Older Adults, Race/Ethnicity and Mental Health Disparities: A Consumer Focused Research Agenda

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The Literature Search

This document was supplemented by a comprehensive literature search conducted on EMB Cochrane, EMM Health, EMBASE, Medline, CINAHL, AARP, Eric, Pharm, and Psycinfo databases. The purpose of the literature search was to succinctly summarize the current evidence concerning aging (e.g., older adults, elderly, seniors), mental health disparities (i.e., including ethnic minorities) and mental health literacy. Other keywords explored included the general terms of “health disparities” and “health literacy” as it was assumed that materials and publications on mental health disparities and mental health literacy might be subsumed under these categories and would not be available outright. This process proved to be a viable decision as only about one percent of the documents that were revealed by the search were found by specifically inputting the keywords “mental health disparities” and “mental health literacy” coupled with terms related to older adults. These results are clearly indicative of the lack of emphasis on these areas in research on health versus mental health in diverse older adults.

The search was limited to the years spanning 2003 – 2008 because of the rapidly expanding focus of research on health disparities. Nearly 2,000 results were returned from the nine databases outlined in Table 1. Many of the hits were found to be duplicates across databases or were only tangentially related to the topics of concern. The citations and references listed in this paper reflect a combination of the results from the literature search as well as reference materials already housed at Human Resources Research Organization (HumRRO).

All documents collectively identified by the combination of searches are outlined by topic in Appendices A – I at the end of in this document and may serve as a bibliography for the interested reader, researcher or student. A selected number of the documents that are specifically relevant to the areas of discussion are referenced within the paper itself. All materials included as specific citations within the paper and those revealed by the literature search are outlined in the Reference section.
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Introduction

In the late 1990s, the Federal government acknowledged that the U.S. population was aging and becoming increasingly diverse. This transformation was expected to have direct effects on the future of healthcare services across the nation. Therefore, many Federal entities and other organizations began expanding their research objectives and policies to accommodate the changes that were rapidly approaching in the demographic profile of the country (Administration on Aging, 2002; Agency for Healthcare Research and Quality, 2002).

For example, The National Institute on Aging established the Resource Center for Minority Aging Research in 1997 and published its Strategic Plan to Address Health Disparities in 2000 (National Institute on Aging, 2000). Two of the goals of the Healthy People 2010 Initiative, released in 2000, were to increase the quality of years of healthy life for all citizens and to eliminate racial and ethnic health disparities (Pastor, Makuc, Reuben, & Xia, 2002; National Center for Health Statistics, 2001 U.S. Department of Health and Human Services, 2000). The Racial and Ethnic Approaches to Community Health (REACH) 2010 initiative was created in 2002 by the Centers for Disease Control and Prevention (CDC) in response to the national goal of eliminating racial and ethnic health disparities. In that same year, Partnership for Solutions recommended that, because home-based healthcare or “aging in place” was an emerging preference of older adults, planning to allow this option must be afforded the highest priority.

The concentration on older adults and mental health disparities has continued through the efforts of NIMH, SAMHSA and the Administration on Aging by participation in activities during Older Americans Month in May and Healthy Aging Month in September, some grantee programs and a limited number of agency specific initiatives throughout the years. In addition, several Federal efforts that have been traditionally related to mental health issues in children, adolescents and families have included a limited focus on the elderly with the supposition that older adults are an integral component of extended family dynamics.

Health disparities, and to a lesser degree mental health, in racial/ethnic groups and the elderly are well documented. However, the integration of these topics, specifically the relationships between aging (i.e., older adults, defined here as individuals ages 65 and over), race/ethnicity, mental health and the use of mental health services, has only begun to receive adequate attention. Despite recent shifts in focus, large gaps continue to exist in service provision for all older consumers of mental health care. It has been shown that mental health problems in older adults
can decrease quality of life and independence, cause premature institutionalization, influence physical disease onset and progression, and lead to increased utilization of health services (Yang & Jackson, 1998). Yet, little is known about mental health problems in older racial/ethnic populations or about how these disparities affect individuals or the mental health system as a whole.

**The Purpose of This Document.** This concept paper addresses one of the strategic foci of the Center for Mental Health Services’ (CMHS) Eliminating Mental Health Disparities (EMHD) Initiative: Developing a research agenda targeted toward improving culturally responsive services for individuals across the lifespan. To date, the EMHD Initiative has supported work to address policy issues and as a result will be implementing a Policy Summit on the Elimination of Mental Health Disparities in 2009 that is designed to enhance states’ abilities to enact new regulations to combat mental health disparities in local jurisdictions. Other projects designed to address the deficiency of diverse paraprofessionals and professionals in the mental healthcare workforce through education efforts aimed at specific racial/ethnic groups have been funded by the Initiative are already in place or are under development. More information on these projects can be found on the EMHD Initiative website: http://www.endmentalhealthdisparities.org.

This paper is designed to form the foundation for a research agenda focused on the development of practical programs that address mental health issues from the **consumer** perspective. This topic was established as an additional area of concern by Gary M. Blau, Ph.D., Chief, Child, Adolescent and Family Branch, CMHS, and director of the EMHD Initiative, during a meeting of the EMHD External Workgroup on May 19-20, 2008 held at SAMHSA in Rockville, MD. Specifically, this document presents a variety of methods for improving mental health literacy that can be researched, developed and implemented almost immediately in order to reduce mental health disparities in older adults of diverse backgrounds. One goal of this document is to explain how information technology (IT) can help promote mental health literacy among the diverse elderly in the form of consumer mental health informatics. Such strategies include the use of the Internet and other IT-related delivery technologies (Eng & Gustafson, 1999).

*Note:* (See The Institute of Medicine’s publication “Retooling for an Aging America”, released in 2008, for a practical focus and a research agenda for additional instruction on how to address policy and workforce development health-related issues for older Americans on the following topics: 1) the projected future health status and health care services utilization of older Americans, 2) models of health care delivery which hold promise to provide high-quality and cost-effective care for the elderly, 3) the recruitment and education of a more diverse healthcare workforce and 4) how public programs can...
Questions to be Answered. The scarcity of research literature on diverse older adults’ mental healthcare points directly to an immediate need for a detailed practical research agenda on consumer-related topics. It is imperative that the causes of disparities in mental health care for older persons, especially members of racial and ethnic minority groups, are more thoroughly understood in order to reduce their negative impact on quality of life and to increase the provision of culturally-relevant services.

To address the mental healthcare needs of the elderly in the early-21st Century, the authors consider the following questions in this document:

- Can we generalize the findings from research on health disparities in the elderly to supplement the sparse findings from studies on mental health disparities in older adults?
- Has enough research been conducted to move forward with a practical agenda to increase mental health literacy in older adults of diverse backgrounds in order to reduce mental health disparities?
- Do we know enough about the correlation between health disparities in older adults and health literacy in this population to make an educated guess on how to proceed in developing interventions/programs to improve conditions for diverse elderly in the area of mental health?
- Can IT-based interventions be designed to improve mental health literacy in older adults of diverse backgrounds that may subsequently reduce disparities in mental health?
- Can we afford to wait to address mental health disparity issues in diverse older adults as the demographics of the nation are rapidly changing?

In order to explore the answers to these questions, this document is divided into seven sections:

1. The Demographics of Aging and Diversity consists of an outline of the projected aging of the U.S. population and accompanying demographic changes by mid-21st century;
2. Health and Mental Health Disparities in Ethnic/Racial Groups contains a review of recent research findings on health disparities and results from the few studies
available on mental health disparities;

3. *Emphasizing the Aging Factor* takes into account the superimposition of the effect of the aging of the population on existing health and mental health disparities in order to profile expected outcomes in the future;

4. *Health Literacy* includes a summary of the literature on this topic in order to provide a background for the scant material available on mental health literacy;

5. *Mental Health Literacy and Older Adults* is comprised of a discussion on how improving mental health literacy may be one way in which mental health disparities may be mediated;

6. *The Questions Answered* are responses to the queries posited in the section above; and

7. *A Research Agenda* is an overarching practical plan for improving diverse older adults’ mental health through qualitative research and systematic investigations on mental health disparities and mental health literacy in diverse older adults.

### 1. The Demographics of Aging and Diversity

The future demographic makeup of the United States is apparent today. According to two recent reports, the nation will be older and more racially and ethnically diverse by 2050 (Institute of Medicine, 2008; U.S. Census Bureau, 2008). It is probable that these factors will have a dramatic effect on health, mental health and the utilization of health-related services throughout the nation (Institute of Medicine, 2008).

**The Baby Boomers.** One of the primary causes for the population transformation in the U.S. is the aging of the 78 million baby boomers (e.g., individuals born during the post-World War II period between 1946 and 1964; Adler, 2007). All of the baby boomers will be 65 years of age and older in 2030 and, in addition to the existing cohort of older adults, will account for nearly 20 percent of U.S. residents. This segment is projected to increase to 88.5 million in 2050, which is more than double the number of individuals in this age range in 2008 (38.7 million) (U.S. Census Bureau, 2008). The body of individuals 85 and older in the population is also expected to more than triple, from 5.4 million to 19 million between 2008 and 2050 (U.S. Census Bureau, 2008). Furthermore, the percentage of U.S. veterans who are ages 65 and over will double over the next 30 years (representing 54% of the U.S. veteran population) (Hisnanick, 1994).
Life Expectancy. Another reason for the predicted increase in the number of older adults in the population is the increase in life expectancy or the average length of survival of a specified population. According to the National Center for Health Statistics in 2008, Americans' life expectancy reached a record high of 78.1 years in 2006, with disparities among racial/ethnic groups and between genders generally narrowing. The overall U.S. life expectancy rose 0.3 years from 2005 with average life expectancy for women predicted to be 80.7 years and 75.4 years for men in 2006. White women had the longest life expectancy (81 years), followed by African American women (76.9 years), white men (76 years) and African American men (70 years). The 2006 data also provided evidence for the "Epidemiologic or Hispanic Paradox" (Markides & Coreil, 1986). As a group, Hispanics have much lower mortality rates than expected for a population of relatively less socioeconomic status. This phenomenon has been substantiated for most foreign-born Hispanics and also for immigrant Asian older adults (Palloni & Arias, 2004; Hummer, Benjamin & Rogers, 2004). Heart disease and cancer accounted for 1.2 million of the 2.4 million deaths in the United States in 2006. For the purpose of this discussion, it is important to note that on the list of leading causes, Alzheimer's disease, which is often a consequence of aging, became the sixth most common cause of death (up one rung) and diabetes dropped to the seventh position.

Some researchers argue that not all Americans can expect a longer life and some individuals are facing death at an earlier age than their counterparts in certain parts of the country (Ezzati, Friedman, Kulkarni, & Murray, 2008). Their findings indicated that areas that show the greatest relative decline in longevity are Appalachia, the Mississippi River Valley, the Deep South, the southern part of the Midwest, and Texas. In these regions, a large segment of the population lives in economically depressed areas. Most affluent areas of the country reported a continued increase in life expectancy. Therefore, the two trends of overall national improvement, with certain subgroups reflecting a decline, may not be contradictory.

It is generally agreed that life expectancy is directly associated with the quality of health care and social systems within a country suggesting that the areas of the U.S. presenting lower relative longevity may be at a disadvantage. However, as a whole, the health status of older Americans has improved over the past several decades. According to Institute of Medicine (2008) older adults live longer today and have less chronic disability than their counterparts in previous generations. It is important to note, however, that older adults continue to have more chronic diseases than younger adults and almost all Medicare spending is devoted to chronic conditions. Older adults are
also the highest volume users of health care services. Furthermore, some researchers suggest that older adults also tend to experience more mental health conditions (e.g., depression and anxiety) than younger adults.

**Diversity.** Ethnic/racial minority groups, which include all U.S. residents except for non-Hispanic, single-race whites, who now compose about one-third of the U.S. population, are expected to become the majority in 2042, with the overall population of the nation projected to be comprised of approximately 54 percent minority in 2050 (U.S. Census Bureau, 2008). The nation will reach the 400 million population milestone in 2039 (Institute of Medicine, 2008). By 2050, the minority population is projected to be 235.7 million out of a total U.S. population of 439 million. As a result of this population shift, the older cluster of the population will also be more racially and ethnically diverse than previous older age bands with about 40 percent of this group comprised of members of racial/ethnic groups (U.S. Department of Health and Human Services, 1999).

According to the Institute of Medicine (2008) the non-Hispanic, single-race white population is projected to increase slightly in 2050 (203.3 million) from 2008 (199.8 million) and will drop in representation in the population during the 2030s and 2040s (i.e., from 66% of the population in 2008 to 46% of the population in 2050). The Hispanic population is projected to nearly triple, from 46.7 million (15%) to 132.8 million (30%) over the next 40 years. The African American population is projected to increase from 41.1 million (14%) in 2008, to 65.7 million (15%) in 2050. The Asian American population may climb from 15.5 million to 40.6 million, rising from 5.1 percent to 9.2 percent of the total population. The numbers of American Indians and Alaska Natives in the population are projected to increase from 4.9 million to 8.6 million (an increase of 0.4% of the total population). The Native Hawaiian and Other Pacific Islander population may more than double, from 1.1 million to 2.6 million. In addition, the number of people who identify themselves as being of two or more races will more than triple, from 5.2 million to 16.2 million by 2050.

In terms of the numbers of older adults in the population, data from the National Institute of Aging (2000) suggest that the proportionate percentage of non-Hispanic Whites in the older population will lessen from 84% in 2000 to about 64% in 2050. Contemporaries of these individuals by the middle of the 21st Century will consist of non-Hispanic Blacks (an increase from 8% to 12%), Hispanics (an increase from 6% to 16%), Asian/Pacific Islander (an increase from 2% to 7%), and non-Hispanic American Indian/Alaska Native (a slight decrease from 1% to less than 1%).
It is important to note, however, that these predictions do not take into consideration that each racial/ethnic group, as defined by the national data classification system, consists of a number of subgroups which may reflect larger linguistic and cultural diversity within each group (Jasti, Siega-Riz & Bentley, 2003). For example, there are 28 subgroups in the Asian American Pacific Islander (AAPI) ethnic population including individuals of Chinese, Japanese, Vietnamese, Cambodian, Korean, Filipino and Native Hawaiian descent (Sohn, 2004). Similarly, people of Latin American, Mexican - Americans and Nationals, South American, Cuban and Puerto Rican descent are all deemed Hispanic by the Federal government in federally funded research (Coms-Diaz, 2006; Zunker & Cimmins, 2004). Native American tribes throughout the country are also individually culturally unique. Thus, the projected increase in the diversity of the population may be even more culturally rich than originally conceived and these distinctive differences, to a large degree, are barely represented in systematic research or considered in today’s mental healthcare system.

2. Health and Mental Health Disparities

Although innovations in medical science and improvements in public health may be considered monumental in the 20th Century relative to past eras, serious racial/ethnic health disparities continue to exist. (Lurie, 2005; Satcher, Fryer, & Troutman, 2005; Mullins, Blatt, Gbarayor, Yang, & Baquet, 2005; Smedley, Stith, & Nelson, 2003). The Commonwealth Fund (2002), reports that minority Americans do not fare as well as whites in effective patient-physician communication and encounter difficulties when it comes to bridging cultural and linguistic barriers, gaining respectful treatment, and having access to healthcare and insurance coverage. For this reason, the elimination of racial/ethnic health disparities constitutes a major area of research in the U.S. (U.S. Department of Health and Human Services, 20001 also see Smedley, Stith, & Nelson, 2003).

Populations that suffer health disparities are defined in The Health Care Fairness Act of 2000 House Resolution #3250 as those “with a significant disparity in the overall rate of disease incidence, morbidity, mortality and survival rates in the population as compared to the health of the general population” (House Resolution #3250, 2000). According to the CDC (REACH-2010, 2002), racial and ethnic minority groups in America, including African Americans, Alaska Natives, American Indians, Asian Americans, Hispanic Americans, and Pacific Islanders are more likely than whites to have poor health and die prematurely. Recent research indicates that health disadvantages are continuing to be documented for African Americans in mortality (National Center for Health Statistics, 2002; Centers for Disease Control, 2002); cancer (American Cancer Society, 2004; Alexander, & Brawley, 1998; Baquet & Commiskey, 2000; Brown, 2000; Kelsey & Berstein
1996; Miles, 2005; National Cancer Institute, 2008; Shavers & Brown, 2002; Smedley, Stith & Nelson, 2003; Whitfield & Hayward, 2003); hypertension, cardiovascular disease and stroke (American Heart Association, 2004; Pickle, Mungiole, & Gillum, 1997); low birth weight (Jaffree & Perloff, 2003); asthma (Grant, Wagner, & Weiss, 1999; Sly, & O'Donnell, 1997); forms of arthritis (Bruce, Fries, & Murtagh, 2007) and kidney disease and end stage renal disease (Nzerue, Demissochew, & Tucker, 2002) (see also Underwood, Buseh, Canales, Power, Dockery, Kather & Kent, 2005 a,b).

African Americans, Asian American, Native American and Hispanic groups have higher rates of diabetes than whites (Haethorne, Robles, Cannings-John & Edwards, 2008; McBean, Gilbertson & Collins, 2004; Miller, Schlundt, Larson, Reid, Prihert, Hargreaves, Brown, McClellan, & Marrs, 2004). Cancer is the leading cause of death for Asian Americans unlike other racial/ethnic groups or whites (Louie, 2001). In addition, some findings suggest that Alzheimer’s disease may have an earlier onset among Latino patients than for whites and possibly greater than or equal prevalence in Asian American subgroups as whites (Allery, Arnada, Dilworth-Anderson, Guerrero, Hann, Hendrie, et al., 2004; Chui & Gatz, 2005; Graves, Larson, Edland, et al., 1996; Valle, Yamada, & Matiella, 2006; White, Petrovitch, Ross, et al., 1996).

There is no one single factor that is responsible for the health disparities that have been observed among racial/ethnic groups in the United States. Causes for the health disparities that have been explored in the last decade include differences in: socioeconomic status (Bouchard, Gilbert, Landry, & Deveau, 2006; Blackwell, Hayward, & Crimmins, 2001; Bowen, 2007; Dunn, Hayes, Hulchanski, Hwang, & Potvin, 2006; Hayward & Gorman, 2004; George, 2005; Lynch,& Kaplan, 1997; Macintyre, Ellaway, Ford, & Hunt, 1998; Phelan & Link, 2005; Robert & Ruel, 2006; Shavers, Helchanski, 2007; Shema, 2007; Yao & Robert, 2008); education (Banks, Marmot, Oldfield, & Smith, 2006; Herd, 2006); income (Angel & Angel, 2006; Banks, et al., 2006; Centers for Disease Control, 2003; Kahn & Fazio, 2005); access to health care and utilization (Escarce, 2007; Williams & Collins, 1995; Xu & Borders, 2007); insurance/Medicare status (Elchner & Vladeck, 2005; Institute of Medicine, 2001); personal habits (Bopp, et al., 2006); English proficiency and literacy skills (Caesar, 2006; Calderon, Zadshir, & Norris, 2004); home-related quality of life (Goins, John, Hennessy, Denny & Buchwald, 2006; level of activity (Hinterlong, 2006; Ross & Hamlin, 2007); and childhood/past experiences (Berney, Blane, Smith & Holland, 2001; Blackwell, Hayward & Crimmins, 2001; Larson, 2007; Lynch, Kaplan, & Shema, 1997; Mirowsky & Ross, 2001; Smith &
The relationships between these factors are interwoven and are at best complex. They remain to a great extent unresolved (Andresen & Miller, 2005).

**Mental Health Disparities.** Little was known, until recently, about disparities in mental health status and mental healthcare use by the predominant racial/ethnic groups in the U.S. (McGuire & Miranda, 2008). New findings suggest that disparities in mental health are different than the more commonly observed patterns in general health. Results from recent research reveal that members of racial/ethnic groups, as a whole, have lower prevalence of mental disorders than whites or the prevalence may be equal. Data from four studies funded by the National Institute of Mental Health (NIMH) Consortium on Psychiatric Epidemiology Studies (CPES) compared prevalence rates across white, black (African American and Caribbean descent), Hispanic (Puerto Rican, Cuban, Mexican, and other descent), and Asian (Chinese, Filipino, Vietnamese, and other descent) ethnic groups (Heeringa, et al., 2004, also see McGuire & Miranda, 2008). Only Puerto Ricans reported higher rates of lifetime mental disorders in this research than white Americans reported, whereas, Latinos and African Americans reported about the same rates as whites. Moreover, compared with a nationally representative sample of the U.S. population, American Indians were found to be at lower risk for major depression than whites (Beals, et al., 2005 a,b).

It is important to note that although overall mental health prevalence in certain populations may be lower or equal to whites, well-documented exceptions exist. For example, it has been shown that American Indians are at a heightened risk for posttraumatic stress disorder (PTSD) and alcohol dependence (Beals, et al. 2005). African Americans are over-represented in state psychiatric hospitals, have higher incidence of schizophrenia than whites and may be more severely affected by schizophrenia (Kendler, et al., 2005; Snowden & Cheung, 1990). The prevalence of clinically relevant levels of depressive symptoms in middle-aged African Americans has been found to be greater than that of the general population (Miller, Malmstrom, Joshi, Andresen, Morley, & Wolinsky, 2004). Disparities in mental health among older African American men in Harlem have been shown to be associated with low socioeconomic status and poor physical health when race is held constant (Love, 2003). Hispanics and African Americans report a lower risk of having a psychiatric disorder compared with whites, but those who are diagnosed with a condition tend to have more persistent disorders (Breslau, et al., 2006). African Americans are also more likely than whites to report their depression as very severe and disabling (Williams, et al., 2007). Some results have shown that elderly Korean and Hispanic immigrants may be at a very high risk for mental health problems and other difficulties (See Kreps & Sparks, 2008 for a review of this literature). The prevalence rates of depression among older Chinese-Canadian immigrants from
Mainland China also appear to be higher than the general population (Lai, 2004). In addition, the number of psychological symptoms across all racial/ethnic groups tends to be greater than among whites (U.S. Department of Health and Human Services, 2001 a,b).

Although rates of lifetime mental disorders might be less for some ethnic/racial groups than for whites, an urgent problem exists nevertheless. The literature suggests that ethnic/racial disparities exist in mental healthcare, but there is no consensus on how to measure disparities although a number of definitions exist (Hebert, Sisk & Howell, 2008; Yee & Chiriboga, 2007). According to the Institute of Medicine, a disparity is a difference in health care quality not due to differences in health care needs or preferences of the patient (Smedley, Stith & Nelson, 2003). As augmentation to this definition, it has been suggested for some time that poor mental health outcomes among racial/ethnic groups are linked directly to differences in access, referrals, diagnosis, treatment, and quality of care (Wells, et al., 2001; Zhang, Snowden & Sue, 1998). The Agency for Healthcare Research and Quality (AHRQ) suggests that a disparity exists where any difference between populations is a disparity, with no adjustment for underlying need for care. Furthermore, AHRQ states that disparities exist if any difference among populations are statistically significant and differ from the reference group by at least 10 percent (Agency for Healthcare Research and Quality, 2006).

Some of the research literature also adjusts disparity estimates for socioeconomic and geographical variables that may disregard relationships associated with lack of insurance coverage, geographic access to providers, education, or income (McGuire & Miranda, 2008). It is also clear that racial/ethnic groups are usually sorely underrepresented in mental health research (Bilheimer & Sisk, 2008; U.S. Department of Health and Human Services, 2001). Many health data systems are also unable to report data for all of the Office of Management and Budget’s (1997) five classifications categories for reporting race and ethnicity.

3. Emphasizing the Aging Factor

From the sections above, it is obvious that in planning for the future of health and mental health care in the U.S., the major demographic shifts in the population will play a significant role in how these services are structured. While the population surge in aging and diversity has been foreseen, little has been done to prepare the general health care workforce for its arrival. Older Americans as a group use considerably more health care services than younger Americans and their health care needs are often more complex. The increase in the older population will be undoubtedly accompanied by an increase in the overall number of mental disorders in this cohort.
A recent consensus statement released by the World Psychiatric Association and the World Health Organization specifically states that there is a need to promote and expand policies and programs for combating stigma and discrimination against older adults with mental disorders (Graham, et al., 2003).

There is also the real possibility that older adults of racial/ethnic backgrounds may find themselves in their later years having a relative greater number of health problems that are complicated by a lifelong pattern of underutilization of services (Williams & Rucker, 2000). Furthermore, establishing a healthcare system that permits healthy lifestyles, expert coordination of care, and active participation of older diverse adults in their treatment decisions will be a significant challenge. What is more, a discussion about disparities in health or mental health care for older racial and ethnic groups cannot be held without acknowledging that the problem exists at a broader level for all older adults.

It has been reported that mental disorders account for $193 billion annually but the extent to which mental disorders in older adults contribute to this figure is somewhat ambiguous as this figure is based on estimated earnings (Kessler, Heerings, Lakoma, Petukhova, Rupo, Schoenbaum, Wang & Zalavsky, 2008). In general, mental health problems in older adults have been neglected, treated inadequately, and not well researched. Disparities in the mental health of racial/ethnic minorities and women have been widely acknowledged. However, disparities among older populations have only recently become the focus of the scientific community (Glass, 2003; U.S. Department of Health and Human Services, 2001; Whitfield, 2004; Yee & Chiriboga, 2007).

**Prevalence.** The prevalence of mental health problems in older adults ranges from 15% to 20% (Jenkins & Laditka, 1998). These rates are projected to increase significantly as the baby boomer generation ages and as a result of the immigration status of certain racial/ethnic groups (Koenig, George, & Schneider, 1994; Yee & Chiriboga, 2007). In 2002, approximately 40% of Hispanics were foreign born and over one-half had immigrated to the U.S. between 1990 and 2002 (U.S. Bureau of the Census, 2003). Disproportionately greater numbers of Asian older adults (e.g., Vietnamese, Cambodian – two populations with recent increases in immigration status) other than Japanese are foreign born. Immigrants are likely to be young when they arrive and this may provide an explanation for lesser numbers of Hispanic and Asian-American older adults in the population at present relative to African American and white elders (Yee & Chiriboga, 2007).
Until recently, the belief was held widely that older adults suffer more from depression than younger adults (Snowden, 2001). Results from several recent studies suggest there is not a positive correlation between age and depression (Fisher & Goldney, 2003; Henderson, Jorm, Korten, et al., 1998; Henderson & Hall, 2000; Regier, Farmer, Rae, et al., 1993). Furthermore, older adults may be more likely than younger adults to receive antidepressant medication and to have recently consulted a clinician for the condition (Fisher & Goldney, 2003). However, older adults may be less likely to recognize depression or perceive standard treatments for it as useful (Lauber, Nordt, Falcato, & Rossler, 2001; Yoder, Shute, & Tryban, 1990). Moreover, the rate of depression increases significantly alongside co-morbidities and functional limitation. Estimates of major depression in community dwelling older adults may be as high as 5% increasing to 13.5% in individuals who require home healthcare and to 11.5% in older hospital patients (NIMH, 2007). Nonetheless, people, age 65 and older, accounted for 16% of the suicides in 2004 (Centers for Disease Control and Prevention, 2005; NIMH, 2007). The rate of suicide in this cohort is greater than for the general population. Non-Hispanic white men, ages 85 and older, were the most likely to die from suicide.

Causal Factors. Very little research has investigated causes of different mental illnesses in elderly diverse populations. Results from some studies suggest higher actual rates of mental problems in older adults of diverse backgrounds than whites (Jackson, Antonucci, & Gibson, 1995). Other researchers note that any differences between racial/ethnic groups and whites are not due to actual differences in prevalence (e.g., Snowden & Cheung, 1990; Strakowski et al, 1993). For example, the overall disparities that have been observed between age groups may be the effects of age itself on the nervous system across the board (Briones, 2007). It is more likely that there are multiple factors at work such as with posttraumatic stress disorder (PTSD) where greater trauma has been experienced by refugees from Central America and from Southeast Asia (Handeman & Yeo, 1996; Hinton, Pich, Chean, Safren & Pollack, 2006; Knight, 2000; NAAPIMHA, 2008; Tran, 1991; Yee, 1997). Differences are also possible in diagnoses in different groups. African American patients may be more likely to receive severe mental illness diagnoses, whereas whites may be more likely to be diagnosed with affective disorders, which reflect cultural bias in the diagnosing clinicians (Strakowski, et al, 1993; Whaley, 1997).

Cultural Differences. Disparities in mental health care for racial/ethnic groups have served as an impetus for the development of culturally competent care (see Fuertes, Stracuzzi, Bennett, Scheinholtz, Mislowack, Hersh, & Cheng, 2006; Griner & Smith, 2006; Huey & Pan; 2006; Lakes,
Lopez & Garro, 2006). Furthermore, culture and social factors may be one of the predominant contributors to the causation of mental illness in certain racial/ethnic groups (U.S. Surgeon General Report, 2001). Stigmatization of mental illness in certain cultures may lead to avoidance in treatment. The lack of literacy in English may be a barrier to communication and comprehension of available consumer health information (Major & O'Brien, 2005; Yee & Chiriboga, 2007).

It is also clear that older ethnic minorities in the U.S. have historically greater exposure to racism, discrimination, violence, and poverty, all of which can affect rates of mental illness. Culture also influences definitions and meanings of mental health, which in turn can influence help-seeking behaviors. A lack of respect or perception of unfair treatment by consumers of racial/ethnic backgrounds may be associated with nonadherence to treatment regimens (Iyee & Chiriboga, 2007). Breakdowns in communication and incongruent cultural values between children and immigrant parents may increase over time and place families at risk for mental illness (Hwang, 2006). Therefore, it is important to understand the perspective of the consumer on mental health, which is grounded in the traditions, values, and social norms of an individual's referent cultural group (Hedelin & Strandark, 2001). Although national standards for culturally and linguistically appropriate services (CLAS) were defined by the Office of Minority Health in 2001, the actual implementation of these directives is not universal (Ross, 2001). For recent articles on the application of the CLAS standards see Beamon, Devisetty, Hill, Huang, & Shumate, 2006; Kripalani, Bussey-Jones, Katz & Genao, 2006.

**Underutilization and Access.** The under-utilization of mental health services has been a concern of gerontological mental health workers for some time as the lower rate of mental health services use by older adults of ethnic/racial backgrounds compared to younger adults and whites has been and remains alarming. Only a few studies have examined this phenomenon (e.g., Beals et al., 2005; Sanchez, 1992). In addition to underutilization, large gaps exist in access to services for all older clients who need mental health care. The barriers faced by African-American and Hispanic older adults have been explored and for both groups they appear to be at the system level (Biegel, Farkas & Song, 1997). For older African-Americans, impediments include an inability to afford services, lack of awareness of mental health services, and the availability of few mental health programs designed specifically for them.

For older Hispanics, the top three obstacles to care were identified as limited mental health programs for minority elderly, lack of staff with specialized knowledge about cultural differences, and limited outreach services. Another important hindrance for older Hispanics was language. This may be particularly exacerbated in rural areas (Averill, 2005; Gattuso, 2003; Guo & Phillips, 2006; Magilvy, Congdon,
Martinez, Davis & Averill, 2000; Parsons & Askland, 2007; Steel, 2001; U.S. Department of Health and Human Services, 2001) and in inner-city and urban districts (Fiscella & Williams, 2004; Institute of Medicine, 2000; Lau & Morse, 2008; Miller, Wolinsky, Malmstrom, Andresen & Miller, 2005).

4. Heath Literacy in Older Adults

The literature search conducted as background for this document revealed very little material pertaining directly to “mental health literacy and aging”. For this reason, as with the section above on health disparities, this discussion will begin with a brief overview of health literacy in general and its inverse correlation with aging. Attention will then converge on what is known about the relationship between mental health literacy and aging.

In today’s society, consumers must have specialized knowledge and skills to promote their own health and to effectively navigate a cumbersome healthcare system. This requirement is driven in some ways by newly established trends in healthcare delivery brought on by increasing costs and a growing emphasis on prevention. Furthermore, most services have shifted from an inpatient model to community-based or home-based services. Moreover, the burden of treatment has by and large been transferred from service providers to consumers who must rely on consumer health informatics in many instances to educate and inform themselves (Dubow, 2004; Greene, Hibbard, & Tusler, 2005). The lack of health knowledge places a patient in direct jeopardy for poor health outcomes. Conversely, a high level of health knowledge may not only empower individuals to better manage or cope with their disorder, but it may also enhance their ability to make crucial treatment decisions.

For these reasons, it is fundamental that consumers of health services understand the causes and complications of their disorders, treatment options, and probable outcomes to improve functioning, maintain function, and in some instances slow deterioration and subsequent dysfunction. With the population aging, the ability to access, read, comprehend and act on health information will be a major predictor of increased positive health outcomes, which will subsequently affect the management of national healthcare costs. Furthermore, the need to understand the correlation between low health literacy and increasing age will likely exacerbate as the individuals who most need to be empowered consumers of the healthcare system, such as older adults, may have the least ability to do so.

Literacy and Health Literacy. In everyday terms, being literate means having the ability to read and write. The United Nations Education, Scientific, and Cultural Organization (UNESCO, 1986) defines literacy as the ability to both read and write a simple sentence about everyday life. The
1998 National Work Group on Literacy and Health (NWGLH) indicated that nearly 44 million individuals in the U.S. population demonstrated rudimentary literacy skills. English illiteracy has been described as a “silent disability” that disproportionately affects undereducated individuals, minority populations, the poor and the elderly (Billek-Sawhney, & Reicherter, 2005; Erlen, 2004). Sixty-six percent of the individuals falling into the lowest literacy groups are age 65 and older (NWGLH, 1998). Some sources report that as many as 44% of older adults are functionally illiterate (Giorgianni, 1998).

There is a positive correlation between literacy and health literacy. Estimates indicate that possibly 90 million Americans are affected by low health literacy which may be a direct cause of increased healthcare expenditures of $73 billion annually due to extended hospitalizations, ineffective prescription use, treatment nonadherence and poor health outcomes (Cuellar, 2004; Chew, Bradley, Flum, Cornia, Koepsell, 2004; Cho, Lee, Arozullah, & Crittenden, 2008; Curry, Walker, Hogstel, & Burns, 2005; Echt, 2007; Echt & Morrell, 2003; DeBuono, 2006; Kirsch, Jungeblut, Jenkins, & Kolstad, 1993; MacLaughlin, Raehl, Treadway, Sterling, Zoller & Bond, 2005; Mitty & Flores, 2007; Murray, Morrow, Weiner, Clark, Wanzhu, Deer, Brater, Weinberger, 2004; Ownby, 2006; Pawlak, 2005; Roth & Ivey, 2005; Sicat & Delafuente, 2005).

Findings from the NALS (1992) suggest that the American population reads at or below the 8th grade level and improvements have only been partially successful since the release of the original document (NAAL, 2003). Low-income community-dwelling older adults were found to read at approximately the 5th grade level (Weiss, Reed & Kligman, 1995). Findings regarding the mismatch between patient literacy levels and reading grade levels of materials suggest that there has been a general lack of progress. Reasons for this are unclear given the availability of recommendations and guidelines for improving health literacy (i.e., Doak, Doak, & Root, 1985). Nevertheless, most health-related materials are notorious for being written at levels that far exceed many patients’ abilities (Liu, 2006; Friedman, 2008; Friedman & Hoffman-Goetz, 2003, 2006; Powers, 1988; LoVerde, Prochazka, & Byyny, 1989).

Health literacy has been widely studied in the past several decades and this paper is not designed to list or to individually summarize all of the findings. However, there are a number of recent comprehensive reviews, overviews and bibliographies available on the topic and many of these sources provide specific recommendations on how to enhance health literacy in diverse populations and across the lifespan (i.e., Nielsen-Bohlman, Panzer, & Kindig, 2004). The more current research in this area will be highlighted below, as well as a summary of the pertinent topics.
(see Andrus & Roth, 2002; Berkman, DeWalt, Pignone, Sheridan, Lohr, Lux, Sutton, Swinson, & Bonito, 2004; DeWalt, Nerkman, Sheridan, Lohr, & Pignone, 2004; Rudd, Colton & Schacht, 2000; Rudd, Moeykens & Colton, 1999 for recent reviews, overviews and bibliographies. For recent research on interventions to improve health literacy in older adults, see Broering, Chauncey, and Gomes, 2006; Gross, Famiglio, & Babish, 2007; Hill, 2005; Hoffman-Goetz, Friedman, & Celstine, 2006; Kobylarz, Pomidor, & Heath, 2006; Leung, Ko, Chan, and Chow, 2007; Loiselle & Cossette, 2007; Morrow, et al., 2005; Morrow, et al., 2007; Murray, et al., 2004; The Joint Commission, 2007).

On an academic level, definitions of health literacy and explanatory derivatives have grown increasingly complicated over time. On the positive side, the evolving definitions, which range from concrete to the abstract and simple to complex, do demonstrate an increased awareness of the tremendous impact of health literacy on the individual and the healthcare system (Lee, Gazmararian, & Arozullah, 2006; Lee, Arozullah & Cho, 2003). Some examples follow.

Healthy People 2010 defines health literacy as the capacity to obtain, interpret and understand basic health information and services and the competence to use such information and services to enhance health. Functional health literacy is typically described as the ability to read and comprehend prescription bottles, appointment slips, and other essential health-related materials required to successfully function as a patient (AMA, 1999; Williams, Parikh, Pitkin, et al., 1995; see also U.S. Department of Education, 1996). According to the World Health Organization, health literacy represents the cognitive and social skills, which determine the motivation and ability of individuals to gain access to, understand and use the information in ways that promote and maintain good health. In short, health literacy involves more than being able to read pamphlets and successfully make appointments (WHO, 1998). Renkert and Nutbeam (2001) view health literacy as continuum that includes empowerment. That is, individuals have varying capabilities to seek out information and assess its relevance and reliability. Even when information is trusted and readily at hand, an individual may not be motivated to act on it if he or she does not feel empowered to do so. Thus, while literacy is the ability to read and write, health literacy is the ability to think critically about information, to engage in self-directed learning, to self-advocate for health, and to solve problems and make decisions related to health (Echt & Morrell, 2003).

**The Effect of Age and Race/Ethnicity.** Findings from research indicate that about one in three older adults do not have the health literacy skills needed to understand basic health information, such as instructions for prescriptions, medical forms, and doctors’ directions for self care (Medicare
Rights Center, 2001; also see Sorrell, 2006). Results from the National Assessment of Adult Literacy (NAAL) (2003) indicated that the majority of adults (53%) had Intermediate health literacy. About 22 percent had basic and 14 percent had below basic health literacy. Adults with below basic or basic health literacy were less likely than adults with higher health literacy to get information about health issues from written sources (newspapers, magazines, books, brochures, or the Internet) and more likely than adults with higher health literacy to obtain information about health issues from radio and television (NAAL, 2003).

Furthermore, a strong relationship appears to exist between increasing age and lower levels of functional health literacy (Gazmararian, Parker, Baker, 1999; Miller, Degenholtz, Gazmararian, Lin, Ricci, & Sereika, 2007). Functional health literacy was found in only 19.5% of an Atlanta sample of predominantly minority and indigent elderly patients aged 60 years and older (Williams, et al., 1995). Williams, Baker, Parker and Rudd (1998) concluded that inadequate functional health literacy poses a major barrier to educating patients with chronic diseases in general, and current efforts to overcome this problem appear to be unsuccessful. Davis, Michielutte and Askov (1998) report that approximately 48% of American adults have difficulty reading and understanding discharge instructions, medication labels, patient education materials, and consent forms. In addition, Baker, Gazmararian, Sudano, and Patterson (2000) noted that functional health literacy was lower among older age groups even when controlling for differences in the Mini Mental Status Exam performance, newspaper reading frequency, health status, and visual acuity. Similarly, Gazmararian and colleagues (1999) found that elderly managed care enrollees may not have the literacy skills necessary to function adequately in the healthcare environment which may significantly impact medical decision making skills (Donelle, Hoffman-Goetz & Arocha, 2007).

As older adults are more likely to have chronic conditions than any other age group, health literacy may become a deciding factor for good or poor health outcomes (Sudre,Mehta, Simonsick, Harris, Newman, Satterfield, Rosano, Rooks, Rubin, Ayonayon, & Yaffe, 2006; Villaire & Mayer, 2007; Wolf, Gazamararian & Baker, 2005). Inadequate health literacy has been shown to be associated with less knowledge among older patients with chronic diseases, worse self-management skills, and lower use of preventive services (Baker, Wolf, Feinglass, Thompson, Gazamararian, & Huang, 2007; Gazamararian, Williams, Peel, & Baker, 2003; Scott, Gazamararian, Williams, & Baker, 2002). In addition, low health literate older adults may have higher risk-adjusted rates of cardiovascular death but not death due to cancer in general (Baker, et al., 2007). Furthermore, measures of health literacy have been found to be significantly related to diabetes self care in the elderly (Benzel-Lindley, 2005) and older men, in particular, may not have the necessary health
literacy levels and decision making skills to understand healthy nutrition standards (Drummond & Smith, 2006; see also Higgins & Barkley, 2004). Moreover, patients with chronic conditions have less knowledge of their disease and its treatment and fewer correct self-management skills than health literate patients (AMA Council on Scientific Affairs Report, 1999). Finally, individuals who rate their health as fair or poor were twice as likely to have inadequate health literacy compared to individuals who rate their health as good or excellent (38.7% versus 19.2% respectively) (E-Care Management News, 2001).

It has been demonstrated that African Americans, Hispanic Americans, American Indians, Alaskan Natives and Asian/Pacific Islanders were more likely than whites to perform in the lowest literacy levels in the NALS (1996). Findings have indicated that individuals with inadequate health literacy were more likely to be older, minority and have lower income (Baker, Gazmararian, Williams, Scott, Parker, Green, Green, Ren & Peel, 2002; Morrow, Clark, Wanzhu, Jingwei, Weiner, Steinley, & Murray, 2006). Health literacy has also been shown to be influential in differences in health status and receipt of vaccinations normally attributed to educational attainment (Howard, Sentell, & Gazmararian, 2006). Similarly, among adults age 65 and older, findings from research by Echt and Schuchard (2002) revealed that more than half of the low health literate participants in their sample (56%) were African American, relative to 17% in the adequate range. Nearly half (48%) indicated household incomes of $19,999 or lower.

**Implications of Low Health Literacy.** For an individual seeking services, low health literacy can be associated with feelings of shame, denial, inadequacy and low self-esteem (Parikh, et al., 1996). It has been found that there may also be fear associated with discovery of this problem and therefore, some patients will take covert measures to conceal this deficit (Brez & Taylor, 1997). As a result, confusion and misunderstanding about instructions can lessen an individual's capacity to ask pertinent questions. As vital questions may go unasked, individuals may be less apt to comply with important instructions (Hussey & Gilliland, 1989). This situation is compounded by a healthcare system that depends on patients to read and understand prescription information, health forms and print-based health-related information (Nichols-English, 2000).

Low health literacy may act as a barrier to successful interactions within healthcare settings, thus health literacy is also a patient safety issue (Baker, et al., 1996). It has been found that individuals with the lowest health literacy have the poorest health status and are at greatest risk (Weiss & Coyne, 1997). In addition, low health literacy is directly related to incidence of chronic illness (Rogers & Fisk, 2001). Overall, low health literacy appears to perpetuate diminished health.
knowledge; increase the likelihood of poorer self-reported health; foster misunderstanding of
diagnoses, tests and medications; increase the risk of misdiagnosis; misinform treatment
decisions; and decrease a person’s ability to recognize warning signs of health conditions (Echt &
Morrell, 2003). Maladaptive health behaviors resulting from low health literacy include failure to
comply with treatment regimens, incorrect management or failure to manage disease, and failure
to seek timely screening or treatment [e.g., lower treatment adherence in HIV patients (Kalichman,
Ramachandran & Catz, 1999); higher prevalence of prostate cancer (Bennett, Ferreira, Davis,
Kaplan, Weinberger, Kuzel, Seday & Sartor, 1998); underutilization of breast cancer screening
(Davis, Arnold, Berkel, Nandy, Jackson & Glass, 1996); lower levels of asthma knowledge and self-
care (Williams, Baker, Honig, Lee & Nowlan, 1998); less likelihood of gonorrhea screening
(Fortenberry, McFarlane, Hennessy, Bull, Grimley, Lawrence, Stoner & VanDevanter, 2001)
colorectal cancer screening (Davis, Dolan, Ferreira, Tomori, Green, Sipler & Bennett, 2001); and
greater incidence of depression (Gazmararian, Baker, Parker & Blazer, 2000)].

5. Mental Health Literacy

Mental health literacy has been defined as the knowledge and beliefs about mental disorders that
aid their recognition, management or prevention (Jorm, Korten, Jacomb, et al., 1997). Results
have suggested that among community-dwelling older adults, inadequate health literacy is
associated with poorer physical and mental health (Wolf, Gazamararian, & Baker, 2005).
Additional findings have indicated that the beliefs of the lay public, particularly with mental
disorders that result in stigmatization and stereotyping, can impact on health seeking behaviors
and effective treatment decision making (see Schlosser, 2006). This description emphasizes the
idea that the person affected by the disorder and those people in contact with him or her is
important in managing the symptoms of the disorder (Werner, 2005). Mental health literacy may
include the assessment of several aspects including: the ability to correctly identify and label a
specific disorder, knowledge and beliefs about risk factors and causes associated with a disorder,
and knowledge and beliefs about the available treatments and professional help (Jorm, 2000).

Most systematic investigations on mental health literacy have focused on depression and
schizophrenia (Angermeyer & Marschinger, 1996 a; Angermeyer, et al., 1999; Jorm, 2000; Lauber,
et al., 2001). Other studies have addressed alcohol and drug dependence (Link, et al., 1999) and
panic disorder (Angermeyer & Matschinger, 1996 b; Hugo, et al., 2003). Much of the methodology
for this research is based on vignettes used to elicit participants’ beliefs and most of this research
has been conducted outside the United States (i.e., Australia and Germany). None of the
vignettes used have included older individuals and older participants have rarely been included in research that assesses mental health literacy (Werner, 2005). The authors of the one study that has used older participants did report that older persons have poorer mental health literacy than younger people (Fisher & Goldney, 2003). Additionally, little attention has been devoted to the nature of the relation between age and mental health disorders when assessing lay peoples’ perceptions of mental health. There is also a limited amount of research on one of the most common mental disorders among older adults, Alzheimer’s disease (AD) (Werner, 2005). Findings from this type of research generally reveal that the lay public cannot recognize the symptoms of AD (Werner & Davidson, 2004). This is particularly interesting, because as the population ages, the prevalence and incidence of AD will increase and AD and dementia are often associated with stigmatization (Werner, 2005).

For the purposes of this discussion, and borrowing somewhat from the definitions of health and mental health literacy above, it is suggested that a broader view of mental health literacy is required (see Echt & Morrell, 2003; Morrell, 2005 a,b,c). Therefore, authors of this paper suggest that mental health literacy includes:

1) The ability to access current and reliable information on mental health (i.e., Where is the information? If the information is online, is access available?),

2) The ability to understand mental health information (i.e., When the information is found, is it comprehensible?),

3) The ability to communicate with mental health service providers (i.e., Can the consumer explain to the clinician what is happening to him/her? Can the consumer recognize symptoms of disorders? Can the provider explain the disorder in tangible, lay language terms?),

4) The ability to understand a treatment program and make treatment decisions (i.e., Does the consumer understand enough to make an educated decision about a treatment plan?), and

5) The ability to read and comprehend prescription bottles, appointment slips, and other essential consumer mental health print-based materials and informatics to be able to successfully function as a consumer (i.e., Can the consumer understand enough so that he/she can act proactively when in “the mental health system”?

Likely Causal Factors. Low mental health literacy (and health literacy in general) in older adults is expected to be the result of a combination of interacting variables. They include: 1) age-related declines in sensory ability and cognition, 2) psychosocial factors, 3) the lack of culturally and
linguistically competent materials and 4) a greater reliance on traditional methods of health information delivery (newspapers, television) because of less familiarity and/or access to information technology that can provide consumer mental health information in multi-media formats.

**Age-Related Declines in Sensory Ability and Cognition.** Little research has focused on the roles that age-related declines in sensory (i.e., vision and hearing) and certain cognitive abilities play with regard to health literacy and mental health literacy. This is remarkable because a substantial body of cognitive aging literature corroborates that sensory abilities and cognition are directly related to: 1) the ability to read and understand health texts (Echt & Schuchard, 2002), 2) engage in everyday activities (Marsiske, Klumb, & Baltes, 1997; Morrell, 1997), and 3) communicate effectively (Pichora-Fuller & Carson, 2001; Wahl & Tesch-Roemer, 2001). For example, age-related deficits in text processing are pronounced for individuals with average and low verbal ability (i.e., less vocabulary ability) and these insufficiencies are related to lower levels of education (Meyer, Young & Bartlett, 1989; Meyer, 1987). Educational attainment has been linked with health literacy performance (Matthews & Sewell, 2002), however older adults are far removed from their formative school years. Age differences in perceptual speed, or the rate at which mental operations are performed, are well documented and increase as the complexity of cognitive tasks increase (Salthouse, 1993). Thus, reading time slows with age. Working memory, the ability to simultaneously store recently presented information and process new information, declines substantially with age (see Craik & Jennings, 1992). Declines in working memory have a negative effect on an older person’s ability to process text especially as processing demands increase.

Finally, the use of strategies for learning health information may be important in determining how well that information is stored and recalled for use at a later time. Strategy training has been shown to enhance the text processing performance of older adults (Harris, Rogers & Qualls, 1998; Rybash, Hoyer & Rudin, 1986; Kim & Van Dusen, 1998; Meyer et al., 1989) and information processed more deeply results in better memory for that information (Craik & Jennings, 1992). All of these cognitive factors are likely to have a substantial influence in mental health literacy in older adults. More comprehensive reviews on hearing, vision, and cognition and aging can be found in edited volumes by Craik and Salthouse (2001), Hummert and Nussbaum (2001), Charness, Park and Sabel (2001), Fisk and Rogers (1997), Rogers and Fisk (2001) and, specific to health information and technology, in chapters by Morrell (2002 a,b) and in Echt (2002).
Psychosocial Factors. The efficacy of health-related interventions can be influenced by certain psychosocial factors with which a low health literate person approaches health information. Motivation and health beliefs (including beliefs about mental health) could be significant determinants of and potential barriers to an individual's active engagement in his/her health promotion and subsequent adherence with treatment regimens regardless of health literacy ability (Hussey & Gilliland, 1989). Leventhal and Cameron (1987) suggest that medication/treatment regimen adherence is a self-regulatory process where one's belief system and perceptions are an integral part of the medication or treatment regimen adherence process. There is some evidence that beliefs about illness, drug efficacy and physician-patient interaction affect adherence. It is possible that this may be directly related to levels of health literacy because it has been shown that individuals with a more sophisticated understanding of their disorder are more likely to adhere to prescribed medication regimens, whereas lack of belief in a particular medication may result in nonadherence (Ferguson & Bole, 1979). Simply put, people who do not believe their medication or treatment is effective (whether based on fiction, fact, anecdotal comments from others, poor physician-patient interaction, or a general lack of understanding about your disease and treatment plan) are less likely to take their medication or follow a treatment regimen as prescribed.

In addition, fear has been cited as a consideration in populations with low health literacy (Giorgionni, 1998). Leventhal, Leventhal, Robitaille and Brownlee (1999) suggest that fear can lead to diminished self-confidence to engage in self-protective behaviors. Thus, the experience of greater personal relevance and control may lead to better outcomes. That is, highly personalized health/mental health instructions are most likely to motivate a change of health behavior (Bandura, 1986).

Culturally and Linguistically Competent Materials. Ensuring that materials are culturally and linguistically appropriate is critical for older members of typically underserved groups because these individuals are more likely to suffer lower health literacy. Health-related informatics designed without the consideration of the CLAS standards (Ross, 2001) may not be comprehensible or relevant to diverse consumers and may not be attended to regardless of other considerations made in their construction. Collins and colleagues (2002) found that, Hispanics (33%), Asian Americans (27%) and African Americans (23%) reported more communication problems with their physician relative to whites (16%). Moreover, the same groups of participants were found to be less likely to report high levels of confidence in their physician. Furthermore, Hispanics and Asian Americans were least likely to report being “very satisfied” with their care. Few systematic efforts have focused on the needs of ethnically diverse older adults.
Consumer Health Informatics. Numerous guidelines for the development of materials to increase health literacy have been compiled and disseminated and much research has been conducted on how to improve the efficacy of health information as noted in the discussion above (see Echt & Morrell, 2003 for a guide to these materials and a discussion of their effectiveness). A majority of this information is presented in traditional text-based formats. Unfortunately, it is unclear what aspects of these materials make them effective because low health literacy continues to prevail in certain populations. Rudd, Moeykens and Cohen (1999) note that simply lowering reading levels of health-related materials may be insufficient to address the needs of people with low health literacy. Furthermore, reading alone may be an inadequate method to convey healthcare messages to certain populations of concern. The general design of most health materials is based on “one size fits all” without any recognition that people have different cognitive abilities, motivations, backgrounds and learning styles.

According to Eysenbach & Jadad (2001), all consumers should be able to access reliable and relevant health information in order to ascertain advantages and disadvantages of all possible treatment options according to their values, beliefs, preferences, and their personal circumstances. Consumer health informatics is a branch of medical informatics that analyzes consumers’ needs for information, studies and implements methods of making information accessible to consumers, and models and integrates consumers’ preferences into medical information systems (Eysenbach, 2000). The burgeoning growth of interactive information technology and related media can be utilized to promote an “information age healthcare system” that holds the potential for a high level of consumer participation in healthcare decision making (Eysenbach & Jadad, 2001; Nelson & Ball, 2004; Smith, 1997).

It is possible that tailoring health messages or developing health and mental health informatics that can be individualized or self-tailored by consumers may represent a promising direction in promoting health and mental health literacy in diverse older adults. Several studies have shown that the simple method of combining relevant illustrations with text instructions aids older adults in assimilating skills and knowledge (i.e., Echt, Morrell & Park, 1998; Morrell & Park, 1993). There are also findings that indicate that, interactive, tailored presentations, featuring video, audio, graphics and other materials that are not text based, can help older consumers comprehend and utilize health and other types of information properly (Stoltz-Loike, Morrell & Loike, 2005a,b). The provision of information in multi-media formats allows consumers to pick and choose and combine the types of media that best meet their individual comprehension needs and learning styles.
Information technologies may hold the greatest promise in this regard given the ease with which digital applications can custom-tailor health messages.

**The Internet.** There are a myriad of websites devoted to health information on the Internet. Typing in the terms “health information” into a Google search will reveal over 700 million hits and over 100 million hits when “mental health information” is entered. A 2000 survey of older adults indicated that locating health information was frequently an activity they would like to learn how to perform on the Web (Morrell, Mayhorn, & Bennett, 2000). It has been estimated that about 122 million Americans have used the Web in some manner to obtain health information with more than half of online adults over the age of 60 engaged in Web-based searches (see Bard, 2002; Pew Internet & American Life: Online life report, 2000; Tu & Cohen, 2008 for more discussion).

Some important goals of using the Internet and information technology include informing, influencing, and motivating older individuals on health-related issues in order to promote their health and mental health literacy. In addition, information technology can be used to 1) enable informed decision making, 2) promote healthful behaviors, 3) promote peer information exchange and emotional support, 4) encourage self-care, 5) manage demands for health and mental health services, and 6) assist in caregiving (derived from Eng & Gustafson, 1999; also see Storck, 2002; Ben-Said, Consoli & Jean, 1994; Street, Voigt, Geyer, Manning & Swanson, 1995). However, little is known about the use of electronic technology in health and particularly mental health promotion with older adults. Additionally, more information is needed to inform caregivers regarding the usability and acceptability of such products with older adults. To this end, there is some evidence available to suggest that electronic interventions to promote mental health literacy in diverse older adults can be developed (Stoltz-Loike, Loike & Morrell, 2005, a,b).

The use of the Internet and information technology has been described as having the greatest potential for delivering health information to individuals with low literacy skills because the information can be presented in multi-media formats (Baur, 2005; Bell, Patel, & Malasanoa, 2006; Campbell, Honess-Morreale, Farrell, Carbone, & Brasure, 1999; Brickmore, Caruso, Clough-Gorr, & Heeren, 2006; Brickmore, & Giorgino, 2006; Franklin, Rosenbaum, Carey, & Roizen, 2006; Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005; Morrell, 2004a,b, 2006; Morrell, et al., 2007; Morrell, Rager, Herrmann, Rebok, Harley, & Parente, 2006; Stoltz-Loike, Morrell & Loike, 2005 a,b; Turner, et al., 1998). This technology has been shown to be an effective way to communicate information about public health issues (Campbell, Bernhardt, et al., 1999), physical activity (Bull, Kreuter, & Scharff, 1999; Echt & Kressig, 2001), cancer screening (Skinner, Strecher & Hospers, 1994), and smoking cessation (Strecher, et al., 1994). Researchers have also demonstrated that people with
low health literacy skills tend to be more comfortable and willing to disclose sensitive or controversial information to a computer-based survey than to a human interview or when completing a paper and pencil survey (Locke, et al., 1992; Turner, et al., 1998).

Above all, the Internet and information technology allows for health information to be individualized by the consumer. That is, consumers may selectively combine text, audio, and visual elements to further increase their comprehension of a topic. The Internet can be used at any time, which provides greater access to health information and support on demand. Barriers to direct communication among peers and between patients and professionals can be reduced through email and chat rooms. Finally, health information can be more widely disseminated and updated immediately (adapted from Eng & Gustafson, 1999; see Echt, 2007; Morrell, et al., 2007; Harris, 1995; Locke, et al., 1992; Robinson, 1989; Pingree, et al., 1996 for more discussion on these topics).

**Older Adults and the Internet.** Substantial evidence suggests that older adults can learn and retain computer skills and are also very interested in learning how to use the Internet (for a reviews of these topics, see Cresci, Yarandi & Morrell, in press; Czaja & Lee, 2001; Echt, 2007; Morrell, 2005 a,b,c; Morrell, et al., 2007; Morrell, Mayhorn & Bennett, 2002; Morrell, Park, Mayhorn, & Kelley, 2000; National Institute on Aging, 2003). Older adults are logging on the Internet more and more often - destroying the long-held myths that they are afraid and reluctant to use new technologies (see Adler, 2002; Morrell, 2002a; National Institute on Aging, 2002 for more in depth discussions). Members of the predominant racial/ethnic groups are also logging onto the Internet with greater frequency (Fox, 2004). On the other hand, it is important to note that there is still a "digital divide" between older users of the Internet and information technology as there are many older adults far removed from cyberspace (Fox, 2004; U.S. Department of Commerce, 1999). However, the gap in Internet usage by different age groups is expected to become smaller over time. In 2004, 67% of Americans between the ages of 50 and 58 reported having Internet access. As these people age into their 60’s they will no doubt continue to be wired, thus transforming and increasing the online presence of older users. For other barriers to and cautions for using the Internet as a source of health-related information see Eysenbach, 2001.

**The NIH Senior Health Project.** As evidence that health information can be relayed effectively via the Internet, one of the more ambitious projects to provide accessible health information to older adults is the NIH Senior Health Project - a joint effort between the National Institute on Aging (NIA) and the National Library of Medicine (NLM). This project culminated in the implementation of the
website: http://www.nihseniorhealth.gov. This website was the first to be entirely designed to compensate for some of the common age-related declines in vision, cognition, and motor skills that are observed as part of the normal aging process as well as to meet 508 standards for accessibility (see Echt, 2002, Morrell 2001, Morrell & Echt, 1996, 1997; Morrell, et al., 1997; Morrell, 2005a; for a general discussion and National Institute on Aging, 2002 for an in-depth discussion of how these conditions were met in the construction of the web site). As part of this project, a comprehensive set of national guidelines were developed by the first author of this paper for NIA and NLM to guide the development of accessible online materials (on any topic) for use specifically by older adults. However, only two topics on the website to date focus on mental health issues concerning older adults: Alzheimer's disease and Caring for Persons with Alzheimer's disease.

6. The Questions Answered

A set of questions was posed at the beginning of this document that were centered on the relationships between age, race/ethnicity, health and mental health disparities and health literacy and mental health literacy. It is posited that from the discussion above these questions can be answered and these reactions can drive a much needed research agenda.

- **Can we generalize the findings from research on health disparities in the elderly to supplement the sparse findings from studies on mental health disparities in older adults?** To some degree.

It is important to first recognize that health disparities exist in older adults as a whole and it is probable that mental health disparities can be documented as well for the older cohort. Recent findings have indicated that health disparities in older adults may not mirror mental health disparities. Therefore, stringent data collection and analysis is required in order to determine the extent of prevalence and incidence of specific mental disorders in the elderly and the likely causal factors that are related to the trends observed. The analysis should include clarification of the impact of depression on older adults and be expanded to closely examine other disorders that are common in older adults that have not received sufficient attention to date.

- **Has enough research been conducted to move forward with a practical agenda to increase mental health literacy in older adults of diverse backgrounds in order to reduce mental health disparities?** Probably.

Guidelines have been developed on how to improve readability and accessibility of printed and IT-
based materials for older adults. The CLAS standards and other recommendations are available on how to construct culturally and linguistically competent materials in order to address the overlay of race/ethnicity on aging and the correlation of these factors with health disparities and health literacy. However, a clearinghouse is needed in order to compile and summarize the guiding materials and to house new materials that will be developed to supplement the original documents. Above all, careful consideration must be given to any differences that may exist in the presentation of mental health information versus health information in general.

- **Do we know enough about the correlation between health disparities in older adults and health literacy in this population to make an educated guess on how to proceed in developing interventions/programs to improve conditions for diverse elderly in the area of mental health?** Yes.

It is impractical to delay the development of interventions on enhancing mental health literacy because numerous guidelines have been developed on how to improve health literacy through various educational avenues (i.e., printed materials, classroom training materials, multi-media presentations, IT-based health informatics). The guidelines, however, need to be revamped to focus on mental health issues in older diverse populations. In addition, all of the interventions must be piloted with samples of older adults of different racial/ethnic backgrounds to ensure accessibility and cultural and linguistic competence (i.e., user driven designs, cultural sensitivity).

- **Can IT-based interventions be designed to improve mental health literacy in older adults of diverse backgrounds which may subsequently reduce disparities on mental health?** Yes.

The key to this effort is to meet existing readability and accessibility standards and cultural and linguistic competency guidelines for print- and IT-based materials for older adults of different racial/ethnic backgrounds. It appears that the Internet and information technology can potentially eliminate some of the problems confronting older adults who want to access health and/or mental health information that could improve their level of health/mental health literacy. However, this can be true universally only if online materials can be read, understood, and used easily and equally by diverse older populations. Evaluations of existing efforts to provide online health information to older adults are clearly needed as well as extensions of research on the use of the Internet and information technology by the elderly. Older adults must also have access to the Internet to move
themselves out of the "digital divide". Only then can it be said that the Internet can be a potential powerful intervention to reduce low health or mental health literacy in older adults.

- Can we afford to wait to address mental health disparity issues in diverse older adults as the demographics of the nation are rapidly changing? No.

The demographic change and the need for the development of elder accessible, culturally competent mental health informatics are upon us.

7. A Research Agenda

It is apparent from the discussion above that research on mental health disparities and mental health literacy in older adults has taken a backseat when compared to the focus of investigators on the more general topics of health disparities and health literacy in the populations of concern. Most of the research has been devoted to mental health issues in children, adolescents and families with the presumption that older adults are extended family members. To this end, a plan is outlined below that is designed to fill the gaps in analysis. There are four foci of the recommended research agenda:

1) Conduct statistical and qualitative analysis on the relationship between race/ethnicity and age and the prevalence and incidence of specific mental health disorders in order to isolate the most common mental disorders that may afflict different groups of elder diverse older adults;

2) Compile existing consumer informatics on mental health issues in diverse older adults in order make these materials available and to also identify barriers that are distinct across and within older racial/ethnic groups;

3) Conduct systematic theoretical explorations of the age-related declines in sensory and cognitive abilities and the psychosocial factors that are likely to influence health literacy in older diverse populations; and

4) Develop IT interventions that meet accessibility requirements for older adults and CLAS standards to improve mental health literacy in the populations of concern.
Each of the foci are explored in detail below.

1. **Conduct statistical and qualitative analysis on the relationship between race/ethnicity and age and the prevalence and incidence of specific mental health disorders in order to isolate the most common mental disorders that may afflict elder diverse older adults.**

   Included in this effort are:
   
   A. Conducting a meta-analysis of available data from the CDC, Bureau of Health Statistics, NIMH, and SAMHSA and other Federal sources on the prevalence and incidence of specific mental disorders in the elderly of diverse backgrounds in order to document disorders of primary concern;
   
   B. Mapping through GPS capabilities geographical (i.e., state, congressional district and state house and senate districts) pockets of prevalence and incidence by age, disorder and racial/ethnic group in order to pinpoint where the focus of interventions are needed;
   
   C. Implementing needs assessments in local jurisdictions to determine where the lack of mental health services for older diverse adults are evident, with a particular focus on rural areas and urban/inner city districts;
   
   D. Determining the use patterns of the population of concern of existing mental health services in order to design and implement required additional efforts to increase use; and
   
   E. Evaluating the effectiveness of services that are available today and including an evaluation component as standard procedure when new programs are implemented.

   Inherent in this process is the intention of dissemination of this information so as to influence national and state policy as well as workforce development for the inclusion of more diverse paraprofessionals and professionals.

2. **Compile existing consumer informatics on mental health issues in diverse older adults in order to make these materials available and to also identify barriers that are distinct across and within older racial/ethnic groups.**

   In order to accomplish this goal, the following are suggested:
   
   A. Compiling the guidelines and directives developed from Federal Initiatives that have been constructed to increase literacy and health literacy with the aim of applying these general recommendations to the development of materials to reduce mental health disparities. Included in this would be information gleaned from:
• The Plain Language Initiative (1998), a regulation for federal agencies to write customer information in plain language. Specifically, the initiative requires the use of everyday words, active voice and short sentences. The Veteran’s Administration, The Food and Drug Administration and others have developed extensive plain language programs;
• Healthy People 2010 which is focused on national health promotion and disease prevention and outlines national health objectives;
• The Joint Commission Standards for Patient Education, an initiative of the Joint Commission on the Accreditation of Healthcare Organizations. The standards for patient and family education include elements that patients receive understandable education and training specific to their needs and abilities including education about medications, nutrition interventions, modified diets and oral health;
• The Education Reform Act that targeted adult education as one of its objectives;
• The National Institute for Literacy (NIFL), a federal organization that shares information about literacy and supports the development of high-quality literacy services so all Americans can develop essential basic skills. NIFL has developed a Literacy Information and Communication System (LINCS). The goal of LINCS is to bring adult literacy-related resources and expertise to a single point of access for users throughout the world;
• The National Cancer Institute (NCI) formed a National Work Group on Cancer and Literacy that issued guidelines for developing effective print materials for low-literacy readers. NCI has also released guidelines to improve the usability of online information for the general public;
• The National Committee for Quality Assurance requires providers to take actions necessary to ensure that patients understand the medical information they receive;
• The Food and Drug Administration issued a recommendation that manufacturers of over-the-counter drugs provide simple labels with clear warnings; and
• The National Heart, Lung and Blood Institute funded the Stanford Nutritional Action Program to develop low-literacy nutrition education materials.

B. Organizing the various printed materials such as fact sheets and brochures as well as videos, DVD presentations, and online consumer mental health informatics already currently available on symptoms, diagnosis, treatments and prognosis of mental health disorders in older adults into one source. Many of these are can be collected from the American Psychological Association, The American Psychiatric Association, The Alzheimer’s Disease Education and Research (ADEAR) Center, SAMHSA, NIMH, the National Institute on Aging and other national organizations;
C. Evaluating the accessibility of these materials for older adults in terms of standardized reading and comprehension level requirements;

D. Evaluating the materials with reference to cultural competence according to accepted CLAS standards;

E. Identifying materials available to individuals whose first language is not English or who do not speak English; and

F. Providing access to the information through print and online methods through Federal resources (i.e., NIA, NIMH, SAMHSA, Administration on Aging) and national organizations focused on the needs of specific racial/ethnic groups (i.e., NAAPIMHA, NLBHA, NLC, First Nations, and NAMBHA).

3. Conduct systematic theoretical explorations of the age-related declines in sensory and cognitive abilities and the psychosocial factors that are likely to influence health literacy in older diverse populations.

The following variables should be included in this research:

A. Exploring the relationship between sensory capabilities and mental health literacy. Improving aurally and visually presented information, and using what is understood about age-related changes in sensory ability, can facilitate cognitive processing in older adults (e.g., Echt, 2007, Morrell, et al., 2007; Echt & Pollack, 1998; Lustig, Tonev & Hasher, 2000; Schneider & Pichora-Fuller, 2000). Improving the design of information will allow older users to allocate cognitive resources to understanding and remembering relevant aspects of the information.

B. Examining the influence of cognitive factors that have shown to exhibit age-related decline on mental health literacy. These would include perceptual speed, text comprehension, working memory, and strategy use;

C. Determining the role of motivation and health beliefs on medication and treatment regimen adherence. Overall, the relationship between motivation and health beliefs and adherence is not clearly understood. However, some preliminary indication of a possible relationship between low health literacy and medication management capacity has been demonstrated (Gokal & Echt, 2003). Nevertheless, there has been little investigation in this area and additional research needs to be conducted in order to reach any firm conclusions;

D. Examining the role of cultural factors and the possible mediation by age in mental health literacy; and
E. Developing and testing conceptual models on the individual and cumulative relative influence of all of these variables on mental health literacy and adherence to mental health treatment regimens.

4) Develop IT interventions that meet accessibility requirements for older adults and CLAS standards to improve mental health literacy in the populations of concern.

Included in this work are the following:

A. Developing IT applications that are directed toward low-literate older diverse individuals. Older adults are quite capable of acquiring new skills (see Rogers, Fisk & Walker, 1996; Morrell, et al., 2007), particularly when training materials accommodate the needs of these learners (Morrell & Echt, 1996; Echt & Pollack, 1998). A rich literature exists on strategies for reading, many of which have demonstrated efficacy with or have been developed specifically for training older adults (i.e., Meyer, Young & Bartlett 1989; Harris, et al., 1998). Unfortunately, these training interventions may be too high level for effective implementation among low health literate older adults.

B. Addressing issues concerning the Internet’s use by older adults before it can be pronounced that online materials are a viable source of mental health information that can ultimately promote mental health literacy in any population. These include: 1) media intervention comparisons, 2) methods to determine the quality of mental health information online, 3) methods to reduce the “digital divide”, 4) comparisons between the methods that are employed to seek mental health information, 5) investigations into the positive and negative effects of easily available mental health information online and 6) the effects of easily accessible Internet-based information on patient-clinician trust and communication.

C. Distinguishing between effects due to Internet versus other traditional forms of health information delivery (e.g., printed materials, videotapes, and other electronic media). In essence, it might ultimately boil down to a cost/efficiency trade-off. What intervention can best promote mental health literacy in most cost effective manner in the general population and in diverse older adults? Conversely, if an intervention proves to be effective but it may more costly, is the cost/efficiency argument relevant or substantiated in terms of reducing mental health disparities? In addition, measures of these effects are also limited at present and some existing measures may not be specific enough to detect effects (Eng & Gustafson, 1999). Therefore, Eng and Gustafson (1999) suggest that developers need to precisely define the objectives of instruments before selecting outcome measures.
D. Determining the quality of mental health information. One of the gravest concerns of older adults is their inability to differentiate reliable sources of health information on Internet. Standards and guidelines must be developed to assist them on how to determine if the mental health information they are reading is current, reliable, and presented from a reputable source.

E. Reducing the "digital divide". Clearly the "digital divide" contributes to the problem of low health literacy in diverse older adults. Efforts must be made to increase access to computers for older adults and training opportunities to teach them how to use the machines and surf the Internet. In addition, programs must be developed to teach older adults about the benefits of the Internet in order to motivate their use of it to find health information.

F. Seeking comparison of the various types of online mental health information seeking behaviors (e.g. direct searching versus interactions with support groups or professionals) (Cline & Haynes, 2001).

G. Assessing the effects of the availability of access to online mental health information. Little is known presently about how the availability of health or mental health information on the Internet has affected health and mental health knowledge, beliefs and health- mental health- related behaviors in laypersons (Cline & Haynes, 2001). Research should be conducted in this area to determine both the positive and negative effects of easily accessible online information. Furthermore, the factors that also influence the use and nonuse of the Internet should also be examined (Eng & Gustafson, 1999; Cresci, Yarandi & Morrell, in press).

H. Identifying the needs of potential users. Little research has focused on what people (of any age, educational, or cultural background) desire in terms of mental health information. Therefore, the kind of mental health information consumers are seeking needs to be identified in general and within sub-populations.

I. Developing measures of mental health literacy as few of these instruments are available. The instruments that currently exist for measuring health literacy in general may not be adequate because they take too long to administer and most overemphasize reading medical terms and understanding medical jargon which might instantly disadvantage older adults. It is suggested that comprehensive health literacy assessment instruments should take into consideration physical access to health information (vision and hearing), native language literacy, media literacy, computer literacy, and cultural factors that can affect message access, comprehension, and application. Research is needed to develop such
instruments for use in an electronic environment, as well as to collect and validate normative data for older adults.

J. Designing and implementing **community-wide mental health interventions** that are directed to the populations of concern. More research is needed to facilitate the development of novel and effective ways to present mental health information to older adults and the general public. One example is the placement of kiosks in public areas that can be accessed easily, thus creating multiple environments for obtaining mental health information.
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# Appendix A. Research on Health Disparities and Chronic Diseases

<table>
<thead>
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<th>Population</th>
<th>Findings</th>
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<tr>
<td>Akhter &amp; Levinson (2003)</td>
<td>Aging and Chronic Disease</td>
<td>United States-Older adults (ages 65-84; 85+)</td>
<td>Overcoming barriers to establish a system of care for seniors</td>
</tr>
<tr>
<td>Banks, Marmot, Oldfield, &amp; Smith (2006)</td>
<td>Diabetes, hypertension, heart disease, myocardial infarction, stroke, lung disease, cancer</td>
<td>U.S. and U.K.-Older adults (ages 55-64)</td>
<td>US residents are less healthy than UK counterparts across all points of the SES distribution</td>
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<tr>
<td>Calderon, Zadshir &amp; Norris (2004)</td>
<td>Chronic Kidney Disease</td>
<td>NA</td>
<td>Electronic info about CKD may not be comprehensible by general public, especially underserved with limited literacy skills</td>
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<td>Guo &amp; Phillips (2006)</td>
<td>Chronic Diseases. Disparities (general)</td>
<td>US Health and social services providers for elderly and community leaders</td>
<td>Infrastructure issues limit capacity to respond to aging pop. needs, cultural influences, border crossing issues, health problems (special needs) and educational needs.</td>
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<tr>
<td>Jang, Kim &amp; Chiriboga (2006)</td>
<td>Health perception and depressive symptoms</td>
<td>US Korean older adults (ages 60+)</td>
<td>Positive health perceptions and emotional states among individuals with higher levels of acculturation, fewer chronic conditions, less disability, and greater sense of mastery</td>
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<tr>
<td>Jasti, Siega-Riz &amp; Bentley (2003)</td>
<td>Coronary disease, colon and breast cancer, and Multivitamin use</td>
<td>US women</td>
<td>Lit Review. Health disparities and usage patterns indicate women who could benefit from supplements most are not using them.</td>
</tr>
<tr>
<td>Authors (Year)</td>
<td>Disease/Condition</td>
<td>Population</td>
<td>Interventions</td>
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<tr>
<td>Phelan &amp; Link (2005)</td>
<td>Brain and Ovarian Cancer</td>
<td>Men and women aged 25-64 years old</td>
<td>No indication of emerging disparities over time by race or SES; Disparities arose when new knowledge and technology to prevent deaths.</td>
</tr>
<tr>
<td>Roux, Dingley, Lewis &amp; Grubbs (2004)</td>
<td>Cancer</td>
<td>Aging women with cancer</td>
<td>A therapeutic partnership between patient and provider should be based on mutual goal setting.</td>
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<tr>
<td>Underwood, Buseh, Canales, Powe, Dockery, Kather &amp; Kent (2004)</td>
<td>CVD, Cancer, Diabetes, HIV/AIDS, mental health/illness, sickle cell disease</td>
<td>African-Americans</td>
<td>Knowledge and insights relative to concerns of childbearing, parenting, the elderly, care giving is essential to eliminate health disparities.</td>
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<tr>
<td>Yoder (2005)</td>
<td>CVD</td>
<td>Data from 2002 National Ambulatory Medical Care Survey</td>
<td>Women consistently disadvantaged when compared to men.</td>
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## Appendix B. Research on Health Disparities and Physical Debilitation

<table>
<thead>
<tr>
<th>Author(s)</th>
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</thead>
<tbody>
<tr>
<td>Andresen &amp; Miller (2005)</td>
<td>Physical frailty</td>
<td>African Americans</td>
<td>SES impact on AA health and health disparities</td>
</tr>
<tr>
<td>Bruce, Fries &amp; Murtagh (2007)</td>
<td>Rheumatoid Arthritis</td>
<td>Older adults-Caucasian, African American, and Hispanic (mean age 55-62)</td>
<td>Ethnic minority patients with RA had poorer outcomes than Caucasians</td>
</tr>
<tr>
<td>Foy, Penninx, Shumaker, Messier &amp; Pahor (2005)</td>
<td>Knee osteoarthritis</td>
<td>US African and Caucasian American adults (ages 60+)</td>
<td>Ethnicity and baseline function are important factors and should not be overlooked in knee OA research</td>
</tr>
<tr>
<td>Lau &amp; Morse (2008)</td>
<td>Physical and functional states, social supports, material resources, activity and leisure, and mental efficacy</td>
<td>Australia. Urban and rural Anglo- and Italian-Australian adults (ages 50-89)</td>
<td>Urban Anglo-Australians report higher general/emotional health and higher stress. Rural Italian-Australians report higher resilience and control and poorer general/emotional health</td>
</tr>
<tr>
<td>Levy, Carter, Priloutskaya &amp; Gallegos (2003)</td>
<td>Influenza and Pneumonia</td>
<td>US New Mexican Hispanic seniors</td>
<td>Preliminary findings suggest Hispanic seniors are not get immunizations</td>
</tr>
</tbody>
</table>
## Appendix C. Research Health Disparities and Cognitive Disabilities in Diverse Older Adults

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Topic</th>
<th>Population</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Briones (2007)</td>
<td>Psychoneuro-immunology</td>
<td>Book Chapter</td>
<td>Effects of aging on neuroendocrine and immune functions</td>
</tr>
<tr>
<td>Chui and Gatz (2005)</td>
<td>Alzheimer Disease and Cultural Competence</td>
<td>NA</td>
<td>Summary of conference: Sustained, concerted, interdisciplinary effort needed to fix under-representation of ethnic minorities in AD research</td>
</tr>
<tr>
<td>Gallagher-Thompson</td>
<td>Dementia (Lit Review)</td>
<td>Diverse Older adults</td>
<td>Inclusion of family in caregiving will lead to better patient and caregiver outcomes</td>
</tr>
<tr>
<td>Hahn &amp; Aronow (2005)</td>
<td>Intellectual and developmental disabilities</td>
<td>US Los Angeles County residents (ages 32+)</td>
<td>APN intervention to promote healthy aging and reduce disparities in aging adults with intellectual and developmental disabilities is feasible, needed, and warrants further study</td>
</tr>
</tbody>
</table>
## Appendix D. Research on Oral Health Disparities

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Topic</th>
<th>Population</th>
<th>Findings</th>
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<tbody>
<tr>
<td>Evans (2006)</td>
<td>Oral health</td>
<td>NA</td>
<td>Comments on workshop papers</td>
</tr>
<tr>
<td>Hewlett, Davidson, Nakazono, Baumeister, Carreon &amp; Freed (2007)</td>
<td>Oral Health disparities</td>
<td>US dental school seniors</td>
<td>Dental school environment significantly related to adequacy of curriculum time for cultural competency</td>
</tr>
</tbody>
</table>
### Appendix E. Research on Health Disparities in Diverse Older Adults

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Topic</th>
<th>Population</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bennett &amp; Riegel (2003)</td>
<td>Health status (general)</td>
<td>Mexican Americans- mean age 75.3</td>
<td>US Spanish Short Form 36 Health Survey was a satisfactory measure of Mexican American health status</td>
</tr>
<tr>
<td>Boonyoung (2003)</td>
<td>Health status, self care, access</td>
<td>Thai middle-aged women</td>
<td>Comparison of two health insurance programs effects on Thai women’s health show disparities</td>
</tr>
<tr>
<td>Bopp, Lattimore, Wilcox, Laken, McClarin, Swinton, Gethers &amp; Bryant (2006)</td>
<td>Health disparities</td>
<td>African Americans-adult (&lt;55&lt;=) from South Carolina churches</td>
<td>Focus groups suggest tying physical activity (PA) to faith-based organizations may increase use of PA programs</td>
</tr>
<tr>
<td>Bowen (2006)</td>
<td>Health (general)</td>
<td>US-Elderly Black and Hispanic</td>
<td>Racial differences in health problems, insurance, and treatment and racial/ethnic minorities have worse self-reported health than whites</td>
</tr>
<tr>
<td>Carlson &amp; Chamberlain (2005)</td>
<td>Allostatis</td>
<td>NA</td>
<td>Theoretical framework for health disparities using allostatis and allostatic load</td>
</tr>
<tr>
<td>Center for Disease Control (CDC) (2003)</td>
<td>Health Related Quality of Life (HRQOL)</td>
<td>US Low income adults (ages 45-64)</td>
<td>Low income adults (age 45-64) report more unhealthy days than younger and older low and high income adults</td>
</tr>
<tr>
<td>Cheng, Cumber, Dumas, Winter, Nguyen &amp; Nieman (2003)</td>
<td>HRQOL</td>
<td>US adults (ages 55-64) with chronic diseases</td>
<td>HRQOL data can assist health care providers to gain a more complete picture of how chronic disease impacts perceived mental and physical functioning in pre-geriatric patients</td>
</tr>
<tr>
<td>Eichner &amp; Vladeck (2005)</td>
<td>Medicare</td>
<td>NA</td>
<td>Medicare has not realized its potential as a catalyst in reducing health disparities</td>
</tr>
<tr>
<td>US Food and Drug Administration (2004)</td>
<td>Health disparities</td>
<td>Older Hispanic Americans</td>
<td>Older Hispanic American population is at risk for chronic diseases</td>
</tr>
<tr>
<td>Authors (Year)</td>
<td>Title</td>
<td>Population</td>
<td>Findings</td>
</tr>
<tr>
<td>----------------------------------------------</td>
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<tr>
<td>Goins &amp; Manson (2006)</td>
<td>NA</td>
<td>American Indian and Alaska Natives</td>
<td>Intro to supplemental issue of Journal on Applied Gerontology</td>
</tr>
<tr>
<td>Goins, Spencer &amp; Krummel (2003)</td>
<td>Obesity and HRQOL</td>
<td>Appalachians (ages 65+)</td>
<td>Obese elderly Appalachians report poorer self-rated health and more days of poor physical health than non-obese counterparts</td>
</tr>
<tr>
<td>Heitkemper &amp; Bond (2003)</td>
<td>NA</td>
<td>NA</td>
<td>State of Nursing Science</td>
</tr>
<tr>
<td>Hinterlong (2006)</td>
<td>Health (general)</td>
<td>US African American and white adults (ages 60+)</td>
<td>Engagement in productive activities predicts better functional status for both groups but higher self-rated health among whites only</td>
</tr>
<tr>
<td>Hsu (2005)</td>
<td>Aging and Gender</td>
<td>Taiwanese adults (ages 60+)</td>
<td>Significant disparities were found between elderly men and women in activities of daily living, instrumental activities of daily living cognitive function, depressive symptoms, social support and productive activities</td>
</tr>
<tr>
<td>Jackson (2005)</td>
<td>Health inequality (general)</td>
<td>Minority populations</td>
<td>Lit Review</td>
</tr>
<tr>
<td>Jenkins, Fultz, Fonda &amp; Wray (2003)</td>
<td>Body weight</td>
<td>US adults (ages 51-61)</td>
<td>Differing physiologic and social or environmental experiences may have implications for body weight patterns</td>
</tr>
<tr>
<td>Kelley-Moore (2006)</td>
<td>Estimates of racial health inequality</td>
<td>US adults (ages 65+)</td>
<td>Face-to-face interviews yield higher reports of disability than telephone interviews. Blacks have more disability than</td>
</tr>
<tr>
<td>Study</td>
<td>Topic</td>
<td>Population</td>
<td>Findings/Notes</td>
</tr>
<tr>
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<tr>
<td>Martin (2004)</td>
<td>Health disparities (general)</td>
<td>US Iranian immigrants (seniors)</td>
<td>Cultural differences (the way health, illness, and healing are defined) are significant in explaining participants' health related behaviors</td>
</tr>
<tr>
<td>Miller, Wolinsky, Malmstrom, Andresen &amp; Miller (2005)</td>
<td>Frank and subclinical disability</td>
<td>US African Americans (born between 1936-1950)</td>
<td>AAH inner city group experienced more frank disability than other populations of AAs and NHWs. AAs living in poor inner city areas need intensive and targeted clinical public health efforts</td>
</tr>
<tr>
<td>Pamuk, Wagener &amp; Molla (2004)</td>
<td>Life Expectancy</td>
<td>Asian/Pacific Islander</td>
<td>Achievement of Healthy People 2010 would produce increases in longevity and health.</td>
</tr>
<tr>
<td>Reisz (2006)</td>
<td>Gerontology</td>
<td>9 urban, poor, older African American women (born around WWII, after Great Depression, before Great Depression)</td>
<td>Moral orders guided lives of older women through oppression and stress but is failing younger women who are exposed to new environmental pressures.</td>
</tr>
<tr>
<td>Reynolds (2004)</td>
<td>End-of-life care</td>
<td>8 central North Carolina nursing homes</td>
<td>Another way of conceiving advance care planning is by focusing on in-depth discussions.</td>
</tr>
<tr>
<td>Robert &amp; Ruel (2006)</td>
<td>Racial segregation and self-reported health</td>
<td>Older Adults (672 Blacks; 2038 Whites) from ACL and NSFH</td>
<td>Socioeconomic status at multiple levels contribute to race disparities in health.</td>
</tr>
<tr>
<td>Shultz (2007)</td>
<td>Vodou medicine and healing practices</td>
<td>NA</td>
<td>Reliable information on Vodou healing practices is difficult to find on the</td>
</tr>
<tr>
<td>Reference</td>
<td>Topic</td>
<td>Sample Description</td>
<td>Summary</td>
</tr>
<tr>
<td>--------------------------------------------</td>
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<tr>
<td>Spitzer (2005)</td>
<td>Gender and Health</td>
<td>Canadian Women and Men</td>
<td>Unfair health burden borne by women whose access to healthcare is limited.</td>
</tr>
<tr>
<td>Stewart &amp; Nápoles-Springer (2003)</td>
<td>Systematic development of measurement research</td>
<td>Small conference convened by 6 Resource Centers for Minority Aging Research (RCMAR)</td>
<td>National commitment to reduce health disparities may be compromised without more research on measurement quality.</td>
</tr>
<tr>
<td>Stockdale, Tang, Zhang, Belin &amp; Wells (2006)</td>
<td>Alcohol, Drug &amp; Mental Health</td>
<td>14,985 respondents that completed Healthcare for Communities (HCC) wave 2 telephone survey</td>
<td>Nonwhites, poor, uninsured and elderly had lower likelihood of service use.</td>
</tr>
<tr>
<td>Szanton (2007)</td>
<td>Mortality risk of older women</td>
<td>728 women aged 70-79</td>
<td>Perception and adequacy of financial resources are better predictors of mortality than income of African Americans.</td>
</tr>
<tr>
<td>Yao &amp; Robert (2008)</td>
<td>Self-rated Health and Mortality</td>
<td>Black and white older adults in US</td>
<td>Black older adults have greater declines in self-rated health over time that white older adults; explained by individual and neighborhood SES.</td>
</tr>
<tr>
<td>Reference</td>
<td>Title</td>
<td>Description</td>
<td>Lit Review</td>
</tr>
<tr>
<td>-----------</td>
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<td>------------</td>
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<tr>
<td>Yee &amp; Chiriboga (2007)</td>
<td>Disparities (general)</td>
<td>US older adults, females, ethnic/minority or poor people</td>
<td></td>
</tr>
<tr>
<td>Youmans, Schillinger, Mamary &amp; Stewart (2007)</td>
<td>Perception of Pharmacists</td>
<td>Insured, older African Americans (&gt;60 years old) with chronic disease (30 women; 12 men)</td>
<td>Difficulty executing physical tasks is more common for women than men although differences smaller after adjustment for underlying illness.</td>
</tr>
<tr>
<td>Zahran, Kobau, Moriarty, Zack, Holt &amp; Donehoo (2005)</td>
<td>Health Related Quality of Life (HRQOL)</td>
<td>1,291,986 persons (52% female) participated in BRFSS</td>
<td>During 1993-2001 mean number of physically and mentally unhealthy days and activity limitation days was higher after 1997 than before.</td>
</tr>
<tr>
<td>Zunker &amp; Cummings (2004)</td>
<td>Health Related Quality of Life (HRQOL)</td>
<td>1,450 persons 60+ older population along US-México border from Western Texas &amp; Southern New Mexico</td>
<td>Significant differences between groups after controlling for socioeconomic status and age.</td>
</tr>
</tbody>
</table>
## Appendix F. Research on Health Disparities and SocioEconomic Status

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Topic</th>
<th>Population</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ajrouch (2007)</td>
<td>Elder health and social relationships</td>
<td>Arab-Americans-Ages 56+</td>
<td>Intergenerational relations related to less illness</td>
</tr>
<tr>
<td>Caesar (2006)</td>
<td>Language and Health care access</td>
<td>US-Hispanic-Older adults (65+)</td>
<td>Significant relationship between English proficiency and access to Medicare</td>
</tr>
<tr>
<td>Dunn, Hayers, Hulchanski, Hwang &amp; Potvin (2006)</td>
<td>Socio-economic dimensions of housing and health</td>
<td>Canada. Public and Private organizations and individuals</td>
<td>Dearth of research on Housing as a socio-economic determinant of health</td>
</tr>
<tr>
<td>George (2005)</td>
<td>SES and health</td>
<td>NA</td>
<td>Intro to Special Issue of Journals of Gerontology</td>
</tr>
<tr>
<td>Tung &amp; Mutran (2005)</td>
<td>SES</td>
<td>Ethnic groups of elders in Taiwan: Mainlanders and Taiwanese</td>
<td>Taiwanese elders experience disproportionate burden of health because lower SES.</td>
</tr>
<tr>
<td>Yen, Stewart, Scherzer &amp; Pérez-Stable (2007)</td>
<td>Childhood experiences related to SES and health later in life</td>
<td>25 adults aged 55-80 years from diverse economic and ethnic backgrounds (Whites, African Americans, Asian Americans and Latinos)</td>
<td>Domains of childhood social and economic circumstances add breadth and depth to conventional conceptualization of childhood SES.</td>
</tr>
</tbody>
</table>
## Appendix G. Workforce Issues in Health Disparities

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Topic</th>
<th>Population</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carnes, Schuler, Sarto, Lent &amp; Bakken</td>
<td>Recruitment in aging research</td>
<td>Women</td>
<td>Focusing on areas of research with personal relevance to applicants and individualizing the program can be used to recruit diverse post-doc fellows in aging research</td>
</tr>
<tr>
<td>Chavez, Turalba &amp; Malik (2006)</td>
<td>Pedagogy for Collegiality</td>
<td>SF State University MPH students</td>
<td>With a pedagogy of collegiality, students can move beyond learning about health disparities in the community to having actual experience</td>
</tr>
<tr>
<td>Curry &amp; Jackson (2003)</td>
<td>Recruitment and Retention of older ethnic adults in health research</td>
<td>Older adults (from ethnic/racial minorities)</td>
<td>Summary of related issues. Preamble to Vol. 43, No. 1 of The Gerontologist</td>
</tr>
<tr>
<td>Heitkemper &amp; Bond (2003)</td>
<td>NA</td>
<td>NA</td>
<td>State of Nursing Science</td>
</tr>
<tr>
<td>Manson, Goins &amp; Buchwald (2006)</td>
<td>AI/AN workforce</td>
<td>American Indian and Alaska Native Postdoctoral students</td>
<td>Description of successful post-doc training program that prepares AI/AN investigators for careers as independent scientists who work on culture, aging, and health</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Topic</td>
<td>Population</td>
<td>Findings</td>
</tr>
<tr>
<td>-------------------------------</td>
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</tr>
<tr>
<td>Angel &amp; Angel (2006)</td>
<td>Lit Review</td>
<td>African Americans and Hispanics</td>
<td>Review of race and ethnicity definitions, summary of health differentials related to social structure, emphasize SES factors effect on healthful aging</td>
</tr>
<tr>
<td>Averill (2005)</td>
<td>Lit Review</td>
<td>Hispanic Migrant workers and multicultural older adults</td>
<td>Model to reduce health disparities in vulnerable populations</td>
</tr>
<tr>
<td>Fiscella &amp; Williams (2004)</td>
<td>Lit Review</td>
<td>NA</td>
<td>Recommendations for improving urban health care and reducing disparities based on racial/ethnic and SES characteristics</td>
</tr>
<tr>
<td>Jablonski, Munro, Grap &amp; Elswick (2005)</td>
<td>Oral Health</td>
<td>Frail and functionally dependent elders in nursing homes</td>
<td>Lit Review</td>
</tr>
<tr>
<td>Mensah &amp; Brown (2007)</td>
<td>Cardiovascular Disease</td>
<td>NA</td>
<td>Lit Review</td>
</tr>
<tr>
<td>Miles (2005)</td>
<td>Cancer</td>
<td>Minority Elders</td>
<td>Lit Review</td>
</tr>
<tr>
<td>Mullins, Blatt, Gbarayor, Yang &amp; Baquet (2005)</td>
<td>Cardiovascular disease, diabetes mellitus, and cancer</td>
<td>NA</td>
<td>Lit Review</td>
</tr>
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<td>Author(s) and Year</td>
<td>Domain</td>
<td>Population</td>
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<tr>
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</tr>
<tr>
<td>Shavers (2007)</td>
<td>SES</td>
<td>US adults</td>
<td>Choosing best measure of SES is dependent on its relevance to the population and outcomes under study.</td>
</tr>
<tr>
<td>Tiedje (2005)</td>
<td>Maternal-Child Health (MCH)</td>
<td>US families and individuals</td>
<td>Home visit to poor women to improve MCH or use of community resources are cost-effective and successful.</td>
</tr>
</tbody>
</table>
## Appendix I. Health Literacy

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Topic</th>
<th>Population</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency for Healthcare Research and Quality (2007)</td>
<td>Low Health Literacy</td>
<td>US Elderly Medicare patients</td>
<td>60% of elderly Medicare managed care members who had trouble understanding medical info received little to no social support from others</td>
</tr>
<tr>
<td>Benzel-Lindley (2005)</td>
<td>Diabetes self care</td>
<td>US elders with Type 2 Diabetes</td>
<td>Health literacy and cognitive reasoning ability were statistically significant to the measure of diabetes self care</td>
</tr>
<tr>
<td>Billek-Sawhney and Reicherter (2005)</td>
<td>Health literacy (general)</td>
<td>NA</td>
<td>Lit Review</td>
</tr>
<tr>
<td>Blanson Henkemans, Rogers, Fisk, Neerincx, and Lindenberg (2008)</td>
<td>Diabetes self care</td>
<td>US adults with Diabetes (ages 61-75)</td>
<td>Adaptive computer assistant had a positive effect on development of health literacy</td>
</tr>
<tr>
<td>Broering, Chauncey, and Gomes (2006)</td>
<td>Health (general)</td>
<td>US senior citizens</td>
<td>Flexibility and trustworthiness are most important factors when providing consumer health info classes</td>
</tr>
<tr>
<td>Campbell, Edwards, Ward, and Weatherby (2007)</td>
<td>Self-Determination in completing Advanced Directives</td>
<td>US adults (age 60+)</td>
<td>Receiving info about Advanced Directives (AD), positive attitudes toward Ads and health literacy significantly affected likelihood of completing Ads</td>
</tr>
<tr>
<td>Chew, Bradley, Flum, Cornia, and Koepsell (2004)</td>
<td>Low Health Literacy</td>
<td>US adults in VA preoperative clinic</td>
<td>Low Health Literacy common among older patients and may be associated with lower adherence to preoperative medication instructions</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Study Population</td>
<td>Findings</td>
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<td>-----------</td>
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<tr>
<td>Cho, Lee, Arozullah and Crittenden (2008)</td>
<td>Health status and health service utilization</td>
<td>US Medicare patients (age 65+)</td>
<td>Improving health literacy may improve health status and reduce use of expensive hospital/emergency room services among elderly</td>
</tr>
<tr>
<td>Donelle, Hoffman-Goetz and Arocha (2007)</td>
<td>Heath numeracy</td>
<td>Canadian adults (ages 50+)</td>
<td>Need for clarification of the numeracy concept and refinement of health numeracy assessment instrument</td>
</tr>
<tr>
<td>Drummond and Smith (2006)</td>
<td>Men's Nutrition</td>
<td>Australian males (WWII and Vietnam Vets)</td>
<td>Many aging men do not have the necessary health literacy levels and decision-making skills associated with healthy nutrition.</td>
</tr>
<tr>
<td>Dubow (2004)</td>
<td>Health Literacy (general)</td>
<td>NA</td>
<td>Lit Review</td>
</tr>
<tr>
<td>Echt (2007)</td>
<td>Health Literacy (general)</td>
<td>low health literate persons</td>
<td>Lit Review</td>
</tr>
<tr>
<td>Friedman and Hoffman-Goetz (2006)</td>
<td>Cancer</td>
<td>Seniors</td>
<td>Need for lower article readability levels and inclusion of more mobilizing information in cancer articles targeting seniors</td>
</tr>
<tr>
<td>Daniela (2006)</td>
<td>Cancer</td>
<td>Canadian adults (age 50-75)</td>
<td>Need for more readable and tailored cancer information on the Web</td>
</tr>
<tr>
<td>Gordon (2006)</td>
<td>Nutrition (culturally relevant wellness services)</td>
<td>Older Adults</td>
<td>Lit Review Understanding the cultural identities and social/cultural environments aids in overcoming barriers to good nutrition</td>
</tr>
<tr>
<td>Author(s) and Years</td>
<td>Topic</td>
<td>Population</td>
<td>Description</td>
</tr>
<tr>
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</tr>
<tr>
<td>Hibbard, Greene and Tusler (2005)</td>
<td>Health literacy (general)</td>
<td>US Medicare beneficiaries</td>
<td>S-TOFHLA achieves a relatively high level of both sensitivity and specificity for predicting health literacy levels.</td>
</tr>
<tr>
<td>Hill (2005)</td>
<td>Literacy and Health Literacy</td>
<td>US adults (age 65+)</td>
<td>Older adults' reading level rated at high school or below. Rewriting patient education materials at a lower reading level has been documented to be a useful strategy.</td>
</tr>
<tr>
<td>Howard, Gazmararian and Parker (2005)</td>
<td>Medical Care Use and Cost</td>
<td>US elderly in Medicare managed care plan</td>
<td>Persons with inadequate health literacy incur higher medical costs and use an inefficient mix of services.</td>
</tr>
<tr>
<td>Howard, Sentell, and Gazmararian (2006)</td>
<td>Health status and Receipt of vaccinations</td>
<td>US elderly in Medicare managed care plan</td>
<td>Health literacy explained a small to moderate fraction of the differences in health status and, to a lesser degree, receipt of vaccinations that would normally be attributed to educational attainment and/or race if literacy was not considered.</td>
</tr>
<tr>
<td>Kantor (2006)</td>
<td>Health literacy</td>
<td>US</td>
<td>Lit Review</td>
</tr>
<tr>
<td>Study</td>
<td>Findings</td>
<td></td>
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<tr>
<td>Kobylarz, Pomidor, and Heath (2006)</td>
<td>Mnemonic SPEAK tool helps to enhance providers' awareness of health literacy components during patient care.</td>
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<tr>
<td>Lee, Gazmararian and Arozullah (2006)</td>
<td>US adults (age 65+) enrolled in Medicare managed care</td>
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<tr>
<td>Leung, Ko, Chan, Chi, and Chow (2007)</td>
<td>Chinese adults (age 50+)</td>
<td></td>
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<tr>
<td>Chiung-ju (2006)</td>
<td>US adults (age 65+)</td>
<td></td>
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<tr>
<td>Loiselle and Cossette (2007)</td>
<td>Confidence in seeking health info via the Internet was not associated with age, educational level or experience using computers</td>
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<tr>
<td>MacLaughlin, Raehl, Treadway, Sterling, Zoller and Bond (2005)</td>
<td>Medication adherence</td>
<td></td>
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<tr>
<td>Magwood (2006)</td>
<td>US older adults</td>
<td></td>
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<tr>
<td>Meece (2007)</td>
<td>Health literacy, medication adherence, and safety are related to patient's special needs and/or impairments which need to be taken into consideration by providers</td>
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<tr>
<td>Study</td>
<td>Topic</td>
<td>Population</td>
<td>Findings</td>
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<tr>
<td>Mitty and Flores (2007)</td>
<td>Medication Management</td>
<td>US assisted living residents</td>
<td>Formal assessment is necessary when measuring residents' ability to self-manage medications</td>
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<tr>
<td>Morris, MacLean, and Littenberg (2006)</td>
<td>Diabetes</td>
<td>US adults (age 57+)</td>
<td>Literacy is not associated with glycated hemoglobin, blood pressure, lipid levels, or self-reported diabetes complications</td>
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<tr>
<td>Morrow, Clark, Tu, Wu, Weiner, Steinley and Murray (2006)</td>
<td>Chronic Heart Failure</td>
<td>US adults (middle aged and older)</td>
<td>Education and cognitive ability were independently associated with the STOFHLA measure and explained age differences</td>
</tr>
<tr>
<td>Morrow, Weiner, Steinley, Young, and Murray (2007)</td>
<td>Chronic Heart Failure</td>
<td>US adults (middle aged and older)</td>
<td>Patient-centered instruction preferred over pharmacy instructions for learning about adherence information and drug interactions. Literacy reflects more fundamental cognitive mechanisms</td>
</tr>
<tr>
<td>Morrow, Weiner, Young, Steinley, Deer, and Murray (2005)</td>
<td>Chronic Heart Failure</td>
<td>US adults</td>
<td>Patient-centered instructions were recalled and understood more quickly than standard instructions.</td>
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<tr>
<td>Murray, et al. (2003)</td>
<td>Chronic Heart Failure</td>
<td>US adults</td>
<td>NA</td>
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<tr>
<td>Nursing (2007)</td>
<td>Illiteracy and mortality</td>
<td>US adults (age 65+)</td>
<td>Illiteracy linked to earlier death in older adults</td>
</tr>
<tr>
<td>Pawaskar and Sansgiry (2006)</td>
<td>Health literacy (general)</td>
<td>US older adults</td>
<td>To use medications independently, older people need medication info in a large font and easy-to-understand language</td>
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<tr>
<td>Author(s) and Year</td>
<td>Topic</td>
<td>Population</td>
<td>Findings/Implications</td>
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<td>Pawlak (2005)</td>
<td>Health literacy (general)</td>
<td>NA</td>
<td>Lit Review</td>
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<tr>
<td>Reisfield, Paulian, and Wilson (2005)</td>
<td>Pain management</td>
<td>Case Study US African American (age 60)</td>
<td>Once illiteracy was addressed, pain and symptoms were managed successfully</td>
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<td>Rootman and Tonson (2005)</td>
<td>Literacy and Health</td>
<td>Canada</td>
<td>Lit Review</td>
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<tr>
<td>Roth and Ivey (2005)</td>
<td>Medication Use</td>
<td>US adults (age 60+)</td>
<td>Inadequate health literacy, poor adherence, and potentially inappropriate medication use were prevalent in sample. Race may have an important role in the risk of developing medication-related problems</td>
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<tr>
<td>Rudd and Horowitz (2005)</td>
<td>Oral health</td>
<td>US adults (age 60+)</td>
<td>Lit Review</td>
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<tr>
<td>Sicat and Delafuente (2005)</td>
<td>Medication use</td>
<td>Case Study US female with diabetes</td>
<td>Create a risk-free environment, reassess self-management skills regularly, and involve a family member or friend to improve medication management and reduce impact of health illiteracy</td>
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<tr>
<td>Sorrell (2006)</td>
<td>Health literacy (general)</td>
<td>NA</td>
<td>Lit Review</td>
</tr>
<tr>
<td>Sudore, et al. (2006)</td>
<td>Health literacy (general)</td>
<td>US adults (age 70-79)</td>
<td>Low health literacy associated with low SES, co-morbidities, and poor access to health care</td>
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<tr>
<td>Thobaben (2007)</td>
<td>Health literacy (general)</td>
<td>US elderly</td>
<td>Nursing strategies to help patients with low health literacy provided</td>
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<tr>
<td>Valle (2005)</td>
<td>Alzheimer disease and associated disorders</td>
<td>Ethnically diverse populations</td>
<td>Best practices in recruitment, retention, and adherence</td>
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<tr>
<td>Villaire and Mayer (2007)</td>
<td>Chronic illness management</td>
<td>NA</td>
<td>Definition of health literacy and recommendations for case managers to better understand the scope of the problem</td>
</tr>
<tr>
<td>Wolf, Gazmararian, and Baker (2005)</td>
<td>Health risk behaviors</td>
<td>US elderly new Medicare enrollees</td>
<td>Low health literacy was not independently associated with health risk behaviors after controlling for relevant covariates</td>
</tr>
<tr>
<td>Worcester, Echt, and Rooney (2005)</td>
<td>Health literacy (general)</td>
<td>US adults (age 65-91) high health literacy</td>
<td>Significant differences between high and low health literacy adults with regard to their ability to manage new medications and comprehend counseling related to a new regimen</td>
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</tbody>
</table>