

Baseline Study on Knowledge, Attitude and Practice Assessments on Covid-19 Transmission and Preventive Actions Among Ecotourism Operators in Kuala Tahan and Kuala Gandah

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ABSTRACT

Background: The SARS-CoV-2 virus that caused COVID-19 led to a global pandemic with widespread impacts on economies, particularly the tourism sector. This study assesses COVID-19-related knowledge, attitudes, and practices (KAP) among ecotourism operators in Kuala Tahan and Kuala Gandah by exploring demographic factors influencing these variables. **Methods:** A cross-sectional design was employed, surveying 96 ecotourism operators using a structured and validated KAP questionnaire. The survey captured detailed demographic data and assessed COVID-19 knowledge, awareness, and preventive practices. **Results:** Overall, respondents demonstrated high knowledge of COVID-19 (mean score: 12.76, SD: 1.8) likely influenced by public health campaigns. Knowledge scores were significantly associated with gender and education background ($p < 0.05$). Attitude and practice scores were also positively correlated with knowledge scores, showing mean scores of 4.20 (SD: 0.59) and 9.61 (SD: 0.91) respectively and there were weak positive correlations between KAP variables ($p < 0.01$). **Conclusion:** These findings highlight the importance of targeted, demographic-specific education and the integration of technology to enhance health literacy and promote adherence to COVID-19 prevention measures in rural communities.

Keywords:

COVID-19, ecotourism operators, public health, preventive measures

INTRODUCTION

The novel coronavirus pandemic caused by the widespread impacts of the SARS-Cov-2 virus has drastically affected health, economics, and rural ecotourism operators (Marinov & Todorova 2020). According to The World Tourism Organization (UN Tourism 2020), the pandemic led to a decline in tourist arrivals, the closure of ecotourism destinations, and reduced activity in associated businesses such as travel agencies, tours, and hospitality. The World Economic Forum highlights how the pandemic disrupted the tourism industry globally particularly ecotourism, as it relies heavily on face-to-face engagement and international mobility making it less resilient to such shocks. This fragility was evident in the closure of destinations, loss of income, and the challenge of adapting to virtual or alternative tourism models (Al-Khateeb, 2021). The decline in tourist numbers and rising unemployment have significantly reduced both local and international visits, leading to a marked decrease in financial income for operators in the ecotourism sector. This decline has been particularly severe in Malaysia, where rural ecotourism areas have been hit hard due to the pandemic's extensive reach and the resulting movement control orders (MCO) that halted operations completely (Hussin et al., 2022). Despite these challenges, there is a notable lack of research specifically addressing the impact of COVID-19 on rural ecotourism operators in Pahang and Malaysia in general, as well as insufficient

documentation of the effectiveness of countermeasures implemented to mitigate the adverse effects of the endemic on this sector. According to Yousufuddin (2024), rural health systems are less equipped to manage outbreaks due to lack of resources, trained personnel, and facilities. Hence, the increasing influx of tourists to rural ecotourism sites poses a significant threat of COVID-19 outbreaks, especially in areas where healthcare services may be limited. Besides, a collaborative frameworks that involve stakeholders from various disciplines, including infectious disease experts and tourism professionals are essential for controlling and managing COVID-19 transmission in rural ecotourism areas such as Kuala Tahan and Kuala Gandah. Engagement with health authorities, local governments, and ecotourism operators in designing health and safety protocols to mitigate transmission risks and maintain economic viability is therefore highly recommended (Gössling et al., 2020).

Hence, implementing effective surveillance and disease control measures is crucial for monitoring and managing health and well-being in these vulnerable populations (Suttiporn et al., 2021; Piyooosh et al., 2022). Conducting a KAP assessment in this context is crucial within the rural ecotourism operators in Malaysia's tourism sector particularly in Pahang as these communities face increased vulnerability to COVID-19 outbreaks due to limited healthcare resources and a high influx of tourists (Naz et al., 2022). This study aim to assess the knowledge,

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attitudes, and Practices (KAP) related to COVID-19 transmission and preventive measures among ecotourism operators in Kuala Tahan and Kuala Gandah, Pahang and to identify how socio-demographic factors such as age, gender, and education level influence these variables.

MATERIALS AND METHODS

Study Design and Setting

This cross-sectional study targeted ecotourism operators and their employees specifically in Kuala Tahan and Kuala Gandah, Pahang. A convenience sampling was employed to select participants based on their availability and willingness to participate and snowball sampling was used to identify additional participants through referrals from initial respondents.

Ethics

This study was conducted upon ethical approval that was granted by the Kulliyah Postgraduate and Research Committee (KPGRC) of the Kulliyah of Allied Health Sciences, IIUM Kuantan Campus (Reference no: IIUM/310/14/11/2) to ensure minimal risks and benefits for human subjects. In addition, the study also received ethical clearance from the IIUM Research Ethics Committee (Reference no: IREC-2023 199).

Tools

The survey was conducted from February to March 2024, used a questionnaire adapted from Kaderi et al. (2024) and translated into English and Bahasa Melayu. The content was based on Conceptual Framework Figure 1 which outlines the key variables influencing KAP towards COVID-19 and preventive measures. The survey was administered through face-to-face interviews to ensure clarity and to allow the interviewer to provide explanations if any questions were unclear. The questionnaire included six sociodemographic items and 34 KAP items to assess COVID-19 knowledge, attitudes, and practices. The scoring system for the attitude items was a likert scale on a scale from "strongly disagree" (1) to "strongly agree" (5). However, the scoring system for knowledge items and practice items were dichotomous scale; "yes" and "no". Inclusion criteria required participants to work at least 12 hours per week in ecotourism within the Kuantan District and be proficient in English or Malay. Exclusion criteria included premises not directly related to ecotourism. A pilot study with 30 respondents from the Royale Chulan Cherating staff evaluated the questionnaire's clarity, reliability, and validity. Data from the pilot study were analyzed using SPSS Version 26.0 to assess internal

consistency with Cronbach's alpha. The results showed alpha coefficients of 0.866, 0.960, and 0.825 for knowledge, attitude, and practice items, respectively, indicating good reliability. The study followed Roscoe's (1975) sample size standards, suggesting 30 to 500 respondents to balance statistical significance and avoid errors.

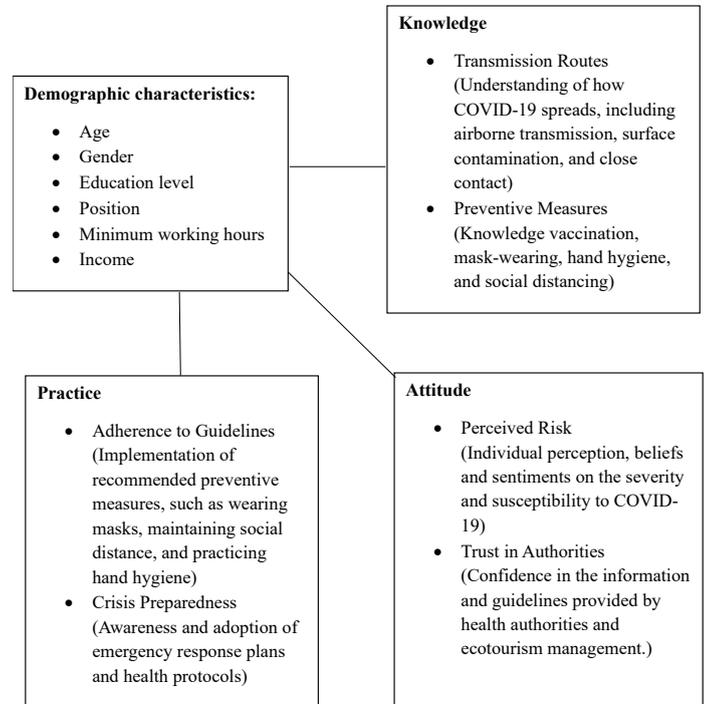


Figure 1: Conceptual Framework of Knowledge, Attitude and Practice of COVID-19 Transmission and Preventive Actions Among Operators Of International Attraction Ecotourism Areas In Rural Pahang

Analysis

Descriptive analysis was applied to the sociodemographic data to provide a clear summary of the characteristics of the respondents, such as age, gender, education level, and occupation. To investigate potential associations between demographic factors and KAP (knowledge, attitudes, and practices) levels, non-parametric statistical tests were utilized. The Mann-Whitney U test was used to compare the KAP scores between two independent groups, such as gender or educational background, to determine if there were significant differences between these groups. For assessing relationships between continuous variables, the Spearman's rank correlation coefficient was employed, as it is suitable for measuring the strength and direction of relationships between variables. These statistical methods allowed for a comprehensive analysis of the associations and correlations within the study to provide insights into how sociodemographic factors might influence the knowledge, attitudes, and practices towards COVID-19 among ecotourism operators.

RESULTS

A total of 96 ecotourism operators participated in the study. Majority of the participants were male (65.6%), aged between 21 to 30 years old (37.3%), obtained their secondary education level (59.4%), working for more than 24 hours per week (55.2%) and earn within RM1001 to RM3000 monthly (66.7%) (Table 1).

Table 1: Socio-demographic characteristics of the study participants

Variables	Frequency (n)	Percentage (%)
Gender		
Male	63	65.6
Female	33	34.4
Age		
<20	4	4.2
21-30	32	33.3
31-40	26	27.1
41-50	22	22.9
51-60	9	9.4
61-70	3	3.1
Education Level		
Primary	13	13.5
Secondary	57	59.4
Tertiary	26	27.1
Position		
Employer	17	17.7
Employee	79	82.3
Min working hour/week		
12-16 hours	28	29.2
17-21 hours	10	10.4
22-24 hours	5	5.20
>24 hours	53	55.2
Income		
<RM1k	21	21.90
RM1.1-3k	64	66.70
RM3.1-5k	5	5.20
>RM5k	6	6.30

Table 2 provides descriptive data summarizing the levels of knowledge, attitude, and practice (KAP) among respondents regarding COVID-19, along with the percentage distribution and mean scores.

Table 3 illustrates the knowledge levels categorized as poor, moderate, and good among respondents, along with the corresponding p-values to indicate statistical significance. Result show that there are association between gender and education level with p-value of 0.028 and 0.042 respectively proven by statistically significance ($p < 0.05$).

Table 4 presents attitude levels of respondents. Most respondents demonstrated a "good" attitude level across all demographic categories.

Table 2: The association between sociodemographic variable and knowledge scores

Category	n	%	Mean score	S.D
Knowledge Level				
Poor	15	15.6	12.76	1.80
Moderate	13	13.5		
Good	68	70.8		
Attitude Level				
Poor	1	1.0	4.20	0.59
Moderate	9	9.4		
Good	86	89.6		
Practice Level				
Poor	2	2.1	9.61	0.91
Moderate	8	8.3		
Good	86	89.6		

n = number of respondents, % = percentage of respondents, S.D = standard deviations

Table 3: The knowledge level and association between sociodemographic variable and knowledge score

Categories	Knowledge level			p-value
	Poor	Moderate	Good	
Gender				
Male	13	11	39	0.028
Female	2	2	29	
Age				
<20	2	1	1	0.129
21-30	4	3	25	
31-40	1	5	20	
41-50	3	2	17	
51-60	3	2	4	
61-70	2	0	1	
Education Level				
Primary	5	2	6	0.042
Secondary	7	8	42	
Tertiary	3	3	20	
Job Category				
Employer	5	2	10	0.089
Employee	10	11	58	
Mini working hours per week				
12-16 hours	5	2	21	0.658
17-21 hours	2	2	6	
22-24 hours	1	1	3	
> 24 hours	7	8	38	
Income				
< RM1000	7	2	12	0.066
RM1001-RM3000	5	10	49	
RM3001-RM5000	1	0	4	
> RM5000	2	1	3	

Table 5 presents practice levels among all the respondents and only age has a statistically significant association with practice levels.

Table 4: The attitude level and association between sociodemographic variable and knowledge score

Categories	Attitude level			p-value
	Poor	Moderate	Good	
Gender				
Male	1	6	56	0.055
Female	0	3	30	
Age				
<20	0	1	3	0.141
21-30	0	3	29	
31-40	1	3	22	
41-50	0	2	20	
51-60	0	0	9	
61-70	0	0	3	
Education Level				
Primary	0	2	11	0.506
Secondary	1	6	50	
Tertiary	0	1	25	
Job Category				
Employer	0	2	15	0.640
Employee	1	7	71	
Mini working hours per week				
12-16 hours	0	1	27	0.919
17-21 hours	1	2	7	
22-24 hours	0	0	5	
> 24 hours	0	6	47	
Income				
< RM1000	0	1	20	0.574
RM1001-RM3000	1	8	55	
RM3001-RM5000	0	0	5	
> RM5000	0	0	6	

Table 5: The association between sociodemographic variable and practice scores

Categories	Practice level			p-value
	Poor	Moderate	Good	
Gender				
Male	1	5	57	0.837
Female	1	3	29	
Age				
<20	0	2	2	0.003
21-30	1	2	29	
31-40	0	2	24	
41-50	1	0	21	
51-60	0	1	8	
61-70	0	1	2	
Education Level				
Primary	1	0	12	0.10
Secondary	1	7	49	
Tertiary	0	1	25	
Job Category				
Employer	0	2	15	0.704
Employee	2	6	71	
Mini working hours per week				
12-16 hours	2	4	22	0.409
17-21 hours	0	2	8	
22-24 hours	0	0	5	
> 24 hours	0	2	51	
Income				
< RM1000	0	2	19	0.820
RM1001-RM3000	2	5	57	
RM3001-RM5000	0	1	4	
> RM5000	0	0	6	

As shown in Table 6, results of the correlation analysis indicated that there is a weak positive correlation between knowledge and attitude scores ($r = 0.260$, $p=0.01$), knowledge and practice scores ($r = 0.267$, $p=0.009$), attitude and practice scores ($r = 0.325$, $p=0.001$).

Table 6 : Correlation between Knowledge, Attitude and Practice Scores

Variable	Correlation Coefficient, r	p-value
Knowledge-Attitude	0.260	0.01
Knowledge-Practice	0.267	0.009
Attitude-Practice	0.325	0.001

*Correlation is significant at 0.01 level (2-tailed)

DISCUSSION

The study reveals a statistically significant association between knowledge scores and gender with a p-value of 0.028, whereby female have better knowledge scores compared to males. This aligns with broader research indicating gender differences in COVID-19 knowledge, where women often show higher awareness and knowledge levels about the virus than men (Loleka & Ogawa 2022; Tan et al., 2022). In many settings, women are more likely to be involved in housekeeping and facility management. These roles may require them to stay informed about health and hygiene practices to maintain a safe and clean environment, thereby increasing their knowledge about COVID-19 (McInnes et al., 2020). Hence, understanding these gender-based disparities is crucial for tailoring public health interventions to ensure both men and women are equally informed and capable of adopting preventive measures.

Furthermore, the association between education level and knowledge scores is also statistically significant with a p-value of 0.042. This indicates that individuals with higher educational attainment tend to have better knowledge about COVID-19. A study conducted by Tao et al (2023) informs that high health literacy is associated with better understanding of COVID-19 symptoms and preventive behaviour. These findings emphasize that enhancing access to education and health literacy can play a critical role in improving public health outcomes during epidemics. Besides, the significant association between practice scores and age groups indicated by a p-value of 0.003 highlights the differences in how individuals across various age categories adopt preventive measures against the virus. Younger individuals are often more proficient in leveraging digital platforms and social media to gather information which can influence their adherence to preventive practices during public health crises like COVID-19 (Hauer & Sood, 2020).

The results imply that individual knowledge about COVID-19 seems to enhance their attitudes towards the disease transmission and preventive measures. This is consistent with the Knowledge-Attitude-Practice (KAP) model which emphasizes that accurate health-related knowledge can foster positive attitudes and drive adherence to preventive behaviors. For instance, a study by Zhong et al. (2020) found that Chinese residents with higher knowledge levels exhibited more proactive attitudes and better compliance with COVID-19 prevention guidelines, such as social distancing and mask-wearing. In addition, similar observations were also reported on acceptance and compliance to vaccination programs (Liu et al., 2022). The current study demonstrates a positive correlation between knowledge and practice regarding COVID-19 preventive measures. Similar findings were observed in a study by Srichan et al. (2020) which assessed knowledge, attitudes, and practices (KAP) among the Thai population during the COVID-19 pandemic showed that individuals with better knowledge were more likely to adopt preventive measures such as wearing masks and frequent handwashing. This highlights the critical role of health education in fostering better practices in disease prevention. Moreover, the correlation between attitude and practice in public health studies has been proven showing that positive attitudes often lead to better health practices (Jenny et al., 2022). For example, a study among university students in Pakistan found a significant positive correlation between attitude and preventive behaviors toward COVID-19 with individuals that have positive attitudes being more likely to adopt recommended preventive measures such as handwashing, wearing masks, and social distancing (Rehman et al., 2021). Similar association was also reported elsewhere (Wassif & Ahmed 2022)

CONCLUSION

This study highlights the significant role of knowledge, attitudes, and practices (KAP) in controlling and preventing COVID-19 among ecotourism operators. The findings demonstrate a high level of knowledge and positive attitudes toward COVID-19 preventive measures, reflecting the effectiveness of public health interventions and education campaigns by health authorities and tourism organizations. However, socioeconomic factors such as educational background remain critical for enhancing compliance with recommended practices. Thus, continued engagement between health authorities and the ecotourism community is vital for maintaining and improving preventive behaviors. Investing in targeted education programs tailored to the specific needs of ecotourism operators can further enhance their ability to

adapt to any evolving health challenges and ensure that the ecotourism sector remains resilient to future public health crises while promoting safer tourism practices in Malaysia. However, the study's findings are limited by a small sample size due to the absence of precise data on ecotourism premises in Pahang hence restricting the broader applicability of the results. This limited sample may not fully capture the diverse demographics and behaviors within Pahang's ecotourism sector or similar regions. In this context, the results reflect only a subset of surveyed operators as they may not represent the entire ecotourism sector.

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