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The quality of nutrition research reporting by leading daily newspapers in India

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Background: Newspapers are an important form of Mass media which plays significant role in health promotion, and is crucial for social development. Studies revealed that newspaper reports lacked consistency in presenting nutrition research results to the readers. A study was conducted with a hypothesis "Newspapers often highlight nutrition research findings disproportionately in order to draw reader's attention". Objective: To assess presentation of nutrition research findings/ outcomes by newspapers as compared to the original research papers on which they are based. Method: The top six popular newspapers in India were selected for the study. A scale was evolved based on 10 parameters for gauging accuracy of the reports. Results: A total of 214 reports were identified as based or claimed on nutrition research in all the above six newspapers. One-fourth of the newspaper reports did not conveyed nutrition research results properly. Few reports were found as contrary to the original findings on which they were based on. Almost one-fifth of the reports have no mention of the source, which denies access to the reader for the original report. Usually, any research or scientific study has its own limitations. But, this vital aspect is missing in the newspapers reports on nutrition research. Conclusions: With emphasis on short, "newsworthy" pieces, the media often only report the results of single studies, and many stories are chosen simply because the results run contrary to current health recommendations. Scientists need to help translate their research for consumers. Key words:, Print media, Nutrition, Research translation, Health communication.

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INTRODUCTION

Globally, Mass media are one among the most believable sources of health and nutrition information for people next only to medical sources (International food information council, 2007). Exposure to mass media may have a considerable impact on the eating habits of people (Heinz et al., 2009). Newspapers form an important part of mass media of health and are considered to be credible (Jones sources of nutrition and information by many people et al., 2008). A substantial proportion of health reports in newspapers today deals with topics related to diet and fitness (Maheshwar and Rao, 2012). Reporting on evolving diet and related health science issues presents a particular challenge for journalists as the public's thirst for this information grows (Gupta and Sinha, 2010; Hilbert and Reid, 2009; Motl et al., 2005).

News reports influence daily food and lifestyle choices

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(Houn et al., 1995; Abbasi, 1998). In India, the circulation of newspapers has increased to 34% between the year 2006 to 2010 and India is the biggest newspaper market in the world with over 108 million daily sales (WAN, 2012). In the south Indian city of Hyderabad alone, as per the audit bureau of circulation (ABC, 2010) of India, the top three English and Telugu (vernacular) dailies have huge circulation and readership figures. The top dailies in English were - Deccan chronicle (with a daily net paid circulation of 6,58,037 copies), The Hindu (4,52,096) and Times of India (1,97,911). Similarly the top circulation slots among the Telugu dailies were Eenadu (15,37,086 copies daily), Sakshi (13,38,845) and Andhra Jyothi (5,73,857) (ABC, 2010).

In a recent study that assessed the coverage of nutrition-related topics by print media in India, it was observed that at least 25% of news articles in English and regional language dailies on nutrition-related issues were referring to the findings of research papers published in peer reviewed journals (Maheshwar and Rao, 2011a). Many newspapers report the findings of research studies published in peer-reviewed medical/ nutrition journals or reports released or papers presented in conferences (Voelker, 1998). These reports act as bridge between scientific research and communications with the public. However, studies carried out in India as well as in other countries have reported that some of the news reports over or under-emphasized certain information in presenting the research results to the readers (Maheshwar and Rao, 2011b; Frost and Frank, 1997).

It was also observed that, few of the news reports lacked consistency in presenting the research results to the readers. Review of literature shows, previous studies on linkage between alcohol and cancer indicated these types of inconsistencies. In a particular year it was reported that, moderate drinking can increase the risk of breast cancer (Foreman,1978; Nelson,1987; Johnson,1987) and the next year it was also reported that there is no increased risk with moderate alcohol consumption (Edwards,1988; Kolata,1988). Another study highlighted health stories, with which consumers find most confusing (Princeton Survey for Rodale Press 1998). Stories about vitamins and supplements top the list, followed by nutrition stories. Consumers find it difficult to distinguish between public-interest trivia and information that actually warrants behavior change. Under these circumstances, the public are not only confused but, may even feel misguided (Angell and Kassirer, 1994). Given this, it is increasingly important to understand how the mass media "filter and translate scientific information".

But, in recent time, media is aim only for news that is hot and sells. Often, one gets sensational depiction of news stories (Maheshwar and Rao, 2011-a). Media's main goal, is to gain television rating points (TRPs), many issues are hyped for a day or two, flashing the stories with a sensational touch (Liberman, 2005). Some channels broadcast and publish the messages in such a manner that the real messages are left behind (Shakuntala and Johal, 2006). This could be attributed to variation in quality of reporting, which is determined by how accurately the scientific information is translated (Smith,1996). Factors such as accuracy, breadth and depth of reporting determine the quality of reporting (Begley and Cardwell 1996).

Hackman and Moe (1999) have developed scores to assess the quality of nutrition reports by considering factors such as background information, description of study population, results, citation of original article and author details etc. Two studies have developed quality scores based on the presence or absence of relevant background information, description of study population and results, critical evaluation of results, mention of principal author and interview with the author of the study or other authorities (Koren and Klein, 1991; Oxman et al, 1993). Furthermore, it is suggested that a critical piece of information for scientists to look for when evaluating newspaper reports is the citation of the original journal article in the newspaper report. This verifies that the article was based on a published study (Smith R 1996).

Although, there are studies in India that assessed the extent of nutrition related news reports in relation to the other reports in Indian newspapers (Maheshwar and Rao, 2011a; Gupta and Sinha, 2010), to our knowledge, there are hardly any studies that compared and assessed newspaper articles about nutrition-related research with the original journal articles/ research studies on which they are based. Earlier studies on the daily newspapers of the south Indian city of Hyderabad also found substantial differences in reporting of nutrition news in English and Vernacular dailies (Maheshwar and Rao, 2011a; 2012). The current study was conducted with an objective to evaluate the quality of newspaper articles that reported nutrition research as compared to the original journal articles/research reports on which they were based. We have also compared the extent of accurate reporting of nutrition research findings among various dailies.

MATERIALS AND METHODS

Study design: It was a prospective study conducted for a period of six months from 1st September, 2010 to 28th February, 2011.

Sample: Based on the circulation figures in the south Indian city of Hyderabad, six popular newspapers (three English + three Telugu) were selected for the study. During the study period, 179 issues of each of the six newspapers were published, making the total sample 1074. All the articles/ reports related to nutrition and food that were based on research studies were selected for the study using the following inclusion and exclusion criteria.

Inclusion: Articles/ reports/ news items based on findings from research studies on nutrition, food and dietetics either press releases from peer-reviewed journals or sourced from international news agencies (*example,* Reuters, Associated Press etc), foreign newspapers and magazines (*example,* New York times, Time etc,) or written by local journalists.

Exclusion: Editorials, commentaries, articles for debate and education, narrative reviews, letters to the editor, case reports and articles related to the local health sector and advertisements of nutritional products and services were excluded.

Analysis: The basic parameters that were considered for assessing the quality of the news reports were related to the traceability of the original research study (on which they were based) from information reported in the newspaper. The variables/scale constructed and reported by Hackman and Moe (1999) was adopted with minor modifications. The following were the variables considered and a score of "0" was assigned for 'No' and 1 for 'yes' –

(i) Sample size reported;
ii) Study population described;
(iii) Description of variables measured in the study provided;
(iv) Study design and analysis described;
(v) Limitations of the study, if any, reported;
(vi) Prime source of the report mentioned;
(vii) Only secondary source of the report mentioned;
(viii) News report based on a peer-reviewed study;
(ix) Headline reflects the original study accurately;
(x) Appeared on Page-One

Then through manual, library and internet search, the actual research studies which were traceable from the information provided in the newspaper articles were collected. Such newspaper articles were then compared with the relevant research article.

Statistical analysis

Descriptive statistics were calculated for all the ten variables of the study. Mean values of all these variables across the six newspapers were compared using *ANOVA*- F test with post- hoc tests of LSD (Least Significant Different) method. Level of significance was considered as 0.05.

RESULTS

A total of 214 news reports on nutrition research were identified in all the six newspapers *viz.,* Deccan Chronicle, The Hindu, Times of India, *Eenadu, Sakshi* and *Andhra Jyothi* during the study period. Overall, regional language (Telugu) newspapers published more reports (125) on nutrition research than the English dailies (89). Among the Telugu dailies, *Andhra Jyothi* published highest number (71) of nutrition research reports and *Sakshi* published the least in entire six months of the study period (table-1). Among the English dailies, Deccan Chronicle published more nutrition reports than the other two dailies (table-1).

More than 70% of all the nutrition research reports across the dailies were from secondary sources and fewer (<30%) were based on the primary source. Reports based on secondary sources mostly quoted only the names of the country or University where the research was carried out or foreign newspapers/news agencies like The Daily Mail, New York Times, and Washington Post as their source of information. Of the 22.5% of the reports which were based on the primary sources, over two-thirds were in English newspapers. Among the reports that were based on secondary sources, a few (6%) were even based on the claims made by public relations professionals of food and pharmaceutical industries quoting some research studies.

Only 15.7% of the English reports indicated the limitations of the respective research/ study, whereas none of the reports in Telugu dailies reported the limitations. About 45% reports in English dailies mentioned the sample size, whereas, only 30.4% of Telugu dailies reported this variable. Similarly, 47.1% reports in the English newspapers described the study population; 52.8% gave description of research variables and 57.3% described study design and analysis, whereas, in vernacular dailies only 31.2% reports stated about the study population; 39.2% mentioned about the research variables and 48.8% outlined the study design and analysis.

ANOVA- F test results show that out of 10 variables compared, 6 variables *viz.,*

(1)Sample size reported,
(2)Study population described,
(3)Limitations of the study,
(4)Prime source of the report mentioned,
(5)only secondary source mentioned and
(6)News Report based on peer-reviewed study, were found to be statistically significant among the newspapers.

When Post-hoc tests were conducted on these parameters, least significant difference (LSD) was revealed among the newspapers for each of the variable and the same have been indicated as superscripts in table1. It was observed that, English newspapers mentioned more number of variables, in each of the report compared to Telugu dailies (table-2). In all the three English dailies, almost a quarter of reports (23.5) consists more than 6 variables in each of the report, whereas it was only 1.6% in all the three Telugu dailies put together. Reports containing with only one variable of nutrition research is more (39.2) in Telugu dailies, compared to (29.2) English dailies. Of all the reports appeared in Telugu dailies put together, 67% of them quoted only three or less than three variables of the nutrition research, whereas in English dailies 61.5% of reports consists three or more than three variables.

When the newspaper reports were compared to the original articles on which they were based, it was observed that regional dailies exaggerated the findings and sensationalized the headlines, whereas only one report with exaggerated headline was found in English daily (Deccan Chronicle) during the study period. The headline in Deccan Chronicle read "Energy drinks can kill, warns study". However, the article reported a study that assessed the adverse effects of energy drinks on children who suffer from diabetes, seizures, cardiac abnormalities, or mood and behaviour disorders. The

Table 1. Percentage of news articles containing each of the 10 variables used to measure the accuracy of reporting.

S.No.	Variables in newspaper report	Overall *(Sub total 1+2)* N=214	*P value* (<0.05 Significant)	English Dailies			*Sub total-1 n=89*	Telugu Dailies			*Sub total 2 n=125*
				Deccan Chronicle n=41	The Hindu n=24	Times of India n=24		Eenadu n=42	Saakshi n=12	Andhra Jyothi n=71	
1.	Sample size reported	36.4	*0.002*	43.9[a]	20.8[a]	70.8[b]	*44.9*	33.3[a]	41.6[ab]	26.7[a]	*30.4*
2.	Study population described	37.8	*0.003*	46.3[ab]	25.0[a]	70.8[b]	*47.1*	30.9[a]	41.6[ab]	29.5[a]	*31.2*
3.	Description of variables measured in the study	44.8	*0.198 (N.S)*	56.1	37.5	62.5	*52.8*	40.4	41.6	38.0	*39.2*
4.	Study design and analysis described	52.3	*0.053 (N.S)*	65.8	33.3	66.6	*57.3*	40.4	50.0	53.5	*48.8*
5.	Limitations of the study reported	6.5	*0.000*	21.9[a]	4.1[bc]	16.6[ab]	*15.7*	0[c]	0[c]	0[cd]	*0*
6.	Prime source of the report mentioned	29.4	*0.000*	48.7[a]	29.1[ac]	70.8[b]	*49.4*	14.2[c]	33.3[ac]	12.6[cd]	*15.2*
7.	Only secondary source of the report mentioned	70.5	*0.000*	51.2[a]	70.8[ac]	29.1[b]	*50.5*	85.7[c]	66.6[ac]	87.3[cd]	*84.8*
8.	News Report based on a peer-reviewed study	22.5	*0.001*	34.1[a]	25.0[ac]	45.8[a]	*34.8*	9.5[bc]	33.3[ab]	12.6[bc]	*13.6*
9.	Headline does not reflect the original study accurately	97.2	*0.306 (N.S)*	97.6	100	100	*98.9*	100	91.7	94.4	*96.0*
10.	Appeared on Page one	0.9	*0.086 (N.S)*	2.4	0	0	*1.1*	0	8.3	0	*0.8*

N.S= Not Significant.
Note: Variations in superscripts indicates significance of mean differences across newspapers (P<0.05).

original study did not report the effects of energy drinks on normal kids. Similarly, in *Andhra Jyothi* some misleading headlines were - "*Tiffin maanesthe… Gunde Jabbu Khayam!*" (If you skip breakfast… you will surely get cardiac ailments); *"Meegada baaga thinte… Moothrasaya cancer guarantee"* (Cancer to Urinary bladder is guaranteed with more intake of cheese or milk cream); *"Choclates thinte pandlu thinnatley..!"* (Eating Chocolates is Equal to Fruits Intake); *"Suvaasanalathone kovvu karuguthundhi"* (Body Fat Dissolves by Fragrance).

However, they either over-emphasized one of the findings or misreported the results of the original studies. Similar findings were observed in *Sakshi* daily too. During the six-month period, only two research reports, one in Deccan Chronicle (English) and another in *Sakshi* (Telugu) appeared

Table 2. Percentage of news reports containing no. of variables in each report

S.No.	News Paper	7 variables reported	6 variables reported	5 Variables reported	4 Variables reported	3 Variables reported	2 Variables reported	Only 1 Variable reported
English Dailies								
1.	Deccan Chronicle n=41	2.4	14.6	26.8	14.6	9.7	12.2	19.5
2.	The Hindu n=24	0	16.6	4.2	8.3	8.3	8.3	54.2
3.	Times of India n=24	4.2	37.5	29.2	0	4.2	4.2	20.8
	Pooled (English Dailies) n=89	*2.2*	*21.3*	*21.3*	*8.9*	*7.8*	*8.9*	*29.2*
Telugu Dailies								
1.	Eenadu n=42	0	7.1	21.4	7.1	7.1	14.3	42.8
2.	Saakshi n=12	8.3	25.0	8.3	8.3	0	16.7	33.3
3.	Andhra Jyothi n=71	0	5.6	15.5	7.0	16.9	16.9	38.0
	Pooled (Telugu dailies) n=125	*0.8*	*8.0*	*16.8*	*7.2*	*12.0*	*16.0*	*39.2*
	Total (N=214)	1.4	13.6	18.7	8.0	10.3	13.0	35.0

on page one of the newspaper.

DISCUSSION

This article has attempted to evaluate the accuracy of newspaper reports based on scientific research articles using a 10 parameter scale and evaluated the relative accuracy in reporting in vernacular and English dailies. It was observed that less than a quarter of all the news reports had fulfilled at least half of the parameters that we considered were necessary for ensuring accuracy of reported nutrition research studies in newspapers. The current study indicates that the sample characteristics, methodology and study limitations are not routinely reported. These components are very critical for accurate understanding of the research results. Although, relatively higher number of reports in English dailies contained these components than the vernacular ones, Times of India accounted for maximum of such reports. Among the Telugu newspapers, not even a single report had quoted limitations of studies. Reporting these components was found to be limited in a similar study conducted by Hackman and Moe way back in 1999 in American newspapers. They found that only 43% descrybed the study population, 68% stated the sample and only 23% reported the limitations.

For the readers who might want to locate the original nutrition research studies, the current trend of reporting in the Indian newspapers provides very little scope. Unlike in the American dailies (Hackman and Moe, 1999), only about a third of the reports in the current study provided the primary source with significantly higher number of English dailies doing so than the Telugu newspapers. Headlines of some of the news reports have missed the real messages and highlighted inappropriate content, perhaps to grab the readers' attention. This observation was in concurrence with findings of an earlier study, which observed that the news headlines tend to focus on partial study results (Maheshwar and Rao, 2011a). Commenting on this trend, Hilbert and Ried (2009) in their research paper say, "With medicine being one of the most elusive, mysterious, and misunderstood fields in society, the press often has to unearth the answers to the questions many citizens have. The medical field is constantly pressured to find the next breakthrough and the next lifesaver, but when the slightest information is discovered, the news is everywhere, no matter how accurate the findings may be". This type of reporting may misinform the lay public and may lead to questions about the applicability of the results to individual patients (Motl et al., 2005).

Nutrition-related information portrayed by media, often over-emphasized and could confuse readers. Though, appearance of such kind of information is rare (about 4% in the current study), it cannot be ruled out as insignificant

since media have potential influence on readers. The use of exaggeration or slant (whereby some features are ignored and others are overemphasized) may be motivated by the conflicting expectations of readers and responsibilities of journalists (Condit, 2004). While the readers consider health and nutrition information that appears in daily newspapers authentic (Maheshwar and Rao, 2011b), reporters need to gain newspaper space (and ultimately an audience) for their topics, so they are prone to include, sensationalistic, absolutist or at least dramatic statements (Wilcox, 2003). This drive also conflicts with the norms of science journalism, which encourage cautious, detailed, balanced reporting, thus reflect the norms of the science that is covered (Jones *et al*, 2008).

The background and level experience of reporters (and scientists) influence the accuracy of reports. Many reporters with solid backgrounds in nutrition science present research findings correctly, in context, and with a clear indication of the relation of new findings to the existing body of research. Others, however, report new scientific findings without clearly indicating their limitations or inconclusiveness, which may lead consumers to act on information that change or that, is proven by further research to be inaccurate. Such developments fuel public confusion and the perception that nutrition information is unreliable and ever-changing (Nutrition Science Policy, 1996). The media's major obstacle in communicating science is a lack of understanding of the scientific process itself, especially among non-science writers. Journalists with science backgrounds may better understand that every new study is not necessarily news, but rather part of a larger process of discovery and debate. However, to a general assignment reporter who may not understand this process, each new study seems to provide newsworthy information and potential headlines (Sylvia B. Rowe 2002).

Most reporters work hard to keep their stories accurate. However, the media are in business to sell papers or attract viewers and listeners. To do so, they sometimes use headlines or story lead-ins with words such as "breakthrough" and "cure" to describe the findings of studies that may offer only preliminary results (Abbasi, 1998). These tactics may attract the audience, but they could be misleading, especially if the audience does not read or listen to the entire story (Frost and Frank, 1997). In addition, some media reports are sensationalized. For instance, some special interest groups promote their own agendas by citing statistics out of context or touting inaccurate and alarming data. The media present this information because of its shock value and audience appeal (Miller et al., 2002).

The process of conveying scientific information through the media has been likened to a "communications chain", which has the scientist on one end and the journalist who delivers the information on the other end. In between are several key players who may influence the end result, including editors, public affairs professionals, special-interest groups, and representatives of the food, pharmaceutical or supplement industries (Rowe, 2001).

Media reports about new nutrition research are abundant, but they may confuse the public when unqualified sources are quoted, findings are reported out of context, or results appear to contradict previous studies (Miller et al., 2006).

The media's major obstacle in communicating science is a lack of understanding of the scientific process itself, especially among non-science writers. Journalists with science backgrounds may better understand that every new study is not necessarily news, but rather part of a larger process of discovery and debate. However, to a general assignment reporter who may not understand this process, each new study seems to provide newsworthy information and potential headlines (Rowe, 2001).

CONCLUSION

From the present study, it can be concluded that important components of research studies that are critical for accurate and meaningful interpretation of nutrition related research - sample characteristics, study methodology, and study limitations- are not routinely reported. With emphasis on short, "newsworthy" or sensational pieces, the media often only highlight some results of the studies, and stories are chosen simply because the results run contrary to current health recommendations. The media will continue to be consumers' main source of nutrition information, and an important means for the nutrition scientists to help translate their research to the public. There is a need for synergetic efforts between journalists covering health topics and experts in the field of diet and nutrition, to avoid inaccurate information to the readers.

Conflict of Interests

The authors have not declared any conflict of interests.

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