Contents lists available at GrowingScience

# International Journal of Data and Network Science

homepage: www.GrowingScience.com/ijds

# Exploring consumer attitudes: Organic herb cordyceps and intention to purchase

# Natphasuth Patthirasinsiria\*

<sup>a</sup>KMITL Business School, King Mongkut's Institute of Technology Ladkrabang, Bangkok 10520, Thailand

#### CHRONICLE

# Article history: Received: July 5, 2023 Received in revised format: July 25, 2023 Accepted: August 6, 2023 Available online: August 6, 2023

Keywords:
Organic herb cordyceps
"Thungchao"
Perceived heath benefit
Subjective norm
Cordyceps mushroom
Health
Online purchase
Social media
Communication

#### ABSTRACT

Cordyceps are a form of herb that is nurtured and propagated utilizing organic farming techniques. This study investigated consumers' intention towards adopting the organic herb cordyceps, also referred to as "Thungchao" in Thai language. The research was driven by increased health awareness among people, and skewness towards use of organic as compared to conventional medication. In Thailand, the herb has been consumed traditionally for years, because of its medical benefits. The Theory of Planned Behavior (TPB) was applied to investigate the outcomes of users' perceptions (perceived experience with organic product, perceived health benefit, information awareness) and TPB aspects (subjective norm, perceived behavioral control, attitude towards organic herb) to examine intentions of consumers' towards adopting codyceps. The research collected primary data from 452 Thai respondents. Collected data were evaluated utilizing Structural Equation Modeling analysis. Results revealed that for the perceived customers' experience, intention to use organic herb cordyceps was positively and significantly influenced by perceived experience with organic hers and information awareness. All the TPB variables - subjective norm, perceived behavior control, and attitude towards organic herbs - significantly and positively influence consumers' intention towards organic herb cordyceps. The research recommended that organic herb cordyceps "Thungchao" has many medical benefits, and its consumption should be encouraged. Information awareness and sharing of the knowledge of the herb's medical requirement and benefits, resources and dosage are necessary to encourage or rather influence consumers intention.

© 2023 by the authors; licensee Growing Science, Canada.

## 1. Introduction

The organic herb cordyceps also referred to as "Thungchao" in Thai language has been in use for decades as an organic herb. It is scientifically referred to as the *Cordyceps militaris* or the Cordyceps. Mushrooms (Jędrejko, Lazur & Muszyńska, 2021). It has a long tradition of use in Asian countries, especially in Thailand because of its medical benefits such as aptitude to mitigate fatigue and boost human immunity. Inhabitants of Thailand and other countries such as China, India and Nepal consume cordyceps, from a tradition dating back to hundreds of years to help them adapt to the inclement mountainous terrain (Wang et al., 2016). These conditions include low temperatures, elevated atmospheric pressure, and low environmental oxygen levels. It has been recommended in Asian countries as a vital herb for management and treatment of various illnesses such as cardiac and pulmonary health issues. These include the kidney, lungs and liver disorders, malignancies, parasitic infections, STDs, hormonal imbalances, and various infectious diseases (Agrawal, et al, 2017).

The organic herb cordyceps, commonly referred to as the cordyceps mushroom, has been consumed raw as a tradition for years. Besides being used and applied in tonic medicine, it is currently being applied in the modern systems of medicine. Its processing and packaging are also currently done, where it is referred to as cordyceps mushroom powder. The herb has been

\* Corresponding author.

E-mail address: natphasuth.pa@kmitl.ac.th (N. Patthirasinsiri)

ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print) © 2023 by the authors; licensee Growing Science, Canada. doi: 10.5267/j.ijdns.2023.8.003

considered to have several medically verified benefits to the human body (Das, Masuda, Sakurai & Sakakibara, 2010). The organic herb is considered to promote a healthy heart, through its antispasmodic and anti-inflammatory properties, which are vital in strengthening the cardiovascular and enhancing blood circulation. It is also considered to play a critical role in strengthening blood sugar levels and lowering cholesterol levels. The organic herb cordyceps is also considered to be a strong source of energy, stamina and endurance by boosting the energy level uptakes in the body, as well as ensure cellular energy creation (Manideep & Reddy, 2019).

Traditionally, cordyceps have been harvested from the wild, but over time, the herb has become significantly rare in the present and hard to get. Due to these restrictions, studies on the growth and generation of cordyceps have been carried out using a variety of techniques for a long time (Wongsorn et al., 2021; Kontogiannatos et al., 2021). Since cordyceps is cultivable, growing it has been considered as a common method for ensuring its supply for medical purposes. Additionally, researchers have attempted to study the various aspects with potential to improve growing conditions (Tao et al., 2020; Wen et al., 2019). However, it is critical to understand that the growth or qualities of cordyceps are significantly impacted by changes in the environment (Sung et al., 2010).

So much focus has lately been placed on promoting organic anti-inflammatory drugs that are safer and have fewer negative effects. Since the beginning of time, organic items have been used to treat illnesses and promote general health (Adeniji, 2019). A therapeutic empire made up of substances extracted from or derived from natural sources was built on the foundation of the discovery of pharmacologically active morphine, which gave rise to the current system of medicine (Turk et al., 2022). Scientists were previously pushed to concentrate on the large-scale production of therapeutic compounds due to the paradigm shift away from isolation from natural sources and toward synthesis or combinatorial chemistry. Recent decades have seen a resurgence of natural products due to laborious efforts and decreased productivity in the synthetic process.

The growing concern about health, which is the most important part of human life, has become a topic of attention in recent years. People are becoming more aware and interested in their health status and health consumption. There is a more careful selection of what people are consuming and taking care of after they feel sick or injured (Ronald & Adamchak, 2017).). And they have been trying to find ways to make themselves healthier every day. This can be seen in the increase in the number of fitness centers and gyms around the world. Among the major ways people are focusing on to improve their health is organic products (Patel, Sharma & Purohit, 2021). The demand for organic herbs and organic food has been increasing in recent years as more people become aware of the benefits of consuming products that are free of harmful chemicals and pesticides. Many people believe that organic herbs are healthier and more nutritious than conventionally grown herbs. Some research suggests that organic herbs may contain higher levels of certain antioxidants and other beneficial compounds, but further clarity is required to fully understand the differences (Singh et al., 2021). In Thailand, the use of organic herbs has been a common practice among the community, for medicinal purposes (Van Doan et al., 2017). However, few studies have been carried out to assess adoption intention, measuring the organic herbs status. Specifically, this research did not spot any research that investigated the intention to use organic herb cordyceps "Thungchao" in Thailand. Therefore, with the intention to bridge this lacuna, the study has as its main aim to investigate the consumers' intention towards organic herb cordyceps.

## 2. Literature Review

## 2.1 Organic Herb in Thailand

The organic herb market is growing at a rapid pace. The demand for organic herbs has increased because of health concerns and environmental concerns. More people are adopting organic herbs nowadays. Organic farms have been increasing in number, while the demand for organic herbs has also gone up due to their health benefits and environmental benefits (Ayyub et al., 2021). The growth of the organic herb market will be driven by the rising demand for natural products, especially since people are becoming more conscious about their health as well as their environment. The global market size of organic herbs is expected to grow from \$15 billion in 2015 to \$21 billion by 2020 at a CAGR of 6.4% over the 2015-2020 period (The Business Research Company, 2023). Among the organic herbs is cordyceps which is being studied for its potential use as an anti-inflammatory agent. It has been ascertained to be an effective treatment in animal models to treat inflammatory bowel disease, rheumatoid arthritis and other autoimmune diseases. The benefits of cordyceps may also be extended to people living with diabetes and other metabolic disorders; some studies have found that cordyceps can improve glucose tolerance in people who are overweight or obese (Van Doan et al., 2017). In Thailand, cordyceps is typically found growing in the wild on high mountain ranges and is collected by farmers and sold as a dietary supplement. Some organic farmers in Thailand may also cultivate Cordyceps using organic methods, but it is a rare and expensive product.

Organic cultivation of cordyceps in Thailand is a contemporary and evolving industry. Organic farmers in Thailand use natural and sustainable methods to cultivate cordyceps, without the use of synthetic chemicals, pesticides or fertilizers (Ayyub et al., 2021). This ensures that the cordyceps produced is of high quality, safe to consume and free of harmful chemicals. Organically cultivating cordyceps in Thailand helps to support local farmers and promote sustainable farming practices and conservation effort (Patel et al., 2021; Ndinojuo. 2020). Cordyceps is a highly valued medicinal herb in Thailand, it is used for many health issues like fatigue, asthma, diabetes, and cancer. The high-altitude and cool temperatures that are ideal for the growth of Cordyceps in Thailand (Thakur, Singh, Goyal & Kumar, 2022). Cordyceps growth in the wild has become scarce and expensive; Thai farmers are exploring innovative methods to cultivate this herb considered valuable. Organic cultivation is one of

the best ways to cultivate Cordyceps because it is natural, sustainable, and safe for consumption (Laohaphatanaler & Gavinlertvatana, 2020). This is why many farmers are starting to explore the possibility of organic Cordyceps cultivation in Thailand.

## 2.2 The place of Theory of Planned Behavior in cordyceps research

The Theory of Planned Behavior is the theoretical framework the study was hinged on; it is a theory of behavior change developed by Ajzen and Fishbein in 1975 The ideology driving the model is propelled by the notion that individuals tend to participate in explicit behaviors because of the belief those actions will lead to a favorable desired outcome; the TPB has been applied to explore and elucidate a wide range of human behavior. For example, the TPB was used to explain the success of the condom program in the United States, which has dramatically reduced rates of sexually transmitted diseases (STDs) (Ajzen, 2020). TPB suggests that the behavior of individuals can be altered based on their beliefs about specific requirements to fulfil life goals; these include both conscious and unconscious beliefs and intentions as well as their knowledge of previous behavior. In research, the TPB has been used to predict health behaviors such as smoking, dieting and exercise; occupational behaviors such as job performance; political behavior such as voting; sexual activity; and academic performance (Ulker-Demirel & Ciftci, 2020).

The TPB proposes that individuals evaluate their current behaviors and the outcomes of these behaviors; this evaluation will determine whether the individual intends to change his/her current behavior in the future. If an individual has a pre-planned action (i.e., he/she already knows what he/she wants), then he/she will attempt to change his/her current behavior for it to achieve his/her goal; if not, then he/she will continue with his/her current behavior without any change at all (Bosnjak, Ajzen & Schmidt, 2020). From this standpoint, the incorporation and utility of organic herbs such as cordyceps would be influenced by the health goal that an individual would be willing to achieve. Considering that people are more concerned about their health, this would drive them to using organic herb cordyceps.

## 3. Variables and Hypothesis Development

This section evaluated the existing literature related to the topic and the understudied determinants. The research was hinged on the Theory of Planned behavior, from which three variables that could predict human behavior towards the adoption of organic herb cordyceps were developed –perceived behavior control, subjective norm, and attitudes towards buying.

**Subjective Norm:** The concept denotes how much societal pressure individuals feel to engage in each action (Ajzen & Fishbein, 1980). It could be the personal drive to take advantage of chances presented by those who have significance for the person (Taylor & Todd, 1995). The subjective norm is also known as the social norm or normative reference point, and it refers to what people think others think about their behavior. The aspect of subjective norm is expected to exert pressure on the people to engage or rather adopt the use of organic herb cordyceps.

Perceived Behavioral Control (PBC): This is the discernment of an individual's resolve to control a particular environment. This includes perceptions of ability to select the time and place of work, the method of work, and the way one works. As a result, those who feel themselves to have more personal control tend to have stronger behavioral intentions (Ajzen, 1991). For individuals to make optimal decisions in uncertain environments, they need information about how others are likely to act so that they can predict future outcomes (Xiao & Wong, 2020). When individuals do not have sufficient information about others' behavior it leads them to rely on other people's intentions. The aspect of perceived behavior control would indicate the people's perception towards their ability to adopt the organic herb cordyceps.

Attitude towards buying: the concept of the attitude towards buying, inferring from Ajzen (1985) implies the declaration of support or hostility toward an individual, location, items, event, etc. It is associated with a measure of how the mind of a person is ready to act or react in a particular manner. It is a theoretical construct that conveys the degree to which a person's tendency to purchase goods and services depends on their anticipated benefits. The applications of the Theory of Planned Behavior include many studies to explain consumer behavior. Attitude towards buying is defined as the beliefs, attitudes, and feelings about purchases in general (Manideep & Reddy, 2019). The theory states that consumers' behavior varies with the attitudes they must have towards buying a good or service. Consumers who are more likely to buy a product or service will demonstrate an ABT-PB attitude, which means they will be more likely to buy it if they have favorable attitudes towards it. Attitudes influence beliefs and behaviors so that if you have an unfavorable attitude towards something, you will probably not be as likely to purchase it as someone with a favorable attitude.

H<sub>1</sub>: Consumers' subjective norm has a significant influence on the attitude towards buying organic herb cordyceps.

H2: Perceived behavior control has a significant influence on the attitude towards buying organic herb cordyceps.

H<sub>3</sub>: Attitude towards organic herbs has a significant influence on the attitude towards buying organic herb cordyceps.

The concept of user perception was used to develop the study variables and the resultant hypothesis. The user perception aspects considered were the past experience with organic products, perceived health benefit, and information awareness.

Past Experience: Past experience is the best way to predict future behavior. As a result, experience can be used to predict future adoption and usage. Experience is a major factor in the adoption of products. Many people use products for the first time after going through a trial period, which is called "fast-tracking" (Shi, Wang, Chen & Zhang, 2020). This means that they will adopt a product if it meets their needs and solves their problems (Chawla & Joshi, 2019). For the case of organic herb, past experience is also important when both adopting and recommending the organic herb cordyceps. In this case, past experience influences future adoption of the organic product because people will make decisions based on their past experiences with similar products and services. From the analysis above evaluation, the following hypothesis was developed:

Perceived Health Benefit: A perceived health benefit is a subjective measure of the satisfaction derived from a particular product, service or activity. The perceived health benefit is the difference involving the specific health benefit and the anticipated usefulness of that health benefit. The specific health benefits are determined by using published research data and by observing how people respond to their current use of products or services (Shin & Kang, 2020). The perceived health benefit can be used to evaluate the effectiveness of a particular intervention. In this case, the adoption of organic herbs would be influenced by how people perceive their health would be if they were to use it. It would be a factor in how their health would improve.

**Information awareness:** Information awareness effect on intention to adopt is the result of exposure to the information. The individuals are exposed to a message that they need to take some action or make changes. This leads them to decide about taking action or not. According to Prokopy et al., (2019) people who are informed about the issue tend to be more likely to act than those who are not informed about it. The information awareness effect is a theory in consumer behavior, which states that consumers exhibit a higher propensity to engage in willful acts of purchasing products or services, if they discern to have been exposed to the products or services. Information is an important factor in consumer decision-making. The level of awareness would influence the likeliness of adoption of organic herbs (Sobti, 2019). Following the above discussion, the following hypotheses were developed.

**H**<sub>4</sub>: Past experience with organic herb products has a significant influence on the attitude towards buying organic herb cordyceps.

 $H_5$ : Perceived health benefit with organic herb products has a significant influence on the attitude towards buying organic herb cordyceps.

**H**<sub>6</sub>: Information awareness of organic herb products has a significant influence on the attitude towards buying organic herb cordvceps.

## 4. Conceptual Framework

The hypotheses discussed enabled the advancement of the conceptual framework. This framework consists of six independent variables: subjective norm, perceived behavior control and attitudes towards buying, past experience with organic products, perceived health benefit, and information awareness.

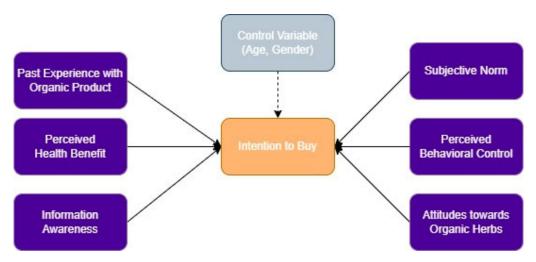


Fig. 1. Conceptual Framework of the Research

The initials used in the study were as follows PEO = perceived experience with organic product, PHB = perceived health benefit, IA = information awareness, SN = subjective norm, PBC = perceived behavior control, ATO = attitude towards organic herbs, ITB = intention to buy.

#### 5. Research Methodology

The quantitative research methodology was adopted for this study, where primary data was obtained from the sample participants. Quantitative techniques were used in the data analysis process. The study population was those who had used organic herb cordyceps at least once during their lifetime. These were considered suitable because they could effectively understand information regarding the product. Since a wide population had used the herb, a representative sample was selected as a representative of the population.

# 5.1 Questionnaire and Sampling

This research adopted a structured questionnaire as an instrument of data collection from respondents who had previously used the organic herb cordyceps in Thailand. The development and construction of the questionnaire was informed by the findings of the literature review and the theoretical background adopted. The questionnaire contained two parts; the first sought to answer questions on the social demographic of the respondents. The next second part contained questions on the various research variables used in the study. The questions were closed ended, which adopted the five--point Likert Scale (1-5 as strong disagree, disagree, neutral, agree, strongly agree). The study used a sample size of 452 respondents. The sampling technique adopted was convenient sampling, since the study focused only on the respondents who had a previous experience of the herb. This study was approved by the Ethics Committee of King Mongkut's Institute of Technology Ladkrabang; with approval number EC-KMITL\_66\_071.

## 5.2 Data Collection and analysis

The data was collected from participants in Bangkok city, Thailand from June 10, 2023 to July 25, 2023. The area was selected because it has a high population, and it is believed that the population was aware of the organic herb cordyceps. To collect the data, the study questionnaire was hosted on Google Forms, respondents were requested to fill the questionnaire online and submit. The data was analyzed using to evaluate the hypotheses, utilizing structural equation modeling. Before the assessment, the fitness of the collected data were evaluated using confirmatory factor analysis, validity and reliability tests.

#### 6. Results Presentation

## 6.1 Descriptive Statistics

The first analysis was the descriptive statistics of the study. The study encompassed an assessment of the demographic attributes of the participants, specifically focusing on age, gender, educational attainment, and employment situation. The findings are succinctly presented in Table 1.

**Table 1** Demographic details of participants

Variables	Variable levels	Variable levels Frequency (n)	
Employment	Public Sector	77	17
	Private Sector	65	14.4
	Self-employed	183	40.5
	Others	127	28.1
Education	Primary	77	17
	Secondary	111	24.6
	College	141	31.2
	University	123	27.2
Gender	Male	213	47.1
	Female	196	43.4
	Others	43	9.5
Age	18-20	0	0.0
C	21-30	48	10.6
	31-40	158	35
	41-50	149	33
	50+	97	21.5

The descriptive statistics indicated that the most popular age category is the 31-40 who comprised 35%, followed by the 41-50 range comprising 33%. The least age category was 0.0% recorded for those from 18-20. For the case of gender variables, the results indicated male were the majority of 47.1% while females were 43.4%. Those identified as others who do not consider themselves male or female constituted 9.5% of the participants. The education variable comprised most of the college level (31.2%) followed by university level (27.2%), then secondary (24.6%) and lastly the primary level (17%). The employment level of the respondent was evaluated, where the majority consisted of self-employed respondents (40.5%), followed by others (28.1%), then employment in public sector (17%) and lastly those employed in the private sector (14.4%).

# 6.2 Model Evaluation

The model was evaluated to see whether it fitted the data well. To carry out these tests, the confirmatory factor analysis (CFA) was performed. The fitness indices that were tested include Incremental Fit Index (IFI), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Normed Fit Index (NFI), and Goodness of Fit (GFI). The results indicated that the RMSEA = 0.063, which was within the required threshold of <0.08.It was also found that GFI = 0.913, NFI = 0.905, CFI = 0.928, and TLI = 0.902 were all above the required threshold of >0.900 (Awang, 2012; Byrne, 1994; Tucker & Lewis, 1973; Schumacker & Lomax, 2004; Kline, 2015).

**Table 2**Model Evaluation Results

Variables		Standardized coefficients	CR	AVE	Cronbach's Alpha
	ATB1	0.702			0.836
ATB	ATB2	0.771		0.543	
	ATB3	0.699	0.856		
	ATB4	0.759			
	ATB5	0.75			
	IA1	0.784		0.573	0.869
	IA2	0.712	0.870		
IA	IA3	0.756			
	IA4	0.733			
	IA5	0.798			
	ITB1	0.812		0.652	0.707
	ITB2	0.838			
ITB	ITB3	0.774	0.903		
	ITB4	0.829			
	ITB5	0.781			
	PCB1	0.692	0.829	0.493	0.852
	PCB2	0.742			
PBC	PCB3	0.704			
	PCB4	0.69			
	PCB5	0.682			
	PEO1	0.781		0.629	0.796
	PEO2	0.779	0.894		
PEO	PEO3	0.822			
	PEO4	0.818			
	PEO5	0.764			
	PHB1	0.806		0.606	0.760
	PHB2	0.761			
PHB	PHB3	0.815	0.885		
	PHB4	0.766			
	PHB5	0.743			
	SN1	0.701			
	SN2	0.695			
SN	SN3	0.69	0.825	0.486	0.869
	SN4	0.733			
	SN5	0.665			

Furthermore, it is important to consider the level of fitness of the model, the validity and reliability was also tested. The reliability was tested using convergent reliability and Cronbach's alpha. Fornell and Larcker (1981) stated that the required threshold for AVE is Cronbach's alpha and convergent reliability is 0.7 which was satisfied since all the values were above 0.7. The required threshold for average variance extracted (AVE) and standardized coefficients should be above 0.5 (Fornell & Larcker, 1981). This threshold was satisfied because all the values were above this threshold. Having satisfied the threshold tests for reliability, validity and model fitness, it was appropriate to test the hypothesis of the study.

## 6.3 Hypothesis Evaluation

To evaluate the hypotheses, the structural equation modeling approach was utilized to carry out the analysis and establish the link involving the variables of the study. Table 3 and Fig.3 present a summary of the findings.

**Table 3** Hypothesis Evaluation

	TO BY WITH WITH				
Paths		Beta	S.E.	C.R.	P
SN	→ ITB	.111	.038	2.904	.004
PBC	→ ITB	.441	.049	9.082	***
ATO	→ ITB	.165	.036	4.547	***
PEO	→ ITB	.150	.035	4.269	***
PHB	→ ITB	121	.036	-3.346	***
IA	→ ITB	.405	.045	8.992	***

Gen	→ ITB	073	.054	-1.352	.176
Age	→ ITB	.035	.027	1.302	.193

NB: PEO = past experience with organic product, PHB = perceived health benefit, IA = information awareness, SN = subjective norm, PBC = perceived behavior control, ATO = attitude towards organic herbs, ITB = intention to buy.

In the analysis, the control variables age and gender were used to control for the results of respondents' age and gender categories, outlining the effect of relationships involving the independent variables on the dependent variables. The findings indicated that the path coefficient between consumers' subjective norm (SN) and intention to buy (ITB) was positive and significant ( $\beta = 0.111 \text{ p} = 0.004$ ). This confirmed H1 that consumers' subjective norm has a significant influence on the attitude towards buying organic herb cordyceps. The path coefficient between perceived behavioral control (PBC) and intention to buy (ITB) was positive and significant ( $\beta = 0.441 \text{ p} = 0.000$ ). This confirmed H2 that perceived behavior control has a significant influence on the attitude towards buying organic herb cordyceps cordyceps. The path coefficient between attitude towards organic herbs (PEO) and intention to buy (ITB) was positive and significant ( $\beta = 0.165 \text{ p} = 0.000$ ). This confirmed H3 that attitude towards organic herbs has a significant influence on the attitude towards buying organic herb cordyceps. The path coefficient between past experience with organic herbs (ATO) and intention to buy (ITB) was negative and significant ( $\beta$  = 0.150 p = 0.000). This confirmed H4 that previous experiences with organic herb products have significantly influenced the attitude towards buying organic herb cordyceps. The path coefficient between perceived health benefit (PHB) and intention to buy (ITB) was negative and significant ( $\beta = -0.121 \text{ p} = 0.000$ ). This confirmed H5 that Perceived health benefit with organic herb products has a significant influence on the attitude towards buying organic herb cordyceps. The path coefficient between information awareness of organic herbs (IA) and intention to buy (ITB) was significant and positive ( $\beta = 0.405 \text{ p} = 0.000$ ). This confirmed H6 that information awareness of organic herb products has a significant influence on the attitude towards buying organic herb cordyceps herb cordyceps.

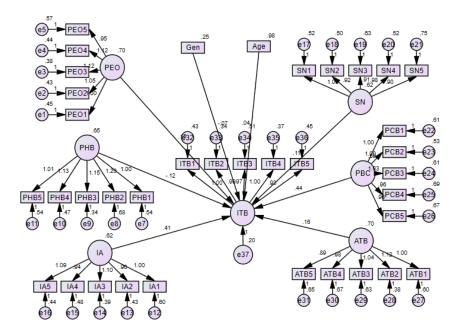


Fig. 2. Hypothesis Evaluation Results

## 7. Discussions and Conclusions

The study investigated consumers' intention towards adopting and using the organic herb cordyceps in Thailand. This organic herb has been used for decades in many parts of Asia, especially in Thailand. However, from the critical evaluation of the literature, scarce research has been done on the consumers' adoption of organic herbs, and specifically on the organic herb cordyceps. From the findings of this research, the organic herb cordyceps is considered to promote a healthy heart, through its antispasmodic and anti-inflammatory properties, which are vital in strengthening the cardiovascular and enhancing blood circulation. On the investigation of the intention of consumers to adopt or buy the organic herb the users perception aspects (past experience with organic product, perceived health benefit, and information awareness) were evaluated, while controlling for respondents age and gender.

Information awareness had the highest positive and significant effect on the acceptance of organic herb cordyceps. An incremental unit increase in information awareness can result in 0.405 units rise in the adoption of organic herb cordyceps. The aspects of information awareness that were evaluated in this research included consumers having enough information regarding the organic herb, ability to get required information, differentiate between organic and conventional mediation, and knowledge about the usage of the organic herbs cordyceps. These aspects are therefore relevant as far as relevance of

information is concerned in the usage of organic herbs cordyceps. This was followed by past experience with the use of organic products, where a one unit increase in the past experience with the use of organic herb would increase the adoption of organic herb cordyceps with 0.150 units. The aspects of past experience that had an influence towards future adoption of the herb included good experience, positive and negative results obtained, results satisfaction and ability to meet the expected results. These results were in agreement with that of Miralles, Giones & Riverola (2016) who indicated that past experience is a critical factor for consideration, towards future adoption and use of products or services in future. This research, however, found out that perceived health benefits negatively influence intention to adopt the organic herb cordyceps.

The research also evaluated the aspects of theory of perceived behavior (TPB) and their influence towards adoption of organic herb cordyceps. The aspects evaluated were subjective norm, perceived behavior control, and attitudes towards organic herbs. The research found out that all these aspects have positive and significant influence on consumers' intent to utilize organic cordyceps. Perceived behavior control was found to have the highest influence, where a unit improvement in perceived behavior control would result in 0.441 units increase in adoption of organic herb cordyceps. Attitudes was the second in influence while subjective norm was the last. These findings rhyme with Mzoughi (2011) and Rezvanfar et al. (2011) who indicated that attitude is a critical aspect, in influencing people towards the adoption of an organic product. The attitude held by people triggers their adoption action towards the use of a product. According to Läpple and Van Rensburg (2011), positive attitudes have an encouraging effect towards adoption while negative attitudes have the opposite effects. Other studies (Chawla & Joshi, 2019; Yanakittkul & Aungvaravong, 2020) have obtained similar results regarding the outcome of perceived behavioral control on the intention to accept an organic product. The aspects of behavioral control that are critical include self-confidence and knowledge, as well as a supportive environment towards adopting a particular organic herb product.

# 8. Research Implications and Contributions

Several recommendations were developed from this research, with regard to the adoption and use of organic herb cordyceps. From a theoretical perspective, this study developed a model incorporating aspects of user perceptions regarding organic products, and the theory of perceived behavior to explore how they influence the consumers' intention to adopt organic herbs. From the management perspective, this research recommends that the most critical aspects to consider in influencing the use and adoption of organic herb cordyceps are information awareness and perceived behavior control. If consumers are aware of the benefits of the herb, have full information regarding how to access and use it, their adoption and use habits for the organic herb cordyceps would be influenced. In addition, other important aspects to consider with regard to use of is the behavioral control, such as self-confidence, knowledge regarding the medical requirements, the resources required for them and the capacity to use the organic herbs. The research reveals that organic herb cordyceps are vital for health purposes to the human body. However, in addition to its adoption concern, more people are becoming interested in its use, and therefore its demand is increasing with time. As people are becoming more concerned with their healthy conditions, the consumption of organic foods and medical products is increasing (Laohaphatanalert & Gavinlertvatana, 2020). This has affected the consumers' attitude towards organic herb, which is one the significant variables affecting the consumer use of organic herb cordyceps. Other aspects vital to consider include subjective norms and consumers past experience with organic herb products. The research was considered to have been conducted successfully. The limitation that were highlighted is that though consumers were aware of the benefits or organic herb cordyceps, they herb is becoming scarce and hard to get, which limits peoples usage for medical benefits. This research evaluated the intention of people to adopt the herb. It is recommended that future research should evaluate the availability of the herb, and the factors influencing farmers' intention to farm the herb.

## 9. Conclusions

The study explored the discourse around consumers' intention in accepting organic cordyceps. The findings are important considering the increased awareness and interest of people regarding their health. cordyceps, also referred to as "Thungchao" in Thai language, has been used for decades as an organic herb for various medical purposes and benefits. The research was also important considering that Thailand's organic herb market has been increasing over time, with more people consuming organic products as compared to conventional medication products. The research was guided by the theory of perceived behavior, with an additional factor of personal experience with organic herbs products. The research was conducted using primary data obtained from 452 participants. Findings showed that the intention to adopt organic herb cordyceps is influenced by subjective norm, perceived behavior control and the attitudes towards organic herbs. These three aspects of theory of perceived behavior were found to have significant influence. For the case of user experience with organic herbs, prior experience and information awareness were determined to positively and significantly affect the customers' intention to adopt organic herb cordyceps. The research recommended that the adoption and use of organic herb cordyceps should be adopted and its use encouraged because of its medical benefits to the health body. The aspects that should be emphasized are information awareness and perceived behavior control such as full information regarding the benefits of self-confidence, knowledge regarding the medical requirements, and the resources required for the use of organic herbs.

## Acknowledgment

This work is supported by KMITL Business School, King Mongkut's Institute of Technology Ladkrabang, Bangkok 10520, Thailand.

## References

- Adeniji, C. A. (2019). Adoption of Organic Poultry and Rabbit Production for Improvement of Quality of Life in Nigeria: A Review. *The International Journal of Organic Agriculture Research and Development*, 15, 35-41.
- Agrawal, D. C., Tsay, H. S., Shyur, L. F., Wu, Y. C., & Wang, S. Y. (Eds.). (2017). *Medicinal plants and fungi: recent advances in research and development* (Vol. 4). Singapore: Springer Singapore.
- Ajzen I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 179–211.
- Ajzen, I. (2020). The theory of planned behavior: Frequently asked questions. Human Behavior and Emerging Technologies, 2(4), 314-324.
- Ajzen, I., & Fishbein, M. (1980). Understanding Attitudes and Predicting Social Behavior (1st ed.). Pearson.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action control* (pp. 11–39). Springer.
- Awang, Z. (2012). A handbook on SEM. Structural equation modeling.
- Ayyub, S., Asif, M., & Nawaz, M. A. (2021). Drivers of organic food purchase intention in a developing country: the mediating role of trust. SAGE Open, 11(3), 21582440211045076.
- Bosnjak, M., Ajzen, I., & Schmidt, P. (2020). The theory of planned behavior: selected recent advances and applications. *Europe's Journal of Psychology*, 16(3), 352.
- Byrne, B. M. (1994). Structural equation modeling with EQS and EQS/Windows. Thousand Oaks, CA: Sage Publications.
- Chawla, D., & Joshi, H. (2019). Consumer attitude and intention to adopt mobile wallet in India–An empirical study. *International Journal of Bank Marketing*, 37(7), 1590-1618.
- Das, S. K., Masuda, M., Sakurai, A., & Sakakibara, M. (2010). Medicinal uses of the mushroom Cordyceps militaris: current state and prospects. *Fitoterapia*, 81(8), 961-968.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18, 39–50.
- Future Market Insights. (2023, January 5). *Herbs and Spices Market*. Retrieved January 24, 2023, from <a href="https://www.future-marketinsights.com/reports/herbs-and-spices-market">https://www.future-marketinsights.com/reports/herbs-and-spices-market</a>
- Jędrejko, K. J., Lazur, J., & Muszyńska, B. (2021). Cordyceps militaris: an overview of its chemical constituents in relation to biological activity. *Foods*, 10(11), 2634.
- Kline, R. B. (2015). Principles and practice of structural equation modeling. Guilford publications
- Laohaphatanalert, K., & Gavinlertvatana, P. (2020). Potential of Chinese Herb "Cordycep militaris" as a Medicinal Food. *RICE Journal of Creative Entrepreneurship and Management*, 1(3), 23-35.
- Läpple, D., & Van Rensburg, T. (2011). Adoption of organic farming: Are there differences between early and late adoption?. Ecological economics, 70(7), 1406-1414.
- Manideep, A. S., & Reddy, M. S. K. (2019). Intention to Adopt Organic Farming: An Empirical Analysis.
- Miralles, F., Giones, F., & Riverola, C. (2016). Evaluating the impact of prior experience in entrepreneurial intention. *International Entrepreneurship and Management Journal*, 12(3), 791-813.
- Mzoughi, N. (2011). Farmers adoption of integrated crop protection and organic farming: Do moral and social concerns matter? *Ecological Economics*, 70(8), 1536-1545.
- Ndinojuo, B.-C.E. (2020). Visual images associated with reporting about biodegradables in Nigerian newspapers. *International Journal of Environmental, Sustainability, and Social Science*, *I*(2), 46-51. https://doi.org/10.38142/ijesss.v1i2.27
- Patel, H. R., Sharma, M., & Purohit, R. (2021). Factors Influencing Millennials' Purchase Intention of Organic Food. *International Journal of Future Generation Communication and Networking*, 14(1), 2032-2046.
- Prokopy, L. S., Floress, K., Arbuckle, J. G., Church, S. P., Eanes, F. R., Gao, Y., ... & Singh, A. S. (2019). Adoption of agricultural conservation practices in the United States: Evidence from 35 years of quantitative literature. *Journal of Soil and Water Conservation*, 74(5), 520-534.
- Rezvanfar A., Eraktan G., & Olhan E. (2011). Determine of factors associated with the adoption of organic agriculture among small farmers in Iran. *African Journal of Agricultural Research*, 6(13), 2950-2956.
- Ronald, P. C., & Adamchak, R. W. (2017). *Tomorrow's Table: Organic Farming, Genetics, and the Future of Food.* Oxford: Oxford University Press.
- Schumacker, R. E. & Lomax, R. G. (2004). A beginner's guide to structural equation modeling. 2<sup>nd</sup> ed. Mahwah, NJ: Lawrence Erlbaum Associates.
- Shi, S., Wang, Y., Chen, X., & Zhang, Q. (2020). Conceptualization of omnichannel customer experience and its impact on shopping intention: A mixed-method approach. *International Journal of Information Management*, 50, 325-336.
- Shin, H., & Kang, J. (2020). Reducing perceived health risk to attract hotel customers in the COVID-19 pandemic era: Focused on technology innovation for social distancing and cleanliness. *International Journal of Hospitality Management*, 91, 102664.
- Singh, S., Singh, G., Mishra, P., Singh, R., Singh, D. V., & Sengar, R. S. (2021). Evaluation of different organic additives effects on spawn production of Cordyceps militaris. *The Pharma Innovation Journal*, 10(8), 855-858.
- Sobti, N. (2019). Impact of demonetization on diffusion of mobile payment service in India: Antecedents of behavioral intention and adoption using extended UTAUT model. *Journal of Advances in Management Research*, 16(4), 472-497.

- Tao, S.-X., Xue, D., Lu, Z.-H., \* Huang, H.-L. (2020). Effects of substrates on the production of fruiting bodies and the bioactive components by different Cordyceps militaris strains (ascomycetes). International Journal of Medical Mushrooms, 22, 55–63. doi: 10.1615/IntJMedMushrooms.2019033257
- Taylor, S., & Todd, P. (1995). Assessing IT usage: the role of prior experience. MIS Quarterly, 19(4), 561-70.
- Thakur, S., Singh, Y., Goyal, P., & Kumar, M. (2022). Current Therapy And Protective Potential Of Medicinal Mushroom Cordyceps Militaris Against Alzheimer's Disease. *Journal of Positive School Psychology*, 6(8), 2100-2108.
- The Business Research Company. (2023, January). *Dried Herbs Market Size, Trends and Global Forecast To 2032*. Retrieved January 25, 2023, from https://www.thebusinessresearchcompany.com/report/dried-herbs-global-market-report
- Tucker, L. R., & Lewis, C. (1973). The reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, 38, 1-10.
- Turk, A., Abdelhamid, M. A., Yeon, S. W., Ryu, S. H., Lee, S., Ko, S. M., ... & Lee, M. K. (2022). Cordyceps mushroom with increased cordycepin content by the cultivation on edible insects. *Frontiers in Microbiology*, 13.
- Ulker-Demirel, E., & Ciftci, G. (2020). A systematic literature review of the theory of planned behavior in tourism, leisure and hospitality management research. *Journal of Hospitality and Tourism Management*, 43, 209-219.
- Van Doan, H., Hoseinifar, S. H., Tapingkae, W., Chitmanat, C., & Mekchay, S. (2017). Effects of Cordyceps militaris spent mushroom substrate on mucosal and serum immune parameters, disease resistance and growth performance of Nile tilapia, (Oreochromis niloticus). Fish & Shellfish Immunology, 67, 78-85.
- Wang, J., Chen, C., Jiang, Z., Wang, M., Jiang, H., & Zhang, X. (2016). Protective effect of Cordyceps militaris extract against bisphenol A induced reproductive damage. *Systems Biology in Reproductive Medicine*, 62(4), 249-257.
- Wen, Z., Du, X., Meng, N., Li, Y., Mi, R., Li, X., ... & Li, S. (2019). Tussah silkmoth pupae improve anti-tumor properties of Cordyceps militaris (L.) Link by increasing the levels of major metabolite cordycepin. *RSC advances*, 9(10), 5480-5491. doi: 10.1039/C8RA09491H
- Wongsorn, D., Surasilp, T., & Rattanasuk, S. (2021). Effects of edible insects on the mycelium formation of *Cordyceps militaris*. *Pakistan Journal of Biological Science*, 24, 881–887. doi: 10.3923/pjbs.2021.881.887
- Xiao, X., & Wong, R. M. (2020). Vaccine hesitancy and perceived behavioral control: A meta-analysis. Vaccine, 38(33), 5131-5138.
- Yanakittkul, P., & Aungvaravong, C. (2020). A model of farmers intentions towards organic farming: A case study on rice farming in Thailand. *Heliyon*, 6(1), e03039.



© 2023 by the authors; licensee Growing Science, Canada. This is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) license (http://creativecommons.org/licenses/by/4.0/).