilities to identify and interact with patients with low health literacy.

DESIGN

A 3-credit required course titled Health Promotion and Literacy was offered in P3 at the SIUE School of Pharmacy. Specific details about the structure, format, and grading scale used in the course can be obtained from the authors.[25] This manuscript provides a description and assessment of the health literacy portion of the course. Assessment of health literacy was performed during the second offering of the course in fall 2008. Except for several changes to enhance the course, the essential format, particularly the health literacy section of the course, remained the same between the first and second offering.

The specific objectives of this study were to evaluate the impact of an educational approach to determine improvement in P3 students' (1) health literacy knowledge in the following content areas: health literacy as a public health issue; the extent of the problem of low health literacy; the consequences of low health literacy; behaviors typically exhibited by patients with low literacy; risk factors

for low health literacy; strategies used by pharmacists for handling patients with low literacy; and (2) confidence in their ability to identify and communicate with patients with low health literacy, and assess the readability of patient education materials.

The health literacy portion of the course was comprised of 6 sessions, each approximately 1.5 hours long. The first 3 sessions were devoted to introducing the topic of health literacy and providing foundational knowledge about the topic, its measurement, and interaction with patients with low literacy. Foundational knowledge included describing the scope of the problem of health literacy, recognizing the general characteristics of people with low health literacy, understanding the health consequences of low health literacy, recognizing the key differences between skilled and poor readers, and specific myths associated with health literacy.

Measurement of health literacy focused on awareness of the health literacy gap, and learning the formal tests and informal signs (behaviors displayed) of low health literacy. The key formal tests described were Rapid Estimate of Adult Literacy in Medicine (REALM),[26] Test of Functional Health Literacy-short form (S-TOFHLA),[27] and Newest Vital Sign (NVS).[28] Discussion also centered around medical terms commonly used in conversation that may not be understood easily (eg, *cardiac*, *chronic*). The principles of clear health communication, such as keeping information simple and clear, avoiding complex medical terms, providing picture-based materials, using the teach-back method, and translating information into other languages were described. Relevant research findings involving patients with low literacy and their interpretation of prescription labels and warnings, as well as their pharmacy experiences were discussed along with a description of the most common misunderstandings in dosage instructions. The class also viewed *Health Literacy: Help Your Patients Understand*, a DVD prepared and marketed by the American Medical Association as part of its 2003 Health Literacy Educational Kit.[29]

In the remaining 3 sessions, students were taught how to identify, assess, and tailor appropriate patient education materials for patients with low literacy, and how to use the readability formulas. Readability formulas were emphasized because health care providers rely heavily on forms and printed information, such as medical history forms, insurance forms, test results, and hospital discharge and home care instructions. Students were taught ways to improve the usability of health forms by testing their readability and how to revise the forms to ensure clarity and simplicity. The text readability formulas discussed included the Fry Formula[30] and the Simple Measure of Gobbledygook (SMOG) readability formula.[31]

To describe the concepts of identifying, assessing, and tailoring patient education materials, the Suitability Assessment of Materials (SAM) analysis[30] was discussed, and an active-learning activity using the formulas was performed (see active learning section below). Additional factors beyond readability formulas such as print size, color contrast, unfamiliar context, and concept density were discussed. The comprehension process was delineated, and the goal of transferring health information into the long-term memory of the patient was emphasized. Association and interaction are the 2 key factors for long-term learning.[30] Students were able to discuss ways by which association and interaction have increased comprehension in previous pharmacy classes. Examples of association techniques used by students included mnemonics, pictures, and demonstrations. Examples of interaction techniques included asking questions during the learning session, using interactive technology such as clickers, and leaving blanks on written materials for writing in information. Finally, the key factors to help with comprehension were summarized, such as conveying the most important concepts, utilizing terms that are understood by the audience, making use of as many senses as possible, and employing the teach-back method.

Active-Learning Activities

To emphasize the concepts taught in the 6 sessions that comprised the health literacy cluster, several active-learning activities were embedded in the sessions.

Formal Literacy Assessments. The purpose of this out-of-class activity was to familiarize students with the use of formal assessments of health literacy using available instruments. Based on their last names, students were divided into groups to receive 1 of 3 health literacy instruments, REALM, NVS, or TOFHLA, with all 3 instruments represented in each group. This individual activity required students to administer the assigned health literacy instrument face to face to someone not enrolled in the pharmacy school. Specific criteria were provided to guide students in choosing individuals, and 1 week was given to complete this activity. During the following week, students worked in groups in class to discuss the 3 instruments and their findings. The in-class discussion revealed that given directions, the students did not experience any difficulties in administering the instruments. Overall, most groups preferred the REALM as the easiest and quickest instrument to administer.

Informal Signs of Low Literacy. Patients with low health literacy often experience a sense of shame about their literacy level and do not reveal it to others.[17] The purpose of this activity was to provide students some experience with identifying the informal signs of low health literacy that are displayed by patients. Students were required to work in groups to identify the informal signs of low health literacy displayed by the patient in the written case, followed by in-class discussion (Appendix 1).

Patient Counseling Exercise. The third activity was a role-play counseling exercise. The purpose of this activity was to train students to use strategies of clear health communication and the teach-back method to communicate the directions provided on a prescription bottle. Each group was given a prescription bottle containing candy and a small slip containing the name of a prescription medication, directions, and warnings – the typical information found on prescription labels. The patient names were varied to include both genders and reflect diverse cultural backgrounds/ethnicities. Each 4-member group had 1 student play the role of a pharmacist, 1 the role of a patient, and the other 2 students were observers. The role of the observers was to determine whether the pharmacist applied clear health communication techniques (using simple words, emphasizing 1 to 3 key points and repeating them, using teach-back to confirm understanding, etc) in their patient interaction. For a 5-member group, the fifth member recorded observations.

Readability Formulas. This activity aimed at giving students experience in using readability formulas. Students were able to practice using all 3 readability formulas (Fry Formula, SMOG formula and SAM analysis) in groups by choosing 1 online patient education material and assessing it. The students compared their results from the 3 analyses and the ease of use of the readability tools.

Information in Drug Advertisements. The purpose of this individual homework activity was to show students the importance of the concept of comprehension. Students were instructed to look in a magazine or online for patient information about any drug, and have 2 non-healthcare individuals read and assess the information. Students were required to determine what information the non-healthcare individual did not understand and brainstorm ways to make the material easier to comprehend. This was followed by class discussion of the homework assignment.

Memory Exercise. Students were provided 3 columns of 5 words each that were unrelated, and then asked to remember as many words as possible without looking back. This activity demonstrated the capacity limits of short-term memory and showed the importance of chunking information into smaller related groups to aid long-term memory.[30]

Patient Education Materials. As a group activity in class, students were instructed to create education materials for patients with low health literacy on a provided topic using the skills and information they had learned. Examples of topics included how to inject insulin, administer

eye ointment, and use a metered-dose inhaler. The patient education material had to include both pictures or graphics and text. After each group completed their health material, a copy was assigned to another group for evaluation. The evaluating group had to determine the main objective or purpose of the material, assess the readability level utilizing either the Fry Formula or SMOG formula, and provide feedback and suggestions to the group that had created the material.

EVALUATION AND ASSESSMENT

The health promotion and literacy course was designed using a team-based learning approach as described by Larry Michelson, wherein students work in teams with minimal exposure to educational lectures.[25,32] While no examinations were administered in the course, students were graded routinely on their pre-class readings using readiness assessment tests, assessment of in-class exercises and assignments, graded reflective portfolios, and graded team projects and presentations. There was no formal assessment of students' performance in the active-learning exercises; however, in-class participation suggested that they gained new knowledge based on the activities. For example, in the activity on readability formulas, many groups discovered that reading levels of online education materials were greater than the recommended sixth-grade level.[18] Students were asked which readability formula tool they preferred to use, and most thought the Fry Formula and the SMOG formula were both good options to assess readability of materials.

To assess the effectiveness of the health literacy portion of the course, a survey instrument was developed. The instrument contained 20 questions addressing the objectives related to knowledge about health literacy, and 5 questions about confidence in the ability to identify, communicate, and assess health literacy. The knowledge questions were adapted from a previous study on health literacy knowledge.[21] Confidence in students' ability to identify and communicate with patients with low health literacy were examined using 5 statements. These statements examined confidence in their ability to: (1) use health literacy instruments to identify patients with low health literacy; (2) identify behaviors typically exhibited by patients with low literacy; (3) effectively use relevant strategies to counsel patients with low health literacy; (4) judge the appropriateness of written health information for patients with low health literacy; and (5) reduce the readability of written health information from a higher grade level to a lower grade level. All the confidence statements were assessed in the pretest and posttest using retrospective pretest methodology (explained below).[33] A

Likert scale ranging from 1 = not at all confident to 5 = extremely confident was used for this section.

The instrument was administered to 10 students in the fourth-year (P4) class to assess face validity, and appropriate changes were made to the instrument. A retrospective pretest/posttest methodology was employed for the set of confidence questions to avoid the problem of response-shift bias, which typically occurs when self-report measures are used.[33] Response shift bias refers to bias arising because the experimental intervention changes the subjects' evaluation standard. Using this method in the posttest, students were asked to report how they perceived themselves at present (posttest), and immediately thereafter they were to answer the same item again, this time based on how they perceived themselves before they attended the health literacy sessions (retrospective pretest).

The pretest of the entire instrument containing knowledge and confidence questions was administered before the beginning of the health literacy portion of the course. The posttest for the knowledge and confidence statements as well as the retrospective pretest for the confidence statements were administered after both sections of the health literacy cluster were completed. Approval from the SIUE human subjects committee was obtained prior to conducting the study.

Seventy-six students completed the pretest, posttest, and retrospective pretest. Sixty-two percent were female students with a mean age of 22.8, approximately 33% had prior bachelor's degrees, about 79% were white, and the majority (51.3%) came from southern Illinois. Table 1 shows the percent of correct responses to knowledge questions in the pretest and posttest. Because the knowledge scale had nominal data, the McNemar test for paired samples was performed to compare the pretest and posttest groups. For paired ordinal data, the Wilcoxon matched pairs signed-rank test was performed. The majority of the knowledge statements showed improvements in the percent of correct responses from pretest to posttest. However, 6 of the 20 statements showed significant improvements from pretest to posttest. Improvement for the 6 items ranged from almost 8 percentage points to about 40 percentage points.

Table 2 provides mean scores for the individual items comprising the confidence scale and compares the pretest, retrospective pretest, and posttest scores using paired *t* tests. The scale used for the confidence in ability statements ranged from 1 = not at all confident to 5 = extremely confident. The overall posttest mean as well as the mean for individual items improved from pretest and retrospective pretest means. Three comparisons were made using paired *t* tests. These included: (1) traditional pretest-posttest

Table 1. Percentage of Correct Responses by Third-Year Pharmacy Students to Health Literacy Knowledge Statements (N = 76)

Pretest and Posttest Questions (N = 76)	Correct Answer	Pretest	Posttest	*P*
Health literacy refers only to a person's ability to read.	False	100	100	NA[b]
Years of schooling are a good estimate of a person's reading level.	False	53.9	93.4	<0.01[c]
Adequate health literacy means the ability to read, understand, and process health information.	True	96.1	100	0.25
People will tell you if they cannot read.	False	97.4	100	0.5
Family members of people with low literacy usually know about their low literacy.	False	82.9	77.6	0.48
People with low health literacy usually identify medications by the name on the bottle. (n = 75)	False	88	93.4	0.42
People with low health literacy are more likely to misinterpret medication instructions provided on prescription labels.	True	97.4	100	0.5
People with low health literacy know what their medicationsare for.	False	90.9	97.4	0.12
Often people with low health literacy will bring family members along when talking to healthcare professionals.	True	68.4	90.8	<0.01
When given material to read, low literacy patients will give excuses to avoid reading health information materials.	True	92.1	100	<0.05
Persons with low health literacy can be found in all segments of society.	True	97.4	100	0.5
Age is a significant risk factor for developing poorliteracy.	True	47.4	80.3	<0.01
People with high education and income levels are not at risk for developing low health literacy.	False	94.7	98.7	0.38
People with low literacy are usually compliant with their medications.	False	98.7	100	NA[b]
Patients with low health literacy have ___ health outcomes than patients with adequate health literacy.	Worse	98.7	98.7	NA[b]
What % of the US has limited health literacy?	30-39%	42.1	65.8	0.14[a]
Most people with low health literacy have ___ IQs.	Average	55.3	88.2	<0.01
The *average* American reads at or below the _____ grade level.	8th – 9th	30.3	46.1	0.15[a]
Most written health information for patients is written at the ____ grade level.	10th grade	19.7	43.4	<0.01[a]
When counseling patients with low health literacy, a pharmacist should:Use simple language,Use open-ended questions,Have patients repeat back instructions.All of the above	All of the above.	100	97.4	0.5
Overall		77.57	88.56	

[a] Wilcoxon signed rank test for paired samples performed.
[b] McNemar test could not be performed because pretest and posttest variables were not dichotomous.
[c] Significant difference.

comparison; (2) posttest-retrospective pretest comparison; and (3) pretest-retrospective pretest comparison. All sets of comparisons were significant ($p < 0.01$), with the exception of 1 comparison (item 5 in the pretest-posttest comparison) that was significant at the 0.05 level ($p = 0.046$). However, for this item, the posttest and retrospective pretest comparison was significant ($p < 0.01$). The overall mean difference as well as individual item mean differences were significant for the pretest/retrospective pretest comparison ($p < 0.01$).

Further, the overall mean as well as the individual item means for the pretest were much higher than the retrospective pretest means.

Students completed a standard course assessment at the end of the semester on which they were asked about various clusters (cultural competency, health literacy, health beliefs, etc) that were part of the course. For the health literacy section, 1 statement of assessment included "the course enhanced my knowledge of health

Table 2. Pharmacy Students' Confidence in Their Ability to Perform Various Health Literacy-Related Activities (N = 75)

Confidence in Ability to:	Mean (SD)			Difference in the Means (SDs)		
	Pretest	Retrospective Pretest	Posttest	Posttest vs. Pretest	Posttest vs. Retrospective Pretest	Pretest vs. Retrospective Pretest
Use health literacy instruments to identify patients with low health literacy.	2.7 (0.8)	2.3 (0.8)	3.8 (0.7)	1.0 (0.8)[a]	1.5 (0.9)[a]	0.5 (1.0)[a]
Identify behaviors typically exhibited by people with low health literacy.	3.3 (0.8)	2.7 (0.8)	4.2 (0.6)	0.8 (0.1)[a]	1.5 (0.8)[a]	0.6 (0.9)[a]
Effectively use relevant strategies to counsel patients with low health literacy.	3.2 (0.7)	2.4 (0.8)	3.8 (0.7)	0.6 (0.8)[a]	1.3 (0.8)[a]	0.7 (0.9)[a]
Judge the appropriateness of written health information for patients with low health literacy.	3.2 (0.7)	2.2 (0.7)	3.9 (0.7)	0.7 (0.8)[a]	1.7 (0.8)[a]	1.1 (1.0)[a]
Reduce the readability of written health information from a higher grade level to a lower grade level.	3.5 (0.8)	2.5 (0.8)	3.7 (0.7)	0.2 (0.9)[c]	1.2 (0.7)[a]	1.0 (0.9)[a]
Overall mean (SD)	3.2 (0.6)	2.4 (0.6)	3.8 (0.6)	0.7 (0.6)[b]	1.4 (0.6)[b]	0.8 (0.7)[b]

[a] Significant difference, $p < 0.01$
[b] Significant difference, $p < 0.001$
[c] Significant difference, $p \leq 0.05$

literacy issues." On a scale of 1 to 6, ranging from strongly disagree to strongly agree, the overall mean response from the 27 students was 4.8 (1.2).

DISCUSSION

The extensive use of active-learning techniques to emphasize various concepts on health literacy improved student knowledge and confidence in the ability to identify, communicate, and assess readability of patient education materials. Using retrospective pretest methodology provided a much more accurate measurement of pretest confidence in the ability to perform various types of health-literacy related activities. This methodology is particularly suited to interventions where the objective is to change a subject's understanding of a particular item or topic.[33] The presence of significant differences between pretest and retrospective pretest demonstrates the successful use of retrospective pretest design to minimize the effects of response shift bias.

While the percent of correct responses increased between pretest and posttest for every knowledge statement except 1, the increase was significant for only 6 of the 20 statements. The 6 items (items 2, 9, 10, 12, 17, 19) on which students' scores significantly improved suggests that students were not aware of important information related to health literacy that might be useful in providing patient care in the future. Particularly important were improvements in scores for the statements describing experiences in routine

community practice (Table 1). Student awareness that the number of years of schooling does not provide a good estimate of a person's reading level will prove useful when students collect demographic data and tailor their educational activities to patients, when providing medication therapy management (MTM) and disease management services. Significant increases in knowledge about informal signs of low health literacy (items 9, 10, 12) suggest that an important goal of conveying awareness about low health literacy risk factors and characteristics was achieved. Further evidence of learning was noted when students readily identified various signs of low health literacy, displayed in the written patient case presented in one of the active-learning activities. Recognizing and identifying the informal signs of low health literacy in routine practice is important so that pharmacists can target their counseling efforts appropriately.

In Sicat and Hill's study,[21] from which some of the knowledge statements used in this study were adapted, students scored significantly higher between posttest and pretest on more items in the knowledge section. One explanation is that the students in our study were in their third year while the students in Sicat and Hill's study were in their first year. Thus, our students may have been more aware than the first-year students about some of the knowledge items before starting the course. Although the content may have been similar, most of the questions in our study were worded differently to tailor it to the goals

of the current assessment, and this may have made it easier for many of our students to respond correctly to items on the pretest and posttest, thereby reducing the percentage change in correct responses. Another possibility is that prior awareness of health literacy may have cued students to answer some statements correctly on the pretest and posttest.

The numerous active-learning activities were aimed at enhancing students' interest, understanding, and confidence in their ability to work with patients with low literacy and with written materials focused on health literacy. Students demonstrated the greatest improvement in confidence using health literacy instruments to identify patients with low health literacy; judging the appropriateness of written health information; and identifying behaviors typically exhibited by patients with low literacy. The higher means for the pretest (individual item means as well as overall mean) versus the retrospective pretest suggested that students initially perceived (pretest) their confidence as much higher than it probably was (retrospective pretest). The retrospective pretest mean was a more accurate estimate of the true mean for the pretest than the traditional pretest mean.[32] The significant differences among pretest, retrospective pretest, and posttest confidence statements offered evidence that students may translate their confidence into future action when they are in the practice environment.

The assessment of the health literacy cluster had several limitations. The overall survey instrument was subjected only to assessment of face validity. Also, because our assessment involved only third-year PharmD students from 1 school, the generalizability of the results was limited. Although students role-played counseling sessions using clear health communication principles in group format, the lack of additional class time prevented monitoring students individually in their application of clear health communication techniques when counseling patients. Further, the role-playing exercise did not have a rubric with which to evaluate role-playing activities. The fall 2009 course was revised to address both of these deficiencies. Addition of another session for health literacy allowed students to role-play counseling sessions, applying clear health communication techniques in front of the entire class, with fellow students offering constructive critiques and comments based on their work experiences. Students in the fall 2009 class were allotted class time to work in groups to create a script based on specific directions prior to their role-playing session. In addition, a rubric was created to assist in formal evaluation of the role-playing process. In the future we hope to use standardized patients to teach low literacy communication skills as some medical schools have done.[34,35] While responses to the survey items showed significant improvement

in students' confidence, additional assessment of confidence in their ability to create appropriate education materials for low literacy patients was not tested. Future work should include examination of whether students translate their learning of health literacy into action by examining their interaction and practice during advanced pharmacy practice experiences (APPEs). In addition, future research should include examining students' perceptions and preconceived notions about patients' literacy because this may guide their actions as they interact with patients of varying literacy levels.

SUMMARY

The use of numerous active-learning strategies in a required pharmacy course enhanced P3 students' knowledge and confidence in their ability to apply health literacy concepts. Low health literacy is a serious healthcare problem that is expected to worsen with the projected demographic changes in the US population and the increase in the number of immigrants and non English-speaking US residents. Pharmacists who are the most accessible healthcare professionals must be knowledgeable about health literacy, trained to identify and interact with patients with low health literacy, and create or refer patients to appropriate patient education materials based on literacy level. Incorporating active-learning activities related to identifying and communicating with patients with low literacy, and evaluating patient education materials successfully, taught students ways to address various health literacy issues. Future studies should examine whether students apply this learning during their advanced community and ambulatory care educational experiences.

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Appendix 1. Patient Case Used in an Active-Learning Exercise in a Course on Health Literacy

Identifying behaviors typically displayed by patients with low literacy.

JM is a 45 year-old, well-developed, well-nourished (WDWN) African American male who presents to the pharmacy for his MTM pharmacotherapeutic session/interview. From his prior reports, you notice that he has missed 3 appointments previously over the course of the last year. You ask him to take a seat in the waiting area and complete some health and insurance forms to update his information.

When he comes into your office, you notice that the health form has many answers missing. JM complains of itchy and watery eyes and a runny nose that started in April, and a nagging cough that started in September of this year. JM reports he does not utilize a pill box and tends to forget doses "once in a while." When probed further he admits to usually missing 1-3 doses of medication per week. JM does not follow any particular meal plan but always eats at his favorite fried chicken joint on Fridays. You ask him to show

the medications that he is on and he brings them all out. He opens the various bottles and tells you how he takes it by looking at the shape and color of the pills from each bottle. When you ask him why he is taking the albuterol, he says that he does not know. You give him some typewritten information regarding his medications and ask him to look over it. He responds by saying that he forgot his reading glasses and that he will look over it at home.

ALL: NKDA
SH: (+) tobacco 2ppd (-) recreational drugs
(+) alcohol 4 beers daily
PMH: COPD, HTN, Dyslipidemia, Gout
FH: unknown
Meds: (assume patient is compliant with all medications)

Medication	Strength	Dosing	Indication	Prescriber	Start Date
Ramipril	10 mg	One daily	HTN	Dr. Herndon	09/2008
Hydrochlorothiazide	12.5 mg	One every morning	HTN	Dr. Herndon	09/2008
Advair	250/50	One puff twice daily	COPD	Dr. Crazy	02/2007
Albuterol MDI	MDI	1-2 puffs every four to six hours as needed prn SOB and wheeze	COPD	Dr. Crazy	02/2007
Lipitor	10 mg	One daily	Dyslipidemia	Dr. Herndon	01/2006
Allopurinol	300 mg	One every morning	Gout	Dr. Herndon	01/2005
Indomethacin	75 mg	One three times daily prn	Gout	Dr. Herndon	01/2005

Objective
BP: 150/100mm Hg   **HR:** 72
T-score: 1.5   **RR:** 20
TC: 180   **Temp:** 98.6
LDL: 110   **WBC:** WNL
HDL: 52   **TG:** 130   **Pain:** 0

Answer the following questions as a group and turn in your responses.

(1) Identify at least 3 specific behaviors described in the case above that this patient displays that may suggest that he may be at risk for low health literacy.

(2) List some behaviors (not covered in this case) suggestive of low literacy that you have experienced in your work environment.

(3) List 3 specific strategies that you will use to tailor your counseling towards this patient.