

What Are The Top-Circulating Magazines in the United States Telling Older Adults About Cognitive Health?

Anna E. Mathews, PhD, MS, Sarah B. Laditka, PhD,
James N. Laditka, DA, PhD, and Daniela B. Friedman, PhD

There is growing evidence that healthy behaviors may promote cognitive health. The behaviors include physical activity, heart-healthy diets, and social engagement. Popular print media helps disseminate health information. This study examines the content focused on cognitive health in 5 top-circulating magazines marketed to older people in the United States. All pages (29 881 pages) of each magazine published in 2006 and 2007 were searched. There were 84 articles on cognitive health. Few were by health or science writers. Of the 58 articles on prevention, the contents focused primarily on diet and multiple behaviors, with less on

physical activity or social engagement. Less than 20% provided resources to help readers obtain further information. Articles focused on physical activity, with information directing readers to credible resources, and by writers with health or science backgrounds, could enhance the quality of cognitive health communication in popular media.

Keywords: Alzheimer's disease; cognitive health; dementia; health communication; health behaviors; popular media

Adults are concerned about maintaining cognitive health. In a recent nationally representative survey in the United States, nearly 27% of adults reported being concerned about developing Alzheimer's disease.¹ These concerns are understandable, as cognitive decline is a leading cause of disability.² The prevalence of cognitive problems increases dramatically with age,³ making this issue particularly important for older adults and baby boomers. There is growing evidence that physical activity may reduce risks of developing problems with cognitive health.⁴⁻⁸ Research also suggests that healthy eating and social engagement may promote cognitive health.^{7,9} This evidence provides new opportunities to promote cognitive health.

From the Department of Health Promotion, Education, and Behavior, Arnold School of Public Health, University of South Carolina, Columbia, South Carolina (AEM, DBF); and Department of Public Health Sciences, University of North Carolina, Charlotte, North Carolina (SBL, JNL).

The authors declare no conflicts of interest.

Address correspondence to: Anna E. Mathews, PhD, Department of Health and Exercise Science, Furman University, 3300 Poinsett Highway, Greenville, SC 29613; e-mail: AnnaEMathews@gmail.com.

The Centers for Disease Control and Prevention (CDC) and the Alzheimer's Association recently launched a National Public Health Action Plan to Promote and Protect Brain Health. National experts who participated in this initiative concluded that an adequate science base exists to support public health interventions to promote cognitive health.^{7,9} As a part of this action plan, the National Public Health Road Map to Maintaining Cognitive Health¹⁰ calls for research to "determine how diverse audiences think about cognitive health and its associations with lifestyle factors."¹⁰ In response, researchers from 9 US universities participating in the Healthy Brain Study recently conducted formative research with more than 50 focus groups of diverse older adults, to inform the development of communications about cognitive health.⁹⁻¹⁶ Findings from this research emphasize that being active physically and mentally, and being socially involved, play central roles in public perceptions about aging well.¹¹ Results also suggest that many older adults are concerned about confusing and contradictory cognitive health messages that they receive from the popular media.¹³ Our study contributes to this initiative by examining cognitive health content in top-circulating popular

magazines in the United States targeted exclusively or largely toward older adults.

Communication linking health behaviors to cognitive health can increase awareness of health risks and provide individuals with knowledge and motivation to reduce those risks, and thus positively affect public health.¹⁷ Such communication may also influence policy makers to support community interventions designed to promote healthy behaviors. A number of studies have found that people search for health information in the media more often than they do from health care professionals.¹⁸ At the same time, research also suggests that health resources described in the popular media can be inaccurate and unreliable.¹⁹

Little published research has examined ways that cognitive impairment is presented in the print media. Using a qualitative approach, Clarke²⁰ examined the 20 highest-circulation mass print English-language magazines published in 1991, 1996, and 2001 in the United States and Canada. Twenty-five articles were identified, which focused on the latter stages of Alzheimer's disease, with minimal focus on prevention or risk reduction. This result is not surprising, because the substantial evidence linking health behaviors with cognitive health began to accumulate only in recent years.⁹

This study extends recent research that examined cognitive health content in 22 widely circulating popular magazines in the United States²¹ In this study, we extend the research by conducting an in-depth analysis of the 5 top-circulating magazines in which the readership is exclusively or largely older adults, defined as age ≥ 50 . The age ≥ 50 eligibility criterion is consistent with common approaches to defining the older adult population when the context of the definition is health promotion or disease prevention.²² Every page of every issue of American Association of Retired Persons Magazine (AARP: The Magazine), Time, Newsweek, US News & World Report, and Reader's Digest published in 2006 and 2007 was examined for articles on cognitive health. Given their extremely large readership, and that these magazines are targeted exclusively or largely toward older adults, these popular publications can play an important role in promoting cognitive health. Further, research has found that communication strategies focused on specific audience characteristics, such as age, have the potential to positively influence health knowledge, beliefs, attitudes, and behaviors.²³ Focusing on cognitive health among top-circulating magazines targeting older adults, the study objectives are to describe the frequency of

coverage, narrative and illustrative content, sources of information, and resources provided for additional information. As the top-circulating popular magazine in the world, and a communication of an organization dedicated to the well-being of its members, AARP: The Magazine has a unique opportunity to provide information to older adults and their families about ways to maintain and promote cognitive health. Thus, we summarize and analyze all cognitive health articles published in AARP: The Magazine in 2006 and 2007 with particular focus.

Methods

Publication Inclusion Criteria

The top-circulating magazines in the United States were selected from AdvertisingAge Magazine Circulation Rankings Index (http://adage.com/datacenter/article?article_id=106355). Readership and age information was obtained from Mediamark Research & Intelligence (<http://www.mediamark.com>). Mediamark calculates readership statistics by multiplying the magazine's total circulation by the average number of people who are estimated to read each copy.²⁴ Inclusion criteria were a print magazine; published and distributed in the United States; in existence and available in 2006 and 2007; written in English; produced at least 4 times annually; with a readership consisting exclusively or largely of adults ages ≥ 50 ; and with circulation rates available through AdvertisingAge. The years selected for this study provide a baseline for further research following the 2007 publication of the National Public Health Action Plan to Promote and Protect Brain Health.¹⁰

Article Selection Criteria, Article Characteristics Examined, and Analytical Approaches

The magazines were searched manually for all articles about cognitive health; 29 881 pages were searched. Articles were identified as "cognitive health articles" if they included the following terms: brain, cognition, cognitive health, brain health, Alzheimer's, cognitive decline, cognitive impairment, memory, mind, dementia, staying sharp, alert. The manual search was performed by 1 of the authors, with 2 additional authors also participating in the evaluation of articles. In an initial search, every article including any of the search terms, or content related to any of the search terms, was selected for

further analysis. To make a final determination about articles to be included in the study, 3 of the authors reviewed articles to determine whether they fulfilled the inclusion criteria. In the initial search, 97 articles were identified; of these, 84 fulfilled the inclusion criteria. These 84 articles were used in the data analysis.

For each article, we examined the section where the article appeared (eg, feature, health/lifestyle, science, family, entertainment); article length (eg, less than 1 page, 1 page); authorship type (eg, staff reporter, editor); article format (eg, text only, text and illustration); illustrations (content, portrayals of activity, tone); article type (eg, breaking news, promotional); article content (eg, diet, physical activity); specific cognitive health content (eg, memory, Alzheimer's disease); health focus (eg, prevention, screening); information source (eg, researchers, other professionals); first person quoted (eg, doctor, researcher, nonprofit representative, celebrity); celebrity quotes (yes/no); contact source listed (hospital, university, government, nonprofit, for-profit); and format of contact information (Web site, telephone number, address). Where the authorship type was not provided, this information was sought online, primarily using the Google search engine. An article was considered to have a particular health focus (eg, treatment) or cognitive health content (eg, Alzheimer's disease) if the focus or content area was discussed in 75% or more of the article.²⁵ The purpose of this study is to describe the content of published cognitive health articles and to relate that content as a whole to recent scientific evidence about factors that may help to promote cognitive health. Thus, as we are primarily interested to identify in general what messages the public currently receives about cognitive health, we do not present a detailed evaluation of the accuracy of information in each article.

Illustrations were evaluated to determine tone and were coded as positive (eg, image of people smiling or laughing), negative (eg, a woman with a concerned look on her face), or neutral (eg, bowl of blueberries, deck of cards, or other inanimate objects).^{19,25} The primary focus of this study was on the analysis of article content rather than illustrative material, although we also provide initial analysis of illustrations.

The number of cognitive health articles is reported. To provide a measure of the prevalence of cognitive health articles among magazines, a standardized frequency was calculated as the number of articles per 1000 pages.²⁵ For example, 9406 pages were

searched for Time magazine (56 issues published per year), whereas only 1072 pages were searched for AARP: The Magazine (6 issues per year). The standardized frequency provides a measure that can meaningfully compare the publication prevalence among magazines.

Articles were reviewed qualitatively for recurring topics and themes. To ensure consistent and accurate coding, 2 articles, with substantive content and illustrations, were coded independently by all authors. All authors discussed coding as a group until they were in complete agreement. In addition, all authors independently reviewed all 9 articles published in AARP: The Magazine, and reached consensus about content, illustrations, and other characteristics. We provide results of that more focused analysis of AARP: The Magazine owing to its status as the world's top circulating magazine, and also because it represents the voice of a large nonprofit organization whose mission includes enhancing its members' quality of life. Thus, it might be expected that the cognitive health content of this magazine, in particular, would align closely with current scientific evidence about associations between behaviors and cognitive health.

Results

General Descriptive Findings

Table 1 shows readership characteristics for the top-circulating magazines included in the study. The median readership age was highest for AARP: The Magazine (61.6), followed by Reader's Digest (52.0); the median age of readers for Time, Newsweek, and US News & World Report was nearly 47. For AARP: The Magazine, all readers were age ≥ 50 ; the majority of readers of Reader's Digest were age ≥ 50 ; a substantial percentage of readers for the other three magazines were age ≥ 50 , ranging from nearly 42% to 47%.

In all, 84 cognitive health articles were identified. Table 2 shows the magazines searched, by: circulation, number of annual issues, number of pages searched, number of annual cognitive health articles, number of articles with a cognitive health focus per 1000 pages, and number of articles with a cognitive health focus with illustrations per 1000 pages. AARP: The Magazine had the most cognitive health articles per 1000 pages (8.40) followed by Reader's Digest (3.82), US News & World Report (2.71), Time (2.45), and Newsweek (1.93). Of the articles,

Table 1. Cognitive Health in Top-Circulating Popular Magazines, 2006 and 2007: Readership Statistics

Publication	Readership Statistics		
	Median Age (years)	Readers 50+ (n)	Readers 50+ (%)
AARP: The Magazine ^a	61.6	34 755 000	100.0%
Time ^b	46.4	8 658 000	41.6%
Newsweek ^b	46.9	8 000 000	43.2%
US News & World Report ^b	46.9	4 786 000	47.0%
Reader's Digest ^b	52.0	19 000 000	55.0%

^a Source: AARP, 2008.

^b Source: Media Mark Research & Intelligence.

Table 2. Cognitive Health in Top-Circulating Popular Magazines, 2006 and 2007: Study Sample and Quantitative Results

Publication	Circulation ^a	Annual Issues	Pages Searched	Number of Articles			
				2006	2007	Per 1000 Pages	Illustrated, Per 1000 Pages
AARP: The Magazine	23 434 052	6	1 072	6	3	8.40	7.46
Time	4 066 545	56	9 406	16	7	2.45	2.23
Newsweek	3 118 432	53	7 776	7	8	1.93	1.93
US News & World Report	2 036 261	52	6 654	10	8	2.71	2.55
Reader's Digest	10 094 281	12	4 973	8	11	3.82	3.02
Total		179	29 881	47	37		

^a Source: AdvertisingAge, December 2006.

31% were longer features (greater than 2 pages); 45.2% were 1 to 2 pages; 23.8% were less than 1 page (results not shown in tables).

Article Placement and Authorship

Cognitive health articles were featured in a variety of publication sections, including health/lifestyle sections, general sections, special sections devoted to brain health, editorials, family sections, science sections, and entertainment sections. Most articles were featured in health/lifestyle sections (50%) or special sections devoted to brain health (23.8%). Although every article listed an author's name or initials, most (79.8%) did not specify authorship type. When authorship type was not specified, the authors' names were searched using Google. The findings from this search were added to the authorship information already provided in the articles. The results of both the manual examination of the articles and the Internet search revealed that the majority of articles were written by freelance writers (20.2%), columnists (15.5%), editors (11.9%), and senior writers (9.5%). Authorship type remained unknown for 19% of the articles (results not shown in tables or figure).

Sources Cited, Celebrity Quotes, and Contact Information Provided

The main sources cited for article content were colleges/research institutions (35.7%), doctors (20.2%), and personal stories from lay persons (11.9%). Overall, half of articles included evidence from scientific studies; however articles published in AARP: The Magazine included evidence from scientific studies more often than articles in the other 4 magazines (77.8% vs 46.7%). Nearly 62% of articles contained quotes. The first quote in articles most often came from researchers (26.2%), lay persons (14.3%), celebrities (6.0%), doctors (7.1%), and other professionals such as registered dietitians (6.0%). Celebrity quotes were featured in 9.5% of articles. Only 19% of articles provided contact information for additional resources. Of those containing contact information, all provided Web site addresses; most were for commercial/for-profit organizations (64.7%); 18.7% were for colleges or universities; 12.5% were for nonprofit organizations (results not shown in tables).

Text and Illustrative Content

Figure 1 displays the specific areas of content as a percentage of the cognitive health articles for the

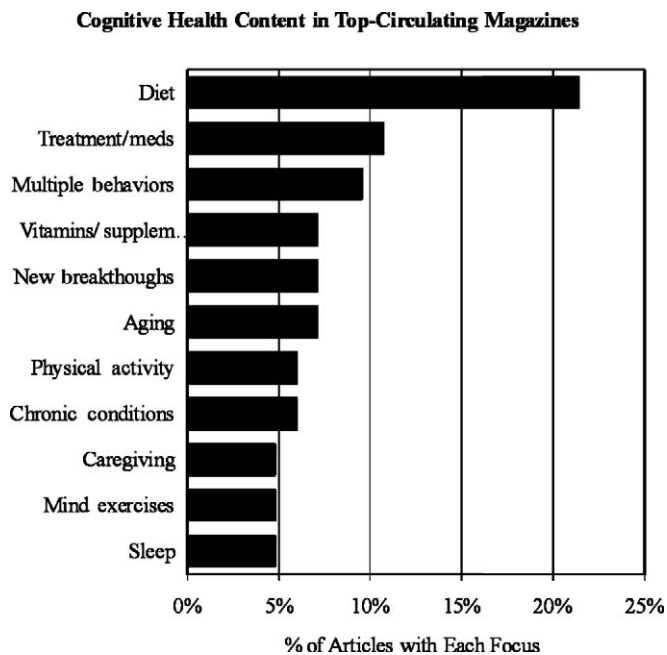


Figure 1. Content of 84 top-circulating magazine articles about cognitive health (2006-2007).

most frequently occurring content areas; because less frequently occurring content areas are not shown, percentages do not total 100. The most frequent content areas were on diet alone (21.4%), treatment/medications (10.7%), and multiple behaviors (9.5%), such as diet and physical activity.

Articles Focused on Diet

Articles focused on diet mentioned a wide variety of foods and beverages, including red wine, coffee, fish, flax seed, blueberries, kale, chocolate, pomegranate juice, walnuts, and canola oil. Thirty-nine percent of articles did not mention any research to support the claimed dietary benefits. About one third of the articles mentioned “research studies” without providing any details about specific studies. About 28% of articles explained studies to support the health benefits described, providing content such as the amount of the food consumed or the population used for the study. Most of the articles included an illustration of the food or beverages discussed in the article.

Articles Focused on Multiple Behaviors

These articles most often discussed diet, physical activity (eg, resistance training, walking, biking,

swimming, aerobics, and jogging), and cognitive activity (eg, brain teasers and crossword puzzles). While physical activity and cognitive activity were rarely the sole focus of cognitive health articles (See Figure 1), physical activity and cognitive activity were mentioned in 87.5% and 62.5% of articles on multiple behaviors, respectively. The articles in this content category presented lists or summaries of the multiple behaviors as they relate to cognitive health. About half of the articles described evidence to support the health benefits discussed. Social engagement, which was not the main focus of any of the cognitive health articles, was discussed in only about 14% of articles on multiple behaviors. Additional behaviors discussed included painting, scheduling routines, and playing musical instruments.

Articles Focused on Medical or Alternative Treatments or Medications

Among the 9 articles in this category, 6 described medical or alternative treatments; 4 described medications to treat and prevent cognitive decline, memory loss, or Alzheimer’s disease. For example, 1 article mentioned that aspirin may help to ward off memory loss; others discussed several cognitive health drugs that are undergoing testing. Drugs already on the market were mentioned; however, the articles mentioned that these drugs have shown only minimal effects on healthy brains. Alternative treatments described included marijuana, electrical implants, stem cells, and working with plants for therapy. For example, an article in *Time* magazine mentioned how delta-9-tetrahydrocannabinol (THC), a chemical in marijuana, may help slow the progression of Alzheimer’s disease and may block the formation of plaques in the brain.²⁶

Aspects of Cognitive Health Described in the Media

In all, 55 articles focused largely on cognitive health; 29 articles only briefly mentioned cognitive health (eg 1 or 2 sentences about cognitive health in a larger article not focused on cognitive health). Among the articles that focused on cognitive health, the content most often addressed keeping sharp or alert (45.5%), Alzheimer’s disease (36.4%), and memory (10.9%).

Articles that mentioned general alertness or staying sharp provided content about improving cognitive health, such as increasing alertness and focus, and improving intelligence or cognitive ability, rather

than focusing on brain pathologies such as Alzheimer's disease. These articles described a variety of factors related to general alertness/sharpness, including physical activity, diet, cognitive activity, social activity, meditation, sleep, and singing. Most of the illustrations included in these articles were neutral to positive in tone and portrayed behaviors or objects being described in the article, eg, a glass of wine, a brain, or a man meditating.

The 20 articles that focused on Alzheimer's disease mentioned how eating healthy foods, engaging in physical activity, and not smoking may help prevent Alzheimer's disease. Most illustrations were neutral to positive in tone, showing behaviors described, such as a woman lifting weights. Four articles also mentioned how other disease conditions, such as diabetes, high blood pressure, and high cholesterol increase one's risk of developing Alzheimer's disease.

Articles focusing on memory specifically mentioned "memory" or "remembering." These articles were similar to articles focusing on general alertness/sharpness as these articles also listed a variety of behaviors related to maintaining memory, including physical activity, diet, relaxation, cognitive activity, and getting enough sleep. Illustrations were neutral to positive in tone, showing pictures related to health behaviors discussed in the article. For example, illustrations included a woman holding blueberries, and 2 older women playing video games.

Cognitive Health Articles Published in AARP: The Magazine, 2006 and 2007

Nine cognitive health articles were published in AARP: The Magazine in 2006 and 2007. Table 3 reports selected characteristics of each article, including the article type, health focus, illustrative content and tone, information source, experts quoted, and contact information and type, together with a brief synopsis of the article. These articles illustrate the range of content and areas of focus. Of the articles, 2 focused exclusively on physical activity; 2 on diet alone; and another on diet, physical activity, and cognitive activity. One article described the needs of caregivers in general, and those who cared for a family member with Alzheimer's disease. One article spotlighted an actor who served as a spokesperson for the Alzheimer's Association. One article emphasized the importance of humor, including the benefits of relaxation and reducing stress. Eight of the articles incorporated information from experts, including researchers and physicians. Spokespeople included those from federal or non-

profit agencies, including the National Family Caregivers Association, the Alzheimer's Association, the American Dietetic Association, and/or the National Institute on Aging. Only 2 articles included contact information for more resources.

Discussion

There is growing evidence that adopting healthy behaviors may notably promote cognitive health. Adults are concerned about their ability to maintain cognitive health as they age.¹ Concerns about promoting and maintaining cognitive function will increase as baby boomers age. Ours is the first study to focus on cognitive health content in top-circulating popular magazines targeted exclusively or largely to older people in the United States.

The majority of articles focused on diet and multiple behaviors; the latter included discussion of physical activity. A relatively smaller percentage of all articles focused on physical activity. Physical activity was the focus of only about 5% of the articles and was mentioned in only about 18.5%. These percentages suggest that popular magazines have an opportunity to enhance information about evidence linking physical activity with cognitive health.⁴⁻⁸ Of articles published in AARP: The Magazine, a notably higher percentage focused solely on physical activity compared with those published in the other 4 magazines. Articles published in AARP: The Magazine were also more likely to include evidence from scientific studies than articles published in the other 4 magazines. The cognitive health content of articles in AARP: The Magazine was generally consistent with the growing science base, which suggests that regular physical activity may help maintain cognitive function.^{4-6,8} Collectively, the findings for all magazines studied suggest that cognitive health content was consistent with evidence that adopting a heart-healthy diet may promote cognitive health.^{36,37}

Although much of the content in articles discussing cognitive health was consistent with findings increasingly supported by scientific studies, some of the content described recommendations that are not evidence-based or for which the evidence is mixed, such as use of vitamin E,³⁸ ginkgo biloba,³⁹ or folic acid.⁴⁰ Messages with suggestions that are not supported by science are likely to lead to perceptions of receiving confusing and contradictory messages about cognitive health.^{13,14}

A small percentage of articles were authored by health or science writers. Less than 20% of articles

Table 3. Qualitative Summary of Cognitive Health Articles Published in AARP: The Magazine, 2006-2007 (n = 9)

Article title	Health Focus Content focus	Article Summary	Illustrative Content & Tone	Information sources	Experts quoted
Section Length					Contact information
• 9 Healing Foods ²⁷	• Prevention • Diet and staying sharp	• Foods described as “disease fighting” included whole grains, cherries, yogurt, salmon, cabbage, walnuts, blueberries, beans, tomatoes; each food type described in a 125-150 word paragraph	• Pictures of the foods described • Neutral and positive tones	• Federal research, nonprofit, university, journal, hospital, doctor, book • Quotes from physicians and spokesperson from American Dietetics Association • AARP Web site for more recipes	
• Editor		• Health benefit and studies providing evidence included for each food; eg, eating blueberries may help lessen the damage from strokes and may reduce the effects of Alzheimer’s disease or dementia			
• Health section					
• Longer feature					
• Living Longer Diet ²⁸	• Prevention • Diet and Alzheimer’s disease	• Focus on dietary factors that may increase longevity; separating diet myths from facts	• Pictures of foods described; photo of an African American woman holding blueberries	• University and Federal research; scientific journals cited, eg, Journal of the American Medical Association	
• Health writer		• Antioxidant rich foods, such as blueberries and kale will clear arteries, help prevent the buildup of Alzheimer’s plaque in the brain, and protect the brain from free radical damage	• Neutral and positive tone	• Quotes from university researchers and National Institute on Aging • No contact information	
• Special section on living longer		• Includes two brief sidebar articles: “Red wine and chocolate: the reality;” and “5 foods that can add years to your life.”			
• Longer feature					
• Plant Power ²⁹	• Alternative treatment • Alzheimer’s disease	• Describes the healing and therapeutic power of tending a garden	• Pictures of plants • Neutral and positive tone	• Nonprofit, university, therapist • Quotes from university researcher; an occupational therapist; a nonprofit spokesperson • No contact information	
• Freelance writer		• Among other benefits, briefly mentions how plants have also been used to treat Alzheimer’s patients			
• Health section					
• Longer feature					
• David Hyde Pierce ³⁰	• Alzheimer’s disease • Supporting caregivers	• Article highlights people’s accomplishments; spotlights David Hyde Pierce, an actor, who has been a spokesperson for the Alzheimer’s Association since 1994	• Photo of Pierce, holding sculpture of a head, with parts of the brain marked, titled “Phrenology”	• No information sources • Quotes from David Hyde Pierce • AARP Web site, included a talk by Pierce	
• Freelance writer		• Pierce emphasizes the need to support those caring for people with Alzheimer’s disease			
• Feature article					
• Short feature					
• Funny Business ³¹	• Quality of Life • Humor and cognitive function	• Results of a research study indicating decline in cognitive function affects individuals’ ability to understand humor	• Photo of Winston Churchill	• University research study • Gerontologist quoted • No contact information	
• Authorship type not provided		• Gerontologist counters study’s conclusions, saying many who experience age-related cognitive decline maintain a sense of humor			
• Brief item		• Concludes with humorous quote from Winston Churchill			

(continued)

<ul style="list-style-type: none"> • Brain Blitz³² • Freelance writer • Health • Brief item 	<ul style="list-style-type: none"> • Prevention • Multiple lifestyle behaviors 	<ul style="list-style-type: none"> • Describes four things people can do to maintain cognitive health: eating 5 small daily meals rich in omega 3 fatty acids, whole grains, and antioxidants; taking brisk walks; doing stretching and relaxation exercises to counter stress; and doing brain teasers or crossword puzzles • Based on university research study, which found persons who did these four activities showed metabolic changes in the brain area linked to working memory 	<ul style="list-style-type: none"> • No illustration 	<ul style="list-style-type: none"> • University research • Physician quoted • No contact information
<ul style="list-style-type: none"> • 9 Reasons to Start a Fitness Plan³³ • Editor • Health • Longer feature 	<ul style="list-style-type: none"> • Prevention • Physical activity and improved memory 	<ul style="list-style-type: none"> • Describes 9 benefits of physical activity, eg, live longer, improve memory; each benefit described in 125-150 word segment • Segment on memory says that short-term memory decreases with age, but exercise may help 	<ul style="list-style-type: none"> • Photos of women and men exercising, eg, lifting weights, swimming • Positive tone 	<ul style="list-style-type: none"> • University research, scientific journal articles • Researchers and physicians quoted • No contact information
<ul style="list-style-type: none"> • Living Longer Exercise³⁴ • Freelance writer • Special section on living longer • Longer feature 	<ul style="list-style-type: none"> • Prevention • Physical activity and chronic conditions, including Alzheimer's disease 	<ul style="list-style-type: none"> • Focus is that physical activity increases longevity and reduces the risk of Alzheimer's disease • Provides examples from a number of scientific studies of the benefits of physical activity • Includes a side-bar article with 8 strength-training exercises 	<ul style="list-style-type: none"> • Photo of older man's arm while lifting weights • Diagram of 8 strength-training exercises • Neutral and positive tone 	<ul style="list-style-type: none"> • University, nonprofit, federal research, scientific journals, physicians, books • Physicians and fitness experts and directors quoted • No contact information
<ul style="list-style-type: none"> • Caring for the Caregiver³⁵ • Freelance writer • Feature article • Longer feature 	<ul style="list-style-type: none"> • Quality of life • Caregiving, Alzheimer's disease 	<ul style="list-style-type: none"> • Describes needs of caregivers; stresses caregivers' experiences; how to ease caregiver stress • Explains that people who provide care to those with Alzheimer's disease often feel profound sadness and rage • Includes a side-bar "9 ways to make it better," with suggestions for caregivers 	<ul style="list-style-type: none"> • Photos of caregivers and care recipients • Positive tone 	<ul style="list-style-type: none"> • Personal stories, university research, nonprofit, physicians, books • Quotes from caregivers, physicians, spokespersons from National Family Caregivers Association, Alzheimer's Association • 9 organizations, Web address, and phone number under "Getting help"

provided contact or mobilizing information for readers interested to learn more about promoting cognitive health. These results echo previous studies that have found few articles authored by health or science writers,²⁵ and little information about other available resources.⁴¹ These findings are particularly notable, given that 3 of the magazines in this study are popular news magazines, *Time*, *Newsweek*, and *US News & World Report*. A fourth magazine, *AARP: The Magazine*, is published by AARP, which focuses on advocacy for older people, and on providing members with mobilizing information.

Enhanced social environments have been linked to reduced risk of developing dementia.^{42,43} In addition, being socially involved has also been identified as playing a vital role in successful aging.^{11,44,45} The finding that no articles focused on social engagement, and that only a small proportion included any discussion of this factor, suggests an opportunity to enhance communication about the benefits of social engagement for cognitive health.

Several considerations should be weighed when evaluating the results of this study. The focus of this study was on analysis of article content rather than analysis of the illustrative material, although we also provided some initial analysis of illustrations. Almost all cognitive health articles included illustrations; thus, more detailed analysis of illustrative content of cognitive health articles is warranted. Second, we searched an extensive number of publication issues (358 issues; 179 per year for each of 2006 and 2007); however, we did not have the resources to examine a comprehensive body of print publications. Notwithstanding this consideration, given that we examined top-circulating magazines, it seems likely that the findings may generally represent cognitive health coverage in the mass print media targeted toward older people during the study period. There is increasing commercial interest to promote cognitive health. For example, large-scale advertising campaigns associating consumption of fruit beverages (eg, pomegranate juice) with cognitive health appeared in newspapers and magazines during 2008. Nonprofit organizations have also had substantial brain health promotions in recent years, including the Alzheimer's Association's *Maintain Your Brain* project and the AARP's *Staying Sharp* program. In light of these commercial and nonprofit campaigns, research in this area would benefit from including newspapers, advertising, and other forms of media, as well as radio and television. It may also be useful to examine Internet communication in this area. For example, the Google search engine lists

over a half million Web sites in response to a search for the phrase "brain health," with another 78 000 for "cognitive health."

This analysis of articles on cognitive health published in top-circulating magazines with a primary readership of older adults provides recommendations for future media communication promoting cognitive health. Additional stories focused specifically on the evidence for benefits of physical activity for cognitive health, containing appropriate mobilizing information directing people to credible information sources (eg, Alzheimer's Association, CDC), and written by writers with health or science backgrounds, could enhance the quality of cognitive health communication for older adults in the popular media. Of course, not all of those who produce such magazines will be interested to enhance the quality of their health communication. Their principle interest may be to entertain, or simply to ensure financial success. The findings of this study may be useful to those whose public communication is designed to promote health, such as *AARP: The Magazine*. They may also be useful to public health officials and nonprofit organizations interested to promote cognitive health, as they indicate areas where the public currently receives relatively little information, such as the likely role of physical activity in promoting cognitive health.

Conclusion

Print communication sources have the potential to promote cognitive health by providing evidence-based information. This study identified some communications that were consistent with the scientific evidence linking cognitive health with behavior, such as suggestions that adopting a heart-healthy diet may promote cognitive health.^{36,37} At the same time, findings highlighted opportunities to promote cognitive health that remain largely unfulfilled, including communication about likely associations between physical activity and cognitive health, and social interaction and cognitive health. Professionals in the personal health care system and in public health could use popular print communication to promote healthy behaviors. Such communication may also influence policy makers to support community interventions designed to promote healthy behaviors, such as funding for community facilities or resources that encourage physical activity. By providing evidence-based information about factors associated

with cognitive health, print communication can contribute to improved public health.

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