ORIGINAL ARTICLE

A Study of the Accuracy and Reliability of Articles about Alopecia in Newspapers

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Background: There is growing interest in alopecia among the general population. Many people obtain information from easily accessible media rather than from doctors; thus, the media can play an important role in shaping public opinion. **Objective:** The goal of this study was to evaluate the content and reliability of newspaper articles on alopecia. **Methods:** Newspapers were categorized into three groups: one group of print newspapers and two groups of online newspapers. Online newspapers were further divided into two groups according to type of publishing company; one publishes both print and online newspapers and the other publishes online newspapers only. The most frequently subscribed or circulated newspaper in each group was selected. Articles containing information on alopecia were selected from 3 years of each newspaper and evaluated for reliability. **Results:** Most articles in each group used the general term "alopecia" instead of naming a specific hair loss disease. The majority of articles were based on consultation with experts. Assessment of the accuracy of articles with three grade scales showed that the percentage with high accuracy was 38.9%, 47.2%, and 23.3%. Assessment of reliability scores for five selected articles in each group showed that there were statistically significant differences between common readers and dermatologists ($p < 0.05$). **Conclusion:** The results of this study suggest that closer monitoring of the media is required to supply easily accessible, balanced, and trustworthy information regarding alopecia. (**Ann Dermatol 30(3) 309~315, 2018**)

INTRODUCTION

In Korea, the proportion of internet users relative to the entire population has rapidly increased, and the effects of the internet are becoming more apparent[1]. As quality of life improves, people's interest in their own outward appearance has also been increasing, in turn increasing programs or articles about dermatological diseases[2,3]. However, studies evaluating information on dermatological diseases presented to the general public through freely available domestic newspapers or broadcasting programs have indicated that the information was often obtained from uncertain sources or differed from established facts[2,3]. Kilkenny et al.[4] reported that <50% of patients with skin disease sought doctors' advice regarding the disease.

The purpose of this study was to analyze the content and level of reliability of newspaper articles issued by many domestic media regarding alopecia, and to assess differences in recognition between dermatologists and common readers.

MATERIALS AND METHODS

Study subjects

We categorized newspapers into three groups: one group of print newspapers and two groups of online newspapers. Online newspapers were further divided into two groups according to type of publishing company; one publishes

both print and online newspapers and the other publishes online newspapers only. The print newspaper that had the largest circulation among all print newspapers in 2012 based on data obtained from the Korea Audit Bureau of Circulation was designated newspaper A. The online newspaper with the highest numbers of hits during June and July 2013, based on data obtained from Rankey.com, was selected in each group and designated as newspaper B and newspaper C. Among articles appearing in newspapers A, B, and C during a 3-year period (August 2010∼July 2013), study subjects were identified by using "alopecia", "hair", and "baldness" as search terms.

Study methods

1) Analysis of newspaper articles on alopecia

Articles were analyzed by three dermatologists. Evaluation items were as follows.

(1) Title: Titles were divided into "information-oriented", "interest-oriented", and "mixed" types. Information contained in articles determined to be information-oriented or mixed type was classified as "medically proper", "medically improper", or "nonmedical" (not pertaining to medical issues/judgments).

(2) Author: Authors were divided into "reporter", "joint coverage", "expert contribution", and "no writer specified". For articles written by a reporter, we also determined whether the reporter had published any dermatological/alopecia-related articles within the previous 5 years.

(3) Content: The content of articles was categorized as "etiology", "epidemiology", "diagnosis", "treatment", or "progress/prognosis"; multiple selections were allowed. In each article regarding treatment, treatment type was subcategorized as "medication (oral/topical agent) included in treatment guidelines for alopecic diseases", "surgical procedure", "cosmetics/shampoo/quasi-drug", "lifestyle guidance", and "research on newly emerging treatments". Multiple selections were allowed. We also examined whether any specific product, institution, or company name was mentioned. Next, terms used in each article were analyzed. First, the numbers of articles using the terms "alopecia" or "hair loss disease" were counted. When the term "alopecia" was used, the specific meaning was divided into three categories: "all hair loss diseases", "certain types of hair loss disease", and "symptoms of hair loss diseases such as hair shedding or decreased hair density".

(4) Evidentiary material: Evidence sources mentioned in articles were divided into categories of "research papers", "official guidelines/announcements", "interagency announcements", "expert opinion (direct quotations and consultations)", and "no evidence". Multiple selections were allowed. In expert opinion, experts were divided into categories of "dermatologists", "non-dermatological specialists", "other medical personnel" (such as oriental doctors and pharmacists), and "others".

(5) Tone of title and article: The tone of the title and article was divided into "negative", "neutral", or "positive".

(6) Accuracy of content: The accuracy of the article content was divided into "high", "medium", or "low", based on standard dermatology textbooks.

2) Comparative analysis of the reliability of articles: assessments by dermatologists and common readers

Five recently published articles were selected from each newspaper, and total 15 articles were assigned to each subjects with questionnaires.

The questionnaires for dermatologists were designed to evaluate the medical accuracy and reliability of article content using an 11-point scale (0∼10). The questionnaires for common readers were designed to evaluate reliability only. For common readers, major sources for medical information were also obtained.

Differences in the reliability scores between the two groups were analyzed. This study was approved by the Institutional Review Board of Inje University Busan Paik Hospital (IRB no. 14-0045).

Statistical analysis

Pearson's chi-square test was used for statistical analysis of the newspaper articles, and linear mixed effects model in R, paired t-test and Student's t-test were used for statistical analysis of the questionnaire surveys. Results were considered statistically significant at a p-value of <0.05. Data were analyzed using IBM SPSS Statistics ver. 23.0 (IBM Co., Armonk, NY, USA).

RESULTS

Analysis of newspaper articles on alopecia

After a search using the above-mentioned keywords, 36, 127, and 43 articles were extracted from newspapers A, B, and C, respectively.

Table 1. Types of titles of articles from three newspaper groups

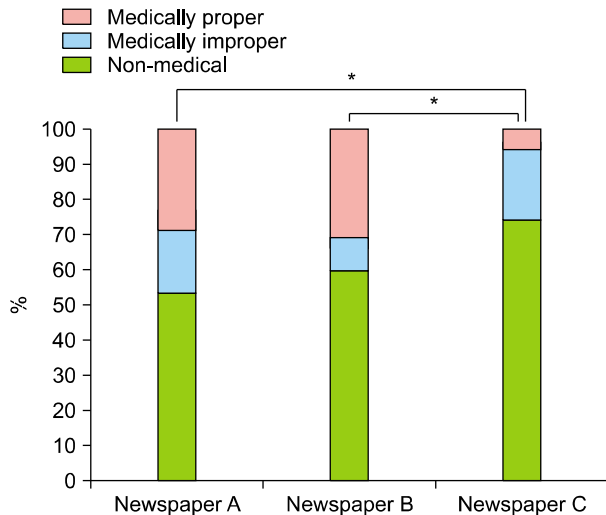| Type of title	Newspaper A (n=36)	Newspaper B (n=127)	Newspaper C (n=43)
Information-oriented	9 (25.0)	26 (20.5)	6 (14.0)
Interest-oriented	8 (22.2)	47 (37.0)	8 (18.6)
Mixed	19 (52.8)	54 (42.5)	29 (67.4)

Values are presented as number (%).

Fig. 1. Analysis of objective contents included in the titles of articles. *$p<0.05$.

1) Title

The distribution of types of article titles is summarized in Table 1.

Fig. 1 shows results of further analysis of information-oriented and mixed-type titles. The results of analysis of the objective content of the title were significantly different ($p<0.05$); on a *post hoc* test, a statistically significant difference was found between newspapers A and C, and between B and C ($p<0.05$).

2) Author

Newspaper A had 33 articles (91.7%) written by reporters and 3 (8.3%) written by experts. In newspaper B, articles were most frequently written by reporters (n=64, 50.4%), followed by "joint coverage" (n=46, 36.2%) and "contributions by experts" (n=5, 3.9%); no writer was specified for 12 articles (9.4%). None of the articles in newspaper C had a specified author. All reporters for newspapers A and B had published dermatological or alopecia-related articles previously.

Table 2. Distribution of terms used in articles

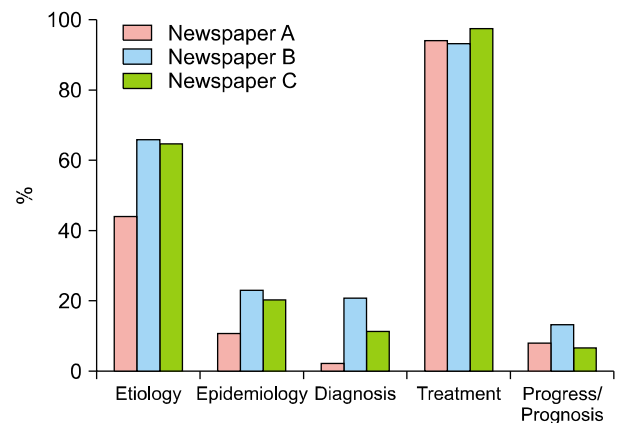|	Newspaper A (n=36)	Newspaper B (n=127)	Newspaper C (n=43)
Specific hair loss disease only	2 (5.6)	15 (11.8)	0 (0.0)
'Alopecia' only	27 (75.0)	72 (56.7)	29 (67.4)
'Alopecia' and specific hair loss disease	7 (19.4)	40 (31.5)	14 (32.6)

Values are presented as number (%).

Fig. 2. Distribution of mentioned subjects in articles.

3) Content

The distribution of terms used in articles is summarized in Table 2.

Seventy-eight articles mentioned specific hair loss diseases. In newspaper A, male pattern hair loss (MPHL) was mentioned in eight articles followed by female pattern hair loss (FPHL) (3) and telogen effluvium (3). MPHL was mentioned in 39 articles followed by FPHL (18) and alopecia areata (AA) (17) in newspaper B. In newspaper C, MPHL and FPHL were both mentioned in 10 articles, and AA in 9. In most cases, "alopecia" was used to refer certain types of hair loss disease (17, 50.0%), followed by all hair loss diseases (13, 38.2%) and symptoms of hair loss disease (4, 11.8%) in newspaper A. Newspapers B (41.1%, 35.7%, and 23.2%) and C (58.1%, 41.9%, and 0%) showed similar results. Among articles in which "alopecia" was used to refer to certain types of hair loss disease, 73 (83.0%) of 88 used "alopecia" for MPHL.

When the content of each article was analyzed, treatment was mentioned most frequently (195), followed by etiology (128) in all newspapers (Fig. 2). In a further analysis by treatment type, "cosmetics/shampoo/quasi-drug" was cited most frequently in newspapers A (47.1%) and C (52.4%), while "lifestyle guidance" was the most frequent

Table 3. Proportion of each mentioned types of treatment

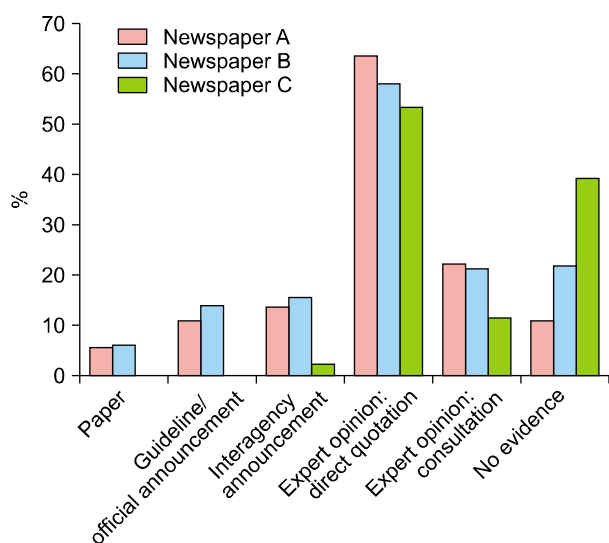|	Newspaper A (n=34)	Newspaper B (n=119)	Newspaper C (n=42)
Lifestyle guidance	6 (17.6)	76 (63.9)	10 (23.8)
Medication (oral/topical agent)	9 (26.5)	54 (45.4)	6 (14.3)
Surgery/procedure	5 (14.7)	50 (42.0)	20 (47.6)
Research about newly developing treatment	3 (8.8)	9 (7.6)	1 (2.4)
Cosmetics/shampoo/quasi-drug	16 (47.1)	28 (23.5)	22 (52.4)

Values are presented as number (%).

Fig. 3. Analysis of evidence in each article.

Table 4. Analysis of quoted experts as an evidence in articles

	Newspaper A (n=33)	Newspaper B (n=85)	Newspaper C (n=26)
Dermatologist	19 (57.6)	43 (50.6)	5 (19.2)
Doctor (non-dermatological specialist)	0 (0.0)	26 (30.6)	14 (53.8)
Other medical personnel	4 (12.1)	7 (8.2)	3 (11.5)
Others	10 (30.3)	9 (10.6)	4 (15.4)

Values are presented as number (%).

Comparative analysis of reliability of articles: assessments by dermatologists and common readers

In total, 39 dermatologists (male:female=34:5; mean age, 40.0) and 40 common readers (male:female=23:17; mean age, 39.2) completed the questionnaire.

Common readers obtained information on alopecia from the internet (12, 30.0%) followed by hospitals (11, 27.5%), beauty shops/scalp care centers (6, 15.0%), broadcasting programs (4, 10.0%), print newspapers (1, 2.5%), and other sources (6, 15.0%).

For newspapers A, B, and C, the mean reliability scores evaluated by common readers were 7.86 ± 1.95, 7.49 ± 2.14, and 7.17 ± 2.38, respectively, and the difference among the three groups was significant. A post-hoc test revealed there was a significant difference between newspapers A and B, B and C, and A and C ($p < 0.05$).

For newspapers A, B, and C, mean article content accuracy scores evaluated by dermatologists were 7.92 ± 2.08, 5.99 ± 3.21, and 4.46 ± 2.90, and mean reliability scores were 7.60 ± 2.35, 5.59 ± 3.18, and 3.95 ± 2.68, respectively. Both accuracy and reliability scores showed significant differences among the three newspapers, with the post-hoc test showing significant differences between newspapers A and B, B and C, and A and C ($p < 0.05$).

In the comparative analysis of reliability score between two groups, newspapers B and C showed a significant difference ($p < 0.05$) (Fig. 5).

type in newspaper B (63.9%) (Table 3). Specific products, institutions, and company names were mentioned in 17 (47.2%), 17 (13.4%), and 29 (67.4%) articles, respectively.

4) Evidentiary material

Direct quotation of expert opinion was the most frequent in all newspapers (63.9%, 58.3%, and 53.5%, respectively) (Fig. 3). Dermatologists were the most common experts in newspapers A (57.6%) and B (50.6%), but non-dermatological specialists were most common in newspaper C (53.8%) (Table 4).

5) Tone of title and article

These results are summarized in Table 5.

6) Accuracy of content

The distribution of the accuracy of articles is summarized in Fig. 4; the difference in the distribution among the three newspapers was statistically significant ($p < 0.05$). On post-hoc testing, a statistically significant difference was found between newspapers A and B, and between newspapers B and C ($p < 0.05$).

Table 5. Tone of title and article

		Newspaper A (n=36)	Newspaper B (n=127)	Newspaper C (n=43)
Tone of Title	Positive	16 (44.4)	80 (63.0)	27 (62.8)
	Neutral	15 (41.7)	25 (19.7)	13 (30.2)
	Negative	5 (13.9)	22 (17.3)	3 (7.0)
Tone of article	Positive	19 (52.8)	16 (12.6)	33 (76.7)
	Neutral	16 (44.4)	109 (85.8)	10 (23.3)
	Negative	1 (2.8)	2 (1.6)	0 (0.0)

Values are presented as number (%).
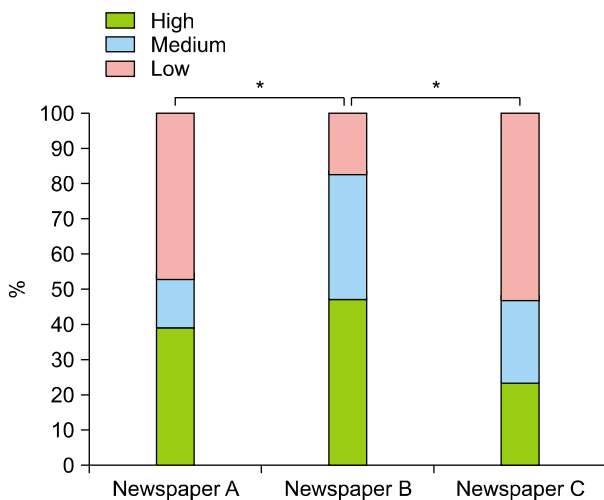
Fig. 4. Analysis of the accuracy of contents. *$p<0.05$.

Fig. 5. Analysis of accuracy and reliability grades of articles as assessed by dermatologists and common readers. *$p<0.05$.

DISCUSSION

As quality of life has been enhanced, dermatologic disease has become a subject of interest. In line with these changes, related articles by various mass media outlets have been increasing. Cho et al.[3] analyzed domestic television broadcasting programs dealing with dermatology-related issues and reported that hair-related content accounted for 10.1% of all broadcasted content. According to data from the Korea Press Foundation (http://www.kpf.or.kr/), although the readership of domestic print newspapers decreased by approximately 50% over the past 10 years, consumption of news obtained through the internet increased such that, overall, news readership has increased. The effects of these media outlets on public recognition of hair loss diseases are expected to further increase.

Our analysis of article titles showed that three newspapers mostly used titles containing both information and interest. When information in titles was analyzed, the majority of them were medically indeterminate or contained irrelevant information. In particular, newspaper C showed a sig-
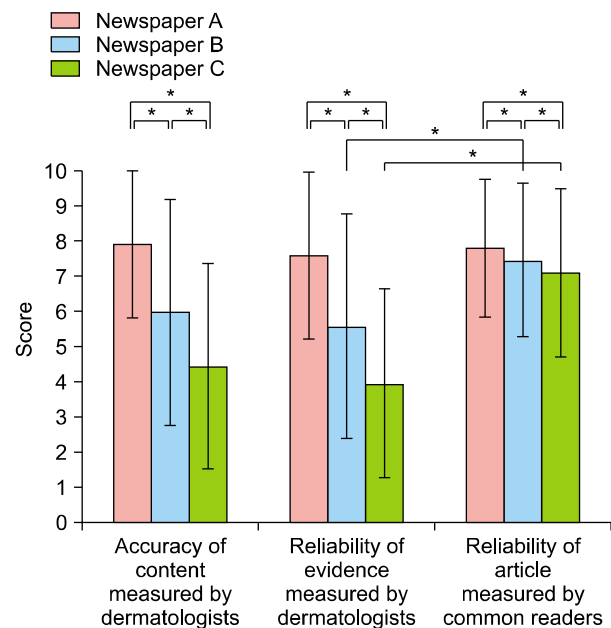
nificantly different distribution in the accuracy analysis. The ranking of online newspapers, as determined by the view count and number of clicks, is dependent on the title. Thus, authors prefer enticing titles that arouse readers' interest, and may even revise titles irrelevant to contents[5]. Because titles are exposed more frequently than articles in online newspapers, their importance cannot be overlooked.

Chang et al.[6] found that, in judgments of article quality, the author is the most easily recognizable and important element. In particular, for subjects requiring expertise, such as health, the reliability of the article is largely dependent on whether the author is an expert in the field, or a reporter who specializes in a particular area. Articles in newspapers A and B specified the author and, in the case of articles written by reporters, they had sufficient relevant experience. On the other hand, none of the articles in newspaper C revealed the author identities.

"Alopecia" was mentioned in most articles in all three newspapers, but it can be easily misunderstood as referring only to certain hair loss diseases; our study showed that a large proportion of newspaper articles equated alopecia with specific diseases, usually MPHL. To prevent confusion, this generally used, ambiguous term should be substituted with a more accurate one. The prevalence of MPHL is higher than that of any other hair loss diseases. However, considering the fact that 73.7% of patients who visited the hospital for alopecia had AA in a previous study, the excessive emphasis on MPHL in media should be addressed[7].

According to results of our analysis of article tone, whereas articles in newspapers A and C showed a positive tone, newspaper B had more articles with a neutral tone. Among articles in which the name of specific products, institutions, or company names were given, a positive tone was detected in 58.8% and there was no article with a negative tone. If articles are considered as kinds of indirect advertisement, it is possible that they will be concerned mainly with advantages of products, to maximize advertising effects, consequently affecting the overall tone of the articles. If the term "alopecia" is entered into Google or Yahoo search engines, scientific organizations and trustworthy patient guidance sites based in the US or UK appear first, alongside the dictionary definition of alopecia. However, if an individual searches the term "talmo," which means alopecia in Korean, on Naver or Daum, the most popular portal site in Korea, advertisements appear first followed by dictionary meanings. This clearly shows differences in the recognition of alopecia on the internet among countries.

When the accuracy of the article contents was analyzed, in newspaper B, the ratio of articles with a low level of accuracy was the lowest (17.3%) and that with a high level of accuracy was the highest (47.2%), while the reverse situation was found in newspaper C. This difference between the two newspapers might be associated with differences in authors, terms, distributions of cited experts, and frequencies of advertisement exposure, as shown in the present study. From our viewpoint, as a whole, neither the ratio of articles with a high level of accuracy (40.8%) nor that of each newspaper was considered sufficient.

Expert opinions represented the most frequent type of evidence presented in articles. Dermatologists were the most frequently cited experts in newspapers A and B. Non-dermatological specialists constituted the highest proportion of cited experts in newspaper C. We performed a further analysis of the accuracy of article content according to type of quoted expert: among articles that quoted dermatologists, 63.4% were rated as high-grade for accuracy and

7.0% were low-grade; for articles that quoted experts other than dermatologists, 26.7% and 40.0%, respectively. Selecting articles that identify quoted experts may be one of the best ways for readers to avoid articles with low accuracy.

People in Korea commonly obtain information on alopecia from the internet, hospitals, beauty shops, or scalp care centers. Many studies have been conducted on the reliability of the health information currently available on the internet, and most of them showed low reliability[6,8-10].

In our questionnaire survey, scores assessed by dermatologists were highest for newspaper A, followed by newspapers B and C; differences among the three newspapers were statistically significant. Although scores for reliability given by common readers showed a similar pattern, the difference among the newspapers was much smaller than that in the dermatologist group. Additionally, in the comparison of reliability scores of each newspaper, scores given by common readers were higher than those given by dermatologists for all newspapers; the difference in reliability score was statistically significant between each two groups. These results indicate that common readers tend to give higher grades, indicating an insufficient discernment capacity and higher possibility of accepting article contents at face value. Therefore, more emphasis should be placed on enhancing the accuracy of articles.

A limitation of this study was that it concerned articles published in only three newspapers. In addition, because some items on the evaluation form required subjective judgments, subjectivity could not be completely eliminated despite the fact that conclusions were drawn according to agreement among three dermatologists.

In conclusion, considering that common readers showed a tendency to uncritically trust articles, writers should make an effort to use proper terms and provide accurate evidence. Moreover, physicians should endeavor to correct inaccurate information.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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