Knowledge, Attitudes and Practices (KAP) Towards Medicinal Plants among Malaysian Consumers

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ABSTRACT

This study aims to assess the knowledge, attitude and practice of consumers towards medicinal plants (MPs). Besides that, this study also determined the association between consumers demographic profiles and MPs practice. A survey was performed among 300 MP consumers (Kelantan=100, Terengganu=100 and Pahang=100) from East Coast Economic Region (ECER) using self-administered questionnaire. The findings indicated that 52% of consumers are females, Muslims and Malay. Most of them living in rural (67%) than urban (33%) areas. The results from Chi-Square statistic showed that education level (p=0.033) and locality (p=0.008) have significant relationships with the level of knowledge. Marital status has significant relationships with the level of practice (p=0.010) of medicinal plants. A significant difference between the knowledge (p=0.00) and attitude (p=0.00) towards practice of medicinal plants was also found. There was a moderate relationship between consumers' knowledge on MPs and their practice using MPs (p=0.000), whereas there was a strong relationship between their attitude towards MPs and their practice (p=0.000). This study recorded that consumers' attitude has a stronger relationship towards their practice compared to the knowledge.

Keywords: Knowledge; Attitude; Practice; Medicinal plant; Consumers

INTRODUCTION

Medicinal Plants (MPs) are commonly used by the local people as an alternative for health care. However, the extent to which consumers' are knowledgeable on the benefits of medicinal plants cannot be ascertained as there is a lack of research being carried out to access the level of knowledge especially in Malaysia context. Furthermore, the knowledge about medicinal plants were transferred by verbal communication from one generation to another and lead to poor transmission in tranferring the knowledge. The usage of medicinal plants is categorized under Complementary and Alternative Medicine (CAM).

Malaysian medicinal plants consumption

Salleh [1] reported that Malaysia imported approximately RM 1.2 billion herbal products for consumption every year. This figure is in rising trend as Rezai et al. identify that shifts in lifestyle and self-medication are main factors leading to the rised popularity of herbal medicine among Malaysians [2]. Therefore, entrepreneurs should well-versed about herbal purchasing trend of customers for instance how, how much, what and where is the product being bought to be a competitor in the herbal industry [3].

Herbal medicine has long been known for its beneficial effects.

Alsarhan et al. [4] reviewed 10 most important medicinal plants in Malaysia as an alternative for synthetic antioxidants. In addition, Ghazali et al. [5] points out that cancer patients consumed *Goniothalamus umbrosus*, *Typhonium flagelliforme*, *Myrmecodia pendens*, *Strobilanthes crispus* and *Clinacanthus nutans* to fight against the cancer cells growth. Therefore, they suggested specific research on Malaysia herbs with anticancer properties should be performed to formulate an effective therapeutic approach as these plants contain high amount of phenolic compounds which could help in healing process.

Sekar et al. [6] also acknowledged 10 medicinal plants in Malaysia that contain hypoglycemic properties. They were normally consumed by diabetic patients. However it is recommended for more pharmacological and toxicological research to verify the potential of these plants. Abu Bakar et al. [7] had recognized 76 Malaysian medicinal plants that posseses anti-inflammatory agents with *Melicope ptelefolia* and *Portulaca oleracea* having strongest anti-inflammatory activity.

Knowledge on medicinal plants

Knowledge is required to utilise the potentials of medicinal plants. As Hisham et al. [8] mentioned, adequate information is needed prior to use any herbal medicines and product. Normally,

the traditional medicine man or 'bomoh' passed the traditional herbal knowledge from generation to generation via verbal communication (Lin, 2005).

The Department of Education (DOE) South Africa [9] has recommended the integration of Indigenous Knowledge (IK) and knowledge about medicinal plants to be included into the school science curriculum. This is a good initiative proposed to educate people about medicinal plants at an early age. Education on the importance and safety of herbal medicine is a requirement in pharmacy curriculum to ensure the quality of the local universities [10]. The ethnobotanical knowledge on medicinal plants and their uses by aboriginal cultures are important not only for the conservation of local knowledge and biodiversity but also to encourage community health care and role in drug development [11].

The younger people appear to be quite familiar with the good impacts of herbal medicine and food supplements. However they have lack experience and knowledge on them [12]. A study conducted by Suleiman [13] revealed that herbal medicine was frequently used by people but they have lack of knowledge on its correct usage. Awad and Al-Shaye [14] stated that there is a need for seeking medical officers advice before using herbal medicines. Jantan [15] stressed that pharmacists are the right persons to advise and educate people on herbal products therefore they need to have knowledge on the chemical constituents, contraindication, dosage, dose form, possible side effects, pharmacology and clinical controlled trials. They should always be updated with new scientific information on herbal products.

Attitude towards medicinal plants

Attitude is the perceptive, motivational, emotional and cognitive beliefs that influence the practice or behaviour of an individual in a positive or negative way. Attitudes are learned by observing behaviour of people in environments with different social and economic pressures [16]. A research carried out by Deshpande [17] on attitude of consumers proved that they are going green especially in the cosmetics market that used natural or herbal components. Jantan stated that consumers belief that no side effects from natural products and their dissatisfaction with modern medicine lead to popularity of herbal medicines. Majority of respondents among pregnant women in Nigeria consumed herbs during their pregnancy. They believed the use of herbal medicine is safe, natural, higher accessibility and cultural belief to treat many illnesses. Furthermore, herbal products were generally cheap compared to conventional medicine.

Practice of medicinal plants

The medicinal plants practitioners used the mixture of medicinal plant based on their formulations with prayers, religious or ritual recites before hands them to their patients [10]. The usages of medicinal plants as traditional medicine increased due to awareness on the effectiveness to cure the disease. A review on Malaysian traditional medicinal plants with therapeutic properties had listed 10 most important antioxidant plants that are naturally exist in many different parts of plants used to cure numerous ailments [4]. This is supported by a review by Smith et al. [18] stated that consumers gain benefits from medicinal plants through maintenance of health and treatment of illnesses. According to Sulaiman et al. majority of

the respondents among urban community in Klang Valley believed that herbal product can enhance health related quality of life and relieve of serious of diseases. Medicinal plants were the most common treatment among diabetic patients which used by 84.9% of the respondents [19]. However, less than half of them consulted with their doctors on their usage. Increase of insulin secretion, reduction resistance against insulin and decrease the level of bad fats are the antidiabetic effects of medicinal plants [20].

Despite of medicinal plants benefit towards health; it can also act as pesticides. Chemical pesticide is the conventional and favourable way by farmers to encounter pest infestation through faster and easier method. However, major negative side effects either towards human, environment or other animals had initiated farmers to look for alternative plant-based pesticides. "Ecofriendly-agrochemicals" as proposed by Govil and Sanjib [21] could be potential and practical solution to prevent the consequences toward environment. Major factors of misuse of medicinal plants are misconception, ignorance, criminal intentions and accidental poisoning [22] therefore intensive public awareness about the medicinal plants is essential to avoid the misuse of plants [23].

East coast economic region

East Coast Economic Region include all the states in East Coast of Peninsular Malaysia; Kelantan, Terengganu and Pahang also included Northern of Johor (Mersing). The total area covered is 66,736 kilometer squares or 51% from the total area of Peninsular Malaysia. Abundance of land and natural resources are able to be utilized to boost the economy in East Coast region. Agriculture sector is one of the 12 National Key Economic Areas (NKEAs) incorporated in Economic Transformation Program (ETP).

Rohana et al. stated that there is a need for herbal industry to reduce the dependency towards imported raw materials. This can be achieved by empowering the producers of plant materials (nurseries) and farmers to fulfil the needs of herbal product and species commercialization. Thus, a good coordination between farmers and manufacturers is essential to balance the demand and supply in the chain. This initiative will ensure continuous supply of high quality herbal plants to fulfil every level of supply chain and Malaysia becoming the hub regional for medicinal plants.

RESEARCH METHODOLOGY

Theoretical framework

This study proposed the conceptual framework adapted and modified from Wan [24], as shown below (Figure 1). Eckman and Walker [25] claimed that KAP studies are more cost-effective and conserve resources than other social research methods because they are tightly focused and limited in scope. The KAP model proposes that knowledge about any practices (behaviour) will determine how the person's attitude towards the behaviour then the attitude will display through the practices [26].

Independent and dependent variables

The independent variables for this study are knowledge on and attitude towards medicinal plants as components to determine the practice of medicinal plants. This study defined practice as consumption of medicinal plants.
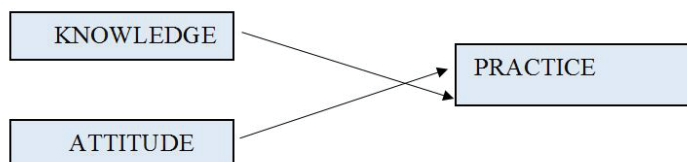
Figure 1: The conceptual framework of the study.

Questionnaire design

The questionnaire was designed semi-strucured, a combination of open and close ended questions. The instruments applied for this study has been adapted and modified from the literature of the previous research conducted to suit with the current research. Questions related to KAP elements were recoreded based on a 10 point Likert-scale of interval with 1 'Strongly Disagree to 10 'Strongly Agree'.

Population and sample

The study was conducted in the east coast economic region (ECER) Terengganu, Kelantan, Pahang and Mersing, Northern of Johor, Malaysia. The respondents were chosen using the convenient sampling to identify respondents from the mass population [27]. The sampling population for this study was 300 subjects as recommended by Awang [28] following the 10-to-1 ratio sampling. There were 30 items in the questionnaire of this study, 10 items for knowledge, attitude and practice are equally distributed.

Data analysis

Analysis of data was conducted to transform the raw data into meaningful information by performing descriptive and inferential statistics using the International Business Machines Corporation Statistical Package for Social Sciences (IBM SPSS) Version 21.0 software. Descriptive analysis was carried out to retrieve the information of the respondents such as age, gender, religion, ethnic, marital status, education level, occupation, monthly income and locality. The relationship between demographic variables and knowledge, attitude and practice of medicinal plants were identified through Chi-Square Statistics. The cross tabulation of the demographic variables and knowledge, attitude and practice would show the correlation status and Chi-Square is responsible to test wether to accept or reject the null hypothesis. Multiple regression were used to determine the interaction between knowledge and attitude (independent variables) with practice (dependent variable). If the significant value was less than 0.05, we concluded that there was significant relationship between the independent and dependent variables. In addition, Pearson-Correlation Analysis determined the strength of relationship between knowledge and attitude with practice.

RESULTS AND DISCUSSION

Profile of medicinal plants consumers

This section presents the results of the demographic profiles of medicinal plants consumers', sources of knowledge about medicinal plants, frequency of use, and the medicinal plants that are known by consumers. Descriptive analysis was carried out to retrieve the information of the respondents such as age, gender, religion, ethnic, marital status, education level, occupation,

monthly income and locality. There were 143 (47.7%) male and 157 (52.3%) female consumers with response rate of 75% from the study. The consumers mostly were married (66.3%). This could imply that the medicinal plants were popular among women for post-partum treatment and enhance reproductive system for male. This findings is correspondent with the survey by Sulaiman et al. which reported that herbal product consumption was important for female compared to male by means of 16.4% of the respondents consumed herbal products for the treatment of menstrual problem. Hussain et al. found that *Labisa pumila* is the most frequent herbal used in South-East Asian countries specifically among married woman. Moreover, a survey on attitude of medical students in Ghana showed 67.9% average attitude of female students have better attitude than male [29].

Majority of the subjects in this study were also Muslims and Malays as they are the main population in the East Coast area. The highest number of medicinal plants consumers are between 20 to 29 years old (n=93, 31.0%) compared to other age category showed the positive attitude towards medicinal plants from the youth population. This finding is supported by Zimmerman and Kandiah which showed that younger people appear to be quite familiar with good impacts of herbal medicine and food supplements. Moreover, 55.3% of the consumers had higher education background showing that wider awareness among them and more concern with health by choosing natural based products. A study among the American adults found that higher education was related with the increasing usage of herbal supplements [30]. Sulaiman et al. found that 53.4% of herbal consumers among Malaysian adults have tertiary level of education.

Sixty-seven percent of the consumers were from rural while 33% were from urban area. This study was congruent with those reported by Jazul that people lived in rural area were more exposed to medicinal plants due to the availability and accessibility of these plants in their locality [31]. Furthermore, traditional medicine using medicinal plant still become the primary health care system of resource poor communities in Medan as the result of easily accessible and the most affordable source of treatment [32]. Half of the respondents consumed medicinal plants only if necessary or recommended, whereas 73 persons (24.3%) taken for daily. There are 52 people (17.3%) consume once a week and 6.3% (n=19) respondents once a month. Kautsar et al. discussed the buying trends of herbal based products in Malaysia based on the frequency of usage herbal medicine, customer loyalty and buying intention [33]. Consumption of herbal products also influenced by the culture and ethnic according to the study by Aziz and Tey [34] and supported by Mitha et al. [35]. Besides that, Ching et al. mentioned that the chronic diseases suffered by the individuals also impact the usage of herbal goods. The most source of knowledge is from older generation 88.7% and 70.7% are family and friends who recommended the usage [36].

According to Jantan, herbal consumers measure the effectiveness based on the length of time herbal medicines have been used and handed down from generation to generation and most of them are strong believers and preservers of tradition. Besides that, 70% of the respondents referring to online sources as nowadays utilization of internet is widening and the information also world

Table 1: Results of Chi-square analysis.

Hypothesis	Variables	Decision (Knowledge)	Decision (Attitude)	Decision (Practice)
H_{1a}	Gender	Fail to reject	Fail to reject	Fail to reject
H_{1b}	Age	Fail to reject	Fail to reject	Fail to reject
H_{1c}	Marital status	Fail to reject	Fail to reject	Reject
H_{1d}	Education level	Reject	Fail to reject	Fail to reject
H_{1e}	Occupation	Fail to reject	Fail to reject	Fail to reject
H_{1f}	Monthly Income	Fail to reject	Fail to reject	Fail to reject
H_{1g}	Locality	Reject	Fail to reject	Fail to reject

Dependent variable: Practice; Independent variable: Knowledge and attitude

Table 2: Pearson correlation value.

DV / IV	Practice		
	Pearson Correlation	Significant Value	Strength of Relation
Knowledge	0.642	0.000	Moderate
Attitude	0.731	0.000	Strong

wide. Information regarding the herbal product promotion and sale by many websites in the internet becomes a famous source of reference among the consumers and practotioners.

Chi-square test

Chi-square test of independence was computed to assess the relationship between the demographic variables ; gender, age, marital status, education, occupation, monthly income and locality with consumers attitude. Furthermore, it displays that only marital status has rejected the null hypothesis. The data of knowledge on, attitude towards and practice of medicinal plants were transformed from interval scale to categorical before analysed. The cross tabulation of the variables will show either the hypothesis accepted or rejected. The results of Chi-Square was illustrated in Table 1.

According to Jazul, people live in rural area are more exposed to medicinal plants due to the availability and accessibility of these plants in their locality. Mohd Zahran et al. claimed that age and marital status contribute to the main factor in consuming herbal based products [37].

Multiple regression analysis

The multiple regression analysis is used to analyse the statistical significance between the knowledge and attitude (independents) towards practice (dependant variables). The results revealed value of $R^2 = 0.574$ meaning that both independent variables; knowledge and attitude together fitted 57.4% of the variance (R square) towards practice of medicinal plants. Therefore, both independent variables have significant relationship with the dependent variable. The unstandardized B coeffecient (0.041) is positive value point out positive relationship as the knowledge and attitude increase, the practice also will increase. The knowledge increase by (0.287) and attitude by (0.609) and can be simplified by the equation as follows:

Practice = 0.041 + (0.287) Knowledge + (0.609) Attitude

Jantan suggested there is a need for pharmacists and physicians to have adequate knowledge about traditional herbal medicine in order for them to consult the community on the importance, quality, safety and appropriate use of herbal products. A total of 270 (98.5%) among respondents agree about the importance towards Traditional Medicine (TM) health education about the risks and benefits [38] showing that the awareness regarding the knowledge of TM based on survey conducted at Plateau, Nigeria. Jantan denied although medicinal plants have been utilized in folk medicine for a long time it cannot just be claimed safe therefore, it is a requirement for manufacturers to include the information regarding the contraindications and possible side effects before registering the crude drugs for commercialization however, there are less concern of some people specifically herbal traders that medicinal plants are natural. The belief that herbal can improve ones' health living among people in the developed countries for example United Kingdom, Australia and the remaining of Europe and North America become major purpose looking for herbal therapy. Moreover, those with chronic diseases can easily misperception with claims on herbal products as long as that gives hope thus they are willingly to spend money on alternative therapies for self-medication [15]. Ghimire et al. supported that adult people tend to have more probability for chronic diseases therefore they tend to combine herbal remedies and drug medicines [39].

Pearson correlation analysis

The Table 2 below confirms that a significant positive relationship exists between knowledge on and attitude towards the practice of MPs. Knowledge and practice illustrates moderate relationship whereas attitude and practice has a strong relationship. A finding from a survey in Trinidad Venezuela showing that most of the herbal users agreed that herbal products are effective and some believed herbal products are more effective compared to modern medicines [40]. Hence, Ekor study is congruent with the outcome of this research that relationship attitude and practice are stronger than knowledge and practice where people will consume the medicinal plants when they have good attitudes and beliefs [41-47].

CONCLUSION

This study is anticipated positive behaviour on medicinal plants consumption. Scientific research also need to be conducted for reliable and trusted evidence to rise the confidence among the consumers. Furthermore, it will helps to empower the local community in enhancing their economic status. The outcome from this study on the level of knowledge towards medicinal plants of people showed there is a need for an aggressive promotion to create awareness among people about existence of various medicinal plants species with valuable benefits.

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