

Television News Coverage of Obesity in China, 1982-2009

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Abstract

Objective The purpose of this study was to explore how obesity was covered in television news in China, including the trends over time and the characteristics of obesity-related news.

Methods The frame analysis was adopted to assess the content of obesity-related news broadcasted in China Central Television (CCTV) from 1982 to 2009. To investigate the characteristics of the news, the obesity-related news was divided into subgroups according to populations concerned, as well as the period in which the news was broadcasted. The differences between subgroups were examined.

Results A total of 1 599 pieces of news reported obesity, in which 1 278 pieces (79.92%) aired in “wealthy” period (2006-2009). More news was concerned with adults (1 134, 70.92%). “Individual behavior” dominated most of the cause frames (389, 24.33%), solution frames (522, 32.65%), and responsibility frames (860, 53.78%). There was more news mentioning individual factors in news aired in “wealthy” period and news concerning children. The coverage of social-structure causes was higher in news concerning children, while the coverage of social-structure solutions was higher in news concerning children and news aired in “wealthy” period.

Conclusion Although the coverage of obesity was modest, it showed an incremental trend as the economy grew. Obesity was mostly depicted as an individual problem in terms of responsibility, causes and solutions.

Key words: Obesity; Television; News; Frame analysis

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INTRODUCTION

News media is an influential and important source of health information^[1-2]. It shapes the audiences' perception of certain health issues by agenda setting and framing. In agenda setting, news media chooses which story to report and where to put the story^[3]; in framing, it highlights some aspects of the problem and weakens others^[4]. Studies have showed that media coverage has an effect on people's awareness of disease risks, behavior in disease screening^[5] and medication use^[6-9]. Media could also turn personal issues into public issues^[10] and furthermore, influence public

opinion^[11], social norms^[12] and policy making^[13-14].

While obesity is widely accepted as a consequence of unhealthy life styles, including poor dietary patterns and lacking of physical activities^[15], social-structural and environmental factors are now recognized as contributors as well^[16-17]. Television is always blamed not only for providing a kind of sedentary behavior, but also for the content of promoting unhealthy lifestyle. For example, advertisements in children's program are always about food that is high in calories and low in nutrients^[18] and slim characters in movies often consume unhealthy food and alcohol^[19].

As obesity becomes a global health problem^[15],

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it has increasingly attracted media attention since 2001^[20-21]. However, researches on obesity-related news are limited. A few researches have been done in print media^[14,22-29] and television news^[30-32] within developed countries. Up to the present, there has been no longitudinal study examining the coverage of obesity in television news in developing countries to our knowledge.

Facing urbanization and lifestyle transition, China has seen dramatically increased obesity prevalence in both adults^[33] and children^[34] in the

past few decades. In the meanwhile, the quantity of research papers worldwide and obesity-related information in television news in China have skyrocketed (Figure 1^[35-36]). An analysis of news coverage could give insights into the way how health issues are framed to improve communication^[37]. In a survey conducted by the National Health Council in fall of 2009, television was considered as the primary source of health information^[38]. So it is valuable to know how obesity is portrayed in television news.

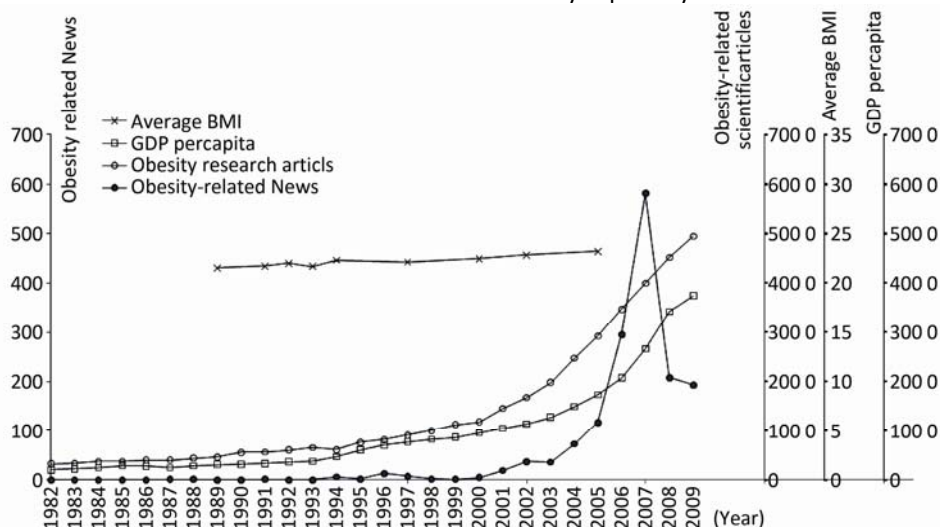


Figure 1. The trends of obesity-related news, obesity-related scientific articles, average BMI and GDP per capita in China. *Note.* 1. Data of obesity-related news was from CCTV News and Current Affairs Index. 2. Quantity of obesity-related scientific articles were from Pubmed (Search performed in December 2010)3. Average BMI of the Chinese people was calculated from the 2005 National Health and Nutrition Survey in China^[35] and the Report on the Second National Physical Fitness Surveillance^[36].

This study was initiated to describe the news coverage of obesity in television, as well as the trends of obesity reporting in China over 28 years (1982-2009). We aimed at identifying in the debate on obesity in television news, how the portray of obesity shifted as economy grew and living standard rose, what kinds of causes and solutions were presented, and who was considered to be responsible for the problem. We also analyzed the content of obesity-related news concerning different populations.

MATERIALS AND METHODS

Searching Strategy

The news was from the database of China Central Television (CCTV) News and Current Affairs

Index, which contained titles, abstracts, texts and broadcasting information of all the programs aired in the network from January 1, 1982 to December 31, 2009. CCTV was chosen because it reaches majority of audiences in China and its news and current affairs programs continuously receive high rating within the country^[39]. A search was performed in CCTV News and Current Affairs Index by using "obesity", "overweight", "fat", and "dieting" and "body weight" as keywords in titles, abstracts and texts of all the news aired in the study period. The search strategy was testified by manually checking in a pilot study and using a smaller database consisting of the random items from CCTV News and Current Affairs Index, to make sure that it could be sufficient to catch all the items concerned. Since the accumulated exposure to the information was considered to be essential^[40], we took every piece of

news related to obesity issue as a single item, no matter similar information had appeared in other news or not. Totally 1 599 pieces of news were collected.

Coding and Quality Control

The frame analysis was adopted to describe the content of obesity-related news, which used a coding form developed by authors and experts in relevant fields. The coding form was based on literature review and the objectives of this study. The structure of the coding form is shown in Figure 2. The coding form had been revised through the pilot study mentioned above to ensure that it could capture the content of each piece of news sufficiently. To minimize subjective judgment, all the items were dichotomous (0 or 1). One piece of news could be coded as “1” on multiple items, even apparently contradictory ones. Two trained coders independently reviewed the text of each piece of obesity-related news and did the coding job. Percentage of agreement (PA) and Kappa K statistic index were adopted to measure inter-coder reliability. After the preliminary coding, the two coders discussed the disagreement and reached a consensus, and finally gave one exclusive set of codes to each piece of news.

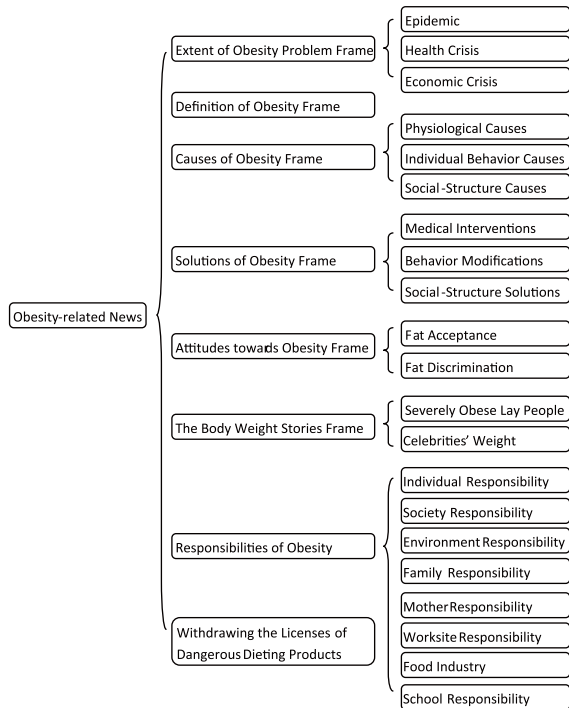


Figure 2. The structure of frames in obesity-related TV news.

To find out the trends of obesity-reporting over time and the characteristics of news talking about different populations, the obesity-related news was further divided into subgroups. The Engel’s law held that the proportion of income spent on food diminished as incomes increased^[41]. This proportion could reflect the living standards^[42]. Since the average proportion of total family income spent on food consumption in China fell below 40% in 2006^[43], we took this year as a cutoff point to divide the obesity-related news into “Moderate Wealthy Period” (1982-2005) and “Wealthy Period” (2006-2009) subgroups accordingly. The news was also divided into “Children” and “Adults” subgroups according to the target population.

Statistical Analysis

Data were analyzed with the Statistical Package for the Social Sciences (SPSS) for Windows, Version 13.0. Chi-square (χ^2) test was performed to analyze the differences between the subgroups. Significance was defined as $P<0.05$.

RESULTS

Among the 1 599 pieces of obesity-related news, a great part was aired in the 4 years of the “Wealthy Period” (1278, 79.92%), while about one fifth was aired in the 24 years of the “Moderate Wealthy Period” (321, 20.08%). There was more news talking about adults (1 136, 71.04%) than about children (463, 28.96%).

According to K classification by Landis and Koch, the inter-coder reliability of this study (Percentage of Agreement: 96.75%, $K=0.959$) achieved a substantial agreement ($K=0.81\sim1.00$)^[44]. The most frequently reported frame was “Solutions of obesity” (753, 47.09%), followed by “Extent of obesity problem” (541, 33.83%), “Causes of obesity” (429, 26.83%), “Withdrawing the licenses of dangerous dieting products” (274, 17.14%), “Body weight stories” (236, 14.76%), “Attitudes toward obesity” (96, 6.00%), and “Definition of obesity” (24, 1.50%). Individuals were considered to be responsible for obesity in more than half of the obesity-related news (860, 53.78%) (Table 1).

“Individual behavior causes” (389, 24.33%) dominated over 90% of the “Causes of obesity” frame while “Physiological causes” (66, 4.13%) and “Social-structural causes” (79, 4.94%) were mentioned far less frequently (Table 1). “An improper diet” (349, 21.83%), “Lacking of exercise”

(183, 11.44%), “Gluttony” (43, 2.69%), “Bad genes” (40, 2.50%), “Too much time spending at TV and computer” (39, 2.44%) and “Over burden of school works” (33, 2.06%) were the top five causes of obesity presented by the news media (Table 2).

Table 1. Proportion of News Stories Containing Different Frames

	Percentage of Total Amount (1 599)(%)
Extent of obesity problem	33.83
Epidemic	21.70
Health crisis	21.01
Economic crisis	3.38
Definition of obesity	1.50
Causes of obesity	26.83
Physiological causes	4.13
Individual behavior causes	24.33
Social structural causes	4.94
Solutions of obesity	47.09
Medical interventions	9.38
Behavior modifications	32.65
Social-structural solutions	13.07
Attitudes towards obesity	6.00
Fat acceptance	5.13
Fat discrimination	0.88
Body weight stories	14.76
Severely obese lay people	11.57
Celebrities	3.19
Withdrawing the licenses of dangerous dieting products	17.14
Responsibility	
Individuals	53.78
Society	9.51
Environment	3.25
Family	7.00
Mothers	0.60
Worksites	0.19
Food industries	3.56
Schools	3.30

In the news containing “Solutions of obesity” frame, over two thirds mentioned “Individual behavior modification” (522, 32.65%), nearly one third mentioned “Social-structural solutions (209, 13.07%) and less than one fifth mentioned “Medical interventions” (150, 9.38%) (Table 1). However, unlike the emphasis of dietary issues given on causes of obesity, news media took “Increasing physical activities” (373, 23.33%) as the primary way to resolve the problem. Other solutions included “Dietary solutions” (325, 20.33%), “Weight-loss surgeries” (85, 5.32%), “Health education campaigns” (61, 3.81%) and “Diet pills” (45, 2.81%) etc. (Table 3).

Table 2. The Causes of Obesity Presented in News Stories

	Number	Percentage (429) (%)
Individual causes		
Improper diet	349	81.35
Lacking of exercise	183	42.66
Too much time spending at TV/computer	39	9.09
Insufficient sleep	21	4.90
Sloth	15	3.50
Gluttony	43	10.02
Lacking of will-power	11	2.56
Physiological causes		
Bad genes	40	9.32
Social-structural causes		
Over burden of school works	33	7.69
High price of healthy food	8	1.86
Too many fast food restaurants	5	1.17
Modern life figured by home appliances and vehicles using	22	5.13
Prolonged working hours	13	3.03
Social economic status	3	0.70
Ethnic & race issues	3	0.70
The overflow advertisements of junk food	3	0.70
Education level	8	1.86
Insufficient or inaccurate health information	9	2.10
Social pressure	9	2.10
Insufficient space for physical activities	5	1.17

The aspects of reporting on obesity varied substantially between the subgroups. There were more reports talking about “Causes of obesity” ($P=0.001$), “Individual behavior causes” ($P<0.001$), “Social-structural solutions” ($P<0.001$), “Body weight stories of severely obese lay people” ($P=0.006$) and “Withdrawing the licenses of dangerous dieting products” ($P<0.001$), and fewer reports on “Economic crisis” ($P<0.001$), “Attitudes toward obesity” ($P<0.001$), “Fat discrimination” ($P<0.001$), “Body weight stories of celebrities” ($P<0.001$) in the “Wealthy Period” than in the “Moderate Wealthy Period”, and other frames evoked in these two periods showed no significant difference (Table 4).

In news stories concerning children, obesity was more likely to be portrayed as an epidemic ($P<0.001$), health crisis ($P<0.001$) and economic crisis ($P<0.001$). There were more reports on Causes of obesity ($P<0.001$), “Behavior modifications” ($P<0.001$) and “Social-structural solutions” ($P<0.001$), and fewer reports on “Definition of obesity” ($P=0.007$), “Medical interventions” ($P<0.001$), “Attitudes

toward obesity” ($P<0.001$), “Fat acceptance” ($P<0.001$) and “Withdrawing the licenses of dangerous dieting products” ($P<0.001$) in the children subgroup (Table 5).

Table 3. The Solutions of Obesity Presented in News Stories

	Number	Percentage (%) <i>(n=753)</i>
Individual solutions		
Dietary solutions	325	43.16
Increasing physical activities	373	49.54
Reducing television and computer use	7	0.93
Increasing sleeping time	10	1.33
Medical interventions		
Weight-loss surgeries	85	11.29
Diet pills	45	5.98
Chinese Traditional therapies such as massage or acupuncture	22	2.92
Staying on being motivated	31	4.12
Social-structural solutions		
Tax policies on food	21	2.79
Regulating advertisement on fast food or “junk food”	15	1.99
Improving neighborhood environment	30	3.98
Food labeling	31	4.12
Government offering low-price or freehealth food	9	1.20
Health education campaign	61	8.10
Increasing physical education	44	5.84
Government taking care of overweight children	14	1.86

DISCUSSION

Baseline Characteristics of the Middle-aged Group and the Elderly Group

This study presented a longitudinal analysis of obesity-related television news content in a developing country. In China, although the media tended to portray obesity as an epidemic health crisis and economic crisis, obesity received a modest coverage in television news. Among 2 436 609 pieces of news aired in CCTV from 1982 to 2009, only about 0.6‰ mentioned obesity in human race (1 599 pieces). Tobacco, a public health problem that was usually taken as an analogy while discussing obesity, received a similar amount of coverage. A

Table 4. Proportion of News Stories Containing Different Frames in Wealthy/Moderate Wealthy Period

	Percentage of news in Wealthy Period <i>(n=1 278)</i>	Percentage of news in Moderate Wealthy Period <i>(n=321)</i>
Extent of obesity problem		
Epidemic	22.14	19.94
Health crisis	21.13	20.56
Economic crisis	* 2.19	8.10
Definition of obesity	1.41	1.87
Causes of obesity	* 28.72	19.31
Physiological causes	4.38	3.12
Individual behavior causes	* 26.21	16.82
Social-structural causes		
Solutions of obesity	47.97	43.61
Medical interventions	9.00	10.90
Behavior modifications		
Social-structural solutions	* 14.71	6.54
Attitudes towards obesity		
Fat acceptance	4.62	7.17
Fat discrimination	* 0.23	3.43
Body weight stories		
Severely obese lay people	* 12.68	7.17
Celebrities	* 2.03	7.79
Withdrawing the licenses of dangerous dieting products	* 18.94	9.97

Note. * indicate that distribution of the coverage of a given item was significantly different at $P<0.05$ between the subgroups.

simple search in the same database indicated that there were 1 767 pieces of news containing the word “tobacco” or “smoking”. On the other hand, infectious diseases attracted higher media interest in television news. For example, there were 7 991 pieces of news reporting SARS, 6 409 pieces reporting avian influenza and 3 058 pieces reporting AIDS in CCTV during the same study period.

The first obesity-related television news appeared in 1987. Afterwards, there were scattered reports between 1988 and 2002 with the average annual number below 5 pieces. Since 2003, the coverage of obesity in television news had increased rapidly at a speed of almost two folds each year until 2007, and then it fell to about 200 pieces per year in

Table 5. Proportion of News Stories Containing Different Frames in Children/Adults Subgroup

	Percentage of News Concerning Children (<i>n</i> =463)	Percentage of News Concerning Adults (<i>n</i> =1136)
Extent of obesity problem	* 62.80	21.96
Epidemic	* 53.55	8.64
Health crisis	* 29.68	17.46
Economic crisis	* 6.24	2.20
Definition of obesity	* 0.22	2.03
Causes of obesity	* 58.06	14.02
Physiological causes	* 8.60	2.29
Individual behavior causes	* 54.62	11.90
Social-structural causes	* 11.40	2.29
Solutions of obesity	* 67.31	38.80
Medical interventions	* 2.80	12.08
Behavior modifications	* 52.69	24.43
Social-structural solutions	* 31.61	5.47
Attitudes towards obesity	* 1.29	7.94
Fat acceptance	* 0.22	7.14
Fat discrimination	1.08	0.79
Body weight stories	12.69	15.61
Severely obese lay people	12.69	11.11
Celebrities	0.00	4.50
Withdrawing the licenses of dangerous dieting products	* 0.22	24.07

Note. * indicate that distribution of the coverage of a given item was significantly different at $P<0.05$ between the subgroups.

2008 and 2009. The reporting of obesity in China showed a similar trend as in developed countries^[24-25,32]. There were many factors that might impact on obesity reporting. In a frame analysis of print media and evening television news, Lawrence stated that the reporting of obesity mirrored the growth of obesity in the real-world^[31]. Saguy argued that the reporting of obesity was driven by scientific studies^[24]. In this study, as shown in Figure. 1, while the average BMI of the Chinese people increased slightly, the curves of obesity-related news, GDP, and obesity-related scientific articles showed similar incremental patterns over time until 2006, but in 2007 it seemed that the peak of obesity reporting

could not be explained by any factor listed in Figure 1. Considering journalists' pursuit of newsworthiness, including prominence, human interest, drama, timeliness, relevance, unusual phenomena and proximity^[45], some events in 2007 might result in the intensive reporting, for example, the release of Reports of Chinese Students Fitness Survey (47 pieces), the withdrawing of a dieting herbal tea product (109 pieces) and the ban on size 0 model in several European countries (21 pieces). The decline after the peak of obesity reporting was also found in the United States of America and France^[25-26], but there seemed to be no persuasive explanation of this phenomenon.

In Chinese TV news, the coverage of individual behavior /social-structural causes and solutions all increased from the "Moderate Wealthy" to the "Wealthy" period, although the incremental trend of "social-structural causes" and "individual behavior modification" frames was not significant. It suggested that the content of news had become more complex over time. Other studies have found that the social-structural, or systemic frames of obesity had expanded over time in news media in developed countries, but the trend of individual behavior frame varied^[28,31-32].

In this study, the news media's emphasis on individual responsibility was consistent with previous studies in western countries such as Australia^[30] and the United States of America^[27,31]. Other frames of responsibilities commonly seen in western news media, such as the culture of sloth and a sedentary lifestyle, social economic status, ethnics, obesogenic environment, abundance of food made by the industries, and parent/family blaming^[22,27,31], were not so often evoked in this study samples.

Individual behavior was stressed as the most important cause of obesity by Chinese TV news despite the fact that the coverage was less intensive than that in American and French print media according to percentage^[28]. In China, the leading discourse of causes of obesity in TV news was improper diet followed by lacking of exercise and too much time spent at TV/computer. It was partly consistent with previous studies which found that news media tended to blame individuals for unhealthy eating, minimal physical activities and poor decision making^[24,27]. However, other factors such as sloth, gluttony and lacking of willpower, which also received lots of attention in western news media, were mentioned less frequently in Chinese TV news^[26].

The report on physiological causes such as genes varied in different studies. A frame analysis about five highest circulating dailies found that genetics was mentioned most often as a contributory cause of obesity^[23]. Other studies found that biological causes were mentioned in only a quarter of the news articles or less in television and print media^[28,32]. In China, the reports on physiological causes, including genetic factors, were sparse.

Social-structural frames such as social economic status, education backgrounds or neighborhood environment were always evoked when causal factors concerning ethnic minorities and the poor in USA and France were talked about^[26-27], but these factors received far less media attention in Chinese TV news. Over burden of school works, modern life figured by home appliances and vehicle using, and prolonged working hours were the dominant discourses of social-structural causes.

Again, the individual behavior frame was reinforced in the television news when it discussed solutions of obesity. Although the percentage of behavior modifications coverage was a little lower than that in American and French print media^[28], it was still the primary solution of obesity. This tendency of emphasizing individual exertion in obesity management was consistent with findings of previous studies^[22,24]. There were still some differences. For example, the most common solution in Australian^[30] and American^[32] television news was a healthier diet, while in Chinese TV news, increasing physical exercise appeared most frequently as a remedy. Being famous for the traditional cuisine, French print news always emphasized a traditional way of eating^[28], whereas in Chinese TV news there were only 17 pieces mentioning a traditional Chinese plant-based dietary pattern.

The hot social solutions in western news media such as "regulating advertisement on fast food or junk food" and "better school lunch"^[14,29,46] were not so widespread in Chinese television news, other solutions such as "increasing physical education", "health education campaign", "food labeling" and "tax policies on certain food" were more common. In American news, the discussion of social-structural and medical solutions always fell back to individual exertion^[22,27,31]. In Chinese TV news, this situation also existed. Nearly a quarter of the news stories that discussed medical solutions and over a half of the news stories that discussed social-structural solutions mentioned individual behavior modification simultaneously.

As news in western countries^[27], obesity was usually presented as epidemic and health crisis in Chinese television news. Despite the intensive reporting on the extent of the obesity problem, "Guidelines for Obesity Control and Prevention in Chinese Adults" (issued by the Ministry of Health of the People's Republic of China) and "Dietary Guidelines for Chinese Residents" (issued by the Chinese Nutrition Society) were not mentioned in any news stories in conjunction with obesity. Media could influence people's health-related behaviors. It could engage in public health campaigns by raising population's awareness and disseminating credible information. More collaboration of mass media and guideline makers would be welcomed in the health communication and promotion field.

We found that in Chinese television news, the coverage of individual behavior causes and solutions in news concerning children both exceeded the counterparts in news concerning adults. It was not consistent with previous studies which suggested that, the crusade against childhood obesity always focused on social-structural factors such as obesogenic environment^[31], the fast food or junk food industries, the school meals and ignoring parents, especially mothers^[27,29,32,47]. It was widely accepted that children should not be blamed for being obese. They were sympathetic because their behavior were affected or even determined by family and environment. A number of researches had found that environment, including accessibilities of food^[48-49], neighborhood safety^[50] and space for physical activities^[51-54], was associated with weight status or lifestyle related to obesity in both children and adults. Government actions were powerful to foster environmental change. For example, the Columbus Healthy Places (CHP) program established by the public health department in Columbus, Ohio, increased the active transportation components in development applications^[55]. Media could influence legislation and policy. By addressing obesity in public agenda and reframing the social aspect of the problem, media could assist in shifting the public attention upstream from individual responsibility to shared responsibility, thus promoting environment optimization. The experience of media movement in tobacco control and anti-alcohol abuse could be adopted in tackling obesity.

There were several limitations of the present study. First, we did not include several local television networks which could reach audiences all over the country by satellites. Second, the obesity

issues in other television programs, such as talk shows, soap operas, movies, as well as non-program time content, such as advertisements, were not measured in the study, which might also influence the audiences' perception. Third, this study did not examine the news in print media, where portrays of obesity might be different.

The importance of social-structural factors in obesity was well established, but the reporting in Chinese television news was partial to individual frames. Although people felt ambivalent about the society's role in obesity prevention, the government's effort was welcomed^[56]. Media advocacy could be deployed to reframe the obesity problem in social agenda and address the importance of social-structural and environmental amelioration. Future researches might lie in how the news media should communicate with policy makers and what kind of information should be conveyed by the media in order to tackle obesity effectively.

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CONFLICT OF INTEREST

There are no competing financial interests in relation to the work described.

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