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AN ASSESSMENT OF TOURIST KNOWLEDGE AND AWARENESS LEVEL TOWARDS THE ENVIRONMENT IN TUNKU ABDUL RAHMAN PARK, MALAYSIA

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ABSTRACT

Tunku Abdul Rahman Park (TARP) is the first Marine Protected Area gazetted in Sabah, Malaysia in 1974. It is also one of the most famous tourist destinations in Sabah which experiences a high anthropogenic disturbance that could create major damage in the long run if not properly managed. TARP has been flooded by tourists receiving more than 500,000 tourists in 2018 and 2019. It is clear that tourism activity in TARP is one of the major contributions to anthropogenic disturbance. Therefore, it is essential for tourists to have a high level of awareness to conduct sustainable and eco-friendly tourism activity. In this study, we assessed the level of awareness and knowledge of the marine environment among tourists in TARP. Briefings by tour guides or companies were also assessed. Overall, results showed a low awareness level among tourists in TARP. This is somehow related to the fact that the briefing score by tour companies was low and only focused on promoting their company. TARP authority should implement a standard 5-minute video on the marine environment and assign more signage on the island in an effort to raise awareness among tourists.

Keywords: *Tourist knowledge, Briefing effectiveness, Park management, Marine Protected Area, Sabah.*

INTRODUCTION

Tunku Abdul Rahman Park (TARP) is the first Marine Protected Area (MPA) gazetted in Sabah, Malaysia in 1974 and is well-known for its extensive coastline and splendid island landscape, making it a prized possession of Sabah tourism. The spectacular marine ecosystem, especially the coral reef, is home to various marine life species, including turtles, reef fishes, and sharks accompanied by conventional beach holidays. This attraction is an important asset of the Sabah tourism industry that boosts recreational activities such as exploring the sea by snorkelling and diving (Chan, 2016). Although tourism promotes the conservation of the environment, the marine ecosystems of Sabah water still face challenges due to weak legislation, uncontrolled human activities and lack of awareness from visitors.

One of the biggest challenges for sustainable tourism activities is to encourage tourists to actually conduct in an eco-friendly behaviour only (Brown et al,. 2010). Several other studies have shown that environmental education is capable of being an effective formula for managing tourist interactions with wildlife and nature (Orams, 1997). It also can be stated that the level of efficiency of an environmental education program will ultimately determine the level of impact received by the MPA as a result of the tourism industry. The design of environmental education through accurate MPA interpretation will be able to reduce the negative impact of tourism activities that will ultimately produce motivated tourists who support environmental conservation (Powell & Ham, 2008). A study by Priskin (2003) shows that tourists are aware of the impact of their activities on the environment, although such awareness is at different levels.

The objectives of this study are to compare the dominant visitors according to nationality and assess the level of knowledge among them, primarily in which are related to environmental awareness and responsibility. This study also assessed the briefing effectiveness by tourist guides. In the end, this study will provide a better understanding to the Parks Authority

in managing or establishing environmentally-conscious tourists.

LITERATURE REVIEW

The concept of environmental education and awareness is explored and understood primarily to reflect Malaysian's perspective. It may vary slightly, but one can agree that environmental education and awareness measure how good we are in knowing what is happening to our mother earth nowadays. According to Hassan et al. (2010), environmental consciousness has three (3) principles: emotional awareness, attitude, and sustainability practice. Performing environmentally-friendly acts is motivated by psychological variables and dynamic forces. The lack of environmental understanding of immense environmental issues, urbanization, industrialization, deforestation, increasing global temperatures, and biodiversity depletion hinder policymakers' achievements in resolving environmental stresses (Keles, 2012).

Policymakers are concerned about the quality of life, and the assessment of environmental knowledge among Malaysians is therefore of considerable importance to the effectiveness of policy planning. Policy design will cause the environmental protection programme to be far from planned without public awareness concern being involved (Mei et al., 2016). The study found out that with four (4) categories out (water pollution, air pollution, waste management, climate change), water pollution has the highest awareness while climate change is the lowest among Malaysians. This showed that Malaysians are more aware of the impact felt locally and affected personally rather than globally. It can be concluded that Malaysians have the highest level of knowledge of water pollution for the four categories of environmental issues and show the highest intent to simultaneously conduct conservative action. However, it is interesting to mention that the outcome showed the reverse for climate change. Thus, the cost-saving of water and electricity is the intervening aspect that comes across. Malaysians' environmental behaviour is triggered not by their environmental consciousness, but by cost savings. Waste management and air quality safety also failed to meet the score as high as their degree of environmental consciousness had simultaneously indicated an intervening convenience factor (Singhirunnusorn et al., 2012).

In this case, convenience implied refers to environmental behaviour. Illegal dumping and open burning, for example, are more straightforward than proper disposal of garbage (i.e., segregation and packaging of rubbish for disposal in waste disposal facilities), which eventually leads to air pollution and inadequate waste management. Because of public transport's difficulty, Malaysians are more likely to have a personal vehicle that leads to excessive vehicle emissions and low air quality. This study is expected to activate the value of expressing environmental awareness and behavioural performance among Malaysians to governmental and non-governmental authorities. Such issues strengthen policymaking considerations by integrating environmental knowledge and behavioural success with Malaysian culture. In the future, the report will cover more aspects of environmental concerns, such as biodiversity, forestry and wildlife preservation, and soil conservation. In this way, ecological awareness and behavioural success among Malaysians can be assessed (Mei et al., 2016).

In 2001, The Ministry of Tourism, Art and Culture (MOTAC) and the Ministry of Education developed an educational tourism programme to promote local travel by establishing tourism clubs in schools to boost domestic tourism (MOTAC, 2001). Students and schoolchildren are thus targeted to convince their families to travel throughout the country more frequently. The Student Tourism Programme (STP) has recently succeeded in attracting tour operators as partners to introduce and promote the programme. This programme could theoretically be expanded to include educational establishments and tourist destinations throughout the country. More social interaction, cultural exchanges and understanding between young people in the region could be fostered in the long run (Hamzah, 2004).

METHODOLOGY

Data of tourist arrival was collected from January 2018 to December 2019, while data collection of tourist’s knowledge level assessment and tourist guide's briefing effectiveness were conducted from July 2019 to July 2020. However only a limited amount of data were available in the study area due to the Movement Control Order (MCO). All these data were obtained either from the five tourist counters (entry point) or from around tourist resting area in TARP. The details of the study site in this study, are shown

in Table 1 and Map 1.

Table 1. Location of all Five Study Sites in TARP

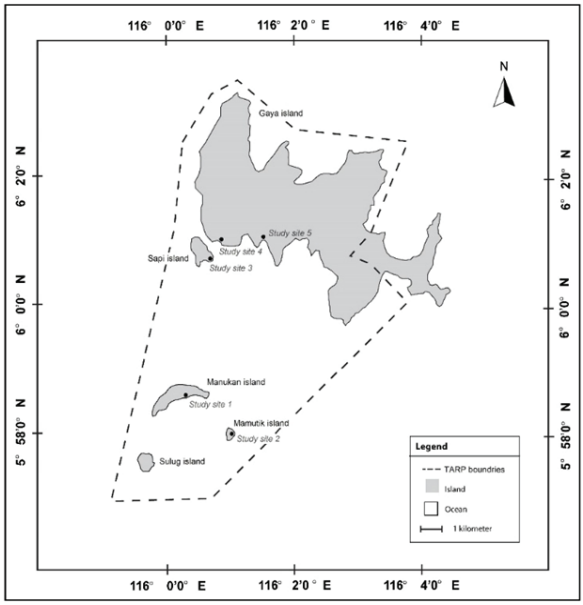
Sites	Location	Coordinate
Study site 1	Manukan island	5° 58'31.13" N 116° 0'18.56" E
Study site 2	Mamutik island	5° 57'58.63" N 116° 0'51.75" E
Study site 3	Sapi island	6° 0'31.64" N 116° 0'28.63" E
Study site 4	Padang Point, Gaya island	6° 0'44.18" N 116° 0'34.82" E
Study site 5	Base Camp, Gaya island	6° 0'46.50" N 116° 1'13.59" E

Note: Each coordinate was labelled in Map 1. Coordinates represent the exact location of the entry point of each island.
(Source: Author, 2021)

In assessing tourists' knowledge level, only three nationalities were considered; Malaysia, China and Korea. Both sampling (tourists' knowledge and briefing effectiveness) were conducted only in Study site 1 and Study site 2. This strategy is selected because most tourists chose the island-hopping packages to visit two or three islands in one day. Considering the fact that all of the tourists will eventually end up visiting either Manukan or Mamutik island or both, this data can simultaneously represent the other Study site. Also, because of logistic and budget limitation, Manukan and Mamutik island were chosen since their location is near to each other while Sapi and Gaya island are in a different cluster of islands.

The tourist's knowledge towards environment data was collected through tourists' interviews and was conducted in four different languages which are in Malay, English, Korean, and Mandarin. There was a total of 4,740 interviews conducted during this study using a Likert-type scale. As a psychometric scale commonly involved in research that employs questionnaires, it can allow the individual to express how much they agree or disagree with a particular statement (Croasmun & Ostrom, 2011). Although the personal data collected were just necessary personal information, we treat the data as private and confidential. A set of questionnaires were given and explained to the tourist. To overcome language barriers, the tourist guides were recruited to assist as interpreters (Korean and Mandarin languages)

for the interviews.



Map 1: Manukan and Mamutik Islands Study Sites (Sabah Parks, 2020). Both islands are accessible by tourists via boat ride with a third party tour company. TARP is known for its easy access as it is only 15 minutes away by boat from the mainland city of Kota Kinabalu.

As an additional objective in this study, a total of 100 videos were evaluated on tourist guide briefing to the tourist. Altogether there were five elements of evaluation that represent the tourist guide briefing content to the tourist. In this study, there were 100 videos recorded and assessed. The content of the selected element of the briefing, as shown in Table 2. As the Parks Authority, their staff is allowed to take videos for later review for random purposes. It is entirely legal to record them as we are in a public place (Carman, 2018). The tourist guides gave not all of the tourists a briefing before entering TARP, one of them is Free Independent Tourists (FIT), that come and manage their visit independently and come individually or in a group. The scoring scale practised in this study is from score 1; did not mention at all, 2; mentioned lightly, 3; a brief introduction on the topic, 4; good and compact briefing on the topic and 5; excellent and very detailed on the topic. The video recording was reviewed more than a few times to obtain precise data and scoring.

Table 2. Description of Selected Briefing Content
A more detailed briefing will be given a higher score. The score from the total sample (n=100) will be presented in percentage (%) to see the overall briefing score by the tourist guides in both study sites.

No.	Content/Description
A.	**Marine Protected Area (MPA);** (i) Inform the tourists that they are now inside an MPA (ii) Share to the tourists that this MPA is managed by Sabah Parks/Parks Authority (iii) Told the tourists that there are existing regulations in the MPA (iv) Warned the tourists that there would be a penalty for breaking regulations
B.	**Safety of marine animals;** Warn the tourists that all flora and fauna life as listed below should not be interrupted, touch, feed, collected, hurt, or damage as well as to explain to them the reason; (Corals, turtles, fishes, invertebrates, and other marine flora and fauna)
C.	**Damage control;** Control potential damage by the tourist by sharing do's and don'ts in the MPA as well as to explain to them the reason; (i) Don't wear a glove (ii) Don't bring knives/rod (iii) Don't collect anything as a souvenir (iv) Don't litter (v) Other control information
D.	**Tourist safety;** Instruct the tourist always to wear a life jacket during water activity, share the location of lifeguard tent, check on their health, and other safety briefings.
E.	**Marketing of water sports;** Share with the tourist types of activity they can participate in and give them brochures, any use of marketing aid, pricing, and other types of persuasion to make sure the tourist take part in the activity.

(Source: Author, 2021)

All collected raw data were processed and analysed using Statistical Package for the Social Sciences (SPSS), except for tourist arrival data which were analysed using Microsoft Excel. In the tourist knowledge level assessment, the chi-squared analysis was adopted for the dichotomous question with two possible answers only used in this survey are 'yes' or 'no'. Since the 'yes/no' scale is a categorical variable, Chi-squared analysis is commonly used for testing relationships between categorical variables that are independent of each other. At the same time, Cramer's V value (φc) can determine the power of the relationship between the two groups. The interpretation of the effect size from Cramer's V value was listed in Table 3 (Kotrlik et al., 2011). Furthermore, Kruskal-Wallis analysis was used to determine the significant difference in mean of groups by education level.

Table 3. Interpretation of Cramer's V values

φc	Effect size
0.00 and under 0.10	Negligible association
0.10 and under 0.20	Weak association
0.20 and under 0.40	Moderate association
0.40 and under 0.60	Relatively strong association
0.60 and under 0.80	Strong association
0.80 and under 1.00	Very strong association

(Source: Author, 2021)

Since the 5-Point Likert-type Scale item score was merged into a single composite score to represent a particular trait, it can be adopted as an interval measurement scale that uses descriptive statistics, including mean and standard deviation to determine the central tendency for every item and the total score (Boone & Boone, 2012). Reliability of the Likert scale data was determined using the Cronbach Alpha. Cronbach Alpha reliability coefficient ranges between 0 and 1. The closer the coefficient is to 1, the more reliable the data is (Gliem & Gliem, 2003). The level of public support can be classified based on the mean score, as shown in Table 4.

Table 4. Classification of the Public Support Level

Mean score	Interpretation
1.00-1.80	Very supportive
1.81-2.60	Supportive
2.61-3.40	Neither supportive nor not supportive
3.41-4.20	Not supportive
4.21-5.00	Very not supportive

(Source: Author, 2021)

RESULTS & DISCUSSION

For tourists' arrival count, 2018 recorded a total of 554,035 numbers of tourists from 65 countries and a slight decrease of 6.85% in 2019 with 516,086 tourists from 67 countries. Malaysia, Korea and China were the top 3 with the most tourists for the two years comprised of 85.91% in 2018 and 86.25% in 2019 (Figure 1).

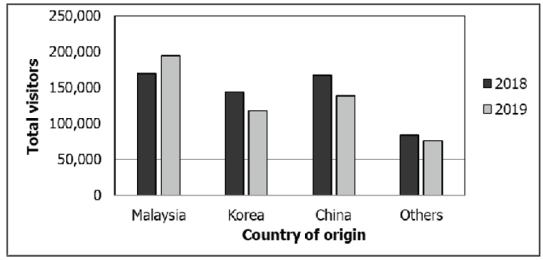


Figure 1. Distribution of Tunku Abdul Rahman Park Visitors by Countries of Origin and Year

Details on the number of tourists arrival were shown in Table 5. Since the tourists were mainly from Malaysia, Korea and China, the tourist's knowledge assessed were only based on these three countries.

(Source: Author, 2021)

In assessing tourist knowledge, a total sample of 4,740 respondents was collected. This study recorded a slightly higher number of female respondents with 51.68%. Middle range age also recorded a higher number than the other age group with the highest (41.46%) being those from 21 to 30 years old and then 31 to 40 years old with 29.04%. Children under the age of 10 only comprise 0.47% as they were less likely to give cooperation. The same goes with the tourist above 60 years old with only 1.12% as we do not want to disturb or cause any discomfort to them. China recorded the highest number of respondents in this study, with a total of 47.52% while Malaysia and Korea recorded 36.22% and 16.26% respectively. In respect of education level, we recorded tertiary education as the highest in number with 50.34%. Quarternary and secondary education has almost the same amount, with 21.56% and 19.93% respectively. Only 5% of them only had primary education while others recorded only 3.17%.

Table 5. Tourists Arrival in 2018 and 2019 According to their Respective Countries

Malaysia, Korea and China were the focus of this study in assessing tourists knowledge as they comprise more than 80% of total tourists arrival.

Country/year	2018		2019	
Malaysia	168,285	30.37%	196,240	38.01%
Korea	141,733	25.58%	110,756	21.46%
China	165,966	29.96%	138,127	26.76%

Other countries	78,051 (62 countries)	14.09%	70,963 (64 countries)	13.75%
Total	554,035	100.00%	516,086	100.00%

(Source: Author, 2021)

Table 6. Tourists Knowledge on MPA and Results of Chi-square test on Education Dependence

Respondents were asked if they ever heard of MPA, the purpose of it and its importance. Chi-square test was performed on different education level.

Tourists' MPA knowledge	% (n=4,740)	Education dependence significance level
Know what MPA is	37.26%	**
Know TARP is an MPA	28.76%	**
Agree that MPA is important as an individual	32.62%	**
Agree that MPA is important in general	39.96%	**

(Source: Author, 2021)
-: not significant
* p-Value <0.05
** p-Value <0.01

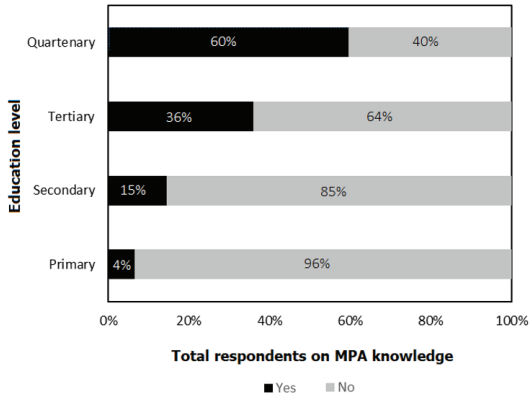


Figure 2. Visitors Knowledge about Marine Protected Area according to Education Level

(Source: Author, 2021)

Based on Cramer's V values obtained, φc=0.338, it shows that the relationship between respondents' knowledge on MPA and their education level is moderately associated. Kruskal-Wallis test was used to evaluate

the difference in knowledge on MPA according to respondents' education level. It is revealed that the p-value is smaller than the α-value ($p<0.05$), indicating that the knowledge on MPA is significantly different across the respondent's education level. Figure 2 depicted the knowledge on MPA by education level. Obviously, the higher the respondent's education level, the higher level of their knowledge on MPA. As much as 60% of the respondents who have quaternary education have more understanding of an MPA than respondents who only obtain primary education (4%).

Tourists' general knowledge of marine ecosystems was assessed with a series of simple generic questions, as shown in Table 7. Results show that the relationship between respondents' knowledge of marine ecosystems is significant, X2 (4, N=4740)=3.082E2, $p<0.01$ with $\varphi c=0.113$ indicating a weak association. The difference between knowledge on the marine ecosystem of respondents based on their education level was tested using the Kruskal-Wallis test. The test obtains a p-value smaller than 0.05 ($p<0.05$), indicating a significant difference across the education level. The higher the respondent's education level, the higher the respondents' knowledge of the marine ecosystem possessed.

Results show that only 25.93% of the respondents know that coral is an animal, yet 63.19% still know that coral reef is threatened. It also showed that respondents have a higher awareness of endangered sharks and turtles issues with 66.69% and 73.35% respectively. According to Boyd in 2008, MPA serves as a foundation for almost all threatened and endangered species. However, the vast majority and diversity of threatened and endangered species will be lost without urgent conservation interventions.

Sunscreen contains substances that could harm the ocean in the long term. According to Tovar-Sánchez et al. (2013), a source of organic and inorganic chemicals that reach the sea significantly came from sunscreen products that bring potential ecological consequences on the coastal marine ecosystem. In 2018, Corinaldesi et al., found that coral bleaching was recorded to be significantly induced by the chemical release by sunscreen. Other marine animals were also affected by this. Another study by Corinaldesi et al. in 2017 showed that sea urchin's (Paracentrotus lividus) development was impaired due to the ocean's excessive sunscreen chemical. Regarding this issue, 64.60% of respondents did not know that sunscreen

could cause harm to coral reefs. Insufficient knowledge in this subject could lead to more organic and inorganic matter absorbed into the ocean and cause harm to marine animals in the future.

As TARP is also known for its marine biodiversity, it is expected that more tourists will be more curious and interested in touching any marine life. It is proven that 61.05% of respondents tend to pick up or touch marine life. However, touching or handling marine animals will stress or damage the animal (Dogu H., 2011). We observed some of the snorkellers in TARP deliberately touch some marine animals such as corals, fishes, starfishes, and feeding them. This behaviour could be harmful to the animal itself and could affect the marine ecosystem. Finally, a total of 80.84% of respondents were willing to watch a compulsory 5 minutes video on MPA and marine conservation information. Respondents' willingness to watch a video based on their education level serves as a concrete proof that despite the low common knowledge of marine conservation in MPA among the tourists, a majority of them still desire to learn more. Statistical analysis using Chi-squared from the previous section confirms that marine conservation knowledge and awareness were dependent on respondents' educational background. Tourists with higher education tend to have more knowledge, more awareness, are more supportive and more likely to watch the five-minute video briefing on marine safety.

Table 7. Tourist General Knowledge of the Marine Ecosystem and Chi-square Results of Relation to Education

Tourist knowledge/awareness (n=4,740)	Yes	No	Education dependence significance level
know coral is an animal	25.93%	73.07%	**
think coral reefs are threatened	63.19%	36.81%	**
think sharks are threatened	66.69%	33.31%	**
think sea turtles are threatened	73.35%	26.65%	**
know that sunscreen leaches will harm coral reefs	35.40%	64.60%	**
tend to pick up or touch marine life	61.05%	38.95%	**
willing to watch a compulsory 5 minutes video on marine safety	80.84%	19.16%	**

(Source: Author, 2021)
-: not significant
* p-Value <0.05
** p-Value <0.01

To protect the wildlife and marine ecosystem, stricter legislation enforcement as in imposing fines to visitors for certain offences such as littering or harassing wildlife was suggested. According to Table 8, more than half (57.2%) of respondents with a mean of 2.3 ± 1.00 shows a supportive attitude towards the suggestion and willingness to abide by the law if enforced.

The coral reef of branching coral is fragile and is likely to break off if any impactful disturbance is strong. Coral reef does not only become susceptible to natural turbulence from the rough sea; it also acquires damage from human activities such as snorkelling, diving and swimming, especially during low tide. Snorkelling activities should only be allowed during high tide (Nasrulhakim et al., 2020) as shallow water recorded a significantly higher coral contact than the deeper snorkelling area. Due to this reason, we forwarded the suggestion to the tourists if they agree to be allowed to do snorkelling activity only during high tide to prevent the coral reef from being harmed by human intervention. It is revealed that most of the respondents (38.7%) neither agree nor disagree with the suggestion. A mean score of 2.84 ± 1.08 indicates that participants do not show supportive or unsupportive attitudes if snorkelling should be conducted during high tide only. This is due to the fact that tourists knowledge was low, and they did not know the purpose of the ban to lower the possibility of damaging coral contact by tourists. Besides, it is understandable as foreign tourists from all over the world who came to TARP must have the desire to do water activity as they may not be able to come often. However, during the assessment, we also found that the Park Authority had done an excellent job in managing water activities during bad weather such as heavy rain and intense wave action or current. Lifeguards had the responsibility to forbid any tourists from entering the water during bad weather. It was proven that strong currents recorded a higher coral contact by snorkelers compared to weak currents (Nasrulhakim et al., 2020). According to the Park Authority, a lot of conservation activities were supposed to be done in 2020. Still, they were unable to implement it as the pandemic of Covid-19 has affected all activities in Sabah and the whole of Malaysia. One of the significant successful conservation programs was in 2018. Sabah Parks and 32Marine worked together to organise an ocean and beach clean-up event in TARP (The Borneo Post, 2019).

Tourists showed positive support, as 61.59% were interested and

agreed to join a conservation activity. A mean of 2.23 ± 0.94 indicates that respondents support participating in conservation work if organised by the management. Plastic pollution has been a significant problem worldwide, and in 2014 it was estimated that at least 5.25 trillion plastic particles weighing 268,940 tons are currently floating at sea (Erikson et al., 2014). A total of 64.06% of respondents with a mean score of 2.17 ± 0.98 agreed that any non-reusable plastic or styrofoam should be banned. According to Petrosillo et al., (2007), entering upon and offering a recreational ecosystem in the MPA shouldn't be free. We recorded that only 59.94% agreed on paying the compulsory conservation fees upon entering MPA. However, a minimal number (6.71%) disagree while the rest (33.35%) did not have an opinion on it. Nevertheless, the mean score of 2.24 ± 0.97 shows the respondents support conservation fees upon entering the marine park. Overall, the scale produced an average mean score of 2.36 ± 0.99, which indicates that participants showed support in the conservation effort and raised awareness in MPA. The data appeared to have good reliability, α=0.85.

Most of our respondents came to TARP through a tour operator handled by third party companies. However, most of them, 71%, did not get any kind of briefing on MPA or marine awareness (Figure 3). When we assessed 100 of the tour operator/guides (Figure 4), the result showed that they only excel (95.90%) in promoting their water activities as it will give them revenue to attract more tourists. A low score on the marine-related component where they only scored; MPA=30.60%; animal safety=25.95%; and damage control=26%. Tourist's safety recorded a decent score with 53.80%.

A briefing session for tourists upon entering the MPA is crucial to determine the quality of tourist behaviour while in and leaving the MPA. The results would depend on the tourist guides' effectiveness in delivering ample information on conservation work, portraying environmentally responsible behaviour, and incorporating a good quality interpretive message in the briefing content. The effectiveness of employing interpretation approaches in educating tourists has simultaneously improved their attitude towards wildlife, especially for marine species, reported in several literature works (Powell & Ham, 2008; Zeppel & Muloin, 2008). Tourist guides should equip themselves with more knowledge, and excellent communication skill which also contributes to tourist satisfaction (Çetinkaya & Öter, 2016; Chilembwe & Mweiwa, 2014; Koroglu & Guzel, 2013). A formal training

program and certificate were offered in many countries to achieve a higher performance of the tourists briefing and producing a well-performing tourist guide. This training program aims to aid candidates in developing the necessary skill such as giving impactful direction, which enriches tourist experiences (Chowdhary & Prakash, 2009; Prakash & Chowdhary, 2010; Weiler & Walker, 2014).

Table 8. Likert Scale of Tourists' Support in the Conservation Effort and Raising Awareness in MPA

A total of five questions regarding the effort of Park management action to raise awareness in MPA. A total of 5 alternative answers were available scaling from strongly agree to disagree strongly.

Tourist support in raising awareness in MPA (n=4,740)	Strongly agree	Agree	Neither Agree/ Disagree	Disagree	Strongly Disagree	Mean	Standard deviation
Do you agree to pay a fine if it is imposed on illegal activity?	24.73%	32.47%	34.28%	5.57%	2.95%	2.30	1.00
Do you agree for snorkelling activities to be only conducted during high tide?	14.51%	19.24%	38.71%	22.64%	4.89%	2.84	1.08
Do you agree to join in conservation activities held at TARP?	23.76%	37.83%	32.26%	3.50%	2.66%	2.23	0.94
Do you agree if plastic bags/plastic straws/ styrofoam being banned?	28.23%	35.89%	29.68%	2.95%	3.25%	2.17	0.98
Paying the compulsory conservation fees upon entering MPA areas.	25.78%	34.16%	33.35%	3.84%	2.87%	2.24	0.97
Average score						2.36	0.99

(Source: Author, 2021)

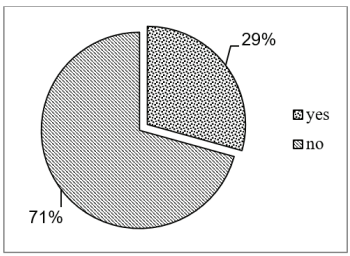


Figure 3. Number of Tourists that Received any Type of Briefing by Tour Operator/guides n=4,740.

(Source: Author, 2021)

The dotted region represents tourists that receive some type of briefing. The diagonal lined region represents tourists that come without any type of briefing.

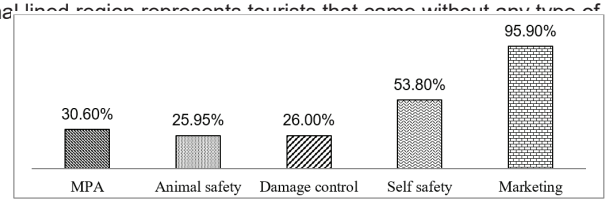


Figure 4. Briefing score in TARP based on Five Components, as shown in Table 2

(Source: Author, 2021)

The score is presented in percentage (%) from the total n=100 samples. No sample succeeded in getting a score of 4 or 5 on any topic. The highest score for a topic was only 3.

CONCLUSION

Tourists' knowledge level on MPA and awareness toward marine conservation were low in TARP. Such awareness could be improved among tourists through adequate environmental information provision via visible information signs, warning notices education/excursion programs, and so on (Petrosillo et al., 2007). Relating knowledge and awareness information with the briefing evaluation that was done in TARO, we believe that the lack of effort by the tour operators in raising the awareness level of tourists affected the overall awareness in TARP. According to Stanford (2006), one way of maximizing the positive and minimizing the negative impact of tourism is through establishing responsible tourism. Clearly, with better quality in briefing content and a new alternative such as using informative video to complement the briefing session, the Park Authority and the tourist guides have the power to educate the tourists. Spreading knowledge and awareness on the environmental impact is the key to preserve the future generation's natural resources (Ahmad Halmi & Ismail, 2017).

Ecotourism in TARP should be geared towards producing educated and responsible visitors at the end of their trip by providing an exceptional experience from the beauty of nature and broadening the views on the importance of conservation and fostering environmental sensitivity in the hearts and minds of respectful visitors. Further study should be done in

addition to this study to better understand the ecotourism of TARP. Another factor that should be considered in achieving ecotourism in TARP is to assess tourists' satisfaction level in TARP. Offering environmental programmes or green events (Chiu et al., 2020) have the potential to raise awareness and attract more satisfied tourists.

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REFERENCES

Ahmad Halmi, N., & Ismail, Z. (2017). Environmental Pollution and Existing Regulations: A Review Analysis. *Malaysian Journal Of Sustainable Environment, 2*(1), 73-86.

Boone, H. N. & Boone, D. A. (2012). Analysing Likert data. *Journal of Extension, 50*(2), 1-5.

Boyd, C., Brooks, T. M., Butchart, S. H. M., Edgar, G.J., Da Fonseca, G. A. B., Hawkins, F., Hoffmann, M., Sechrest, W., Stuart, S. N. & Dijk, P. P. V. (2008). Spatial scale and the conservation of threatened species. *A Journal of the Society for Conservation Biology. 1*(1), 37-43.

Brown, T. J., Ham, S. H. & Hughes, M. (2010). Picking up litter: an application of theory-based communication to influence tourist behaviour in protected areas. *Journal of Sustainable Tourism.* 18, 879-900.

Carman, A. The Verge. (2018). You can keep recording people in public,

but don't capture their faces. [Online] Available : https://www.theverge.com/2018/ 10/24/18015374/ whyd-you-push-that-button-record-stranger-public (23 October 2020).

Çetinkaya, M. Y. & Öter, Z. (2016). Role of tour guides on tourist satisfaction level in guided tours and impact on revisiting intention: A research in Istanbul. European Journal of Tourism, Hospitality and Recreation. 7(1), 40-54.

Chan, J. K. 2016. Understanding coastal seaside resorts in Sabah: its growth factors, key attributes and operational strategies. Tourism, Leisure and Global Change, 1(1), 12-23.

Chilembwe, J. M. & Mweiwa, V. (2014). Tour guides: Are they tourism promoters and developers? Case study of Malawi. International Journal of Research in Business Management. 2(9), 29-46.

Chiu, L., Ramely, A., & Abdul Wafi, A. (2020). Make Green Growth a Priority: Issues and Challenges in Organising Green Sports Tourism Events. Malaysian Journal Of Sustainable Environment, 7(1), 53-71. doi:10.24191/myse.v7i1.8910

Chowdhary, N. & Prakash, M. (2009). Tour Guide Training in India: A Comparison of Approach and Content with Other Programs. Journal of Teaching in Travel and Tourism. 8(2-3), 161-191.

Corinaldesi, C., Damiani, E., Marcellini, F., Falugi, C., Tiano, L., Brugè, F. & Danovaro, R. (2017). Sunscreen products impair the early developmental stages of the sea urchin Paracentrotus lividus. Scientific Reports. 7(7815).

Corinaldesi, C., Marcellini, F., Nepote, E., Damiani, E. & Danovaro, R. (2018). Impact of inorganic UV filters contained in sunscreen products on tropical stony corals (Acropora spp.). Science of The Total Environment. 637-638, 1279-1285.

Croasmun, J. T. & Ostrom, L. (2012). Using Likert-type Scales in the Social Sciences. Journal of Adult Education. 40(1), 19-22.

Dogu, H. 2011. Editorial: Reforms Needed For Heavy-Handed Touching Exhibits At Public Aquariums. Retrieved at https://www.underwatertimes.com/news.php? article_id=6029 1043175 on 16 November 2020.

Erikson, M., Lebreton, L. C. M., Carson, H. S., Thiel, M., Moore, C. J. & Borerro, J. C. (2014). Plastic Pollution in the World's Oceans: More than 5 Trillion Plastic Pieces Weighing over 250,000 Tons Afloat at Sea. PLoS ONE, 9(12), Article e111913.

Gliem, J. A. & Gliem, R. R. (2003). Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales. Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education.

Hamzah, A. (2004). Policy and planning of the tourism industry in Malaysia. In The 6th. ADRF General Meeting.

Hassan, A. a., Noordin, T. A. & Sulaiman, S. (2010). The status on the level of environmental awareness in the concept of sustainable development amongst secondary school students. Procedia - Social and Behavioral Sciences, 2(2), 1276-1280.

Keles, R. (2012). The quality of life and the environment. Procedia - Social and Behavioral Sciences, 35, 23-32.

Koroglu, O. & Guzel, F. O. (2013). Visitor perceptions of the role of tour guides in natural resource management and sustainable tourism. Romanian Economic And Business Review. 69.

Kotrlik, J., Williams, H. & Jabor, K. (2011). Reporting and Interpreting Effect Size in Quantitative Agricultural Education Research. Journal of Agricultural Education, 52(1), 132-142.

Mei, N. S., Wai, C. W. & Ahamad, R. 2016. Public environmental awareness and behaviour in Malaysia. Asian Journal of Quality of Life, 2(5), 43-53.

Ministry of Tourism, Art & Culture (MOTAC). 2001. Rural Tourism Master Plan, Ministry of Culture, Arts and Tourism: Kuala Lumpur.

Nasrulhakim, M., B. Mabel, M.M. & M. Rafiee, Z.A. (2020). *The Tourist Briefing: How Effective and Meaningful to the Environment? A Case Study of Mamutik and Manukan Islands*, Tunku Abdul Rahman Park, Malaysia (Unpublished paper).

Orams, M. B. (1997). The effectiveness of environmental education: can we turn tourists into "greenies'?. *Progress in Tourism and Hospitality Research.* 3, 295-306.

Petrosillo, I., Zurlini, G., Corlianò, M. E., Zaccarelli, N. & Dadamo, M. (2007). Tourist perception of recreational environment and management in a Marine Protected Area. *Landscape and Urban Planning, 79*(1), 29-37.

Powell, R. B. & Ham, S. H. (2008). Can Ecotourism Interpretation Really Lead to Pro-Conservation Knowledge, Attitudes and Behaviour? Evidence from the Galapagos Islands. *Journal of Sustainable Tourism*. 16, 467-489.

Prakash, M. & Chowdhary, N. (2010). Tour guides: Roles, challenges and desired competences: A review of the literature. *International Journal of Hospitality and Tourism Systems. 3*(1).

Priskin, J. (2003). Tourist Perceptions of Degradation Caused by Coastal Nature-Based Recreation. *Environmental Management.* 32, 189-204

Roberts, C.M. & Polunin, N.V.C. (1991). Are marine reserves effective in the management of reef fisheries?. *Rev Fish Biol Fisheries*. 1, 65–91.

Sabah Parks. (2020). Map of Tunku Abdul Rahman Park.

Sabah Parks Official Websites. (2020). Retrieved from http://www.sabahparks.org.my/ index.php/the-parks/tunku-abdul-rahman-park on 9 November 2020.

Singhirunnusorn, W., Donlakorn, K., Kaewhanin, W., Kpxguvkicvgu, U., Kpbwgpekpi, H., Tge, J. & Dgjcxkqwt, E. (2012). Household recycling behaviours and attitudes toward waste bank project: Mahasarakham Municipality. *Journal of ASIAN Behavioural Studies, 2*(6).

Stanford, D. (2006). *Responsible Tourism, Responsible Tourists: What makes a responsible tourist in New Zealand*? Victoria University of Wellington. (Thesis for Doctor of Philosophy in Tourism Management)

The Borneo Post. (2019). Marine Park, Semporna beach clean-up. p5.

Tovar-Sánchez, A., Sánchez-Quiles, D., Basterretxea, G., Benedé, J. L., Chisvert, A., Salvador, A., Moreno-Garrido, I. & Blasco, J. (2013). Sunscreen Products as Emerging Pollutants to Coastal Waters. *PLoS ONE, 8*(6), e65451.

Weiler, B. & Walker, K. (2014). Enhancing the visitor experience: Reconceptualising the tour guide's communicative role. *Journal of Hospitality and Tourism Management*. 21, 90-99.

Zeppel, H. & Muloin, S. (2008). Conservation Benefits of Interpretation on Marine Wildlife Tours. *Human Dimensions of Wildlife. 13*(4), 280-294.