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## Tsunami and Earthquake Symbols and Signs on the Children's Semiotic Understanding

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# Tsunami and Earthquake Symbols and Signs on the Children's Semiotic Understanding

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**Abstract.** This qualitative research aims at describing the coastal children's knowledge and perspective about the Tsunami and earthquake's symbols and signs. The use and purpose of the signs on the warning board is very important for children on the coastal area as an understanding of disaster preparedness. Consequently, the researchers chose 43 respondents with 8-13 years old who live at the coast of Kampung Jawa, Banda Aceh to respond questionnaire and interview. The questionnaire set contained the verbal and non-verbal symbols and signs about tsunami and earthquake which was formulated in the form open-ended questions. It was found that only 12 children who could answer 80% of the questions correctly from the questionnaire. This implies that their understanding and background knowledge about the tsunami and earthquake's symbols and signs are very low level even though the symbols and signs are put on their environment. Moreover, during interview process, children had wrong interpretation about the signs and symbols and did not know the function because they never get information about the symbols, the way to evacuate and preparation before the disaster happened from their school and environment. Consequently, it is suggested that stakeholder should conduct practices for disaster education that can improve their disaster awareness.

**Keywords:** Tsunami and earthquake; disaster; symbols; the study of signs; semiotics

## 1. Introduction

The coastal areas of Aceh have been struck by such catastrophic ocean waves named Tsunami in 2004. There had been a lot of damages—both regarding the physical and non-physical issues undergone by the Acehnese people, specifically speaking for people in Banda Aceh. The attack of a natural disaster can be sudden and recovery may take years and even decades.[1] Consequently, a lot of international countries have also done their favor to help the impacts of the disaster. The favors included physical necessities such as food, building reconstruction, and other staple needs for survival; while the non-physical helps have been seen in the manifestation of psychological guidance, educational supports, and until today, there are continuous research on the Tsunami and earthquakes that can be taken into account as the pro activeness of the disastrous experience in the past. In fact, linguists have also taken a stand to contribute to this research area in attempt to minimize the effect of the disasters in the future. The linguists' concern being discussed here is about the use of signs in the warning boards for Acehnese people—the semiotics. Chandler noted that the value of a sign depends



on its relations with other signs within the system.[2] Someone cannot get involved in a semiotic study of how meaning is delivered in text and cultural practice without adopting a philosophical standpoint in relation to nature of sign, illustration and reality. As a result, there are mutual relationship between signs and meaning in real life. In Banda Aceh, several standardized symbols and signs have been designed to be put around the cautious areas in the coastal areas. The symbols and signs are clearly stated in the government rules; Badan Nasional Penanggulangan Bencana (BNPB) no: 07, 2015[3] and Disaster Preparedness Manual from Badan Nasional Penanggulangan Bencana (BNPB), 2017.[4] This study intended to seek the information whether Acehnese children who live around the coastal areas are well-informed of these symbols and signs and their perspective toward tsunami and earthquake signs in daily life.

## 2. Literature Review

A sign is defined based on various types of things—a shading, a motion, a wink, a question, a scientific condition, and so on—that stands for an option that is other than itself. The word “red” qualifies as a sign since it does not remain for the sounds r-e-d that involve it, but instead for a specific sort of shading and different things. All things considered, the term semeiotics (spelled along these lines) was instituted by Hippocrates (460-377 BC) as the exploration of manifestations and symptoms. The side effect, Hippocrates guaranteed, was referred to as semeion—which means “check” or “sign in Greek”. Disentangling what a side effect rely on, how it shows itself physically, and why it is demonstrative of specific illnesses or conditions is the quintessence of medicinal determination. These days, while the objective of semiotics today is to research something very extraordinary (a sign, for example, red), it in any case has held a similar fundamental technique for request.[5]

Danesi further urges that the thing to which a sign alludes is referred to, sensibly, as the referent.[5] There are two kinds of referents: (1) a solid referent, for example, the creature assigned by the word feline, and (2) a unique referent, for example, the “bright ideas” assigned by—commonly—a light bulb. The second one is something that can be appeared to exist in reality – for example, a “feline” can be demonstrated by basically indicating one. The former is fanciful and cannot be shown by just indicating it-how might you point to a “bright idea” inside somebody’s mind? Signs enable us to allude to things and thoughts, despite the fact that they probably will not be physically present for our faculties to witness. When we say or hear the word feline, the picture of the creature being referred to comes immediately to mind, regardless of whether the genuine creature is not around for us to see with our sense. In addition, semiotics has the representation which is the forms, object which is the actualization, and interpretant which is the value of the symbols.[6]

In a similar line of satirize contention forever guaranteeing semiosis, Chang addresses on the semiotic ramifications of an ongoing worldwide occasion, in actuality a calamity, that has influenced where it occurred as well as where it did not happen, either; to be specific, the quake and tidal waves in South Asia that asserted almost a quarter million of lives, a significant number of whom were from this remote Nordic piece of the bewildered world.[7] At that point, what are fiascos? How are they encoded as they are decoded? Why semioticians did not give careful consideration to it, why there has not been a semiotics of calamity. For all our enthusiasm in globalization, for what reason has not there been a semiotics of worldwide disaster?

The calamity has constrained us to ponder the semiosis of a system of frameworks, both regular and social. The polysystem of that charitable quake and its ensuing executioner ocean floods is intricate to the point that it justifies inside and out semiotic investigation. It is a system comprising of numerous logical and folkloric translations of arrangement of changes among famous, indexical and representative signs, one understanding offering ascend to another; revealed creature and human reactions to semiotic activities and responses, where mankind is isolated into national, ethnic and social gatherings, some of which, similar to those minorities in the Andaman archipelagos, have been up to this point covered in puzzle.[8] The outcomes are sound geophysical readings, observer stories of different purposes of perspectives, a considerable measure of which are semantically overcoded by religion and superstition, for example, creatures sparing human lives, and so forth. Tourism, media, altruistic associations, debacle alleviation gatherings, flotsam and jetsam, bodies – all these had a part to play in shaping this hopeless mixture of enormous scale.[7]

Take for instance the Tsunami disaster, the innate older folks in the Andaman ocean locale saw the approaching tide and alarmed his kin to escape and look for higher safe houses. His alarm is undoubtedly etymological or conceivably paralingual, given the direness existing apart from everything else. Here the interpretant is no uncertainty the Peircian ‘propensity’, however propensity is now semantically intervened or, at any rate, when the message was conveyed, the normal signs must be meant phonetic signs. Clarke contends that before the experience is conveyed, the quick view of regular issue can be free from dialect intercession. Unconvinced by Peirce, he proposes the qualification between common sign and sensibly more crude ‘natsign’, the last being a ‘short-go’ sign, which is delivered not for correspondence and can be deciphered without surmising.[9]

Indonesia is one of the archipelagic country which has tropical climate. Besides, the country has many active volcano and mountain that are potentially occurred earthquake, tsunami, and landslides.[10] The need of disaster socialization is very essential for people as one of disaster risk reduction. One of the efforts is introducing disaster education at schools. School preparedness of disaster risk reduction can be done by prevention, protection, mitigation, response and recovery activities (REMS).[11] Those terms can be defined in the following: prevention can be done with the action of schools to prevent of the actual incident; protection is the progress actions of school to take the safeguard of the school, students, and staff from emergency event; mitigation is the action of schools to eliminate and reduce of injury and poverty damage; response is the action of putting the schools as a place to respond the emergency events and provide the fast need for students and staff in particular; and recovery is the action of cooperation with community to restore educational programming, the physical environment, business operation, social, emotional, and behavioral health.

Schools are expected to be familiar with mitigation efforts in the areas of safety, security and emergency help and it can be done by drills. For instance, the drills conducted to prepare emergency for community from earthquake. According to Zein, the frequent disaster occurrence in Indonesia both natural and non-natural disaster has given impact for the community so that they have had experience about it.[12] Based on the reason, it becomes the important issues in socialization efforts related to disaster migration. Each country has different types of disasters that also need the different handling. Therefore, Indonesian people must have built the awareness of potential disaster will occur. It makes the community will more prepared to disaster will happen. Based on disaster risk reduction research in the Philippines, Mamon, *et.al* argue that there is the integration of the concepts about the disaster preparedness, awareness, mitigation, prevention, and adaptation towards the knowledge and understanding of students on disaster risk reduction.[13] Concerning to the relation between education and mitigation, it is undeniable to the statement that the school as an educational for the citizens. Hence, education and public awareness toward disaster mitigation reduction have correlation each other. School can consider to put the learning material about disaster mitigation to build awareness of disaster mitigation reduction.

According to Tuladhar *et.al*, the most of the students in Nepal do not have specific knowledge and have anxiety for various disasters.[14] All variety of disasters can occur any time in their region. The disaster information, disaster knowledge, disaster readiness, disaster awareness, disaster adaptation, and disaster risk perception of the students were evaluated regarding their exposure to past disasters. The result represents that previous experience of students to disaster is not contributed to obtaining the knowledge of disaster risk reduction. Therefore, disaster education for young people with disaster readiness behaviours and disaster adaptation are necessary tools for disaster risk reduction.

### 3. Research Methods

The approach used in this study was merely qualitative. There were 43 respondents involved in this study. They were children aged between 8-13 years old. These children are homeless and they are school drop-outs who live in a coastal area named Kampung Jawa, Peunayong, Banda Aceh, Indonesia. Kampung Jawa is one of coastal area in Banda Aceh that happened tsunami and earthquake. The research was conducted in May 8th – 13th, 2018 at *Taman Edukasi Anak Pemulung* Place and the research instruments were questionnaire and interview. The respondents were given a questionnaire set contained the verbal and non-verbal symbols and signs about tsunami and earthquake

which was formulated in the form open-ended questions. They were asked to answer the questionnaire set based on researchers' guidance.

There are seven types of questionnaire questions described in the table as follows:

**Table 1.** Type and Total of Questions in Questionnaire

Questions Types	Total of Questions
Symbols/ Signs	10
Safety Color	5
Action Code for Earthquake	20
Action Code for Tsunami	5
Written Signs	4
Word/ Phrase/ Sentence	3

As they finished filling it out, the data were analyzed using percentage to depict their understanding about the symbols and signs. After gaining the result of questionnaire, researcher interviewed respondents to clarify the questionnaire data about their perspective on tsunami and earthquake symbols and signs for their daily life. The symbols and signs were adopted from Disaster Preparedness Manual and government rule. Then, from the percentage, discussions and conclusions over the study as a whole was settled descriptively.

#### 4. Results and Discussion

The percentage of respondents' understanding of symbols and signs can be seen in the table as follows:

**Table 2.** Percentage of Respondents' Understanding of Symbols and Signs

Students who can answer correctly	Thorough understanding of all type questions (%)
12	80%
14	50%
11	30%
4	20%
2	5%

From the questionnaire data, it was found that only 12 of the respondents who could answer 80% of the questions correctly. This shows that their understanding very low level although the symbols and signs are put on their coastal area. Delicado, *et.al* refer to his case studies in Portugal that highlight the need to involve children as active participants and have a vital role to play in disaster risk prevention and mitigation.[15] In reality, children who live at coastal area of *Kampung Jawa* still lack of knowledge about disaster education, tsunami and earthquake symbols and signs.

Based on the result of questionnaire about children's understanding on tsunami and earthquake symbols and signs, children got confused about the meaning of symbols and signs. The knowledge of symbols and signs is needed to extend the understanding of the disaster's impacts and to reduce the hazard of disaster. Providing this knowledge is a child-centered mitigation and preparedness program to reduce disaster impacts. In brief, Reid has summarized that there is a nearby correspondence between original perception and natural language.[16] The signs in unique discernment are sensations, of which nature has given us in such an awesome assortment, suited to the assortment of the things meant by them. Nature has built up a genuine association between the signs and the things meant; and

nature has additionally showed us the translation of the signs—so that, past to encounter, the sign recommends the thing connoted, and make its conviction.

In addition, to clarify the result of questionnaire, researchers did interview for respondents and they responded enthusiastically. In fact, there are several signs on the road to show the direction of evacuation for citizen when the disaster happened. The respondents thought that the purpose of signs to give the direction for transportation on the road. As a result, they have the wrong interpretation about the signs. They are also difficult to respond the interview questions about the location that we can find the symbols and signs because they rarely pay attention the symbols and signs in daily life. They do not realize the function and benefit of symbol and signs for their safety and preparedness. Understanding the symbols and signs of the cautions is so important for disaster-effect reduction.[12]

Moreover, several verbal signs are also difficult for them to comprehend because there are some vocabularies that they are not familiar for their language. They are difficult to read because most of them are school drop-outs and lack of education. In interview process, they also responded that they never get information about the ways to evacuation when the disaster happened and steps to prepare something before the disaster happened. Marskole, *et al.* claims that the scope of disaster learning is unsatisfactory and there is a tremendous need of providing knowledge to children and youth.[17] They are the social strength who can help perform and reduce the risk of disasters. Effective training and purposive programmes are to be timely organized to create the future generation aware. Khorram-Manesh states that there is a children's and youth's need for self-motivation education in the field of emergency and disaster management.[18] The purpose of this education is to enhance emergency preparedness and individual skills, increase the understanding and advocate for young people to grab responsibility in emergency situations and gain the concept of the psychological effects of a disaster.

## 5. Conclusions

From the results narrated above, it can be concluded that the children who live in the coastal area of Banda Aceh are still lacking knowledge about the Tsunami and earthquake symbols and signs. Gibbs *et al.* claim that participatory approaches can participate children and young people in community preparedness, response, and recovery processes in a supported way to encourage a self-efficacy and capability that can prevent the injured effects to disasters.[19] It is important for them to understand this as an entire perception to live with—regarding the fact that they spend their time in the on the agitated catastrophic area on the daily basis. Additionally, it is important for the stakeholders who are directly involved with the disaster mitigation counseling to include the counseling about symbols and signs along with other disaster awareness topics during any counseling programs. Mitigation education is actions taken to prevent or minimize the risk to life, social and economic activities, and natural resources from natural hazards. The guidance to reduce the impacts of a natural disaster on communities is widespread awareness, education, preparedness, prediction, and warning systems. Children must be made aware of what natural hazards they are likely to take on their own communities. They should know previously what specific preparations to do before a disaster, what to do during an earthquake, tsunami, or another likely disaster, and what actions to take in its aftermath. Preparedness is the manner of turning awareness of the natural hazards and risks encountered by a community into actions that renew or enhance its capability to respond and recover from disasters. Further perspective that can be drawn based on the data found above is the fact that all signs and symbols around the cautious areas need to be renewed as most of them are now hard to see clearly.

**6. Appendices**

**Appendix A Questionnaire Set Questions**

**NAME** : \_\_\_\_\_

*nama*

**AGE** : \_\_\_\_\_

*umur*

**ADDRESS** : \_\_\_\_\_

*alamat*

**1. What is the kind of disaster below?**

*Apa jenis bencana di bawah ini?*



a. \_\_\_\_\_



b. \_\_\_\_\_



c. \_\_\_\_\_



d. \_\_\_\_\_



e. \_\_\_\_\_



f. \_\_\_\_\_

**2. What is the meaning of Symbols and Sign below?**

*Apa maksud dari tanda dan simbol di bawah ini?*



a. \_\_\_\_\_



b. \_\_\_\_\_

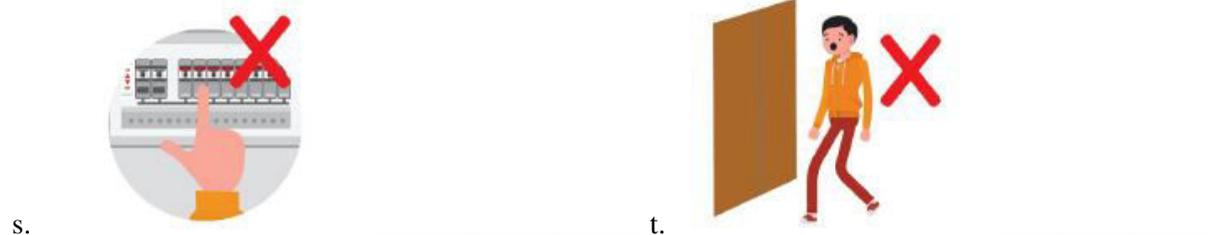
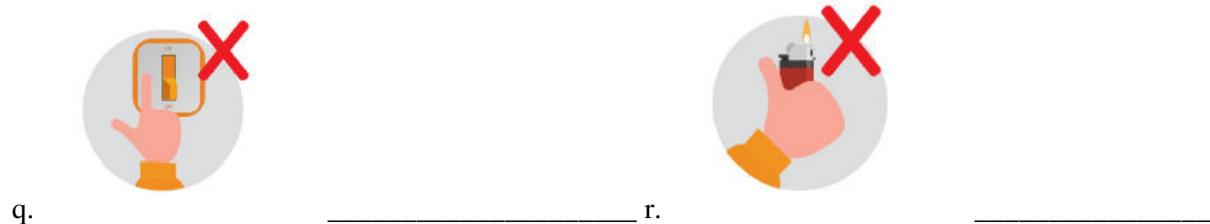
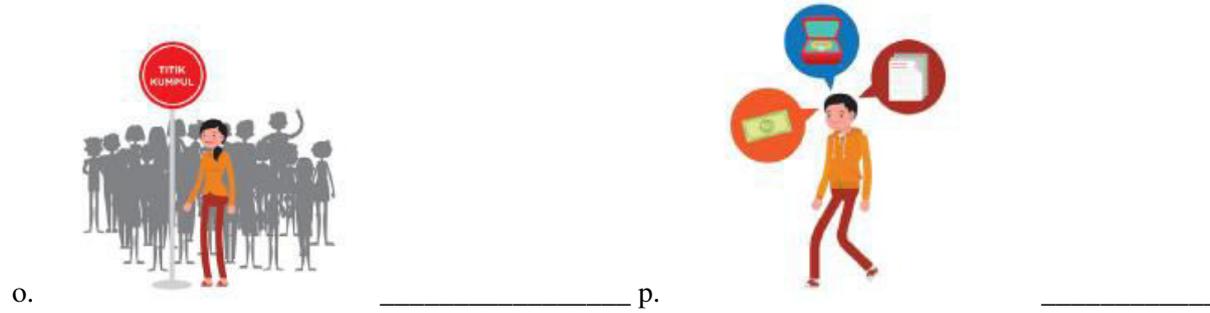
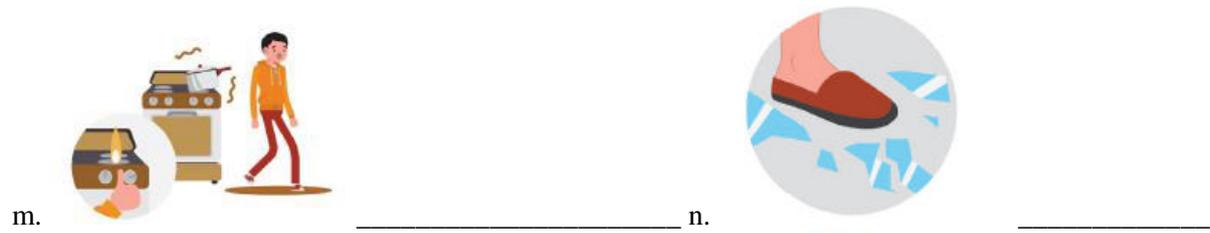
c.		d.	
e.		f.	
g.		h.	
i.		j.	

**3. What is the meaning of Safety Color below?**  
*Apa maksud dari warna keselamatan di bawah ini?*

Warna Keselamatan	
<b>MERAH</b>	→
<b>KUNING</b>	→
<b>HIJAU</b>	→
<b>BIRU</b>	→
<b>PUTIH</b>	→

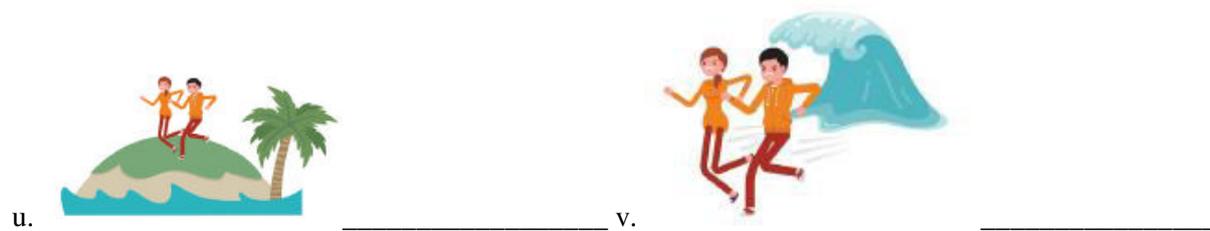
**4. What is the meaning of Action Code for Earthquake below?**  
*Apa maksud dari kode tindakan gempa bumi di bawah ini?*

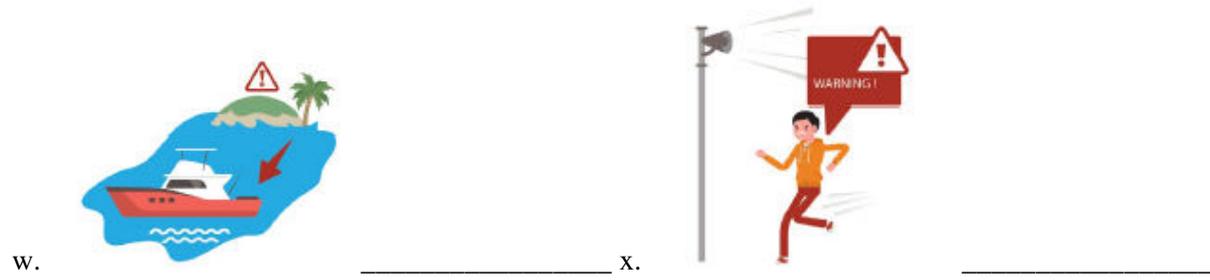
a. 	_____ b.		_____
c. 	_____ d.		_____
e. 	_____ f.		_____
g. 	_____ h.		_____
i. 	_____ j.		_____
k. 	_____ l.		_____



**5. What is the meaning of Action Code for Tsunami below?**

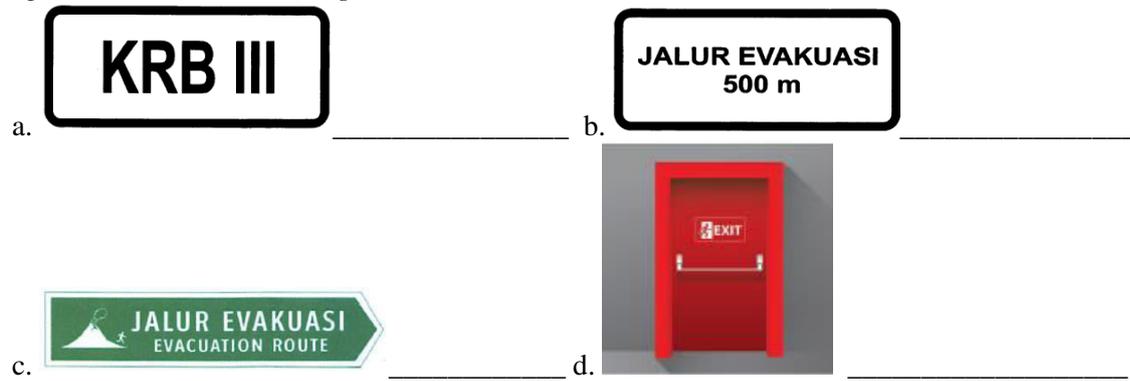
*Apa maksud dari kode tindakan tsunami di bawah ini?*





**6. What is the meaning of Written Sign below?**

*Apa maksud dari tanda yang tertulis di bawah ini?*



**7. What is the meaning of word/ phrase/ sentence below?**

*Apa maksud dari kata/ frasa/ kalimat di bawah ini?*

**Word:**

*kata*

a. Smong =

**Frasa:**

*phrase*

a. ie raya =

**Kalimat:**

*Sentence*

a. Plueng ie raya =

**Appendix B Interview Questions**

**1. What is the function of tsunami and earthquake symbols and signs?**

*Apa fungsi dari simbol dan tanda tsunami dan gempa bumi tersebut?*

**2. What is the benefit for us to know the function of tsunami and earthquake symbols and signs?**

*Apa manfaat bagi kita untuk mengetahui fungsi dari simbol dan tanda tsunami dan gempa bumi?*

**3. Where is the tsunami and earthquake symbols and signs put on?**

*Dimana simbol dan tanda tsunami dan gempa bumi sering di pasang?*

**4. Have you ever gotten information about tsunami and earthquake symbols and signs?**

*Apakah kamu pernah mendapatkan info mengenai simbol dan tanda tsunami dan gempa bumi?*

**5. Have you ever gotten information about evacuation and disaster education from your environment and school?**

*Apakah kamu pernah mendapatkan informasi tentang evakuasi dan pendidikan kebencanaan di lingkungan dan sekolahmu?*

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