

How Indonesian Media Frame the Harms and Benefits of E-cigarette

S.P. Ratih

*Public Health Sciences, Faculty of Sports
Science*

Universitas Negeri Malang
Malang, Indonesia
puspita.ratih.fik@um.ac.id

D. Anshari

*Department of Health Education and
Behavioural Sciences*
Universitas Indonesia
Depok, Indonesia
dienanshari@gmail.com

B.J. Maycock

*School of Public Health, Faculty of
Health Sciences*

Curtin University
Bentley, Western Australia
b.maycock@curtin.edu.au

R. Damayanti

*Department of Health Education and
Behavioural Sciences*

Universitas Indonesia
Depok, Indonesia
damayanti.rita257@gmail.com

Abstract--*Electronic cigarettes (e-cigarette), of which the health effects are still unknown, have been sold in Indonesian market since 2010. We sought to examine the portrayals of harms and benefits of e-cigarette in online news media as they have been the new main source of information among Indonesians. This study performed a quantitative content-analysis method in online news articles published by four most popular online news media in Indonesia from 2012 to 2017. The news articles were obtained from the media websites and Google Advance Search. The reports were reliably coded for topics of the story, news source, and coverage of benefits and harms of these products. Framing of e-cigarette is equally or more harmful than traditional cigarettes appeared more than framing of e-cigarette is not harmful or less harmful than traditional cigarettes. Over time, e-cigarette was portrayed more negatively with a sudden three-fold increase in the number of articles published from 2016 to 2017. The outnumbering negative frames of e-cigarette indicated that the online news media tried to influence the public to oppose these products. However, the tendency of dominantly portraying the negative effects of e-cigarette must be supported by more scientific evidence on the effects of the devices. Future research investigating the political economy of media may obtain a deeper understanding on how online news media produce their stories.*

Keywords—*tobacco control, policy, smoking, vaping*

I. INTRODUCTION

Electronic Nicotine Delivery System (ENDS), commonly known as electronic cigarettes (e-cigarette), is a new cigarette-like device that is composed of liquid with flavoring agents instead of tobacco leaves and generally contain nicotine [1],[2],[3]. The concept of e-cigarette was firstly patented in 1965 by Herbert A. Gilbert, while an aerosolized e-cigarette was first manufactured in China, then entered the marketplace in 2003 [4],[5]. E-cigarette was patented internationally in 2007 by Ruyan Technology with an evolving design that continues until today [6],[7]. The most common e-cigarette types that people currently use are the refillable devices that

contain liquid. The process of inhaling vaporised liquid is referred to as ‘vaping’, which is in a similar fashion to tobacco-smoking, but without inhaling tobacco tar and carbon monoxide [7].

There is a major debate arguing the effects of e-cigarette on health. Chemical substances and nicotine in e-cigarette are known to be toxic. However, there are still limited data on the short-term effects of e-cigarette use on health, and there are no adequate data on the long-term effects. The number of toxic chemicals, other than nicotine, used in the e-liquids might increase cytotoxicity [8]. A review of forty-four articles showed that aerosolized propylene glycol and glycerol that could be generated from vaping could cause mouth and throat irritation and dry cough [9]. Some recent studies claim evidence that e-cigarette may help some people reduce cigarette consumption and quit smoking, or at least that they possibly reduce the harm from tobacco cigarette smoking, although there are not yet adequate comparisons with other cessation drugs or tools [7],[10],[11],[12]. The claims are stating that e-cigarette helps people quit smoking are used as a sales promotion strategy by presenting news and testimonials from people who claimed to have quit smoking after using e-cigarette [13],[14],[15].

E-cigarette has been sold in Indonesian market since 2010 and steadily gains their popularity, especially among youth, with many forms of marketing strategies. The U.S. Food and Drug Administration has prohibited the sale of e-cigarette to those under 18 years of age and regulated their advertisements and health warning since August 2016 [16]. Moreover, there have been thirty-eight states banning the sale of e-cigarette including the use of e-cigarette in public spaces [17]. The European Union and Tobacco Products Directive have revised the regulation which prohibits cross-border advertising and promotion of e-cigarette [16]. Brazil and Singapore also have been implementing regulations of e-cigarette sales, however,

in some countries, including Indonesia, e-cigarette is still unregulated although the use, selling, and promotion of e-cigarette keep increasing [17]. The lack of data on short- and long-term effects of e-cigarette use on health might contribute to the legal status of the product in some countries [5].

A massive news release talking about e-cigarette might contribute to stimulating the public's concern about the use of e-cigarette for smoking cessation. Policy makers should be aware that e-cigarette related issue is likely to be influenced by news coverage which is outside industries' direct control [18]. The messages presenting the harms and/or benefits of e-cigarette on the online news may help the public understand the issue on a larger societal level, as well as influence the individuals in considering whether to use e-cigarette and/or to support e-cigarette regulations. Thus, a systematic content analysis of online news reports about e-cigarette is needed to assess how the coverage of benefits and harms of e-cigarette is presented in the news.

II. METHODS

This study used a quantitative content-analysis method started with a structured search of articles with certain inclusion and exclusion criteria. The methodology used in this study is similar to previous studies analysing how e-cigarette issues were framed in the news media in The U.S. and South Korea [18],[19],[20].

A. Article Sources

The data were obtained from articles published by credible Indonesian online media. The selection criteria of the media are based on daily time on site, daily page per visitor, percentage traffic from search, and total sites linking in as measured by Alexa. Other criteria for the selection are the presences of editorial boards and the physical mailing address. There are four top online news media that met the criteria and were selected for this study: 1) Liputan6.com, 2) Detik.com, 3) Kompas.com, and 4) Tempo.co

B. Structured Search, Identification, and Content Analysis

At the beginning of identification, researchers conducted a structured search of the articles in the selected media sites and the Google Advance Search using the most popular key search terms adopted from the previous study by Kim et al., as follow: ("rokok elektrik" (Indonesian term for e-cigarette) OR "e-cigarette" OR "vape" OR "vaping") [KIM ET AL]. The search was limited to articles published on 1 January 2012 to 15 November 2017 as we stopped searching and started the next phase. This systematic search resulted in 600 articles from four selected online media. The articles then were listed including the site names, links, year of publications, and titles. Amongst 600 articles, we excluded duplicated articles, broken pages, photo/video only sites, and articles that did not discuss e-cigarette at all which resulted in 418 articles remaining. Of the 418 articles mentioning e-cigarette in their titles or contents, 98 articles (23.4%) showed a minor story about e-cigarette. An article was considered having a major/whole story about e-cigarette if it talked about e-cigarette or vape including at least

its benefit or harm, description, regulation, marketing, or trend. There are 320 articles (76.6%) focusing on e-cigarette in their major part of their story. Therefore, there are only 320 articles that were included in further analyses and coding.

C. Coding

In this phase, we used a coding sheet to determine the code of each category in a variable. There were four coders who reviewed and coded the article contents using the coding sheet as a guide. Coding variables in this study were determined based on a combination of deductive and inductive approaches similar to the coding method by Kim et al. [20]. Deductively, initial variables are developed from the coding variables used by Kim et al. [20]. and were identified through the literature review of e-cigarette. This activity generated an initial coding sheet that was used for analysing 10% of articles in the pilot-test session. In the inductive phase, we examined whether there were any variables to add to or remove from the initial coding sheet to generate the final coding sheet. The final coding variables were firstly used to examine 20% of the overall sample by all coders to test the reliability among all coders ($n=93$). The intercoder-reliability test was performed to evaluate the reliability of the data. The test showed that all measured variables were considered reliable with Krippendorff's alpha 0.7 or more.

III. RESULTS AND DISCUSSION

A. Trend of E-Cigarette Stories on Online News Media

The number of news articles reporting e-cigarette stories increased dramatically from 5 articles (1.6%) in 2012 to 123 articles (38.4%) in 2017. There was a gradual decrease between 2014 and 2016, from 66 articles (20.6%) in 2014 to 61 articles (19.1%) in the following year, then slightly declined to 55 articles (17.2%) in 2016. Surprisingly, there was a sudden two-fold increase in 2017. This pattern roughly reflects the trend of articles talking about e-cigarette on the studied news media. Majority of the articles (39.7%) were published by detik.com, 29.4% articles were published by liputan6.com, 16.3% and 14.7% were published by kompas.com and tempo.co respectively. More than half of the articles (58.8%) were found in the health section, followed by articles found in the economic/business section (13.8%).

B. Topic of News Story

Topic of news story in this study was measured based upon the overall topic or theme that was primarily discussed in the body of the articles talking about e-cigarette. There are 9 topics of the news stories about e-cigarette identified in the articles. Over the studied period, the dominant topics of e-cigarette stories from 2012 to 2017 were policy/regulation and health effects of e-cigarette (26.6% and 21.6% respectively). Of the 85 articles that talked about policy updates or regulations of e-cigarette, 65.9% presented the domestic story, while 30.6% of them presented international stories. However, the story about the health effects of e-cigarette was almost evenly presented in both domestic and international stories (39.1% and 31.9% respectively).

Between 2012 and 2013, the articles mostly talked about events or accidents in the use of e-cigarette (26.7%), followed by the health-effects related topic (20%) and the introduction of new research findings of e-cigarette (20%). From 2014 to 2015, the articles mostly talked about policy updates or regulations (34.6%) and health effects of e-cigarette (21.3%). In more recent years, between 2016 and 2017, policy updates or regulations and the health effects of e-cigarette also dominated the stories (22.5% and 21.9% respectively). Over this period, the story about e-cigarette containing marijuana increased significantly (13.5%). Similarly, the articles telling about the use of e-cigarette among youth and children quadrupled from 3 articles in 2014-2015 to 12 (6.7%) articles in 2016-2017.

C. Source of News Stories

News source in this study was obtained based on the name of people or organizations of which their quotes or statements were mentioned in the articles. The sources of the e-cigarette stories in the measured articles mostly came from scientist/researcher backgrounds (34.7%) and government officials or policymakers (30.3%). In 2012 and 2013, most articles used statements from scientist/researchers (53.3%) and non-profit organizations (33.3%) to tell readers about e-cigarette stories. During this period, however, the statements from government officials or policymakers and law enforcement were not mentioned in any articles. Between 2014 and 2015, the government officials or policymakers seemed to start giving statements about e-cigarette related issues. They dominated the sources of the e-cigarette stories in this period (38.6%), followed by scientists/researchers (31.5%). Over this period, people from more varying backgrounds began to speak up about e-cigarette related issues such as doctor/health practitioners (11.0%), NGO/advocacy (9.1%), as well as e-cigarette manufacturers/vendors (7.9%). From 2016 to 2017, the source of e-cigarette stories in online articles was dominated by scientist/researchers (35.4%), followed by government officials/policy makers (27%). During this period, statements from law enforcement officials appeared in the articles (14.6%) following the emergence of e-cigarette containing marijuana and increasing events or accidents caused by e-cigarette use.

D. Harms and Benefits of E-Cigarette

This study measured the proportions of benefits and harms of e-cigarette presented in an article as to whether there were more benefits, more harms, or a balance between the benefits and harms discussed in the article. Accordingly, we categorized the articles presenting the coverage of benefits and harms of e-cigarette into three measurements: 1) articles that presented more benefits than harms of e-cigarette; 2) articles that presented more harms than benefits of e-cigarette; and 3) articles that were balanced in presenting benefits and harms of e-cigarette. Among the 320 articles, 214 articles (66.9%) talked about the harms of e-cigarette more than benefits, 49 articles (15.3%) mentioned more benefits than harms of e-cigarette,

while 57 articles (17.8%) have a balanced discussion about the benefits and harms of e-cigarette. This pattern reflects the propensity for discussion about the harms and benefits of e-cigarettes in the four online media.

The discussion about the harms of e-cigarettes obviously outnumbered the stories about the benefits of the device during the measured periods as seen in figure 1. Between 2012 and 2013, from 15 articles, 46.7% talked about the harms of e-cigarette more than their benefits. Similarly, in articles published in 2014 and 2015, the harms of e-cigarette were prominently mentioned more than the benefits of these products (65.4% & 16.5 respectively). In 2016 and 2017, the discussion about the harms of e-cigarette seemed to significantly increase up to 124 articles (69.7%), while there were only 24 articles (13.5%) discussing more benefits of these devices than their harms during this period.

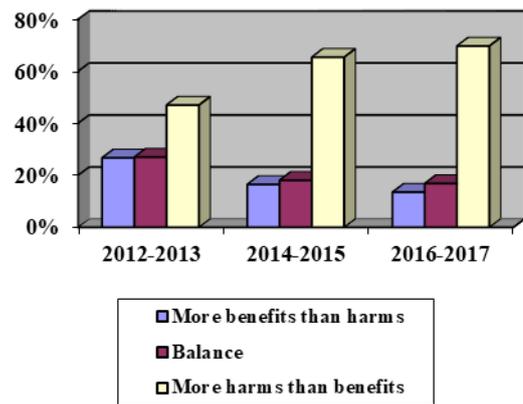


Fig. 1. Coverage of harms and benefits of e-cigarette discussed in the articles across studied periods

Among the 320 articles, 126 articles (39.4%) said that e-cigarette was harmful, as harmful, or more harmful than traditional cigarettes. Other harms of e-cigarette mentioned in the articles were safety concerns (12.5%), the devices contain addictive nicotine (12.2%), and the governments are considering stronger regulations towards these products (12.2%). The McNemar’s tests significantly show that this harm was mentioned the most in the articles as compared to the other harms including safety concern ($\chi^2 = 52.8, p < 0.001$), nicotine addiction ($\chi^2 = 59.6, p < 0.001$), and statements saying that e-cigarette would be more strongly regulated ($\chi^2 = 50.8, p < 0.001$).

In articles published in 2012-2013, 60% of the articles said that e-cigarette are harmful, as harmful, or more harmful as traditional cigarettes. Similarly, the harmful effects of e-cigarette compared to tobacco cigarettes were still a major concern in articles published in 2014 and 2015, followed by addiction to nicotine (15.7%). Some articles published in this period also said that the health effects of e-cigarette are still unknown (13.4%) and the efficacy of e-cigarette in helping smoking cessation has not been adequately proven (13.4%). Articles published in 2016 and 2017 mostly said that e-cigarette are harmful, as harmful, or more harmful than traditional

cigarettes (33.7%). During this period, the articles also mentioned that the governments were considering stronger regulations about e-cigarette such as taxes and restrictions to sell the products to children (14.6%). In line with that, the articles saying that e-cigarette might contain marijuana or other illegal drugs, as well as safety concerns, seem to increase in this period (12.4% and 12.9% respectively). Other harms that are mentioned more often in this period include vape-related behavioral effects in teenagers and children (7.9%) and effects through second-hand smoke (4.5%). Harms of e-cigarette mentioned in the articles across the studied periods can be seen in table 1.

TABLE 1. TYPICAL HARMS OF E-CIGARETTE MENTIONED IN THE ARTICLES ACROSS STUDIED PERIODS

Harm	2012-2013	2014-2015	2016-2017	Total
	n (%)	n (%)	n (%)	n (%)
E-cigarettes are harmful, or equally/more harmful than traditional cigarettes	9 (60.0)	57 (44.9)	60 (33.7)	126 (39.4)
Nicotine in e-cigarettes is still addictive, leading to more nicotine consumption	1 (6.7)	23 (18.1)	20 (11.2)	44 (13.8)
Safety concern	3 (20.0)	14 (11.0)	23 (12.9)	40 (12.5)
The government is considering stronger regulation about e-cigarettes	1 (6.7)	12 (9.4)	26 (14.6)	39 (12.2)
Health effects are unknown	2 (13.3)	17 (13.4)	13 (7.3)	32 (10.0)
The efficacy of e-cigarettes for smoking cessation has not been proven	2 (13.3)	17 (13.4)	13 (7.3)	32 (10.0)
E-cigarettes may contain marijuana, or lead to drug abuse	0 (0.0)	7 (5.5)	22 (12.4)	29 (9.1)
Teens/children are typically affected, leading to traditional smoking among adolescents	1 (6.7)	7 (5.5)	21 (11.8)	29 (9.1)
E-cigarettes may be less harmful, but still more harmful than not smoking at all	1 (6.7)	2 (1.6)	13 (7.3)	16 (5.0)
E-cigarettes affect others (second-hand smoke)	1 (6.7)	5 (3.9)	8 (4.5)	14 (4.4)
Others	1 (6.7)	12 (9.5)	12 (6.7)	25 (7.8)
Total	15 (100.0)	127 (100.0)	178 (100.0)	320 (100.0)

Benefits of e-cigarette that were mentioned most often in articles over the studied periods are statements saying that e-cigarette is not or are less harmful or safer than tobacco cigarette and that e-cigarette help smoking cessation (19.7% and 16.8% respectively). A series of McNemar's tests shows that the statements saying that e-cigarette are not or are less harmful or safer than traditional cigarettes were significantly

mentioned more often than statements saying that e-cigarette look fancy/trendy or are new/popular trend ($\chi^2 = 20.3, p < 0.001$) and e-cigarette have a variety of flavours/nicotine level ($\chi^2 = 25.1, p < 0.001$). Similarly, the McNemar's tests also show that statements saying that e-cigarette can help smoking cessation appeared significantly more often in the studied articles than in the statements saying that e-cigarette look fancy/trendy or are new/popular trend ($\chi^2 = 16.5, p < 0.001$) and e-cigarette have a variety of flavours/nicotine level ($\chi^2 = 21.7, p < 0.001$).

In articles published in 2012 and 2013, the role of e-cigarette in helping smoking cessation was more likely to be mentioned than other benefits (40%), followed by the statement saying that e-cigarette is not or are less harmful or safer than conventional cigarettes (26.7%). The trend remains similar to articles published in 2014 and 2015; those benefits were also likely to be mentioned more often than other benefits (17.3% and 16.5% respectively). Similarly, articles published in 2016 and 2017 more likely mention the statements saying that e-cigarette is not or are less harmful (18.5%) and that e-cigarette help smoking cessation (14.6%). E-cigarette as a new trend or as trendy or fancy were also often mentioned in articles published in 2014-2015 and 2016-2017 (7.9% and 5.6% respectively). The percentages of the benefits discussed in the articles across the periods can be seen in table 2.

TABLE 2. TYPICAL BENEFITS OF E-CIGARETTE MENTIONED IN THE ARTICLES ACROSS STUDIED PERIODS

Benefit	2012-2013	2014-2015	2016-2017	Total
	n (%)	n (%)	n (%)	n (%)
E-cigarettes are not/less harmful than traditional cigarettes, e-cigarettes are safe	4 (26.7)	24 (18.9)	35 (19.7)	63 (19.7)
Help smoking cessation	6 (40.0)	22 (17.3)	26 (14.6)	54 (16.9)
E-cigarettes look fancy/trendy or are new/popular trend	2 (13.3)	10 (7.9)	10 (5.6)	22 (6.9)
E-cigarettes have a variety of flavours/nicotine level	1 (6.7)	9 (7.1)	7 (3.9)	17 (5.3)
E-cigarettes do not affect second-hand smoke, can be used to avoid smoking regulation	4 (26.7)	5 (3.9)	1 (0.6)	10 (3.1)
E-cigarettes are not/less addictive	1 (6.7)	4 (3.1)	4 (2.2)	9 (2.8)
E-cigarettes taste like real cigarettes	1 (6.7)	3 (2.4)	1 (0.6)	5 (1.6)
Others	1 (6.7)	6 (4.7)	6 (3.4)	13 (4.1)
Total	15 (100.0)	127 (100.0)	178 (100.0)	320 (100.0)

Our findings build on results of previous research and produce new insights on several issues related to message coverage of e-cigarette in Indonesia. This study reveals a significant increase in news coverage of e-cigarette from only 5 articles in 2012 to 123 articles in 2017. It indicates that public attention to e-cigarette related issues became higher in recent years in Indonesia. Indonesia is known to have big tobacco companies with increasing smoking prevalence. The prevalence of tobacco smokers in Indonesia increased by 5.2% and even reached 54.8% among male adolescents in 2016 and

was found higher in low-income households than in high-income ones [21]. According to the survey conducted by Indonesia Forum on Parliamentarians for Population and Development (IFFPD, 2009), among 19 million low-income households, 63% of heads of the households were smokers [22]. It indicates that e-cigarette of which the prices are more high than tobacco cigarettes may not be the best solution to reduce the high prevalence of smokers in Indonesia.

However, tobacco companies claimed that they plan to eventually replace their tobacco products with e-cigarette as a much safer alternative [23]. In contrary, tobacco control experts revealed that promotional activities of e-cigarette lure non-smokers especially young people to the new product, rather than just encourage current smokers to switch to e-cigarette as a quit aid [23]. The Phillip Morris's youth-oriented marketing of their 'Be Marlboro' cigarette campaign targets low and middle-income countries [23]. On the other hand, tobacco industries in Indonesia have not obviously shown their supports to these devices nor stated any possibility to expand their products into e-cigarette. Additionally, there is a belief that the big tobacco companies in Indonesia might play a role in shaping e-cigarette related issues that inflicted a large number of negative messages of these products on mass media. Consequently, Indonesia is facing a new big challenge to confront the aggressiveness of big tobacco companies as well as to address health-related problems that might increase as the consequence of the use of tobacco products, e-cigarette, or dual use of tobacco and e-cigarette.

The number of articles presenting harms of e-cigarette is much higher than that of articles presenting the benefits of these devices. The arguments saying that e-cigarette is harmful or as harmful as traditional cigarettes are twice that of those saying that e-cigarette is not harmful or less harmful than traditional ones. The discussion about e-cigarette harms and benefits is likely unbalanced in the articles on online media. This finding also supports that of a study in Korea by Kim et al. that mentioned the harms of e-cigarette were much more frequent than the benefits of e-cigarette (27.9% and 13.3% respectively). It is in line with the study by Yates et al. that found more articles over the period of the measured years addressed potential harms of e-cigarette rather than their benefits.

At the beginning of its emergence, e-cigarette was claimed helpful to reduce cigarette consumption. This study found that in the earlier period (2012-2013), this was the prominent benefit presented in the articles. However, some researchers agreed that it is only a part of sale promotion strategies by manufacturers. Moreover, e-cigarette contains nicotine from which its effects such as cardiovascular disease and cancer risk remain high [13],[15]. Another similar study on e-cigarette-related tweets over 2012 to 2015 suggested that the reasons people using e-cigarette were shifting away from cessation toward the social image, meaning that people no longer use e-cigarette for smoking cessation, rather, they use these devices as a new trend. It reflects a similar pattern with tobacco

smoking behaviour of which people who smoke are considered cool or trendy [24].

There has been a massive and continuous campaign by governments, anti-tobacco organizations, and even individuals encouraging people to quit smoking. Indonesian governments have also issued comprehensive regulations on tobacco products, indicating that tobacco products are dangerous and should have no longer be used. However, the number of tobacco smokers is still increasing especially among young adults. Therefore, the claim saying that e-cigarette is less harmful or not harmful yet giving the same sensation seems to be used as the strategy of e-cigarette marketing, especially in countries with a high prevalence of smokers. Consequently, Indonesia is facing a new big challenge to address health-related problems that might increase as a result of the use of tobacco products, e-cigarette, or dual use of tobacco and e-cigarette

IV. CONCLUSION

The increasing number of tobacco smokers and the emergence of e-cigarette in this country inflict a new challenge in public health sector in addressing health problems that might arise as a result of the dual use of tobacco and e-cigarette. In this study, the number of articles presenting e-cigarette significantly increased over the studied periods and mostly talked about the negative side of e-cigarette. The outnumbering negative frames of e-cigarette indicated that the online news media tried to influence the public to oppose these products. Although the majority of the articles is saying that e-cigarette is harmful rather than saying that e-cigarette is safe, the government has not yet made a firm decision about e-cigarette either to issue a total ban or a comprehensive regulation. However, the tendency of dominantly portraying the negative effects of e-cigarette must be supported by more scientific evidence on the effects of the devices. Future research investigating the political economy of media may obtain a deeper understanding on how online news media produce their stories.

ACKNOWLEDGMENT

This study was funded by Indonesia Endowment Fund for Education Ministry of Finance, the Republic of Indonesia. All authors have no conflict of interest to report.

REFERENCES

- [1] World Health Organization, "Electronic Nicotine Delivery Systems" in Report by WHO, 2014 [Retrieved from apps.who.int/gb/ctc/PDF/cop6/FCTC_COP6_10-en.pdf on 2017, September 28]
- [2] Leventhal, A. M., Strong, D. R., Kirkpatrick, M. G., & et al., "Association of electronic cigarette use with initiation of combustible tobacco product smoking in early adolescence" *JAMA*, 314(7), 700-707. doi:10.1001/jama.2015.8950, 2015
- [3] Jankowski, M., Brozek, G., Lawson, J., Skoczynski, S., & Zejda, J. E., "E-Smoking: Emerging Public Health Problem?" *International journal*

- of occupational medicine and environmental health, 30(3), 329-344. doi:<http://dx.doi.org/10.13075/ijomeh.1896.01046>, 2017
- [4] Foulds J, Veldheer S, Berg A. "Electronic cigarettes (e-cigs): views of aficionados and clinical/public health perspectives" *Int J Clin Pract.* 2011;65:1037-1042, 2011
- [5] Bertholon JF, Becquemin MH, Annesi-Maesano I, Dautzenberg B., "Electronic cigarettes: a short review" *Respiration*, 2013
- [6] Bell K, Keane H., "Nicotine control: electronic cigarettes, smoking and addiction" *Int J Drug Policy*, 2012
- [7] McDonough, M., "Update on medicines for smoking cessation" *Australian Prescriber*, 38(4), 106-111., 2015
- [8] Bahl V, Lin S, Xu N, Davis B, Wang YH, Talbot P. "Comparison of electronic cigarette refill fluid cytotoxicity using embryonic and adult models" *Reprod Toxicol* 34:529-37. doi:10.1016/j.reprotox.2012.08.001, 2012
- [9] Callahan-Lyon, P., "Electronic cigarettes: human health effects" *Tobacco control*, 23(suppl 2), ii36-ii40., 2014
- [10] Pepper, J. K., & Brewer, N. T., "Electronic nicotine delivery system (electronic cigarette) awareness, use, reactions and beliefs: a systematic review" *Tobacco control*, 23(5), 375-384. doi:<http://dx.doi.org/10.1136/tobaccocontrol-2013-051122>, 2014
- [11] Palazzolo, D. L. "Electronic cigarettes and vaping: a new challenge in clinical medicine and public health. A literature review" *Frontiers in public health*, 1, 56., 2013
- [12] Franck, C., Budlovsky, T., Windle, S. B., Filion, K. B., & Eisenberg, M. J. Electronic cigarettes in North America: history, use, and implications for smoking cessation. *Circulation*, 129(19), 1945-1952., 2014
- [13] Grana, R. A., Ling, P. M., Benowitz, N., & Glantz, S., "Electronic cigarettes. Cardiology patient page" in *Circulation*. 2014 May 13;129(19):1972-86; PMID: 24821826, e490-492, 2014
- [14] Prochaska, J. J., & Benowitz, N. L. "Smoking cessation and the cardiovascular patient" *Current Opinion in Cardiology*, 30(5), 506-511., 2015
- [15] VanDevanter, N., Zhou, S., Katigbak, C., Naegle, M., Sherman, S., & Weitzman, M. "Knowledge, Beliefs, Behaviors, and Social Norms Related to Use of Alternative Tobacco Products Among Undergraduate and Graduate Nursing Students in an Urban U.S. University Setting" *Journal of Nursing Scholarship*, 48(2), 147-153, 2015
- [16] Dai, H., & Hao, J., "Exposure to Advertisements and Susceptibility to Electronic Cigarette Use Among Youth" *Journal of Adolescent Health*, 59(6), 620-626. doi:<http://dx.doi.org/10.1016/j.jadohealth.2016.06.013>, 2016
- [17] Duderstadt, K. G. "Electronic cigarettes: Youth and Trends in Vaping" *Journal of Pediatric Health Care*, 29(6), 555-557. doi:<http://dx.doi.org/10.1016/j.pedhc.2015.07.008>, 2015
- [18] Yates, K., Friedman, K., Slater, M. D., Berman, M., Paskett, E., & Ferketich, A. K. "A content analysis of electronic cigarette portrayal in newspapers" *Tob Regul Sci*, 1(1), 94-102, 2015
- [19] Wu, L., & Gibson, R., "Control frames dominate E-cigarette news articles" *Newspaper Research Journal*, 38(2), 245-258, 2017
- [20] Kim, S.-H., Thrasher, J. F., Kang, M.-H., Cho, Y. J., & Kim, J. K., "News Media Presentations of Electronic Cigarettes: A Content Analysis of News Coverage in South Korea" *Journalism & Mass Communication Quarterly*, 1077699017696881, 2017
- [21] Indonesia Central Bureau of Statistics, "Health Statistics", 2017, [Retrieved from <https://www.bps.go.id/publication/2017/11/06/50fc52fce6b4d50d2e349366/statistik-kesehatan-2016.html>]
- [22] Widati, S., "Efektivitas Pesan Bahaya Rokok Pada Bungkus Rokok Terhadap Perilaku Merokok Masyarakat Miskin (Effectiveness of Warning Messages on Tobacco Packs on Smoking Behaviour of Poor Households)" *Jurnal Promkes*, 1(2), 105-110, 2013
- [23] Jancey, J., Maycock, B., McCausland, K., & Howat, P. "E-cigarettes: Implications for health promotion in the Asian Pacific Region", 2017 [Retrieved from personal communication on 10 January 2018]
- [24] Ayers, J. W., Leas, E. C., Allem, J. P., Benton, A., Dredze, M., Althouse, B. M., . . . Unger, J. B. (2017). Why do people use electronic nicotine delivery systems (electronic cigarettes)? A content analysis of Twitter, 2012-2015. *PLoS One*, 12(3), e0170702. doi:10.1371/journal.pone.0170702