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EXPLORING BRAND AWARENESS AND UTILIZATION PATTERNS OF POISON CONTROL CENTER SERVICES IN THAILAND: A COMPARATIVE STUDY AMONG HEALTHCARE PROFESSIONALS AND THE GENERAL PUBLIC

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ABSTRACT

Purpose – The purpose of this study is to compare the brand awareness and utilization patterns of Poison Control Center services in Thailand among healthcare professionals and the general public.

Methodology – This study employs quantitative methodology to compare the brand awareness and utilization patterns of Poison Control Center services among healthcare professionals and the general public in Thailand.

Results – The results of the study reveal that healthcare professionals in Thailand have significantly higher brand awareness of Poison Control Center services compared to the general public. The findings also indicate that healthcare professionals are more likely to utilize these services than the general public.

Implications – Implications of this study suggest the need for targeted educational campaigns to increase brand awareness and encourage more effective utilization of Poison Control Center services among the general public in Thailand.

Originality/Value – This study contributes to the existing literature by examining the brand awareness and utilization patterns of Poison Control Center services in Thailand, specifically comparing healthcare professionals and the general public. The findings highlight the need for targeted educational campaigns to increase brand awareness and promote the effective utilization of Poison Control Center services among the general public in Thailand. The findings of this study highlight the disparity in brand awareness and utilization of Poison Control Center services between healthcare professionals and the general public in Thailand.

Keywords: Thailand Poison Control Center (PCC), Brand awareness, Public awareness, Communication channel, Healthcare professionals, General public

Paper Type: Research Article

INTRODUCTION

Poison control centers are crucial in managing and preventing poisoning incidents, providing guideline and treatement planning for both the general public and healthcare professionals. The science of toxicology reveals an increase in poisoning cases in Thailand due to economic growth, technological advancements, and industrial expansion. The introduction of different chemical-related products has extended beyond industry to the households (Erkekoğlu & Sabuncuoğlu, 2021).

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The causes of poison exposure are diverse, including work-related equipment, household products, medication issues, poisonous animals, and insecticides. Lack of knowledge in handling chemicals poses fatal risks that require prompt treatment. The establishment of toxicology center is vital for the to promote public awareness on poison control (Saoraya & Inboriboon, 2013). Moreover, understanding brand awareness and utilization patterns of Poison Control Center services is crucial for improving public health outcomes (Guo & Bai, 2019; Sabahi et al., 2022).

Most studies focused on technical aspects of poison control center, such as reported cases, case management procedures, and the effects of drugs/poisons. Little attention was presented on the awareness and utilization of poison control center. Additionally, there is a lack of comprehensive studies examining the utilization or adoption of poison information systems among healthcare professionals (Leong et al., 2018; Rhalem et al., 2013).

This study seeks to critically assess and improve the service quality of Poison Control Centers (PCCs) in Thailand by exploring the awareness and utilization levels across different demographics, focusing on healthcare professionals and the general public. This study investigates what drives individuals to use PCC services, discern any variations in these motivations across user groups, and examine if perceptions about communication channels differ between the general public and healthcare professionals. Additionally, the study will determine the most effective communication channels for engaging with PCCs and whether user preferences for these channels vary among different groups. The resaerch findings are scrutinized for the development of business strategy to promote the awareness and utlization of poison control in Thailand. The research also seeks to identify potential improvements in the area such as communicaton channel and service quality (e.g. ease of contact and information accuracy). Through a comprehensive review of the Thai poisoning literature, it becomes evident that there is a need for further support of the PCC in Thailand (Saoraya & Inboriboon, 2013).

This study provides significant public health advantages through the facilitation of targeted educational initiatives, the provision of insights for policy development, and the enhancement of healthcare provision. It advocates for efficient allocation of resources, fosters additional research endeavors, and fosters inter-sectoral cooperation to enhance emergency readiness and responsiveness.

LITERATURE REVIEW

Global Perspectives on Poison Control Center Effectiveness

Toxic exposure is a major global public health issue, therefore; PCCs have emerged globally to assist health professionals in understanding the toxicity of various substances, recognizing the impracticality of expecting them to possess comprehensive knowledge about every substance's toxicity (World Health Organization, 2016). Poison control centers play a crucial role in providing information, guidance, and treatment for poison-related incidents (Pourmand et al., 2012). They serve as a valuable resource for healthcare professionals, offering expertise in toxicology and aiding in the diagnosis and management of poison exposures (World Health Organization, 2021).

A Poison Control Center addresses inquiries regarding exposure to various chemical agents through phone communication, offering clinical guidance and tailored advice on treatment for poisoning incidents. These incidents occur in settings like homes, workplaces, or rural areas far from medical facilities. The center provides evidence-based advice as a hub of toxicological expertise and aids in diagnosing patients with acute symptoms of unknown origin (World Health Organization, 2021; World Health Organization, 2016).

Globally, services offering information, advice, and sometimes treatment and laboratory services for poisoning management are designated by various terms such as "poisons information centre," "poison control centre," "toxicology information service," among others. In this context, these terms could denote establishments solely providing information and advice or functioning as both a poisons information centre and possessing a clinical treatment unit and/or a toxicological laboratory (Ramathibodi Poison Center, 2015; Siriraj Poison Control Center, 2020; World Health Organization, 2016).

The Historical Evolution of Poison Control Centers in Thailand.

The increasing chemical usage in Thailand, driven by population growth, economic expansion, industrialization, agricultural practices, and household consumption has resulted in widespread environmental pollution and contamination of the food chain. This presents a significant public health risk from both acute and chronic toxicities due to the improper use or overuse of these substances (Ramathibodi Poison Center, 2015; Siriraj Poison Control Center, 2020). Healthcare professionals play a crucial role in diagnosing and treating toxicities but face challenges such as inadequate data on the toxic substance's patients are exposed to. Patients often arrive at hospitals too late for timely treatment because of factors like geographic distance or lack of awareness about the dangers of toxic substances. The poison control centers are dedicated institutions that research and manage toxins' impact on public health by providing comprehensive information about these substances, which empower medical practitioners with essential knowledge.

Background: Public Awareness of Poison Control Center in Thailand

In Thailand, the role of Poison Control Centers (PCCs), particularly the Siriraj Poison Control Center (SiPPC) and the Ramathibodi Poison Control Center (RPCC), is pivotal in the fight against the acute health effects of pesticide exposure, an issue that continues to challenge public health efforts (Ramathibodi Poison Center, 2015; Siriraj Poison Control Center, 2020). Studies indicate a notable gap in public awareness of these centers, with pesticide poisoning standing out as a pressing problem that underscores the urgent need for enhanced education and utilization of PCC services (Saoraya & Inboriboon, 2013). Although emergency healthcare professionals have some knowledge in this area, there is room for improvement. Research indicates that actively promoting poison prevention behaviors and increasing awareness of the services offered by poison centers can significantly reduce hospitalizations and emergency department visits related to poisoning incidents (Spiller & Griffith, 2009). Community characteristics such as population density and education levels also influence the utilization of poison center services (Churi et al., 2013; Nguyen et al., 2016). Addressing the current challenge of insufficient public awareness and education on poison control in Thailand can benefit from valuable recommendations derived from existing research and best practices Additionally, there is a lack of awareness regarding the critical importance of timely management in poisoning cases. Interventions aimed at improving public awareness and education about poison control centers in Thailand are crucial to ensure timely and appropriate management of poisoning incidents (Kanjanarach et al., 2014). Using the provided sources, it is evident that pesticide poisoning is a major problem in Thailand (Saoraya & Inboriboon, 2013). Recent research by Somboon et al. (2022) has highlighted the alarming prevalence of pesticide-related health issues among agricultural workers, while Laohaudomchok et al. (2020) emphasize the significant health and environmental risks posed by pesticides, further pinpointing critical research and policy gaps. Moreover, Sapbamrer et al. (2024) illustrate the acute health symptoms from pesticides that Thai farmers experience, spotlighting the importance of perceptions and practices in managing these risks. Collectively, this body of work advocates for a strengthened role of PCCs in promoting safe practices and improving public and medical practitioners' awareness to manage and mitigate the incidence of pesticide poisoning effectively. It is essential for the public and medical practitioners to be aware of and utilize the services offered by poison control centers in Thailand to effectively manage and reduce the incidence of pesticide poisoning cases.

Research Questions

To enhance the service quality of PCCs in Thailand through a quantitative methods approach, the study addresses the following consolidated main research questions: What is the level of awareness and utilization of PCC among different user groups, and what factors influence their choice to use its services? It also identifies four sub-questions as follows:

1. What is the level of awareness and utilization of the PPC among the general public and healthcare professionals?
2. What factors influence the choice of using the PPC's services, and are there differences in these factors among various user groups?

3. Is there any difference on the perceived communication channels between the general public and healthcare professionals?

4. Which communication channels are most suitable for contacting the PCC and is there any difference in the choice of channel among user groups?

This discusses key aspects such as public awareness, user demographics, service use, and communication preferences to understand poison control dynamics in Thailand. As a result, the study aims to investigate the awareness, usage, and factors that impact the utilization of PCC among different user groups in Thailand. The research questions are formulated to identify differences in levels of awareness, patterns of use, and factors influencing the selection of PCC services among both the general public and healthcare professionals. This leads to the following hypotheses:

Awareness and Utilization:

The variable under consideration in this research is the dependent variable, which is influenced by independent variables. Specifically, the focus lies on the degree of awareness, utilization, or intention to use PCC among healthcare professionals (Saoraya & Inboriboon, 2013). Given the current limited implementation of PCC among healthcare professionals, this study concentrates on evaluating awareness levels and intentions towards usage, aiming to predict motivating factors influencing PCC utilization. The situation in Myanmar serves as a pertinent parallel. There, increased Facebook usage without adequate digital literacy led to misinformation and social unrest (Whitten-Woodring et al., 2020). Similarly, in Thailand, insufficient PCC knowledge among healthcare professionals could impede the effective management of poisoning incidents. Therefore, this study formulated a hypothesis designed to examine various drivers behind healthcare professionals' knowledge and willingness regarding PCC usage. Additionally, recognizing its broader implications, our investigation extends beyond medical settings to consider societal impact. Educating the public about PCC plays a crucial role in preventing severe poisoning cases, empowering individuals to proactively contribute to the reduction of poisoning incidents and enhancing community well-being in Thailand (Pac-Kożuchowska et al., 2016). The hypothesis is defined as follows:

H0: There is no significant difference in the level of awareness and utilization of the PCC between the general public and healthcare professionals.

H1: The level of awareness and utilization of the PCC varies significantly between the general public and healthcare professionals.

Factors Influencing Service Utilization:

Factors Influencing Service Utilization: Various factors can impact the utilization of PCC services. These encompass the accuracy and precision of information, the timeliness or speed of advice, the ease of access, completeness of information and assistance in treatment planning. In essence, a multitude of factors contributes to the adoption of PCC services. Refer to Figure 2, the results of descriptive statistics on factors influencing the decision to use PCC by healthcare professionals. The hypotheses are stated as follows:

H2: The factors influencing the decision to use PCC services are consistent across different user groups.

H3: There are significant differences in the factors influencing the decision to use the PCC services among various user groups.

Communication Channels

The choice of communication methods and channels of communication perceived by the user are critical in influencing the use of PCC services (Ellington et al., 2011). Additionally, Kshatri et al. (2021) stated that the readily available and easily accessible effective communication channels are essential to enhance awareness and utilization of services. In term of the perceived communication channels, the provision of a telephone number for easy access to poison control centers can significantly influence the use of their services and result in quicker response times, ultimately leading to improved outcomes for those seeking help from these centers(Alexander et

al., 2007; Carr et al., 2010). Additionally, the impact of social media platforms can offer another avenue for people to obtain information and support from PCC services. By prioritizing user expectations and offering multiple communication channels such as a phone number and social media platforms, the accessibility and utilization of PCC services can be enhanced, ensuring that individuals receive prompt and accurate support in managing poisoning incidents (Churi et al., 2013), as hypothesized H4, H5,H6 and H7 in this study.

H4: There is no difference in the perceived communication channels of PCC across user groups.

H5: There is a difference in the perceived communication channels of PCC across user groups.

H6: The choice of communication channels for contacting the PCC is consistent across user groups.

H7: The choice of communication channels for contacting the PCC is different across user groups.

METHODOLOGY

Data Collection and Sample size:

Data was gathered through the distribution of questionnaires to a sample group including both the general public and healthcare professionals in Thailand. This study employs a quantitative approach to investigate public awareness and education on poison control in Thailand. The data collection process involves designing a questionnaire for healthcare professionals and the general public, conducting a pilot survey with 25 individuals, and then distributing the finalized questionnaire to 193 respondents using snowball sampling for large-scale statistical data collection. Data analysis includes eliminating missing responses and using statistical tests to explore relationships between variables.

The research covers surveying both the general public and healthcare professionals to gather data on their recognition and utilization of PCC by distributing questionnaires inclusive of healthcare providers, medical staff, as well as members of the public. The collected data is then analyzed accounting for incomplete responses; statistical analysis is subsequently conducted covering response frequencies, means calculation, along with exploring relationships between variables employing quantitative surveys coupled with statistical analysis aiming at achieving comprehensive understanding focusing specifically on recognition and utilization patterns concerning PCC dynamics through numerical research methods.

The conclusive step involves reporting and summarizing research findings in a comprehensive research report. Key insights, such as the frequency of PCC use, factors influencing service utilization, and recommendations for improving the PCC, are presented. This structured approach ensures a thorough investigation, utilizing quantitative methods for a holistic understanding of PCC. The quantitative approach used in this study facilitates a comprehensive examination of public awareness and education on PCC in Thailand.

RESULTS

Descriptive analysis aims to illustrate the basic characteristics of data by summarizing and examining it to understand its inherent patterns and nature. This approach presents data in a clear format, facilitating decision-making and planning efforts. It serves as a crucial initial step in data analysis, providing fundamental insights before further examination. The obtained data sheds light on the features of respondent groups within the project.

The study involved 193 participants who responded to the survey. Among them, 41.5% (N = 80) were from the professional healthcare sector, including physicians, nurses, pharmacists, paramedics, and medical volunteers. The rest of the respondents at 58.5% (N = 113) were from the general public. The demographic characters of the sample size, including both healthcare professionals (N = 80) and the general public (N = 113) are presented in Table 1. Among the respondents, 74.1% identified as female; age groups included Generation Z (> 26 years old), 3.1%,

Generation Y (27-42 years old), 60.l%, Generation X (43-58 years old), 35.2%, and Boomers (more than 59 years old), 1.6%. The majority have an average working experience of more than five years.

Table 1. Demographic characteristics

Individual-level variables	N	Percent
Age		
Less than 26 years old	6	3.1
27-42 years old	116	60.1
43-58 years old	68	35.2
More than 59 years old	3	1.6
Gender		
Male	48	24.9
Female	143	74.1
LGBTQ	1	0.5
Rather Not Say	1	0.5
Years of Experience		
Less than 1 year	8	4.1
1-3 years	8	4.1
3-5 years	11	5.7
More than 5 years	166	86
Income		
Less than 5000	3	1.6
5000-15000	13	6.7
15001-50000	61	31.6
More than 50000	116	60.1

To address hypotheses H0 and H1, the survey data, encompassing responses from 80 healthcare professionals and 113 members of the general public, provides insights into the awareness and utilization of PCC services. Among healthcare professionals, the findings indicate that 72.2% were not only familiar with PCC services but had also utilized them. Additionally, 22.8% were aware of the services but hadn't utilized them, and a smaller percentage, 5%, were neither aware of nor had used the services. In contrast, within the general public group, a minimal percentage of 0.8% had utilized PCC services while being acquainted with them. A larger proportion, 23.3%, were aware of the services but hadn't used them.

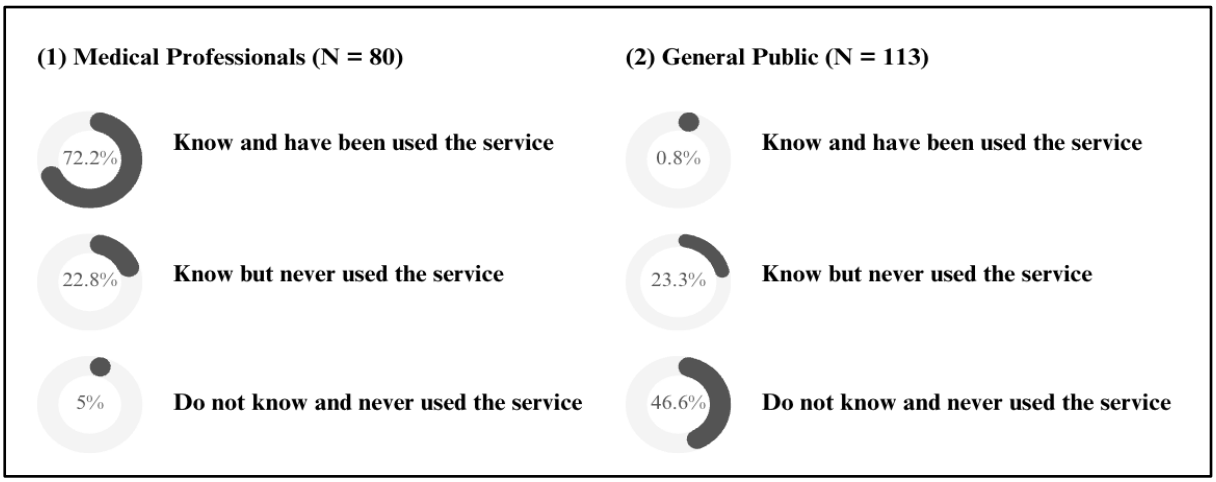

Figure 1. The results of descriptive statistics on awareness and utilization of the Poison Control Center (PCC) between the general public and healthcare professionals.

Significantly, a substantial portion, comprising 46.6%, indicated neither awareness nor utilization of PCC services. These findings offer valuable insights into the utilization patterns and awareness levels of PCC services among both healthcare professionals and the general public, laying the foundation for the assessment of hypotheses H0 and H1.

To further validate the descriptive analysis on the awareness and utilization of PCC. The independent samples t-test was performed to evaluate the significant level of differences between the target groups. Table 2. illustrates the results of t-test analysis.

Table 2. The result of independent samples t-test on awareness and utilization of the Poison Control Center (PCC) between the general public and healthcare professionals

Occupation	N	Mean	Std. Deviation	t	P
Healthcare professionals	80	1.34	0.57	19.126	.001*
General Public	113	2.75	0.45		

*Significant at the level $p < 0.05$

The results indicated a significant level of $p < 0.05$ of an awareness and utilization of PCC between healthcare professionals and the general public. The finding reveals the profession has an influence on the awareness and utilization of PCC and hence rejected H0.

The next hypothesis focuses on the factors influencing the decision to use PCC across user groups. These factors are (1) accuracy and precision of information, (2) completeness of information, (3) speed of information provision, (4) the ability to recommend antidotes and allocate resources, (5) assistance in treatment planning, (6) consultation from poisonology experts, and (7) case study development.

The descriptive analysis presented in Figure 2 demonstrated the factors influencing the selection of PCC for healthcare professionals, including the accuracy and precision of information (average importance score of 9.55), the speed of information provision (average importance score of 9.19), and the ability to recommend antidotes and allocate resources (average importance score of 9.15). Similarly, the general public emphasized comparable factors as crucial in their choice of using PCC services. Figures 3 exhibited factors being prioritized by the general public, including accuracy and precision of information (average importance score of 9.06), completeness of information (average importance score of 8.86), and assistance in treatment planning (average importance score of 8.80).

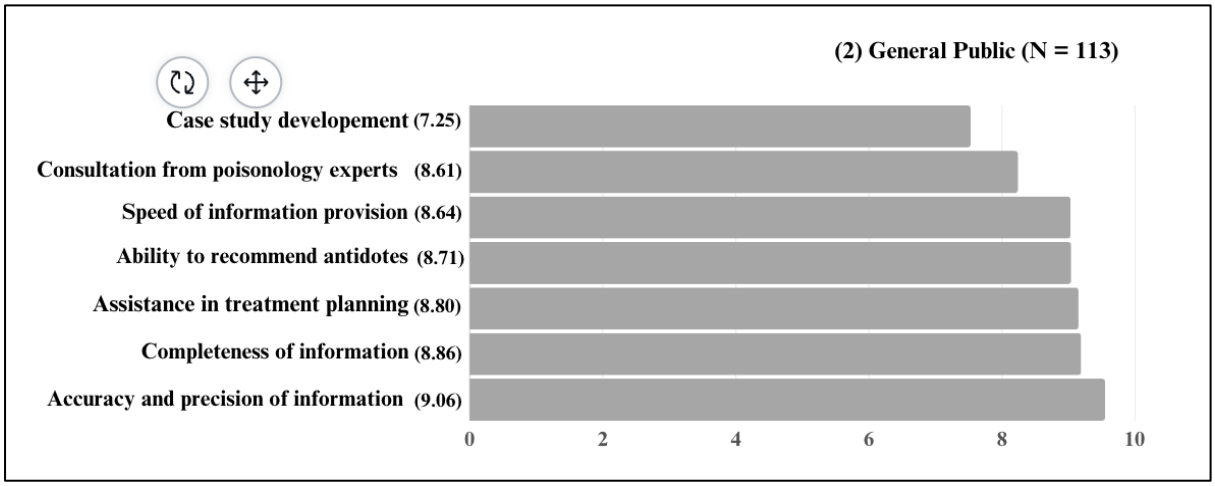

Figure 2. The results of descriptive statistics on factors influencing the decision to use PCC by healthcare professionals

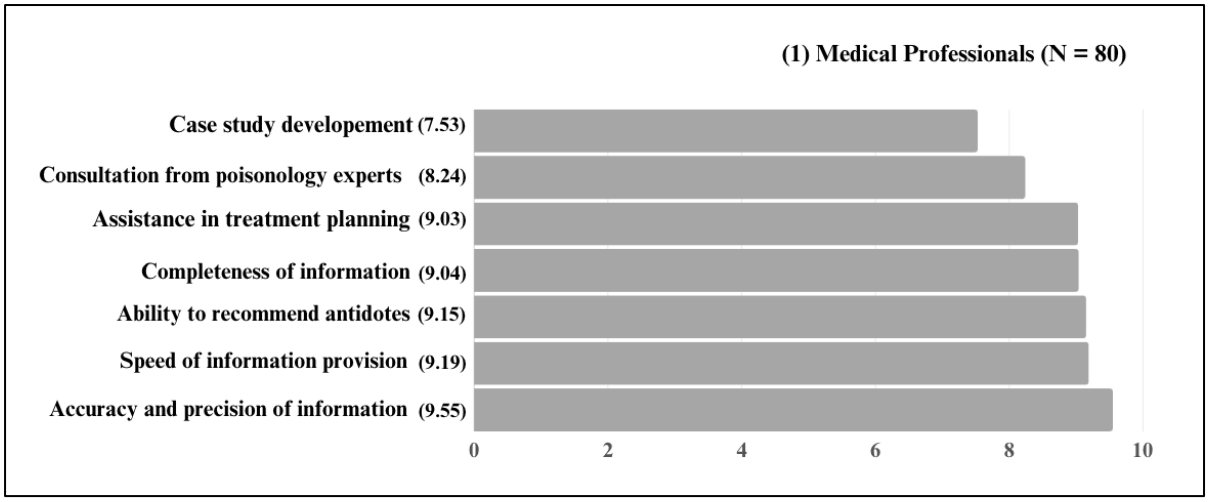

Figure 3. The results of descriptive statistics on factors influencing the decision to use PCC by the general public.

These findings align with H2, indicating consistency in factors influencing PCC service choice across user groups. Nuanced distinctions in importance scores support the exploration of H3.

The descriptive analysis was validated by the independent samples t-test. Table 3. illustrates the results of significant test analysis on the factors influencing the decision to use PCC.

Table 3. The result of independent samples t-test on the factors influencing the decision to use PCC across different user groups

Factors	Professions	N	Mean	Std. Deviation	t	P
Speed of information provision	Medical Professional	80	9.20	1.51	1.86	0.06
	General Public	113	8.64	2.37		
Accuracy and precision of information	Medical Professional	80	9.56	1.38	1.83	0.06
	General Public	113	9.05	2.19		
Completeness of information	Medical Professional	80	9.04	1.47	0.60	0.54
	General Public	113	8.87	2.19		
Consultation from poisonology experts	Medical Professional	80	8.29	1.94	1.00	0.31
	General Public	113	8.60	2.27		
Assistance in treatment planning	Medical Professional	80	9.05	1.66	0.87	0.38
	General Public	113	8.79	2.27		
Case study development	Medical Professional	80	7.59	2.56	0.91	0.36
	General Public	113	7.23	2.74		
Ability to recommend antidotes	Medical Professional	80	9.15	1.57	1.43	0.15
	General Public	113	8.72	2.34		

*Significant at the level $p < 0.05$

The results indicated an insignificant level of $p > 0.05$ for all the factors influencing the decision to use PCC. The t-test analysis corresponding to the descriptive analysis showed that the differences of factors used to select PCC by professions was naught, and hence rejected H3.

Hypotheses 4 & 5 investigate the differences on perceived communication channels between the general public and healthcare professionals. Figure 4 & 5 presented the descriptive analysis on perceived communication channel. The results suggested that (1) word-of-mouth, (2) website, and (3) social media are the most well-perceived channels for all user groups.

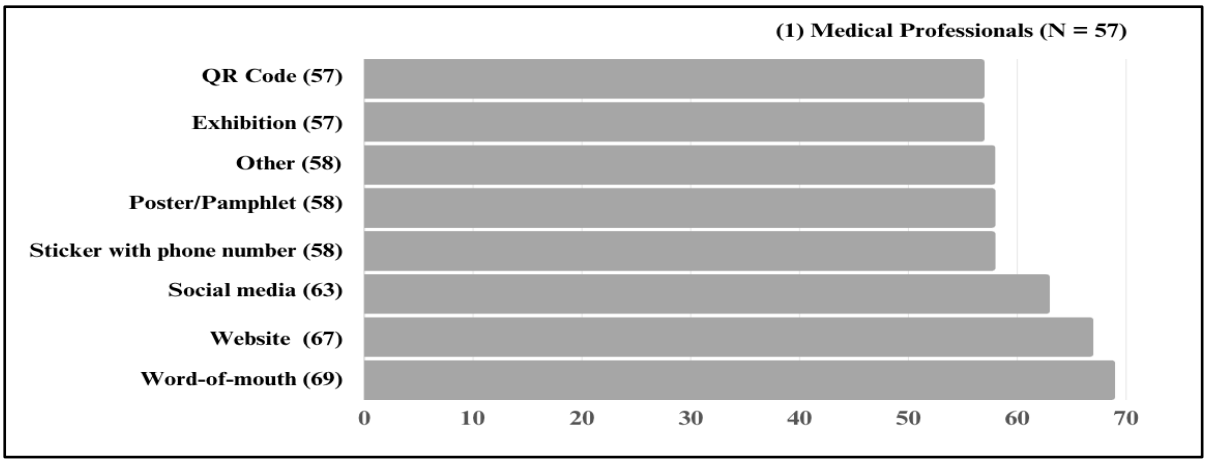

Figure 4. The results of descriptive statistics on perceived communication channel of PCC by healthcare professionals

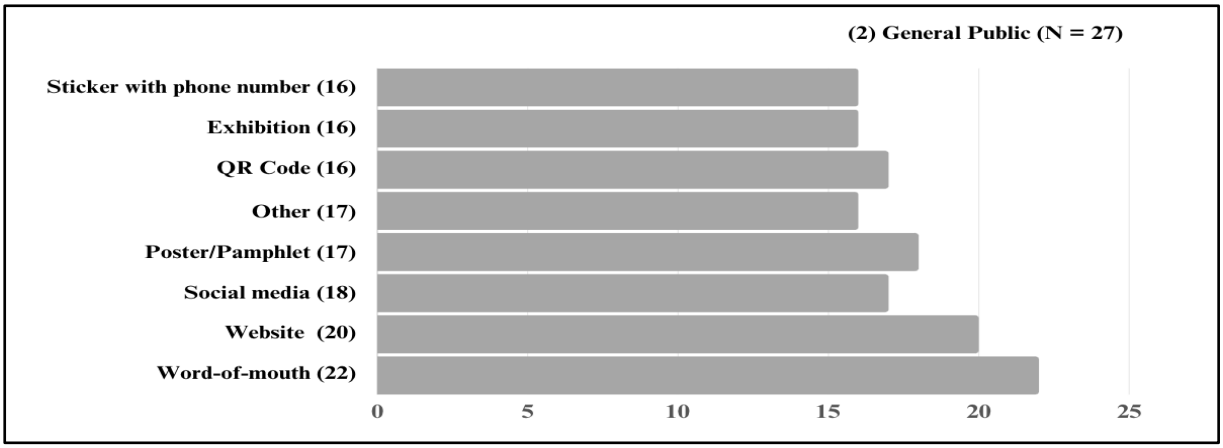

Figure 5. The results of descriptive statistics on perceived communication channel of PCC by the general public

Table 4. presented the result of independent samples t-test on perceived communication channel of PCC across user groups. The analysis indicated an insignificant level of $p > 0.05$ for all the perceived communication channels. The t-test result suggested that there is indifference on how the users perceived the service of PCC and therefore rejected H5.

Table 4. The result of independent samples t-test on perceived communication channel of PCC across different user groups

Factors	Professions	N	Mean	Std. Deviation	t	P
Website	Medical Professional	67	0.52	0.50	0.95	0.34
	General Public	20	0.40	0.50		
Social Media	Medical Professional	63	0.48	0.50	1.00	0.31
	General Public	18	0.61	0.50		
QR Code	Medical Professional	57	0.02	0.13	0.96	0.33
	General Public	16	0.06	0.25		
Sticker	Medical Professional	58	0.16	0.36	0.95	0.34
	General Public	16	0.06	0.25		
Exhibition	Medical Professional	57	0.02	0.13	0.96	0.33
	General Public	16	0.06	0.25		

Table 4. (Cont.)

Factors	Professions	N	Mean	Std. Deviation	t	P
Poster	Medical Professional	58	0.09	0.28	0.38	0.70
	General Public	17	0.12	0.33		
Word-of-mouth	Medical Professional	69	0.70	0.46	0.51	0.60
	General Public	22	0.64	0.49		
Other	Medical Professional	58	0.09	0.28	0.36	0.71
	General Public	17	0.06	0.24		

*Significant at the level $p < 0.05$

Hypothesis 6 & 7 addresses the choices of communication channels for contacting the PCC between user groups. Figure 6 and 7 revealed the results of descriptive analysis on communication channel to promote PCC by healthcare professionals and the general public. The findings showed consistent results on the promotional communication channel, including (1) social media, (2) website, and (3) doctor reference as the most preferred communication channels across user groups.

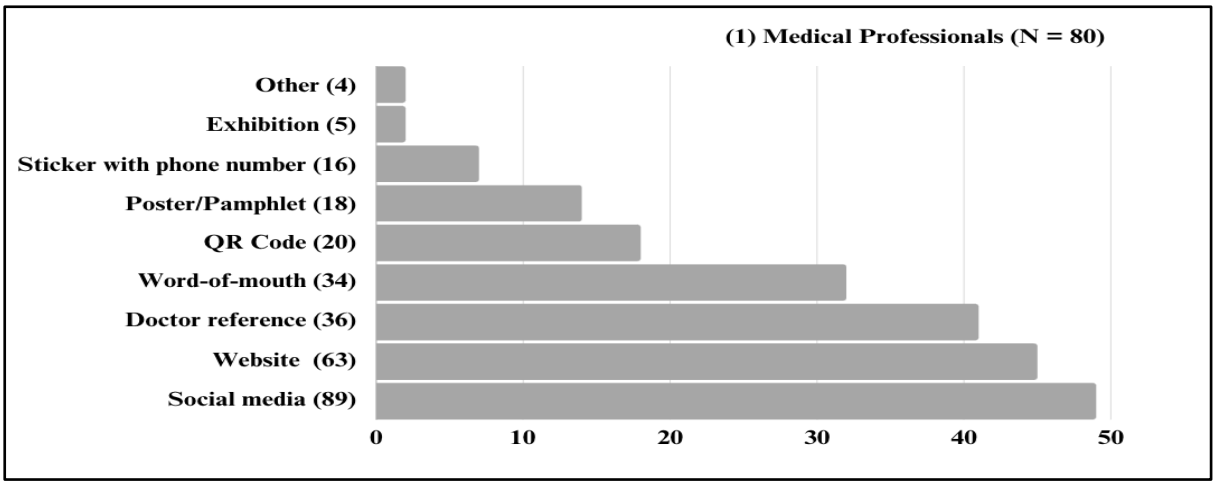

Figure 6. The results of descriptive statistics on communication channel to promote PCC by healthcare professionals

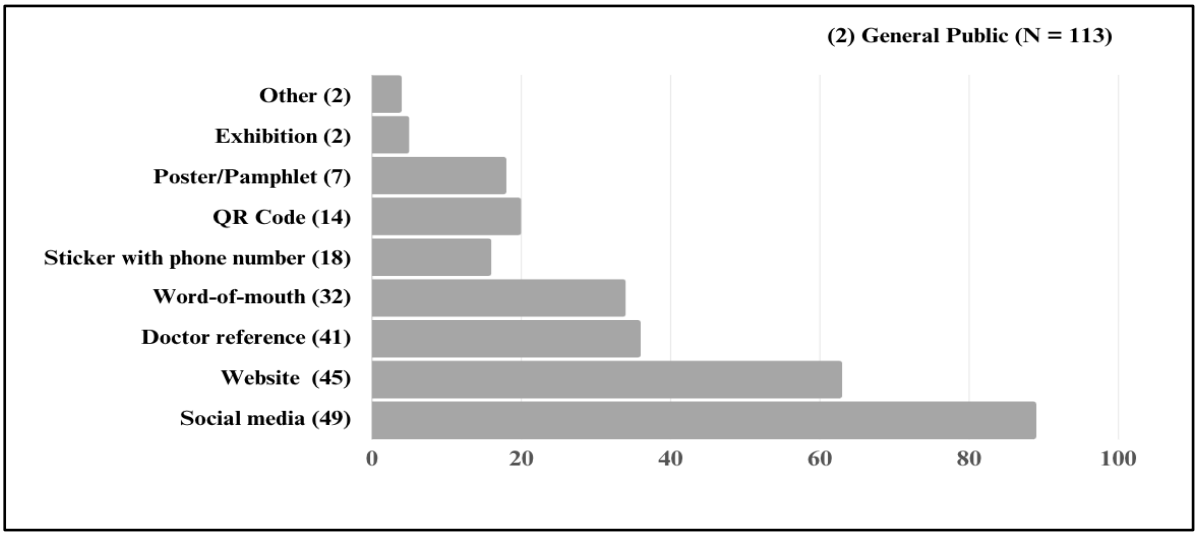

Figure 7. The results of descriptive statistics on communication channel to promote PCC by the general public

Table 5. showed the result of independent samples t-test on communication channel to promote PCC. The results revealed a p-value > 0.05 for all the communication channels. This indicated no significant difference on the choices of communication channels of PCC between healthcare professionals and the general public and hence rejected H7.

Table 5. The result of independent samples t-test on communication channel to promote PCC by healthcare professionals and the general public

Factors	Professions	N	Mean	Std. Deviation	t	P
Website	Medical Professional	80	0.57	0.49	0.24	0.81
	General Public	113	0.56	0.49		
Doctors	Medical Professional	80	0.55	0.50	3.14	0.00
	General Public	113	0.33	0.47		
Social Media	Medical Professional	80	0.59	0.49	2.30	0.02
	General Public	113	0.74	0.43		
QR Code	Medical Professional	80	0.15	0.35	0.49	0.62
	General Public	113	0.18	0.38		
Sticker	Medical Professional	80	0.23	0.42	1.49	0.13
	General Public	113	0.14	0.35		
Exhibition	Medical Professional	80	0.04	0.19	0.07	0.93
	General Public	113	0.04	0.18		
Poster/Pamphlet	Medical Professional	80	0.09	0.28	1.30	0.19
	General Public	113	0.15	0.35		
Word-of-mouth	Medical Professional	80	0.40	0.49	1.98	0.04
	General Public	113	0.27	0.44		
Other	Medical Professional	80	0.03	0.15	1.19	0.23
	General Public	113	0.06	0.24		

*Significant at the level $p < 0.05$

DISCUSSION AND IMPLICATIONS

This study underscores a notable disparity in the utilization of PCC resources between healthcare professionals and the public. The results reveal that healthcare practitioners exhibit significantly greater familiarity with, and active utilization of these facilities compared to other groups. The study's findings highlight a consistent discrepancy in the levels of engagement with PCC services, with healthcare professionals consistently demonstrating a higher level of involvement than the public. However, it is important to acknowledge the limitations inherent to the scope of our sample. The diversity within the healthcare professional community and the general public, as well as regional variations across Thailand, may not be fully represented in our study. This limitation could potentially restrict the direct applicability of our findings to all segments of the Thai population. While our results offer valuable insights, they should be interpreted with caution when considering their extension to the broader populace.

When studying the factors influencing the use of poison control services, this study indicates that accuracy and speed were significant influences. Additionally, treatment planning assistance and poison antidote recommendations emerged as important factors. These findings may present opportunities for expanding or developing new services at PCC (Alexander et al., 2007; Churi et al., 2013). Furthermore, our study revealed that healthcare professionals predominantly rely on word-of-mouth referrals and online channels such as websites and social media to gather information about poison control services. To more fully understand the disparities observed in our study, it is crucial to consider the underlying factors that contribute to these differences. The roots of disparity in healthcare service utilization are complex and multifaceted. It is possible that healthcare professionals' greater familiarity with PCC services is a result of their professional education and networks, which emphasize the importance of poison control in clinical practice. In contrast, the general public's awareness and utilization may be influenced by a variety of factors, including but not limited to socioeconomic status, accessibility

of resources, and educational outreach. Additional research exploring these factors could shed light on the mechanisms driving these disparities and help inform targeted interventions.

Healthcare professionals primarily learn about facilities through word-of-mouth referrals and online channels such as websites and social media. Using social media can be more effective than just relying on websites for raising awareness about PCCs. This highlights the importance of fast service delivery in influencing decision-making for recommending personnel and potential users. It suggests a need to concentrate on minimizing perceived information gaps to improve service performance, as suggested by Saud et al. (2020)

Moreover, our findings prompt a discussion about the barriers to service utilization, which may range from socio-economic and educational limitations to cultural and linguistic barriers. For instance, individuals from lower socio-economic backgrounds may lack the means to access poison information centers, while differences in educational levels may influence an individual's understanding and perception of poison control services. Furthermore, cultural beliefs and practices might shape attitudes towards seeking assistance from such centers. To address these barriers, targeted educational programs and culturally sensitive communication strategies must be developed. This would ensure that PCC services are not only available but also accessible to all segments of society, regardless of socio-economic status or cultural background.

Placing a greater emphasis on communication strategies through word of mouth, healthcare alumni, and social media is recommended. Poison information centers play a crucial role in providing timely services to reduce poisoning incidents, improve patient care, and prevent future accidental poisonings. Their utilization can help decrease morbidity and mortality caused by poisoning. Additionally, these centers have a critical role in acquiring and disseminating vital information during crises such as bioterrorism or chemical terrorism, as well as in responding to public health emergencies. By effectively utilizing social media platforms, poison centers can enhance their communication strategies and reach a wider audience to increase awareness and utilization of their services for improved public health outcomes (Kirk & Iddins, 2015; Vo & Smollin, 2015). Therefore, in today's rapidly changing world, the significance of accurate communication and fast service delivery, through channels such as websites and social media, cannot be overstated. The ability to adapt and respond quickly is crucial in order to meet the evolving needs of individuals and communities.

Theoretical Contributions

This research provides new insights into the awareness and utilization of Poison Control Centers among healthcare professionals and the general public in Thailand. It highlights disparities in knowledge and usage, emphasizing the need for targeted interventions. The study also enriches understanding of factors influencing PCC services' utilization, such as accuracy, speed, education, and communication strategies. Additionally, it emphasizes strategies like community workshops, public service announcements, collaborations with healthcare providers, and effective use of social media to increase PCC services' usage. Overall, this study contributes to developing a theoretical framework for improving poisoning management strategies and enhancing public health safety. Overall, this research emphasizes the importance of effective communication and fast service delivery in the context of poison information management. Public education plays a crucial role in promoting poison prevention behaviors and raising awareness of poison center services. It has been shown to significantly reduce hospitalizations and emergency department visits for poisonings (Lambdin et al., 2022).

Managerial Contribution:

The study's quantitative method explanatory approach yields implications for healthcare organizations and policymakers, emphasizing the need for tailored interventions to strengthen public awareness and education on poison control. Delineating distinct communication channels specifically tailored for healthcare practitioners and the general public is also emphasized. The research recommends strategic utilization of social media platforms as a powerful tool to broaden informational reach, engaging a diverse audience. It advocates integrating targeted interventions and deploying social media strategically to enhance public comprehension, increase use of poison

center resources, and reduce hospitalizations linked to poisoning cases. Overall, it offers actionable recommendations that can be embraced by healthcare organizations and policymakers alike toward fostering heightened awareness on poison control.

The study provides guidance for healthcare organizations and policymakers to prioritize efforts in promoting poison prevention behaviors and raising awareness of poison center services. By focusing on enhancing public understanding of the role of poison control services, stakeholders can contribute proactively to improvements in public health outcomes. The comprehensive findings recommend strategically tailored interventions and leveraging social media platforms to effectively disseminate crucial knowledge, engage diverse audiences, and enhance public awareness and education on poison control. These measures are poised to catalyze transformative improvements in public health outcomes by reducing hospitalizations and emergency department visits linked to poisoning cases.

LIMITATIONS AND FUTURE RESEARCH POSSIBILITIES

Certain limitations warrant acknowledgment; sample size may not fully capture population diversity. Besides these limitations our study establishes foundation for future targeted interventions initiatives aimed at enhancing public awareness of education on poision control.To address these, future research could involve larger diverse samples & employ more objective measures.Also exploring comparative effectiveness traditional advertising versus digital marketing strategies promoting brand awareness for Poision Control Services.Thus,this study influences use opportunities meaningful improvements.

CONCLUSION

In summary, our research has provided insights into the current landscape of poison control awareness and utilization in Thailand. Employing quantitative methods, this study delved into the factors shaping the decision to engage with poison control services. The research identified challenges faced by the center and presented strategies for enhancement. Extensive public awareness campaigns on online platforms have been underscored, catering to both the general public and healthcare professionals. Additionally, addressing sustainability concerns related to budgeting and income generation for information services is imperative. The intricacies of communication channels and the impact of phone numbers on service usage were scrutinized, emphasizing comprehensive education and awareness programs in fostering PCCs' utilization.

PCCs play a crucial role in providing timely assistance,reducing morbidity and mortality caused by poisoning, as well as assisting in preparedness response to public health emergencies. To ensure high-quality services at new Poison Information Center thorough assessment of nature quality through an evaluation plan examining areas such as timely response treatment planning gathering feedback from both populations is recommended. Furthermore, collaboration between PCC & other relevant stakeholder, such hospitals, universities, public health serves crucial in developing countries like Thailand.

In conclusion, our research has provided insights into poison control awareness and utilization in Thailand through a comprehensive quantitative approach. This study has identified factors influencing service usage, pinpointed challenges faced by the center, and proposed targeted improvement strategies. Emphasizing the importance of extensive online awareness campaigns for both the general public and healthcare professionals, our study underscores the need to address sustainability issues in budgeting and income generation for information services. This study has also scrutinized communication channels and phone number impact on service usage, focusing on enhancing direct services by poison specialists' recall. Acknowledging limitations such as potential bias and sample size constraints, the research lays a solid foundation for future endeavors to enhance public awareness and education on poison control in Thailand. Overall, this study contributes to the understanding of poison control services and suggests ways to improve public awareness and utilization in Thailand, emphasizing the need for targeted interventions and collaboration among various stakeholders to ensure effective poison control measures are implemented and sustained.

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CONFLICTS OF INTEREST

The author declares that there are no conflicts of interest found in this research.

REFERENCES

Alexander, J. A., Copeland, L. A., & Metzger, M. E. (2007). Explaining differences in operating costs among poison control centers: An exploratory study. *Clinical toxicology*, *45*(5), 440-450.

Carr, A. S., Cardwell, C. R., McCarron, P. O., & McConville, J. A. (2010). A systematic review of population based epidemiological studies in Myasthenia Gravis. *BMC Neurol, PMC2905354*, 10-46. doi: 10.1186/1471-2377-10-46.

Churi, S., Abraham, L., Ramesh, M., & Narahari, M. (2013). Evaluation of poison information services provided by a new poison information center. *Indian journal of pharmacology*, *45*(5), 496.

Ellington, L., Rebecca Poynton, M., Reblin, M., Latimer, S., Bennett, H. K., Crouch, B., & Caravati, E. M. (2011). Communication patterns for the most serious poison center calls. *Clinical toxicology*, *49*(4), 316-323.

Erkekoğlu, P., & Sabuncuoğlu, S. (2021). Introductory chapter: Medical toxicology. In *Medical Toxicology*. IntechOpen United Kingdom.

Guo, J., & Bai, J. (2019). The role of public participation in environmental governance: Empirical evidence from China. *Sustainability*, *11*(17), 4696.

Kanjanarach, T., Jaisa-Ard, R., & Poonaovarat, N. (2014). Performance of health product risk management and surveillance conducted by health personnel at sub-district health promotion hospitals in the northeast region of Thailand. *Risk Management and Healthcare Policy*, 189-197.

Kirk, M., & Iddins, C. J. (2015). Resources for toxicologic and radiologic information and assistance. *Emergency Medicine Clinics*, *33*(1), 69-88.

Kshatri, J. S., Palo, S. K., Panda, M., Swain, S., Sinha, R., Mahapatra, P., & Pati, S. (2021). Reach, accessibility and acceptance of different communication channels for health promotion: a community-based analysis in Odisha, India. *Journal of Preventive Medicine and Hygiene*, *62*(2), E455.

Lambdin, B. H., Davidson, P. J., Browne, E. N., Suen, L. W., Wenger, L. D., & Kral, A. H. (2022). Reduced emergency department visits and hospitalisation with use of an unsanctioned safe consumption site for injection drug use in the United States. *Journal of general internal medicine*, *37*(15), 3853-3860.

Laohaudomchok, W., Nankongnab, N., Siriruttanapruk, S., Klaimala, P., Lianchamroon, W., Ousap, P., Jatiket, M., Kajitvichyanukul, P., Kitana, N., & Siriwong, W. (2020). Pesticide use in Thailand: Current situation, health risks, and gaps in research and policy. *Human and Ecological Risk Assessment: An International Journal*, *27*(5), 1147-1169.

Leong, Y.-H., Ariff, A. M., Khan, H. R. M., Rani, N. A. A., & Majid, M. I. A. (2018). Paraquat poisoning calls to the Malaysia National Poison Centre following its ban and subsequent restriction of the herbicide from 2004 to 2015. *Journal of forensic and legal medicine*, *56*, 16-20.

Nguyen, M. B., Pizon, A. F., Branas, C. C., & Fabio, A. (2016). Regional variations in pediatric medication exposure: Spatial analysis of poison center utilization in western Pennsylvania. *Clinical toxicology*, *54*(1), 47-52.

Pac-Kożuchowska, E., Krawiec, P., Mroczkowska-Juchkiewicz, A., & Melges, B. (2016). Patterns of Poisoning in Urban and Rural Children: A Single-Center Study. *Advances in Clinical and Experimental Medicine, 25*(2), 335-340.

Pourmand, A., Wang, J., & Mazer, M. (2012). A survey of poison control centers worldwide. *DARU Journal of Pharmaceutical Sciences*, *20*(1), 13. https://doi.org/10.1186/2008-2231-20-13

Ramathibodi Poison Center, F. o. M. R. H., Mahidol University. (2015). *Ramathibodi Poison Center*. https://www.rama.mahidol.ac.th/poisoncenter/en/about_us

Rhalem, N., Aghandous, R., Chaoui, H., Eloufir, R., Badrane, N., Windy, M., Hardouz, H., Ouammi, L., Soulaymani, A., & Soulaymani-Bencheikh, R. (2013). Role of the poison control centre of Morocco in the improvement of public health. *Asia Pacific Journal of Medical Toxicology*, *2*(3), 82-86.

Sabahi, A., Asadi, F., Shadnia, S., Rabiei, R., & Hosseini, A. (2022). Data Infrastructure for a Poisoning Registry with Designing Data Elements and a Minimum Data Set. *Shiraz E-Medical Journal*, *23*(5), e116103. https://doi.org/10.5812/semj.116103

Saoraya, J., & Inboriboon, P. C. (2013). Acute poisoning surveillance in Thailand: the current state of affairs and a vision for the future. *International Scholarly Research Notices*, *2013*. https://doi.org/10.1155/2013/812836

Sapbamrer, R., Sittitoon, N., Thongtip, S., Chaipin, E., Sutalangka, C., Chaiut, W., La-Up, A., Thirarattanasunthon, P., Thammachai, A., & Suwannakul, B. (2024). Acute health symptoms related to perception and practice of pesticides use among farmers from all regions of Thailand. *Frontiers in Public Health*, *11*, 1296082.

Saud, M., Mashud, M. i., & Ida, R. (2020). Usage of social media during the pandemic: Seeking support and awareness about COVID-19 through social media platforms. *Journal of Public Affairs*, *20*(4), e2417.

Siriraj Poison Control Center, F. o. M., Siriraj Hospital. (2020). *Siriraj Poison Control Center*. https://www.si.mahidol.ac.th/th/division/shtc/index.asp

Somboon, S., Jirapongsuwan, A., Kalampakorn, S., & Tipyamongkolkul, M. (2022). Acute pesticide poisoning among mixed-crop agricultural workers in Thailand. *Trends in Sciences*, *19*(3), 2154-2154.

Spiller, H. A., & Griffith, J. R. (2009). The value and evolving role of the US Poison Control Center System. *Public Health Reports*, *124*(3), 359-363.

Vo, K., & Smollin, C. (2015). Online social networking and US poison control centers: Facebook as a means of information distribution. *Clinical toxicology*, *53*(5), 466-469. https://doi.org/10.3109/15563650.2015.1014906

Whitten-Woodring, J., Kleinberg, M. S., Thawnghmung, A., & Thitsar, M. T. (2020). Poison if you don't know how to use it: Facebook, democracy, and human rights in Myanmar. *The International Journal of Press/Politics*, *25*(3), 407-425.

World Health Organization. (2016). *Poisoning prevention and management.* https://www.who.int/ipcs/poisons/en/

World Health Organization. (2021). Guidelines for establishing a poison centre. https://www.who.int/publications/i/item/9789240009523