

The Influencing Factors of Consumer Purchase Intention Towards Innovative Herbal Topical Anesthetic Spray

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Abstract—The purpose of this study is to evaluate the effect of the factors influencing consumer purchase intention toward the innovative product of herbal topical anesthetic spray. A total of 150 questionnaires were collected from participants who were in the presence of oral ulcers with or without receiving the topical anesthetic in their medical history using an online self-administered questionnaire. The factors influencing consumer purchase intention on the innovative herbal topical anesthetic spray are evaluated into 7 factors: attitude, product attribute, price, place, promotion, social influence, and source of information. The questionnaire was divided into three parts including characteristics and past medical history data, factors of consumer purchase intention toward the product, and characteristics of participants. The collected data were analyzed by SPSS version 22.0. The characteristics of respondents and their past medical history were summarized as frequencies and percentages. Each factor was present in the descriptive data as an average score with standard deviation and level of influence. The Multiple regression analysis was used to identify the influence between consumer purchasing intention and related factors. The result showed the most important level of product and place factor. Moreover, a positive significant influence was indicated between attitude, price, place, and consumer purchase intention. Creating a positive attitude, presenting the product differentiation to increase the price, and choosing a convenient place with medical personnel to sell the product is essential to increase consumer purchase intention. This finding can help this herbal product to improve its product attribute to meet consumer preference and develop a suitable strategy to increase consumer purchase intention.

Keywords—Purchase intention, Innovative product, Herbal medicine, Topical anesthetic spray

I. INTRODUCTION

Acceptance of herbal products is increasing around the world indicated by the strong variation in growth rate. The global herbal or traditional products market size is USD 49,119.1 million in 2020 and is expected to reach USD 67,382.7 million by 2025 [1]. Similar to the situation in Thailand, The herbal or traditional products market size is 45,837 billion baht in 2020 and is expected to reach 53,236.5 billion baht in the next 5 years [2]. The export value of Thai herbal medicine nearly reach 10,000 billion baht [3]. This indicated the potential

for Thai herbal medicine to expand to a global market. The increasing preference for herbal medicine is from consumer behavior. Moreover, the policy of the Ministry of Public Health of Thailand encourages all public hospitals to integrate herbal products into the health care service [4]. These factors affect the growth of herbal medicine market. However, only 4% of herbal is develop into herbal medicine [5]. The herbal product is usually produced with a simple manufacturing process that lacks innovation to improve efficacy and gain more value to improve herbal medicine. Using innovation is the key to improve herbal to herbal medicine.

A topical anesthetic is a medicine that causes numbing when applied to the surface of the body. The medicine inhibits action on the nerve membrane near the site of administration, causing loss of sensation on the superficial layer. The purpose of using a topical anesthetic on oral mucosa is to relieve pain or uncomfortable caused by injury, disease, and dental procedures. It is usually used to treat painful oral conditions such as aphthous ulcers, teething, or sores in the Hand, foot, and mouth disease (HFMD) in children and adults.

The most common local anesthetic for the mucous membranes in the mouth and pharynx is composed of chemical active ingredients such as Lidocaine HCl, Benzocaine, and Tetracaine. These chemical active ingredients have been reported as safety concerns in children. Life-threatening and fatal events can be found in infants and children younger than 2 years of age [6], [7]. However, alternative local anesthetic medicine is still not available.

Even though various topical preparations such as solution, gel, and ointment are available in the market, they still do not meet patient requirements. The solution can apply to every area of the mouth and pharynx. However, it is easily eliminated through saliva and cannot attach to the mucous which leads to short contact time in a painful area. Gel and ointment offer longer contact time in the painful area, but they are difficult to apply in a deep area or the pharynx. These preparations are inconvenience to use. They mostly need additional equipment such as syringe or cotton bud to apply the medicine to the affected area.

From the safety concern, the interest in traditional medicine has led to the investigation of medicinal herbs for relieving

pain. Clove oil is an essential oil that can be used as a food ingredient, aromatic and herbal medicine. It is notable in the treatment agent for oral diseases such as toothache, and it is widely used in dentistry. It is also considered a safe (GRAS) substance by US Food and Drug Administration [8]. The active ingredient in clove oil, Eugenol, offers many pharmacological activities and therapeutic effects such as anesthetic, analgesic, anti-inflammatory, antioxidant, antibacterial, antifungal, and antiviral [9]. According to the long history of use, efficacy, and safety, clove oil can be considered a potential medicine for topical anesthetic to reduce pain in the mucous of the mouth and pharynx. Furthermore, an ideal topical anesthetic would be easy to apply and show effectiveness by attaching to the mucous in a painful area.

Unavailable safe anesthetic agents and effective formulations for topical anesthetic make an innovative herbal topical anesthetic spray possible for alternative use. This product uses clove oil, which is a safe substance with efficacy and safety. In addition, the product develops by using in situ gelling systems for drug delivery to increase ease of use. This spray is a solution at room temperature, making it easy to spray on any painful area. When this solution attaches to the oral mucosa, it will transform into a gel. The transition from solution into gel will increase contact time in painful areas and prevent the elimination of saliva. As a result, this product will increase medication compliance and quality of life in patient who suffers from oral pain.

Purchase intention is a significant factor in predicting actual purchasing behavior and actual purchase. The purchasing possibility of consumers is associated with their purchase intention. Many studies have presented the factors influencing consumer purchase intention on herbal medicines and products. The relationship between the attitude of the consumer towards consumer purchase intention for herbal medicine and the herbal product was indicated in several studies [10]-[12]. The consumer evaluated herbal as a natural product with fewer or no side effects [13] and harmless [14]. For Product attribute, the study of C. Thongruang [15] showed the factor that influences consumer purchasing behavior for herbal medicine was complete information on the label and offer good indications. Quality [16], the legality of product registration [15], [16] and Safety [10], [11], [16] of the product are also presented in several studies. The effect of price, place and promotion factors on herbal medicine consumption behavior was present in the study of S. Satsue [16]. Social influencer [14], [16] and sources of information [13]-[15] were also indicated as important factors in consumer decisions.

The influencing factors summarize into 7 factors: attitude, product attribute, price, place, promotion, social influence, and source of information as shown in Table 1.

TABLE I. FACTORS INFLUENCING CONSUMER PURCHASE INTENTION ON HERBAL MEDICINES AND HERBAL PRODUCTS

Factors	Detailed	Reference
1. Attitude	• Be healthier, more natural, higher tolerability, fewer or no side effects, trustable	[13]
	• Harmless	[14]
	• Attitude relates to purchase intention	[10]-[12]
2. Product attribute	• Complete label	[15]
	• Drug indications	[15]
	• Quality	[16]
	• Registered and approved by the regulatory agency governing	[15], [16]
	• Safety	[10], [11], [16]
3. Price	• Price-quality relationship	[16]
4. Place	• The place with medical personnel and convenient (hospital or pharmacy)	[16]
5. Promotion	• Promote herbal medicine used through hospital	[16]
	• Online advertising and social media advertising	[17]
6. Social influence	• Medical personnel – Physician, Pharmacist, Nurse	[14], [16]
7. Source of information	• Book/Magazine, Parents and Medicinal expert	[13]

The purpose of this study is to evaluate factors influencing consumer purchase intention on the innovative product of herbal topical anesthetic spray. The influencing factors is evaluated into 7 factors according to literature review: attitude, product attribute, price, place, promotion, social influence, and source of information. The conceptual framework is shown in Figure 1.

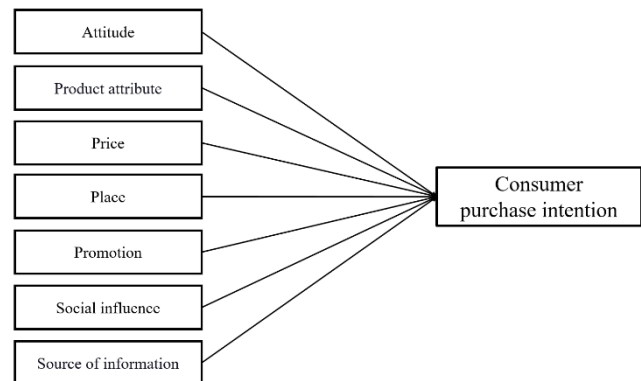


Fig. 1. Conceptual framework

II. METHODOLOGY

A. Sample

The population for the study consisted of participants 20 years of age or older who were presence of oral ulcer with or without receiving the topical anesthetic in their past medical history. Quota sampling was used to determine the sampling technique. The sample size in this study was calculated by G*Power software. The minimum number of respondents suggested by the analysis was 153. Data

were collected from participants in Thailand through a self-administered questionnaire.

B. Instruments

A self-administered online questionnaire created by Google form was used as the data collection method. The questionnaire consisted of 3 parts. The first part was past medical history data (oral ulcers incidence, frequency of oral ulcer incidence, history of receiving the topical anesthetic and frequency of receiving the topical anesthetic). The second part was related to the factors of consumer purchasing intention toward the innovative herbal topical anesthetic spray. Items were scored on a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5) and were calculated into the level of influence. The last part was the data on the demographic characteristics of participants (gender, age, and education level).

The content validity of the questionnaire was evaluated by three experts based on the item objective congruence (IOC) index. The content validity scores in the final questionnaire were greater than 0.50. Thus, the validity of this questionnaire was acceptable.

The reliability of the questionnaire was measured using Cronbach's alpha test in 30 respondents in a pilot study. To indicate consistency between the item's variables, the acceptable value of Cronbach's alpha score should be greater than 0.7. The instrument reliability of this study was performed using 30 respondents from a pilot test. The reliability of attitude, product attribute, price, place, promotion, social influence, and source of information was 0.903, 0.958, 0.712, 0.704, 0.754, 0.868, and 0.845, respectively.

The result indicated that all items were valid and reliable. This questionnaire was suitable for evaluating factors influencing consumer purchase intention on innovative herbal topical anesthetic spray.

C. Data analysis

The collected data were analyzed by SPSS version 22.0. The characteristics of respondents and their past medical history were summarized as frequencies and percentages.

Level of influence in each factor were present the descriptive data as average score with standard deviation. The average score from factors of consumer purchasing intention was calculated and was rated into a level of influence

where:

- (1) Average score of 1.00-1.80 indicates no importance.
- (2) Average score of 1.81-2.60 indicates low importance.
- (3) Average score of 2.61-3.40 indicates neutral.
- (4) Average score of 3.41-4.20 indicates importance
- (5) Average score of 4.21-5.00 indicates the most importance.

The Multiple regression analysis was used to identify the impact of selected factors and their influences on consumer purchasing intention. The statistically significant was determined by $p < 0.05$.

III. RESULTS AND DISCUSSION

A. Characteristic of Respondents

From 153 respondents suggested by G*Power analysis, the completed questionnaires in this study were 150 respondents. The response rate was 98.04 percent. According to the table 2, most participants were women with the ages ranging from 36 – 49 years. Education levels of participation were equal between undergraduate education and graduate education.

For their past medical history in table 3, every participant was the presence of an oral ulcer with 4.09 average times per year (max=20, min=1, Mean \pm SD = 4.09 \pm 3.46). Most participants never receive the topical anesthetic. The average use per year of topical anesthetic users was 2.48 times (max=12, min=1, Mean \pm SD = 2.48 \pm 1.86).

TABLE II. DEMOGRAPHIC INFORMATION OF PARTICIPANTS (N=150)

Variables	n (%)
Gender	
Male	33 (22.0)
Female	117 (78.0)
Age (Years)	
20 – 35	58 (38.7)
36 – 49	73 (48.7)
\geq 50	19 (12.7)
Education level	
Undergraduate	75 (50.0)
Graduate	75 (50.0)

TABLE III. PAST MEDICAL HISTORY OF PARTICIPANTS

Variables	n (%)	Mean \pm SD (Range)
Presence of oral ulcer		
Yes	150 (100.0)	
No	0 (0.0)	
Frequency of oral ulcer incidence (Times per year)		4.09 \pm 3.46 (1 - 20)
History of receiving topical anesthetic		
Yes	65 (43.3)	
No	85 (56.7)	
Frequency of receiving the topical anesthetic (Times per year)		2.48 \pm 1.86 (1 – 12)

B. Factors of consumer purchase intentions towards the Innovative herbal topical anesthetic spray

Factors of consumer purchase intentions towards the innovative herbal topical anesthetic spray were evaluated into 7 dimensions - attitude, product attribute, price, place, promotion, social influence, and source of information. Table 4 present the descriptive data, which are the average score and influence level of factors influencing consumer purchase intention.

The first factor with the highest influence score was product (Mean 4.45 ± 0.47) with the most importance level. For the product attribute factor, participants strongly agree that the product should produce with high quality and standards from a trustworthy manufacturer. They also considered about indication, efficacy, safety, and flavor of the product. Moreover, the product form should be attractive, easy to use, portability. Our study showing the product attribute of this herbal medicine was consistent with the suggestion in several studies [10], [15], [16]. The innovative product with herbal containing should meet the requirement of the consumer to gain consumer acceptance. Besides quality and safety, the packaging design is also important [18].

The second factor was place (Mean 4.38 ± 0.50) with the most importance level. Participants considered receiving this product from a place with medical personnel (hospital or pharmacy) and a convenient place (convenience store, supermarket, or mall) as the most important level. It appears that consumers expect to receive the product in a convenient place with medical personnel. Thus, research by Satsue, Prompomjorn, and Rukpurk [16] found that people considered receiving herbal medicine from a place with medical personnel (hospital or pharmacy) more than a convenient place because they trust in the medical personnel. This is possibly due to the different groups of participants that focus only on one district. For pharmaceutical products, the distribution channel must follow the regulation of the Thai FDA regarding their registration. The medicine can be sold only in a licensed place such as a hospital or pharmacy. Thus, a pharmacy in the community or shopping mall is an appropriate place to sell the product to meet consumer requirements. Moreover, telemedicine applications are a new channel to distribute the product. With the growth of service innovations, telemedicine applications offer a convenient medical service to the consumer.

The third factor was promotion (Mean 4.14 ± 0.59) with importance level. Receiving product information from an offline channel such as a hospital or a pharmacy influenced participants the most. However, the online channel also gained high levels of impact on consumer purchasing intention. This finding supports the study of Karnreungsiri and Praditsuwan [17] that online advertising and social media advertising are very influential in customer purchasing behavior. The results indicate that the offline channel should be the main channel for introducing product information to the consumer. The online channel has the potential to use as a new channel for introducing product information and building product awareness. However, the promotion strategy should relate to laws and regulations of product registration.

The fourth factor was attitude (Mean 4.08 ± 0.51) with importance level. For attitude toward the innovative herbal topical anesthetic spray, Participants strongly considered that the product is natural and safe. Participants also agree that the product is safe for oral use, efficacy, possible to use as alternative medicine and less adverse drug reaction, respectively. Attitude is one of the important factors that influence behavioral intention [12]. A positive attitude of

participants strongly influences intention and actual purchase [11]. These results indicate that participants are well acceptant of this herbal medicine as effective and unthreatened, which affects purchasing intention and actual purchase. Our finding agreed with the previous studies on the participants' attitudes toward herbal medicine. Most participants consider herbal medicine as more natural, with fewer side effects, trustable [13], and harmless [14].

The fifth factor was price (Mean 3.94 ± 0.71) with importance level. For the product's price, Participants were willing to pay more compared with the conventional topical anesthetic at a high level. Participants mostly suggested that the price of this product should not be more than 5% compared with conventional topical anesthetic. Price image [19] and perceived price [20] affected purchase intention. There is a relationship between price and quality; therefore, the consumer accepts that a higher product price indicates a higher level of quality. The results indicate that when consumers perceive the product's benefit and ease of use, their willingness to pay will increase.

The sixth and seventh factor was social influencer (Mean 3.90 ± 0.53) and source of information (Mean 3.83 ± 0.54) with importance level, respectively. Social influence played an important role in consumer purchase intentions. Social influence impacts people's attitudes and behaviors [21], [22]. The opinion of physicians, pharmacists, and other medical personnel received the highest score, which impacted the customers' intention the most. Family members, relatives, and friends were considered at a high score, whereas influencers or bloggers were considered at a medium score. These results emphasize the effect of the trust and confidence of the consumer in medical personnel. The suggestion and recommendations by medical personnel to the consumer before purchasing have influenced their purchase intention.

The source of information is also important for consumer purchase intentions. Most consumers usually searched for information before purchasing. The most accepted sources for the product information were people with a medical background [15], [16]. The most important source of information is physicians, pharmacists, and other medical personnel. Family members, relatives, friends, and media were considered at a high level, while influencers or bloggers were considered at a medium level. Similar to the social influence result, medical personnel gain more trust and confidence than others. The result suggests that medical personnel is the key person that affects consumer purchase intention. Consequently, a medical representative should introduce the product to increase product awareness, which leads to the recommendation and prescribing for patients. Average score and influence level of factors influencing consumer purchase intention

TABLE IV. AVERAGE SCORE AND INFLUENCE LEVEL OF FACTORS INFLUENCING CONSUMER PURCHASE INTENTION

Factors	Mean ± SD	Influence level
Product	4.45 ± 0.47	The most importance
Place	4.38 ± 0.50	The most importance
Promotion	4.14 ± 0.59	Importance
Attitude	4.08 ± 0.51	Importance
Price	3.94 ± 0.71	Importance
Social influencer	3.90 ± 0.53	Importance
Source of information	3.83 ± 0.54	Importance

The results from multiple regression analysis present factors that influence consumer purchase intention on the innovative product of herbal topical anesthetic spray. The model evaluation uses the stepwise regression analysis. The coefficient of determination value (R square) of the final model was 0.47. Product, promotion, social influencer, and source of information were independent variables that were removed from the final model according to their statistical significance.

As a result, the final model consisted of three independent variables, which were attitude, price, and place with a significant level ($p < 0.05$). The multiple linear regression analysis result is presented in table 5.

Multicollinearity of a set of multiple regression variables was detected by Variable Inflation Factors (VIF). VIF values exceeding 5 indicate as high multicollinearity with a group of independent variables. VIF value of attitude, price and place in the model was 1.350, 1.326, and 1.217, respectively. The results showed that this model was acceptable with VIF values less than 5. The equation (1) presents consumer purchase intention for the innovative herbal topical anesthetic spray.

$$\text{Consumer purchase intention} = -0.224 + 0.290 \text{ Attitude} + 0.368 \text{ Price} + 0.359 \text{ Place} \quad (1)$$

The multiple linear regression analysis results and estimated model indicate that attitude, price, and place factors significantly influence consumer purchase intention.

The positive attitude of consumers towards the product will increase consumer purchase intention. The finding suggests that perceiving of naturalness of the product is an essential factor to create positive attitude of consumers. The product show presents the natural of active ingredient, clove oil, to increase their preference.

A positive influence between price factors was observed. The price of the product significantly influences consumer purchase intention. The consumer purchase intention still increases when the price of the product is higher. However, consumers consider the relationship between the price and quality of a product. Consumers accept higher prices with higher product quality. As a result, consumer purchase intention will increase when product price relates to its quality.

A positive influence between place factors was found. The important factor is the presence of medical personnel and convenience. The place with medical personnel and convenience will increase consumer purchase intention. However, the place is related to product registration. If the

product categorizes as medicine, it must be sold in a registered place. To increase convenience, the product should sell in pharmacy in the community or shopping mall. Furthermore, telemedicine applications are one the place that should be investigated.

The finding suggests that the product should present the naturalness through the main ingredient - clove oil, improve quality to meet price and quality consumer preference, and sell in a convenient place with medical personnel.

TABLE V. MULTIPLE LINEAR REGRESSION ANALYSIS RESULT

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-.224	.409		-.547	.585		
Attitude	.290	.091	.222	3.176	.002	.741	1.350
Price	.368	.066	.388	5.600	.000	.754	1.326
Place	.359	.088	.271	4.073	.000	.822	1.217

IV. CONCLUSION

The objective of this research is to evaluate the factors which influence consumer purchase intention toward the innovative herbal topical anesthetic spray. In the pre-commercialization business analysis stage of the new product development process, this information is essential for developing an effective marketing strategy.

The study found that product and place are considered the most important level with the high influence score. Followed by, promotion, attitude, price, social influencer, and source of information are considered important levels. The study indicated that attitude, price, and place factors significantly influence consumer purchase intention. These three factors showed a positive influence between consumer purchase intention. Most people have a positive attitude towards herbal medicine. They relate herbal medicine as natural and safe. As a result, the product should emphasize safety and efficacy issues to gain a positive attitude from consumers and to increase consumer purchase intention toward the products. The product quality should meet consumers' expectations because they relate price to the quality of the product. The higher price is accepted if this product offer advantages over the conventional product. Furthermore, a suitable distribution channel should be a convenient place with medical personnel which is determined by product registration.

This finding can help this herbal product to improve product attribute to meet consumer preference and develop a suitable strategy to introduce the product to the market and increase consumer purchase intention with these essential factors.

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