

ORIGINAL ARTICLE

Knowledge, Attitudes, and Practices Regarding Stroke in Multicultural Communities: Should the Indonesian Government Reconsider Stroke Awareness Campaigns?

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ABSTRACT

Introduction: A stroke awareness campaign is crucial for primary stroke prevention. Therefore, it is important to evaluate people's knowledge, attitudes, and practices regarding stroke awareness to assess the effectiveness of the campaign that has been carried out so far. This study aims to identify people's knowledge, attitudes, and practices regarding stroke and analyze the influence of demographic factors on their knowledge, attitudes, and practices. **Methods:** This cross-sectional study involving 512 randomly selected adults was conducted in the east and west of Java Island Indonesia in June – August 2022. A questionnaire containing 31 items of knowledge, ten items of attitudes, and 10 items of practices was used as an instrument. Demographic data obtained includes age, gender, place of residence, education, occupation, monthly income, and ethnicity. The collected data were analyzed using ANOVA. **Results:** Fifty-one percent of respondents had poor knowledge, 67% had poor attitudes, and 48% had poor practices regarding stroke awareness. However, gender and occupation do not affect their knowledge, attitudes, and practices, while education level affects knowledge and attitudes, place of residence only affects knowledge, age only affects attitudes, and ethnicity affects all knowledge, attitudes, and practices scores. **Conclusion:** Because ethnicity is the only factor that can affect all domains (knowledge, attitudes, and practices), the Indonesian government must immediately review the stroke awareness campaign strategy using an ethnic/cultural approach. Given that Indonesia has one of the world's highest levels of cultural diversity, it is expected to be right on target.

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(the island with the most population) is taking the lead in this enhancement. (5). Until now, stroke control and prevention programs have been the focus of health problems in Indonesia.

INTRODUCTION

Stroke attacks are considered the leading cause of premature death in the world (1, 2). The global scale shows that stroke is not only the leading cause of disability worldwide, but also the second - leading cause of death and dementia, both due to a first stroke or recurrent attacks (2). This of course causes a high financial and emotional impact on sufferers and their relatives (3), with the result that it is also the cause of a significant increase in the government's economic burden, especially in developing countries (4). The prevalence of stroke in Indonesia has continued to increase drastically in the last decade, and Java Island

Primary prevention of stroke requires good knowledge, attitudes, and public awareness regarding risk factors and their control. Public education and effective stroke prevention campaigns are two of the main concerns in a stroke control or prevention program. So far, the Indonesian government has conducted several national-scale stroke campaigns through print and digital media, but the problem of changing behavior regarding stroke awareness has not been fully resolved until now. Effective community-based stroke prevention education programs and campaigns require specific and accurate assessments of people's knowledge, attitudes, and practices in dealing with risk factors. This assessment is expected to guide the government and

other health activists in designing clear strategies and targets to maximize stroke prevention and treatment programs. Therefore, it is essential to know whether there is a diversity of knowledge, attitudes, and practices towards stroke awareness among people with diverse ethnic-demographic groups. The profile of knowledge, attitudes, and practices toward stroke awareness in the community is very crucial to study considering the stroke risk factors included modifiable factors, and there is a lot of evidence about primary stroke prevention based on lifestyle and behavior.

Seeing that the problem of stroke in these ethnically diverse developing countries is very complex, it is important to specifically evaluate knowledge, attitudes, and practices towards stroke awareness in a multicultural society in relation to relevant ethnic demographic data, as this can provide information and insights for the government and other health activists to design a stroke awareness campaign strategy. It is hoped that the target will help to improve the situation. However, until now, on September 20, 2022, all national journals in Indonesia indexed by MoECRT in "SINTA" have never published a survey article on knowledge, attitudes, and practice towards stroke awareness conducted at the national level by trying to include samples from several main ethnicities, especially in Java Island which has the highest ethnic diversity and occupies the first position in increasing the prevalence of stroke in Indonesia. In addition, there are several studies that discuss awareness of stroke, but they are only limited to certain community groups, of course this is not enough to provide information to policymakers in Indonesia to develop a stroke awareness campaign strategy that is right on target, considering that this country has a very high ethnic diversity and requires a special campaign strategy.

Our main goal is to find out what people know, how they feel, and what they do to be aware of strokes in East Java and West Java Island communities with different kinds of people. Secondly, this study is conducted to analyse the effect of ethnic demographic on their knowledge, attitude, and practice scores towards their stroke awareness. Consequently, the result will assist the government and various other health activists in identifying diverse profiles of community knowledge, attitudes, and practices towards stroke awareness. As a result of this study, it is expected that it can be taken into consideration in developing a stroke awareness campaign strategy that is right on target in a multicultural society.

MATERIALS AND METHODS

Design and participant

A cross-sectional study was conducted in June – August 2022 among 512 adults who had come for treatment at the primary health care owned by the Indonesia

government located in East Java and West Java (the areas with the highest ethnic diversity in Indonesia). In addition, there is currently no national campaign regarding stroke awareness, a relatively small stroke awareness campaign was carried out by the government in 2018 (through posters and print media). Samples were selected randomly through the database of medical visits owned by primary health care. Prospective respondents were screened to ensure that they met the specified criteria, and then respondents were asked for their written consent to participate in this study. Before the respondents confirmed their willingness, they were given an explanation regarding the research goals, research time, and respondents' rights.

It is certain that the respondents in this study are Indonesian citizens and are aged 20 years and over. Recruitment of respondents in this study was limited by several criteria, namely people who are domiciled in East Java and West Java, people who speak Indonesian as their mother tongue, and people who confirm their willingness to be respondents. Respondents who withdrew while the study was in progress and/or did not provide complete demographic data were excluded. Each eligible respondent was asked to identify their own ethnic group.

Instrument and procedure

Respondents who said they would take part in this study were asked to fill out all of the questionnaires that had been tested to make sure this tool was valid and reliable.. Eight health promotion experts reviewed the questionnaire content using the Content Validity Index formula. As a result, all questionnaire items scored more than 0.7. After that, the questionnaire was given to a pilot sample of 30 people to test its reliability. The results of the analysis showed that the Cronbach's alpha values for the three questionnaire domains Knowledge, Attitudes, and Practices (KAP) were all greater than 0.7. Thus, the validity and reliability of the questionnaire have been guaranteed and are suitable for use in collecting data.

The instrument consisted of demographic profile questions and core questions regarding KAP. First, respondents were asked to complete items from their demographic profile consisting of age, gender, place of residence, education, occupation, monthly income, and ethnicity. Education is categorized as: (1) primary school, (2) junior high school (3) senior high school, and (4) undergraduate. Ethnic groups are categorized as: (1) Javanese, (2) Sundanese, (3) Indo-Chinese, (4) Madurese, (5) Batak, (6) Minang, and (7) Others. Meanwhile, income is only categorized into two, namely: (1) below the minimum wage and (2) more than the minimum wage. Second, after filling out the demographic questionnaire, respondents were asked to fill out a 31-item questionnaire that was used to assess knowledge about risk factors for stroke, complications,

and warning signs of stroke. Third, respondents were asked to fill out a 10-item questionnaire about attitudes towards stroke risk factors, including how strong their beliefs about a risky lifestyle are (strength belief) and how much they believe in the results if they manage to avoid a risky lifestyle (outcome evaluation). Finally, respondents were asked to complete a questionnaire about their practises related to stroke awareness. It contains 10 question items aimed at measuring the behaviour of respondents in avoiding stroke risk factors, such as high blood pressure, excessive cholesterol consumption, low levels of physical activity or exercise, consumption of junk food, alcohol consumption, excessive salt consumption, excessive sugar consumption, consumption of excess fat, obesity, and smoking.

The respondents were asked to determine the truth of the information written on each item of the knowledge domain by choosing one of three answer options, namely “correct”, “incorrect”, or “do not know”. On each item in the attitude domain, respondents were asked to determine their response by choosing one of three answer options, namely “agree”, “not sure”, and “disagree”. Meanwhile, for each item in the practice toward stroke awareness domain, respondents were asked to choose what describes their habits/behaviour towards stroke awareness, they had to choose one of the three answer choices provided, namely “yes”, “not sure”, or “no”. Each question asked in all domains has favourable and unfavourable properties, this is one of the tips to prevent response bias. If a response bias is known, the data is excluded from the analysis.

Statistical Analysis

The total score in the domains of KAP is determined by adding up the scores for each item and converting them into a score range of 0-100. The total scores from the three domains are grouped into two categories, namely “good” and “poor” based on Bloom-cut-off-points. The score of the respondents was categorized as “good” if they could answer 80% of the items correctly while if it did not reach 80%, it would be categorized as “poor”. The percentage of the respondents who fall into the good and poor categories in each domain KAP is presented in the form of a diagram. Henceforth, an ANOVA was used to analyze differences in the mean score based on ethnicity and geography. The level of significance used in this analysis was 0.05.

Ethical approval

Ethics approval was obtained from Institut Ilmu Kesehatan Strada Indonesia through the Indonesian Commission of Health Research Ethics with the number 070/2695/407-206/2022 on July 15/2022. A statement was included in the survey stating that study participants could refuse participation if they chose. The respondents must confirm their willingness to participate voluntarily before completing the

questionnaire. Their participation was completely consensual and anonymous and they were informed that they could withdraw their participation in the study at any time they wished.

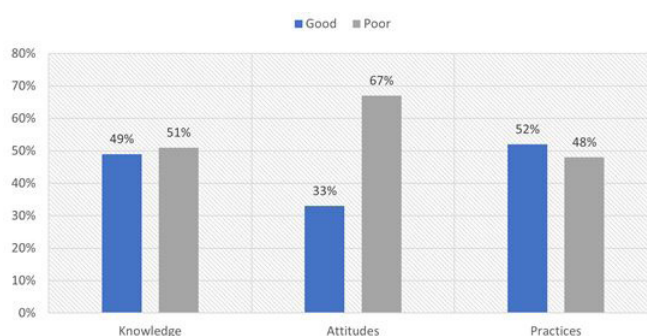


Figure 1 : Profile of respondent's knowledge, attitudes, and practices toward stroke awareness.

RESULTS

Knowledge towards stroke awareness

The mean score in the knowledge domain was 70.36 (SD=10.01) ranging from 25.5-100. From a total of 512 respondents, only 49% were identified as having good knowledge (Figure 1). Of the 31 items in this domain, the sixth item has the highest percentage of incorrect answer; this item asked, “whether consumption of salt, sugar, and excess fat in the long term can increase the risk of stroke?”. While the 21st item which asked, “Is paralysis on one side of the body a symptom of stroke?”, most respondents answered correctly. Furthermore, the item that received the most “don’t know” responses was the 14th item which asked, “can oral contraceptives without a doctor’s advice increase the risk of stroke?”. In the knowledge domain, there are only four items that get a correct response of more than 85%, all of them are items that ask about the warning sign of stroke (Table II).

Attitude towards stroke awareness

The mean score of respondents in the attitude domain was 70.59 (SD=10.76). The range score of the attitude domain was 21.5 to 100. Of the total respondents, more than half (67%) are identified as having a poor attitude towards stroke risk factors, including what lifestyle they believe can reduce their risk, and how they believe in the results if they manage to avoid a risky lifestyle (Figure 1). Of the 10 items in this domain, only the third item received more than 85% “agree” responses. The item contains respondents’ responses to one of the risk factors, namely the assumption that consuming foods with high cholesterol can increase the risk of stroke. While the item that received the most “disagree” responses was the seventh item, and the item that received the most “doubtful” responses was the ninth item, both discussed respondents’ beliefs about the results they would get if they could manage to avoid the risk factors for stroke. The details are presented in Table III.

Table I : The distribution of the respondents' demographic ethnicity information

Demographic Ethnicity	Freq (n)	Percentage (%)
Age		
20 – 39	167	32.62
40 – 59	271	52.93
60 ≤	74	14.45
Gender		
Female	293	57.23
Male	219	42.77
Place of current residence		
City	315	61.52
Rural	197	38.48
Education level		
Primary school	58	11.33
Junior high school	125	24.41
Senior high school	262	51.17
Undergraduate	67	13.09
Occupation		
Self employed	127	24.80
Clerk	62	12.11
Farmer	61	11.91
Workman	57	11.13
Fisherman	54	10.55
Housewife	47	9.18
Lecturer	41	8.01
Government employee	31	6.05
Student	27	5.27
Refused to answer	5	0.98
Income/month		
> Minimum wage	264	51.56
≤ Minimum wage	248	48.44
Ethnicity		
Javanese	159	31.05
Sundanese	141	27.54
Madurese	96	18.75
Indo-Chinese	68	13.28
Batak	21	4.10
Minang	16	3.13
Other	11	2.15

Table II : Profile of respondents' knowledge toward stroke

Area of assessment	Answer		
	Correct (%)	Incorrect (%)	Do not know (%)
Stroke-risk factor			
High blood pressure	84.5	4.3	11.2
Obesity	56.1	40.5	3.4
Smoking	57.4	12.4	30.2
Stress	31.9	18.3	49.8
High cholesterol	81.1	6.6	12.3
Unhealthy diet (high salt, sugar, fat)	43.3	51.1	5.6
Diabetes	42.1	18.5	39.4
Heart diseases	84.8	3.4	11.8
Insufficient physical activity	76.6	9.1	14.3
Pregnancy	8.9	9.2	82.9
Oral contraceptive uses	7.5	6.8	85.7
Aging	55.4	4.4	40.2
Self-history of stroke	83.5	6.7	9.8
Family-history of stroke	82.3	10.1	7.6
Alcohol consumption	78.1	8.7	13.2
Complications			
A part paralysis	84.3	11.2	4.5
Weakness of the limbs	83.1	8.6	8.3
Oral difficulties	78.9	7.6	13.5
Cognitive disorder	77.5	8.4	14.1
Sensory disorder	74.5	11.2	14.3
Depression	74.8	15.6	9.6
Difficulty swallowing	71.3	16.9	
Warning sign of stroke			
Suddenly numb	87.2	3.4	9.4
Suddenly lost balance	86.8	4.8	8.4
Suddenly weak on one side of the body	92.6	2.3	5.1
Sudden weakness on one side of the face	90.1	3.4	6.5
Sudden loss of consciousness	86.1	6.3	7.6
Sudden severe headache	68.3	21.1	10.6
Sudden difficulty speaking	88.4	5.5	6.1
Sudden blurry vision	67.7	19.7	12.6
Sudden garbled pronunciation	81.1	8.7	10.2

Table III : Profile of respondents` attitude toward stroke

Item	Answer		
	Agree (%)	Not sure (%)	Disagree (%)
Strength belief			
For me, the attitude of being alert to stroke needs to be grown because every adult has a risk of stroke	83.4	12.1	4.5
For me, regular exercise can reduce the risk of stroke	56.4	28.5	15.1
For me, reducing the consumption of high-cholesterol foods can reduce the risk of stroke	86.7	10.1	3.2
For me, quitting or not smoking is important in preventing strokes	60.2	28.5	11.3
For me, maintaining an ideal body weight is important to avoid the risk of stroke.	60.8	29.1	10.1
Outcome evaluation			
Being alert to stroke can reduce the risk of stroke in adults.	74.3	11.2	14.5
Individuals who are diligent in exercising regularly can avoid strokes.	19.2	4.4	76.4
Individuals who limit cholesterol consumption can avoid stroke.	74.4	5.3	20.3
Individuals who quit / do not smoke can avoid stroke.	11.3	82.4	6.3
Individuals who have an ideal body weight can avoid stroke.	24.6	45.2	30.2

Table IV : Profile of respondent`s practices toward stroke

Items	Answer		
	Yes (%)	Not sure (%)	No (%)
I always pay attention to my healthy lifestyle to prevent stroke attack.	86.5	12.3	1.2
I am always aware to stroke attack.	87.6	10.5	1.9
I have a regular schedule for exercise.	12.2	35.7	52.1
I limit the salt consumption.	14.5	73.3	12.2
It's been long for me to avoid food with high cholesterol	86.4	11.3	2.3
I reduce the consumption of food processed through the frying process.	34.3	61.4	4.3
I am able to avoid foods that contain a lot of fat	43.8	43.4	12.8
I will never smoke and never start smoking again.	64.5	22.2	13.3
I limit the sugar consumption.	46.5	41.4	12.1
I always pay attention to my weight to stay ideal.	56.2	34.4	9.4

Table V : The differences of respondents' KAP scores on each demographic character

Variables	Freq (n)	Knowledge score		Attitude score		Practice score	
		Mean (SD)	F	Mean (SD)	F	Mean (SD)	F
Age							
20 – 39	167	70.91 (9.560)	1.023	73.34 (10.312)	5.342*	74.03 (11.576)	0.524
40 – 59	271	70.02 (8.843)		72.02 (9.595)		73.84 (9.898)	
60 ≤	74	69.88 (10.643)		68.34 (11.395)		73.66 (10.778)	
Gender							
Female	293	68.77 (9.439)	0.292	69.84 (10.192)	1.015	71.88 (10.365)	
Male	219	68.56 (9.994)		70.03 (10.749)		72.06 (10.920)	
Place of current residence							
City	315	69.02 (9.743)	4.965*	70.02 (10.491)	1.007	70.81 (10.686)	
Rural	197	73.34 (10.232)		69.97 (10.988)		70.04 (11.198)	
Education level							
Primary school	58	66.23 (9.223)	3.235*	67.05 (9.971)	4.325*	70.85 (10.094)	1.019
Junior high school	125	68.82 (9.339)		68.87 (9.784)		71.07 (10.324)	
Senior high school	262	70.11 (9.857)		71.87 (10.608)		71.54 (10.994)	
Bachelor	67	71.23 (9.032)		72.66 (10.092)		72.02 (9.334)	
Occupation							
Self employed	127	69.23 (9.121)	1.089	71.04 (10.089)	0.784	72.11 (10.043)	0.987
Clerk	62	70.56 (10.321)		70.89 (9.619)		72.07 (11.252)	
Farmer	61	71.45 (9.993)		69.97 (8.101)		70.46 (10.964)	
Workman	57	71.01 (11.232)		70.54 (9.418)		70.78 (12.011)	
Fisherman	54	70.05 (9.443)		70.03 (9.745)		70.11 (10.229)	
Housewife	47	69.65 (8.995)		69.88 (10.188)		69.91 (0.920)	
Lecturer	41	72.07 (8.667)		71.01 (11.984)		71.08 (0.966)	
Government employee	31	72.03 (7.349)		71.11 (10.747)		72.03 (8.992)	
Student	27	70.16 (8.867)		70.02 (11.073)		71.88 (9.859)	
Refused to answer	5	71.09 (9.333)		70.81 (9.873)		71.15 (10.540)	
Income/month							
> Minimum wage	264	69.23 (11.349)	0.893	70.65 (12.981)	0.218	72.88 (13.160)	4.771*
≤ Minimum wage	248	68.98 (12.234)		70.21 (12.101)		69.91 (12.763)	
Ethnicity							
Javanese	159	71.31 (9.321)	7.106*	73.33 (9.095)	6.212*	73.54 (10.212)	6.554*
Sundanese	141	69.21 (8.849)		69.01 (10.686)		72.04 (9.494)	
Madurese	96	68.56 (7.764)		70.01 (10.778)		71.06 (8.445)	
Indo-Chinese	68	73.51 (11.343)		70.89 (12.063)		75.75 (12.397)	
Batak	21	67.89 (10.112)		67.21 (8.516)		70.63 (11.330)	
Minang	16	65.48 (9.934)		68.34 (9.614)		69.89 (10.210)	
Other	11	70.32 (8.343)		67.02 (10.084)		69.06 (9.443)	

Practices towards stroke awareness

Mean score in the practice domain was 72.01 (SD=11.02) with a score range of 23.75 – 100. Only 52% of the total respondents were in the good category, the rest showed “poor” practice or stroke awareness behavior (Figure 1). As many as 13.32% of the 512 respondents still smoke or do not want to stop smoking, and only 9.45% of respondents are tolerant of obesity. However, more than half of the respondents (52.13%) do not have regular exercise habits. More detail is presented in Table IV.

Factors influencing KAP

The results of the data analysis using ANOVA showed that only ethnicity, education, and place of residence could affect respondents’ knowledge, while other demographic factors did not show a significant influence (Table V). The respondents who are ethnic Indo-Chinese have much better knowledge of stroke than Javanese, even though the knowledge of Javanese respondents is still above that of Sundanese with a fairly large gap. Furthermore, the respondents with undergraduate education have much better knowledge when compared to primary school education, but they are not much different from respondents with senior high school education. The respondents’ place of residence also determines their level of knowledge, and respondents who live in urban areas have better knowledge than those who live in rural areas.

Table 5 shows that ethnicity, age, and level of education made a big difference in the attitudes domain. The respondents aged 40-59 years and 60 years and over have attitudes that are not much different, but both are identified as having a much better attitude when compared to the age group 20-39 years. Javanese ethnicity has the best attitude when responding to stroke risk factors, followed by Indo-Chinese, Madurese, Minang, and finally Batak ethnicities. In addition, it was revealed that people with higher educational status had better attitudes, these two things were directly proportional. Furthermore, in the practice domain, significant differences were found in ethnicity and monthly income. Indo-Chinese ethnic communities have better habits regarding stroke awareness when compared to Javanese whose habits are not much different from those of Sundanese and Madurese ethnicities. While Minang and Batak ethnic groups in this case rank at the bottom. Furthermore, respondents with income above the minimum wage have far better practices than respondents with income below the minimum wage. (Table V).

DISCUSSION

Researchers from India, Saudi Arabia, Moscow, New Zealand, and the United States (6–10) used closed-ended questions in their studies and compared their results to the results of this study. Respondents’ knowledge of risk factors in this study has a higher percentage of answer

accuracy compared to research conducted in India, but is still lower than research conducted in Saudi Arabia, Moscow, New Zealand, and the United States. Heart disease and smoking were the most identified risk factors in the Moscow study, while hypertension and a history of stroke were the most identified in the Indian study. Even so, there are slight similarities in research findings both in developing and developed countries, they all found that warning signs of stroke such as sudden sensations of numbness, sudden imbalance, sudden disability of speaking, and sudden weakness on one side of the body are common problems that got the most correct answers. They also both had low knowledge of some uncommon risk factors, including oral contraceptive use and pregnancy.

In the domain of general knowledge, it was found that more than half of the respondents had “poor” knowledge related to stroke awareness. For instance, when asked to name a disease that can result in death, respondents most frequently mentioned heart attack (43%), then HIV (35%), and cancer (33%), while only 2.3% of respondents mentioned stroke as a possible cause of death. This finding is in line with a study in India which reported that public knowledge on all aspects of stroke was still low (7).. In addition, research on knowledge of stroke awareness in Egypt and Iran also reported the same thing (1, 4). However, several studies reported the opposite, a study in the United States reported that in general the adult community had a fairly good knowledge of the warning signs of stroke and stroke risk factors (9), similar findings were also reported by other researchers who attempted to investigate public knowledge related to stroke in Moscow and New Zealand (8,10).

Several research reports show that Europeans in developed countries are more likely to have a lot of knowledge about strokes. This opinion is supported by other researchers who state that low knowledge and a high incidence of stroke attacks are more common in developing countries (4). This may be due to the higher average level of public education in developed countries, the availability and ease of access to information are also suspected to have an influence in this regard. A study in Moscow stated that the most common source of information found in a highly educated society is the internet or social media (8). Additionally, stroke campaign strategies carried out in developed countries are more systematic and well targeted because they are supported by a large body of literature that compares the effectiveness of various stroke campaign strategies (11–18).

In this study, the knowledge profile is based on the person’s race, level of education, and where they live. For example, respondents of Indo-Chinese ethnicity have much better knowledge about stroke than other ethnic groups, despite the fact that another study states that knowledge of older adults in China regarding stroke

is still relatively low (13). This could be because people of Chinese ethnicity living in Indonesia are mostly not immigrants from China, but native Indonesians. This opinion is supported by another study which also stated that the knowledge of stroke awareness among Europeans in New Zealand is different from that of Europeans who live in Europe (10). Furthermore, respondents with undergraduate education in this study have much better knowledge when compared to those with only primary school education. This finding is in line with several other studies on stroke awareness that reported that the higher the level of education, the higher the level of knowledge (1,19). It is accepted that people with higher levels of education have the ability to digest information material better than people with lower levels of education (20). This study also revealed that not only ethnicity and education, but also the place where respondents live are able to determine their knowledge of stroke awareness. Research conducted on rural communities in India reported how low knowledge was in all aspects of stroke (7). Those who live in urban areas tend to have better knowledge. It is acceptable because people in urban areas have more internet access than those who live in rural areas. As it is known, 65.77% of the sources of information regarding stroke awareness are obtained from the internet and social media (6). In addition, urban communities are also accustomed to using social media to find valid health information (21–23).

In the attitude domain, most of the respondents (67%) in this study had a “poor” attitude. This percentage is a lot lower than what was found in a study done in China (24), but it is still higher than what was found in a study done on elderly people in rural India (7). It’s important to note that the instruments used in the attitude domain have different content from one study to the next. Also, more than 80% of respondents are sure that stroke risk factors can be dealt with in a positive way. While the items that discuss respondents’ beliefs about the results they will get if they manage to avoid the risk factor for stroke are the items that get the most negative responses (the fifth to tenth items), which are below 35%. This result showed that they have a positive view of addressing stroke risk factors, but their belief in the results they will get tends to be negative, this is what causes their attitude mean scores to be low. As has been known in the Theory of Planned Behavior, attitude has the basis of a “belief” approach that stimulates intentions and encourages individuals to perform a certain behavior, the main indicators of an attitude’s formation are “strength belief” and “outcome evaluation” (25). Referring to this theory, the authors argue that an attitude towards stroke awareness can be well formed by building the belief that stroke awareness behavior is a must and must be done (strength belief), and also by building the belief that by complying with the behavior, as a result, it can guarantee themselves avoiding stroke (outcome evaluation).

Ethnicity, age, and educational status are demographic factors that can determine the attitude of respondents towards responding to stroke risk factors. The Javanese ethnicity has a good attitude and is not much different from the Indo-Chinese and Madurese, but they are much better when compared to the Sundanese, even though the Sundanese themselves also have a better attitude with a fairly large gap when compared to the Minang Minang and Batak ethnicities. This diversity shows that every ethnicity has a cultural diversity that can cause differences in attitudes, so a transcultural approach is also needed in the strategy of an awareness campaign against stroke, so that the strategy will be right on target as planned, especially in a multicultural society like Indonesia. This opinion is supported by another study which reported that the STROKE120 campaign strategy using the local language approach was more effective than the FAST strategy using the national language (14,17). Furthermore, it was also revealed that respondents with a more mature age showed a more positive attitude towards stroke risk factors. Another study that attempted to investigate the relationship between sociodemographics and stroke symptom awareness in the United States also reported the same thing. In that study, it was stated that most young adults did not show a positive attitude towards stroke symptoms (26). In addition, this study also found that the higher the respondent’s education, the better the attitude they showed regarding stroke awareness, another study conducted in Sudan and Sri Lanka also reported that the level of education was directly proportional to one’s awareness of stroke (19, 27).

In the practice domain, more than 48% of respondents had “poor” habits/practices. This presentation is lower when compared to other studies that were also conducted in Indonesia, the study reported a low level of stroke awareness of more than 77% (28). This difference could be because the study only involved people with hypertension in one particular community, while our study involved people from various ethnic and community groups. The residences of the various respondents from this study were also assessed to affect the final presentation of the data obtained. The percentage of respondents’ practice values related to stroke awareness obtained in this study is lower when compared to other studies involving the general public in Riyadh (29), China (24), Saudi Arabia (30), United States (9), and Moscow (8). This result showed that the awareness of the Indonesian population regarding stroke is still very low. It is possibly because in various countries with a high level of stroke awareness, they have a stroke awareness campaign strategy that is always evaluated by researchers in that country. For example, STROKE 120 and STROKE 112 in China (17,31), FAST in California (32), and awareness of Stroke through School-Based Education in Japan (12). In fact, they have also provided studies comparing the effectiveness of stroke awareness

campaign strategies, such as STROKE 1-2-0 vs FAST in Shanghai (14) and 112 vs FAST through a randomized study in Taiwan (33). In addition, in Malaysia has also developed a “STROKE RISCOUNTER” which has been proven to be effective in increasing stroke-risk awareness through a Cluster-Randomized Controlled Trial (34).

So far, the Indonesian government has taken many promotional actions to increase public about stroke risk awareness as a medical emergency, as has been done in several countries. This initiative was carried out by the Government of Indonesia using various media such as leaflets, posters, and digital media, yet the problem of changing behaviour regarding stroke awareness has not been resolved until now. This kind of thing becomes ineffective because it is carried out uniformly and on a national scale, while in this study we found that apart from monthly income, notably, ethnicity is a very important factor in determining the stroke awareness profile of the community. This finding is echoed by at least two other studies conducted on 4 main ethnic groups in New Zealand and on US-and foreign-born individuals in the United States, they all reported a high contribution of ethnic identity in determining a person's stroke awareness profile (10, 20). Furthermore, respondents with income above the minimum wage have much better practices than respondents who earn below the minimum wage, it is also supported by a similar finding that was also reported by a study conducted in Egypt (1).

The Indo-Chinese people in this study have better practices regarding stroke awareness when compared to the Javanese whose practices are not much different from those of the Sundanese and Madurese ethnicities. Meanwhile, the Minang and Batak ethnic groups (adjacent ethnicities) in this case rank at the bottom. This order is still a mystery and needs further investigation. One of the possible causes is the characteristics of their native food. It is known that Minang and Batak specialties are more oily (high in fat), Madurese and Sundanese specialties have a strong salty character (high in salt) Javanese food has a sweeter character (high in sugar). It is reasonable since the characteristics of the typical food of each ethnic group are all included in the risk factors for stroke. With the finding that ethnic identity is the only factor that can affect all domains at once in this study, it is important for the Government of Indonesia to develop a stroke awareness campaign strategy using an ethnic or cultural approach so that the strategy will be right on target, considering that Indonesia is a country with the highest cultural diversity in the world.

Limitation

The main strength of this study is that it was conducted randomly by involving respondents from across provinces, namely East Java and West Java Island, where those provinces are the most densely populated and a gathering place for Indonesians of various ethnic groups.

Second, this study was conducted when there was no national campaign on stroke awareness, thus allowing the testing of baseline awareness. However, this study still has limitations. First, this study only used a written questionnaire in Indonesian, in other words we lost data from people who did not speak Indonesian well. It should be noted that there are still many people in rural areas who do not speak Indonesian well, they are usually elderly and speak a local language. Secondly, the awareness of stroke was captured only in the prompted method, which may have overestimated the level of awareness. Additionally, future research ought to use both prompted and unprompted techniques. Next, the authors only allow respondents to choose one ethnicity as their identity, so the authors lose data on those who come from mixed ethnicities. It obviously allows for bias. Future research can be enhanced based on the lessons learned from this study. For the next study, research with a significantly larger sample size will be required to reflect the demographic variety of Indonesia more accurately. Finally, it was not asked of the respondents how they would respond to particular symptoms. In a subsequent study, including this level of detail would further enhance the data on individual responses.

CONCLUSION

This study concludes that there are many people in East Java and West Java who do not have good knowledge about stroke awareness. Most of them also not shown a positive response in addressing the risk factors for stroke. In addition, more than a third of them do not show good habits/practices regarding stroke awareness. Furthermore, the ANOVA test also reported that gender and occupation did not affect their KAP scores. Different levels of education determine variances in knowledge and attitudes significantly, and the differences in residence only have an effect on knowledge. On the other hand, their age difference only affects the attitude they show, while ethnic identity can affect all domains in this study.

Based on the above conclusion, health activists and the government need to work together to start a stroke awareness campaign right away. Importantly, ethnic identity is the only factor that can affect all KAP domains, consequently, the Indonesian government must immediately develop a stroke awareness campaign strategy using an ethnic/cultural approach so that the campaigns carried out will be right on target, considering that Indonesia is a country with the highest cultural diversity in the world.

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