The Health Literacy of U.S. Adults Across GED Credential Recipients, High School Graduates, and Non–High School Graduates

GED Testing Service™ Research Studies, 2008-1

GED®
General Educational Development Testing Service of the American Council on Education®

GED Testing Service™
One Dupont Circle NW, Suite 250
Washington, DC 20036-1163
(202) 939-9490
Fax: (202) 659-8875
www.GEDtest.org

Running head: HEALTH LITERACY OF GED CREDENTIAL RECIPIENTS

The Health Literacy of U.S. Adults Across GED Credential Recipients, High School Graduates, and Non–High School Graduates

Yung-chen Hsu

General Educational Development Testing Service™
A Program of the American Council on Education®

.

Abstract

Health literacy is important for all adults. Because lower health literacy is associated with lower educational attainment, many adult basic and literacy education programs increasingly provide health education to low-literate adults to improve their health literacy. Using data from the 2003 National Assessment of Adult Literacy (NAAL), this study examined the health literacy of adults across GED credential recipients, high school graduates, and non–high school graduates by various demographic and socioeconomic characteristics. Specific populations with lower health literacy levels were identified so that adult education entities and policy makers can target these groups with more support, funding, and better programs to improve their health literacy skills.

The Health Literacy of U.S. Adults Across GED Credential Recipients, High School Graduates, and Non–High School Graduates

Health literacy is important for all adults, but nearly half of American adults have difficulty understanding written health information and cannot use health information effectively (Nielsen-Bohlman, Panzer, & Kindig, 2004). According to Rudd, Kirsch, & Yamamoto (2004) and Kutner, Greenberg, Jin, & Paulsen (2006), health literacy is strongly related to educational attainment. Both reports show that average health literacy increased with each additional level of educational attainment. Adults with less than high school or some high school education have the lowest health literacy compared with the adults with higher levels of educational attainment. Adults with a General Educational Development (GED)/high school equivalency credential had the same health literacy skills as adults with a high school diploma. These adults with a GED/high school equivalency credential usually demonstrated inadequate literacy skills in comprehending health information and consequently will have some difficulties in engaging in a variety of health activities, such as health promotion, health protection, disease prevention, health care and maintenance, and health system navigation (Rudd et al., 2004).

According to the U.S. Department of Health and Human Services (2000), health literacy is defined as “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (pp. 11–20). Adequate health literacy is crucial for people to understand a complex health system and better manage their health. Several studies suggest that inadequate health literacy is associated with a variety of adverse health outcomes, such as increased hospitalization rates, less frequent screening for diseases, poorer control of

chronic health conditions, and high rates of disease and mortality (Baker, Parker, Williams, & Clark, 1998; Gordon, Hampson, Capell, & Madhok, 2002). The average annual health-care costs for people with very low literacy (reading at the second grade level or below) may be four times greater than for the general population. Approximately 75 percent of people with chronic physical or mental health problems are in the low literacy category. Low literacy is also an increasing problem among the non-English-speaking population and people over 65 years of age (U.S. Department of Health and Human Services, 2000). In recent years, many organizations, such as public and medical libraries; voluntary, professional, and community groups; and many Adult Basic and Literacy Education (ABLE) programs, offered health literacy programs that targeted skill improvement for low literacy adults and those whose English is limited (Office of Vocational and Adult Education, 2006).

The National Center for Education Statistics (NCES) in the U.S. Department of Education's Institute of Education Sciences sponsored the 2003 National Assessment of Adult Literacy (NAAL) to assess the nation's progress in adult literacy from the time the 1992 National Adult Literacy Survey (NALS) was conducted (White & Dillow, 2005). The 2003 NAAL and 1992 NALS measured literacy in three areas—prose, document, and quantitative. The 2003 NAAL also introduced the first-ever national assessment of adults' ability to use their literacy skills in understanding health-related materials and forms. The 2003 NAAL included a health literacy scale that consisted of 12 prose, 12 document, and four quantitative items, which reflect the definition provided by the Institute of Medicine (2004) and the U.S. Department of Health and Human Services (2000). The tasks used to measure health literacy were organized around three domains of

health and health-care information and services: clinical, prevention, and navigation of the health-care system. The materials for the tasks were selected to represent real-world health-related information, including insurance information, medicine directions, and preventive care information. Of the 28 health literacy items, three represented the clinical domain, 14 represented the prevention domain, and 11 items represented the navigation of the health-care system domain (Kutner et al., 2006).

NCES released its results in *The Health Literacy of America's Adults: Results from the 2003 National Assessment of Adult Literacy* (Kutner et al., 2006). The report indicated that 14 percent (about 30 million) of American adults 16 years of age or older had *Below Basic* health literacy, 22 percent (about 48 million) of adults had *Basic* health literacy, and 5 percent (11 million) of adults were nonliterate in English. That is, over 40 percent (about 90 million) of American adults over 16 years of age did not have adequate health literacy to obtain, process, and understand basic health information and services, and consequently could not make appropriate health decisions.

Kutner et al. (2006) also presented the estimates of mean scores and the percentages of adults classified in four health literacy levels (below basic, basic, intermediate, and proficient) by various demographic characteristics. The analyses showed results consistent with those in other reports (see Golbeck, Ahlers-Schmidt, & Paschal, 2005): Minority, immigrant, low-income, elderly, or lower educational attainment populations were vulnerable to having lower health literacy. Adults with less than or some high school education had the lowest health literacy levels. Adults with a GED/high school equivalency credential had mean health literacy scores that were significantly higher than scores of adults without a high school diploma and similar to

those of high school graduates. However, Kutner et al. (2006) did not assess the variability of health literacy by levels of these lower educational attainment groups by demographic variables. Moreover, while Hsu and George-Ezzelle (2007) examined the literacy level of adults with a GED/high school equivalency credential, high school graduates, and non–high school graduates on the prose, document, and quantitative literacy scales, the health literacy scale has not yet been examined. Therefore, the purposes of this study are:

1. To examine the health literacy level of adults with a GED/high school equivalency credential and of adults with and without a high school diploma across race/ethnicity, gender, age, language spoken before starting school, English as a second language status, immigration status, employment status, poverty threshold, and overall health.
2. To identify specific populations with lower health literacy levels so that adult education entities and policy makers can target these groups with more support to improve their health literacy skills.

Method

The analyses focused on the estimates of the health literacy levels of adults in the following three groups: (1) adults with less than or some high school but no longer in high school (non–high school graduates), (2) adults with a GED/high school equivalency credential who did not continue with higher education, and (3) adults who are high school graduates but did not continue with higher education (high school graduates).

Statistical comparisons included mean health literacy score across gender, race/ethnicity, age, language spoken before starting school, English as a second language status, immigration status, employment status, poverty threshold, and overall health. All statistical comparisons of the estimates of health literacy levels of the three groups were based on the *t* statistic, using a 95 percent confidence interval (two-tailed). The formula to compute the *t* statistic was

$$t = \frac{(P_1 - P_2)}{\sqrt{SE_1^{\,2} + SE_2^{\,2}}}$$

where P_1 and P_2 are the estimates to be compared and SE_1 and SE_2 are their corresponding standard errors. The multiple t-tests conducted in this study replicated the method performed in the 2003 NAAL study (Kutner, Greenberg, & Baer, 2005); Bonferroni adjustments were not applied.

Data Sources

Data for this study were obtained from the 2003 NAAL data file, which was released by the U.S. Department of Education's National Center for Education Statistics (National Center for Education Statistics). This file contained demographic and health literacy level information on more than 19,000 adults (ages 16 and older) in households or prisons in the United States. In the sample, about 15 percent of adults did not finish high school and were currently no longer in high school, 5 percent had a GED/high school equivalency credential, and 26 percent were high school graduates (Kutner et al., 2005).

The data were analyzed using AM Statistical Software, which was developed by the American Institutes for Research. AM is a free statistical software that analyzes data

from complex samples, especially large-scale assessments such as the National Assessment of Educational Progress (NAEP), the Third International Mathematics and Science Studies (TIMSS), and the National Assessment of Adult Literacy (NAAL). The software can be downloaded from http://am.air.org/naal.asp.

Results

Table 1 presents the average health literacy scores and their standard errors for adults across the three educational attainment levels by the following demographic characteristics: race/ethnicity, gender, age, language spoken before starting school, country of birth, age of arrival in the United States, age learned to speak English, employment status, poverty threshold, and overall health. Figures 1 to 10 display the comparisons of the average health literacy scores across the three groups for each of the demographic characteristics.

The results indicated that GED/high school equivalency credential recipients generally have statistically significant higher average health literacy scores than that of non–high school graduates across the 10 demographic and socioeconomic backgrounds ($p < .05$). Exceptions were found in comparisons of the adults who indicated “other” race/ethnicity, who spoke English and another language (including Spanish) before starting school, and who started learning to speak English after 11 years of age. In these comparisons, GED/high school equivalency credential recipients showed statistically equivalent levels of health literacy levels as non–high school graduates ($p < .05$).

Comparisons of average health literacy scores of adults with a GED/high school equivalency credential and high school graduates indicated that adults with a GED/high

school equivalency credential generally have statistically equivalent health literacy levels to those of high school graduates across the 10 demographic and socioeconomic backgrounds ($p < .05$). Adults with a GED/high school equivalency credential who were between 25 and 39 years old, and those who were below the poverty threshold, showed statistically significant higher average health literacy scores than the high school graduates with the same demographics ($p < .05$). Only with adults aged 50 or above did the high school graduates have statistically significant higher average scores than GED/high school equivalency credential recipients.

Conclusion

This study provided critical evidence that not only do adults with a GED/high school equivalency credential show higher levels of health literacy than adults with less than or some high school across many demographic backgrounds, but also that their levels of health literacy are generally comparable to those of high school graduates across many demographic backgrounds. This study also identified specific populations with lower health literacy levels so that adult education entities and policy makers can target these groups with more support, funding, and better programs to improve their health literacy.

References

Baker, D. W., Parker, R. M., Williams, M. V., & Clark, W. S. (1998). Health literacy and the risk of hospitalization. *Journal of General Internal Medicine, 19*(3), 215–220.

Golbeck, A. L., Ahlers-Schmidt, C. R., & Paschal, A. M. (2005). Health literacy and adult basic education assessment. *Adult Basic Education, 15*(3), 151–168.

Gordon, M. M., Hampson, R., Capell, H. A., & Madhok, R. (2002). Illiteracy in rheumatoid arthritis patients as determined by the rapid estimate of adult literacy in medicine (REALM) score. *Rheumatology*, 41(7), 750–754.

Hsu, Y. C., & George-Ezzelle, E. (2007, April). *The literacy of U.S. adults with GED credentials 2003 NAAL and 1992 NALS*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Kutner, M., Greenberg, E., & Baer, J. (2005). *A first look at the literacy of America's adults in the 21st century* (NCES 2006-470). U.S. Department of Education, National Center for Education Statistics, Washington, D.C.: U.S. Government Printing Office.

Kutner, M., Greenberg, E., Jin, Y., & Paulsen, C. (2006). *The health literacy of America's adults: Results from the 2003 National Assessment of Adult Literacy* (NCES 2006-483). U.S. Department of Education, National Center for Education Statistics, Washington, D.C.: U.S. Government Printing Office.

National Center for Education Statistics. Retrieved May 10, 2007 from http://nces.ed.gov/naal

Nielsen-Bohlman, L., Panzer, A.M., & Kindig, D.A. (2004). *Health literacy: A prescription to end confusion.* Washington, DC: The National Academies Press.

Office of Vocational and Adult Education. Retrieved May 10, 2007 from http://www.ed.gov/about/offices/list/ovae/pi/AdultEd/index.html

Rudd, R., Kirsch, I., & Yamamoto, K. (2004). *Literacy and health in America*. Princeton, NJ: Educational Testing Service.

U.S. Department of Health and Human Services. (2000). *Healthy people 2010* (2nd ed., Vols. 1–2). Washington, DC: U.S. Government Printing Office.

White, S., & Dillow, S. (2005). *Key concepts and features of the 2003 National Assessment of Adult Literacy* (NCES 2006-471). U.S. Department of Education, National Center for Education Statistics, Washington, D.C.: U.S. Government Printing Office.

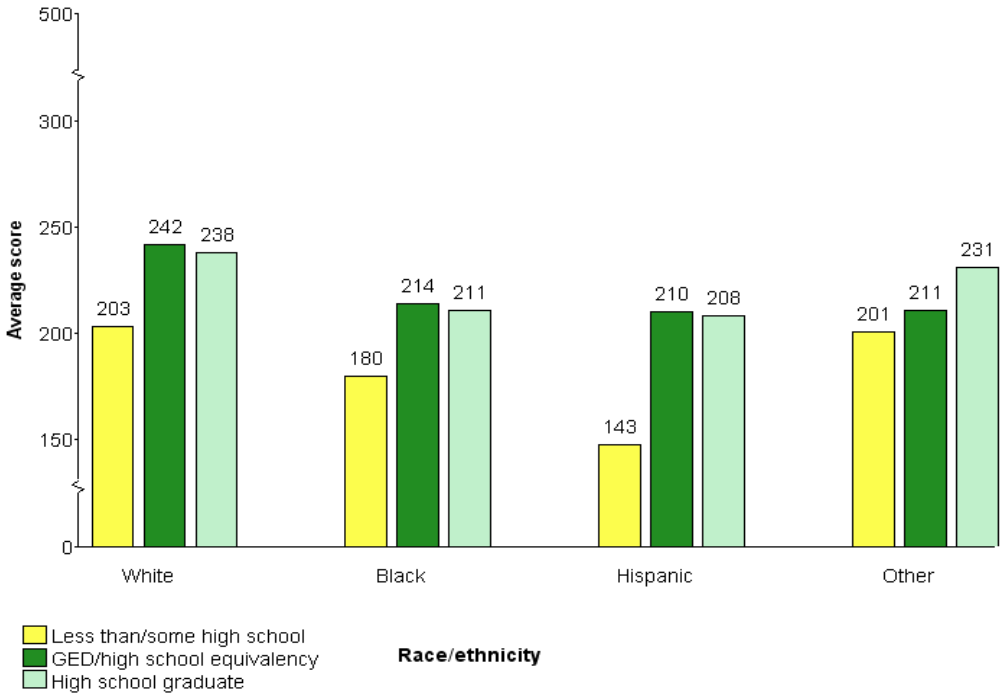

Figure 1. Average health literacy scores of adults, by educational attainment and race/ethnicity: 2003 National Assessment of Adult Literacy.

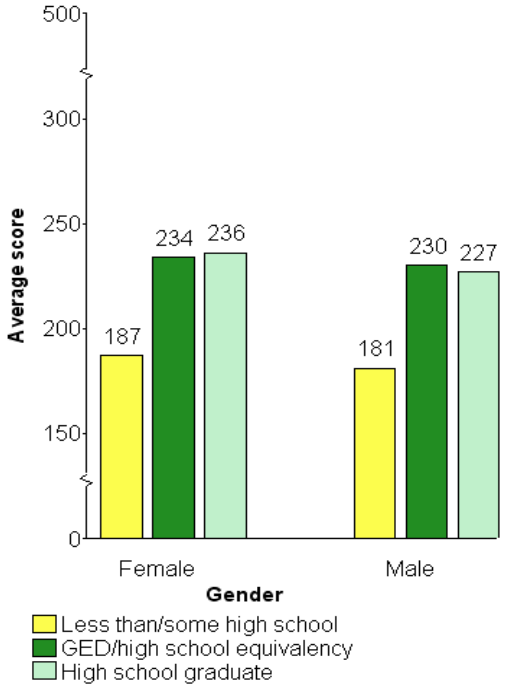

Figure 2. Average health literacy scores of adults, by educational attainment and gender: 2003 National Assessment of Adult Literacy.

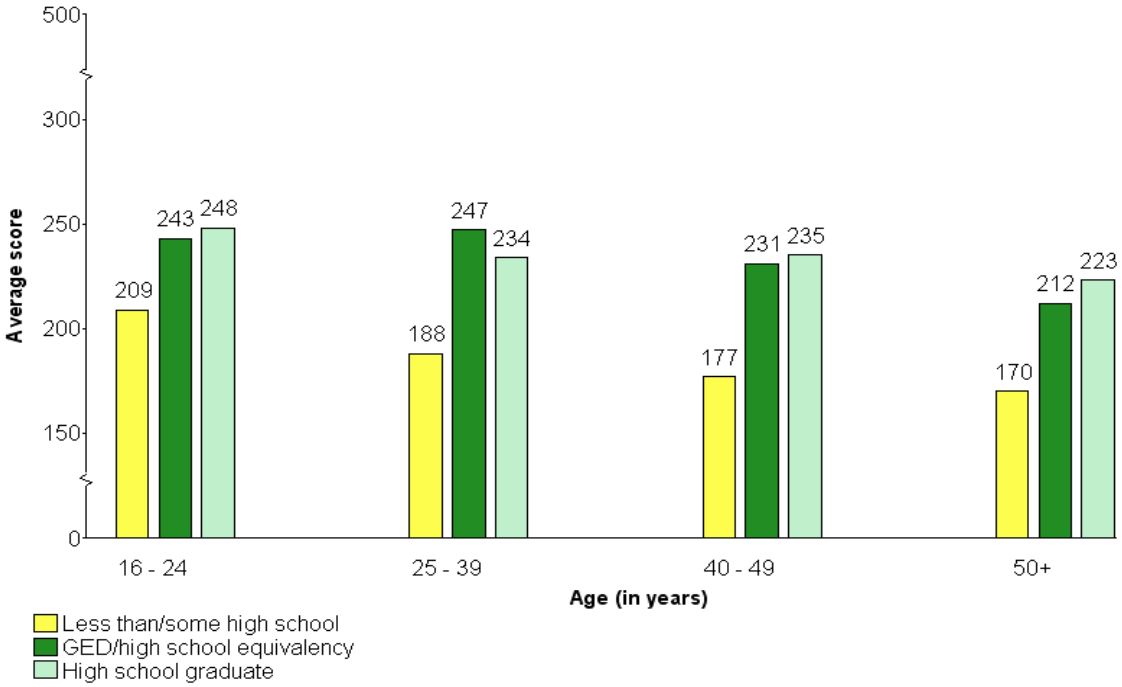

Figure 3. Average health literacy scores of adults, by educational attainment and age: 2003 National Assessment of Adult Literacy.

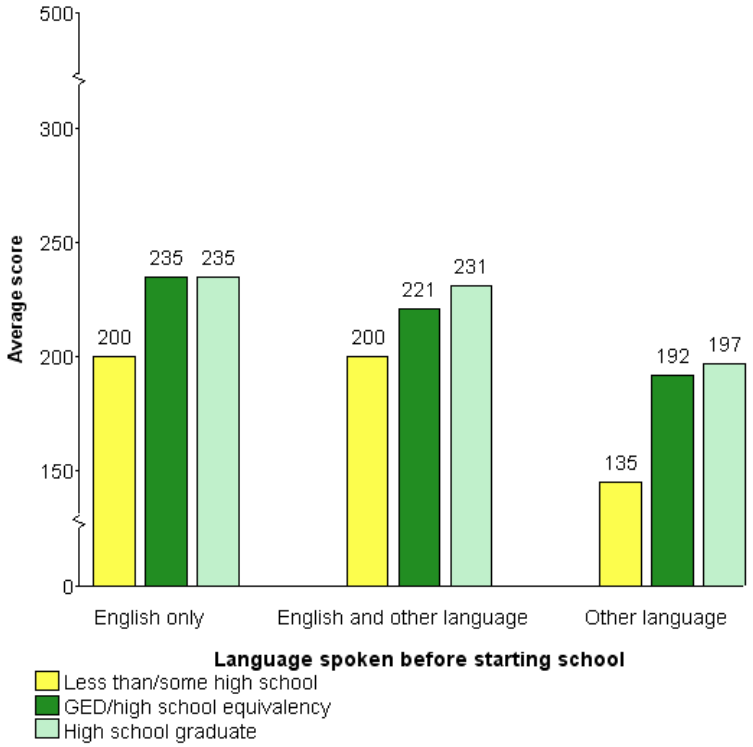

Figure 4. Average health literacy scores of adults, by educational attainment and language spoken before starting school: 2003 National Assessment of Adult Literacy.

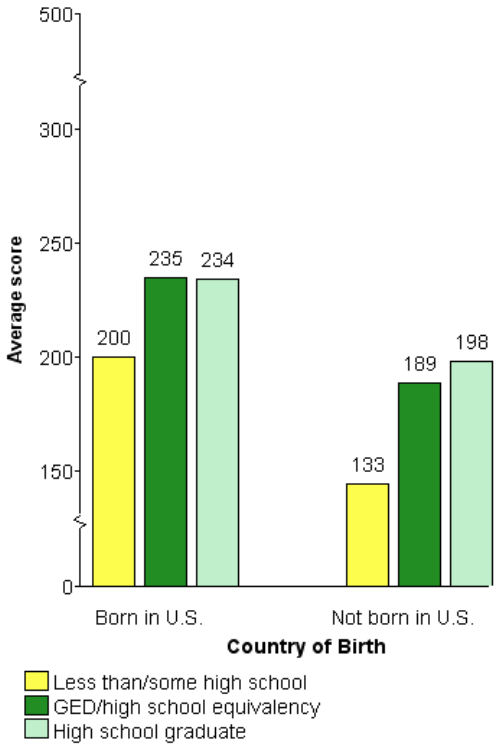

Figure 5. Average health literacy scores of adults, by educational attainment and country of birth: 2003 National Assessment of Adult Literacy.

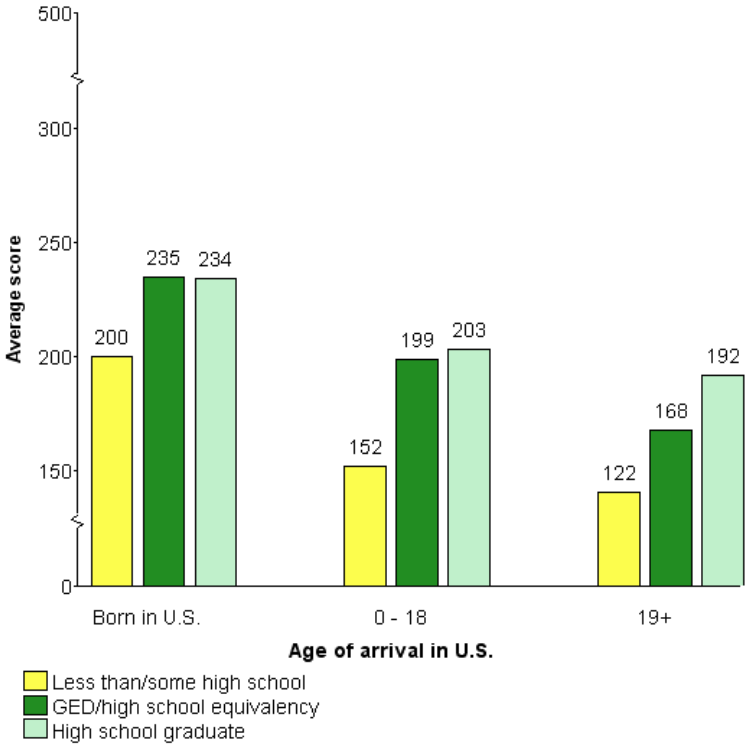

Figure 6. Average health literacy scores of adults, by educational attainment and age of arrival in United States: 2003 National Assessment of Adult Literacy.

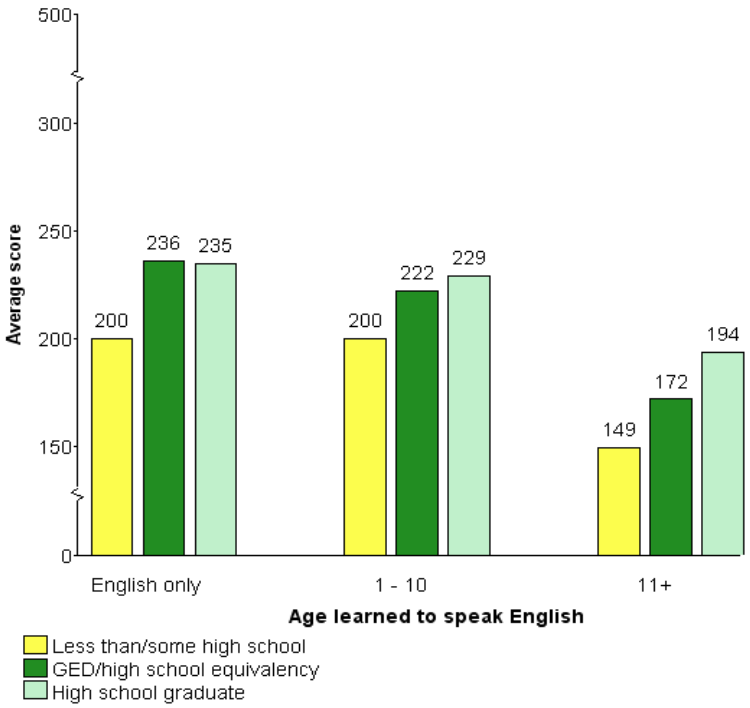

Figure 7. Average health literacy scores of adults, by educational attainment and age learned to speak English: 2003 National Assessment of Adult Literacy.

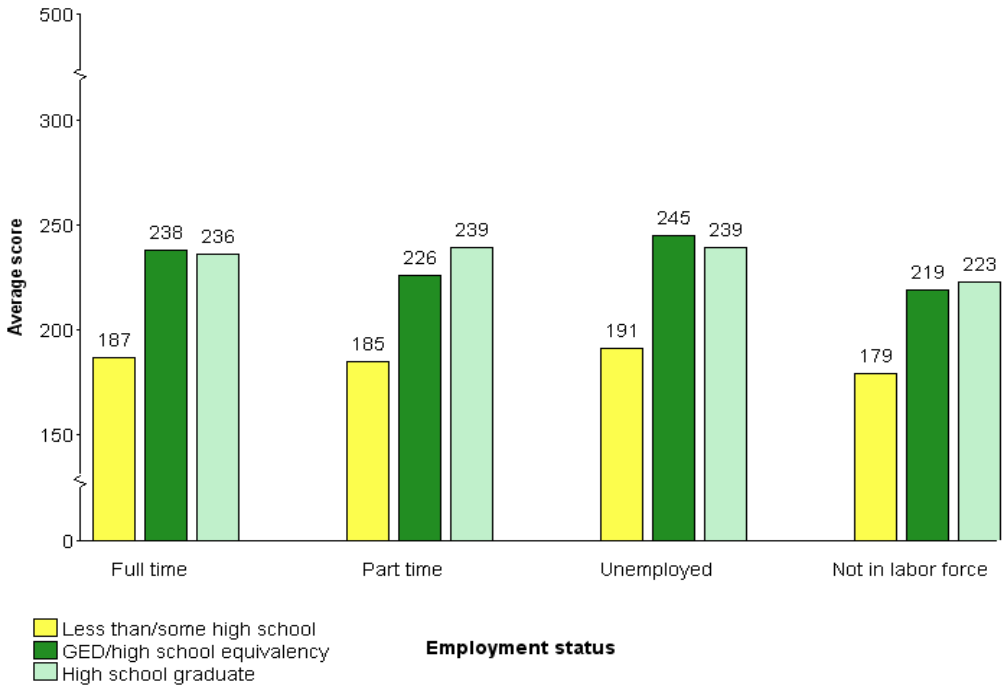

Figure 8. Average health literacy scores of adults, by educational attainment and employment status: 2003 National Assessment of Adult Literacy.

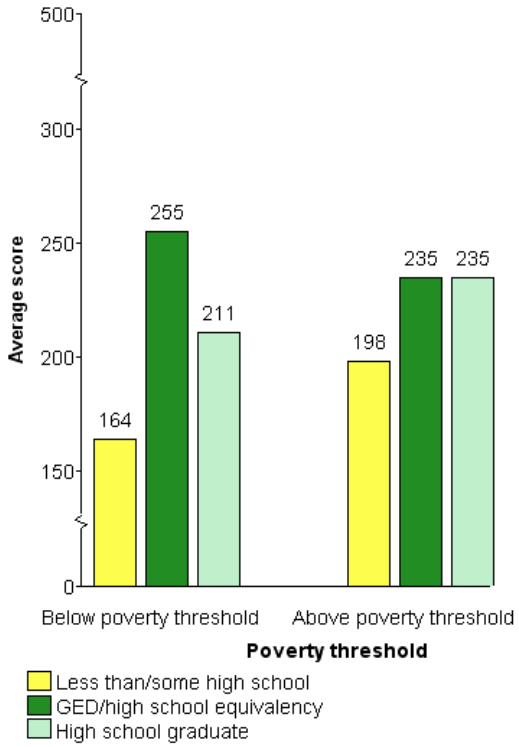

Figure 9. Average health literacy scores of adults, by educational attainment and poverty threshold: 2003 National Assessment of Adult Literacy.

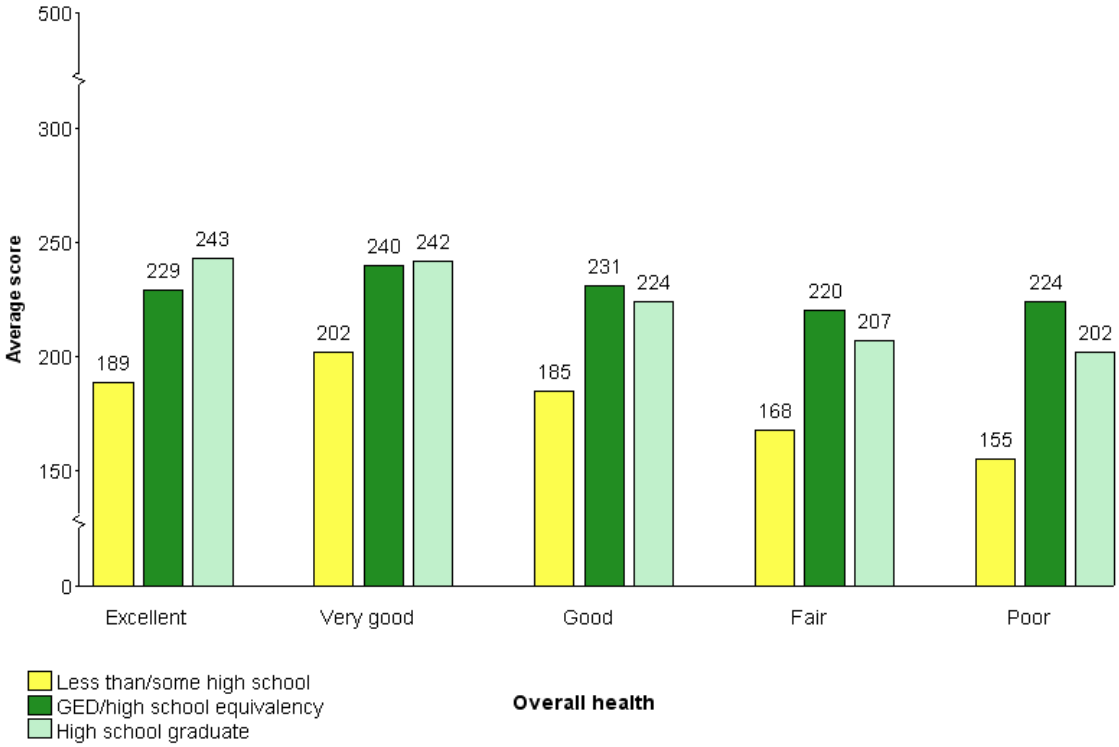

Figure 10. Average health literacy scores of adults, by educational attainment and overall health: 2003 National Assessment of Adult Literacy.

Table 1

Average health literacy scores of adults across three levels of educational attainment, by various demographic characteristics: 2003 National Assessment of Adult Literacy

		Less than HS		GED		HS		GED vs. Less than HS		HS vs. GED	
		Mean	SE	Mean	SE	Mean	SE	Diff	*t*	Diff	*t*
Race/ethnicity											
	White	203	2.9	242	3.9	238	2.0	38	7.77*	4	-0.81
	Black	180	4.1	214	5.2	211	2.7	34	5.17*	3	-0.44
	Hispanic	143	4.3	210	7.8	208	4.4	67	7.48 *	2	-0.21
	Other	201	11.9	211	9.0	231	9.2	11	0.71	20	1.55
Gender											
	Female	187	3.0	234	3.8	236	2.1	47	9.81*	2	0.48
	Male	181	2.9	230	3.7	227	2.6	49	10.35*	3	-0.58
Age											
	16–24	209	3.9	243	9.3	248	4.6	34	3.32*	5	0.47
	25–39	188	4.5	247	5.4	234	2.7	59	8.37*	13	-2.16*
	40–49	177	4.7	231	5.0	235	3.3	54	7.79*	4	0.62
	50+	170	3.6	212	4.2	223	2.1	43	7.76*	11	2.42*
Language spoken before starting school											
	English only	200	2.4	235	2.7	235	1.8	36	9.82*	0	-0.09
	English and other language	200	6.7	221	11.1	231	5.2	21	1.65	10	0.78
	Other	135	4.6	192	13.0	197	5.0	56	4.07*	6	0.41
Country of birth											
	Born in U.S.	200	2.3	235	2.9	234	1.8	35	9.51*	1	0.17
	Not born in U.S.	133	4.7	189	10.6	198	6.0	56	4.77*	9	0.74
Age of arrival in United States											
	Born in U.S.	200	2.3	235	2.9	234	1.8	35	9.51*	1	-0.17
	0–18 years	152	6.1	199	12.7	203	7.6	47	3.31*	5	0.31
	19 years and older	122	5.3	168	15.4	192	9.5	46	2.83*	24	1.32
Age learned to speak English											
	English only	200	2.4	236	3.0	235	1.9	36	9.41*	1	-0.32
	1–10 years	200	4.9	222	8.3	229	3.9	22	2.31*	7	0.77
	11+ years	149	3.4	172	16.0	194	7.6	23	1.41	22	1.26
Employment status											
	Full time	187	4.6	238	4.8	236	2.6	50	7.56*	2	-0.33
	Part time	185	5.1	226	8.4	239	5.1	42	4.21*	12	1.26
	Unemployed	191	6.0	245	11.7	239	6.1	54	4.12*	6	-0.45
	Not in labor force	179	3.9	219	5.0	223	2.3	40	6.27*	4	0.66
Poverty threshold											
	Below	164	4.0	225	5.8	211	3.3	61	8.66*	14	-2.09*
	At or above	198	2.7	235	4.1	235	1.9	36	7.45*	1	0.15
Overall health											
	Excellent	189	3.6	229	9.4	243	4.2	40	3.96*	14	1.34
	Very good	202	3.4	240	4.9	242	2.7	38	6.40*	2	0.32
	Good	185	3.9	231	4.5	224	2.7	47	7.80*	7	-1.31
	Fair	168	4.3	220	7.3	207	3.8	52	6.13*	13	-1.54
	Poor	155	5.6	224	12.3	202	6.9	68	5.08*	22	-1.54

* $p < .05$; SE=Standard Error.

GENERAL EDUCATIONAL DEVELOPMENT TESTING SERVICE
A PROGRAM OF THE AMERICAN COUNCIL ON EDUCATION

One Dupont Circle NW, Suite 250
Washington, DC 20036-1163
(202) 939-9490
Fax: (202) 659-8875
www.GEDtest.org