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## Visualizing the decline of public interest in the Great East Japan Earthquake and Fukushima Daiichi nuclear power plant accident by analyzing letters to the editor in Japanese newspapers

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### Abstract

This study aimed to delineate the decline in public interest toward the March 2011 Great East Japan Earthquake (GEJE) and the Fukushima Daiichi nuclear power plant (FNPP) accident in Japan over a ten-year period. In this longitudinal descriptive study, we searched for publications within a ten-year period in Letters to the Editor that mentioned the GEJE, the FNPP accident, or the January 1995 Great Hanshin-Awaji Earthquake (GHAE) that occurred in Japan, using the official databases of the three largest Japanese newspapers. The GEJE- and GHAE-related publications (4,809 and 2,092, respectively) are depicted as scatter plots. The results show a gradual decrease in the publications mentioning GEJE or GHAE. The impact of GEJE and FNPP on Japanese society was enormous, but the public interest waned over time. Communication strategies that maintain a high public interest in previous disasters may be necessary.

**Key words :** disaster, descriptive study, mass communication media, public interest, radiation anxiety, risk communication

### Introduction

Maintaining a high level of public interest after the occurrence of a disaster contributes to an appropriate public health response and the prevention of victim neglect in a post-disaster society<sup>1)</sup>. Ten years have passed since the Great East Japan Earthquake (GEJE) and subsequent Fukushima Daiichi nuclear power plant (FNPP) accident in Japan in March 2011. As a result of these disasters, approximately twenty thousand people have died, and forty thousand people have been evacuated from their homeland as of March 2021<sup>2)</sup>. Many reports in the media, as well as those by scholars and the Japanese Government have highlighted concerns in the decline of public interest in the GEJE, FNPP accident, and the reconstruction from these disasters<sup>3-5)</sup>.

However, there have been no evidence-based studies examining this decline.

Japan has one of the highest levels of trust in newspapers in the world<sup>6)</sup>, and thus the Letters to the Editor of newspapers are a useful gauge of public interest. As of 2016, the total circulation of Japan's representative daily newspapers, the Yomiuri, Asahi, and Mainichi Shimbun, was approximately 19 million, and all three newspapers ranked in the top ten newspapers circulated worldwide<sup>7)</sup>. These figures suggest that newspapers are deeply related to public awareness amongst Japanese people. Evidence of the decrease of public interest in the GEJE and FNPP accident may contribute to the development of a communication strategy suitable during the recovery period from such disasters leading to improved support for disaster victims.

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The aim of the present study was to visualize the decline of public interest in the GEJE and FNPP accident longitudinally over a ten-year period.

### Materials and methods

Using the official databases of the three representative Japanese newspapers (Yomiuri, Asahi, and Mainichi Shimbun), we searched for publications mentioning the following disasters that were published in the Letters to the Editor over a 10-year period since the disaster occurrence: the GEJE or FNPP accident in March 2011, and the Great Hanshin-Awaji Earthquake (GHAE) that occurred in Japan in January 1995 for comparison to the GEJE. The search terms were the Japanese equivalent to the following English terms: “Great East Japan Earthquake”, “Fukushima Daiichi nuclear power plant”, their abbreviations, and “Tsunami” for the GEJE; “Great Hanshin-Awaji Earthquake”, its abbreviation, and related disaster sites such as “Hyo-go” and “Kobe” for the GHAE. Unrelated publications were excluded manually. In addition to the publication not mentioning the disaster topics targeted in the present study, the following three exclusion criteria were also determined: first, publications with the regional name “Fukushima,” such as those regarding the corona virus pandemic recovery in Fukushima; second, publications written by authors named “Fukushima” or “Kobe,” which are common Japanese surnames; and third, publications which partially matched with keywords due to the specifications of the newspaper databases even when an exact match was performed, such as those including the topics of sport events held in “East Japan,” in spite of the search using the keyword “Great East Japan Earthquake.” The numbers of publications that mentioned GEJE and FNPP were added together because many publications mentioned both GEJE and FNPP, or even in publications that appeared to only mention either the GEJE or the FNPP, there were contents that could be regarded as referring to both GEJE and FNPP when the contents were carefully examined. The total numbers of GEJE- and GHAE-related publications included for analysis were 4,809 and 2,092, respectively. To compress the information, such numbers were converted into a logarithm with base 2. Scatter plots with logarithmic approximation curves were depicted using the number of months passed since the earthquakes and the number of publications. Logarithmic approximation curves were employed because the characteristics of the data distribution on

the scatter plots showed that the trend in the number of publications rapidly decreased and then flattened out among GEJE- and GHAE-related publications.

Ethical approval was not required because all data in the present study consisted only of existing information that does not include humans/animals.

### Results

As shown in Figure 1, gradual decreases in the number of both GEJE- and GHAE-related publications were found. For the GEJE-related publications, a large deviation from the approximation curve was found in the first two months (from March 11th to May 11th in 2011). The number of GEJE-related publications was higher than that of GHAE-related publications in almost all periods as shown in the gap between the two approximation curves.

### Discussion

Our results suggest that there has been a decline in public interest in the GEJE and FNPP accident. The reason that the number of GEJE-related publications did not decline in the first two months may be because of the continuous interest in the critical conditions of the FNPP which created uncertainty among people all throughout Japan. Our finding that the number of the GEJE-related publications was higher than that of the GHAE in almost all time periods may reflect the severity of the long-term social and environmental impacts of the GEJE and the FNPP accident on the public: public anxiety towards radiation spread over a wide area is a specific enduring result of the GEJE. Topics related to the GEJE may have been mentioned by more people in the Letters to the Editor over a longer period of time compared to those related to the GHAE, leading to the gap in the number of publications.

We need to be cautious about the possibility that the Letters to the Editor of newspapers do not reflect public opinion but rather create it. The media has the right to decide which articles to adopt and how to present such articles. Thus, the present results may be under the influence of such bias; the decrease in the number of GEJE-related publications may be a sign of declining interest on the part of the media rather than citizens. On the other hand, citizens refer to public opinion and also create new public opinions based on information from the media<sup>8)</sup>. The decline in the number of publications related to the GEJE and FNPP accident

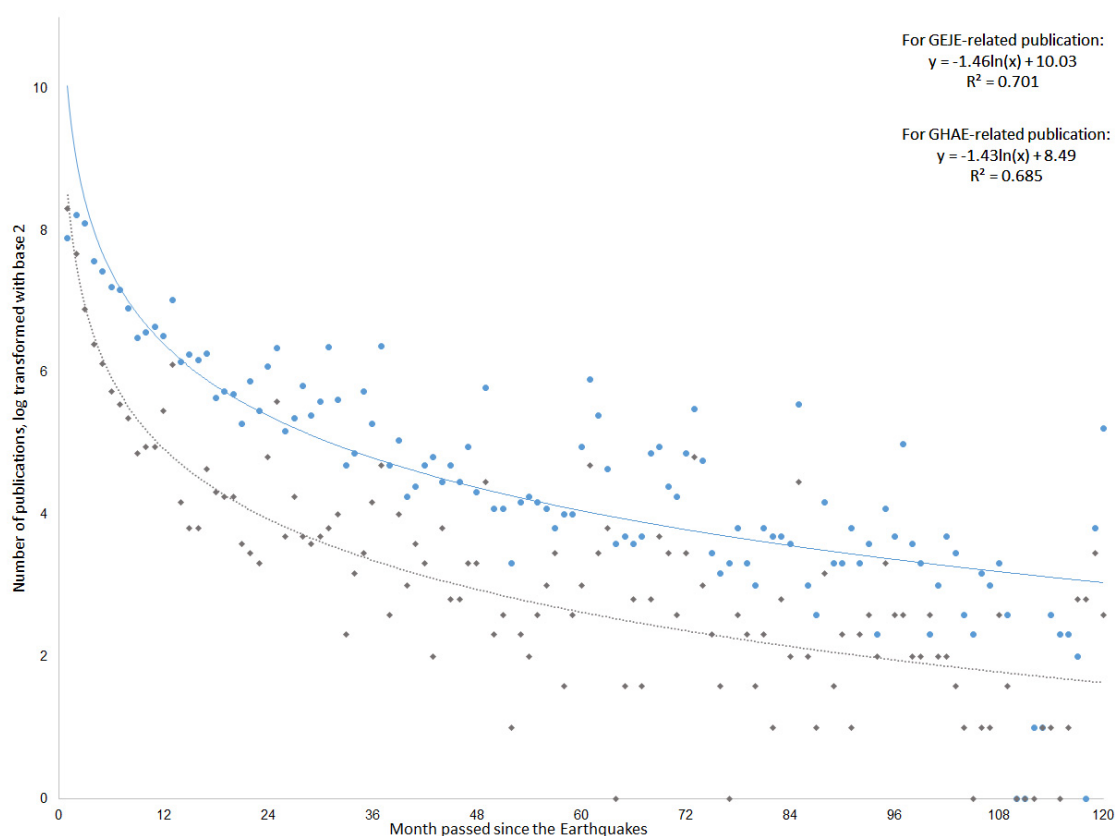


Fig. 1. Time course decline in the number of publications in the Letters to the Editor in Japanese newspapers. The solid blue lines and circles refer to the publications related to the Great East Japan Earthquake or Fukushima Daiichi nuclear power plant accident, while the dotted gray lines and diamonds refer to the publications related to the Great Hanshin-Awaji Earthquake.

in the Letters to the Editor may lead to a decrease in opportunities for citizens to be exposed to such topics, and therefore public interest may decline. Such a decline in the number of publications may be explained by the changing media environment. Although these newspapers were mainstream media at the time of GHAE, they may have been superseded by social networking services which have been spreading rapidly since 2011, when the GEJE and FNPP accidents occurred. Thus, the public may have had fewer opportunities to come into contact with topics about the GEJE and the FNPP accidents in newspapers. Regardless of whether Letters to the Editor reflect or create public opinion, the results of current analysis may have an equivalent meaning in terms of the difficulty in maintaining public interest in GEJE, FNPP accident, and their victims. Although a causal relationship between public opinion and publications in the Letters to the Editor of newspapers could not be examined due to the research design, it is notable that we found a decreasing trend in the number of publications in the

Letters to the Editor of newspapers and that such a trend may be closely related to the decline in the public interest in GEJE.

One limitation of the present study is that it did not normalize the number of GEJE- and GHAE-related publications, and thus cannot deny the possibility that the difference of total circulation of newspapers from 2011 to 2021 for GEJE, and from 1995 to 2005 for GHAE, influences the number of publications in Letters to the Editor. Future research should therefore employ procedures to normalize or correct the publication numbers for a more precise comparison.

Even in 2021 with much progress made regarding the recovery and revitalization of affected areas since the GEJE and FNPP accident, mental health problems are prevalent among disaster victims in Fukushima<sup>9</sup>). Importantly, although mental health problems among disaster victims can occur years after a disaster, such victims may be socially neglected, and may not receive adequate mental health support when public interest in the disaster declines.

In fact, Japan's government budget for physical/mental health support has been gradually decreasing since the GEJE and FNPP incidents of 2011<sup>10)</sup>, and sustainable public mental health support is at stake. Maintaining the public interest years after a disaster may contribute to continued funds and to sustainable public mental health support for disaster victims. Although there is consensus in risk and crisis communication research on the need and importance for public mental health support in the relatively short period after a disaster, our results suggest that communication strategies suitable for the recovery period after the acute phase of disasters are needed in order to achieve sustainable mental health support for disaster victims. While risk and crisis communication are of importance at times of disaster, communication strategies that maintain high public interest in a previous disaster may be necessary in the recovery process to ensure that no victim is left behind.

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### Conflict of interest disclosure

The authors declare that there is no conflict of interest.

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