

News Media Coverage of E-Cigarettes: An Analysis of Themes in Chinese Newspapers

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News media play an important role in shaping public perceptions of e-cigarettes and influencing relevant policies. This study aims to describe the prominent themes in the Chinese newspaper reporting of e-cigarettes and examine how the salience of themes changed over time. Quantitative content analysis and qualitative thematic analysis of 639 e-cigarette-related news stories from 2014 to 2019 were conducted. Seven themes were found: health impact, usage, smoking cessation, youth, regulation, industry development, and description of e-cigarettes, with industry development being a unique theme in Chinese newspapers compared with newspapers in other countries. Although the health impact theme remained dominant throughout all time periods, the other themes showed different salience at different time periods, and e-cigarette reports increasingly focused on regulation in recent years. Frequent reporting by Chinese newspapers on e-cigarette-related research, legislation, and social problems in other countries, based on foreign media coverage, might point at an international media agenda setting effect.

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Despite ongoing debates, electronic cigarettes (e-cigarettes) continue to grow in popularity worldwide (Brown et al., 2014; Yates et al., 2015). Although some have argued that e-cigarettes are safer alternatives to combustible cigarettes, and an effective adjunct in smoking cessation (Bullen et al., 2013; Polosa et al., 2011), others have pointed out that there has been no conclusive scientific evidence showing e-cigarette use results in long-term smoking cessation in the population (World Health Organization [WHO], 2008) and that many e-cigarette products contain chemical substances known to be toxic or carcinogenic (Cheng, 2014). Furthermore, e-cigarette use among youth is associated with subsequent use of combustible cigarettes (Cobb & Abrams, 2011) and with endorsing positive perceptions of e-cigarettes including their being helpful in reducing or quitting smoking, as a safer and healthier alternative to conventional cigarettes, having better and more flavors, being fashionable, and being convenient in places where smoking is prohibited (Adkison et al., 2013; Dockrell, Morrison, Bauld, & McNeill, 2013; Hummel et al., 2015; Zhu et al., 2013). The public most frequently accesses information about issues and events through the media (Wise & Brewer, 2010). Yates and colleagues' study further confirmed the importance of news influencing perceptions about e-cigarette use (Yates et al., 2015). In addition, Cook and colleagues (1983) found that for governmental policy elites, both their perception of importance placed on an issue and their perception of the need for policy action were affected by news coverage. Therefore, examining media coverage of e-cigarettes can provide valuable information to understand how and why the public perceive and use e-cigarettes, and offer insight into regulations of the e-cigarette products by the government.

China produces 95% of the world's e-cigarettes (Eriksen, Mackay, Schluger, Gomeshtapeh, & Drope, 2015), and has had a rapid increase in e-cigarette sales, awareness, and use. In 2017, China's e-cigarette sales were about 590 million U.S. dollars, a 25.30% increase compared with 2016 (He, Lin, Ju, & Chen, 2020). Data from Chinese Center for Disease Control and Prevention (CCDC, 2019) shows increasing proportions of the population have heard of and used e-cigarettes since 2015. Though it was initially export-driven, China's e-cigarette industry has increasingly made inroads into the domestic market in recent years. Figures for the first three financial quarters of 2019 showed a 175% increase in domestic sales (MacKenzie, Fang, & Smith, 2020). Although there is more academic attention to e-cigarettes in China, media communication about e-cigarettes in China is still under-studied. In China, e-cigarettes are not clearly defined or well-regulated products: they are neither classified as tobacco nor drugs. The regulation around e-cigarettes has been limited. Therefore, media portrayals of e-cigarettes may have a substantial impact on the public's awareness of, perception of, attitude toward, and behaviors related to e-cigarettes, and may also exert influence on the legalization of e-cigarettes. As such, an in-depth and timely study of news media representations of e-cigarettes is relevant, especially considering that e-cigarettes have gained escalating attention from the WHO due uncertain effects on health (WHO, 2020), and China has been accelerating its e-cigarette regulations (State Administration for Market Regulation [SAMR], 2018, 2019). However, to the best of our knowledge, there has been only limited research on e-cigarette-related mass media, and the most recent study analyzed data before March 2016 (Sun, Veltri, & Wang, 2018), much earlier than regulation of e-cigarettes in China (SAMR, 2018). To fill this knowledge gap, we used quantitative content analysis and qualitative thematic analysis to examine Chinese newspaper reporting on e-cigarettes from 2004 to 2019 (i.e., from the first e-cigarette news article in Chinese newspapers through the date when this study began) to explore longitudinal changes in theme

frequency, and to provide a thick description of the themes in e-cigarette-related reporting. Specifically, this study aims to answer the following two research questions:

RQ1: What are the themes in e-cigarette-related news coverage?

RQ2: How did the salience of themes change in Chinese news media from 2004 to 2019?

Literature Review

Agenda-Setting Theory

Agenda-setting theory argues that media influence the public by setting the public agenda in terms of designating important issues to think about (McCombs & Shaw, 1972). Media also influence the policy agenda, that is, issues that policymakers such as legislators consider important (Dearing & Rogers, 1996). Though originating from political event studies, the agenda-setting effect was also found in nonpolitical issues (Pratt, Ha, & Pratt, 2006; Yanovitzky, 2002), including health issues (Albalawi & Sixsmith, 2015). Notably, agenda-setting theory rests on two fundamental assumptions: (1) media do not reflect reality but filter and shape it before presenting it to the public, and (2) the more attention media give to an issue, the likelier it is that the public will consider that issue to be important (McCombs, 2005; McCombs & Shaw, 1972). As e-cigarettes have been exerting an increasing impact on the Chinese society in many aspects, such as the economy (MacKenzie et al., 2020), public health (CCDC, 2019), and youth tobacco use (Wang, Zhang, Xu, & Gao, 2019), attracting much attention from both the public and the government (SAMR, 2018, 2019), it is increasingly important to conduct research on media coverage of e-cigarettes in China.

Media Studies of E-Cigarettes in Other Countries

A series of analyses on media coverage of e-cigarettes have been conducted in many countries. Rooke and Amos (2014) examined how e-cigarettes were presented in the U.K. and the Scottish newspapers. Their content analysis of 119 articles between 2007 and 2012 revealed five key story themes: healthier choices, getting around smoke-free policies, celebrity use, price, and risk and uncertainty. In a content analysis of U.S. newspapers, Yates and colleagues (2015) found a series of topics, such as description of e-cigarettes, policy/regulation, benefits of e-cigarettes, drawbacks of e-cigarettes, increasing popularity, and more knowledge needed that emerged from the media coverage of e-cigarettes. Similarly, a content analysis of news coverage in South Korea showed that the most frequently appearing topic was regulations, followed by the topics of health effects, law enforcement, youth, usage, e-cigarette content, safety, and description of e-cigarettes. Although previous studies have similarly found increasing media reporting on e-cigarettes and similar themes across countries, such as the health-related theme, description of e-cigarettes, policy and regulation, and risk and safety, differences have also been discerned: In the U.K. and Scotland, positive coverage of e-cigarettes as a less harmful alternative to cigarettes was found to be dominant in newspapers (Rooke & Amos, 2014); in contrast, South Korean news media were likelier to talk about health risks than benefits (Kim, Thrasher, Kang, Cho, & Kim, 2017), and in the United States, a mixed or neutral view was identified in a majority of the news articles (Yates et al., 2015). In addition, the South

Korean and American media both showed a focus on e-cigarette regulation coverage with regulation of e-cigarettes being the most common topic (Kim et al., 2017; Yates et al., 2015).

Media System and Ecology in China

Media in China have been long considered as the mouthpiece of the government because the government owns and subsidizes the overwhelming majority of the media (Repnikova, 2017). Since the late 1970s, economic reform introduced commercialization and decentralization to the Chinese media (Sukosd & Wang, 2013). As a result, media gained more flexibility and freedom (Duan & Takahashi, 2016). Even so, media censorship and self-censorship are pervasive in China (Hassid, 2020). Because of the unique media system and ecology in China, and China's special status in the e-cigarette industry as the world factory of e-cigarettes, we hypothesized that the newspaper coverage of e-cigarettes in China should demonstrate its uniqueness in addition to sharing common themes with many other countries. In addition, with the rising domestic market and e-cigarette legislation since 2018, we hypothesized that the salience of the themes identified in Chinese news media should change over time with substantial change happening in recent years.

Methods

This study used quantitative content analysis to identify the themes emerging from the Chinese newspapers' e-cigarette-related reporting and to examine changes in frequency of the themes over time, and further used qualitative thematic analysis to provide a thick description of the themes (Braun & Clarke, 2006). Newspaper was chosen as the medium to examine for the following reasons: First, previous studies found that social media are likelier to influence newspapers' agenda in terms of breaking news, while, during nonbreaking news periods, newspapers are likelier to lead social media's agenda in terms of ongoing discussions about an issue (Su & Borah, 2019), such as e-cigarettes; second, in China, commercial news websites and social media have limited privilege to produce their own news stories, therefore, Internet and social media are more reliant on traditional media such as newspapers and relay news from traditional sources (Han, Sun, & Lu, 2017). Thus, though social media use is increasing, newspapers are still the primary choice for analysis of media coverage on issues, as newspapers often set the agenda for other formats and are easy to access and search (Hughes, Lancaster, & Spicer, 2011).

Using key words "Dian Zi Xiang Yan" and "Dian Zi Yan" (Chinese translations of e-cigarettes), we searched all the news articles about e-cigarettes in mainland Chinese newspapers in the Wisenews database, which is a full-text Chinese news database widely used and accepted as a rigorous database to examine Chinese media coverage (Lin, Guo, & Chen, 2013; Lyu, 2012). The analysis included articles from March 6, 2004 (when the first articles about e-cigarettes appeared in China), to July 31, 2019, when this study started. After eliminating articles that mentioned e-cigarettes only in passing ($n = 547$) and unrelated stories ($n = 80$), a total of 639 news articles from 124 newspapers were included in the analysis. Among the 124 newspapers, 19 are party newspapers (13.6%; $n = 87$), while the other 105 newspapers (86.4%; $n = 552$) were market-oriented newspapers. Although both party newspapers and market-oriented newspapers are state-owned, the latter are more liberal and critical than the former (Zhang & Su, 2012). Therefore, our data may reflect more perspectives of liberal newspapers than the party newspapers. Among the articles analyzed, 398 (62.3%) were news articles and 241 (37.7%) were opinion pieces.

To generate the themes and theme coding, this study used a combination of deductive and inductive approaches. Based on the existing literature on e-cigarette media coverage in other countries (Kim et al., 2017; Rooke & Amos, 2014; Yates et al., 2015), and a preliminary reading of 200 news articles that were randomly selected from the sample (i.e., 31% of the included articles), one author (DW) generated a list of 16 subthemes. All the authors discussed the subthemes, reread the articles, and combined the 16 subthemes into seven themes. Several iterative cycles of rereading and refining the themes and subthemes were performed to finalize the code book. Two trained graduate students coded all the articles for the presence of each of the 16 subthemes. Each article was coded for the presence of subthemes, which were subsequently grouped into themes. The operationalization of the subthemes is shown in Table 1.

Table 1. Operationalization of Subthemes.

Themes and subthemes	Examples of statements fitting each subtheme
Health impact	
Healthiness of e-cigarettes	E-cigarettes are not harmful. E-cigarettes have health hazards.
Healthiness of e-cigarettes in comparison to cigarettes	E-cigarettes are less harmful than traditional cigarettes.
Health impact of secondhand smoke of e-cigarettes	Secondhand smoke of e-cigarettes contains toxic and hazardous substances.
Addiction to e-cigarettes	E-cigarette vaping is not addictive.
Usage	
Safety of e-cigarette use	E-cigarettes can explode.
Freedom to use e-cigarettes anywhere	E-cigarettes are not banned in public places.
Consumer feelings and experiences with use	The taste of e-cigarettes is good.
Smoking cessation	
E-cigarette effectiveness for smoking cessation	E-cigarettes can help people quit smoking.
Youth	
Impact on adolescents and youth	E-cigarette vaping can lead youth to try other tobacco products.
Regulation	
E-cigarette regulation and enforcement	Police cracked down illegal e-cigarettes sales.
E-cigarette legislation and policy in China	Shenzhen banned e-cigarette vaping in public places.
E-cigarette legislation and policy outside China	E-cigarettes were added to New York's Clean Indoor Air Act.
Industry development	
E-cigarette industry overall financial prospects	Investors were optimistic about e-cigarette industry.
Individual e-cigarette brand stock forecasts and descriptions	An e-cigarette company's stocks rose.
Description of e-cigarettes	
Characteristics of e-cigarette brands	Ruyan ² offers four options of nicotine concentration: high, medium, low and no.
Introduction to how e-cigarettes work	It controls the output of smoke through high-tech silicon chips and an airflow sensor.

² The first e-cigarette brand in China.

When a subtheme was mentioned, it was coded as 1; otherwise, it was coded as 0. When an article mentioned more than one subtheme, all the mentioned subthemes were coded as 1. When any of the subthemes within a theme was mentioned, the theme was coded as 1. Both positive and negative valence statements were included within each subtheme; for example, statements that "e-cigarettes are safe" and statements that "e-cigarettes can explode" were both coded and included in the "Safety of e-cigarette use" subtheme. To check the intercoder reliability, a random subsample of 209 articles (33%) were double-coded. The level of agreement was high, with Krippendorff's alpha ranging from .84 to 1.0 for each of the seven themes. After coding, qualitative analysis was conducted following this procedure: Under each theme, news articles were organized in chronological order. DW first read through the articles to provide a general description of the theme and identified several representative news articles under the theme, and characterized the possible changes over time. Then the articles were reorganized by subthemes (also in chronological order) to enable a close examination of each subtheme. Regular discussion with JL and consultation with PL were conducted to refine the analysis and to ensure news articles quoted as examples were representative of the themes. Following Rooke and Amos's (2014) thematic analysis of newspaper coverage of e-cigarettes in the U.K. and Scotland, quotes with news sources and dates are provided in the section of results to illustrate each theme.

Results

Table 2 shows the frequency and percentage of each theme and subtheme in the total of 639 articles analyzed. The most frequently mentioned theme was health impact (63.5%), followed by regulation (53.2%), usage (40.8%), smoking cessation (23.2%), youth (22.1%), industry development (18.6%), and description of e-cigarettes (18.2%). In addition, as can be seen in the column of "total each year" in Table 3, the number of media reports on e-cigarettes in Chinese newspapers increased from 2004 to 2019, particularly after 2013. In 2004, there were 22 news articles about e-cigarettes, whereas in the first seven months of 2019, there were already 112 news articles appearing in newspapers. Fluctuations were also observed with a surge happening since 2018.

Table 2. The Frequency and Percentage of Themes and Sub-themes in Chinese Newspaper Articles, 2004–2019.

Themes and subthemes	Frequency	
	(# of articles)	Percentage*
Health impact	406	63.5
healthiness of e-cigarettes	346	54.1
healthiness of e-cigarettes in comparison to cigarettes	138	21.6
health impact of secondhand smoke of e-cigarettes	6	0.9
addiction to e-cigarettes	93	14.6
Usage	261	40.8
safety of e-cigarette use	61	9.5
freedom to use e-cigarettes anywhere	165	25.8
consumer feelings and experiences with use	141	22.1
Smoking cessation	148	23.2
e-cigarette effectiveness for smoking cessation	148	23.2
Youth	141	22.1
impact on adolescents and youth	141	22.1
Regulation	340	53.2
e-cigarette legislation and policy in China	207	32.4
e-cigarette legislation and policy outside China	136	21.3
e-cigarette regulation and enforcement	72	11.3
Industry development	119	18.6
e-cigarette industry overall financial prospects	115	18.0
Individual e-cigarette brand stock forecasts and descriptions	29	4.5
Description of e-cigarettes	116	18.2
characteristics of e-cigarette brands	95	14.9
introduction to how e-cigarettes work	21	3.3

*Note. The percentage = frequency/the total number of articles (i.e., N = 639).

Table 3 shows how salience of themes, which was reflected by frequency, changed over time.

Table 3. Proportions of Each Theme from 2004 to 2019.

Year	Health Impact	Usage	Cessation	Youth	Regulation	Industry development	Description	Total each year
2004	19 (86.4)	13 (59.1)	14 (63.6)	0 (0)	0 (0)	1 (4.5)	20 (90.9)	22
2005	38 (95)	28 (70)	21 (52.5)	0 (0)	4 (10)	3 (7.5)	33 (82.5)	40
2006	16 (94.1)	14 (82.4)	7 (41.2)	0 (0)	3 (17.6)	0 (0)	15 (88.2)	17
2007	10 (62.5)	13 (81.3)	7 (43.8)	0 (0)	13 (81.3)	0 (0)	5 (31.3)	16
2008	11 (55)	7 (35)	4 (20)	0 (0)	5 (25)	2 (10)	9 (45)	20
2009	11 (91.7)	6 (50)	3 (25)	6 (50)	4 (33.3)	0 (0)	0 (0)	12
2010	17 (94.4)	7 (38.9)	9 (50)	2 (11.1)	5 (27.8)	2 (11.1)	6 (33.3)	18
2011	23 (62.2)	11 (29.7)	11 (29.7)	0 (0)	17 (45.9)	5 (13.5)	4 (10.8)	37
2012	10 (62.5)	10 (62.5)	6 (37.5)	2 (12.5)	4 (25)	1 (6.3)	2 (12.5)	16
2013	29 (58)	15 (30)	5 (10)	5 (10)	26 (52)	22 (44)	1 (2)	50
2014	38 (52.1)	23 (31.5)	3 (4.1)	26 (35.6)	38 (52.1)	38 (52.1)	4 (5.5)	73
2015	31 (53.4)	14 (24.1)	7 (12.1)	23 (39.7)	25 (43.1)	8 (13.8)	8 (13.8)	58
2016	15 (53.6)	5 (18)	6 (21.4)	7 (25)	15 (53.6)	3 (10.7)	5 (17.9)	28
2017	18 (62.1)	11 (38)	4 (13.8)	7 (24.1)	21 (72.4)	6 (20.7)	0 (0)	29
2018	47 (51.6)	36 (39.6)	14 (15.4)	21 (23.1)	65 (71.4)	5 (5.5)	2 (2.2)	91
2019	73 (62.5)	48 (42.9)	27 (24.1)	42 (37.5)	95 (84.8)	23 (20.5)	2 (1.8)	112
Total	406 (63.5)	261 (40.9)	148 (23.2)	141 (22.1)	340 (53.2)	119 (18.6)	116 (18.2)	639

Note. (N = 639). Values in parentheses represent percentage of articles in that year with the theme.

The change is also illustrated in Figure 1. The theme of health impact was generally the most salient theme from 2004 to 2019. Another constantly salient theme was usage. Description and cessation were among the top four most frequently mentioned themes in the first three years (i.e., 2004–2006), but they began to decline significantly after 2006 and 2007 respectively. In contrast, the regulation theme kept increasing over the years and has become the dominant theme since 2017, with 84.8% of news articles having this theme in 2019. In most years, the industry theme experienced fluctuation with its peaks in 2013 and 2014. Notably, the theme of youth didn't emerge until 2009 but appeared frequently in news articles after 2014.

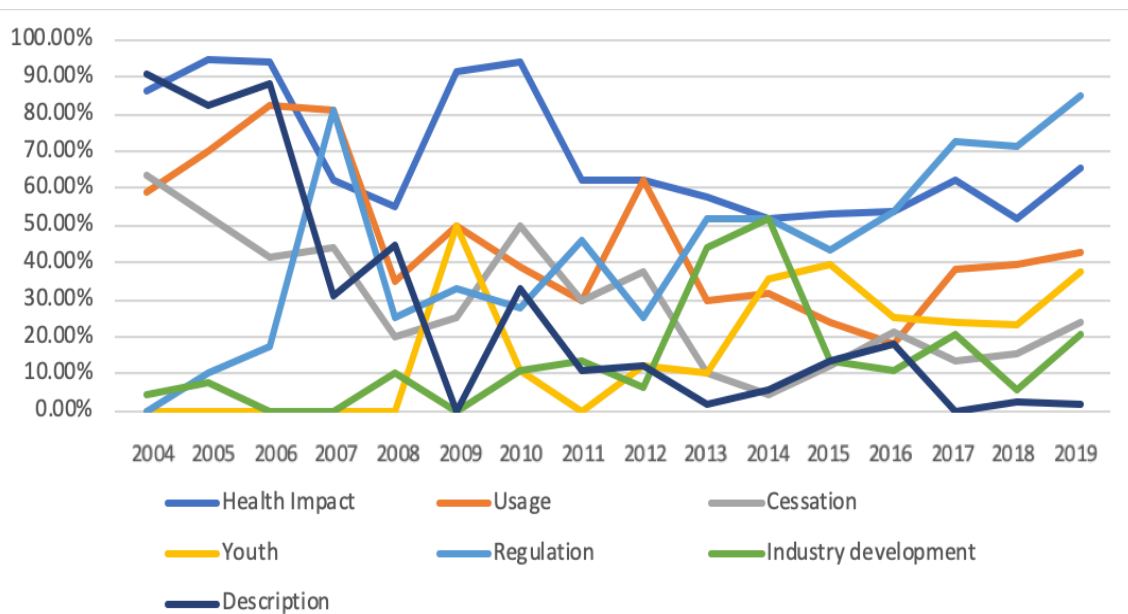


Figure 1. The percentage of the seven themes in the Chinese newspapers, 2004–2019, (n = 639).

Health Impact

The most commonly mentioned theme in media reporting about e-cigarettes was the health impact of e-cigarettes, and this theme frequently appeared in news reporting every year in the 16-year timeframe. In 2004, when e-cigarettes first entered the consumer market, they were presented as completely harmless and a healthy alternative to combustible cigarettes. For example, Beijing Science and Technology News reported that “it (the e-cigarette) does not contain tar or harmful components that stimulate the respiratory tract. Non-combustion avoids the formation of harmful chemicals. E-cigarettes allow smokers to enjoy the fun of smoking under the premise of being healthy” (Luo, 2004, p. C4).

But only one year later, in 2005, stories began to mention the harmful impact of e-cigarettes on health. For example, it was reported that, like cigarettes, Ruyan also contains nicotine, and if nicotine is present, there is harm to the human body (“Ruyan Niguding,” 2006). With the passage of time, more and more articles presented the harm of e-cigarettes to health. However, when comparing the healthiness of e-cigarettes to cigarettes, reports tended to present e-cigarettes as less harmful than cigarettes. A report issued by Public Health England (PHE) stating that e-cigarettes are 95% less harmful than tobacco was cited repeatedly by media from August 2015 through 2019. In some articles, the general healthiness of e-cigarettes and the relative healthiness of e-cigarettes compared with cigarettes were mentioned simultaneously.

The report stated that e-cigarettes are 95% less harmful than tobacco and will be a “weapon” for smokers to quit smoking. [. . .] there are many debates about cigarettes and e-cigarettes abroad. No matter which side wins the debate, it can only be regarded as the lesser of two evils. (“Dianziyan Zhende,” 2015, p. B13)

The health impact theme also included mentions of the health impact of secondhand aerosol and addiction to e-cigarettes. E-cigarette secondhand aerosol impacts were not mentioned as frequently as other subthemes under the health impact theme, which mainly focused on whether the aerosol formed by the vaporized nicotine solution is harmful to humans. Among the news stories including the theme of addiction, it was observed that although the articles featuring brand promotion often claimed that e-cigarettes are not addictive, all the other news stories depicted e-cigarettes as addictive because e-cigarettes contain nicotine.

Usage

Usage was the third most frequently mentioned theme in news stories, including three subthemes: safety, freedom, and consumer feelings and experiences with use. Early stories on safety of e-cigarette use often compared them with the hazards of combustible cigarettes (such as fires) to emphasize that the use of e-cigarettes is safe. In more recent years, “unsafe” stories were not uncommon in newspapers, but most of these stories were accidents from foreign reports, such as “Recently, a 38-year-old man in the U.S. died after an e-cigarette explosion [. . .] According to U.S. Fire Administration, from 2009 to 2016, there were 195 explosions and fire accidents caused by e-cigarettes in the U.S.” (“Meiguo Shouli,” 2018, p. 05).

Probably in response to the accidents, more recent stories addressing safety included improvement of e-cigarette technology, such as being more robust, oil-proof, and explosion-proof. Freedom of use, which means that e-cigarettes can be used anywhere without location restrictions, was the most frequently mentioned subtheme of usage. For example, a 2004 report stated: “E-cigarettes can be used no matter in meetings, business situations, public places, or on airplanes. They do not produce chemical smoke or do harm to either the users or others, and have no impact on the environment” (“Jieyan Xinchangpin,” 2004, p. TMP07).

Especially after China began to tighten its tobacco control measures in 2011, when the first nationwide smoking ban in public places was released (Xinhua News Agency, 2011), many stories highlighted that e-cigarettes can be used to circumvent smoking bans, conferring more freedom than combustible cigarettes because they could be used anywhere. In the subtheme feeling and experiences of use, comparisons to cigarettes were common; stories frequently stated that e-cigarettes were more fashionable and cleaner than combustible cigarettes, but there was controversy over which product tasted better. Despite the fresh mint and fruit flavors that were highlighted in some stories, many held that e-cigarettes could not compete with the nuanced tobacco tastes of cigarette brands. Over time, as more flavors of e-cigarettes were launched, the view that e-cigarettes did not taste as good as cigarettes was found less frequently in news stories. More stories mentioned flavors together with the theme of youth, pointing out that e-cigarette producers use sweet fruit flavors to attract young people.

Cessation

Quitting smoking was the biggest selling point in early e-cigarette promotion. Early news stories featured claims from e-cigarette manufacturers that through the daily decrease in the amount of nicotine intake, quitters would be able to unconsciously minimize the body's physiological demand for nicotine until it was completely absent. Most of these stories featured e-cigarette brand promotion, which only mentioned the advantages of e-cigarettes, and rarely mentioned their disadvantages:

According to the degree of the smokers' addiction, e-cigarette devices can be set with four different nicotine concentrations: high, medium, low and none, which is controlled by electronic chips. Within a certain period of time, the amount of atomization decreases day by day [. . .] until it is completely absent. (Luo, 2004, p. C4)

However, just one year after the emergence of e-cigarettes (i.e., in 2005), doubtful voices were reported in newspapers. For example, a doctor criticized that: "With similar appearance and smoking gestures, e-cigarettes cannot help smokers get rid of psychological dependence on cigarettes, and therefore are not a good way to quit smoking" ("Jieyan Chanpin," 2005, p. 13).

Though few scientific studies from China reported e-cigarette efficacy until recent years, smoking cessation was a common topic in newspapers with a considerable amount of reporting about research findings and related policies from abroad, with different views of cessation efficacy. For example, in 2016, it was reported that the Medicines & Healthcare products Regulatory Agency issued a certification to British American Tobacco for an e-cigarette product, allowing this product to be marketed as a smoking cessation aid ("Ying Wei Dianziyan," 2016). In contrast, *Qingdao Daily* ("Dianziyan Dui," 2014a) reported that a survey by a French monitoring agency stated that e-cigarettes are not very helpful for quitting smoking. In recent years, more articles adopted a "balanced reporting" approach by quoting both opinions on e-cigarette efficacy for smoking cessation and reported this topic as an academic dispute (p.16).

Youth

Starting in 2009, the negative impact of e-cigarettes on adolescents and youth began to appear in news stories, and it continued to receive attention until 2019. The gateway effect of e-cigarettes was mentioned frequently. For example: "A 2013 survey in the U.S. showed that after trying e-cigarettes, 49.3% of teenagers intend to try cigarettes, which is over double the number in 2011" ("Dianziyan Hui," 2014b, p. 04).

Most of the early stories were from abroad, such as foreign bans on selling e-cigarettes to minors, but reports on Chinese youth were very few. For instance, in 2014, the United States planned to ban the sale of e-cigarettes to individuals under the age of 18 years ("Mei Ni Jin," 2014); in 2015, Germany issued bans on the sale of e-cigarettes to minors ("Jin Xiang," 2015). News stories began to question the impact of e-cigarettes on Chinese minors from 2015 onward and alerted the public and the government to be wary of e-cigarette invading campuses. Here is an example reporting the issue: "In order to attract children, e-cigarette manufacturers sell candy-flavored e-cigarettes to them at a very low price of 15 to 20 yuan [approximately 2 to 3 U.S. dollars]" ("Dianziyan Miaoshang," 2015, p. 06).

At the same time, several stories reported that there were grocery stores and stationery stores near the elementary schools that sold e-cigarettes as toys. Some articles reported that certain stores seemed to exclusively target elementary and middle school students. E-commerce websites were also reported to have become a channel for minors to purchase e-cigarettes. The news articles reported that on the e-commerce sites, e-cigarettes were advertised as harmless and suitable for use in schools and many other places. There were even e-commerce platforms blatantly selling "multi-flavor harmless e-cigarettes special for children" ("Nu! Dianshang Pingtai," 2018, p. 05). Notably, and also understandably, the theme of youth often appeared together with the theme of regulation. For example, one story in *Guangzhou Daily* pointed out that the problem of elementary school students using e-cigarettes was caused by two factors: "First, the surrounding environment of schools has not attracted enough attention from related government departments. The second is the weak regulation" (Qian, 2016, p. F02).

In August 2018, SAMR and State Tobacco Monopoly Administration (STMA) jointly issued the "Notice on Prohibiting the Sale of Electronic Cigarettes to Minors" (the Notice; SAMR, 2018), which attracted much media attention. After the Notice, media still kept a close eye on the impact of e-cigarettes on young people. In 2019, that Shenzhen and a few other cities began to include e-cigarettes in the scope of tobacco control and, at the same time, placed the shops around schools under scrutiny, was widely reported by media.

Regulation

Regulation was the second most frequently mentioned theme in news stories, including three subthemes: e-cigarette regulation and enforcement, e-cigarette legislation and policy in China, and e-cigarette legislation and policy outside China. Compared with other themes, a considerable proportion of articles mentioning this theme were opinion and editorials rather than informational news reports. The call for legislating e-cigarettes was present in very early reporting and was mainly because of the lack of policies governing e-cigarettes:

In an interview, Mr. Zhao from Information Office of State Tobacco Monopoly Administration said that according to the provisions of the Tobacco Monopoly Law, tobacco monopoly products do not include Ruyan [. . .] The Information Office of State Food and Drug Administration (SFDA) made it clear, in an interview with reporters, that Ruyan is not within the regulatory scope of SFDA. ("Ruyan' Shenfen," 2006, p. C04)

Because it was not clear whether e-cigarettes were classified as tobacco products, it was unclear whether the Chinese Advertising Law applied to e-cigarette advertising. Although tobacco advertising was legally prohibited, e-cigarette ads appeared frequently in TV advertisements as quitting products, which media reports cited as another reason for calls for legislation. In 2007, many news stories reported that the Civil Aviation Administration of China decided to ban passengers from smoking Ruyan on the plane ("Minhang Zongju," 2007). This was the first regulation about e-cigarettes in China. After that, there emerged a few related law enforcement reports, for example: "A Chinese passenger was administratively detained for using e-cigarettes on the plane" ("Lvke Feiji," 2018, p. A14).

China's legislation on e-cigarettes was almost at a standstill between 2007 and 2018. During that period, most news stories covered e-cigarette policies and regulation in foreign countries and regions. Most of these stories, except very few supporting e-cigarettes, covered new e-cigarette regulations. For example, in 2010, Thailand prohibited the sale of e-cigarettes; in 2014, the United Kingdom prohibited the sale of e-cigarettes to people under the age of 18; in 2017, e-cigarettes were prohibited indoors in New York; and in 2018, the U.S. Food and Drug Administration planned to prohibit sales of most flavored e-cigarettes in stores. In August 2018, SAMR and STMA jointly issued the "Notice on Prohibiting the Sale of Electronic Cigarettes to Minors" as mentioned above, which finally shifted the focus of policy reports in the news from abroad back to China. In 2019, such cities as Beijing, Shenzhen, Hangzhou, and more included e-cigarettes as tobacco products, and the number of news stories with the regulation theme increased significantly.

Industry Development

This theme mainly focused on two aspects: general prospects for the e-cigarette industry and the prospect of specific e-cigarette stocks, with most articles including this theme appearing in 2013 and 2014. As early as 2004, the mainstream attitude toward the prospects of the e-cigarette industry was presented very optimistic:

There are nearly 320 million urban smokers in our country [. . .] the desire to stay away from cigarette harm is becoming stronger, and the demand will also be greater. It can be imagined that this product (e-cigarette) has huge market potential and good prospects. ("Huanbao Shidai," 2004, p. A1)

After the early pure optimism, views on the future of the e-cigarette industry fluctuated several times: When Ruyan left the Chinese market, uncertainty and concerns were reported; but later, with the worldwide economic boom in the e-cigarette business, the financial market expressed interests in the industry again. Especially as many e-cigarette companies were listed and big tobacco companies such as Philip Morris International entered the e-cigarettes market, financial newspapers portrayed both the e-cigarette business and its stocks as promising. In particular, the promulgation of clean air policies and taxes on combustible cigarettes in 2014 contributed to the prosperity of the e-cigarette stock market reported in news:

Legislative Affairs Office of the State Council solicited opinions on Regulations on Smoking Control in Public Places (Draft for Comment). The Draft clearly stipulates that all indoor public places should plan to ban smoking. Affected by this news, e-cigarette concept stocks soared. (Hao, 2014, p. B38)

In 2015, a significant increase in tobacco excise taxes made e-cigarette concept stocks, which means stocks of companies that operate in mainland China but incorporated overseas to give Chinese businesses access to foreign investment, surge again (Hao, 2015). Many clean indoor air policies issued in 2019 were upgraded to include e-cigarettes into regulatory scope. Though some news stories reported the uncertainty about the future of the e-cigarette industry caused by uncertainty about whether e-cigarettes would be included in tobacco control policies, other reports were still optimistic, saying e-cigarettes were one of the hottest investment fields in 2019:

The attention of the capital to the e-cigarette industry has been rapidly increasing [. . .] Although many e-cigarette-related bans have been issued across China, the e-cigarettes produced in China are mainly for export, so commentators indicate that the impact of e-cigarette bans on manufacturers is little, at least in the short run. ("Fengkou Zai Qian," 2019, p. A01)

Description of E-Cigarettes

The theme of description of e-cigarettes mainly included introducing how e-cigarettes work and the characteristics of different e-cigarette brands. About 90% of the e-cigarette news reports in the first three years (2004–2006) featured this theme, and its presence gradually declined after 2006. Many of these stories focused on the working principles and function of e-cigarettes, and this theme was frequently accompanied by the health impact theme, such as:

Medically synthesized artificial nicotine retains the taste and refreshing effect of cigarettes, but does not contain tar and other harmful substances. The electronic chip can also control the intake of nicotine [. . .]. When a person inhales, the liquid nicotine enters the vaporizer under the action of electric current, and the ultra-micro vaporization pump produces the "smoke" and enters the lungs, but smoke is actually water vapor with a smell of smoke, which is not harmful to people. (Luo, 2004, p. C4)

Different from product characteristics, the subtheme, characteristics of e-cigarette brands, focused more on brand promotion by describing the introduction of specific e-cigarette brands. In 2004, Ruyan, the first brand of e-cigarettes in China, was often mentioned in news stories introducing e-cigarettes. After 2006, there appeared reports of other domestic brands, followed by foreign e-cigarette brands. In general, news stories featuring the theme of description of e-cigarettes appeared only in the early years and subsequent articles with this theme basically mentioned it in passing.

Discussion

This study identified and described seven themes from the e-cigarette-related news coverage in Chinese newspapers from 2004 to 2019, and how the salience of themes changed over time. To reiterate, the seven themes are health impact, usage, smoking cessation, youth, regulation, industry development, and description of e-cigarettes. During the 16 years (i.e., 2004–2019), the health impact theme remained dominant throughout, but the other themes to varying extents and degrees showed different salience at different periods of time. This study found that although e-cigarette reporting in Chinese newspapers shared common themes with newspapers in other countries, there was a theme that was unique to Chinese newspapers: e-cigarette industry development.

Health impact is an important theme in e-cigarette reporting across countries. In Chinese newspapers, a shift from promoting e-cigarettes as completely harmless to open discussion about health impact from e-cigarettes was observed. The earlier news articles on e-cigarettes mainly featured statements from the e-cigarette producers. Positive comments on e-cigarettes' healthiness, together with the dominant

theme of e-cigarette description, demonstrated the early influence of e-cigarette industry on media with the likely purpose of promoting e-cigarettes to the public. However, this was a transient effect, and more diverse voices emerged later. These voices were mainly from the scientific research on e-cigarettes in other countries. Part of these findings also escalated the debate over e-cigarettes' smoking cessation efficacy. However, it is also noted that even though the harm of e-cigarettes was often mentioned by newspapers, e-cigarettes were constantly framed as a healthier alternative to cigarettes in Chinese newspapers. Wang and associates' (2019) study found that more than 40% of Chinese people in their sample took up e-cigarettes as a safe replacement for cigarettes and didn't know whether e-cigarettes were addictive. They also found that more than 40% of e-cigarette users reported using e-cigarettes to help quit smoking. Given that media is the main information source for the Chinese public, it may have played a role in shaping this perception of e-cigarettes. As the long-term health impact of e-cigarettes and the relationship between e-cigarette use and smoking cessation are still uncertain, mass media should be cautious in their reporting lest the idea that e-cigarettes are safe or healthier than cigarettes is propagated without evidence, which may encourage e-cigarette use.

Limited previous studies found salient themes about e-cigarette industry from news media reporting. Wackowski and colleagues' (2018) study found a small proportion of U.S. news articles reported industry activities including vape shops, sales trends, advertising strategies, and tobacco company involvement. The theme of industry development in this study was different; articles in this study reporting on the industry focused on the general prospects and financial performance of the e-cigarette industry. China is the largest e-cigarette manufacturer and exporter in the world, feeding the worldwide e-cigarette markets (Eriksen et al., 2015). The vast e-cigarettes market both inside and outside China has brought the prosperity of e-cigarette capital markets in China, which may explain why industry development is a unique theme in the Chinese news coverage and occupies a considerable proportion in newspaper coverage.

In addition, findings of this study indicated that e-cigarette-related news reporting in Chinese newspapers may have been influenced to a certain degree by foreign media coverage of e-cigarette-related scientific research, legislation, and social issues in other countries. As mentioned above, Chinese newspapers reported numerous foreign research findings about the health impact of e-cigarettes. This phenomenon was also very noticeable in the regulation theme and youth theme. This aligns with the finding that health impact from e-cigarettes, policy and regulation, and e-cigarette-related youth issues were the common themes in newspaper reports on e-cigarettes in both China and other countries (Kim et al., 2017; Rooke & Amos, 2014; Yates et al., 2015). In the early time, the youth theme, which usually came abreast of regulation theme, mainly focused on e-cigarette regulation for young people under the age of 18 in other countries and the negative impact from e-cigarette use among the youth, such as the gateway effect to further cigarette smoking (Pepper et al., 2013). When Chinese news articles began to pay more attention to the domestic e-cigarette issues about the youth, they found phenomena that did not exist in other countries, such as selling cheap e-cigarettes in stationery stores near schools to attract students. That may sound an alarm to both the government and the public, especially teachers and parents. With the easy access to the very affordable e-cigarettes and the high social acceptance of smoking in China, the impact of e-cigarettes on Chinese youth may be even more serious, and it calls for more regulation on e-cigarette marketing strategies and sales to protect vulnerable young people. It should be noted that China has long been the biggest e-cigarette producer in the world, and e-cigarettes entered the Chinese domestic market in 2003.

However, in the decade that followed market entry, there was an absence of national-level e-cigarette regulation, perhaps because both the public and policy makers did not feel it was necessary or urgent to regulate e-cigarettes (Sun et al., 2018). Therefore, before 2016, the majority of e-cigarette regulation and policy reports discussed e-cigarette regulation in other countries rather than China (Sun et al., 2018). Consistent with the acceleration of e-cigarette legislation across the world, the theme of regulation became the most salient theme in Chinese newspaper e-cigarette reporting in 2016 and has maintained such salience since then. What also deserves attention is that the first nationwide regulation on e-cigarettes in China (i.e., "Notice on Prohibiting the Sale of Electronic Cigarettes to Minors") was released in 2018 and emphasized youth under 18. Therefore, it may be reasonable to assume that the progress of e-cigarette legislation across the world and the media coverage of these policies, together with increasing attention to youth issues related to e-cigarettes, may have prompted the start of e-cigarette regulation in China. However, e-cigarette legislation in China has just begun, and there are still many areas that remain unregulated, such as restrictions on unsubstantiated health claims made by e-cigarette companies and stipulating quality control standards governing the electronic cigarette manufacturing process (Feldman & Yue, 2016). Given China's slow progress toward implementing tobacco control policies because of structural challenges and deep-rooted institutional barriers (International Tobacco Control Policy Evaluation Project, 2017), coupled with the substantial financial interest in e-cigarettes, the journey of e-cigarette control and legislation in China may be longer than in other countries. In the foreseeable future, regulation may continue to be a salient theme in e-cigarette news reporting in China.

Conclusion

E-cigarettes have attracted increasing media attention over the past years in China. With the changing international and domestic context, including mounting scientific findings about the health impact of e-cigarettes, more e-cigarette-related regulations around the world, and increasing influence of e-cigarettes on society including growth in the market and use by youth, the salient themes in e-cigarette-related newspaper reporting varied over time. These themes had many similarities to those in news reporting in other countries, but also showed a unique theme largely because of China's status as the world's leading manufacturer of e-cigarettes. In addition, frequent reporting by Chinese newspapers on e-cigarette-related research, legislation, and social problems in other countries based on foreign media coverage, might point at international media agenda setting. This may deserve more in-depth study in the future.

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