Disparities in the Coverage of Cancer Information in Ethnic Minority and Mainstream Mass Print Media

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Background: Significant disparities in cancer mortality exist as a function of ethnicity and race in North America. Little is known, however, about the presentation of cancer information in mass media that targets ethnic minority groups.

Objectives: 1) To evaluate the volume and type of cancer coverage and the readability of cancer articles in Canadian mainstream and ethnic minority newspapers; and 2) to compare newspaper coverage of cancer with Canadian cancer mortality.

Design: Seven mainstream and 25 ethnic minority (Jewish, First Nations, Black/Caribbean, East Indian) English-language newspapers were assessed for cancer coverage in the year 2000. Articles were analyzed by using frequencies and nonparametric tests. The total number of cancer articles (N=171) in ethnic minority papers and a random 20% from mainstream papers were also evaluated for readability level by using SMOG.

Results: There were a total of 748 cancer articles (721 mainstream; 27 ethnic). Coverage was weighted towards breast cancer (20.1% mainstream, 33.3% ethnic of cancer articles) and contained little or no coverage of prostate (7.4% mainstream, 8.6% ethnic), colorectal (3.9% mainstream, 3.7% ethnic), or lung (3.9% mainstream, 0 ethnic) cancers. The mean SMOG readability scores were Grades 12.7 and 13.2 for mainstream and ethnic papers, respectively. Readability scores differed significantly in ethnic newspapers, with the most difficult (highest readability) levels in East Indian (Grade 16.3) and the easiest (lowest readability) levels in First Nations (Grade 11.3) papers. Cancer articles were not highly culturally tailored, as measured by identification of specific ethnic minority groups within ethnic and mainstream newspapers.

Conclusions: Cancer coverage in ethnic and mainstream newspapers did not accurately reflect the leading causes of cancer death in Canada. Results also suggest the need for the collection of cancer data by ethnic minority group in Canada. Without the disaggregation of cancer statistics by ethnicity, we cannot inform high-risk subgroups of the population and appropriately tailor cancer prevention and treatment programs. (*Ethn Dis.*2005;15:332–340)

Key Words: Cancer, Ethnic Minority, Mass Media, Mortality, Readability

Introduction

Cancer is one of the leading causes of death in North America. In the year 2000, for example, there were 65,000 cancer deaths (211.8 per 100,000 population) in Canada[1] and 553,091 cancer deaths (200.9 per 100,000 population) in the United States.[2] Only cardiovascular disease accounted for more premature deaths among North Americans. Although breast and prostate cancers are the leading sex-specific incident cancers, lung cancer remains the most common cause of cancer death.

Nonetheless, the burden of premature cancer death is not uniformly distributed across ethnic and racial groups. In the United States, ethnic minorities have a high death rate from lung cancer, most notably so for African Americans (66.4/100,000), compared to White Americans (56.7/100,000). Mortality from breast (35.9/100,000) and prostate (73.0/100,000) cancers among African Americans is also considerably higher than that for White Americans.[3] Comparable statistics disaggregated by race and/or ethnicity are not available for other sovereign jurisdictions in North America (ie, Canada). The lack of ethnic-specific data for Canada is surprising given the universal healthcare system; moreover, collecting ethnic-specific cancer rates would allow health promotion workers to track subgroups at high risk for cancer, tailor prevention programs, and use limited public healthcare resources more effectively.

Higher mortality from cancer in ethnic minority populations is often due to low screening rates. Thus, although the incidence of cancer is lower among Hispanic populations, mortality is high due to late-stage diagnoses.[4] Cervical cancer screening rates were lower for Chinese women in British Columbia than the provincial average despite the increased cervical cancer risk for this subpopulation group.[5] Lower cervical cancer screening rates were also reported for First Nations women in Canada; after controlling for age, 43% of Aboriginal women in Manitoba received Pap tests compared with 60% of non-Native women between 1993 and 1996.[6]

Barriers to cancer screening reported by men and women from diverse ethnic and minority groups in the United States and Canada include fear,[7] embarrassment,[8] modesty,[9] lack of cancer knowledge and low risk perception,[10] language barriers and the need for an interpreter,[11] decreased access to testing,[12] and reliance on social networks rather than the healthcare system.[10] Modesty and embarrassment as well as concern about disrupting their roles and responsibilities as mothers and wives have prevented Chinese women from seeking medical help.[13]

A handful of studies exist about cancer information-seeking behavior and information channel preferences as a function of ethnicity and/or race. One recent and important study by Benjamin-Garner and colleagues found that education and race/ethnicity influenced the exposure to health messages and the

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Magazines were reported to be an effective medium for the delivery of health messages to African Americans, whereas newspapers were preferred by Hispanic Americans.

channel through which these messages were delivered.[14] Magazines were reported to be an effective medium for the delivery of health messages to African Americans, whereas newspapers were preferred by Hispanic Americans. Preferred cancer information channels have also been shown to differ by ethnicity (Caucasians, Japanese, and non-Japanese Asian Pacific Islander).[15] Moreover, individuals benefit from health information that reflects their cultural backgrounds, values, and belief systems. Photoessays, or pictorial representations with captions, depicting the process of mammography for Black women were culturally acceptable and diminished women's fears and embarrassment about cancer screening.[16]

This study was designed as a content analysis of cancer coverage in mass print media targeting ethnic minority populations in Canada. The evaluation of cancer coverage in ethnic minority media is important because media can provide a window of knowledge into cultural values on health and illness, and reveal the extent of "spillover" coverage from mainstream media outlets such as provincial newspapers. Most media analysis about cancer has been conducted on mainstream print materials,[17,18] and little is known about how mass media designed for subcultural or specific class, gender, or ethnic minority groups differs, or indeed whether it differs. What is known is that various media are designed to target particular markets. Accordingly, the objectives of this study were twofold: 1) to evaluate the volume and type of cancer coverage in Canadian ethnic minority, relative to mainstream, newspapers; and 2) to compare this newspaper coverage of cancer with cancer mortality in Canada. Because visible minorities in Canada are often at a lower educational and income level than the general population,[19] and since literacy affects the relevance, salience, and usability of printed health materials,[20] we also evaluated the readability level of cancer articles in ethnic minority and mainstream newspapers.

METHODS

A list of Canadian ethnic minority and mainstream newspapers was compiled by using Bowdens Media Monitoring Limited Media Directory[21] and the Canadian Advertising Rates and Data Ethnic Markets publication for the year 2000.[22] Ethnic minority newspapers were included in the study if they were available at the National Library of Canada, published within Canada, specifically targeted one of four ethnic minority groups (Jewish, First Nations, Black/Caribbean, East Indian), written in English, and produced more than two times per year. The rationale for selecting newspapers targeting these four ethnic minority groups was as follows: these are ethnic minority groups for which: 1) higher cancer incidence occurs relative to the general Canadian population (ie, Jewish ethnic groups with associated BRCA1 and BRCA2 gene mutations)[23,24]; and 2) higher cancer mortality occurs relative to the general North American population (ie, Black and North American Indian ethnic groups due to later-stage diagnosis).[25–27] In addition, these ethnic minority groups make up 1%–5% of the population of Canada (First Nations at 3.4%, East Indian at 2.4%, Black/Caribbean at 2.2%, and Jewish at 1.2%).[28] Although other visible minorities encompass a greater percentage of the Canadian population (ie, Chinese Canadians at 3.7% of the population), newspapers serving these audiences were largely written in languages other than English. Mainstream newspapers were purposefully matched to publication sites of the ethnic minority newspapers. To be included in the analysis, mainstream papers had to have the highest subscription for a given province, be available at the National Library of Canada, and had to be written in English. After applying these inclusion criteria, seven mainstream and 25 ethnic minority (6 Jewish, 14 First Nations, 3 Black/Caribbean, 2 East Indian) newspapers were selected for analysis. This sampling strategy is further described in Hoffman-Goetz, Shannon, and Clarke.[29] The target audience and description of the newspapers are found in Table 1.

The 32 publications were searched manually for all cancer articles published in 2000. Articles were identified as cancer articles if the title and/or first or last paragraph included the terms *cancer, tumor,* or *neoplasm.* Each article was classified as a general or a site-specific cancer article, and cancer sites were coded according to the major common cancers identified by the National Institutes of Health National Cancer Institute.[30] The number of cancer articles was reported as the absolute number of cancer articles and as the number of cancer articles per 1000 pages to account for differences in newspaper sizes.

Each article was coded for date of publication, page number, section, article length, authorship (wire service, staff reporter, freelance writer, not specified), mobilizing information (inclusion of a health/cancer organization's contact information [telephone number, address, or website] for further information-seeking opportunities by individuals after having read the article), and mention of ethnic minority group (Jewish, First Nations, Black/Caribbean, East Indian, "Canadian" [mainstream]). The total number of cancer articles in ethnic mi-

Table 1. Cancer coverage in ethnic minority and mainstream newspapers, year 2000

Ethnic Minority Group	Name of Newspaper	Province of Publication	Frequency of Publication	No. Pages Searched	Total No. Cancer Articles	Average No. of Cancer Articles per 1000 pages
Jewish	Jewish Free Press	Alberta	Bi-weekly	3960	1	4.74
	Edmonton Jewish Life	Alberta	Monthly	318	1	
	Jewish Post and News	Manitoba	Weekly	1503	0	
	Canadian Jewish News	Ontario	Weekly	2603	8	
	Ottawa Jewish News	Ontario	Bi-weekly	592	0	
	Orah Magazine	Nova Scotia	Quarterly	48	1	
First Nations	Micmac Maliseet Nation News	Nova Scotia	Monthly	360	0	1.38
	Western Native News	British Columbia	Monthly	106	0	
	Ha-Shilth-Sa	British Columbia	Irregular	526	2	
	Secwepemc	British Columbia	Monthly	110	0	
	Alberta Native News	Alberta	Monthly	438	2	
	Windspeaker	Alberta	Monthly	448	1	
	Saskatchewan Sage	Saskatchewan	Monthly	152	1	
	Indian Life	Manitoba	Bi-monthly	137	0	
	Tekawennake News	Ontario	Weekly	1401	3	
	Turtle Island News	Ontario	Weekly	538	0	
	Wawatay News	Ontario	Bi-weekly	148	0	
	Wikwemikong News	Ontario	Monthly	165	0	
	Eastern Door	Quebec	Weekly	1434	0	
	Nunatsiaq News	Northwest Territories	Weekly	1602	0	
Black/Caribbean	Share	Ontario	Weekly	1277	3	0.78
	In Focus	Ontario	Irregular	205	0	
	Caribbean Camera	Ontario	Weekly	67	0	
East Indian	India Abroad	Ontario	Weekly	2110	4	0.95
	Times of Sri Lanka	Ontario	Monthly	173	0	
''Canadian''/Mainstream	Vancouver Sun	British Columbia	Daily	26,898	74	4.98
	Calgary Herald	Alberta	Daily	32,286	128	
	Winnipeg Free Press	Manitoba	Daily	19,868	57	
	Toronto Star	Ontario	Daily	17,693	197	
	Montreal Gazette	Quebec	Daily	26,816	147	
	Chronicle Herald	Nova Scotia	Daily	19,420	105	
	Yellowknifer	Northwest Territories	Bi-weekly	3912	13	

nority papers (N=27) and a random 20% from mainstream papers (N=144) were also evaluated for readability level by using the SMOG readability formula[31] in order to estimate the reading level of cancer information available through mass-circulating print media. Readability of cancer prevention materials targeting African-American men and women has been evaluated.[32–34] No prior research has been conducted on the readability of cancer information in mass media intended for ethnic minority groups.

Categorical variables (eg, newspaper type, ethnic minority group, site-specific cancer) were analyzed by using χ^2 and ordinal variables (eg, reading level) were tested by using Mann-Whitney U and Kruskal-Wallis rank-sum tests. P values were set at .05 for all statistical tests.

RESULTS

Volume and Types of Cancer Articles

In the year 2000, a total of 748 cancer articles were published in the 32 Canadian newspapers—27 in ethnic minority papers (N_{Jewish}=11 articles; $N_{\text{First Nations}}$=9 articles; N_{Black}=3 articles; $N_{\text{East Indian}}$=4 articles) and 721 in mainstream or provincial papers.

Most cancer articles in ethnic minority (Total: 63.0% or N=17/27; Jewish: 81.8% or N=9/11; First Nations: 55.6% or N=5/9; Black/Caribbean: 66.7% or N=2/3; East Indian: 25.0% or N=1/4) and mainstream provincial (45.5% or N=328/721) newspapers were by staff reporters. Only 7.4% (2/27) of ethnic minority and 32.2% (232/721) of mainstream articles were syndicated from wire services. The remaining articles were written by freelance columnists or from unidentified sources.

Because ethnic minority and mainstream newspapers differed in number of newsprint pages per issue, the number of cancer articles per standardized number of newsprint pages was also calculated. The number of cancer articles per 1000 pages did not differ signifi-

Table 2. Number of site-specific cancer articles by newspaper type

Site-Specific Cancer	Ethnic Minority Newspapers	Mainstream Newspapers	Total
Breast	9	145	154
Colorectal	1	28	29
Leukemia/lymphomas	7	29	36
Ovarian	0	12	12
Brain/central nervous system	0	12	12
Prostate	2	62	64
Melanoma	1	20	21
Cervix	1	9	10
Lung	0	28	28
Oral	1	6	7
Testicular	0	8	8
Liver	0	2	2
Multiple sites	0	112	112
Other cancers	0	46	46
General cancer	5	208	213
Total	**27**	**721**	**748**

cantly between combined ethnic minority and combined mainstream papers. The average number of cancer articles per 1000 pages in Jewish newspapers (4.74) was comparable to that in mainstream newspapers (4.98). However, the average number of cancer articles per 1000 pages was lower in First Nations (1.38/1000), East Indian (0.95/1000), and Black/Caribbean (0.78/1000) publications. Table 1 summarizes cancer coverage by newspaper type.

Significant differences were found in site-specific cancer reporting according to newspaper type (ethnic minority vs mainstream) ($\chi^2_{(df=14)}=40.587$; $P=.001$). For ethnic minority (33.3% or $N=9/27$) and mainstream (20.1% or $N=145/721$) papers, breast cancer was the cancer type represented most often. Colorectal (3.7% or $N=1/27$ ethnic minority; 3.9% or $N=28/721$ mainstream) and prostate (7.4% or $N=2/27$ ethnic minority; 8.6% or $N=62/721$ mainstream) cancers were covered less frequently in ethnic minority and mainstream papers. Lung cancer was not covered at all in ethnic minority papers and was mentioned in only 3.9% of cancer articles from mainstream papers ($N=28/721$). Table 2 presents the number of site-specific cancer articles by type of newspaper.

Differences in coverage of site-specific cancers were also seen according to ethnic minority group ($\chi^2_{(df=56)}=93.241$; $P=.001$). The highest proportion of breast cancer articles were found in Jewish newspapers (45.5% or $N=5/11$). Leukemia/lymphomas dominated the cancer coverage in First Nations (44.4% or $N=4/9$) and Black/Caribbean (66.7% or $N=2/3$) newspapers. In contrast, 75% of the articles in East Indian papers did not specify a cancer type.

Table 3. SMOG readability scores of cancer articles in ethnic minority and mainstream newspapers

Type of Newspaper (No. Articles)	SMOG Grade
Jewish ($N=11$)	**13.45** (SD=1.97) (95% CI=12.13, 14.77)
First Nations ($N=9$)	**11.33** (SD=2.65) (95% CI=9.30, 13.37)
Black/Caribbean ($N=3$)	**13.67** (SD=0.58) (95% CI=12.23, 15.10)
East Indian ($N=4$)	**16.25** (SD=1.50) (95% CI=13.86, 18.64)
"Canadian"/Mainstream ($N=144$)	**12.73** (SD=1.75) (95% CI=12.44, 13.02)

Readability Level of Cancer Articles

The average reading level (readability score) of the 171 cancer articles was senior high school at Grade 12.80 (95% CI=12.51–13.09) according to SMOG. The mean SMOG score was Grade 13.19 (95% CI=12.17–14.20) for ethnic minority papers and Grade 12.73 (95% CI=12.44–13.02) for mainstream papers. Table 3 shows the differences in SMOG scores as a function of ethnic minority and mainstream newspapers. Readability scores for the cancer articles differed by ethnic minority group ($\chi^2_{(df=4)}=14.972$, $P=0.05$), with the highest readability in East Indian newspapers (Grade 16.25; 95% CI=13.86–18.64) and the lowest readability in First Nations publications (Grade 11.33; 95% CI=9.30–13.37).

The school level of the articles (pre-high school, high school, college) also differed according to publication type ($\chi^2_{(df=8)}=15.505$, $P=.005$). Most mainstream or "Canadian" (63.9% or $N=92/144$), Jewish (54.5% or $N=6/11$), and First Nations (77.8% or $N=7/9$) articles analyzed for readability were written at a high school level (Grades 9–13). Nevertheless, a sizable proportion of Jewish (45.5% or $N=5/11$) and mainstream or "Canadian" (34.7% or $N=50/144$) publications as well as all articles in East Indian papers ($N=4$) contained articles written at a college level (Grade 14+). Only three articles ($N_{\text{First Nations}}=2$; $N_{\text{Canadian}}=1$) were written at less than high school level (≤Grade 8).

The Kruskal-Wallis rank-sum test

Table 4. Site-specific cancer coverage relative to cancer mortality

Site-Specific Cancer	% Cancer Coverage in Newspapers (No. Site-Specific Cancer Articles/Total No. Cancer Articles)	% Total Cancer Mortality (No. Site-Specific Deaths/Total No. Cancer Deaths)
Breast	20.59 (154/748)	8.46* (5,500/65,000)
Prostate	8.46 (64/748)	6.46† (4,200/65,000)
Lung	3.74 (28/748)	27.23‡ (17,700/65,000)
Colorectal	3.88 (29/748)	10.00§ (6,500/65,000)

Source of mortality rates: *National Cancer Institute of Canada: Canadian Cancer Statistics 2000.*
* No. of female deaths/total no. of cancer deaths.
† No. of male deaths/total no. of cancer deaths.
‡ Male mortality: 30.92 (10,700/34,600); female mortality: 23.03 (7,000/30,400).
§ Male mortality: 10.12 (3,500/34,600); female mortality: 9.87 (3,000/30,400).

Cancer coverage tended to focus on site-specific cancers with a strong genetic component . . .as opposed to those cancers associated with lifestyle risk factors such as smoking (lung) or sun exposure (melanoma).

was used to compare the readability levels of articles on the leading incident cancers (prostate, breast, and colorectal) and leading cause of cancer death (lung) in Canada. Though readability levels did not differ significantly according to cancer type (P=.62), articles on colorectal cancer (Grade 13.14, 95% CI=11.59–14.69) were written at the highest readability levels, followed by articles on breast (Grade 12.90, 95% CI=12.14–13.66), prostate (Grade 12.62, 95% CI=11.74–13.49), and lung (Grade 12.33, 95% CI=10.90–13.77) cancers.

Inclusion of Mobilizing Information

Little mobilizing information was provided in the articles, irrespective of whether the cancer article was published in ethnic minority or mainstream newspapers. Of the 748 cancer articles, only 67 (8.9%) contained mobilizing information − 60 in mainstream papers and 7 in ethnic minority papers. Of the ethnic minority cancer articles with mobilizing information, most of them were in First Nations papers (57.1% or N=4/7). Though significance was not attained for presence of mobilizing information (yes/no) by newspaper type (ethnic minority/mainstream), most articles with mobilizing information were on breast cancer in mainstream papers (33.3% or N=20/60) and on leukemia and lymphomas in ethnic minority papers (57.1% or N=4/7). Moreover, of the articles with mobilizing information (N=67), significantly more ethnic minority (57.1% or N=4/7) than mainstream (40.0% or N=24/60) articles provided local contacts, while more mainstream (60.0% or N=36/60) than ethnic minority (42.9% or N=3/7) articles supplied unrestricted contact information ($\chi^2_{(df=3)}$=19.956; P=.001).

Cultural Tailoring of Cancer Information

One indirect measure of cultural tailoring of cancer information was the identification of ethnic minority group within cancer articles. Few cancer articles in mainstream newspapers identified the specific ethnic minority groups included in this study (N_{Jewish}=5; $N_{\text{First Nations}}$=1; $N_{\text{Black/Caribbean}}$=3; $N_{\text{East Indian}}$=1). A significantly larger percentage of ethnic minority newspapers mentioned ethnic minority groups (63.0% or N=17/27) both directly and indirectly compared to mainstream papers (2.1% or N=15/721) ($\chi^2_{(df=2)}$=241.859; P=.001). Most cancer articles from the mainstream newspapers did not mention any ethnic minority groups either as the intended target readers or as risk groups for cancer (97.9% or N=706/721).

DISCUSSION

Volume and Types of Cancer Articles

The overall coverage of cancer in ethnic minority and mainstream newspapers published in Canada for the year 2000 did not reflect cancer mortality for that year (Table 4 shows cancer coverage relative to cancer mortality in Canada). Coverage was weighted towards breast cancer with poorer coverage of other leading incident cancers (prostate and colorectal) and the leading cause of cancer death (lung cancer). Within the ethnic minority newspapers included in this analysis, lung cancer was not covered at all. Cancer coverage tended to focus on site-specific cancers with a strong genetic component (ie, breast cancer among Ashkenazi Jewish women) as opposed to those cancers associated with lifestyle risk factors such as smoking (lung) or sun exposure (melanoma).

The results of this study clearly indicate that breast cancer is the predominant cancer covered in mainstream and ethnic minority newspapers. Similar findings were in previous studies on cancer coverage in Canadian[35] and US[18] women's magazines and in North Amer-

ican seniors' publications.[36] The reasons that breast cancer is more often described in these print media outlets are not known. However, the amount of coverage may reflect the large number of groups advocating for breast cancer research funding,[37] celebrity women whose experiences with breast cancer are profiled in the media (for example, Nancy Reagan, Olivia Newton-John, Suzanne Somers), as well as other, less direct, factors. For example, sex and sexuality sell newspapers, and mainstream mass media construct (and reinforce) images of sexuality and sexual norms.[38] Hence, articles on diseases that relate to women's sexuality may have greater marketing appeal than those with less influence on reproductive or sexual health.

The coverage of lung cancer in ethnic minority newspapers did not reflect lung cancer mortality in at-risk ethnic minority subgroups. The limited coverage of lung cancer is alarming given that this cancer is the leading cause of cancer death in Canada for both men and women. Although lung cancer rates for specific ethnic minority groups in Canada are not available, First Nations populations have very high rates of cigarette smoking and tobacco use[39] and an estimated 60% of the Canadian Aboriginal population use tobacco regularly.[40] US data show that Alaska Natives also have high mortality associated with smoking-related cancers.[41] Despite aggressive measures to reduce smoking in both ethnic minority and mainstream communities (for example, First Nations and Inuit Tobacco Control Strategy, toll-free telephone quit-smoking lines, Go Smokefree: Health Canada's Tobacco Control Program, Canadian Lung Association's Quit Smoking Guide), lung cancer may be "old news" in the newspapers.

The coverage of prostate cancer in ethnic minority and mainstream newspapers accurately reflected the mortality for this cancer. Although prostate cancer is the leading sex-specific incident cancer in Canadian men, mortality is low because of the late onset and indolent nature of the cancer. Nonetheless, lack of media coverage can be frustrating for wives or partners of men with prostate cancer who are active seekers of information about the disease. Men with prostate cancer tend to be passive seekers of medical information and defer treatment decisions to physicians and family members.[42] Moreover, the low overall coverage of prostate cancer in the media may reflect lack of advocacy groups and reluctance of men to be vocal about a disease that is associated with sexuality. US data show that mortality from prostate cancer is lower among Jewish[43] and Asian men[3] compared to Black men.[3] If US data can be generalized to the Canadian population, this finding suggests that more attention to prostate cancer in Black/Caribbean mass print publications in Canada would be timely.

Readability of Cancer Information

The mean readability of the 171 cancer articles was high at Grade 12.80 according to SMOG scores (Grade 13.19 in ethnic minority papers and Grade 12.73 in mainstream papers). Readability scores differed significantly according to ethnic minority group, with the highest readability levels in East Indian newspapers and the lowest readability in First Nations publications. Other studies have reported readability at early high school levels for cancer prevention materials targeting African-American populations (Grades 8.58–9.32).[33,34] High readability levels (Grade 12.47) were also found in publications targeting seniors—another vulnerable subgroup of the population.[36]

Canadian data on literacy skills of specific ethnic minority groups ranks individuals from multiple ethnic backgrounds as having greatest literacy, followed by Whites, Chinese, Asians, and Latin Americans, while Aboriginals/First Nations and Black populations have the poorest literacy skills.[19] Individuals with only basic literacy abilities typically have lower incomes compared to individuals with higher literacy skills.[44] Hence, variations in newspaper readability and literacy skills according to ethnicity could reflect differences in socioeconomic status among the ethnic groups. For example, First Nations cancer articles were at low readability levels, and Canadian Aboriginal peoples have significantly lower SES compared to the general population,[39] which in turn is associated with poorer health and lack of access to health services.[45] Although cancer articles in Black/Caribbean newspapers were at a moderately high readability level compared to the other ethnic papers, US research shows that low health literacy is a barrier of early-stage prostate cancer diagnosis among low-income Black men,[46] associated with increased distress levels among low-income Black women at risk for cervical cancer.[47] Cancer information in the mass media needs to be written at a readability level suitable for individuals with basic literacy skills.

Inclusion of Mobilizing Information

Little mobilizing information accompanied cancer articles (8.9%) in both ethnic minority and mainstream newspapers. This finding supports research showing a lack of mobilizing information in North American newspapers and magazines.[36,48] Results from the current study showed that most articles with mobilizing information were on breast cancer in mainstream papers and on leukemia and lymphomas in ethnic minority papers, which reflects the influences of mainstream advocacy groups for breast cancer (Canadian Breast Cancer Foundation, Canadian Breast Cancer Research Alliance) and childhood cancers including leukemia (Leukemia Research Fund of Canada, Canadian Childhood Cancer Surveillance and Control Program). Culturally relevant mobilizing information is especially important for ethnic minority groups who

may prefer to obtain cancer information from ethnic sources as opposed to mainstream Canadian sources which may not reflect their cultural beliefs about health and illness.

Cultural Tailoring of Cancer Information

A surprising result was that very few cancer articles (<5%) in ethnic minority and mainstream newspapers mentioned ethnic minority populations either as intended target readers or as risk groups for cancer. Tailoring cancer articles towards specific ethnic minority groups could have provided individuals with a sense of ownership, identification, and affiliation, as well as mobilized readers to actively seek out additional health information or medical help. Cultural tailoring is defined as the "process of creating culturally sensitive interventions, often involving the adaptation of existing materials and programs for racial/ethnic populations."[49] According to the elaboration likelihood model,[50] individuals are more likely to engage in active and thoughtful processing of information if it is perceived to be relevant to them. Hence, tailored cancer information could result in greater attention to the message, a higher likelihood of discussing the information with other people, and a greater probability of behavior change.[51] However, the behavioral effects of reading tailored cancer messages can vary. A study by Skinner and colleagues[52] showed that tailored letters from physicians about the importance of obtaining mammograms were more likely to be read thoroughly by older women than women who received standardized letters. In contrast, Jibaja-Weiss and colleagues[53] found that tailored letters containing people's individual cancer risk contributed to a decline in screening rates among low-income and ethnic minority (African- and Mexican-American) women. Women who received generic cancer information were more likely to make an appointment for a mammogram or Pap test within one year after receiving the letter. Though further research on tailored risk information is required, detailed and culturally appropriate cancer information without fear-inducing messages can benefit populations who obtain their information from ethnic minority or mainstream media and encourage preventive actions.

Limitations

This research has potential biases. First, only English-language newspapers were included in the study. The true meaning of cancer articles in the ethnic minority papers may not have been captured accurately if they were translated from people's native languages into English. The quantity and quality of cancer coverage in non-English ethnic minority newspapers may differ from that in English mass media. Second, only seven mainstream newspapers were selected for analysis. The volume and scope of cancer coverage cannot be assumed to be identical to that in every other Canadian newspaper for the year 2000. Third, limitations exist to using readability formulas. These instruments do not account for the experiences, motivation, and knowledge of the reader, since they measure only word difficulty and sentence length.[54] Fourth, we excluded print media available to Black Canadians that were published in the United States (eg, magazines such as Jet and Ebony), and thus the sample size of newspapers for this audience was limited. African Americans have different historical and racial experiences than Black Canadians who have more recent immigration from the Caribbean. Finally, we used identification of ethnicity/race within the newspaper articles as a surrogate measure of cultural tailoring of the cancer information. Culturally competent information entails attention to both the surface aspects (such as mention of ethnic minority group, use of particular language) and embedded aspects (such as symbolic elements, historical framing) of ethnic minority and/or racial group affiliation. Thus, use of a single, surface measure would likely not have captured embedded differences in the framing of cancer articles in ethnic minority and mainstream newspapers.

CONCLUSION

This descriptive study raises possibilities for further research. A follow-up content analysis on the framing of cancer in provincial and ethnic minority newspapers will allow for an evaluation of the quality of cancer information in both mainstream and ethnic minority media. Additional recommendations include working with writers and editors of both mainstream and ethnic minority publications to reflect accurately through newspaper coverage the leading causes of cancer death in Canada, to lower article readability levels, to include mobilizing information for preventive action, and to identify ethnic minority populations as intended readers or risk groups. Furthermore, results of this study strongly suggest the need to collect cancer data by ethnic minority group in Canada. Without the disaggregation of cancer statistics by ethnicity, we cannot identify high-risk subgroups of the population or tailor cancer prevention and treatment programs appropriately. Moreover, a more balanced portrayal of cancer risks in ethnic minority print media could contribute to increased cancer awareness and potentially preventive screening behaviors among Canadian ethnic and visible minority populations.

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REFERENCES

1. National Cancer Institute of Canada. *Canadian Cancer Statistics 2000.* Toronto, Canada; 2000.
2. Mokdad AH, Marks JS, Stroup DF, Gerberd-

ing JL. Actual causes of death in the United States, 2000. *JAMA.* 2004:291:1238–1245.
3. National Cancer Institute. Surveillance, Epidemiology, and End Results (SEER). Available at: http://seer.cancer.gov/faststats/html/mor_all.html. Accessed April 1, 2004.
4. Larkey LK, Hecht ML, Miller K, Alatorre C. Hispanic cultural norms for health-seeking behaviors in the face of symptoms. *Health Educ Behav.* 2001;28:65–80.
5. Hislop TG, Tey C, Lai A, Labo T, Taylor VM. Cervical cancer screening in BC Chinese women. *B C Med J.* 2000;42:456–460.
6. Young TK, Kliewer E, Blanchard J, Mayer T. Monitoring disease burden and preventive behavior with data linkage: cervical cancer among Aboriginal people in Manitoba, Canada. *Am J Public Health.* 2000;90:1466–1468.
7. Tomaino-Brunner C, Freda MC, Runowicz CD. "I hope I don't have cancer": colposcopy and minority women. *Oncol Nurs Forum.* 1996;23:39–44.
8. Shelton P, Weinrich S, Reynolds WA Jr. Barriers to prostate cancer screening in African-American men. *J Natl Black Nurses Assoc.* 1999;10:14–28.
9. Facione NC, Katapodi M. Culture as an influence on breast cancer screening and early detection. *Semin Oncol Nurs.* 2000;16:238–247.
10. Tessaro I, Eng E, Smith J. Breast cancer screening in older African-American women: qualitative research findings. *Am J Health Promot.* 1994;8:286–293.
11. Jackson JC, Do H, Chitnarong K, et al. Development of a cervical control intervention for Chinese immigrants. *J Immigr Health.* 2002;4:147–157.
12. Dignan M, Michielutte R, Wells HB, Bahnson J. The Forsyth County cervical cancer prevention project. I. Cervical cancer screening for Black women. *Health Educ Res.* 1994; 9:411–420.
13. Facione NC, Giancarlo C, Chan L. Perceived risk and help-seeking behavior for breast cancer: a Chinese-American perspective. *Cancer Nurs.* 2000;23: 258–267.
14. Benjamin-Garner R, Oakes JM, Meischke H, et al. Sociodemographic differences in exposure to health information. *Ethn Dis.* 2002; 12:124–134.
15. Kakai H, Maskarinec G, Shumay DM, Tatsumura Y, Tasaki K. Ethnic differences in choices of health information by cancer patients using complementary and alternative medicine: an exploratory study with correspondence analysis. *Soc Sci Med.* 2003;56: 851–862.
16. Paskett ED, Tatum C, Wilson A, Dignan M, Velez R. Use of a photoessay to teach low-income African-American women about mammography. *J Cancer Educ.* 1996;11:216–220.
17. Clarke JN. Breast cancer in mass circulating magazines in the USA and Canada, 1974–1995. *Women Health.* 1999;28:113–130.
18. Gerlach KK, Marino C, Weed DL, Hoffman-Goetz L. Lack of colon cancer coverage in seven women's magazines. *Women Health.* 1997;26:57–68.
19. Finnie R, Meng R. Minorities, cognitive skills, and the incomes of Canadians. *Statistics Canada Catalogue.* (No. 11F0019MIE-No. 196). Ottawa, Canada:2003;1–16.
20. Davis TC, Williams MV, Marin E, Parker RM, Glass J. Health literacy and cancer communication. *CA Cancer J Clin.* 2002;52:134–149.
21. *Bowden Media Monitoring Limited Media Directory.* Ottawa, Canada: Bowdens; December 2000.
22. *Canadian Advertising Rates and Data.* Toronto, Canada: Ethnic Markets Publication; 2000.
23. Tobias DH, Eng C, McCurdy LD, et al. Founder BRCA 1 and 2 mutations among a consecutive series of Ashkenazi Jewish ovarian cancer patients. *Gynecol Oncol.* 2000;78:148–151.
24. Struewing JP, Hartge P, Wacholder S, et al. The risk of cancer associated with specific mutations of BRCA1 and BRCA2 among Ashkenazi Jews. *N Engl J Med.* 1997;336: 1401–1408.
25. Oakley-Girvan I, Kolonel LN, Gallagher RP, Wu AH, Felberg A, Whittemore AS. Stage at diagnosis and survival in a multiethnic cohort of prostate cancer patients. *Am J Public Health.* 2003;10:1753–1759.
26. Arbes SJ Jr, Olshan AF, Caplan DJ, Schoenbach VJ, Slade GD, Symons MJ. Factors contributing to the poorer survival of Black Americans diagnosed with oral cancer (United States). *Cancer Causes Control.* 1999;10: 513–523.
27. Band PR, Gallagher RP, Threlfall WJ, Hislop TG, Deschamps M, Smith J. Rate of death from cervical cancer among native Indian women in British Columbia. *CMAJ.* 1992; 147:1802–1804.
28. Statistics Canada. *Census of Population 2001.* Available at: http://www.statcan.ca. Accessed April 1, 2004.
29. Hoffman-Goetz L, Shannon C, Clarke JN. Chronic disease coverage in Canadian Aboriginal newspapers. *J Health Commun.* 2003; 8:467–488.
30. National Institutes of Health National Cancer Institute. Cancer rates and risks. Available at: http://seer.cancer.gov/publications/raterisk/. Accessed April 1, 2004.
31. McLaughlin GH. SMOG grading—a new readability formula. *J Reading.* 1969;12:639–646.
32. Mohrmann CC, Coleman EA, Coon SK, et al. An analysis of printed breast cancer information for African-American women. *J Cancer Educ.* 2000;15:23–27.
33. Guidry JJ, Fagan P, Walker V. Cultural sensitivity and readability of breast and prostate printed cancer education materials targeting African Americans. *J Natl Med Assoc.* 1998; 90:165–169.
34. Guidry JJ, Fagan P. The readability levels of cancer prevention materials targeting African Americans. *J Cancer Educ.*1997;12:108–113.
35. Hoffman-Goetz L, MacDonald M. Cancer coverage in mass-circulating Canadian women's magazines. *Can J Public Health.* 1999;90: 55–59.
36. Friedman DB, Hoffman-Goetz L. Cancer coverage in North American publications targeting seniors. *J Cancer Educ.* 2003;18:43–47.
37. Waller M, Batt S. Advocacy groups for breast cancer patients. *CMAJ.* 1995;152(6):829–833.
38. Brown JD. Mass media influences on sexuality. *J Sex Res.* 2002;39:42–45.
39. Anand SS, Yusuf S, Jacobs, R, et al. Risk factors, atherosclerosis, and cardiovascular disease among Aboriginal people in Canada: the Study of Health Assessment and Risk Evaluation in Aboriginal Peoples (SHARE-AP). *Lancet.* 2001;258:1147–1153.
40. Canadian Medical Association. Tobacco and health. CMA policy summary. *CMAJ.* 1997; 156:240A–240C.
41. Ehrsam G, Lanier A, Holck P, Sandidge J. Cancer mortality among Alaska natives, 1994–1998. *Alaska Med.* 2001;43:50–60.
42. Davison BJ, Degner LF, Morgan TR. Information and decision-making preferences of men with prostate cancer. *Oncol Nurs Forum.* 1995;22:1404–1408.
43. Rodriguez C, Jacobs EJ, Patel AV, et al. Jewish ethnicity and prostate cancer mortality in two large US cohorts. *Cancer Causes Control.* 2002;13:271–277.
44. Statistics Canada. *Canadians with Literacy Problems—Profile Series.* Ottawa, Canada: Minister of Industry; June 2001.
45. Indian and Northern Affairs Canada. Comparison of social conditions, 1991 and 1996. *Registered Indians, Registered Indians Living on Reserve, and the Total Population of Canada.* Ottawa, Canada: Indian Affairs and Northern Development Canada; 2000. Catalogue R32–163/2000.
46. Bennett CL, Ferreira MR, Davis TC, et al. Relation between literacy, race, and stage of presentation among low-income patients with prostate cancer. *J Clin Oncol.* 1998;16(9): 3101–3104.
47. Sharp LK, Zurawski JM, Roland PY, O'Toole C, Hines J. Health literacy, cervical cancer risk factors, and distress in low-income African-American women seeking colposcopy. *Ethn Dis.* 2002;12:541–546.
48. MacDonald M, Hoffman-Goetz L. Cancer coverage in newspapers serving large and small communities in Ontario. *Can J Public Health.* 2001;92:372–375.
49. Resnicow K, Baranowski T, Ahluwalia J,

Braithwaite RL. Cultural sensitivity in public health: defined and demystified. *Ethn Dis.* 1999;9:10–21.

50. Petty R, Cacioppo J. *Attitudes and Persuasion: Classic and Contemporary Approaches.* Dubuque, Iowa: W C Brown Co Publishers; 1981.
51. Kreuter MW, Strecher VJ, Glassman B. One size does not fit all: the case for tailoring print materials. *Ann Behav Med.* 1999;21;276–283.
52. Skinner CS, Strecher VJ, Hospers H. Physicians' recommendations for mammography: do tailored messages make a difference? *Am J Public Health.* 1994;84:43–49.
53. Jibaja-Weiss ML, Volk RJ, Kingery P, Smith QW, Holcomb JD. Tailored messages for breast and cervical cancer screening of low-income and minority women using medical records data. *Patient Educ Couns.* 2003;50: 123–132.
54. Bailin A, Grafstein A. The linguistic assumptions underlying readability formulae: a critique. *Lang Commun.* 2001;21:285–301.

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