

Diabetes prevention information in Japanese magazines with the largest print runs

Content analysis using clinical guidelines as a standard

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Objectives To characterize information on diabetes prevention appearing in Japanese general health magazines and to examine the agreement of the content with that in clinical practice guidelines for the treatment of diabetes in Japan.

Methods We used the Japanese magazines' databases provided by the Media Research Center and selected magazines with large print runs published in 2006. Two medical professionals independently conducted content analysis based on items in the diabetes prevention guidelines. The number of pages for each item and agreement with the information in the guidelines were determined.

Results We found 63 issues of magazines amounting to 8,982 pages; 484 pages included diabetes prevention related content. For 23 items included in the diabetes prevention guidelines, overall agreement of information printed in the magazines with that in the guidelines was 64.5% (471 out of 730). The number of times these items were referred to in the magazines varied widely, from 247 times for food items to 0 times for items on screening for pregnancy-induced diabetes, dyslipidemia, and hypertension. Among the 20 items that were referred to at least once, 18 items showed more than 90% agreement with the guidelines. However, there was poor agreement for information on vegetable oil (2/14, 14%) and for specific foods (5/247, 2%). For the fatty acids category, "fat" was not mentioned in the guidelines; however, the term frequently appeared in magazines. "Uncertainty" was never mentioned in magazines for specific food items.

Conclusion The diabetes prevention related content in the health magazines differed from that defined in clinical practice guidelines. Most information in the magazines agreed with the guidelines, however some items were referred to inappropriately. To disseminate correct information to the public on diabetes prevention, health professionals and the media must collaborate.

Key words : clinical practice guidelines, health magazine, mass media, content analysis, prevention

INTRODUCTION

Diabetes prevention is gaining attention throughout the world¹⁾. Efforts to reduce the occurrence of diabetes in Japan by 2010 are described in the Healthy Japan 21 Plan²⁾. National and local governments are joining forces with many others, including the media, in order to help individuals become healthy and to support their efforts by providing appropriate information.

Users of medical and health information obtain much of their information from the mass media³⁾. In Europe and North America, consumer health information has become a focus of attention⁴⁾ "Information only exists to support decisions and actions: if it fails to do this, it is irrelevant noise⁵⁾". In Japan, the Health Promotion Law, Pharmaceutical Law, and Food Hygiene Law prohibit the advertisement of false or exaggerated information about health (<http://law.e-gov.go.jp/cgi-bin/strsearch.cgi>).

The results of a 2001 survey of Japanese citizens revealed that most respondents obtain health-related information from doctors (61.3%), followed by books and magazines (43.6%), newspapers and television (20.3%) and the internet (12.8%)⁶⁾. The same survey reported that the average citizen focused mostly on disease prevention. Unfortunately, it is unclear how information on prevention is communicated by general interest magazines.

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The broadcast law that regulates the mass media and journalists' self-imposed ethical rules recognizes the importance of not distorting facts, based on the principle of factuality⁷⁾. However, an NHK survey conducted in 2005 found that 50% of the people are skeptical of the reliability of information provided by the media⁸⁾.

The Japan Diabetes Society published the Clinical Practice Guidelines for Diabetes based on Scientific Evidence^{9,10)}. The guidelines are based on clinical evidence and represent the consensus view of diabetes specialists. While these guidelines for medical care providers bring together valuable information about treatment and care, they also include information on primary prevention.

The objective of this study is to characterize the content of Japanese health magazines aimed at the general public using the evidence-based clinical practice guidelines as a standard to evaluate the degree to which magazines address information included in the guidelines on diabetes prevention and the degree to which that information matches the guidelines.

RESEARCH DESIGN AND METHODS

Research Design

This was a descriptive literature-based study.

Magazine Database

We used the database of the Media Research Center¹¹⁾ as the main source of content in the magazines. This database is a yearly almanac that compiles the contents and characteristics of magazines published in Japan. It includes data from magazines that are published consistently by number under the same title. There are a total of 22,584 magazines, divided into 273 fields.

In order to make up for the lack of information about the number of printed copies of magazines selected from the main magazine database, we made secondary use of the database maintained by the Japan Magazine Publishers Association, which includes data reported by association members (660 magazines)¹²⁾.

Criteria for Selection of Magazines

Our criteria for selection required magazines published in Japan during 2006, those classified as health magazines (lifestyle information, home medicine, and health), and those included in the magazine database. Based on these criteria, magazines not sold in bookstores nationwide were excluded, along with those for which data about the number of copies printed were unavailable. Furthermore, we excluded those lifestyle information magazines that did not match the keywords of health and medicine within the magazines database. The scope of this study was further limited to magazines with large print runs. Magazines with the largest print runs were sequentially selected until 50% of the total print runs was achieved.

Back issues were obtained in order to collect the tar-

get magazines. Magazines that were difficult to obtain in this fashion were borrowed from libraries. Data were collected by inspecting these magazines after obtaining permission from the publishers.

Criteria for Selection of Pages

We examined all pages of the magazines, and set our criteria to include pages with the words "diabetes," "blood sugar level," "blood sugar," "glucose absorption," and "insulin." In addition, pages unrelated to prevention were excluded. Pages that met the selection criteria were considered related to diabetes prevention, and comprised the ultimate focus of the study.

Evaluative Indicators

The main evaluative indicators were determined based on the 2004 version of the clinical practice guidelines on the treatment and prevention of diabetes mellitus⁹⁾. The prevention guidelines consist of 4 statements. If 1 statement included 2 or more units of information, each unit of information was assigned to an individual category, yielding a total of 23 categories related to screening, lifestyle, and diet (Table 2). The main evaluative indicators were the number of times the 23 categories related to prevention was printed and percent match with the content of the guidelines. Two original categories, for statements advising for or against certain health-promoting foods and another for information not corresponding to the 23 categories (labeled as "Other") were added as secondary evaluative indicators.

Survey Method

Content analysis was performed by medical professionals with knowledge about the full content of the diabetes clinical practice guidelines. Once the target pages were selected, 2 authors (EU and TM) independently surveyed each magazine issue and recorded the number of times the content of each evaluative indicator appeared, and whether the content matched that of the guidelines. The criterion for judging whether the magazine information matched the guidelines was whether or not it included information that contradicted the guidelines. If the 2 researchers did not concur, they discussed their results and came to a consensus. The data they obtained were then analyzed. The smallest unit of analysis was the number of pages. If an article or advertisement occupied only part of a page, it was still counted as 1 page.

Analysis

In order to describe the targets, aggregation was conducted by target background and classification (total, article, or advertisement). Given that the reliability of magazine articles and advertisements varies in Japan¹³⁾, we compared the difference in correspondence percentage for information in all 23 categories between magazine articles and advertisements as an exploratory experiment (χ^2 test, two-sided $P=0.05$).

RESULTS

Target Flowchart and Target Background

Figure 1 shows target magazines and the process flow for how pages were chosen. We were able to narrow down target magazines from the database to 29 relevant magazines with a total of 3,294,412 print runs. We further narrowed down the magazines by sequentially selecting those with the highest print runs until 50% of the total print runs were included in our dataset. Seven magazines were sufficient to reach 1,717,849 print runs, which amounted to over 50% of total print runs. Based on this criterion, these 7 magazines were chosen as the study targets.

The publication titles were “Omoikkiri Television” (300,000 copies), “Kyô no Kenkô” (Today’s Health) (267,999 copies), “President Family” (254,350z copies), “Eiyô to Ryôri” (Nutrition and Cuisine) (250,000 copies), “Monthly New Life” (245,500 copies), “Kurashi no Techô” (Notebook for Living) (200,000 copies), and “NHK Tameshite Gatten” (200,000 copies). We surveyed 52 issues and 11 supplementary issues published in 2006, amounting to a total of 63 issues

There were 8,982 total target pages in the magazines (7,640 pages of articles, 1,593 pages of advertisements, and 251 pages combining articles and advertisements). Of these, 884 pages were related to

diabetes and 484 pages were related to diabetes prevention (406 pages of articles and 78 pages of advertisements).

Survey Categories

Table 1 shows the total number of print appearances of the main evaluative indicators—the 23 categories from the guidelines (the total sum of references to all 23 categories)— and the correspondence percentage with the guidelines. The main evaluative indicators appeared a total of 730 times; information matched the guidelines 471 times and the correspondence percentage with the guidelines was 64.5%. In the articles, the main evaluative indicators appeared 568 times; information matched the guidelines 366 times and the correspondence percentage was 64.4%. In advertisements, the main evaluative indicators appeared 162 times; information matched the guidelines 105 times and the correspondence percentage was 64.8%. Table 2 shows the breakdown by category.

The most common category was specific foods included in the guidelines section on diet, which comprised 247 of the total 484 pages related to diabetes prevention. In order, the next most common category pertained to exercise routines (87), energy intake from meals (64), and weight-related information on abdominal fat (51). Within the category of screening of high risk individuals, while there was no mention of high blood pressure, abnormal lipid metabolism, or

Fig. 1 Target magazine and page seslection flow chart

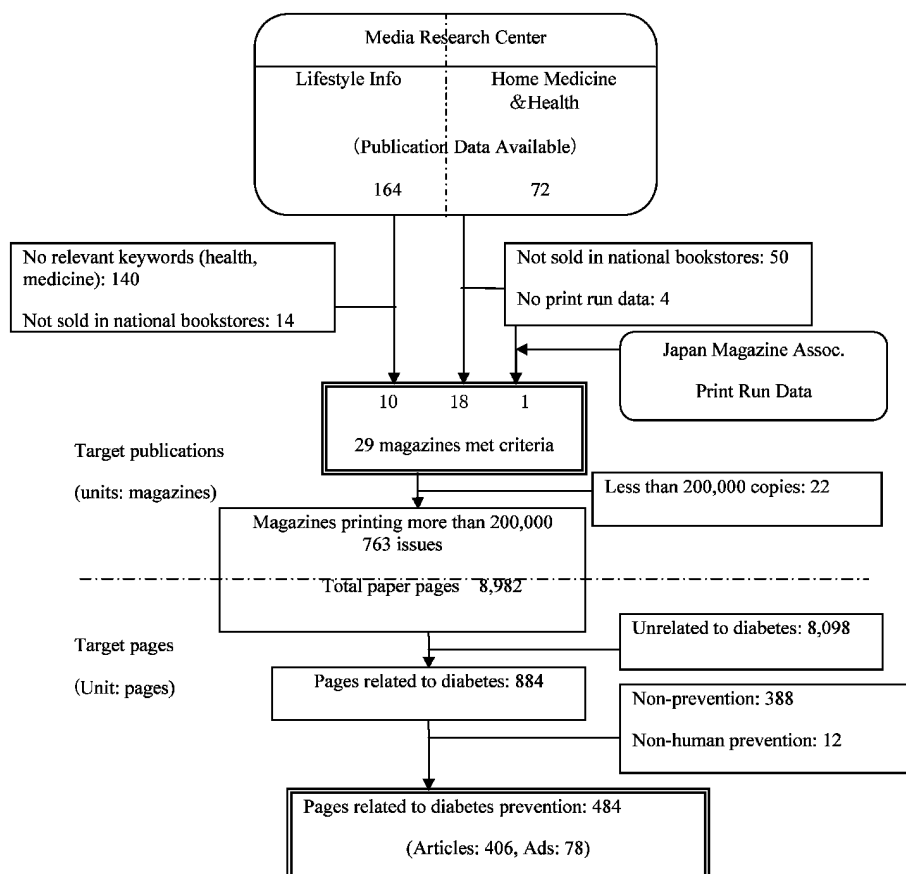


Table 1 Total Appearances of 23 Guideline Categories

	Total		Articles		Ads	
	No.	Percent match**	No.	Percent match**	No.	Percent match**
Total for 23 categories*	730	64.5	568	64.4	162	64.8
Breakdown of categories						
Maximum	247	100	192	100	55	100
Minimum	0	2	0	3	0	0
Median	14	100	11	100	3	100
lower quartile, upper quartile	7, 32	98, 100	5, 25.5	97.8, 100	2, 10	100, 100

* Sum of all references to all 23 categories in guidelines

** Number of matches with guidelines/number of appearances

Table 2 Number of References to 23 Guideline Categories and Percent Match*

Guideline Category	Total (N=484)			Articles (N=406)			Ads (N=78)		
	No.	No. of matches	Percent match	No.	No. of matches	Percent match	No.	No. of matches	Percent match
Screening									
Need for early detection	2	2	100	1	1	100	1	1	100
Family history of diabetes	9	9	100	7	7	100	2	2	100
Gestational diabetes	0	—	—	0	—	—	0	—	—
Borderline	14	14	100	11	11	100	3	3	100
Overweight/obesity	22	22	100	9	9	100	13	13	100
Abnormal lipid metabolism									
Blood pressure	0	—	—	0	—	—	0	—	—
Lifestyle									
Exercise routine	87	85	98	75	73	97	12	12	100
Weight-related									
BMI	7	7	100	5	5	100	2	2	100
Weight	26	25	96	24	23	96	2	2	100
Obesity	33	33	100	23	23	100	10	10	100
Abdominal fat	51	51	100	39	39	100	12	12	100
Diet									
Eating habits	50	50	100	34	34	100	16	16	100
Energy intake	64	63	98	54	53	98	10	10	100
Trans fatty acids	14	13	93	11	10	91	3	3	100
Animal fats	18	18	100	15	15	100	3	3	100
Vegetable oil	14	2	14	11	1	9	3	1	33
GI (glycemic index)	3	3	100	2	2	100	1	1	100
Dietary fiber	31	31	100	27	27	100	4	4	100
Specific foods	247	5	2	192	5	3	55	0	0
Tobacco	7	7	100	5	5	100	2	2	100
Alcohol	8	8	100	6	6	100	2	2	100

* Percentage Match Number of matches with guidelines/number of appearances

gestational diabetes, there were references to other issues such as being overweight and obese (22), borderline diabetes (14), and a family history of diabetes (9). References to tobacco (7) and alcohol (8) also were found.

Overall, correspondence with the guidelines was over 90% for 18 out of 20 categories appearing in the

magazines. Yet, the correspondence percentages for the categories related to vegetable oil (polyunsaturated fatty acids) and specific foods were extremely low, that is, 14% (2 out of 14) for vegetable oil and 2% (5 out of 247) for specific foods.

There were 3 categories related to fatty acids—vegetable oil (which is rich in polyunsaturated fats),

Table 3 Number of Appearances of Guideline Information and Information not in Guidelines

	Screening			Lifestyle habits			Exercise			Weight-related		
	Total	Articles	Ads	Total	Articles	Ads	Total	Articles	Ads	Total	Articles	Ads
Guideline information	41	25	16	23	17	6	87	75	12	84	65	19
Non-guideline information	29	25	4	0	—	—	5	1	4	13	6	7

	Diet			Tobacco			Alcohol			Other		
	Total	Articles	Ads	Total	Articles	Ads	Total	Articles	Ads	Total	Articles	Ads
Guideline information	310	255	55	7	5	2	8	6	2	—	—	—
Non-guideline information	207	187	20	0	—	—	0	—	—	94	75	19

trans fats, and animal fats (saturated fats). The number of appearances categorized by terms used in the 19 cases corresponding to fatty acids is shown in Table 3. Terms used in the guidelines appeared in print 4 times for unsaturated fats, and just once for animal fats. Terms not used in the guidelines also appeared in print, including fat (9), lipids (3), unsaturated fats (1), and greasy foods (1). We also found the following information in print: “Do not eat too much of foods high in fat;” and “Eating fatty foods increases the risk of diabetes.”

In the category of “specific foods,” all but 5 of the 247 total appearances simply recommended eating or not eating certain foods. Commonly recommended foods included vinegar (28), Japanese gelatin (14), raw vegetables (13), okra (8), coffee (7), burdock root (7), squid (6), mushrooms (6), Jerusalem artichoke (5), sweet potato (5), and sugar (4). Some of those appearing once included bean curd refuse, Asian ginseng, Coenzyme Q-10, edible cactus, buckwheat noodles, curry with egg, seaweed, and red wine, Du Zhong tea, Doctor’s hydrogen water, lactic acid bacilli, brewer’s yeast, broccoli buds, fried and boiled eggs, Japanese leeks and dried seaweed, royal jelly, herbal supplements, and yogurt. Conversely, magazines recommended cutting down on fats and sweets, sugar, and polished grains, and women were advised to not eat more fruits than necessary. Of the 247 references, only 23 recommended health-promoted foods approved by the Ministry of Health, Labor, and Welfare (15 were “specially designated health foods” and 8 were “special use foods.”)

Instances in which information not included in the guidelines was mentioned were counted separately (Table 3). In order of frequency, these included meals (207), information not from any category (94), and screening (29). Information outside of the categories was included, such as statements like “Blood sugar reducing drug—roughly 30% of a group of people who used medicine to control blood sugar saw a diabetes preventing effect by using this drug;” and “Prevents heart disease, diabetes, and influenza! We recommend you brush your teeth like this.”

In an exploratory experiment, we compared the difference in correspondence percentage between articles and advertisements (χ^2 test) and did not find any statistically significant difference (95% CI: $-0.09, 0.08$)

DISCUSSION

Guideline Categories and Diabetes Prevention Information in Magazines

There was variation in the number of times the 23 main categories appeared in print. From the perspective of the clinical guidelines, all categories have an important definition for diabetes prevention, but the information was not equally conveyed by the magazines.

Overall correspondence with the guidelines was 64–65%. By category, 18 of the 20 categories had an above 90% match with the guidelines, suggesting that the magazines are accurately communicating information about diabetes prevention. However, plenty of the information about diet did not correspond with that in the guidelines. Furthermore, we found no statistically significant difference in correspondence percentage between articles and advertisements for the 23 categories¹³).

Information about Fatty Acids

For categories related to vegetable oil, the guidelines state that the “intake of vegetable oil (which is rich in polyunsaturated fatty acids) is thought to be a factor which suppresses the occurrence of diabetes.” The 3 categories related to fatty acids are vegetable oils, trans fatty acids, and animal fats (saturated fatty acids), but intake of trans fats and animal fats are thought to have the opposite effect of vegetable oil and, therefore, increase the risk of diabetes^{9,10}).

In the 3 categories related to fatty acids, it was not always possible to distinguish which type of fatty acid was being referenced when fats or lipids were mentioned. Therefore, they were placed in all 3 categories, and we considered how well the print references corresponded to the guidelines. There were 19 target pages related to fatty acids, but often these were simply warnings to not eat fats or lipids, which suggests that the complexity surrounding fatty acids is being simpli-

fied to just “fats and lipids.” However, the characteristics of these 3 types of fatty acids are different^{14~17}). In particular, although it is recommended that people cut back on saturated fats, low intake can actually increase the risk of a stroke or cerebral hemorrhage¹⁴. If these 3 types of fatty acids are treated as one and the same, it is possible that those who receive this information will be misled. However, it is not easy for individuals to understand information that is aimed at medical professionals, and it is important to consider how to properly communicate such information to the general public.

Information Related to Specific Foods

With respect to the “specific foods” category for which correspondence with the guidelines was just 2%, the guidelines state: “Regarding diet, no single conclusion has been reached about which foods increase the risk of diabetes and which foods help prevent it, as differences arise based on research methodology and subjects. It is necessary to collect more data about this.” The majority of the 247 instances of printed information regarding specific foods recommend eating (or not eating) certain types of food, but no information was provided about the lack of certainty behind these recommendations. The problem of food faddism^{18,19}) has been described in some studies, and therefore, the transmission of such information requires adequate consideration.

Some foods recommended in magazines are consumed daily or thought to be rich in dietary fiber. Coffee, for instance, has been linked to a lowered risk for Type II diabetes²⁰), but currently no information on these foods is included in the guidelines^{9,10}). It is possible that magazines are providing the latest information available about these foods from other sources. Some “food with health claims”²¹) and so-called “health foods”²²) were recommended as well. It was clear that magazines recommended eating (or not eating) foods with various characteristics, but more detailed qualitative analysis is necessary to consider the content of this information.

Information Not Provided in the Guidelines

Information not included in the guidelines appeared in the media numerous times. This suggests the possibility that the media is conveying information not recognized by medical professionals as relevant to diabetes prevention. We believe that it may be possible to shorten the information gap between health specialists and consumers, and to deepen their mutual understanding by conducting a more detailed qualitative analysis of this information in the future.

Study Limitations and Future Prospects

This study selected and studied major magazines with large print runs available in bookstores nationwide, and used a main database as the standard. The 29 target magazines had a total print run of 3,294,412, and the total for the 7 selected magazines was

1,717,849. Magazines with small print runs, those for which information about the number of copies was not available, and those only sold in certain regions were not surveyed. Although potential bias exists in that all types of magazines were not analyzed for diabetes information, the purpose of the current study was to characterize the diabetes-related information included in the magazines with the largest print runs. Another limitation is that we selected the clinical practice guidelines on diabetes as a standard for comparison in analyzing the magazines. Unfortunately, the diabetes guidelines are aimed at medical professionals rather than the general public, and were not intended for use as evaluative indicators (Practice guidelines are “systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances”)²³).

We hope that in the future, more research on health information regarding diabetes prevention will be aimed at the general public. While health care specialists attempt to provide appropriate information to their patients in their day-to-day interactions, this study suggests that it is necessary to provide diabetes-related information intended for the public to mass media (magazines) and to build a global cooperative relationship with them. Furthermore, given the importance of sharing appropriate health information in the fields of health and medicine²⁴), we hope that it will be possible to promote sharing and circulation of information on diabetes prevention based on clinical guidelines by creating information aimed at a general audience.

CONCLUSIONS

This study describes the content of diabetes information aimed at the general public that is printed in health magazines using clinical practice guidelines as a standard. There was plenty variation in the amount of information conveyed by the media among the 23 categories related to diabetes prevention in the guidelines. While most of the printed information matched the guidelines, large discrepancies and flaws were evident in the categories of fatty acids and specific foods with respect to the validity of medical information on diabetes prevention. In order to promote the social development of diabetes prevention on a global scale, appropriate media coverage is needed on fatty acids and specific foods, and additional information that appropriately agrees with that in the clinical guidelines needs to be provided to the general public.

ACKNOWLEDGEMENTS

We would like to extend our heartfelt thanks to the doctors and graduate students of the School of Public Health at Kyoto University who provided guidance, and to the magazine publishers and librarians who helped make this study possible.

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