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# Health Literacy in Older Adults

*Determining Gaps in the Health Literacy Skills of Older Adults in Saratoga Springs, New York and Suggestions for Effective Intervention*

Elizah Jacobs

Self-Determined Major in Public Health

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## ABSTRACT

This study aimed to understand the strengths and limitations of health literacy skills among older adults. The results informed a resource to improve any discovered gaps in health literacy.

Participants (n=50) were selected through convenience sampling methods at the Saratoga Senior Center in Saratoga Springs, New York. The Health Literacy Questionnaire (HLQ) was distributed to evaluate health literacy skills among older adults. Measures of means and standard deviations were used to assess strengths and limitations in health literacy skills among nine domains of the HLQ. The results informed the implementation of a resource designed to increase health literacy specifically for members of the Saratoga Senior Center to access and effectively use health information

The elements of health literacy that received the lowest scores among this sample were the scales correlated with finding and using health information. In Part One of the study, scale 2: “Appraisal of health information” had the lowest mean. In Part Two of the questionnaire, scale 8: “Ability to find good health information” received the lowest mean score. Participants scored the highest on scale 1: “Feeling understood and supported by healthcare providers.”

Scales associated with finding information to manage one's healthcare were found to be the most challenging for older adults in this study. This indicates health information may be confusing which can impact the ability to manage health. Participants showed that they feel a strong relationship with healthcare providers. The results reveal that older adults would benefit from additional instructional programs to enhance health literacy skills. Future research should replicate this study with a larger sample size and collect more varied demographic information. The implementation of the resource created in response to the findings of this study has the potential to improve health literacy. Follow-up studies should measure the effectiveness of interventions on health literacy levels among older adults.

## INTRODUCTION

There are vast disparities in the quality of health across different population groups globally which limits an individual's opportunity to live a longer and healthier life. Some of the health inequalities throughout our communities are avoidable. One important inequality is health literacy. The term "health literacy" has become a popular buzzword in the last two decades since shocking studies have demonstrated our nation's limited health literacy skills and the negative health outcomes that can transpire due to low health literacy. Health literacy is broadly defined as the degree to which individuals can obtain, process, and understand basic health information and services needed to make appropriate health decisions (CDC 2022). The Center for Healthcare Strategies estimates that ninety million Americans have low health literacy (2013). Lower health literacy can have negative consequences, including medication errors and unnecessary emergency room visits. Older adults are an important group that may be negatively affected by low health literacy levels.

Issues generated by poor health literacy are amplified in older patients because of several interrelated factors. As age increases, so do the deficits in literacy due to possible declining cognitive function, increased time since formal education, and decreased sensory abilities. For example, reading and comprehension are shaped by vision, hearing, and brain function capability. The majority of patients older than sixty years old perform at the lowest levels of literacy, and 80% have limited ability to fill out forms, such as the ones they are asked to complete in physicians' waiting rooms (Nutbeam, McGill, and Premkumar 2018). The 2003 National Assessment of adult literacy reported that only 3% of adults sixty-five years and older had proficient health literacy skills (Mark 2009). These consequences are powerful since the

elderly are more likely to have chronic and comorbid conditions, which means that minor healthcare errors could mean life or death.

Despite low levels of health literacy, there is limited research on what specific aspects of health literacy skills older adults struggle with the most. There are also insufficient resources that target older adults and their health literacy skills. The health literacy requirements of older adults need to be addressed.

Public health ideology explains that it is an obligation to fulfill society's interest in assuring conditions in which people can be healthy (CDC 2022). Many public health interventions are focused on an organizational level through primary prevention. This approach involves building strong relationships with doctors; communicating in simple, direct, jargon-free, comprehensible language; and training healthcare professionals with practices for the population they serve (Parnell 2014). However, there is also a necessity for local, community, individual, and tertiary prevention. This project offers the opportunity to make a difference in the health outcomes of this community through research and future interventions. Health promotion has the potential to empower people to develop a healthy lifestyle. In terms of health literacy skills, older adults will hopefully improve their health outcomes by decreasing the gaps in their health literacy skills while also strengthening their access to resources. This will positively impact their ability to be responsible for their health care.

The purpose of this study is to understand the strengths and limitations of health literacy abilities among older adults in the community of Saratoga Springs by administering the Health Literacy Questionnaire (HLQ). The results from this survey will inform resources for older adults that will educate and empower their health literacy skills.

## LITERATURE REVIEW

### *Context and Definitions of Health Literacy*

The concept of health literacy was not introduced into health care literature until the 1990s (Parnell 2014). Don Nutbeam's foundational research in this field has provided the main footing for other researchers to analyze health literacy. Nutbeam categorizes health literacy into functional, interactive, and critical health literacy (Nutbeam, McGill, and Premkumar 2018). Functional health literacy includes the basic skills individuals need to understand health information. Interactive health literacy explains literacy and social skills needed to apply information to appropriate circumstances. Critical health literacy describes the advanced skills of analyzing information critically and using it to control one's health. All the definitions in Nutbeam's three-level health literacy framework involve the skills individuals need to access, understand, and use information to make decisions that impact an individual's health. The distinctions in definitions are important so that researchers can have a comprehensive understanding of this topic. Since Nutbeam's research in 1998, scholars have defined and operationalized health literacy differently (Nutbeam, McGill, and Premkumar 2018).

Health literacy is an umbrella term that encompasses many forms. There is not one agreed-upon definition which makes it difficult to measure and analyze. Early definitions focused on the reading and numeracy skills of individuals in healthcare settings (Parnell 2014). More recent definitions emphasize the necessity of including informed decision-making and cultural awareness (Berkman et al. 2011). Other researchers, such as Ratzan, stress that health literacy is merely a framework for health promotion practices (2001). The U.S. Department of Health and Human Services divides the definition of health literacy into organizational and

personal health literacy (U.S. HHS N.d). This distinction emphasizes the role of organizations in enabling the health decisions and actions of individuals.

Many studies have measured only functional health literacy or literacy in general (Nutbeam, McGill, and Premkumar 2018). An important critique of this approach is that an individual may be proficient in one form of health literacy but not another. Health literacy is multidimensional, and it is necessary not to determine health literacy skills by only measuring one component.

This study's approach is grounded in Nutbeam's categorization of the three elements of health literacy and the World Health Organization's (WHO) definition of health literacy. The WHO's definition is explained as the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways that promote and maintain good health (Batterham 2014). This definition is the most appropriate since the Health Literacy Questionnaire explores the limitations of social and cognitive skills while including an individual's motivation which other definitions do not. Although the WHO's interpretation concentrates upon individual ability, relationship, community, societal, and organizational factors also contribute to health literacy skills. The multiplicity of definitions highlights the disorganization of this field of study which can limit reliable measurements and produce inaccurate and sometimes contradictory findings (Osborne et al. 2013).

### *State of Health Literacy and Demographic Data*

Data from the 2003 National Assessment of Adult Literacy (NAAL) demonstrate that 36% of the adult population in the United States had basic or below basic health literacy (Kutner et al. 2006). However, health literacy impacts certain groups more than others. Social

determinants of health, such as socioeconomic status, race, cognition, education level, and language, contribute to health literacy abilities. The results from the NAAL revealed that adults who were sixty-five years or older, Black or Hispanic, male, low-income, spoke another language, and had low educational attainment had the lowest levels of health literacy in the U.S. population (Kutner et al. 2006). Public health research on health equity has proven that reducing health inequities and increasing access to resources requires tackling the social determinants of health (Mogford, Gould, and Devoght 2011).

There are not enough current studies on how identity impacts health literacy (Nutbeam, McGill, and Premkumar 2018). Information about the social gradient of health can be applied to the inequalities in health literacy. The social gradient of health explains that people with lower socioeconomic statuses or marginalized identities have worse health than those that are more advantaged (Mogford, Gould, and Devoght 2011). Since older adults are disproportionately impacted by poverty in the United States, health literacy skills may be the lowest among this group (Gonzalez-Rivera, Bowles, and Dvorkin 2019).

Specific populations are disproportionately burdened by limited health literacy with older adults having among the lowest levels. Results from the 2003 National Assessment of Adult Literacy found that when measuring health literacy by age group, adults sixty-five years or older had the highest percentage of adults who measured below basic health literacy levels. Twenty-nine percent of adults sixty-five and older had below basic levels of health literacy and 30% had basic health literacy levels. In comparison, only 13% of adults aged fifty to sixty-four years old had below basic and 21% basic health literacy levels. This research suggests that as adults age, and specifically once they reach sixty-four or older, health literacy skills severely decrease (Kutner et al. 2006).

Low health literacy in older adults is associated with the mismanagement of one's health, disengagement in health-promoting behaviors, poor adherence to medication, higher rates of hospitalization, worse overall health, and increased mortality (Batterham et al. 2014). Older adults are disproportionately impacted by chronic conditions, with 95% having at least one and 80% having two or more chronic conditions (National Council on Aging 2022). This represents the importance of having the skills necessary to prevent illnesses or manage current ones effectively. Researchers such as Mengyun Zheng associate these challenges with the established link between health literacy and quality of life (Zheng et al. 2019). Additionally, a Finnish study found that older adults with high health literacy levels reported fewer depressive symptoms, greater life-space mobility, and better physical function (Eronen et al. 2019). However, only 3% of American adults sixty-five and older had proficient health literacy levels (Kutner et al. 2006). Enhancing health literacy may promote a healthy lifestyle, prevent disability, and minimize the need for long-term care for older adults (Batterham 2014).

Although it has been demonstrated that health literacy levels are low in older adults, there is not a consensus on which aspect of health literacy proves the most challenging. One study found that the decline in cognitive function of older adults decreases reading skills. Struggles in understanding health information are symptomatic of low literacy levels (Federman et al. 2009). Reading literacy is only one dimension of health literacy which does not allow a multidimensional understanding of the critical and interactive health literacy skills of older adults.

Another study using the Health Literacy Questionnaire (HLQ) found that the largest barrier to maintaining optimal health for older adults is accessing health information by navigating the healthcare system (Fletcher 2014). Research from the *National Association of*

*Area Agencies on Aging* noted that 59% of older adults in the United States find at least one activity difficult when navigating the healthcare system (Managed Healthcare Executive 2019). These struggles could involve understanding benefits or diagnoses, deciding on treatment, and advocating for themselves which has also changed dramatically over the past three years.

The COVID-19 pandemic expanded the e-health field (Williams et al. 2022). Doctors' appointments, patient portals, lab results, medication refills, and appointment summaries are now mainly online. Research demonstrates that older adults experience a disadvantage in adopting digital health practices (Lopez, Kim, and Sacks 2022). This inability to use online systems could impact their ability to navigate the healthcare sector and find information pertinent to their health. The shift towards e-health may disproportionately strengthen existing inequities between adults with low health literacy and those with high levels. As people age, social adaptation is required to ensure desirable health.

The skills necessary to understand health information, navigate the healthcare system, or find information are components of health literacy that may be challenging for older adults. Countless studies have identified problems that older adults encounter within the healthcare field, but the research is not conducted throughout one survey that assesses and compares multiple dimensions of health literacy (Batterham et al. 2014; Boston University 2023; Jordan, Osborne, and Buchbinder 2011). Comprehensive measurement instruments are necessary to identify the limitations that are the most urgent among older adults.

### *Measurement of Health Literacy*

There are more than two hundred health literacy measurement instruments (Boston University 2023). A review of current tools found that health literacy is not consistently

measured so it is difficult to compare results across studies (Jordan, Osborne, and Buchbinder 2011). For example, many instruments, such as the Functional Health Literacy Test (FHLT), focus on numeracy skills, reading ability, and language comprehension. In contrast, the Newest Vital Sign instrument assesses comprehension and numeracy by reading a food item label (Osborne et al. 2013). Other important aspects of health literacy, such as navigating the healthcare system, communicating with providers, or providing social support, are missing from these tools. Other instruments, such as the FHLT generate a single health literacy score which neglects the multidimensional essence of health literacy. This can lead to construct under-representation which lowers the validity of study results (Jordan, Osborne, and Buchbinder 2011). Invalid studies can misdirect where intervention is imperative by ignoring issues among populations.

The Health Literacy Questionnaire (HLQ) was created in 2013 in response to the countless instruments with low validity and reliability (Osborne et al. 2013). This tool detects the needs of people in communities through nine distinct domains.

A systematic review evaluated known health literacy measurements and their effectiveness with older populations. Among the 4,261 articles that researchers located and analyzed, the HLQ was rated the most effective with the highest quality of evidence (Slayter et al. 2020). The HLQ has been tested using the contemporary theoretical validity testing approach (Leslie et al. 2017). The validity of the HLQ is reported to be sufficient. It is reported as reliable because Chronbach's alpha is greater than 0.8 for all scales in multiple settings (Boston University 2023). An advantage of the HLQ compared to other tools is that its validity has been tested among different cultures, ethnicities, languages, and ages. This means that the HLQ can be reproduced in any setting. One weakness of the HLQ is that it lacks data on test-retest reliability

(Osborne et al. 2013). This should be acknowledged if future studies aim to test the effectiveness of interventions. The gap in this data may be the result of the recent implementation of this questionnaire. Overall, the HLQ scales capture the lived experiences of people who access the healthcare system.

### *Current Initiatives*

The 2003 National Assessment of Adult Literacy (NAAL) was the first and only large-scale national assessment in the United States that examined health literacy. Focused mainly on English literacy, the NAAL also included a health literacy scale (Lopez, Kim, and Sacks 2022). Findings from the 2003 NAAL together with an abundance of smaller studies have prompted initiatives to improve health literacy. The U.S. Department of Health and Human Services' Healthy People Initiative has included developing health literacy skills as one of its national objectives since 2000. The Affordable Care Act, the Plain Writing Act, and the HHS National Action Plan to Improve Health Literacy are federal programs that incorporate health literacy in their plans (Lopez, Kim, and Sacks 2022). Despite these initiatives, the absence of current national studies suggests inattention and a lack of progress toward this public health issue.

New York State has various agencies that target literacy levels, but only a few address health literacy. *Literacy New York* aims to help the 22% of New York State residents who suffer from low literacy levels by offering state-wide tutoring and instruction to adults (Literacy New York). This service can improve an individual's functional health literacy skills but it does not increase other skills that are necessary to make well-informed decisions about one's health care.

For example, literacy levels may not assist in an individual's ability to engage with their healthcare provider.

Similar to statewide actions, Saratoga Springs has various community organizations to assist residents which may indirectly benefit health literacy skills; however, the effect of each program in relation to health literacy skills has not been measured. There is no known data on the health literacy skills of Saratoga County residents. Census data from 2003 show that 13% of adults read below a fifth-grade reading level (Literacy NY Greater Capital Region). This statistic suggests that 13% of adults may not be able to read prescription bottles since one study found most prescriptions are written at an eighth-grade or higher reading level (Young, Baker, and Aguirre 2019). Again, reading levels cast an incomplete perception of health literacy.

Don Nutbeam's twenty-year review of health literacy suggests that the rhetoric and popularity of advocating for health literacy have not been converted into meaningful advances in public health interventions (Nutbeam, McGill, and Premkumar 2018). There needs to be more research on effective health interventions which should be then executed at a community level. The Saratoga Senior Center offers many services to its members that may increase health literacy skills. For example, exercise classes, community-building activities, senior life transition assistance, and support from the staff can all influence healthcare decisions and actions (Saratoga Senior Center 2023). However, there are not any interventions that directly target or measure health literacy among older adults in Saratoga Springs, NY.

### *Effective Intervention*

The goal of any research is to provide meaning and transparency into a phenomenon that may be misunderstood. Health education can be an effective strategy to increase the health literacy of a population. Many studies, such as Qarin Lood's, have tested the effectiveness of

health education programs. Research has found that health promotion can empower individuals to live a healthier life. The design of health promotion should be a person-centered approach (Lood, Häggblom-Kronlöf, and Synneve Dahlin-Ivanof 2015). As a researcher, one should identify pre-existing skills, competencies, structures, partnerships, and resources before conducting research and designing a health promotion program in a community.

Van Den Broucke's chapter in the *International Handbook of Health Literacy* presents the theoretical model of capacity building for health literacy. Capacity building includes the actions that strengthen and build resources to improve health services to special populations (Van Den Broucke 2019). Health capacity also involves being mindful of pre-existing structures during research and intervention. Once the context is better understood, researchers can respond appropriately to the environment and cultural context. For example, among community centers with older adults, it may be important to understand what activities they find challenging and create accessible resources. This could mean creating large font print materials versus audio resources. It is important to understand the community being studied so as to not undermine the structures present. These structures could be impacted by social determinants of health and identities. Van Den Broucke discusses a combination of effective capacity building strategies at the individual, group, organizational, and community levels. Health promotion workers can use these guidelines to plan models and interventions for change.

Emphasis on the importance of capacity building throughout the levels of an individual's life draws on social ecological theory. This theory considers the relationship between individual, community, and societal factors that impact health outcomes (Golden 2012). The research and intervention in this study will not be able to include the societal relationship of the social ecological model due to the inability to reach that level. This could be a limitation of this study

when considering the social ecological theory as a model for health change. Community development and individual levels of change will be the focus of this project which contradicts the public health approach of intervention at all levels or a top-down approach.

Health promotion has the potential to empower people to develop a healthier lifestyle. Increasing health literacy skills improves health outcomes by developing the ability to be responsible for one's own health care. The practices in this research derive from the theories and methods in the field of health literacy and public health. In this research, it is important to understand the distinction between the forms of health literacy. In intervention, there are many theories and research to frame best practices for a health promotion educator. The social determinants of health and social gradient of health are acknowledged in the analysis of Health Literacy Questionnaire results. Future studies should conduct this research and intervention with a more diverse sample.

After reviewing the central findings and theories on health literacy, there are many noticeable gaps. First, the study of health literacy is recent which signifies that there is overall limited research on certain aspects of this topic. Although it has been identified that older adults have poor health literacy, there is not enough research testing to discover which dimensions of health literacy are the most difficult for older adults. The separate scales of the HLQ indicate the gaps in knowledge by providing a multidimensional approach. When considering the social ecological model, many studies have focused on individual or organizational intervention. However, a community level intervention is also important. This study will seek to target a larger group to enhance the skills of older adults in Saratoga Springs.

This research can inform other community public health experts on effective education methods to improve health literacy scores in the population of older adults. It also can provide

further evidence for the necessity of governmental funding and programs targeted at older adults. Further exploration of this field is necessary so older adults can effectively manage their health.

As the population of older adults increases, research on understanding the health challenges of this group is imperative (Christian, Bowles, and Dvorkin 2019). Limited studies on which dimensions of health literacy are the most difficult for older adults initiated this research. This study aims to provide an understanding of the strengths and limitations in health literacy skills among older adults at the Saratoga Senior Center in Saratoga Springs, New York. The results will inform suggestions for interventions or resources which can improve health literacy abilities among older adults.

## METHODOLOGY

### *Setting*

Saratoga Springs, New York, is the setting of this research. Saratoga Springs is a small city of 28,000 inhabitants. Around 20% of the population is sixty-five years and older (United States Census Bureau 2021). The population of older adults has steeply increased in Saratoga in comparison to other New York counties (González-Rivera, Bowles, and Dvorkin 2019). To accommodate for the current trends, the Saratoga Senior Center is moving to a new and bigger building in May of 2023 (Saratoga Senior Center 2023).

Data for this study was collected at the Saratoga Senior Center located in downtown Saratoga Springs, NY. Founded in 1955, the center is a non-profit where residents fifty years or older can join for only \$35 a year and participate in programs, activities, and receive free lunch. The center averages around 150 Saratoga residents a day and 1400 members per year (Saratoga Senior Center 2023). This senior center is a favorable location for this research because it has a large sample size of older adults in the area.

### *Participants*

Fifty older adults participated in this study by completing the Health Literacy Questionnaire. Participants were at least fifty years old, but the average age at the center is between seventy and seventy-five years old. Around 75% are women. All participants in this study were members of the Saratoga Senior Center. The overall group's health literacy scores will be examined rather than individual scores. Census data from 2020 shows that 8.3% of Saratoga residents live below the poverty level which is lower than the general rate of New York State. However, 49% of Saratoga residents aged sixty and over receive SNAP (food stamps), which indicates that almost half of older adults in Saratoga have low incomes. Eighty-eight percent of people in Saratoga identify as white and 93% have high school degrees (United States Census Bureau 2021).

### *Ethics*

This study was approved by Skidmore College's Institutional Review Board for conducting research with human subjects. Permission to conduct the surveys was granted by staff members at the Saratoga Senior Center. The primary investigator became acquainted with the schedule of the center, members who regularly frequented the center, and employees prior to data collection. The survey was voluntary, anonymous, and demographic information was not recorded. The intent of the project was explained verbally in clear language to each participant prior to survey administration. Verbal consent was obtained through an informed consent form shown in Appendix A. Participants were offered to keep the consent form which provided the researcher's contact information and the purpose of the study. The completed survey was stored in an enclosed envelope. The data was entered into Microsoft Excel weekly. Physical copies of

the survey were destroyed. The Excel worksheet was password-protected. There were minimum risks involved in this study.

### *Data Collection*

Quantitative data was collected between February 2023 and April 2023 through convenience sampling methods using the Health Literacy Questionnaire (HLQ). Saratoga Senior Center members were approached by the primary investigator during their free time at the center. The older adults were often in communal spaces playing pool, eating lunch, on the computer, or reading. Participants were given the option of self-administration or oral administration of the HLQ. Twenty-five percent of participants chose oral administration of the survey. The investigator accompanied the participant if they needed assistance during the survey. Discussions with the researcher and participant usually occurred following the survey completion.

### *Instrument*

The Health Literacy Questionnaire uses forty-four questions to measure health literacy. The copy of the questionnaire cannot be published in this report due to the terms in the license agreement with the Swinburne University of Technology. The survey was administered by pen and paper and took an average of seven to thirty minutes to complete. Each question covers one of the nine different scales or domains of health literacy and is correlated to a distinct scale. There are multiple questions linked to each domain of health literacy. The scales and ranges are presented in Table 1.

There are two parts of this survey. Part One has four continuous response options and assesses whether a person agrees or disagrees with the statements. These are: “strongly disagree”

= 1, “disagree” = 2, “agree” = 3, and “strongly agree” = 4. Part Two asks respondents to indicate how difficult or easy tasks are. There are five continuous response options. Response options range from: “cannot do or always difficult” = 1, “usually difficult” = 2, “sometimes difficult” = 3, “usually easy” = 4, and “always easy” = 5. The HLQ provides a complete portrayal of health literacy by providing nine separate scores rather than a single summative score.

**Table 1. Health Literacy Questionnaire Scales and Ranges**

<b>Part 1</b> Range 1-4 (lowest to highest)	1. Feeling understood and supported by healthcare providers
	2. Having sufficient information to manage my health
	3. Actively managing health
	4. Having social support for health
	5. Appraisal of health information
<b>Part 2</b> Range 1-5 (lowest to highest)	6. Ability to actively engage with healthcare providers
	7. Ability to navigate the healthcare system
	8. Ability to find good health information
	9. Ability to understand health information well enough to know what to do

### *Data Analysis*

The Health Literacy Questionnaire user package offers instructions and tools for data analysis. The data from the surveys were submitted into a Microsoft Excel worksheet. Means and standard deviation were the measurements used in this study. The mean scores and standard deviations for each participant were automatically populated once the data was entered into Excel. The total scores (mean and standard deviation) were calculated for each scale. Scales were scored by summing the responses to each question and dividing it by the number of questions in that scale to provide the mean score for each scale. In reference to Table 1, scales one through

five have a mean score range of one to four. Scales six through nine, or Part Two, have a mean score range of one to five. Standard deviations were calculated to assess the variation within each scale. These calculations were completed for all nine scales to determine distribution among the sample. The data was also congregated to demonstrate the frequency distributions among each scale.

The nine scores were compared to one another to determine the health literacy scale that was the most challenging for older adults in this sample. Higher means demonstrate greater health literacy skills.

## RESULTS

**Table 2. Health Literacy Questionnaire Mean Scores**

<b>Health Literacy Questionnaire Scale</b>	<b>Mean</b>	<b>SD</b>
<b>Part 1:</b>	Range 1-4 (lowest to highest)*	
1. Feeling understood and supported by healthcare providers	3.75	0.33
2. Having sufficient information to manage my health	2.89	0.47
3. Actively managing health	3.30	0.43
4. Having social support for health	3.41	0.40
5. Appraisal of health information	2.94	0.56
<b>Part 2:</b>	Range 1-5 (lowest to highest)**	
6. Ability to actively engage with healthcare providers	4.02	0.50
7. Ability to navigate the healthcare system	3.85	0.62
8. Ability to find good health information	3.50	0.55
9. Ability to understand health information well enough to know what to do	3.94	0.52

Abbreviations = SD Standard Deviation

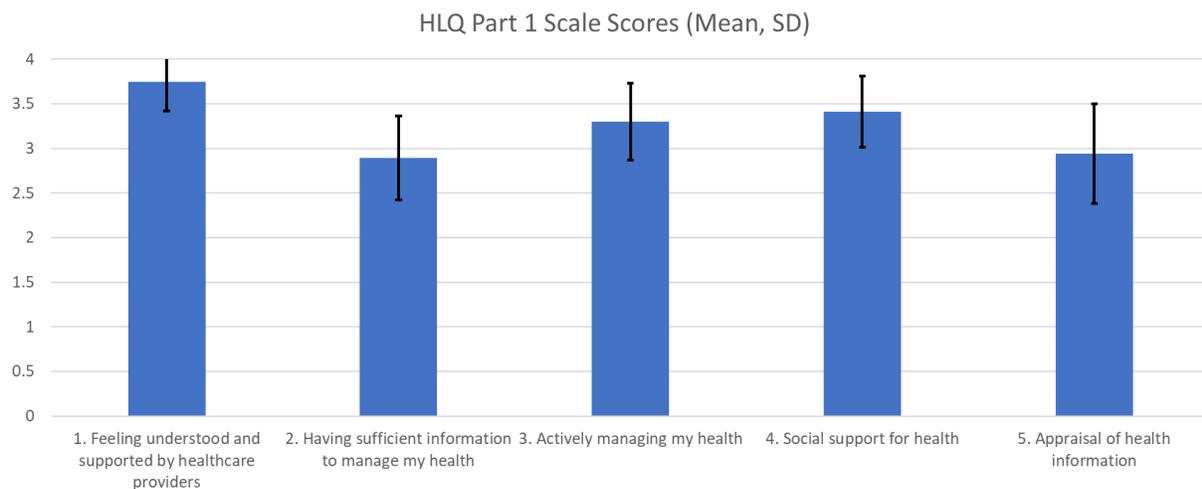
\*1= Strongly disagree, 2= disagree, 3= agree, 4= strongly agree

\*\*1= Cannot do or always difficult, 2= usually difficult, 3= sometimes difficult, 4= usually easy, 5= always easy

Mean scores for each Health Literacy Questionnaire scale are shown in Table 2. The means and standard deviations of scales one to four are represented in Figure 1. Responses from the questions in Part One of the survey range from “Strongly disagree” to “Strongly agree” (range one to four). The scales that received the lowest overall scores in Part One was scale two: “Having sufficient information to manage my health” (mean score 2.89 (SD 0.47)), and scale five: “Appraisal of health information” (mean score 2.94 (SD 0.56)). The mean scores of scales

two and five demonstrate that participants were in between “agree” and “disagree” for feeling that they have sufficient information to manage health or appraise health information. Scale one: “Feeling understood and supported by healthcare providers” received the highest score (mean 3.75 (SD 0.33)). This score indicates that most people agree or strongly agree that they feel understood by their provider.

**Figure 1. Mean Scores for Part One of Health Literacy Questionnaire**



Responses in Part Two, or scales six to nine, range from “Cannot do or always difficult” to “Always easy” (range one to five). Mean and standard deviation scores for Part Two of the questionnaire are displayed in Table 1 and Figure 2. The scale that received the lowest score was scale eight: “Ability to find good health information” (mean score 3.50 (SD 0.55)). This score represents that the mean response of participants was between “sometimes difficult” and “usually easy” to find good health information.” The other scales in Part Two received similar mean scores. Scales six, seven, and nine had means that indicate the tasks associated with these concepts were “usually easy.” Scale six is “Ability to actively engage with healthcare providers” (mean 4.02 (SD 0.81)), Scale seven is “Ability to navigate the healthcare system” (mean 3.85

(SD 0.88)), and scale nine is “Ability to understand health information well enough to know what to do” (mean 3.94 (SD 0.85)).

**Figure 2. Mean Scores for Part Two of Health Literacy Questionnaire**

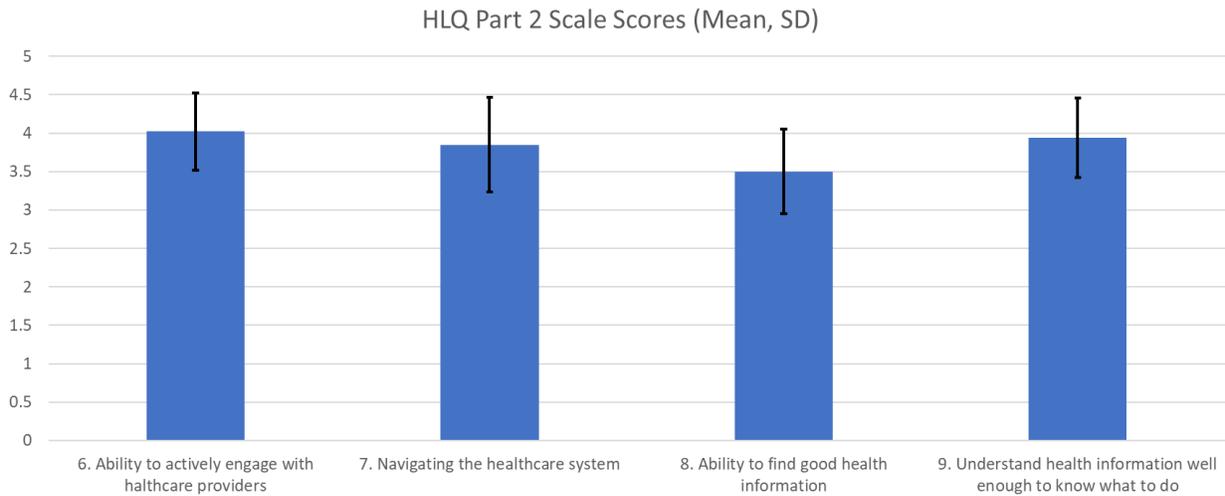
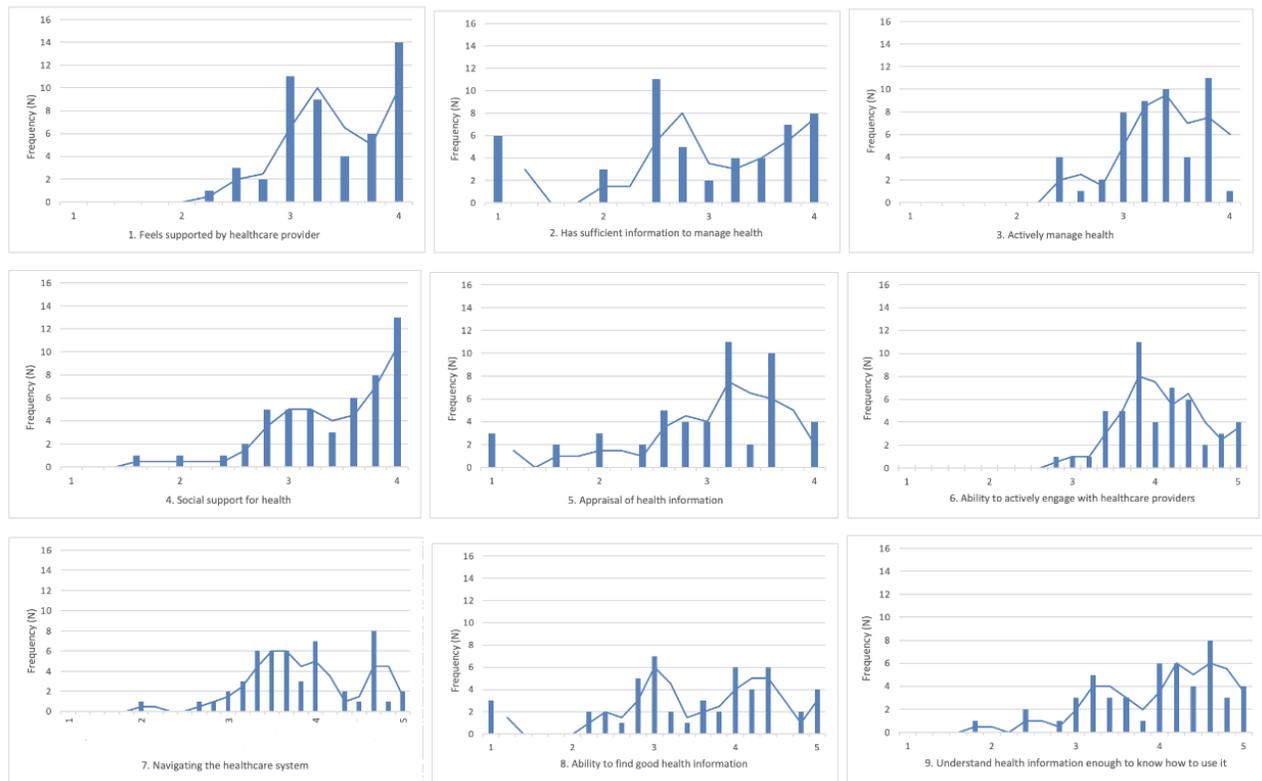


Figure 3 demonstrates the frequency distribution of each of the nine health literacy scales. Some scales show a greater variance in responses than others. For example, scale two: “Having sufficient information to manage my health” produced mixed responses that ranged from one: “strongly disagree” to four: “strongly agree.” Others, such as scale one: “Feels supported by healthcare provider” demonstrate that the majority of mean responses were from three to four, or “agree to strongly agree.”

**Figure 3. Mean Frequency Distribution of Health Literacy Questionnaire Scales**



## DISCUSSION

The application of the Health Literacy Questionnaire enabled the researcher to identify the skills that determine the ability of older adults in Saratoga Springs to gain access, understand, and use information in ways to promote good health (Batterham 2014). Overall, this population had moderate health literacy. The multi-dimensional nature of the study also revealed that this sample experiences different combinations of health literacy strengths and weaknesses. Figure 3 shows that even within a small sample size, variation within scales is evident. The analysis indicates that the area older adults found most challenging was finding and appraising health information and using it to manage their health. The results show that most older adults feel supported and understood by their healthcare providers. This may represent a positive relationship to social services within the Saratoga Springs community.

The health literacy limitations among this sample of older adults involved the skills relating to finding relevant information and applying it to make health decisions. Based on mean scores from the HLQ, Saratoga seniors are less likely to feel confident in the information they have to manage their conditions. Their responses imply that they do not always use a wide range of sources to find current information. This sample also may have trouble identifying reliable information and resolving conflicting information by themselves. The scales that received the lowest scores all shared the similarity of finding, evaluating, and comprehending information relevant to an individual's health.

Limitations associated with accessing and applying health information may be a consequence of poor e-health skills. As mentioned earlier, proficient computer literacy skills are now imperative to successfully accessing the current healthcare system. Unfortunately, previous studies have found that older adults have limited e-health skills when compared to other age groups (Lopez, Kim, and Sacks 2022). A recent study on older adults and their interaction with technology, discovered that although internet usage among older adults has greatly increased from 2000 to 2016, usage is not equivalent to ease of use (Turner et al. 2018). This represents the difference between functional health literacy skills in comparison to critical health literacy skills. Correspondingly, the results from this study reveal that locating information (scale eight) was much easier than utilizing it (scale two). This inability to utilize health information can prevent individuals from taking advantage of telehealth opportunities that support beneficial health behaviors. Older adults may need critical health literacy support and instruction so they can engage with technology more effectively.

The findings from the scales associated with information use may be higher than the broader population of older adults since adults in this study had opportunities to use computers

with staff on-site who could assist them with e-health skill development. However, Saratoga seniors would still benefit from learning the critical health literacy skills of analyzing information after extracting it from multiple sources, including multiple e-health platforms.

Surprisingly, navigating the healthcare system was not perceived as the largest obstacle in this sample of older adults in Saratoga Springs. Previous studies, such as one from The National Association of Area Agencies on Aging, have found that “navigating the healthcare system” is challenging for 59% of older adults in the United States (Managed Healthcare Executive 2019). They explain that these activities involve understanding benefits and diagnoses, deciding on treatment, and effectively communicating with providers. However, studies may evaluate navigating the system differently. The questions associated with the HLQ scale on navigating the health care system asks participants questions about going to the correct providers and offices as well as determining entitled services. The characterization of what involves “navigating the healthcare system” conflicts across various studies. This could cause the misinterpretation of health needs and an inappropriate allocation of services. A new, single instrument is imperative so that studies can be compared and the requirements of older adults can be met.

Another explanation for the relatively low scores adjacent to information use could be the consequence of multiple health challenges of older adults while they navigate the high concentration of health information. Beauchamp’s study on health literacy in Australia found that individuals with more chronic conditions faced difficulties in having sufficient information for their health and navigating the healthcare system (Beauchamp et al. 2015). As mentioned earlier, the majority of older adults experience two or more chronic diseases (National Council on Aging 2022). The amount of information available online, combined with the number of services required to manage chronic conditions could cause older adults to feel overwhelmed in analyzing

healthcare information and sources (Beauchamp et al. 2015). This could motivate older adults to depend on healthcare providers and non-internet sources of information over personal, online exploration options. Additionally, adults who rely only on one source of information, in this study their health providers, have lower health literacy levels and therefore worse health outcomes (Fletcher 2014). Therefore, a high score for relationships with healthcare providers may not correspond with high health literacy.

The results from this research demonstrated that older adults perceived strong relationships with their healthcare providers and support system. Members' responses to the Health Literacy Questionnaire signify that Saratoga seniors seek advice from familiar healthcare providers when necessary. Within these relationships they feel empowered enough to ask questions to clarify what they do not understand. Besides healthcare providers, these older adults also have a social support system that can provide them with practical information or emotional assistance in appropriate circumstances.

Comfortability with health care providers and adequate social support among older adults in this sample may indicate the strength of services for older adults in Saratoga Springs, New York. The Saratoga Senior Center's mission is to connect seniors to local resources. This includes senior life transition advice, transportation to appointments, and advocacy for chronic illnesses (Saratoga Senior Center 2023). The adults in this study may have higher health literacy skills in the scales related to social support because they are members of a community center where older adults can have some of their needs met (Uemuraa, Yamadab, and Hiroshi 2020). However, scores may be high for the perceived relationships with healthcare providers because older generations may not expect to be a participating partner with their health provider and perceive the tasks in the interaction scale as less problematic (Bo et al. 2022). For example, in

reference to a question corresponding to scale six of the HLQ, an adult may state that they “strongly agree” that they “have good discussions about your health with doctors.” However, their perception of quality may be held to a low standard. This can influence the disproportionately high rate of older adults who adhere to their healthcare provider’s instructions without questioning them (President’s Commission 1982). Regardless, any communication with a trusted healthcare provider can be beneficial and demonstrates competent interactive literacy skills.

This study has several limitations and opportunities for replication. The study only consisted of fifty participants which limits its generalizability. The sample is not representative of all older adults or even other older adults from Saratoga, New York. This is because adults who are members of the Saratoga Senior Center may have different capabilities than other Saratoga citizens. Individuals who are more involved in their community or already possess high literacy skills, may be the most willing to participate in health literacy surveys (Beauchamp et al. 2015). Twenty-five percent of participants in this study completed the questionnaire through oral administration. The presence of the researcher may have influenced answers (Fletcher 2014). Since the survey was self-reported, older adults may perceive themselves having greater competencies than they accurately possess. (Brenner and DeLamater 2016). All of these circumstances could influence an underestimation of the needs of older adults.

Demographic data was not collected in this study. The relationship between health literacy capabilities and demographic variables in the larger population is proven to be significant (Mogford et al. 2011). For example, the 2003 NAAL revealed that 58% of African Americans had basic or below basic health literacy, compared with 28% of non-Hispanic whites (Kutner et al. 2006). Therefore, the findings from this study are not generalizable for other racial

identities or communities because their experiences with the healthcare system may be much different. Future studies should consider the impact of race, gender, and socioeconomic status on the health literacy skills of older adults.

It is imperative that strategies to improve health literacy are evidence-based (Lopez, Kim, and Sacks 2022). A current national assessment of adult health literacy is essential in determining the needs of different populations among Americans. The Health Literacy Questionnaire can serve as an example of a tool that measures health literacy through a multi-dimensional, comprehensive approach. Strengthening survey instruments and eliminating inadequate ones will permit the comparison of data among studies. Once accurate data is collected, evidence-based and culturally appropriate interventions can occur.

Both public health research and the findings from this study indicate that there are limitations in the health literacy abilities among older adults (Berkman et al. 2011). The results from this research suggests that interventions should concentrate on developing skills to seek, assess, and apply health information. Older adults have more difficulties engaging with digital health resources and these challenges impact their ability to autonomously care for their health (Lopez, Kim, and Sacks 2022). Efforts to combat technology challenges and information gaps among older adults should stem from the social ecological framework. This multifaceted approach for health promotion and prevention emphasizes that intervention must address individual, community, and societal levels for advancements in health literacy and health outcomes to occur (Golden 2012).

Suggestions for e-health interventions at a societal level involve improving the online health-delivery system by ensuring that health websites are easy-to-understand. Online resources should have clear language, multilingual options, straightforward design, and visuals that support

understanding. Websites could also implement e-health tools such as pop-up chat instructions when consumers face difficulties. Health websites such as Medicaid or the CDC should organize their content so that older adults do not need to access multiple sources if possible. For example, messages should be bundled to avoid clustered information that older adults have trouble absorbing (Lopez et. al 2022). Federal agencies should also support states and communities with funding to provide technology workshops for older adults, health professionals, and other community members. These societal efforts can empower older adults to interact with current health information and technology so they can make independent and informed health decisions.

The findings from this study inspired the creation of a resource shown in Appendix B, to improve the health literacy skills of older adults in the Saratoga community. Scales from the HLQ relevant to older adults' confidence in engaging with health information were targeted. This is apparent by the lower mean scores in scales two, five, and eight which is evident in Table 2. The intervention was tailored based on community needs, cultural norms, and pre-existing resources.

Many older adults in Saratoga may rely on the Saratoga Senior Center to access computers (Fletcher 2014). The printed document will be permanently located next to the desktops in the new Saratoga Senior Center building. Copies will also be electronically sent to older adults by the center. The resource, entitled "Online Health Information: Can I trust it?", aims to help older adults identify reliable digital health information. The document consists of questions adults can ask themselves to assess the quality of health sources. The questions offer support in evaluating online information.

The repetition of applying this resource could influence evaluation and exploration strategies to become ingrained in older adults. Studies on the interaction with technology and

older adults, found that accessing online information is sometimes too intimidating to attempt (Knowles and Hanson 2018). This resource has the potential to increase the self efficacy, or the confidence to undertake behavior, of older adults (Santos, Silva, and Gomes 2022). Self efficacy is an aspect of Nutbeam's characterization of interactive health literacy and an important component of health promotion (2018). This resource could empower Saratoga Senior Center members to independently identify and compare quality information to make healthy lifestyle decisions. This is significant since older adults have to manage multiple conditions which requires information from different sources. Increasing the access to resources and information could influence adults to make informed decisions that minimize or prevent the effects of chronic diseases.

This resource was deliberately designed to be accessible to older adults with low health literacy. Recommendations from the CDC for developing public health communications were helpful in the development of this resource (2022). More importantly, Saratoga Senior Center staff members collaborated in constructing the material. The resource was drafted multiple times to ensure that the content is highly effective. Health capacity strategies were employed to respond effectively to the cultural context of older adults at the senior center.

The text of the resource was designed to be clear, jargon-free, and in large print. The image is clear with a sufficient contrast of color. Stereotypes were avoided and the image illustrates positive behavior. For example, including an image portraying a frustrated older adult on the computer could discourage adults from learning ehealth skills. This culturally-appropriate resource intends to implement behavior and attitude change among Saratoga Senior Center members. Future actions could involve making this resource accessible to the broader Saratoga community.

Along with the resource designed for the Saratoga Senior Center, the findings of this study will be presented to the community at the Saratoga Senior Center May 4, 2023. The presentation will be promoted through the Saratoga Senior Center's newsletter that members receive. The presentation will be tailored to the audience by including only relevant information, using easy-to-understand language, and applying accessible presentation techniques. Although the discovered health literacy challenges of this population will be shared, the main message will be encouraging. The presentation will include the health literacy strengths of the sample and achievable strategies to improve health literacy skills. Following the presentation, inclusive dialogue between older adults, Saratoga Senior Center staff, and the researcher can transpire. This study has attempted to keep the best interests of older adults in mind throughout. Therefore, it is imperative to share the research with members of the Saratoga Senior Center and treat them as capable and active members of society.

## CONCLUSIONS

As the number of older adults in the United States is projected to double by 2060, our healthcare delivery systems must be prepared to meet their needs (Mather, Scommngna, and Kilduff 2015). The older adults in this study displayed confidence in many areas of health literacy. However, limitations were discovered in the scales; having sufficient information to manage health, appraisal of health information, and the ability to find good information. These results suggest that older adults may experience complications while interacting with health information across various platforms and sources. Addressing current barriers among vulnerable populations is essential in promoting health equity.

There are various opportunities to improve the health literacy skills of older adults. This study advocates for a nationwide, multidimensional assessment of health literacy and collaborative interventions from the federal, state, and community level. The resource developed in this study has the potential to increase the health literacy skills, and therefore the quality of life of older adults at the Saratoga Senior Center in Saratoga Springs, New York.

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### **Informed Consent for Research Participation**

**Study Title:** Health Literacy in Older Adults

**Principal Investigator (PI):** Elizah Jacobs, Self-Determined Major in Public Health, Class of 2023, Skidmore College

**Faculty Advisor:** Xiaoshuo Hou, Sociology, Skidmore College

**PI Contact Info:** (513) 828-8721, ejacobs2@skidmore.edu

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You are being asked to participate in a research study entitled “Health Literacy in Older Adults.” Carefully consider the information below and ask questions about any of the information you do not understand before you decide whether to participate.

· **Voluntary Consent.** Taking part in this research project is completely voluntary. You don’t have to participate and you can stop at any time or skip any questions.

· **Purpose.** The purpose of the study is to understand the levels of health literacy skills of older adults in the community of Saratoga Springs through a Health Literacy Questionnaire (HLQ). The researcher hopes to develop a resource for older adults in the community based on the survey results.

· **Procedures.** If you choose to participate, you will be asked to complete a survey in person about your knowledge of health information and services.

· **Duration.** It is expected that your participation will last approximately 7-30 minutes.

· **Risks.** The risks for this study are minimal. Participants may feel uncomfortable reflecting and disclosing their knowledge on health topics. The primary investigator will be next to the participant while they are completing the survey, in case they need any help. There is a small risk of COVID-19 exposure to participants since the participants and researcher will be less than six feet apart. The primary investigator is fully vaccinated and will wear a protective mask during the survey to mitigate COVID-19 risk.

· **Benefits.** Some of the benefits that participants could expect would be the opportunity to increase their health literacy through the implementation of a resource. This could increase an individual’s comfortability to navigate and manage their own health. The researcher hopes to gain information on the health literacy skills of older adults to make the resource more relevant.

· **Confidentiality.** The questionnaire will be anonymous and will not ask any of your personal information. The physical copy of your completed questionnaire will be stored in a locked file cabinet. After all surveys are completed, the questionnaires will be entered into a

password-protected file on the primary investigator's computer and the physical copies will be destroyed.

·**Compensation.** There is no compensation for participating in the study.

·**Contact Information.** The main researcher conducting this study is Elizah Jacobs, Class of 2023 at Skidmore College. If you have questions later, you may contact Elizah Jacobs at (513) 828-8721 or ejacobs2@skidmore.edu or the faculty advisor for this study, Xiaoshuo Hou, at xhou@skidmore.edu. If you have questions or concerns regarding this study and would like to speak with someone other than the researcher, you may contact Mary Hoehn, Institutional Review Board Chair, Skidmore College, 815 N. Broadway, Saratoga Springs, NY, 12866, (518) 580-8052, mhoehn@skidmore.edu.

### **STATEMENT OF CONSENT**

I have had the opportunity to read and consider the information in this form. I have asked any questions necessary to make a decision about my participation. I understand that I can ask additional questions throughout my participation.

I understand that by giving my verbal consent, I volunteer to participate in this research. I understand that I am not waiving any legal rights. I have been provided with a copy of this consent form. I understand that if my ability to consent or assent for myself changes, either I or my legal representative may be asked to re-consent prior to my continued participation in this study.

*I understand what the study is about and my questions so far have been answered. I agree to take part in this study.*

## ONLINE HEALTH INFORMATION

### CAN I TRUST IT?



**It can be hard to know what websites to trust! Let's ask ourselves a few questions to get the best healthcare information:**

#### **WHO RUNS THE SITE?**

- Look for websites ending in .gov, .edu, or .org
- Check the "contact us" page for authors that are experts in the field

#### **WHEN WAS IT MADE?**

- Check for the date at the bottom or top of the web page
- Look for websites that stay current with their information

#### **WHY WAS IT CREATED?**

- Avoid websites trying to sell a product
- Use websites that try to explain information with research
- Check the "About Us" page
- Avoid if the claims seem too good to be true

**Trust yourself!**

For more help: MedlinePlus: Evaluating Internet Information National Library of Medicine