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Research article

Foot-and-mouth disease knowledge and attitude as determinants of preventative behaviors among dairy farmers in a Thai endemic setting based on structural equation modeling

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Abstract

Thailand has been struggling to eliminate foot-and-mouth disease (FMD) for many years. To combat FMD, dairy farmers are advised to implement biosecurity measures and vaccinate their cattle regularly. Despite taking these precautions, the disease persists, with outbreaks occurring frequently in certain regions. This study aims to determine the knowledge, attitude, and practices (KAP) involved in FMD surveillance and prevention among dairy farmers in endemic areas and identify a causal relationship between them. A cross-sectional survey was conducted from April to May 2023 in 109 dairy farms using questionnaires for data collection. Multiple linear regression analysis and structural equation modeling (SEM) were applied to examine the KAP predictors with process path analysis conducted among significant factors. The results indicated that most dairy farmers demonstrated moderate level of knowledge, attitude, and practice toward FMD surveillance and control for 66.06%, 50.46%, and 54.13% of respondents, respectively. Additionally, a positive relationship was found between knowledge and attitude ($\beta = 1.68$, $p < 0.05$) and between attitude and practices ($\beta = 0.55$, $p < 0.05$). Additionally, educational background had a positive effect on knowledge of FMD ($\beta = 2.54$, $p < 0.05$). Accessibility to FMD information positively enhanced the farmers' knowledge and attitude ($\beta = 0.89, 1.79$, respectively; $p < 0.05$) toward preventive practices. The results of this study suggest that continuous and regular FMD surveillance and prevention training should be provided for dairy farmers. Furthermore, practically understandable media and appropriately qualified personnel are required to encourage dairy farmers in this area to improve their knowledge and attitude, which would positively impact the quality of FMD preventive practices.

Keywords: Attitude, Foot-and-mouth disease, Knowledge, Practices, Structural equation modeling.

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INTRODUCTION

Foot-and-mouth disease (FMD) is a highly contagious viral infection in cloven-hoofed animals and has a significant global economic impact (Aiewsakun et al., 2020). While FMD is not typically fatal in adult animals, it can cause severe illness and disability, leading to a significant decrease in productivity, such as weight loss, reduced draft power, and decreased milk production (Grubman and Baxt, 2004). In developing countries like Thailand, FMD is endemic, with regular outbreaks being reported nationwide (Information Center for Surveillance and Control of Animal Diseases, 2023). These outbreaks severely restrict livestock production by making it difficult to sell and export livestock, reducing the incomes of farmers and disrupting the food supply chain.

It is essential for farmers to thoroughly understand FMD to prevent, control, and eradicate the disease. Dairy farmers are most likely to be affected by an FMD outbreak and play a crucial role in its transmission and prevention (Osmani et al., 2021; Seifu et al., 2023). To develop and implement effective disease control and prevention programs, it is essential to assess the knowledge, attitudes, and practices (KAP) of dairy farmers (Balkhy et al., 2010). This study aimed to enhance knowledge dissemination regarding FMD symptoms, prevention measures, and outbreak response strategies among dairy farmers and relevant stakeholders, including veterinary authorities and farming communities.

Understanding the intricate relationships among KAP is crucial for effective FMD prevention and control (Sadiq et al., 2018). While traditional KAP studies have provided valuable insights into descriptive statistics and bivariate associations, they have limitations in elucidating the underlying causal mechanisms influencing farmers' decisions and behaviors (Cao, 2023). To address this gap, this study employed structural equation modeling (SEM) as a robust analytical framework. Compared to traditional linear regression, SEM offers several advantages, including the ability to examine both direct and indirect effects, incorporate latent variables, and assess measurement error, thereby providing a more comprehensive understanding of the factors influencing farmers' KAP and their impact on FMD prevention and control (MacCallum and Austin, 2000; Rachmat and Patricia, 2022; Cao, 2023).

Although several studies have examined the KAP of dairy farmers in terms of FMD in Thailand (Chanda and Tanveschasilp, 2021; Niyamosot and Promsatit, 2022; Pholsri and Sukantharat, 2022), none have investigated the relationships among KAP using SEM. This study aims to assess the relationships between KAP from the perspective of FMD among dairy farmers in the endemic setting of Thailand using SEM. The findings of this study may inform the development of effective policies and guidelines for FMD control in endemic regions.

MATERIALS AND METHODS

Ethical approval

This study was reviewed and approved by the Human Research Ethics Committee of the Faculty of Veterinary Medicine, Chiang Mai University, under number HS4/2566.

Study area

The study area is in Ban Thi District, Lamphun Province, Thailand, notable for its dairy production and where FMD is endemic (Information Center for Surveillance and Control of Animal Diseases, 2023). Therefore, it is representative of FMD-endemic areas in Thailand. Additionally, dairy farmers in this area have experienced the disease and various control and prevention efforts, but their awareness and knowledge of FMD remain limited.

Study design and participants

A cross-sectional study was conducted from April to May 2023 at dairy farms in Ban Thi District, Lamphun Province, Thailand. A structured questionnaire was administered to eligible dairy farmers, defined as members of dairy cooperatives in the study area. Prior authorization was obtained from the relevant agencies.

Sample size calculation was performed using the formula of qualitative variables with a finite population (Daniel and Cross, 2018), admitting no previous knowledge about KAP in the study population, a population of 133 dairy cooperative members, with a significance level of 95% and a margin error of 5%. The minimum sample size calculated was 99 dairy cooperative members. Subsequently, the sample size was computed as proportional into each groups based on the population of dairy cooperatives limited.

Inclusion criteria were dairy farmers aged over 18 years, with farms located in Ban Thi District and members of a local dairy cooperative limited or private company, were eligible to participate in the study. All participants were informed of the study objectives and assured about the confidentiality of their information. Oral consent to participate was obtained before administering the questionnaire.

Data collection

Questionnaire development and validation

The questionnaire was designed specifically to assess the KAP of dairy farmers working in an endemic area. It was based on the Animal Epidemic Act, B.E. 2558 (2015), and existing literature on FMD in Thailand. The development process included item generation, conceptualization, and evaluation by a group of experts in the field. Item generation was also based on a thorough literature review of KAP in terms of FMD prevention and control programs, existing questionnaires on FMD surveillance, and discussions with experts. Three experts from academia and the government veterinary service were recruited to provide feedback on the questionnaire. Serial meetings were held to verify the questions, while the construct and content validity of the questionnaire were assessed by the panel of experts. Content validity was examined by a panel of three experts, and the overall item-objective congruence (IOC) of 0.93 was deemed to be greater than the acceptable mean of 0.50.

A preliminary test was conducted with 35 owners of dairy farms who were members of Mae Wang Dairy Cooperative Limited to assess the understandability and errors involved in the interpretation of specific questions, recalling vital information, performing judgments, and editing the answers. Cronbach's alpha coefficient was chosen to calculate the reliability of the questionnaire and was found to be 0.78. Since this was greater than 0.70 it was considered to be sufficient for consistent internal reliability. The results of the response process validity were used to generate a revised and finalized version of the questionnaire suitable for being self-administered. The questionnaire was created in the local Thai language and comprised five sections (Table 1).

Table 1 Knowledge, attitude, and practice questionnaire on foot-and-mouth disease among dairy farmers in an endemic area.

Sections	Number of items	Concepts measured	Response options
General information	23	Demographic characteristics including dairy farm management, personal information, economic status, and social behavior.	Close-ended and multiple-choice
Knowledge	20	General information on the species susceptible to the virus, disease transmission, source of the virus, typical clinical signs, prevention, control, and recommended vaccination protocols.	True/False/Unsure: Each correct response received one score, while a wrong or unsure response received zero.
Attitude	18 [a]	Attitude toward preventive measures and practices relating to disease transmission. Specifically, vaccination protocols, biosecurity practices as routine programs on the farm, and management practices relating to disease outbreaks.	Five-Likert scale options 1 = Strongly disagree 2 = Disagree 3 = Unsure 4 = Agree 5 = Strongly agree
Practices	25 [b]	Practices relating to disease prevention and control following the Animal Epidemic Act, B.E. 2558 (2015). The majority of items related to those described in the attitude assessment.	Three-Likert scale options 1 = Never 2 = Sometimes 3 = Always

[a] 6 reverse-score items.
[b] 5 reverse-score items.

Questionnaire administration

The questionnaire was administered to dairy farmers at a milk collection center during raw milk transportation in the early morning and late afternoon. Participants were required to self-complete the questionnaire, with clear instructions and guidelines provided. Due to visual problems, some participants were interviewed directly. All participants completed the questionnaire, which took approximately 15–30 minutes.

Data analysis

Data from the completed questionnaires were manually entered into Google Sheets (https://sheets.google.com/) and screened for accuracy. Statistical analysis was performed using R version 4.3.1 (R Core Team, 2023) in an RStudio environment 2023.06.0+421 (Posit Team, 2023). Independent variables were categorized and assigned value labels according to their respective levels. Descriptive statistics were calculated using the freqtables package (version 0.1.1) to obtain the number of responses and frequency distribution for dichotomous and multiple responses, as well as the frequency, percentage, and 95% confidence interval (CI) of respondents for each Likert scale answer.

For the knowledge section, correct answers were scored as 1, incorrect answers as 0, and unsure answers as 0. The knowledge score ranged from 0–20. For the attitude section, the five-point Likert scale responses were treated as continuous values and summed to produce a cumulative score ranging from 18–

90. For the practice section, the three-point Likert scale responses were also summed to produce a total score ranging from 25–75. The scoring system was reversed for inadequate attitude and practice items. Cut-off values were calculated as quartiles for each scale. Using quartiles ensured that the distribution of respondents across the categories was relatively balanced, preventing extreme skewness in the data. KAP scores were categorized as good if the respondent's score was greater than the third quartile, moderate if in the interquartile range, and undesirable for a score less than the first quartile.

Data analysis was conducted in two parts. First, stepwise multiple linear regression analysis was used to identify the predictors of KAP for FMD among dairy farmers. Regression models were built using the jtools package (version 2.2.2) to determine the association between the dependent variables (knowledge, attitude, and practices) and independent variables: affiliation, gender, age, education, experience, farm size, confinement, labor, source of roughage, source of water, FMD infection within the last two years, and accessibility to FMD information. Independent variables were expressed in their absolute values and coded as categorical data. All chosen independent variables were examined for multicollinearity by calculating the variance inflation factor (VIF) for each independent variable in the model. Variables with VIFs of less than two were retained for the final model. The model with the lowest Akaike Information Criterion (AIC) value was chosen as the final model. The R-squared value was calculated to indicate the goodness of fit for the regression model. A P-value of less than 0.05 was considered to be statistically significant.

In addition to the stepwise multiple linear regression analysis, SEM was used to test the following hypotheses based on the conceptual model of KAP: 1) knowledge about FMD affects attitudes toward practices, 2) knowledge about FMD affects practices, and 3) attitudes toward practices affect their implementation. SEM was performed using the lavaan package (version 0.6-15), and the path model was visualized using the semPlot package (version 1.1.6). Maximum likelihood was used to estimate the model. The model fit was evaluated using the chi-square test divided by degrees of freedom (CMDN/DF), comparative fit index (CFI), goodness-of-fit index (GFI), normed fit index (NFI), root mean square error of approximation (RMSEA), and root mean square residual (RMR). An acceptable model fit was defined as CMDN/DF < 3; CFI, GFI, and NFI > 0.90; RMSEA and RMR < 0.08 (Shi et al., 2019; Savalei, 2021; Stone, 2021). A P-value of less than 0.05 was to be considered statistically significant.

RESULTS

Demographics and dairy farm characteristics

From a total of 133 dairy farmers, 109 responded to the questionnaire, representing a response rate of 81.95%. Most respondents were male (82.57%), over 50 years old (47.71%), and members of the Lamphun Dairy Cooperative Limited (47.71%). Most dairy farmers had a basic level of education (82.57%) and had been raising dairy cattle for 10–20 years (54.13%).

In terms of dairy farm characteristics, most farms had a herd size of 30–60 cattle (41.28%). Most dairy farmers raised their animals in permanent stabling (69.72%) and employed laborers to stay on the farm (77.06%). The source of roughage was imported (71.56%), with the most common water source being a private water supply (93.58%). More than half of the dairy farms had experienced FMD outbreaks within the last two years (52.29%). The majority of dairy farmers received information about FMD from personnel and the media simultaneously (50.46%).

Table 2 Demographics and dairy farm characteristics (n = 109).

Variables	Frequency	Percentage	95% CI	
			Lower	Upper
Affiliation				
Chiang Mai Dairy Cooperative Limited	37	33.94	25.57	43.46
Lamphun Dairy Cooperative Limited	52	47.71	38.37	57.20
Chiang Mai Fresh Milk Company Limited	20	18.35	12.07	26.89
Gender				
Male	90	82.57	74.13	88.68
Female	19	17.43	11.32	25.87
Age				
Below 40 years old	28	25.69	18.26	34.85
40–50 years olds	29	26.61	19.06	35.82
Above 50 years old	52	47.71	38.37	57.20
Education				
Basic education	90	82.57	74.13	88.68
Higher education	19	17.43	11.32	25.87
Experiences				
Below 10 years	25	22.94	15.90	31.90
10–20 years	59	54.13	44.59	63.37
Above 20 years	25	22.94	15.90	31.90
Farm size				
Below 30 cattle	25	22.94	15.90	31.90
30–60 cattle	45	41.28	32.31	50.88
Above 60 cattle	39	35.78	27.23	45.34
Confinement				
Permanent stabling	76	69.72	60.33	77.72
Free ranging	33	30.28	22.28	39.67
Labor				
Yes	84	77.06	68.10	84.10
No	25	22.94	15.90	31.90

Dairy farmers' overall knowledge, attitude, and practices toward FMD and associated factors

The majority of respondents fell into the moderate category for knowledge (66.06%), attitude (50.46%), and practices (54.13%), based on the three cut-off values (good, moderate, and poor) for each variable (Table 3).

VIFs did not indicate multicollinearity between the factors in any of the models. Accessibility to FMD information was a significant positive predictor of all KAP scores, with education being a significant positive predictor of knowledge scores. Notably, FMD infection within the last two years was a significant negative predictor of attitude scores. The stepwise multiple linear regression model for demographic variables associated with dairy farmers' KAP scores for FMD awareness is presented in Table 4.

Table 3 Dairy farmers' knowledge, attitude, and practice scores and corresponding proportions of respondents categorized as having poor, moderate, or good scores (n = 109).

Variables	Frequency	Percentage	95% CI	
			Lower	Upper
Knowledge score				
Good (>17)	16	14.68	9.12	22.78
Moderate (12–17)	72	66.06	56.54	74.43
Poor (<12)	21	19.27	12.83	27.90
Attitude score				
Good (>76)	27	24.77	17.47	33.87
Moderate (65–76)	55	50.46	41.02	59.86
Poor (<65)	27	24.77	17.47	33.87
Practice score				
Good (>70)	23	21.10	14.35	29.91
Moderate (57–70)	59	54.13	44.59	63.37
Poor (<57)	27	24.77	17.47	33.87

Table 4 Predictors of dairy farmers' overall knowledge, attitude, and practices in terms of foot-and-mouth disease.

Variables	Items	β	SE	P-value	95% CI	
					Lower	Upper
Knowledge [a]	Intercept	6.74	1.60	0.00*	3.57	9.90
	Affiliation	0.89	0.44	0.05	0.02	1.77
	Education	2.59	0.82	0.00*	0.96	4.22
	Farm size	0.01	0.01	0.16	-0.01	0.04
	Accessibility to FMD information	0.91	0.35	0.01*	0.22	1.59
Attitude [b]	Intercept	56.64	5.16	0.00*	46.41	66.86
	Affiliation	2.49	1.32	0.06	-0.14	5.11
	Experiences	-0.19	0.13	0.13	-0.45	0.06
	Source of roughage	2.97	2.04	0.15	-1.07	7.01
	FMD infection within the last two years	-3.99	1.90	0.04*	-7.75	-0.23
	Accessibility to FMD information	3.85	1.00	0.00*	1.87	5.84
Practices [c]	Intercept	53.54	3.76	0.00*	46.08	61.00
	Affiliation	2.15	1.39	0.12	-0.60	4.90
	Accessibility to FMD information	2.43	1.07	0.03*	0.31	4.55

[a] R^2 = 0.19; AIC value = 260.79.
[b] R^2 = 0.19; AIC value = 495.84.
[c] R^2 = 0.06; AIC value = 508.10.
* Indicates a significant variable (P-value < 0.05).

Structural equation modeling of knowledge, attitude, and practices toward FMD among dairy farmers

The results of the path analysis are shown in Table 5. Knowledge had a significant positive effect on attitude (β = 1.68, 95% CI: 1.24–2.12, p < 0.05), supporting the first hypothesis. However, it did not have a significant effect on practices (β = 0.06, 95% CI: -0.53–0.64, p > 0.05), rejecting the second hypothesis. Attitude had a significant positive effect on practices (β = 0.55, 95% CI: 0.35–0.75,

$p < 0.05$), supporting the third hypothesis. Education had a significant positive effect on knowledge (β = 2.54, 95% CI: 0.92–4.15, $p < 0.05$). Accessibility to FMD information had a significant positive effect on knowledge and attitude (β = 0.89, 1.79, respectively; 95% CI: 0.22–1.56, 0.11–3.47, respectively; $p < 0.05$), but not practices (β = 0.27, 95% CI: -1.58–2.12, $p > 0.05$).

Based on the conceptual model (Figure 1) and related factors from a multiple linear regression model, SEM was conducted to explain the potential pathways among the KAP relationships with related demographics (Figure 2).

The final model had an acceptable fit, as indicated by the following goodness-of-fit indices: CMDN/DF = 0.52 (below 3), CFI = 1.00, GFI = 1.00, NFI = 0.99 (all above 0.90), RMSEA = 0.00, and RMR = 0.06 (both below 0.08) (Table 6).

Table 5 Path coefficient results for knowledge, attitude, and practices in terms of foot-and-mouth disease among dairy farmers (n = 109).

Model paths	Path coefficient	P-value	95% CI	
			Lower	Upper
Knowledge → Attitude	1.68	0.00*	1.24	2.12
Knowledge → Practices	0.06	0.85	-0.53	0.64
Attitude → Practices	0.55	0.00*	0.35	0.75
Education → Knowledge	2.54	0.00*	0.92	4.15
Accessibility of FMD information → Knowledge	0.89	0.01*	0.22	1.56
Accessibility of FMD information → Attitude	1.79	0.04*	0.11	3.47
Accessibility of FMD information → Practices	0.27	0.77	-1.58	2.12

* Indicates a significant variable (P-value < 0.05).

Table 6 Goodness-of-fit indices (Chen et al., 2022).

Fit indices	Model value	Accepted value	Remarks on model
Chi-square/degrees of freedom (CMDN/DF)	0.52	<3	Satisfactory
Comparative fit index (CFI)	1.00	>0.90	Satisfactory
Goodness-of-fit index (GFI)	1.00	>0.90	Satisfactory
Normed fit index (NFI)	0.99	>0.90	Satisfactory
Root mean square error of approximation (RMSEA)	0.00	<0.08	Satisfactory
Root mean square residual (RMR)	0.06	<0.08	Satisfactory

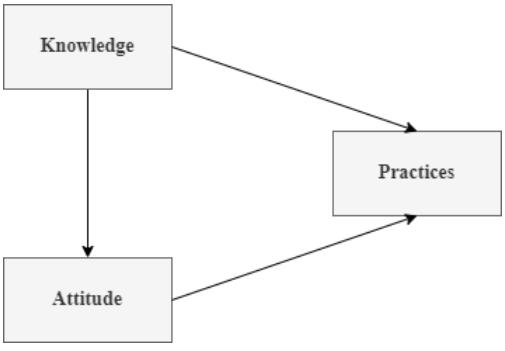

Figure 1 Conceptual framework illustrating the relationships among knowledge, attitude, and practices. The solid lines with arrows indicate hypothesized direct influences between constructs. Knowledge is posited to influence both attitude and practice, while attitude is hypothesized to influence practice.

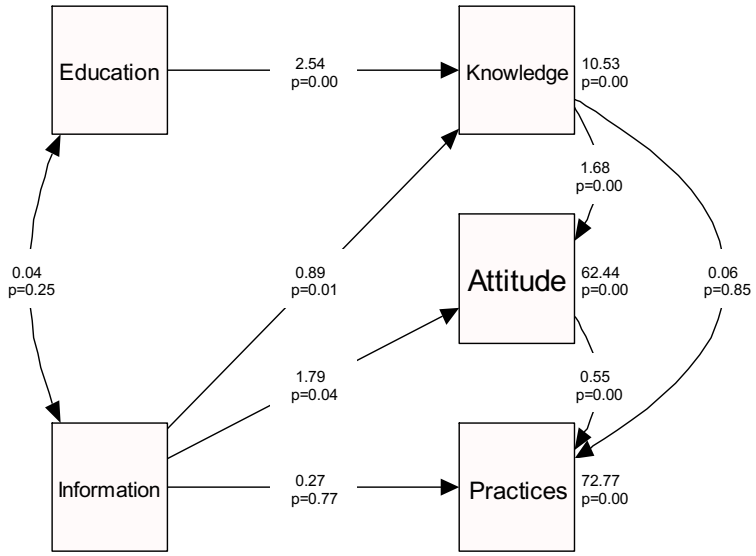

Figure 2 Structural equation modeling for knowledge, attitude, and practices in terms of foot-and-mouth disease among dairy farmers in an endemic area of Thailand (information: accessibility to foot-and-mouth disease information).

DISCUSSION

This study is the first to use SEM to explore the relationships among the KAP of dairy farmers from the perspective of FMD in an endemic area of Thailand. Knowledge is essential for improving FMD prevention and control programs among dairy farmers since it can lead to positive attitudes and practices. The KAP theory provides a framework for understanding the relationships between knowledge, attitude, and practice and how these factors can be influenced to improve FMD awareness. The KAP theory posits that changes in behavior occur through a three-step process: 1) knowledge acquisition, 2) belief generation, and 3) practice formation (Chen et al., 2022). There is limited research on the KAP of dairy farmers in FMD-endemic areas of Thailand.

The evaluation of KAP among dairy farmers in the study area revealed a mixed scenario. While the majority of farmers demonstrated inadequate KAP levels, concerns regarding specific aspects persisted, and a significant proportion exhibited moderate or poor KAP levels. These findings align with the sociodemographic characteristics of dairy farmers in Thailand. Demographic factors, particularly education, play a crucial role in shaping knowledge. The study revealed that educational background positively predicted dairy farmers' FMD knowledge, corroborating previous research indicating a positive correlation between higher education levels and increased knowledge about health and welfare issues, including FMD (Sadiq et al., 2018). This association likely stems from exposure to veterinary and medical terminology and related fields of study in higher education settings. Conversely, lower education levels have been linked to reduced knowledge of animal diseases (Zeng et al., 2018).

The study identified a significant negative association between a history of FMD infection on dairy farms within the last two years and farmers' attitudes toward FMD awareness. Despite routine vaccination programs, the persistence of FMD

outbreaks has engendered negative perceptions among affected farmers, potentially leading to a decline in their motivation to implement preventive measures. The occurrence of outbreaks despite vaccination suggests a lack of herd immunity from the current vaccination program (Chanchaidechachai et al., 2022). Several factors could be contributing to vaccination inefficiency, including the short duration of vaccine-induced immunity (Knight-Jones et al., 2015), poor matching of the vaccine with circulating field strains (Mahapatra and Parida, 2018), and inadequate vaccination coverage (Wataradee et al., 2021), particularly among free-range beef cattle and buffaloes, for which FMD vaccination is not mandatory. The high FMD incidence in endemic areas might be attributable to the variation in FMD virus strains (Chanchaidechachai et al., 2022). However, it remains unclear whether the outbreaks in Thailand stem from ongoing disease transmission or reintroduction from other regions. Further research is warranted to investigate the persistence of FMD outbreaks in Thailand despite vaccination efforts.

Accessibility to FMD information emerged as the sole significant factor associated with dairy farmers' KAP in terms of FMD control and prevention. Dairy farmers acquire FMD information from both personal and media sources. Personnel, including private veterinarians, government officials, friends, and livestock distributors, represent the most accessible sources of FMD information, followed by media sources such as social media platforms, brochures, and posters. These findings align with research highlighting the crucial role of animal health practitioners or local veterinary professionals as a primary source of information for farmers (Osmani et al., 2021; Bayantassova et al., 2023). Several studies have underscored the importance of local veterinarians as one of the most reliable and trusted sources of health management and biosecurity information for livestock farmers (Heffernan et al., 2008; Alarcon et al., 2014; Oliveira et al., 2018). Previous research indicates that dairy farmers obtained information from veterinary personnel during routine farm visits and expressed a preference for future education from these professionals (Sadiq et al., 2021). Farmers' practices are influenced by a complex interplay of factors, including individual knowledge, personal characteristics, and social dynamics, necessitating multifaceted interventions such as villagers' meetings, notice boards, village cadre outreach, media campaigns, and targeted education and training programs (Xu and Zhang, 2021). Accessibility to disease information can help to improve all three aspects of KAP. When dairy farmers have access to accurate and up-to-date information, they are more likely to possess good knowledge, develop positive attitudes, and implement sound practices.

In this study, path modeling demonstrated a significant positive relationship between KAP, education and knowledge, accessibility to FMD information and knowledge, accessibility to FMD information, and attitude. The study findings revealed a direct relationship between knowledge and attitude, while attitude exhibited a direct effect on practices, indicating that attitude has no mediating effect between knowledge and practices. Although this does not indicate a direct relationship between knowledge and practices, the results are supported by literature in other fields, and it can also be confirmed that having good knowledge may not translate into good practices (Ko, 2013; Baser et al., 2017; Soon, 2018). Although with sufficient knowledge, farmers' awareness of animal disease transmission and biosecurity measures may depend on better attitudes toward good practices, no significant linkage was found between knowledge and practices.

Several demographic characteristics in the multiple linear regression model were included in this study to minimize the effects of confounding, and SEM was used to explore the relationship between FMD surveillance and KAP among dairy farmers in an endemic setting. The findings have significant implications for policymakers since they can inform decisions on whether to implement a compulsory FMD surveillance policy for dairy farmers. While this study primarily

focused on farmer-level factors, it is acknowledged that the broader context, including the roles of veterinarians, government authorities, and psychological factors, warrants further investigation. Moreover, the self-administered questionnaire design may have introduced potential biases. Nonetheless, the SEM model, grounded in theoretical underpinnings and supported by robust goodness-of-fit statistics, mitigated these limitations to a certain extent. Additionally, the SEM results were supported by the descriptive analysis and have been interpreted more generally to account for any uncertainty. Overall, this study provides valuable insights into the relationship between FMD surveillance and KAP among dairy farmers in an endemic setting.

CONCLUSIONS

This study sought to explore the KAP of dairy farmers in FMD-endemic areas in terms of FMD surveillance and control and their association with KAP. The results indicated that the KAP of dairy farmers in terms of FMD awareness is inadequate in an endemic setting. The FMD surveillance and control process in dairy farming begins by acquiring sound knowledge, which in turn fosters a positive attitude. A favorable attitude serves as a catalyst for implementing effective practices among dairy farmers. Education is an important factor in knowledge improvement. Access to FMD information is key to knowledge acquisition and a positive attitude toward FMD control, providing a good foundation for adopting preventive practices on dairy farms. Therefore, a routine training program, well-designed media, and personnel expertise are needed to approach dairy farmers in this area and raise their self-awareness concerning the benefits of good practices.

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AUTHOR CONTRIBUTIONS

Patidpong Chumsang: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Resources, Data curation, Software, Writing-original draft, Writing-review and editing, Visualization.
Tawatchai Singhla: Conceptualization, Methodology, Validation, Writing-review and editing.
Veerasak Punyapornwithaya: Conceptualization, Methodology, Validation, Formal analysis, Writing-review and editing.
Warangkhana Chaisowwong: Conceptualization, Methodology, Validation, Writing-review and editing, Project administration, Funding acquisition, Supervision.

INFORMED CONSENT STATEMENT

Informed consent was obtained from all subjects involved in the study.

DATA AVAILABILITY STATEMENT

The dataset generated during the current study is not publicly available but can be obtained from the corresponding author upon reasonable request.

DECLARATION OF COMPETING INTEREST

The authors report no declarations of interest.

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