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Comparative Study on Disaster Prevention Consciousness and Evacuation Intention of International Tourists and Japanese

Introduction

In Japan, inbound tourists reached over 30 million in 2018 with drastic increase and tourism policies for securing safety of tourists are gaining attention along with preparation for Tokyo 2020 Olympic and Paralympic Games (JNTO, 2018). Tourism in Japan is now considered as one of pillars for next economic drivers. This industry is expected to contribute to the recovery from the Great East Japan Earthquake in 2011. The government sets the target by 2020 (Tokyo Olympic 2020) as inbound visitors as 40 million and consumption as 8 billion yen. Under the Strategy for Promoting Tourism-Oriented Country in 2017, preparation for risks related to disasters, incidents, etc. is raised and discussed.

However, there was problem in responding to information needs and guiding evacuation of foreigners in past natural disasters. In past earthquakes such as Oosaka Hokubu Earthquake in 2019, Great East Japan Earthquake in 2011, and Hokkaido Iburi Earthquake in 2018, it is criticized that there was not enough information provision in multiple languages. Also, there was delay in evacuation for foreigners due to lack of information as well as insufficient perception among foreigners. We could understand that behaviors of foreign tourists may be different from that of Japanese since there was panic behavior or run immediately after the shakes in Sapporo area in experience.

One of the reasons behind the problem is that there has been insufficient consideration for disaster management guideline for foreign travelers. Therefore, the study attempts to understand inbound tourist's disaster prevention behavior and mechanism. The objective of the study is to understand inbound tourist's disaster prevention consciousness, intended evacuation behavior and information seeking behavior and analyze their mechanism with control group as Japanese. In the research, we report the initial statistical analysis for the study using the pre-survey dataset. We further extend our survey data sets in depth by adding additional countries as well as revising survey content.

Literature Review

Regarding the evacuation of tourists in previous research, Cahyanto et al. (2014) studied on determining tourist's individual characteristics, travel related variables, and socio-demography on decisions regarding whether to evacuate and conducted a case study for Florida for hurricane evacuation. It suggested increasing awareness of hurricane among tourists and found that ethnicity has not been found significant. Ritchie (2009) investigated how tourists respond to crises is still lacking and suggested that future researchers examine tourist behavior during crises. Phillips and Morrow (2007) found that tourists are vulnerable in the event of a crisis with one of the main reasons being that tourists may not speak and/or read the host language and may lack knowledge of the risks that hurricanes present. This means that tourists may have trouble in receiving, interpreting, and responding properly to risk messages. Risk awareness and intended tsunami evacuation behavior of international tourists in Kamakura City, Japan were conducted by Arce et al. (2017). Evacuation behavior and its relation to seeing information sources and signs in the city were confirmed yet model development has been conducted. Previous studies have identified many factors that influence responses of household to hurricanes such as gender, wealth, past experience, related to hurricanes, hurricane knowledge, race and ethnicity

It is nevertheless to say that little attention has been focused on transient populations in destination such as tourists (Phillips and Morrow, 2007). This means that there have not been enough specific predictions about the behavior of tourists in their communities. However, Cahyanto et al. (2016) found information seeking as one of predictor for evacuation intention and classified it as active and passive where active information seeking as two-way communication and passive information seeking as one-way communication usage. In Griffin et al. (1999), information providers are counseled to provide individuals with the types of information they need rather than giving them only what others with expertise feel they should have. Risk managers are advised to construct decision processes that incorporate all parties influenced by a risky situation, not just those with the most social power.

Also, few studies on human behaviors during and in the immediate aftermath of a disaster were conducted and Prati et al. (2013) studied on modelling human behavior in 2012 Northern Italy Earthquakes. Physical as well as ethical constraints limit the opportunities for studying human behavior in an earthquake (Drury and Cocking 2007). Theories of human behavior in emergencies and disasters are sometimes explained by panic theory called as collective theories in emergencies. Kuligowski and Mileti (2009) stated that individual behavior in crisis situations is the result of a decision-making process in which perceived risk plays a crucial role. Perceived risk refers to how much risk/danger people feel as the result of the event and their perceptions concerning the seriousness of the event

In tourism crisis management, to the best of author's knowledge, most studies on evacuation behavior are studied in hurricane where study target takes place in USA. There have not yet been enough case studies on Japanese context in terms of types of natural disasters. Furthermore, studies on crisis management has been conducted widely in view point of natural disaster management and structural engineering in Japan and there has been little attention on targeting 'international tourists' as research scope due to its complexities and difficulties in capturing the characteristics.

Overall, the study is one of the first attempts in Japan to discuss detailed evacuation intention behavior as well as information seeking behavior or inbound tourists. This transient population has been discussed recently due to drastic increase of population visiting in Japan in recent 10 years as well as preparation for 2020 Tokyo Olympic and Paralympic Games. The scenario focused in the study is firmly based on national report published by Cabinet Office and was designed to increase practical assumptions. There are many predictors or factors for evacuation intention as past disaster experience, risk perception, education, gender, nationality and so on. By applying Ozeki and Shimazaki (2017a; 2017b) and Ozeki et al. (2017)'s works on risk perception, the study broadly explores relationships between abovementioned factors and intended evacuations of international tourists in Japan.

Data Collection

This study is based on data obtained from monitors of an online survey company during February 16th to 21st, 2019. The company translated survey sheet and distributed to each country within its panel data. We have asked two nationalities as this is initial stage before our next survey and analysis and collected 254 samples from Korea and 235 samples from Japan. The total sample size is 489 in the study. The scope of respondents was to ask Korean tourists whether they have experience in visiting Japan especially in Tokyo and the screening question was asked accordingly.

On the other hand, Japanese respondents were asked whether they live outside of Kanto region and have experience in visiting Tokyo as tour purpose.

Table 1. Survey on disaster prevention consciousness and evacuation intention

Survey Target	Korean and Japanese who had experience in visiting Tokyo
Nationality	Japan and Korea
Survey Method	Internet based web survey
Survey Content	Demography Disaster prevention consciousness Experience on disaster education and past earthquakes Knowledge and perception on earthquakes Evacuation intention under disaster scenario Information source under disaster scenario
Samples	Korea 254 samples, Japan 235 samples Total 489 samples
Survey Period	Feb 16 th , 2019 – Feb 21 th , 2019

The characteristics of respondents are summarized in the following figures. Age of respondents is summarized in Figure 1. Majority of respondents (33.3%) aged between 40 and 49 years old. Among Korean, majority is consisted of respondents between 40 and 49 years (35.8%). The majority of Japanese are again aged between 40 and 49 years old (30.6%) and more elderly respondents can be observed.

Respondents had various visiting frequencies to Japan; 22% of them had visited Japan twice and 20% was between fifth and ninth time in their visiting frequencies, and 12% of them responded that it was their first time as in Figure 2. Residence area of Japanese is found in Figure 3. 31.1% of them live in Kinki area, 20.9% in Chubu area, 12.8% in Kyushu area. Visiting spots are summarized in Figure 4 that 51.2% of Korean visit Kyushu area, 46.5% to Hokkaido area, and 37.4% to Okinawa area. On the other hand, Japanese visit 83.4% as Kinki area, 74.8% as Kanto area, and 74.0% as Kyushu area. We asked language capability for Korean only in Figure 5. Approximately 70% of them cannot speak Japanese and only 5.9% of respondents replied that they could speak as business level. Collected information included personal characteristics (age, gender, occupation, and education), travel related attributes, risk perception, knowledge on disasters, intended evacuation behavior under 6 different scenarios.

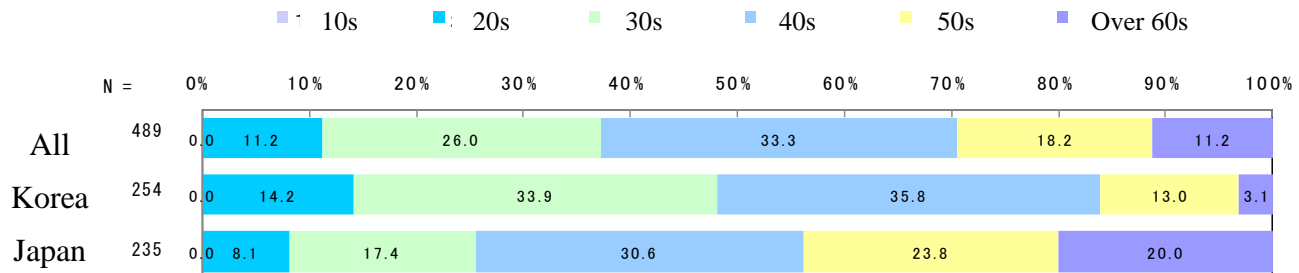


Figure 1. Age of respondents

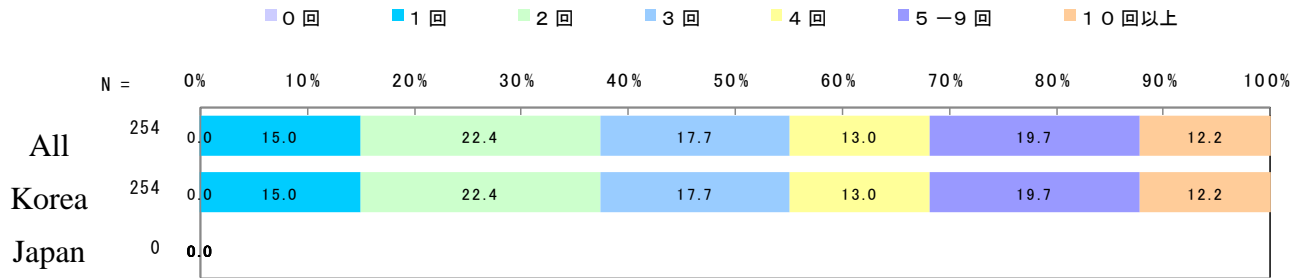


Figure 2. Visiting frequencies to Japan (Korean only)

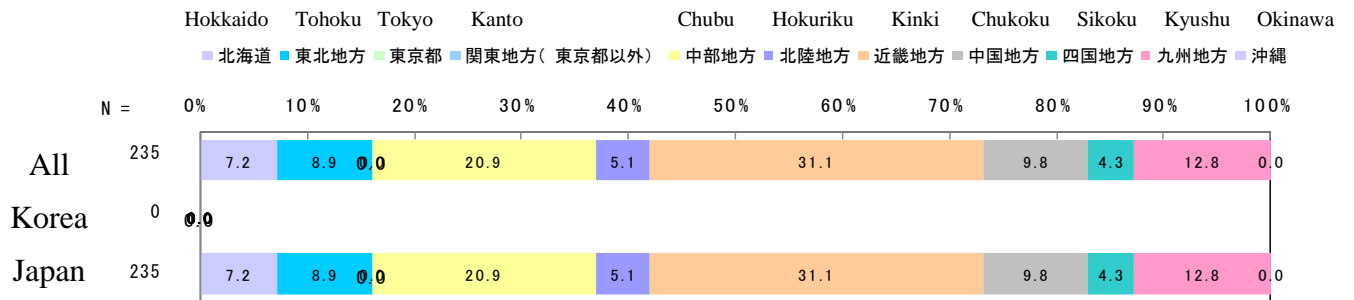


Figure 3. Residence area (Japanese only)

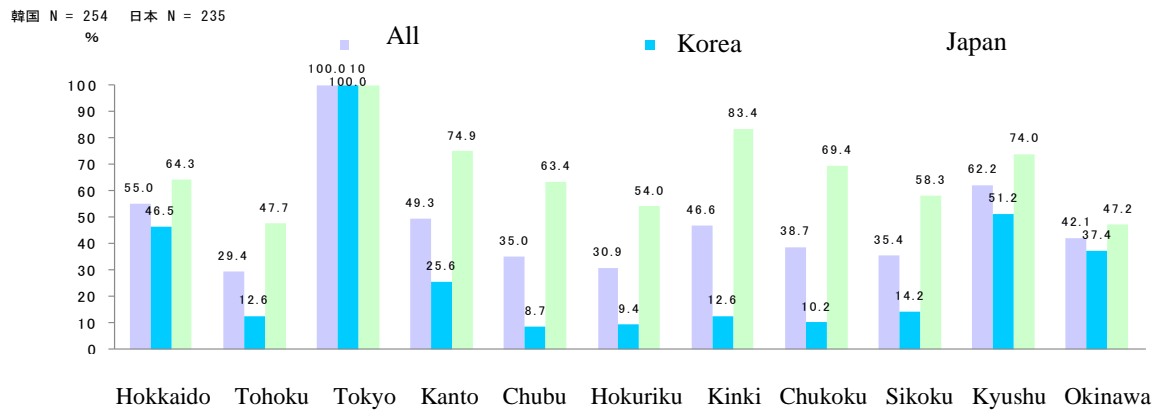


Figure 4. Visiting spots in Japan for tourism

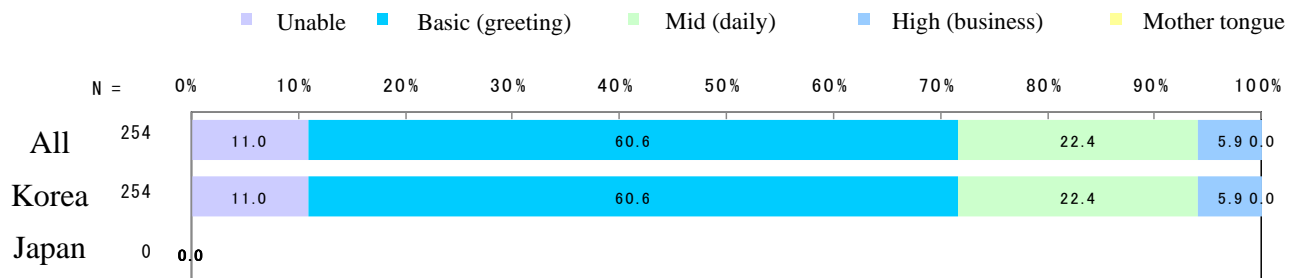


Figure 5. Language capability (Korean only)

Results

Disaster Prevention Consciousness, experience and knowledge

Disaster prevention consciousness is consisted of 5 different components as imagines on disaster damage, sense of crisis on disasters, other-directed personality, anxiety and interests in disasters. The results are summarized based on nationalities. Regarding imagines on disaster damage and sense of crisis on disasters, Korea has higher points compared to Japan. Interests in disasters do not have much difference between the two nationalities.

Figure 6-1 Imagines on disaster damage

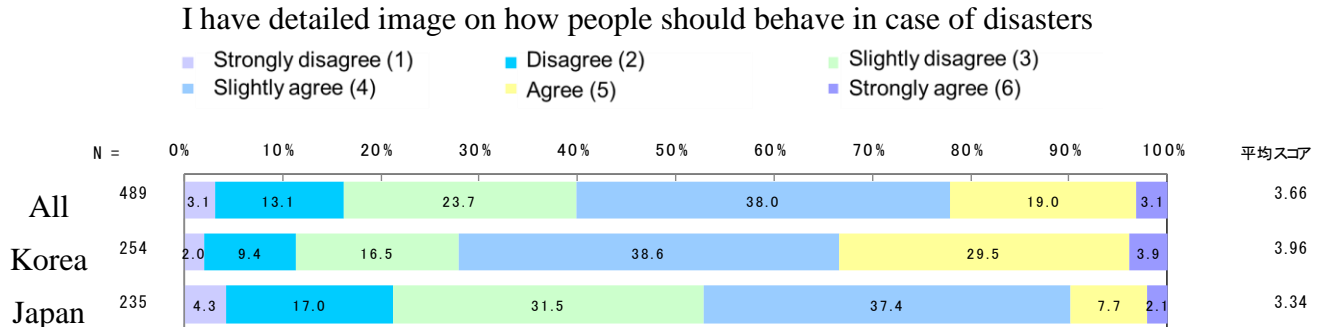


Figure 6-2 Imagines on disaster damage

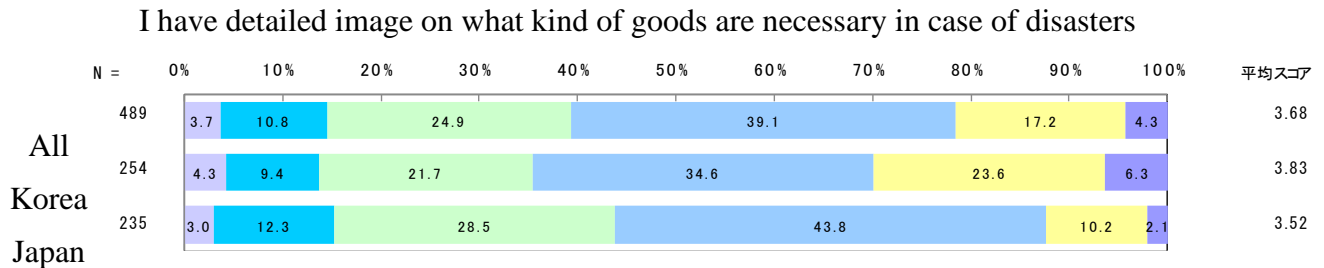


Figure 6-3 Imagines on disaster damage

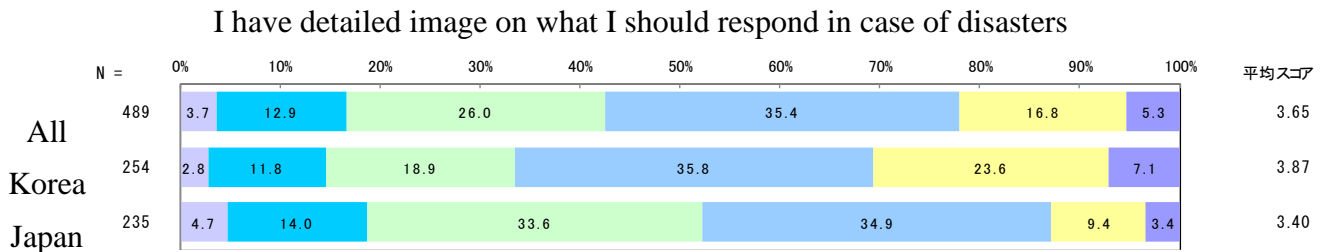
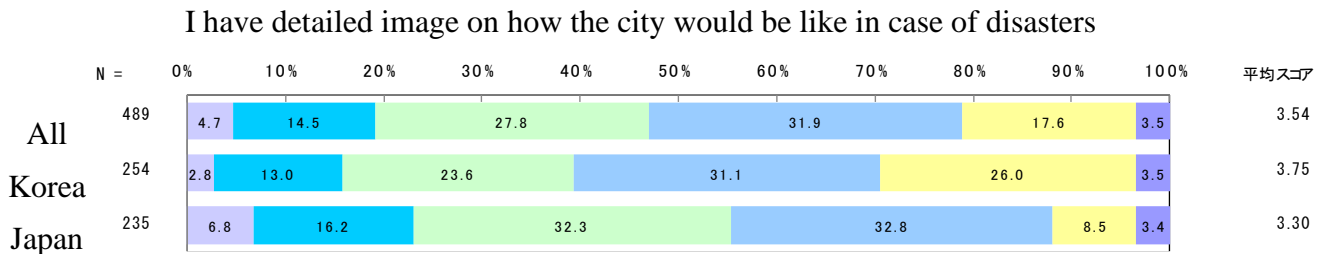


Figure 6-4 Imagines on disaster damage



Sense of crisis on disasters is summarized in the following figures. Japan has higher points in the perception of sense of crisis on disasters stating that it is not strange that we would meet in disasters tomorrow. Japan has average points as 4.66 and Korea has average points as 3.49.

Figure 7-1 Sense of crisis on disasters: It is not strange that we would meet in disasters tomorrow

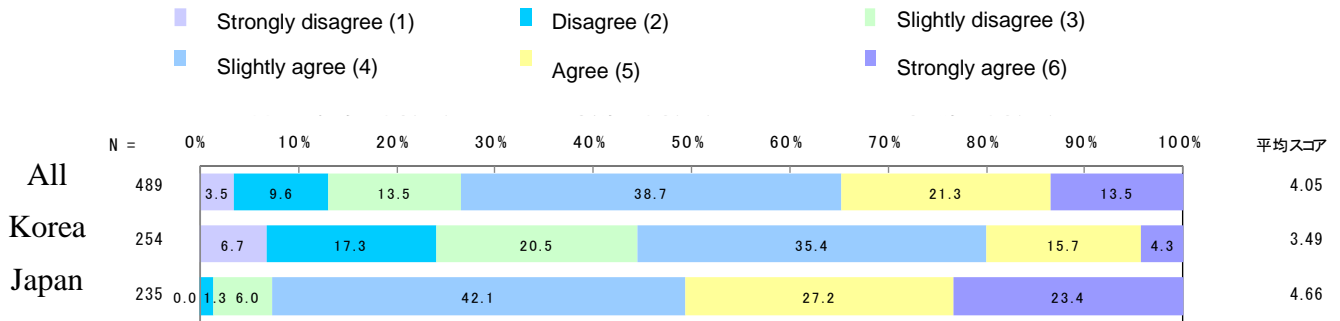


Figure 7-2 Sense of crisis on disasters: I think that it will be chaotic when disasters happen

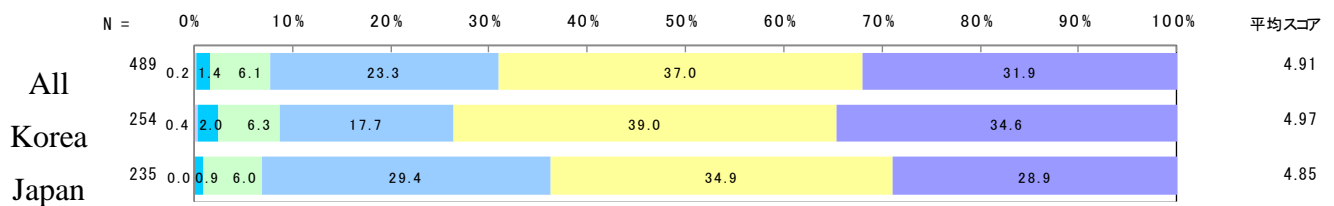


Figure 7-3 Sense of crisis on disasters: I think that reducing impact of disasters cannot be achieved by only efforts of individuals

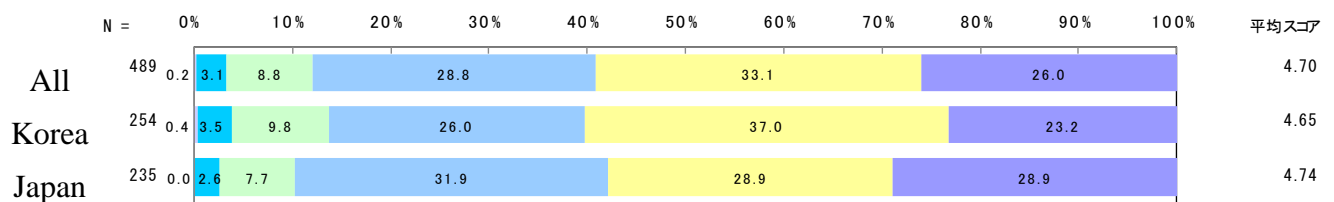
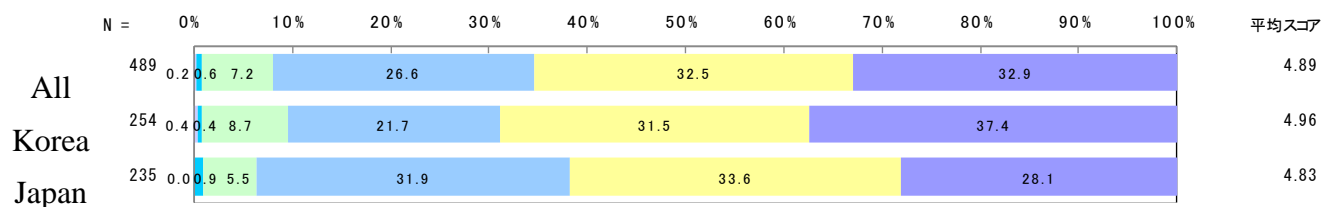


Figure 7-4 Sense of crisis on disasters

Disaster prevention should be worked together across regions not in its own region.



In this section, we analyze other-directed personality in disaster prevention consciousness. The results are found in Figure 8-1 to Figure 8-4.

Figure 8-1 Other-directed personality: I like having communication with others

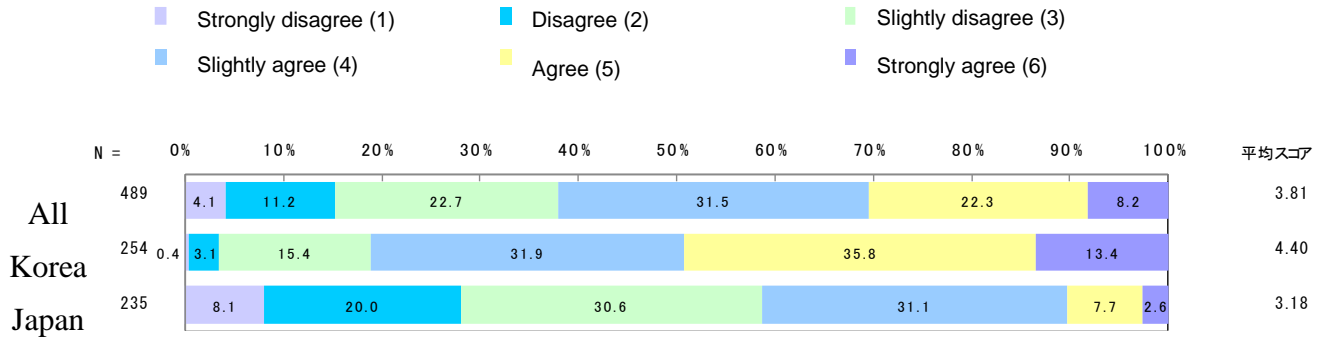


Figure 8-2 Other-directed personality: I like gathering places

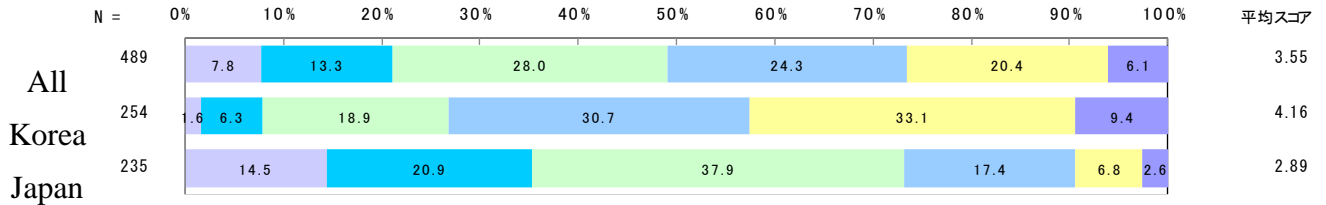


Figure 8-3 Other-directed personality: I would like to make many friends

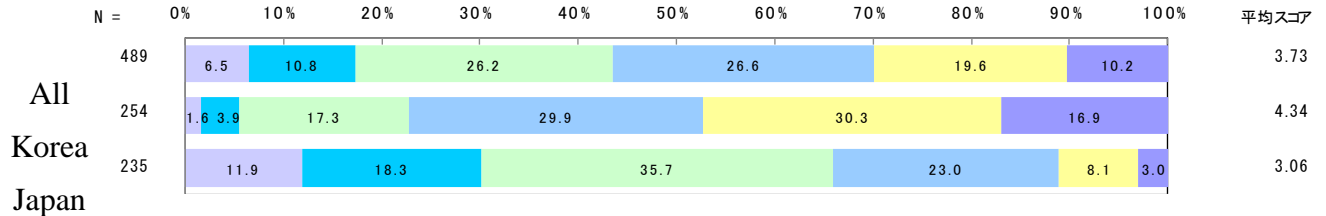
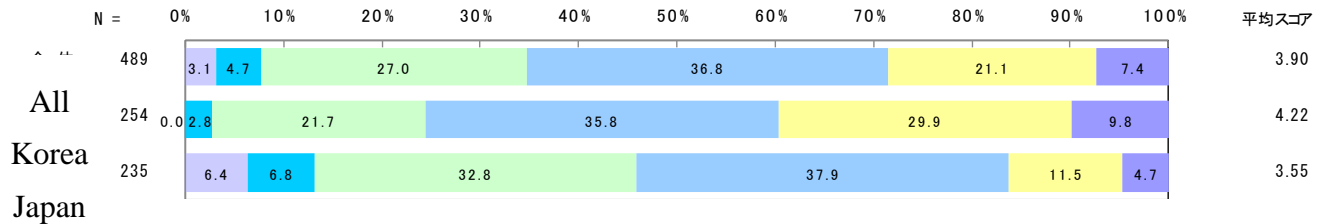


Figure 8-4 Other-directed personality: I would like to do something for others



Regarding the anxiety, the results are shown in Figure 9-1 to Figure 9-4. It is shown that Japanese scores are higher than that of Korean in all criteria regarding anxiety.

Figure 9-1 Anxiety: I feel anxious often

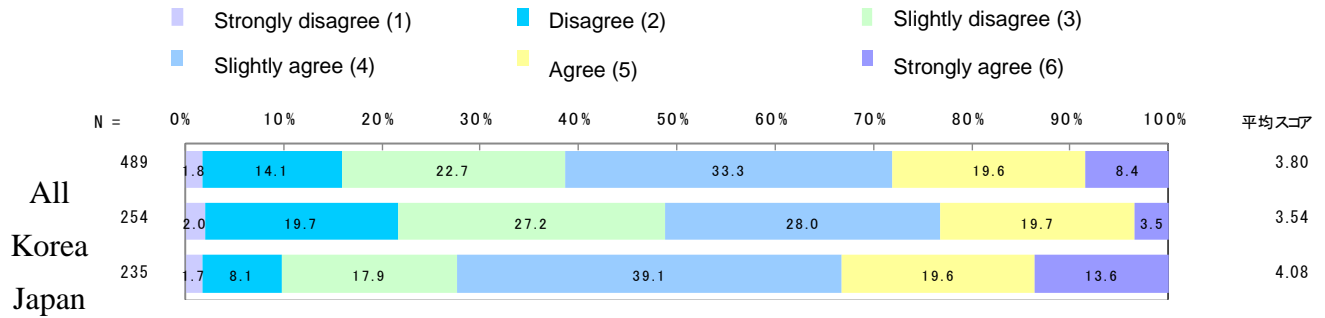


Figure 9-2 Anxiety: I have a worried personality

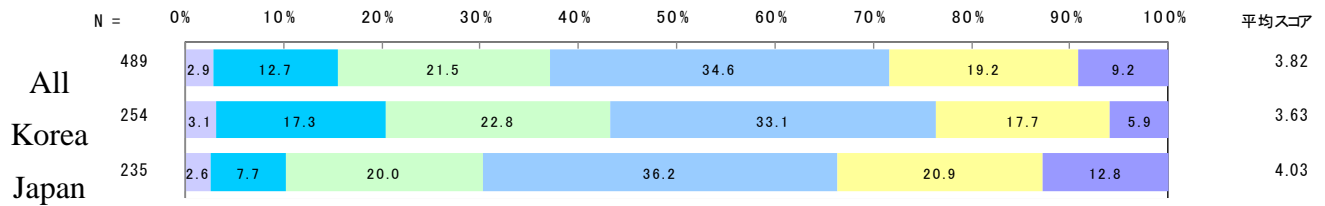


Figure 9-3 Anxiety: I often think of many disastrous situations when thinking of disasters

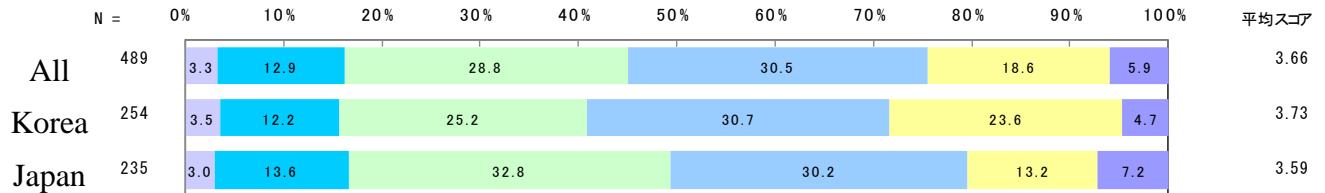
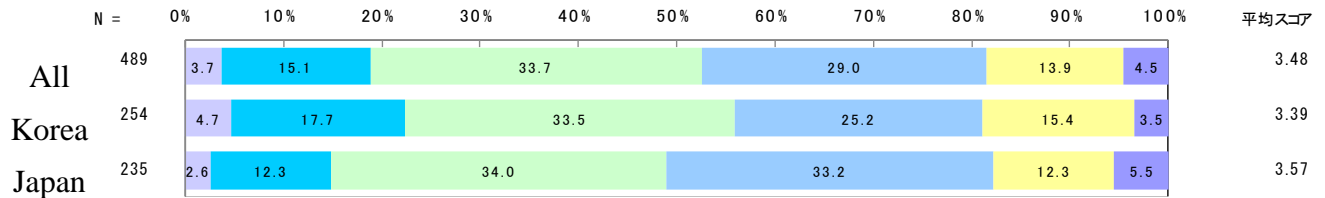


Figure 9-4 Anxiety: I pay attention in danger around my surroundings



Regarding the interests in disasters, the results are shown in Figure 10-1 to Figure 10-4. It is shown that Koreans score slightly higher than Japanese with not much big difference among all criteria.

Figure 10-1 Interests in disasters: I would not want to do things that are not beneficial for me

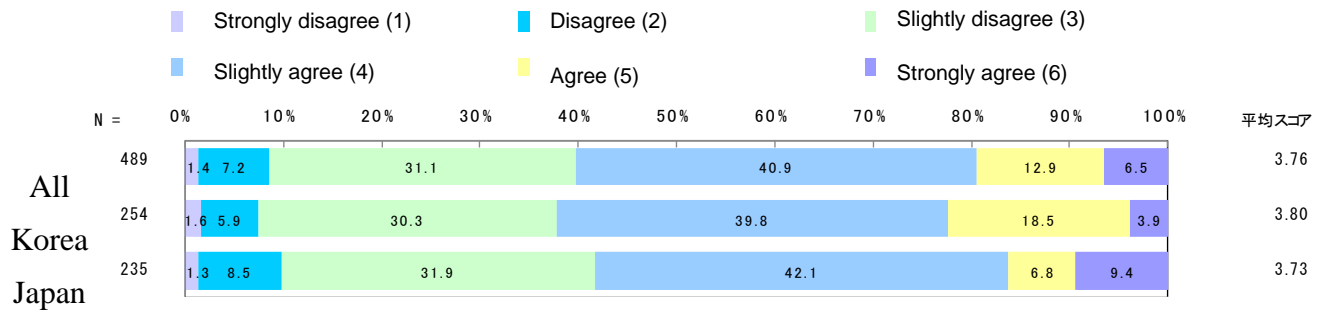


Figure 10-2 Interests in disasters: I think only those that would happen nearby

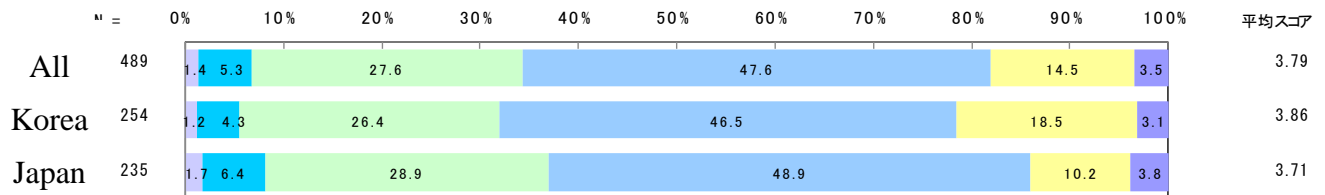


Figure 10-3 Interests in disasters: I do not think of disasters in daily life

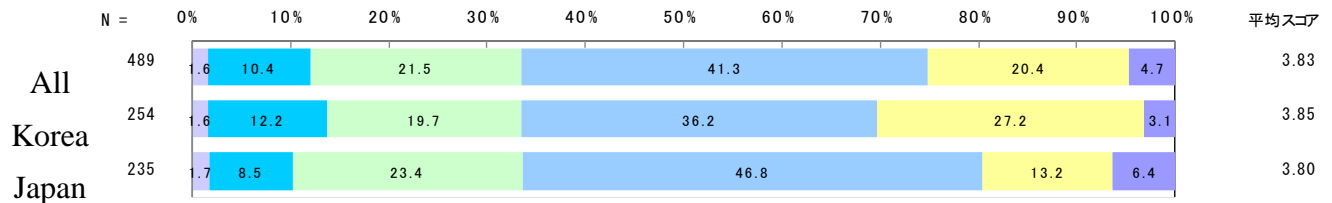
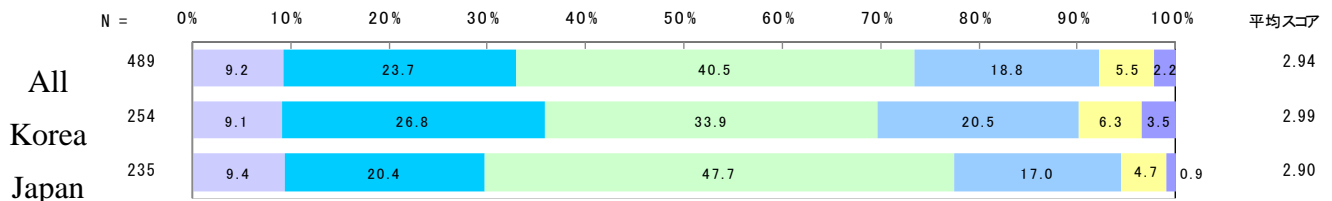


Figure 10-4 Interests in disasters: I think it is enough preparation with earthquake resistant buildings or maintenance which are physical preparation



We collected data on disaster prevention education as well as experience of earthquakes in the past. Regarding the disaster prevention education, we asked the type of disasters and methods that respondents were experienced. Korea and Japan both replied that earthquakes were the most highly educated in terms of types of disasters. The others include landslide as well as typhoon which are less than 1-% for each country. Regarding the methods, Korean replied that television was mostly

used followed by drills, internet as well as listening to You Tube. On the other hand, Japanese replied that drill was the most frequent method followed by television and schools.

Also, frequencies of joining disaster drills were asked among respondents. In Korea, fire drill was scored the highest as average 2.05 followed by earthquakes as 1.27 times. In Japan, earthquake drill was the highest score as 2.44 times followed by fire as 2.07 times. The other types of disaster drills were less than 0.4 times at average in both countries. Experience on disasters were asked by using the maximum earthquake size based on each country's criteria (Sindo as in Japan, MMI as in Korea). It seems that Japanese has experienced larger size of earthquakes when compared to Korean.

Intended evacuation behavior and information sources

Here, we asked survey respondents on their intended evacuation and their expected information sources under disaster scenarios. According to Tokyo Metropolitan Area Earthquake Scenario by Cabinet Office, Tokyo area is expected to experience M 7.3 class and 6 strong class according to JMA standard. Here, we have collected free descriptions of respondents and analyzed according to grouping responses as information collection behavior as information sources and evacuation intention.

While in traveling/immediately after earthquake

As for the information source of traveling/immediately after earthquake, when internet and telephone are available, internet website is the most common in Korea and Japan, followed by telephone. In the case of temporary blackouts and difficulty in using the Internet and telephone, the depending on the surrounding situation is the most common in Korea, whereas radio is the most frequent in Japan. About the behavior of traveling/immediately after earthquake, when internet and telephone are available, in Korea, there are many contact and safety confirmation with family and acquaintances and confirmation of damage status, whereas in Japan, there are many confirmations of situation and collection of disaster information. In the case of temporary power outage and difficulty in using the Internet and telephone, in Korea, follow the surroundings is common, whereas in Japan, moving to an evacuation or safe place, disaster information collection, following around and the guidance.

Figure 11-1. Information collection and evacuation intention in tour (internet accessible)

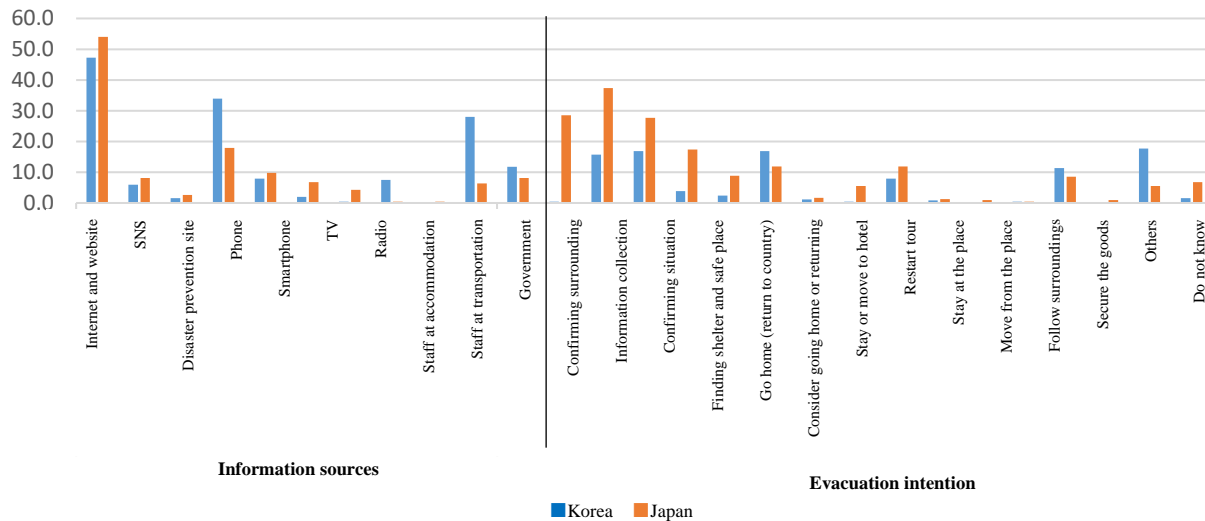
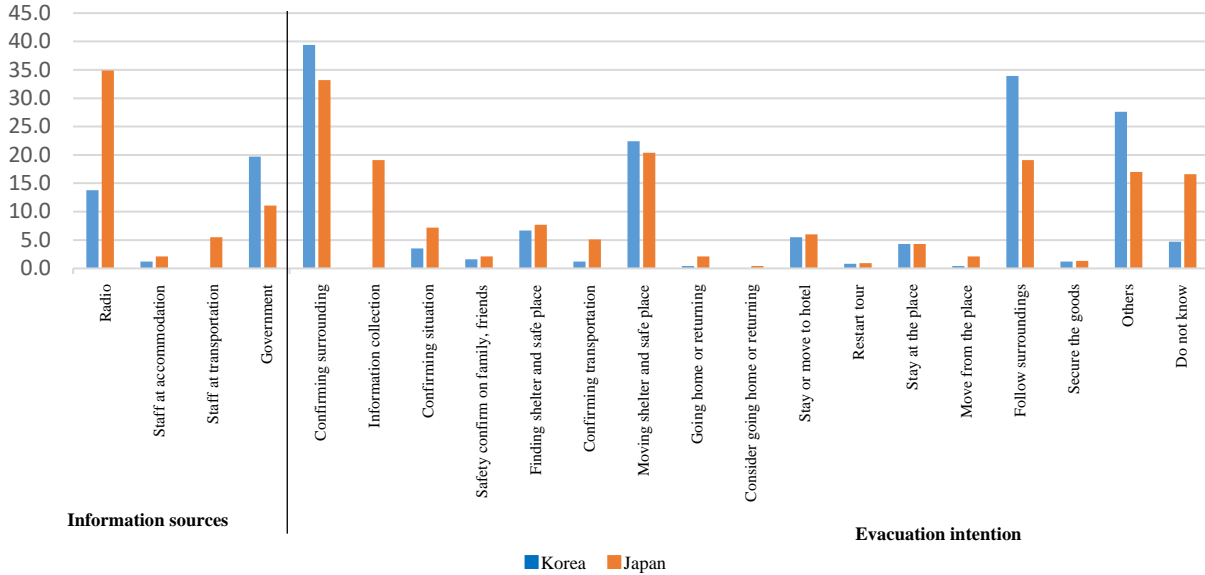


Figure 11-2. Information collection and evacuation intention in tour (no internet)



While in transportation system /immediately after earthquake

As for the information source of tourists while in transportation system and immediately after the occurrence, when internet and telephone are available, internet website is the most common in Korea and Japan. The next source of information is government, meteorological agency, local government, police, etc. in South Korea, while telephone is in Japan. In the case of a temporary power outage and difficulty in using the internet and telephone, the depending on surrounding situation is the most common information source in both Korea and Japan. As for the behavior of tourists while in transportation system, when internet and telephone are available, the highest scores are moving to evacuation and safe places in Korea, whereas in Japan, confirm damage status and collect disaster information. In the case of temporary power outage and difficulty in using the Internet and telephone, both South Korea and Japan often follow the surrounding guidance.

Figure 12-1. Information collection and evacuation intention in transportation (internet accessible)

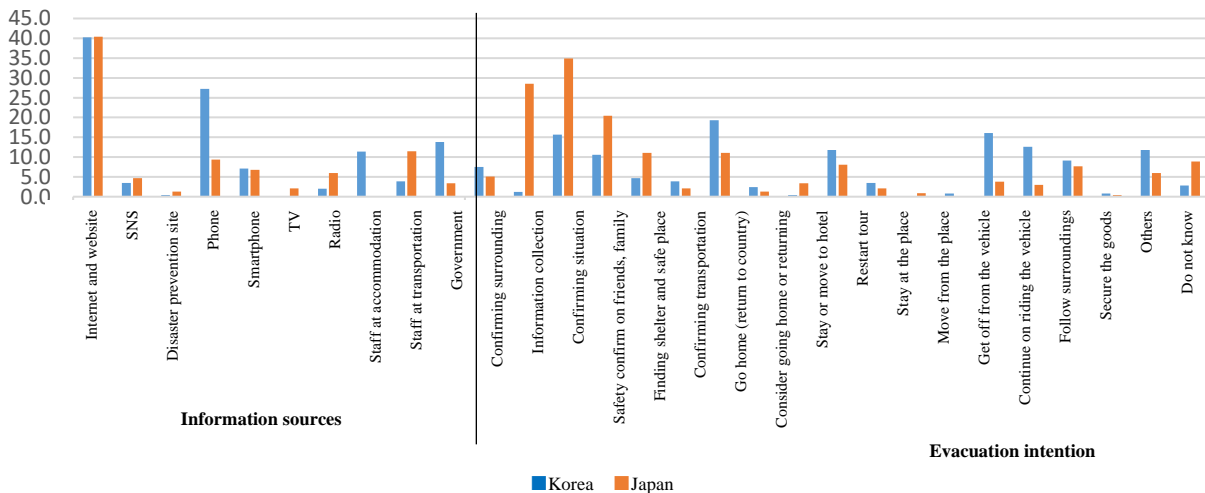
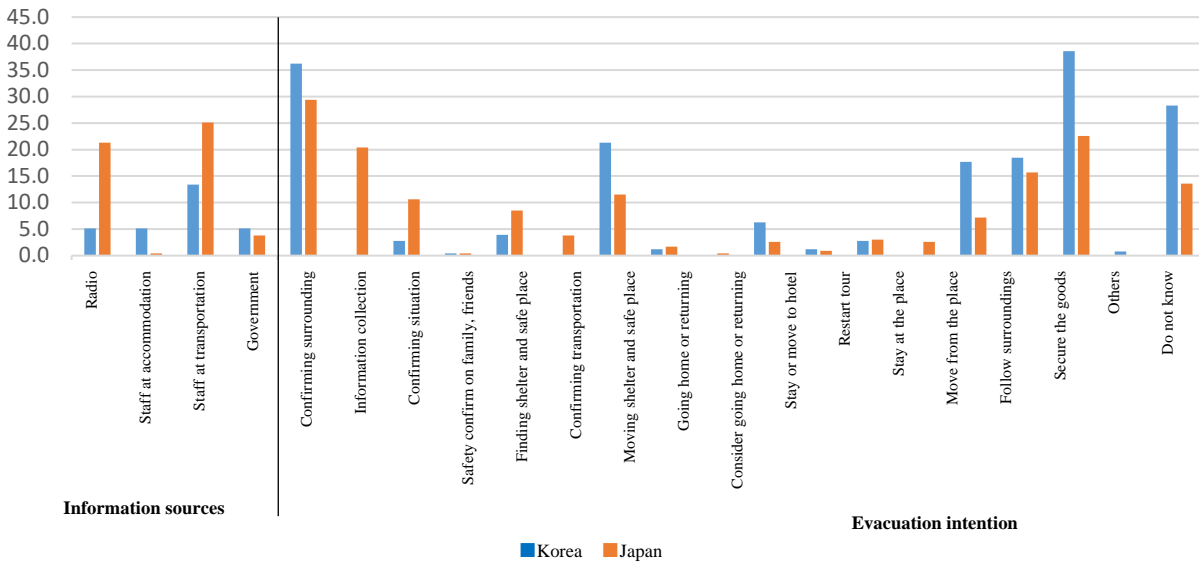


Figure 12-1. Information collection and evacuation intention in transportation (no internet)



While in accommodation and immediately after earthquake

As for the information source of accommodation and just after the occurrence, when internet and telephone are available, there are many of respondents who replied internet website and accommodation staff in Korea and Japan, followed by telephone. In the case of a temporary power outage and difficulty in using the Internet and telephone, the number of accommodation staff is the largest in both Korea and Japan and depending on surrounding the surroundings continues.

About the behavior of accommodation and immediately after the occurrence, in the case of internet and telephone are available, moving to accommodation and staying in accommodation is the most common in Korea, whereas damage status check in Japan. There are many respondents who replied accommodation staff as disaster information collection sources.

Figure 13-1. Information collection and evacuation intention in accommodation (internet accessible)

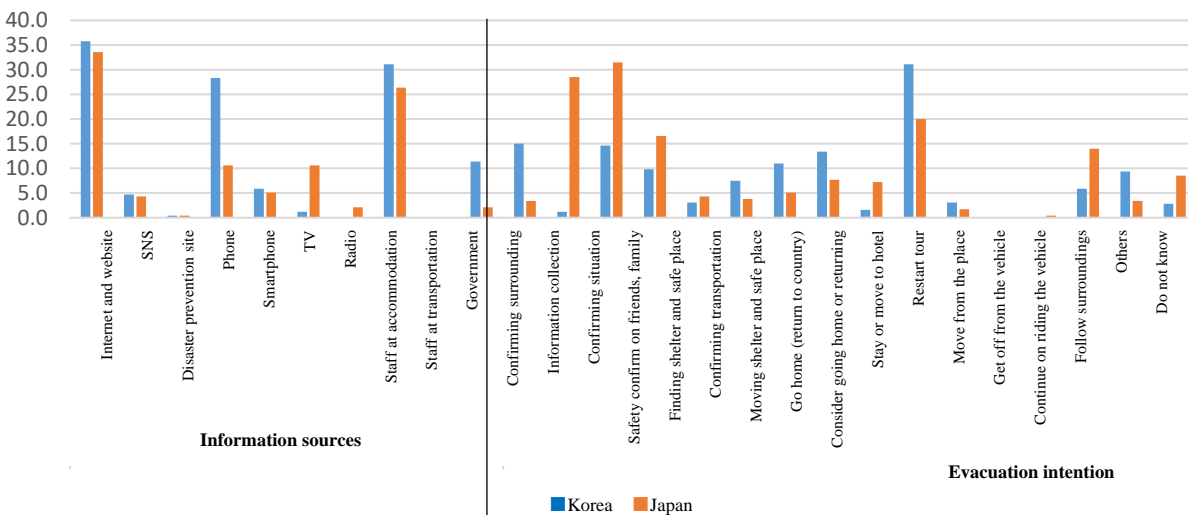
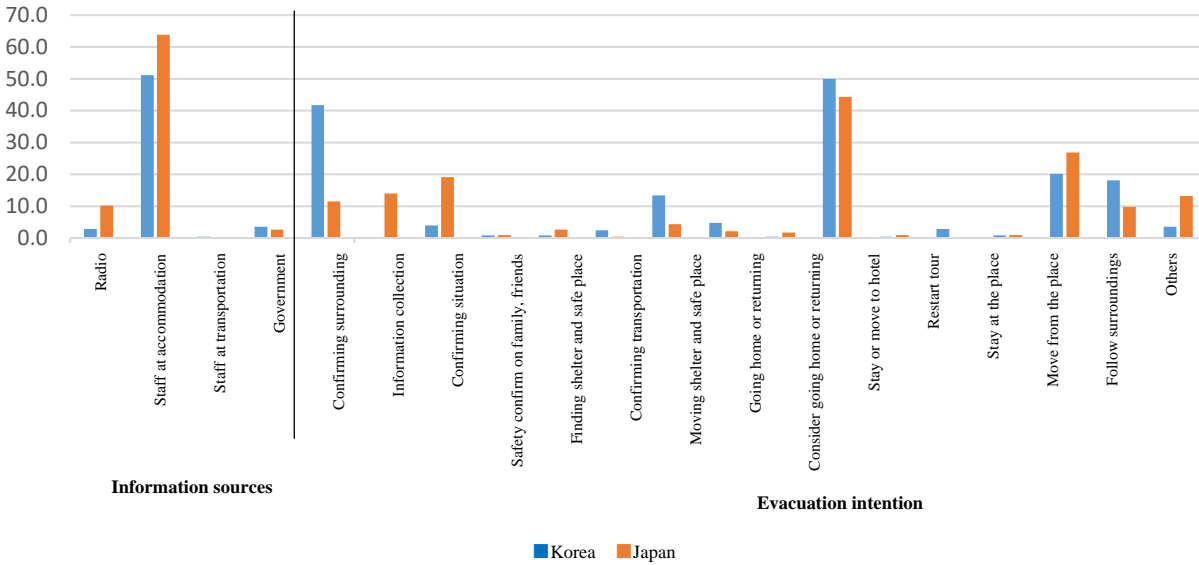


Figure 13-2. Information collection and evacuation intention in accommodation (no internet)



Conclusion and Discussion

This study focused on comparing disaster prevention consciousness and intended evacuation behavior of inbound tourists and Japanese as an initial study for the topic. In tourism crisis management, most evacuation studies were rather focused on hurricanes which are not highly related to Japanese context. Since drastic increase of inbound tourists in Japan has been gaining attention especially for securing the safety and guiding evacuation behavior in case of emergencies, the study designed original survey questionnaire and analyzed disaster prevention consciousness, disaster experience, related education, information seeking behavior and intended evacuation behavior in Tokyo Metropolitan Earthquake scenario.

Here, we compared only Japanese to Korean but would like to extend our research scope to include further countries later in our study. The findings provide the central government as well as stakeholders in tourism (accommodation facilities, transportation operators, tourism information centers, etc.) implications for detailed tourism disaster management planning to consider evacuation guidance and information provision. There are still future extensions of the study as exploring various countries as samples for the study and confirming the relationship between factors by model development.

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