Original Research

Participatory: Stakeholder’s Engagement Toward Dengue Control Techniques in Klang Valley, Malaysia

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Abstract
Dengue is the main health problem in Malaysia. One of the main causes of dengue is the lack of participation in combating dengue. To improve participation, stakeholder’s engagement is considered the best solution which promotes an effective way of forming good governance. Engagement involves a level of knowledge, awareness, and understanding through past intended behavior. The objective of this study is to assess and compare the level of engagement of stakeholders toward dengue control techniques. A survey was conducted on 399 stakeholders who were selected randomly in the Klang Valley region, Malaysia. Result of the study showed that the stakeholders have a moderate level of engagement on dengue control techniques. The scientists seemed (a) more knowledgeable (4.81) than the public (4.68), (b) more aware (4.80) than the public (4.55), and (c) more intended behavior (4.31) than the public (4.11) to behave accordingly in supporting the implementation of these techniques. This study also identified the level of engagement factor across gender, religion, education level, and age were moderate which were translated to a moderately attached in dengue control techniques. However, one-way multivariate analysis of variance (MANOVA) initially detected no significant differences across demographic factors except religion on stakeholder’s engagement. Therefore, these findings will serve as a benchmark to evaluate stakeholder’s engagement to understand their participation in the implementation of dengue control techniques. Good participation promotes good governance in sustaining healthy life without dengue.

Keywords
dengue, participatory, engagement, dengue control techniques

Introduction
Sustainable development is the best strategy to protect the environment for future generation’s need to ensure its survival from any damage related to health problems, including dengue. The spread of dengue virus poses as an impending menace to the country and affects human health worldwide (Lee et al., 2015). According to Wan Rozita et al. (2006), dengue has become one of the main health problems in Malaysia which have emerged from irresponsible human activities. The disease is caused by dengue virus transmitted by Aedes mosquitoes that act as vectors that can transfer the virus. Two types of mosquitoes are known to be the vectors for dengue. The first vector, Aedes Aegypti, is a universal vector around the world but the second vector, Aedes Albopictus, is commonly found in Malaysia. The dengue virus (DENV) is a single positive-stranded RNA virus belonging to the Flavivirus genus of the Flaviviridae family. It has four serotypes of viruses that can cause dengue. The DENV is classified as DENV-1, DENV-2, DENV-3, and DENV-4. Mosquitoes transfer the dengue virus when they

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are sucking the blood from their victims and later transmit the virus to another victim (Chinnakali et al., 2012; Lee et al., 2015; Wan Rozita et al., 2006). After the biting, the virus enters the infected person through blood circulation and causes any dengue fever symptoms to emerge. The infected person will exhibit health implications and symptoms from 3 days of infection. According to Lee (2000), the infected person will probably have a sudden fever as the first symptom followed by various other symptoms like severe headache, pain behind the eyes, severe abdominal pain, and heat rash. Dengue fever, aggravated by the inflammation of blood vessels, can increase fatality risk. As pointed out by Shuaib et al. (2010), there is no specific remedy for dengue other than preventive therapy treatments. Therefore, various alternatives have been introduced to control dengue such as the use of environmental, chemical, biological, or genetical techniques in combating dengue. Engagement with stakeholders remains the best way to evaluate their willingness to participate in existing or newly developed dengue control techniques.

**Participation: Stakeholder's Engagement**

In Malaysia, the main challenge to combat dengue is participation in the practice of implementing the existing dengue control techniques. The engagement of the stakeholders is too limited because most of them do not possess sufficient knowledge and awareness about these techniques. They also view the techniques as crossing the ethical and the norms of life, including genetically modified mosquitoes (GMM) techniques. Amin and Hashim (2015a) found that the engagement factor had no relationship in determining attitudes toward GMM techniques. They also suggested that there is a study gap in terms of stakeholder’s participation to engage with dengue control techniques. This problem has also become a determinant role in poor participation among the stakeholders in the decision-making to implement the techniques because they are unsure of the effectiveness. They put the responsibility for implementing these techniques to the government, nongovernment organizations (NGOs), industry, and private sector. Amin and Hashim (2015a) also stated that several local NGOs and environmentalists have played a major role in criticism and disagree with the release of GMM in the environment due to safety issues. This shows that the stakeholder’s participation is pivotal in giving opinions, ideas, and consents for the implementation of these techniques. Therefore, this study will target to evaluate the participation of stakeholders by involving scientists and the public who are the direct and indirect implementers in combating dengue and also to ascertain their engagement level in determining their acceptance of dengue control techniques.

Some questions emerged among the stakeholders as to the meaning of good governance; how good governance can help stakeholder’s participation to engage in the implementation of dengue control techniques? Why should the implementation involve their engagement in the decision-making process? Sheng (2009) stated that the concept of governance means the process of decision-making and the process by which decisions are implemented or not implemented. Participatory in the decision-making process is one of the elements to achieve good governance because, without participatory from the community, the decision cannot be achieved. Therefore, a good understanding of the concept of good governance is important to secure stakeholders’ participation in the decision-making process regarding dengue control techniques. Toward this end, it is essential to improve the understanding of the public health education on dengue control techniques by increasing the public’s knowledge and awareness on the methods.

Participation can be either directly or through trust on key players or representatives from any institution (Sheng, 2009) which are engaged in the techniques. Participation is more meaningful when it is applied during the early stage. To achieve good governance, it is important to incorporate community’s participation by opinions, ideas, consents, desires, and interests into decision-making process rather than getting their reviews on the decisions that had already been made (Dian & Abdullah, 2013). To ensure sustainability in good governance, eight factors need to be emphasized: participation, legal regulation, transparency, response, consensus-oriented, equity and inclusiveness, effectiveness and efficiency, and accountability. However, this study focuses on aspects of participation by measuring stakeholder’s engagement in implementing these techniques.

Engagement is a commendable approach to promote public health knowledge. Engagement factor consists of knowledge, awareness, and understanding through past intended behavior, which is consistently associated with the new applications of biotechnology (Gaskell et al., 2003). Einsiedel (2000) reported that engagement is known as “attentive public” and is based on people’s knowledge and awareness about biotechnology. However, Pardo et al. (2002) preferred the term “informed citizen” in understanding a citizen’s knowledge about biotechnology. Allum et al. (2002) stated that citizens will participate to support biotechnology after obtaining relevant information. Therefore, engagement involves a certain degree of stakeholder’s motivation to accept or reject a matter depending on positive or negative attitude in determining their behavioral intention; the more positive behavior, the more positive on their participation (Chiu & Qijie, 2012). Past studies have shown an interplay of association between engagement with their perceived benefits in shaping good attitude toward GM rice (Amin & Hashim, 2015b), biodiesel products (Amin et al., 2017), and xenotransplantation (Amin et al., 2017). Mustapa et al. (2019) have suggested engagement as one of the factors in the conceptual framework for determining behavioral intention to adopt pharmacogenomic techniques in Malaysia. The mean score of the engagement factor in this study has
shown a moderate level and has similarity finding the score on biodiesel products (Amin et al., 2017) and xenotransplantation (Amin et al., 2017). In a separate study, Amin et al. (2014) found that demographic factors such as gender may also affect the level of awareness, in which a group of females is highly aware of accepting genetically modified food and medicine. Therefore, knowledge, awareness, and understanding through past intended behavior should be checked across demographic factors in assessing their participation to engage in dengue control techniques. This study also can drive stakeholder’s engagement to act accordingly to their participation in forming good governance toward these techniques.

Stakeholders also need to be educated and noted about gaining knowledge and awareness to create and practice good governance on implementing dengue control techniques, particularly by enhancing their participation. Not only knowledge and awareness about dengue control techniques to improve their attitude, but also the need to form a good understanding of these techniques is crucial. Understanding here refers to how stakeholders play a role and take responsibility in the decision-making process, which they are required to understand and give informed consent for the process of dengue control techniques. They are also encouraged to read, discuss, or listen about these techniques accordingly to combat dengue among the stakeholders, the government, the NGOs, the private sector, and the industry to make effective communication for enabling good governance. One of the approaches is through a public discussion (Castro, 2013) in which media and education system are used as tools to educate about these techniques. Experts in this area need to play a role in engaging stakeholders through education on public health. The informed consent and approval for the implementation of dengue control techniques are also important to assure the public that the techniques will be able to control the disease. Stakeholders also need to be exposed to risk, so they are more prepared to accept any possibility. Once the stakeholders have knowledge and awareness about these techniques, they will understand the importance of engagement to support all the efforts including risk assessment.

Dengue Control Techniques

The available dengue control techniques can be carried out by using chemical, biological, environmental, or mechanical methods. The application of insecticide sprays using pyrethroids, known as “fogging,” is one of the common techniques to kill infected adult Aedes female mosquitoes. The chemicals used in the spray will disrupt the life cycle and transmission of the dengue virus by killing the main vector in the next 24 hr. However, fogging can take place only following reported cases of dengue or at sites with massive mosquito breeding. Fogging is performed only in the inside or outside of a building that has the potential of adult Aedes mosquitoes hiding places (Lee et al., 2015). As for hotspot areas with a higher number of dengue cases, ultra low volume (ULV) fogging is performed using thermal fogger machine loaded with toxic materials such as temephos or Bacillus thuringiensis israelensis (Bti). A vehicle will then be equipped with the loaded ULV fogging machine. Compared with the common fogging, the ULV fogging lasts longer, is more capable of killing adult mosquitoes, and can cover a wide and large-scale area.

Biological control is also implemented in Malaysia to combat dengue. Bti is one of the biological controls and the most efficient technique that can be used as a killer agent for Aedes eggs and larvae without harming the environment and other organisms (Lee et al., 2015). In this technique, Bti is used by paralyzing and damaging the cells of the epithelium of the larval intestine because of the scar crystal protein toxic (Purnama et al., 2012). Bti also can be applied by spraying the water reservoir for water treatment inside the premises. Another type of biological control is to use Wolbachia bacteria following the success of the technique in impeding Chikungunya virus outbreak. According to Noor Afizah and Lee (2014), spreading of the dengue virus outbreak can be reduced after the bacteria are injected to breed resistance to the virus. In addition, laboratory studies were conducted to incorporate Wolbachia bacteria into male Aedes mosquitoes to produce host with genetic defects. The infected male Aedes mosquitoes are released into the environment to mate with wild female Aedes mosquitoes. After the mating had occurred, the female Aedes mosquitoes will lay their eggs normally but the offspring will not survive. This method will also kill the Wolbachia-infected male Aedes mosquitoes quickly and increase the spread of Wolbachia bacteria among the wild female Aedes mosquitoes, which then result in shortening of their lifespan. In Malaysia, the first recorded study on Wolbachia bacteria was conducted by the Institute of Medical Research (IMR), Malaysia. The study revealed a 100% homology Aedes mosquitoes collected from various geographic regions, which indicated the presence of Wolbachia bacteria after they were collected in field studies through the analysis of the double-polymerase chain reaction (PCR) and DNA sequencing (Lee et al., 2015).

The outdoor residual spraying (ORS) and the autocidal trap are among the latest innovations proposed by the Ministry of Health, Malaysia. ORS is an outdoor, complementary activity for controlling dengue by reducing the population of Aedes mosquitoes. This long-lasting insecticide is effective for 3 months and contains water-proof toxins that can cause mosquito to lean or rest at places sprayed with the toxins. The effectiveness of ORS depends on the wall surface characteristics, geographical area, rainfall, humidity, and temperature. Rozilawati et al. (2007) state that the ORS is very effective in controlling the mosquito population at a lower cost. Next, the autocidal trap is used to trap the female Aedes mosquitoes and mosquito larvae. This trap is cheap, environmental friendly, user-friendly, durable, and safe to
use with minimal maintenance. A key component in this trap is the sticky plastic sealing strips that float on the water surface. The trap’s sticky surface can ensnare gravid mosquitoes as they would be interested to use the floating trap as a platform to lay eggs. Lee et al. (2015) have explained that this method has been conducted from previous experiment to collect the ovitrap index. The experiment provides evidence that since the use of the autocidal trap technique, there has been a dramatic decrease in dengue cases (13 cases in 2014 compared with 53 cases reported in 2013).

Vaccination is also one of the latest dengue control techniques which is developed to strengthen public immunization. Scientific studies have shown that when an individual is injected with a dengue vaccine, the individual body will produce antibodies that increase body resistance against infection by dengue virus (Choy & Abdullah, 2016). Dengue vaccine that has undergone clinical studies is the chimeric vaccine (Cyd) that is produced by the Sanofi Pasteur Company. Many efforts were made to produce dengue vaccines. However, there is still no vaccine that is effective against all four serotypes of dengue virus. Currently, many of the vaccines produced have reached the third phase in which the vaccines are only able to control three out of four serotypes of dengue virus. Still, there is ongoing research to produce a vaccine against all four dengue virus serotypes. Once it is successful, it will need public consent prior to its implementation. In addition to that, the public will also need to be taught and made aware of both the advantages and risks of receiving the newly developed vaccination.

Another way to combat dengue is by using genetically modified (GM) male Aedes aegypti mosquitoes. The GM mosquitoes were developed by Oxitec, a UK biotechnology established to fight dengue. When wild female mosquitoes mate with male GMM, their offsprings will not survive larval or pupal stage if there is an absence of tetracycline (Phuc et al., 2007). In the pioneering field tests in Malaysia, 6,000 GM male Aedes aegypti mosquitoes were released in the forest near Bentong, Pahang, on December 21, 2010, to combat dengue in Malaysia. The release of GM mosquitoes was reported in the media and shocked the Malaysians. Some news reports of the survey were suspended following a protest made by NGOs and the public. The Consumers Association of Penang (CAP) and Sahabat Alam Malaysia (SAM) wrote a memorandum to the National Biosafety Board (NBB) asking them to revoke the approval for this experiment for experimental field study of GM Aedes aegypti mosquitoes to combat dengue in Malaysia. If the experiment proves successful, then the GM mosquitoes will be released into the environment nationwide. However, if the issues of community acceptance could not be dealt with accordingly, the potential benefits of GM mosquitoes may not be realized. Community participation and their approval are very important to continue the effectiveness of this technology. Meanwhile, the public is still arguing against the research (Weijer & Emanuel, 2000) and whether the intended results of the community for their participation in research (Senituli & Boyes, 2007). The ongoing investigation should involve the participation of all parties especially public. These issues show that participatory can form good governance on the decision-making process to implement GM mosquitoes to the environment.

Research Methodology

The research was conducted from September 2016 until September 2017 by a survey of adult respondents (age 18 years old and above) in the Klang Valley region of Malaysia. Klang Valley was chosen because it is a central midpoint in Malaysia that is actively developing in terms of social and economic aspects. Klang Valley region was also identified as a place that has the highest number of dengue cases reported by the Ministry of Health, Malaysia. Therefore, the study involved two groups of stakeholders, scientists, and the public. The scientists in the field of environmental or health science were chosen because they are the implementers who are involved directly and indirectly in combating dengue, while the public was chosen due to their risk of being infected with the dengue viruses. Their participation is crucial for the decision-making process to determine the most suitable techniques to be used in combating dengue. The researchers used G*Power 3.1.9.2 application (Faul et al., 2007) by using statistical power of 0.80 and the size effect ($f = 0.15$) with the significant level ($p < .05$) to focus more than 270 respondents (sample size). However, this study focuses on moderate effects size ($f = 0.15$) for gender, stakeholders, education level, and age at a significant level ($p = .05$) which requires a minimum sample of 55 respondents on the statistical power of 0.80. Therefore, this study involved 202 respondents comprising scientists’ group (50.6%) and 197 respondents among the public (49.4%). From the total number of respondents, 51.1% is female and 48.9% is male. For the religion category, there are 181 Muslims and 218 non-Muslims. For education level and age, each category exceeds the number of respondents required (Supplemental Appendix 1).
In this study, a set of questionnaires that has a combination of questions that relates to the relevance of the engagement has been distributed to the respondents. Before answering these questionnaires, respondents were provided with a brief introduction to dengue control techniques. The respondents were asked 10 questions on their basic knowledge about dengue. The queries consist of “true-or-false” questions related to the mosquito life cycle, breeding methods, symptoms of dengue fever, types of fever, and vector. In terms of awareness, the respondents were asked 10 statements concerning the dengue control techniques. Five items represent the understanding through past intended behaviors, which is talking; discussing either in general or online discussions; having read articles through newspapers, magazines, or via the internet; or watching television on dengue control and prevention techniques. Responses were measured on a 7-point scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The data were analyzed using Statistical Package for Social Science (SPSS) version 23.0. Validity (factor loading) and reliability (Cronbach’s alpha) were tested by using SPSS to evaluate the consistency of the factor loading and reliability (Cronbach’s alpha) were tested by using SPSS to evaluate the consistency of the factor loading and reliability (Cronbach’s alpha). Hair et al. (2010) suggested that a good validity measurement of the factor loading must greater than 0.5, in which factor loadings of knowledge, awareness, and understanding through past intended behavior were more than 0.5. Cronbach’s alpha coefficients for the engagement factor in this study were above 0.6, indicating good reliability. Then, one-way multivariate analysis of variance (MANOVA) was performed to determine whether there is a significant difference in the mean score of knowledge, awareness, and understanding through past intended behavior across demographic factors.

### Results and Discussion

The mean scores and interpretations of stakeholders’ engagement are shown in Table 1. Overall, the level of knowledge, awareness, and understanding through past intended behavior of the stakeholders in the Klang Valley is moderate with a mean score of 4.75, 4.67, and 4.21, respectively. Before the MANOVA tests were conducted, Box’s M tests were tested as an essential prerequisite for determining homogeneous variance to determine whether the variance of covariance among dependent variables was the same or did not cross independent variables. If the significant level exceeds 0.001, the MANOVA test can be run (Tabachnick & Fidell, 1996). Supplemental Appendix 2 shows the results of Box’s M tests for each category of demographic factors with engagement factor (knowledge, awareness, and understanding through past intended behavior). It was found that MANOVA’s prerequisites were met when the dependent variable was homogeneous with independent variables of gender, religion, education level, and age except for stakeholder’s group (p < .001) which shows no significant variance of covariance (non-homogeneous). However, the study of Pallant (2001) states that the MANOVA tests can still be carried out if the sample size is large (n = 399), which allows the probability of occurrence of type 1 error to be very small.

Data analysis through the statistical test of Pillai’s Trace obtained by a one-way MANOVA tests were conducted to

### Table 1. Mean Score for Knowledge, Awareness, and Understanding Through Past Intended Behavior.

| Demographic factors           | Knowledge M ± SD | Interpretation | Awareness M ± SD | Interpretation | Understanding through past intended behavior M ± SD | Interpretation |
|-------------------------------|------------------|----------------|------------------|----------------|--------------------------------------------------|----------------|
| **Gender**                    |                  |                |                  |                |                                                  |                |
| Male                          | 4.71 ± 1.13      | Moderate       | 4.66 ± 1.52      | Moderate       | 4.15 ± 1.46                                      | Moderate       |
| Female                        | 4.79 ± 1.07      | Moderate       | 4.69 ± 1.61      | Moderate       | 4.27 ± 1.34                                      | Moderate       |
| **Stakeholder’s group**       |                  |                |                  |                |                                                  |                |
| Scientists                    | 4.81 ± 1.13      | Moderate       | 4.80 ± 1.44      | Moderate       | 4.31 ± 1.44                                      | Moderate       |
| Public                        | 4.68 ± 1.06      | Moderate       | 4.55 ± 1.67      | Moderate       | 4.11 ± 1.35                                      | Moderate       |
| **Religion**                  |                  |                |                  |                |                                                  |                |
| Muslim                        | 4.91 ± 1.04      | Moderate       | 4.95 ± 1.55      | Moderate       | 4.41 ± 1.38                                      | Moderate       |
| Non-Muslim                    | 4.61 ± 1.13      | Moderate       | 4.45 ± 1.54      | Moderate       | 4.05 ± 1.39                                      | Moderate       |
| **Education level**           |                  |                |                  |                |                                                  |                |
| Secondary to diploma          | 4.66 ± 1.10      | Moderate       | 4.80 ± 1.68      | Moderate       | 4.28 ± 1.55                                      | Moderate       |
| Bachelor’s degree             | 4.79 ± 1.10      | Moderate       | 4.75 ± 1.51      | Moderate       | 4.17 ± 1.32                                      | Moderate       |
| Master’s and doctoral degree  | 4.76 ± 1.10      | Moderate       | 4.48 ± 1.54      | Moderate       | 4.21 ± 1.37                                      | Moderate       |
| **Age**                       |                  |                |                  |                |                                                  |                |
| 18–28 years old               | 4.69 ± 1.07      | Moderate       | 4.74 ± 1.58      | Moderate       | 4.23 ± 1.44                                      | Moderate       |
| 29–39 years old               | 4.87 ± 1.14      | Moderate       | 4.76 ± 1.53      | Moderate       | 4.13 ± 1.40                                      | Moderate       |
| >40 years old                 | 4.72 ± 1.06      | Moderate       | 4.40 ± 1.55      | Moderate       | 4.34 ± 1.29                                      | Moderate       |

Note. 1.00–2.99: Low; 3.00–5.00: Moderate; 5.01–7.00: High.
identify significant differences in engagement factor across demographic factors. Tabachnick and Fidell (1996) stated that the Pillai’s Trace test is suitable if the number of samples is not the same, the sample size is small, or does not meet the MANOVA prerequisites. The analysis result shows no significant differences based on gender, $F_{(3,395)} = 0.447$, Pillai’s Trace = 0.003, stakeholder’s group, $F_{(3,395)} = 1.744$, Pillai’s Trace = 0.013, education level, $F_{(6,790)} = 0.870$, Pillai’s Trace = 0.013, and age, $F_{(6,782)} = 1.150$, Pillai’s Trace = 0.017. There is a significant difference in the engagement factor across religion ($p < .05$) (Table 2). Univariate one-way ANOVA was done to confirm the significant differences in engagement factor across religion (Table 3). The results show that this analysis has confirmed a significant difference in the engagement factor across religion ($p < .05$) (Table 2). Univariate one-way ANOVA was done to confirm the significant differences in engagement factor across religion (Table 3). The results show that this analysis has confirmed a significant difference in the engagement factor across religion ($p < .05$) (Table 2). Univariate one-way ANOVA was done to confirm the significant differences in engagement factor across religion (Table 3). The results show that this analysis has confirmed a significant difference in the engagement factor across religion ($p < .05$) (Table 2). Univariate one-way ANOVA was done to confirm the significant differences in engagement factor across religion (Table 3).

All the respondents claimed that they were moderately engaged with the dengue control techniques. From the results, it is apparent that the stakeholders in the Klang Valley were less involved in the implementation of the techniques. These engagement approaches are nevertheless important due to the need to improve and enhance full engagement from the stakeholders in establishing good governance toward dengue control and prevention techniques. Supplemental Appendix 3 shows the percentage of scientists and public who answered “yes” to the query whether they have heard about certain dengue prevention techniques and the mean score obtained from the five queries of past intended behavior. Based on the results, there are two answers for knowledge which showed less than 50% of dengue fever is caused by *Flavivirus* (30.8%) and the carrier vector for dengue fever virus is male *Aedes* mosquitoes (27.2%). Therefore, the results can be concluded that stakeholders among scientists and the public have a good level of knowledge about dengue and dengue control and prevention techniques. In terms of awareness, the public rarely heard about the *Bacillus thuringiensis israelensis* (Bti) and *Wolbachia* technique when the percentage is less than 50%. Lack of awareness is likely due to products that are not being adequately explained to the stakeholders. They also overlooked the technique efficiency. In terms of the level of understanding, most of the public respondents have a moderate level of their past intended behavior because of the range of the mean score within three to five.

| Table 2. One-Way MANOVA to Determine the Engagement Variable Across Demographic Factors. |
| --- |
| **Effect** | **Pillai’s trace** | **$F$** | **DF.h** | **DF.e** | **Significance value** |
| Gender | 0.003 | 0.447 | 3 | 395 | .719 |
| Stakeholder’s group | 0.013 | 1.744 | 3 | 395 | .157 |
| Religion | 0.051 | 7.006 | 3 | 395 | .000* |
| Education level | 0.013 | 0.870 | 6 | 790 | .516 |
| Age | 0.017 | 1.150 | 6 | 782 | .331 |

*Note. MANOVA = multivariate analysis of variance. *$p < .05$. |

| Table 3. Univariate One-Way ANOVA of Engagement Variables Across Religion. |
| --- |
| **Engagement variables** | **Main effect** | **Type III sum of squares** | **DF** | **$M^2$** | **$F$** | **Significance values** |
| Knowledge | Religion | 9.361 | 1 | 9.361 | 7.893 | .005* |
| | Error | 470.853 | 397 | 1.186 | | |
| | Total | 9,472.680 | 399 | | | |
| Awareness | Religion | 24.640 | 1 | 24.640 | 10.296 | .001* |
| | Error | 950.114 | 397 | 2.393 | | |
| | Total | 9,690.240 | 399 | | | |
| Understanding through past intended behavior | Religion | 13.108 | 1 | 13.108 | 6.823 | .009* |
| | Error | 762.683 | 397 | 1.921 | | |
| | Total | 7,851.160 | 399 | | | |

*Note. ANOVA = analysis of variance. *$p < .025$. |
Conclusion
This research gives implication for enriching the literature on stakeholder participation and good governance toward dengue control and prevention techniques, particularly in their knowledge, awareness, and understanding through past intended behavior. The purpose of this study is to enhance stakeholders’ participation in the decision-making process for the current and latest dengue techniques before its implementation by dealing with the engagement approach. As we know, participation is one of the characteristics to form good governance, and the other elements are equitable, transparent, responsive, consensus oriented, accountable, rule of law, effective, and efficient. These elements can be related to form good governance toward dengue control and prevention techniques. Besides, the involvement of stakeholders might help address all the significant issues at an initial stage. From equitable or inclusive element, stakeholders, either men or women, can participate in the implementation of the techniques. The responsible party needs to provide transparent information to be responsive to serve the public and be accountable to encourage stakeholders to participate in the decision-making process. The rule of law, particularly on human rights, must be fair, and consensus must be oriented on the best interest of the stakeholder. As such it implies that implementation of these techniques is in accordance with the rules and the stakeholders’ interest. For future studies, the researchers propose an analysis of the other elements besides participation to strengthen the good governance toward dengue control and prevention techniques. Stakeholder especially scientists and the public need to combat dengue by implementing dengue control and prevention techniques. Besides, the involvement of stakeholders might help address all the significant issues at an initial stage. From equitable or inclusive element, stakeholders, either men or women, can participate in the implementation of the techniques. The responsible party needs to provide transparent information to be responsive to serve the public and be accountable to encourage stakeholders to participate in the decision-making process. The rule of law, particularly on human rights, must be fair, and consensus must be oriented on the best interest of the stakeholder. As such it implies that implementation of these techniques is in accordance with the rules and the stakeholders’ interest. For future studies, the researchers propose an analysis of the other elements besides participation to strengthen the good governance toward dengue control and prevention techniques. Stakeholder especially scientists and the public need to combat dengue by implementing dengue control and prevention techniques. Furthermore, the involvement of stakeholders might help address all the significant issues at an initial stage. From equitable or inclusive element, stakeholders, either men or women, can participate in the implementation of the techniques. The responsible party needs to provide transparent information to be responsive to serve the public and be accountable to encourage stakeholders to participate in the decision-making process. The rule of law, particularly on human rights, must be fair, and consensus must be oriented on the best interest of the stakeholder. As such it implies that implementation of these techniques is in accordance with the rules and the stakeholders’ interest. For future studies, the researchers propose an analysis of the other elements besides participation to strengthen the good governance toward dengue control and prevention techniques. Stakeholder especially scientists and the public need to combat dengue by implementing dengue control and prevention techniques.

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Supplemental Material
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