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Objective Knowledge, Attitude, and Practice of Gum Arabic Consumption among Malaysian Users

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Abstract

This study investigated the relationship between objective knowledge and attitude towards the practice of Gum Arabic (GA) consumption among Malaysian users. This study also considered the influence of attitude as a mediating factor in the relationship between objective knowledge and practice. Data were collected purposively, with a total of 301 valid responses via an online survey. Data analysis was conducted using Structural Equation Modelling (SEM). The findings showed that objective knowledge influenced attitude, but has no influence on the practice of GA, while attitude was strongly associated with the practice of GA consumption. The findings also revealed that attitude mediated the relationship between objective knowledge and practice. These findings are noteworthy contribution to the body of knowledge, especially towards explaining GA users' overall objective knowledge, attitude, and practice. This research proposed that giving correct and justified information as guidance for users may reduce unforeseen risks.

Keywords: Gum Arabic, Consumer Behaviour, Structural Equation Modelling, Objective Knowledge, Practice

Introduction

The gum arabic (GA) multi-functional usage and multi-terms have led to confusion among users and potential users. The United Nations Conference on Trade and Development (UNCTAD, 2018) reported that GA is not only treated as a medicinal plant and natural product, it is also used as food, food ingredient, food additive, functional food, traditional medicine, and food supplement. This statement demonstrates how some people may claim that these products should be treated similarly to conventional drugs and foods, whilst other people may feel that a more specific category is required since there is often a traditional, or historical evidence base for products that contain multiple ingredients (Mohiuddin, 2019).

One of the possible reasons for the confusion regarding GA and other dietary supplements is the lack of global consensus on regulations, and ways to classify products known variously as dietary supplements, natural health products, complementary medicines, or food supplements (Dwyer et al., 2018). Different countries have different regulations for classifying these products, leading to inconsistent product information, thus, causing confusion and impacting practice among users.

Different information on dietary supplements, particularly in the form of endorsements, such as testimonials and feedback from experienced users may increase the popularity of these products and affect how users feel about them (Chin, 2015). Users may be misled by various product claims and information without scientific evidence, putting them at risk of numerous unforeseen consequences. Therefore, consumer education on the efficacy and safety of such products needs to come from professional and reliable sources.

Theoretical Background and Research Hypotheses

It is imperative to understand the factors that influence the individual behaviour of the population being studied. The Knowledge, Attitude, and Practice (KAP) model (Schwartz, 1975) is a useful tool for measuring the extent of existing conditions, and providing a reality of the actual situation. This model offers the chance to improve KAP in various topics of studies, including medicine and supplement usage. KAP have also been used in health education and prevention studies, behavioural changes, and human behaviour.

Objective knowledge is one of the factors that influence product familiarity (Park & Lessig, 1981). Objective knowledge is conceptually and operationally different from subjective knowledge (Brucks, 1985). Both types of knowledge are related to the aspects of product knowledge concerning information search and decision-making behaviour (Raju et al., 1995). However, more attention has been given to subjective knowledge compared to objective knowledge. In this case, the practice of dietary supplements needs an individual to have greater objective knowledge and making decisions based on facts regarding a product.

Objective Knowledge and Attitude

Objective knowledge of GA refers to factual information about this product (Brucks, 1985). Factual information is highly important to help build the confidence and attitude of users, which could develop into attitude-behaviour association when a person receives relevant information (Brucks, 1985). Objective knowledge was found to have a weak influence on the general attitude of people in Belgium who consume organic vegetables (Pieniak et al., 2010). Similar findings were observed among the Dutch towards organic yogurt consumption (Loo et al., 2013). Based on these findings, the first hypothesis was constructed as follows:

H1 There is a relationship between Objective Knowledge and Attitude.

Objective Knowledge and Practice

It is important to study user knowledge because knowledge can influence human decisions or actions (McEachern & Warnaby, 2008). The importance of factual knowledge is undeniable, as most people prescribe their own medicine and health products (Wachtel-Galor & Benzie, 2011). Many studies have been conducted on the impact of objective knowledge on the practice of food product consumption, such as organic vegetables (Pieniak et al., 2010),

organic yogurt (Loo et al., 2013), consumption of fairtrade products (Schaewen, 2014), and green purchasing practice (Gunne & Motto, 2017). However, only a small number of studies has been conducted on dietary supplements, such as GA. Therefore, the second hypothesis was constructed as follows

H2 There is a relationship between objective knowledge and practice.

Attitude and Practice

Consumers nowadays are exposed to different windows of information and various products, with great deals and selections available in the market, which are aimed to stimulate their purchase decision. Practice demonstrates the level of consumer understanding from the acquired knowledge and changes in attitude (Rav-Marathe et al., 2014). A good attitude based on incorrect information may create a positive attitude towards a product. When some of these beliefs are wrong and affect practice among consumers, there is a need to launch a campaign to correct them (Durmaz, 2014). Jasamai et al (2017) found that personal attitude can influence the local population's likelihood of using complementary and alternative medicine. Their report was consistent with the findings of other studies that showed strong correlations between attitude and consumption of organic vegetables (Pieniak et al., 2010; Aertsens et al., 2011). Based on these findings, it was hypothesised that:
H3 There is a relationship between attitude and practice.

Mediating Effect of Attitude

The aforementioned factors are mediated by the belief and attitudes held by individuals (Vabo & Hansen, 2014). Schaewen (2014) confirmed the mediating effect of attitude on the relationship between objective knowledge and behaviour towards the consumption of organic vegetables. Another study showed that the association between objective knowledge and organic yogurt consumption was fully mediated by attitude (Loo et al., 2013). Only a few studies have tested the mediating effect of attitude in the relationship between objective knowledge and practice, which need more conclusive results. Thus, this study has constructed the following hypothesis

H4 Attitude mediates the relationship between objective knowledge and practice.

Methodology

This study used a pre-tested structural questionnaire. Purposive sampling was applied within the criteria set up for the study, which included users who were experienced in GA consumption, with at least a week, in the previous year. The data collection period lasted for three months from March to May of 2020, via an online survey using Google Forms. According to Hair et al (2017), the most cited rule of thumb is to present 10 times the largest number of structural paths directed at a particular construct in the structural model. Hence, the 301 respondents obtained in this study was considered as an appropriate sample size.

The set of questionnaires used in this study was adapted from prior studies. A pre-test and a pilot test were conducted to validate the questionnaire, and the resulting recommendations were considered for its improvement. Details of the validation procedure have been explained elsewhere (Halim et al., 2020). A 6-point Likert scale ranging from strongly agree to disagree strongly was used. Demographic data and general information were analysed using

SPSS, version 26, which explained the descriptive statistics using frequency and percentage. The Partial Least Squares Structural Equation Modelling (PLS-SEM) was used to determine how the indicators and constructs correlated with each other (measurement model), as well as how the constructs correlated with one another (structural model).

Findings

Profile of Respondents

The results showed that 64.8% (n = 192) of the total number of respondents were females, while the remaining 36.2% (n = 109) were males. The high proportion of females who were consuming GA suggested that females consumed more supplementary products than males. Respondents aged between 31 and 40 years old were in the highest percentage of 37.2% (n = 112), followed by those aged between 51 and 60 years old, who accounted for 20.3% (n = 61). Respondents between 41 and 50 years old represented 18.9% (n = 57) of the total sample, while those between the ages of 25 and 30 were 14.6% (n = 44). The lowest two proportions of the sample were those between 60 years old and above at 7% (n = 21), and those between the ages of 18 and 24 years old represented only 2% (n = 6).

Assessment of the Measurement Model

The measurement model, as shown in Figure 1, is used to determine how the indicators and constructs correlated with each other. The reflective measurement model was tested by performing reliability and validity tests.

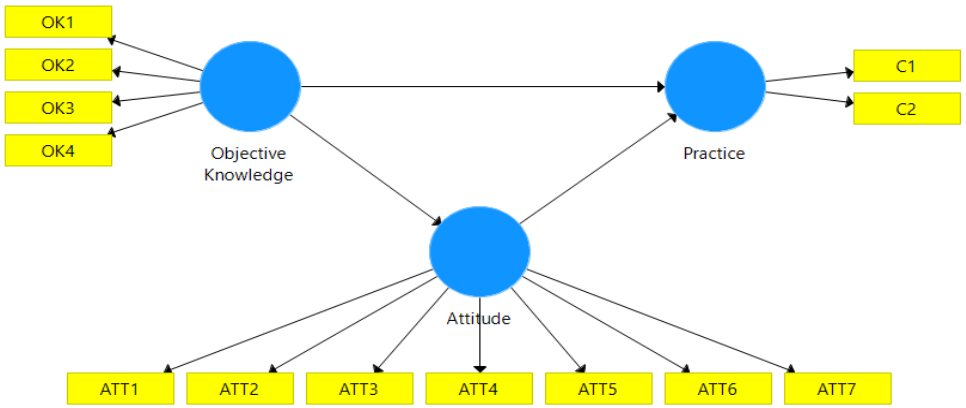

Figure 1: Measurement model

Reliability Analysis

Cronbach's alpha was assessed for the internal consistency reliability of the measured variables. A threshold value of 0.7, or higher was chosen for good internal consistency measurement (Hair et al., 2017). The Cronbach's alpha values obtained in this study ranged between 0.844 and 0.953, which were greater than the threshold value of 0.7. Hence, the internal consistency reliability of the variables is established, as presented in Table 1.

Convergent Validity

Factor loadings, composite reliability (CR), and average variance extracted (AVE) were used to assess convergent validity (Hair et el., 2017). The factor loadings, CR, and AVE values of the constructs are shown in Table 1. All factor loading values ranged from 0.790 to 0.976, which exceeded the recommended value of 0.708 (Hair et el., 2017). All three constructs met the

minimum cut-off values for CR and AVE, whereby all CRs were greater than 0.7, and all AVEs were greater than 0.5. Thus, this study concluded that the constructs met the reliability and convergent validity requirements at this stage.

Table 1
Measurement Model

Variable	Items	Loadings	α	CR	AVE
Objective Knowledge	OK1	0.896	0.844	0.894	0.680
	OK2	0.797			
	OK3	0.755			
	OK4	0.843			
Attitude	ATT1	0.914	0.953	0.962	0.782
	ATT2	0.937			
	ATT3	0.922			
	ATT4	0.906			
	ATT5	0.919			
	ATT6	0.791			
	ATT7	0.790			
Practice	C1	0.974	0.947	0.974	0.950
	C2	0.976			

Discriminant validity refers to the extent of which the constructs under investigation are truly distinct to each other. The Heterotrait-Monotrait (HTMT) approach allowed this study to estimate the true correlation between two constructs if they were perfectly measured. The HTMT value of a construct lower than the HTMT.85 value of 0.85 (Kline, 2011) and the HTMT.90 value of 0.90 (Kline, 2011) indicates excellent discriminant validity. All the HTMT values shown in Table 2 fulfilled the criterion of HTMT.90 and HTMT.85.

Table 2
Discriminant Validity using HTMT

Attitude	Attitude	OK	Practice
Attitude			
OK	0.644		
Practice	0.724	0.523	

Assessment of Structural Model

The structural model was further assessed based on path coefficient (β), coefficient of determination (R2), effect size (f2), and predictive relevance (Q2).

Path Coefficient

The path connecting two latent variables represents a hypothesis within the structural model. Hence, the researcher could confirm the assumption made on each hypothesis. It also indicates the strength of the relationship between two latent variables.

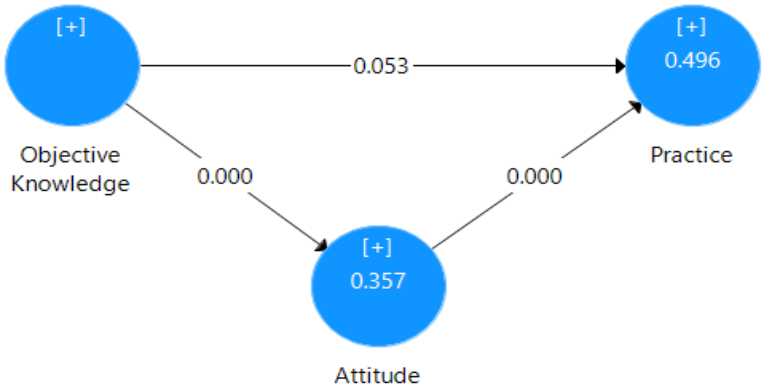

Figure 2: Structural model with the p-value and R2 values

The model assessment using the path coefficient are as shown in Figure 2. Based on the findings presented in Table 3, two relationships have t-values ≥ 1.645, thus, are significant at 0.05 level of significance. First, the effect of objective knowledge on attitude showed that objective knowledge obtained β of 0.598, t-value of 12.963, and p-value of 0.00. Since the p-value < 0.05, thus, H1 was supported. Second, the effect of objective knowledge on practice indicated that objective knowledge obtained β of 0.092, t-value of 1.934, and p-value of 0.053. The relationship between objective knowledge and practice showed a statistical p-value > 0.05; thus, H2 was not supported. Third, the effect of attitude on practice indicated that attitude obtained β of 0.645, t-value of 14.18, and p-value of 0.00. The results showed p-value < 0.05; hence, H3 was also supported.

Table 3
Summary Statistics

	Relationship	Std. Beta	Std. Error	*t*-value	*p*-value	Decision	R^2	f^2	Q^2
H1	OK -> Attitude	0.598	0.046	12.963	0.000	Supported	0.357	0.555	0.269
H2	OK -> Practice	0.092	0.047	1.934	0.053	Not Supported		0.011	
H3	Attitude -> Practice	0.645	0.046	14.18	0.000	Supported	0.496	0.532	0.462

Coefficient of Determination (R2)
The R2 values of 0.357 and 0.496 for H1 and H3 were higher than 0.33 (Chin, 1998), which indicated moderate models.

Effect Size, f2
Effect size can be computed based on the change in the coefficient of determination (R2). It can be measured by following the values of 0.02, 0.15, and 0.35, representing small, medium, and large effects, respectively (Chin, 1998). The findings showed that the values of the exogenous constructs of objective knowledge (0.555) and attitude (0.532) were higher than 0.35, which indicated a large effect in producing the R2 for attitude and practice, respectively.

Predictive Relevance, Q2

Predictive relevance (Q2) was assessed using the blindfolding procedure. If the Q2 value is larger than zero, the model denotes predictive relevance for a certain endogenous construct (Hair et al., 2017). The findings in this study indicated that the model has predictive relevance, as the Q2 value of two endogenous constructs, attitude and practice, was larger than zero.

Mediation Effect

What matters in mediation is the analysis of indirect effect (Hayes & Rockwood, 2016). Using the PLS algorithm's bootstrapping, the indirect effects of objective knowledge and practice, as shown in Table 4, shows β = 0.386, with a significant t-value of 10.061. The indirect effect of 95% of Boot Confident Interval Bias Corrected: [LL = 0.319, UL = 0.462] did not straddle a zero in between, which showed is the existence of mediation (Hayes & Rockwood., 2016); thus, H4 was supported.

Table 4
Mediation effect

Hypothesis	Relationship	Std. Beta	Std. Error	t-value	p-value	Confidence Interval		Decision
						LL	UL	
H4	OK -> Attitude -> Practice	0.386	0.038	10.061		0.319	0.462	Supported

Model Fit

The SRMR was introduced as a goodness of fit measure for PLS-SEM, which can be used to avoid model misspecification (Henseler et al., 2014). The SRMR value using the PLS algorithm for this study was 0.07 (< 0.08) for the saturated and estimated model. Hence, the model in this study was considered a good fit.

This study aimed to examine the relationships between objective knowledge, attitude, and practice of GA among users in Malaysia. The tested model showed that approximately 36% of variance in attitude can be explained by objective knowledge. Overall, 50% of variance in practice can be explained by objective knowledge and attitude. These results showed that the model also has a relatively good predictive relevance on attitude and practice of 0.269 and 0.462, respectively, which were larger than zero. The value of 0.555 for objective knowledge and 0.532 for attitude indicated large effects in producing the R2 for attitude and practice, respectively.

Discussion

This study found that objective knowledge has influenced users' attitude towards GA. This outcome was in line with studies by Pieniak et al (2010); Aertsens et al (2011); Loo et al (2013), which confirmed that the actual information that users have in mind can influence their attitude towards GA. Prior research have explained that information gained on products can help shape the attitude of users in deciding food products to consume (Stobbelaar et al., 2007; Verbeke, 2008; Mielmann et al., 2017). Therefore, it is crucial to ensure the facts are true at all costs, because having a good attitude from incorrect information raises the concern of the

safety and efficacy of dietary supplement products among users in their daily practice (Stobbelaar et al., 2007; Verbeke, 2008; Mielmann et al., 2017).

The insignificant result in the relationship between objective knowledge and practice also aligned with previous studies that were conducted on different food products (Pieniak et al., 2010; Schaewen, 2014; Gunne & Matto, 2017). These results showed that users may not be confident with the knowledge they gain. Hence, the knowledge was not reflected in their practice. Ali et al (2018) reported that the actual information of the product, including product quality and health benefits, nutritional content, hygiene, food product certification, and natural content are the qualities that are highly valued by consumers.

The findings also showed that attitude was strongly associated with the practice of GA consumption. One possible reason for this finding would be that attitude could become stronger when one has direct experience with an object, by which, in this case, it represents the experience of consuming GA (Glassman & Albarracin, 2006; Afina & Retnaningsih, 2018). GA users may also feel that consuming GA will improve their health performance, promotes well-being, give pleasure, and maintain good health, which in turn leads to good practice of GA consumption. This observation was in line with Loo et al (2013), which showed that attitude towards organic yogurt has a positive and relatively strong relationship with organic yogurt consumption, whereby consumers feel that organic yogurt is healthier and has better quality, which became their reason to purchase more organic yogurt.

This current study has also confirmed the significant effect of attitude as a mediator in the relationship between objective knowledge and practice. This result was supported by the results obtained by (Pieniak et al., 2010; Loo et al., 2013). Hence, the influence of attitude needs to be observed because it could interfere in the relationship between objective knowledge and practice of GA consumption.

Limitations and Suggestion for Future Research

Several limitations were faced by this study, which has opened a room of opportunities for future researchers to conduct further studies. The first limitation was the population recruited purposively among users who consumed GA. Thus, the results of this study could not be generalised to users of other products, and the results are also limited to Malaysian users. In addition, this study recruited respondents via a self-administered survey of objective knowledge, attitude, and practice towards GA, which may lead to respondents overestimating their objective knowledge, attitude, and practice towards GA.

Conclusion

This study found that objective knowledge can influence users' attitude, and that attitude was a significant predictor of practice of GA consumption. Factual information should be shared with the public at frequent intervals, because it is highly effective when the authority is always reminded of the importance of information (Cacioppo & Petty, 1989; Tellis, 1988). Information received repetitively and stored in the memory can then turn a person's attitude towards positive and correct practice of usage. Therefore, true and repetitive information may help fight against confusing information resulting from the multi-functional usage of GA and multi-terms used in different countries with different regulation, as well as misleading

and inaccurate information circulated by different information sources, including the internet. Lastly, it will reduce the potential risks that may hamper users in the future.

The implication of these findings can be divided into two parts, namely, in terms of theory and practice. Theoretically, these findings add to the body of literature that focuses on the practice of GA consumption. They also contribute to the evidence in support of attitude, as the factor influencing the practice of GA consumption and objective knowledge as the factor influencing attitude. In addition, the mediating effect of attitude in the relationship between objective knowledge and practice can also add value to the existing literature. Providing as much factual and relevant information as possible is important for users, since objective knowledge can influence their attitudes. Relevant information can affect thoughts and form users' attitude towards a product, which can help them to engage in practising correct usage by following proper guidance, or rules of consuming such products, hence, reducing unforeseen risks.

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