



Intention to purchase halal health supplement online: Lessons learned from the health crisis

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ABSTRACT

Consuming health supplements is essential to strengthen the immune systems and protect against illness, especially during health crises such as the COVID-19 pandemic. Considering the increasing number of Muslim populations worldwide and the necessity of online applications during health crises, this research aims to study the consumer's purchase intention of halal health supplement products online by examining variables influencing consumer's purchase intention. The Theory of Planned Behaviour has been applied as an underlying theory for this study, including religiosity and COVID-19 as an extension to the theory. 214 respondents participated in this study by completing the survey questionnaire via an online platform. Analysis was performed using SmartPLS4. The findings illustrate that perceived benefit is the most important indicator for Indonesian respondents, while attitude, subjective norms, and the COVID-19 pandemic are the factors that contribute to purchase intention among Malaysian respondents. The study enhances current literature, specifically in the context of halal health supplement products. Additionally, investigating the COVID-19 pandemic in the context of halal health supplements with a unique set of variables leads to a new path of study. Examining consumer behavior such as perceived benefit, attitude, subjective norms, and the COVID-19 pandemic that influence online purchase intention will provide consumer insights to marketers involved in halal health supplement products. The perspective on consumer beliefs gives directions for strategy development to businesses.

Originality/Value: The originality of this paper is twofold. First, to the best of the authors' knowledge, this is the first study that investigates the factors influencing the intention to purchase halal health supplements online during health crises. Second, it is the first study that focuses on the role of religiosity and COVID-19 as a moderator in the relationship between attitude, subjective norms, perceived behavioural control, perceived benefit, and perceived risk towards the intention to purchase halal health supplements online. Connecting all the components in a single study will provide a new path for future research.

1. Introduction

The drastic spread of the COVID-19 pandemic encouraged everyone to find a solution to combat the invisible virus. Countries

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worldwide have implemented lockdowns and social distancing, with quarantine and tracking systems as additional precautions against the spread of the virus. Although several vaccines have been developed to reduce the risk of getting and spreading the virus, individuals should still take necessary steps to protect themselves, such as having a healthy diet, exercising, and taking health supplements [1]. In terms of health supplements, customers evaluate the supplements before purchase based on the supplements' quality, features, and health value. The advice on consuming supplements is also supported by previous researchers; who stressed that an accurate balance of dietary supplements would strengthen the immune system to safeguard one's healthy well-being and potentially protect against illness [2]. In essence, the sales and consumption of dietary supplements have been steadily increasing worldwide in the wake of the coronavirus [3].

People have therefore started to find more information on health supplements, and given the need for social distancing, most prefer to find information online. Indeed, this health crisis has changed consumer behaviour from physical to online purchases [4]. A survey shows that 88% of the Malaysian population and 80% of the Indonesian population are digital consumers, the highest rates of digital consumption in Southeast Asia [5]. Having considered that both countries have a majority of Muslim populations which 87.2% in Indonesia and 61.3% in Malaysia [6,7]; it is reasonable to focus on halal health supplements. A person's religion or belief requires someone to behave and act [8]. This religion or belief can underlie the attitude toward consuming health supplements, especially for Muslims, where the supplements must be halal. Furthermore, cleanliness is an essential quality for halal products. Food safety and health concerns could be other reasons customers purchase halal products. Thus, it is expected that Muslims will be more selective in choosing halal health supplements for consumption during health crises. The Theory of Planned Behavior is one of the underlying theories utilized by prior researchers to explain the relationship between religiosity and intention to purchase and consume of halal products [9–11].

The present study, therefore, considers the urgency of consuming health supplements during health crises, along with the increase in online transactions and the need for halal products, providing a new research path in the behavioural intention field.

The authors thus conduct a study on halal health supplements online, with twofold objectives. The first aim is to determine the factors that influence the intention to purchase halal health supplements online, and the second is to examine whether religiosity and health crises play a role in the relationship between attitude, subjective norms, perceived behaviour control, perceived benefit and perceived risk toward the intention to purchase halal health supplements online. Religious variable related to halal health supplements is an interesting topic because for Muslims, the halal factor is an important consideration in purchasing and consuming any products.

This study is one of the earliest studies focused on the combination of three main areas: health supplements, halal products, and online transactions; health supplement suppliers are encouraged to certify their products as halal products and make them available online. This study discovers two different perceptions of Muslims in Indonesia and Malaysia on the intention to purchase halal supplements online; Indonesians focus on the benefit of the health supplement, while Malaysians focus on public attitude, and social norms. Therefore, this study provides insight into online purchases and halal supplement consumption trends. The importance of health supplements is undeniable during the COVID-19 pandemic and due to religiosity. Hence, this study provides practical implications of the demand for halal supplements from the consumer perspective.

The Theory of Planned Behavior (TPB), which dominates behavioral studies, has been applied as the underlying theory to explain the connection of the variables. TPB was proposed by Icek Ajzen in 1985, with three main components leading to behavioral intention: attitude, subjective norms, and perceived behavioral control. The findings from the previous study highlighted that except, for self-efficacy, all other antecedents of TPB had a positive impact on the purchase intention of halal food products among Muslims in India [9]. Furthermore, TPB and Perceived COVID-19 infectability were applied in the case of Iran and found significant mediators in the relationship between fear of COVID-19 and COVID-19 vaccination intention [11]. From another perspective, researchers use TPB components and religiosity to investigate fraudulent customer behavior on eBay [10]. The present study adds perceived benefit and perceived risk as additional independent variables, as these components are important in determining online purchase behavior [12].

2. Literature review

2.1. The COVID-19 pandemic

The COVID-19 fatality rate in Malaysia is below the global because of the fruitful implementation of preparedness and planning, the public health system, contact tracing, case detection, and Movement Control Order (MCO) [13]. However, the virus is reported to transmit primarily through salivary droplets. People are afraid of the risk of using physical money since it can transmit the droplets comprising the COVID-19 virus, and it motivates them to change to e-wallet applications. Perceived risk and perceived usefulness have directly affected the intention to use e-wallets during the pandemic, while the impact of government support on the intention to use e-wallets is mediated by perceived usefulness [14].

During the health crisis, due to control of movement order, people have lessened the occurrence of going out, and need to engage in health-seeking behaviours at home. Health crisis has also impacted health-seeking behaviour through increased health consciousness. Besides the transformation to use e-wallets, consumers also acquire purchases online during the pandemic. A study revealed that e-service quality, health consciousness and subjective norms have an impact on online purchase intention [15]. Another study evidenced that subjective norms and attitude have a significant impact on the intention to purchase sanitizer during the pandemic [16].

The following sections review previous studies on perceived benefits, perceived risks, religiosity, attitude, subjective norms, perceived behaviour control, and the intention to purchase halal health supplements online.

2.2. Attitude, subjective norms and perceived behaviour control

Attitude refers to the preference or feelings that foster people's tendency to act in a certain manner; it is a factor that drives purchase intention. In this study, attitude towards intention to purchase halal health supplements online refers to the degree of a person's belief and expectation in the effect of purchasing the product using digital technology. Previous studies found that customers' attitude has a significant influence on their intention to purchase certain products [17,18].

Subjective norms denote how important an individual or group of people is in influencing individual intention to purchase, in this case, halal health supplements online. The TPB proposed that subjective norms have a positive impact on individual intention behaviour. Subjective norm effect on individuals' intention to buy sustainable products during COVID-19 [19]. Subjective norms were categorized into internal and external elements; external subjective norms have a positive effect on the intention toward online shopping, while internal subjective norms have no significant effect [20].

In this study, perceived behaviour control signifies individual capability and judgment to purchase the halal health supplement online. Individual capability includes sufficient knowledge, ample facilities, and adequate financial resources, while individual judgment evaluates the difficulty level in performing a specific behaviour. Perceived behaviour control has a positive impact on the intention to use online shopping platforms [21]. Perceived behaviour control also has a significant impact on the intention to purchase masks during health crises [22].

2.3. Perceived benefits and perceived risks

Consumers make a purchase if they perceive that they will benefit from the transaction [23]. For example, according to the Theory of Social Cognition, a consumer's understanding of nutrition, the perceived benefits of healthy eating, and the consequences of poor eating habits will affect his or her eating behaviour [24]. It is notable that online purchase is based on the perception of the transactions' benefits and risks [25]. Perceived benefits of online shopping affect the consumer's intention, related to the advantages of adopting e-commerce [26]. The major benefit of online shopping is that consumers can make a purchase at any time and from any place [27]. The intention to purchase will always be related to the comforts and benefits to be obtained [28]. Additionally, online shopping can offer benefits and convenience [28]. Perceived risk and perceived benefits are important in determining e-commerce adoption behaviour [12]; while the benefits offered, the company and the environment affect online business development, such as food delivery [29]. In terms of halal, although most consumers do not possess adequate knowledge about the benefits associated with new goods such as halal cosmetics [30], other consumers may enjoy exploring the potential benefits of halal cosmetics brands [31].

Many argue that electronic commerce is riskier than traditional trade [32], for example, through fraud [33]. Perceived risk has a harmful effect on users' trust in online applications [34]. Risk is the possibility that the product will not offer the expected benefits [35]. Perceived risk can be defined as "any act of a consumer will produce consequences that he or she cannot anticipate, and some to be unpleasant" [36]. Perceived risk is a "subjectively determined expectation of loss" [37].

At a personal level, individual risk-taking behaviour is theorised to be predetermined [38]. Moreover, trust is important in communication transactions, especially when evaluating online risks [39]. The absence of trust and increased perceived risk lead to the transaction being abandoned. On the other hand, it is suggested that financial risks include the cost of paying more for online purchases [40]. Perceived risk rationalises consumer behaviour, reducing their intention to purchase [37]. Perceived risk is the main factor influencing intention to purchase [41], with the perception of risk lowering the willingness to purchase online [42]. Perceived risk impacts purchase decisions involving unpredictable, unpleasant and costly after-effects [43]. Perceived risk negatively affects the consumer's attitude [43,44]. Past studies have found associations between perceived risk and behavioural intention [45], intention to purchase and/or adoption of service [44,46]. Perceived risk is a variable in online shopping. The transaction risk level is higher due to the use of networks in online purchases [47,48]. A study showed that online trust and online transaction risks are major challenges to e-commerce [49]. In other words, perceived risk is an important factor in financial transactions such as online shopping [50] and internet banking [51].

Perceived risk is also an important factor in food purchases. A food shop's image through ambiance, reputation, perceived risk, price and service quality, strongly influence a consumer's choice of purchase [52]. For young consumers, it was found that the perceived risk included hygiene and labeling. Consumers perceived halal food shopping as a risky concern [53,54]. Financial, performance, privacy, psychological and time risks were the perceived risk types in drone food delivery [55]. Additionally, a past study concluded that Muslim travelers' perceived risks of halal food purchases [56].

Health consciousness, hectic lifestyle, and increasing medical expenses are among the factors contributing to dietary supplement consumption [57]. Indeed, the demand for the dietary supplement has surged in the wake of health crises as people believe the supplement will boost their immune systems. A study found that the weekly and daily estimated dietary supplement intake had increased during the COVID-19 pandemic compared to before the pandemic [58]. Nevertheless, for Muslims it is not only to find healthy supplements but more importantly to ensure that it is halal. The authorized institution to conduct the halal certification in Indonesia is Badan Penyelenggara Jaminan Produk Halal (BJPH) and in Malaysia is Jabatan Kemajuan Islam Malaysia (JAKIM). Aside from religious practice, halal products are obtaining global recognition due to safety and quality assurance [59]. A study evidenced that quality, attitude, subjective norms, and packaging influence the millennials in Jakarta, Bogor, Depok, Tangerang, and Bekasi, Indonesia to switch to halal supplements [60].

2.4. Religiosity

Religiosity refers to “the degree of an individual’s beliefs and commitments about the absolute definitiveness and inherent truth qualities of a religion’s teaching and scriptures” [61]. Religiosity or the affiliation of individuals to a specific religion actively guides their attitude and behavioural outcomes [8]. Religiosity drives individuals’ commitment to behave according to their religious values [62]. Religious values affect how individuals evaluate products and make acquisition decisions [63]. Individuals who uphold their religious values, so-called strong religiosity, are less materialistic than low religiosity as they portray happiness not from the materials, they have but from implementing the religious values. Individuals with strong religiosity tend to behave ethically [64]. In the study, it is proposed that Muslims with strong religiosity buy halal supplements because their religious values require them always to consume them. The higher religious group was more conscious about their lifestyle and less confused by information over choice [65].

2.5. Gaps in the literature

Past literature utilized TPB (attitudes, subjective norms, and perceived behavioral control) on the purchase intention of halal food products of Indian Muslims [9] prior to the outbreak of the COVID-19 pandemic. The intention for COVID-19 vaccination in Iran, a large Muslim majority country [11], and religiosity factors on customer intentions and customer behavior on eBay [10]. This shows that a Muslim consuming halal food product really considers these three components.

The pandemic has directly brought health problems to humankind. The COVID-19 virus can be prevented by consuming healthy nutrition and minimizing the risk of transmission. Furthermore, health concern is expected to continue post-COVID-19 pandemic. This is because large zoonotic disease outbreaks will almost certainly continue to happen frequently [66]. Health crises encourage consumers to shop online. On the other hand, shopping online provides benefits in terms of convenience when shopping and flexibility in choosing suppliers. This study adds perceived benefits and perceived risks as additional independent variables in addition to the three TPB components because these variables are important in determining online buying behavior [12]. This study reduces the gaps in the literature with the combination of health supplements, halal products, and online transactions with the underlying theory of TPB.

2.6. Research framework

Fig. 1 presents the research framework for this study, with attitude, subjective norms, perceived behaviour control, perceived benefits and perceived risks as independent variables following TPB model. Two additional variables are incorporated in the model, religiosity and COVID-19, to test whether they will have a direct effect on the intention to purchase halal health supplements online or whether they have a moderating effect on the relationship between the initial five independent variables and intention to purchase the health supplements. Religiosity and COVID-19 are selected as moderators to determine whether they will strengthen or weaken the relationship between the independent variables and dependent variables. In the context of religiosity, Islamic dietary rules emphasize halal products [67]. Nevertheless, the pandemic may limit and restrict access to halal products, which may result in negative results. In the context of COVID-19, the new norm, to a certain extent, has changed consumer behaviour. Thus, it is worth investigating the role of religiosity and COVID-19 in the intention to purchase halal health supplements.

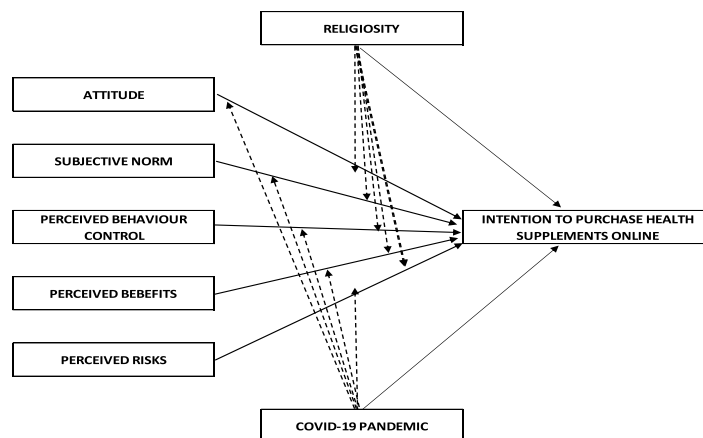


Fig. 1. Research framework.

3. Research methodology

3.1. Population, sample size and sample technique

Indonesia is the largest Muslim country in the world [68] Indonesians and Malaysians are the targeted populations of this study; the adult populations are estimated respectively at 173 million and 21 million (<https://www.statista.com>). These two neighbouring Southeast Asia countries are selected as both have a majority of the Muslim population in Indonesia (87.2%) and Malaysia (61.3%) [6, 7] and these countries offer diverse and dissimilar halal product choices [69] therefore, it is reasonable to focus on a study on halal health supplements.

The sample size for survey research that applies multivariate statistical technique recommended is within the range of 160–300 [70]. A sample of 160–300 is appropriate as it is not too small nor too large [70]. The data obtained were 222; however, the feasible to be processed was 214 after excluded missing data and suspicious response patterns. The quantity of this data is sufficient as it is within the specified range. Thus, a sample of 214 in this study is sufficient and appropriate to be applied in Partial Least Squares-Structure Equation Modelling (PLS-SEM).

Table 1
The questionnaire.

Attitude (72, 73, 77)	
AT1	Purchasing halal health supplement online is attractive to me.
AT2	Purchasing halal health supplement online is well suited to the way in which I normally shop.
AT3	Purchasing for the halal health supplement online is a good idea.
AT4	Purchasing for the halal health supplement online is a wise idea.
AT5	I like the idea of purchasing the halal health supplement online.
AT6	Purchasing for the halal health supplement online is pleasant.
Subjective Norm (72, 73, 77)	
SN1	Members of my family think that it is a good idea to buy halal health supplement via online.
SN2	Most of my friends think that purchasing halal health supplement via online is a good idea.
SN3	Most of my colleagues think that purchasing halal health supplement via online is a good idea.
SN4	People who influence my behaviour think that I should go for the online halal health supplement.
SN5	People who are important to me think that I should go for the online halal health supplement.
Perceived behavioural control (73, 77)	
PBC1	In general, purchasing the halal health supplement online is very complex.
PBC2	It is hard to find the needed halal health supplement products via online.
PBC3	It is difficult to order the halal health supplement product via online.
PBC4	In general, purchasing online halal health supplement yields few problems for me.
PBC5	I have control to purchase for the halal health supplement online.
PBC6	I have the necessary resources to pay for the online halal health supplement.
PBC7	I have the necessary knowledge to pay for the online halal health supplement.
PBC8	Given the opportunities, it would be easy for me to purchase the online halal health supplement.
Perceived Benefits (71)	
PB1	I can shop in privacy at home when buying halal health supplement online.
PB2	I can shop whenever I want when buying halal health supplement online.
PB3	I have a broader selection of products when buying halal health supplement online.
PB4	I can access to many brands when buying halal health supplement online.
PB5	I can access to many retailers when buying halal health supplement online.
PB6	I face no hassles when buying halal health supplement online.
PB7	I am not embarrassed if I do not buy halal health supplement online.
PB8	I can try new experience when buying halal health supplement online.
PB9	I am excited to receive a package when buying halal health supplement online.
Perceived Risks (71)	
PR1	I may purchase something by accident when buying halal health supplement online.
PR2	I might be overcharged when buying halal health supplement online.
PR3	I cannot examine the actual product when buying halal health supplement online.
PR4	I must pay for shipping and handling when buying halal health supplement online.
PR5	It is complicated for me to place order when buying halal health supplement online.
PR6	It is difficult for me to find appropriate websites when buying halal health supplement online.
Online Purchase Intention (75)	
INT1	I intend to make a purchase halal health supplement through the online shopping channels in the future.
INT2	I predict I would make a purchase halal health supplement through the online shopping channels in the future
INT3	I plan to make a purchase halal health supplement through the online shopping channels in the future
COVID 19 influence (74, 76)	
CD1	The pandemic had a significant influence on my online halal supplement consumption.
CD2	The pandemic has increased my online halal supplement consumption.
CD3	The pandemic has encouraged me to spend more on my online halal supplement consumption.
Religiosity (77, 73)	
RL1	My religious beliefs lie behind my whole approach to life.
RL2	I spend time trying to grow in understanding of my faith.
RL3	Religious beliefs influence all my dealings in life.
RL4	Religion is important to me.

The sampling method chosen for this study is convenience sampling. The survey questionnaire was conducted online and distributed to the public, mainly through Whatsapp, Telegram, and Facebook. The respondents must be a minimum age of 18 years old because that age is considered an adult as they can make their own decision and are independent without relying on their parents' suggestions/recommendations. This study performed the survey online because this study was conducted during the pandemic when all of us were asked to stay at home and could not physically meet the respondents.

3.2. Questionnaire

The survey questions are adapted from Refs. [71–77]. The items for the construct are presented in Table 1. For the purpose of coding the respondent's feelings and perception levels in numerical form, a 5-point Likert scale (1 means strongly disagree, 5 means strongly agree) is used for responses to the survey questions. The questionnaire was created using Google Forms, and all questions are expressed in the English, Malay, and Indonesian languages.

3.3. Data analysis techniques and ethical clearance

The data analysis is divided into two parts, descriptive analysis and PLS-SEM. PLS-SEM is appropriate when the objective is to identify the key drivers for the construct, which in this study refers to the determination of the factors to purchase halal health supplements online. SmartPLS 4 software was used for analysis and testing. The measurement and structural models were tested to achieve the objectives of this study. In addition, Multiple Group Analysis was conducted to determine the factors that influence Malaysians and Indonesians to purchase halal health supplements online.

Ethical clearance was obtained from the university's Scientific Ethical Committee (Ethical Approval No.: U/SERC/106/2021).

4. Findings

There is a total of 214 respondents participated in this study. The results of the descriptive analysis are presented in Table 2. There are 60 male respondents representing 27.9% of the respondents and 154 females. The majority of the respondents (76 respondents) are the young generation aged 18 to 24 and the lowest is 55 years old and above. In terms of highest education, most respondents have completed their pre-university and diploma. 114 respondents are married and the remaining are unmarried. 72 respondents working in the private sector, 58 are retirees, 30 are self-employed, 25 are in the public sector, 20 are students, and 9 are housewives. 124 respondents are from Malaysia and 90 are from Indonesia.

In addition, the respondents were asked about their frequency of purchasing online products. The outcome depicted in Fig. 2 below reveals that most of the respondents (80 respondents) are purchasing online products 2 or 3 times a month and 7 respondents never purchased online products. It is predicted that social distancing and restriction movement control orders contribute to online purchases. The public is more convenient to purchase online than queuing for payment in shops and avoiding crowded places.

Notwithstanding the above, the respondents were asked about their frequency of purchasing health supplements, and the result is presented in Fig. 3. Surprisingly, almost half of the respondents (108 respondents) rarely purchase health supplements. The result may be due to precautions on taking the health supplement.

Table 2
Descriptive analysis results.

Item	Description	Frequency	Percentage
Gender	Male	60	27.9
	Female	154	72.1
Age	18–24 years old	76	35.3
	25–35 years old	43	20.4
	36–45 years old	40	19.1
	46–55 years old	47	21.9
	More than 55 years old	8	3.7
Education level	Secondary school	21	9.8
	Pre-University/Certificate/Diploma	82	38.1
	Undergraduate (Bachelor's degree)	50	23.7
	Postgraduate (Doctorate/Master's degree)	57	26.5
	Others	4	1.9
Marital status	Unmarried	100	46.5
	Married	114	53.5
Employment	Public employee	25	11.6
	Private employee	72	34.0
	Own Business/Self-Employed	30	14.0
	Retiree	58	27.0
	Student	20	9.3
	Other	9	4.2
Country	Malaysia	124	58.1
	Indonesia	90	41.9



Fig. 2. Frequency of purchasing online products.

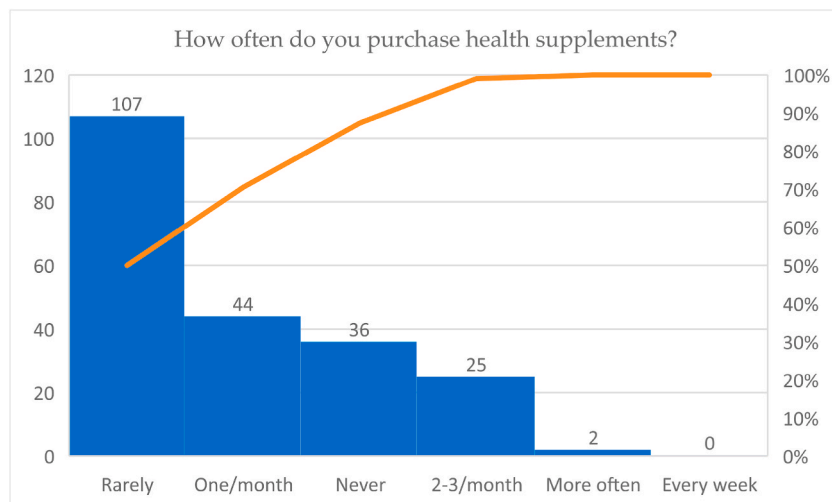


Fig. 3. Frequency of purchasing health supplements.

4.1. Measurement model assessment

PLS-SEM assesses the measurement model, before evaluating the structural model, following several rules of thumb. There are four pointers in assessing the measurement model: indicator loading, internal consistency reliability, convergent validity and discriminant validity [78]. Table 3 presents the results. The first step is examining the indicator loading, and a value above 0.70 is recommended. A few items which do not meet the criteria were deleted. The second stage is evaluating the internal consistency reliability. It was

Table 3
Results for measurement model.

Items	Cronbach Alpha	Rho A	Composite Reliability	Average Variance Extracted (AVE)
Attitude	0.876	0.877	0.924	0.802
Subjective Norms	0.858	0.861	0.914	0.779
Perceived Behaviour Control	0.784	0.923	0.864	0.679
Perceived Benefit	0.863	0.890	0.915	0.783
Perceived Risk	0.823	0.856	0.873	0.579
COVID-19 effect	0.842	0.842	0.927	0.864
Religiosity	0.801	0.812	0.883	0.715
Intention	0.893	0.893	0.949	0.903

Table 4
Factor loadings and VIF results.

	Factor Loadings	VIF
AT1	0.887	2.258
AT2	0.893	2.405
AT3	0.905	2.508
PB2	0.894	1.971
PB3	0.889	2.544
PB5	0.870	2.330
CP1	0.930	2.125
CP3	0.928	2.125
INT1	0.949	2.857
INT2	0.951	2.857
PBC6	0.776	1.759
PBC7	0.802	1.931
PBC8	0.890	1.453
PR1	0.749	1.419
PR3	0.814	2.199
PR5	0.770	2.087
PR6	0.749	1.419
R1	0.862	1.882
R2	0.880	1.901
R4	0.793	1.529
SN1	0.906	2.416
SN3	0.869	2.071
SN4	0.872	2.082
R*SN	1.000	1.000
R*PR	1.000	1.000
R*BN	1.000	1.000
R*PBC	1.000	1.000
R*AT	1.000	1.000
CP*PBC	1.000	1.000
CP*SN	1.000	1.000
CP*PR	1.000	1.000
CP*BN	1.000	1.000
CP*AT	1.000	1.000

executed by extracting the data for composite reliability and Cronbach's Alpha. The results of composite reliability reported in [Table 3](#) indicate that the values are within the suggested range of satisfactory to good [79]. Likewise, the value of Cronbach's Alpha met the rule of thumb as more than 0.70. The third step is examining the convergent validity by conducting the average variance extracted (AVE); again, AVE had an acceptable value of above 0.50.

Moreover, [Table 4](#) shows that all the factor loadings are relevant as the values are more than 0.5 and no multicollinearity issue arises because the VIF values are below 5.

The result further shows no discriminant validity problem since the heterotrait–monotrait ratio (HTMT) of the correlation value is below 0.90. The results are displayed in [Table 5](#).

4.2. Structural model assessment

[Table 6](#) shows the results of the structural model assessment of combining both countries after taking into consideration the effect of attitude (A), subjective norms (SN), perceived behavioral control (PBC), perceived benefit (PB), and perceived risk (PR) on intention to purchase halal health supplements online and incorporates both COVID-19 pandemic (CP) and religiosity (RL) as moderators. It shows that ATT, SN, CP, and RL have a direct effect on the intention to purchase halal health supplements online. The results also reveal a reverse moderation impact of CP and SN on the intention to purchase halal health supplements online. [Table 6](#) indicates the R square is 0.62 for both countries; which explains 62% of the intention to purchase halal health supplements, categorized as moderate.

5. Discussion

The result shows that attitude and subjective norms have a positive impact on the intention to purchase halal health supplements online. The results are in line with the work by previous researchers [17,19] who discovered that attitude and subjective norms have a positive influence on the intention to buy certain products. These outcomes signify that Muslims favour products closely related to their religious beliefs [80]. This result further justifies that respondents believe health supplements help to boost immune response during the pandemic. They also believe purchasing halal health supplements online will be wise since people try to avoid physical shopping and face-to-face conversation. The stay-home restriction also encourages online purchases. In contrast, a past study evidenced that attitude does not influence the intention to purchase halal food among Gen Y in Malaysia [81]. They believe that Gen Y is more focused on social lifestyle.

Table 5
HTMT results.

	A	BN	CP	INT	PBC	PR	R	SN	R x PR	R x PBC	CP x SN	R x A	CP x BN	CP x PBC	CP x A	R x BN	CP x PR	R x SN
A																		
BN	0.56																	
CP	0.66	0.50																
INT	0.75	0.51	0.72															
PBC	0.63	0.78	0.43	0.45														
PR	0.39	0.34	0.10	0.21	0.29													
R	0.23	0.31	0.18	0.25	0.38	0.21												
SN	0.89	0.55	0.72	0.78	0.60	0.37	0.26											
R x PR	0.04	0.01	0.11	0.03	0.09	0.20	0.22	0.05										
R x PBC	0.05	0.08	0.02	0.10	0.10	0.05	0.36	0.09	0.29									
CP x SN	0.35	0.05	0.35	0.41	0.12	0.07	0.05	0.35	0.11	0.02								
R x A	0.04	0.21	0.05	0.15	0.07	0.04	0.13	0.06	0.28	0.65	0.08							
CP x BN	0.08	0.26	0.08	0.13	0.15	0.16	0.14	0.05	0.19	0.11	0.46	0.09						
CP x PBC	0.12	0.16	0.03	0.05	0.31	0.15	0.03	0.06	0.19	0.09	0.32	0.05	0.73					
CP x A	0.38	0.07	0.38	0.38	0.12	0.09	0.04	0.36	0.12	0.02	0.86	0.15	0.53	0.45				
R x BN	0.17	0.16	0.15	0.18	0.13	0.05	0.23	0.12	0.27	0.63	0.09	0.43	0.13	0.10	0.11			
CP x PR	0.08	0.18	0.12	0.12	0.18	0.13	0.09	0.06	0.02	0.19	0.15	0.21	0.12	0.19	0.07	0.21		
R x SN	0.02	0.14	0.09	0.13	0.12	0.05	0.15	0.04	0.31	0.64	0.10	0.74	0.06	0.06	0.07	0.49	0.20	

Table 6
Results for Structural Model using PLS SEM.

	Standard Beta	Standard Deviation	T statistics	P values
A - > INT	0.238	0.225	2.840	0.005
BN - > INT	0.063	0.056	0.835	0.404
CP - > INT	0.223	0.220	3.384	0.001
PBC - > INT	0.013	0.043	0.142	0.887
PR - > INT	0.039	0.030	0.740	0.459
R - > INT	0.116	0.113	2.052	0.040
SN - > INT	0.278	0.272	2.948	0.003
R x PR - > INT	-0.012	-0.011	0.211	0.833
R x PBC - > INT	0.093	0.056	0.840	0.401
CP x SN - > INT	-0.173	-0.188	1.959	0.050
R x A - > INT	0.014	0.019	0.145	0.885
CP x BN - > INT	-0.039	-0.024	0.529	0.597
CP x PBC - > INT	0.074	0.065	1.015	0.310
CP x A - > INT	0.052	0.045	0.513	0.608
R x BN - > INT	-0.046	-0.015	0.534	0.593
CP x PR - > INT	-0.063	-0.071	1.243	0.214
R x SN - > INT	0.047	0.025	0.496	0.620

In addition to the above analyses, a multi group analysis (MGA) was conducted where the data were grouped by country for Indonesia and Malaysia, respectively. For Indonesia, only PB has a significant positive impact on the intention to purchase halal health supplements online, while for Malaysia, ATT, SN, and CP have a significant influence, with R squares 0.65 and 0.69, respectively. This indicates a moderate model.

The finding of this study reveals that during the pandemic immediate families, close friends, and colleagues are important in giving support and disseminating information. Close relationships during the pandemic persuade others' intentional behaviour. Notably, social relationships may compensate for highly favourable attitudes in building intentions to purchase halal products [82].

Nevertheless, the result shows that perceived behavioural control does not have a significant impact on the intention to purchase halal health supplements. The result is consistent with past studies [83,84] conducted on the customers' intention to purchase halal food in South Africa. They argued that consumers might not have control over buying halal products. The outcome contradicts the result obtained from a previous study who found a significant positive relationship between perceived behavioural control and the intention to purchase halal food among Muslim travelers [85].

The results show that COVID-19 affects the intention to purchase halal health supplements. During the global health crisis, having a good health supplement will strengthen the immune system to fight the disease. Consuming vitamin D supplements habitually a year before COVID-19 diagnosis was correlated with less severe disease and better survival than not consuming vitamin D or receiving supplements shortly after diagnosis [86]. The findings also reveal that perceived benefit positively impacts the intention to purchase halal health supplements. These specify that respondents intend to purchase halal health supplements online if they find they will benefit them. Religiosity also has a significant positive impact on the intention to purchase halal health supplements. Specifically, it denotes the respondents' concern and tendency to consume halal products.

Nonetheless, the results of interaction terms show that COVID-19 moderates the relationship between subjective norms and intention to purchase halal health supplements online, while others show no significant results. This suggests that a higher COVID-19 pandemic impact will change the direction of the influence of subjective norms on the intention to purchase halal health products from positive to negative. A possible reason is that respondents' fear of being infected, the restriction on traveling, and physical distancing increase their intention to purchase the halal health supplement inversely to the immediate families' and friends' influence. Rather than being a determinant of purchase intention, the pandemic has a relatively reverse modifying power on subjective norms.

The findings illustrate that perceived benefit is the most important indicator for Indonesian respondents regarding their intention to purchase halal health supplements online. This can be interpreted as privacy, easy access, and a broader selection of products and retailers via online platforms leading to the purchase indentation of online halal health supplements. On the other hand, in Malaysia, attitude, subjective norms, and COVID-19 are the factors that contribute to purchase intention among respondents. Their stance on immunity supplements to prevent the disease and encouragement from immediate families and friends influence their intention to purchase halal health supplements during the pandemic. However, perceived benefit is not a significant indicator for Malaysian respondents regarding their intention to purchase, and the result is in line with a study on the intention to consume Fe tablet [87]. Furthermore, perceived risk does not have a significant effect on the intention to purchase halal health supplements in both Indonesia and Malaysia. This finding is supported by the previous study that perceived risk does not have significant influence on intention to purchase Visval e-commerce products in Indonesia [88].

6. Conclusions

The health crises such as COVID-19 pandemic has changed the way of life in many aspects, including handling business operations, banking transaction, teaching and learning, and purchasing behavior. Many people have shifted from physical to online transactions to avoid crowded places and for safety purposes. In addition, COVID-19 has remarked on the importance of health products. This study adds new insight to the online purchase literature, specifically on halal health supplements, by including the elements of religiosity and COVID-19, supporting the TPB.

6.1. Theoretical and practical implication

This study has several implications in terms of theoretical and practical. In theoretical terms, this study has supported the TPB by concluding that attitude and subjective norms are the drivers that influence the purchase of halal health supplements online. The findings validate the idea that conceptualise in TPB. Moreover, this study incorporates perceived benefit and perceived risk in the framework, which broadens the TPB scope. Additionally, this study extends the theory by proposing the COVID-19 pandemic and religiosity as moderators. The two elements were selected after considering the necessity of online purchases and halal products. It gives a new research path, and the interpretation of the TPB outcome should consider the market situation at a particular time.

In practice, health supplement providers should consider producing halal supplements and moving forward to online business. Consumers express greater gratification if businesses acknowledge the religious obligation [80 and the current market trend. They should also focus on the supplement for long- or post-COVID-19 patients. Policymakers should be involved in inspecting the health supplement's nutritional content to ensure its quality.

In practical terms, this study contributes to the marketing agenda of promoting halal health supplement online. Strategic marketing planning should include developing a positive attitude towards halal health products, boosting halal products through social norms, and learning from COVID-19 pandemic necessities. Despite the lower cases of COVID-19 in recent days and the mild symptoms which is under control, the consumption of health supplement should be continued to keep healthy. Government plays an essential role in promoting awareness of healthy products to the public.

6.2. Limitation and future research

This study is limited to Malaysian and Indonesian respondents. It is recommended to invite other countries to participate in the survey in order to have perceptions from different countries. Additionally, this study's questionnaire comprised close-ended questions, so future researchers may consider open-ended questions to obtain broader feedback. Since this study was conducted during the COVID-19 pandemic, there is a need for the hypothesis to be tested continuously. This study was conducted in Southeast Asia i.e. Indonesia and Malaysia; The findings of the study could vary if it is carried out in other Muslim majority countries. The health supplement is the focus of this study, future studies may focus on other products and services such as halal skin-care products or halal tourism.

Author contribution statement

Adi Tedjakusuma; Hui Nee Au Yong; Erna Andajani; Zam Zuriyati Mohamad: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Data availability statement

The data that has been used is confidential.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix

Section A

Demographic Profile

Section A: Demographic Profile
<p>1. Gender</p> <p><input type="checkbox"/> Male</p> <p><input type="checkbox"/> Female</p>
<p>2. Age Group</p> <p><input type="checkbox"/> 18-24 years old</p> <p><input type="checkbox"/> 25-35 years old</p> <p><input type="checkbox"/> 36-45 years old</p> <p><input type="checkbox"/> 46-55 years old</p> <p><input type="checkbox"/> More than 55 years old</p>
<p>3. Education Level</p> <p><input type="checkbox"/> Secondary School</p> <p><input type="checkbox"/> Pre-University / Certificate / Diploma</p> <p><input type="checkbox"/> Undergraduate (Bachelor's degree)</p> <p><input type="checkbox"/> Postgraduate (Doctorate / Master's degree)</p> <p><input type="checkbox"/> Others. Please state _____</p>
<p>4. Marital Status</p> <p><input type="checkbox"/> Unmarried</p> <p><input type="checkbox"/> Married</p>
<p>5. Employment</p> <p><input type="checkbox"/> Public employee</p> <p><input type="checkbox"/> Private employee</p> <p><input type="checkbox"/> Own Business / Self-Employed</p> <p><input type="checkbox"/> Retiree</p> <p><input type="checkbox"/> Student</p> <p><input type="checkbox"/> Others. Please state _____</p>
<p>6. Country of residence</p> <p><input type="checkbox"/> Malaysia</p> <p><input type="checkbox"/> Indonesia</p>
<p>7. City : Please state _____</p>
<p>8. How often do you purchase online products?</p> <p><input type="checkbox"/> Never</p> <p><input type="checkbox"/> Rare</p> <p><input type="checkbox"/> 1/month</p> <p><input type="checkbox"/> 2-3/month</p> <p><input type="checkbox"/> Every week</p> <p><input type="checkbox"/> More often</p>
<p>9. How often do you purchase health supplement?</p> <p><input type="checkbox"/> Never</p> <p><input type="checkbox"/> Rare</p> <p><input type="checkbox"/> 1/month</p> <p><input type="checkbox"/> 2-3/month</p> <p><input type="checkbox"/> Every week</p> <p><input type="checkbox"/> More often</p>

Section B

Attitude						
s	Purchasing halal health supplement online is attractive to me.	1	2	3	4	5
AT2	Purchasing halal health supplement online is well suited to the way in which I normally shop.	1	2	3	4	5
AT3	Purchasing for the halal health supplement online is a good idea.	1	2	3	4	5
AT4	Purchasing for the halal health supplement online is a wise idea.	1	2	3	4	5
AT5	I like the idea of purchasing the halal health supplement online.	1	2	3	4	5
AT6	Purchasing for the halal health supplement online is pleasant.	1	2	3	4	5
Subjective Norm						
SN1	Members of my family think that it is a good idea to buy halal health supplement via online.	1	2	3	4	5
SN2	Most of my friends think that purchasing halal health supplement via online is a good idea.	1	2	3	4	5
SN3	Most of my colleagues think that purchasing halal health supplement via online is a good idea.	1	2	3	4	5
SN4	People who influence my behaviour think that I should go for the online halal health supplement.	1	2	3	4	5
SN5	People who are important to me think that I should go for the online halal health supplement.	1	2	3	4	5
Perceived behavioural control						
PBC1	In general, purchasing the halal health supplement online is very complex.	1	2	3	4	5
PBC2	It is hard to find the needed halal health supplement products via online.	1	2	3	4	5
PBC3	It is difficult to order the halal health supplement product via online.	1	2	3	4	5
PBC4	In general, purchasing online halal health supplement yields few problems for me.	1	2	3	4	5
PBC5	I have control to purchase for the halal health supplement online.	1	2	3	4	5
PBC6	I have the necessary resources to pay for the online halal health supplement.	1	2	3	4	5
PBC7	I have the necessary knowledge to pay for the online halal health supplement.	1	2	3	4	5
PBC8	Given the opportunities, it would be easy for me to purchase the online halal health supplement.	1	2	3	4	5
Perceived Benefits						
PB1	I can shop in privacy at home when buying halal health supplement online.	1	2	3	4	5
PB2	I can shop whenever I want when buying halal health supplement online.	1	2	3	4	5
PB3	I have a broader selection of products when buying halal health supplement online.	1	2	3	4	5
PB4	I can access to many brands when buying halal health supplement online.	1	2	3	4	5
PB5	I can access to many retailers when buying halal health supplement online.	1	2	3	4	5
PB6	I face no hassles when buying halal health supplement online.	1	2	3	4	5
PB7	I am not embarrassed if I do not buy halal health supplement online.	1	2	3	4	5
PB8	I can try new experience when buying halal health supplement online.	1	2	3	4	5
PB9	I am excited to receive a package when buying halal health supplement online.	1	2	3	4	5
Perceived Risks						
PR1	I may purchase something by accident when buying halal health supplement online.	1	2	3	4	5
PR2	I might be overcharged when buying halal health supplement online.	1	2	3	4	5
PR3	I cannot examine the actual product when buying halal health supplement online.	1	2	3	4	5
PR4	I must pay for shipping and handling when buying halal health supplement online.	1	2	3	4	5
PR5	It is complicated for me to place order when buying halal health supplement online.	1	2	3	4	5
PR6	It is difficult for me to find appropriate websites when buying halal health supplement online.	1	2	3	4	5
Online Purchase Intention						
PI1	I intend to make a purchase halal health supplement through the online shopping channels in the future.	1	2	3	4	5
PI2	I predict I would make a purchase halal health supplement through the online shopping channels in the future	1	2	3	4	5
PI3	I plan to make a purchase halal health supplement through the online shopping channels in the future	1	2	3	4	5
COVID 19 influence						
CD1	The pandemic had a significant influence on my online halal supplement consumption.	1	2	3	4	5
CD2	The pandemic has increased my online halal supplement consumption.	1	2	3	4	5
CD3	The pandemic has encouraged me to spend more on my online halal supplement consumption.	1	2	3	4	5
Religiosity						
RL1	My religious beliefs lie behind my whole approach to life.	1	2	3	4	5
RL2	I spend time trying to grow in understanding of my faith.	1	2	3	4	5
RL3	Religious beliefs influence all my dealings in life.	1	2	3	4	5
RL4	Religion is important to me.	1	2	3	4	5

References

- [1] H. Setyoningsih, Y. Pratiwi, A. Rahmawati, H.M. Wijaya, R.N. Lina, Penggunaan vitamin untuk meningkatkan imunitas tubuh di masa pandemi, *Jurnal Pengabdian Kesehatan STIKES Cendekia Utama Kudus P-ISSN 2614-3593 E-ISSN 2614-3607* 4 (2) (2021), 2021, <http://jpk.jurnal.stikescendekiautamakudus.ac.id>.
- [2] M. Mrityunjaya, V. Pavithra, R. Neelam, P. Janhavi, P.M. Halami, P.V. Ravindra, Immune-boosting, antioxidant and anti-inflammatory food supplements targeting pathogenesis of COVID-19, *Front. Immunol.* (2020) 2337.
- [3] J. Hamulka, M. Jeruszka-Bielak, M. Górnicka, M.E. Drywień, M.A. Zielinska-Pukos, Dietary Supplements during COVID-19 outbreak. Results of Google Trends analysis supported by PLifeCOVID-19 online studies, *Nutrients* 13 (1) (2021) 54.
- [4] E.R. Malthaputri, Y. Sunitiyoso, Online shopping behavioural insight of health products during pandemic, *Journal of International Conference Proceedings* 4 (3) (2021) 185–192.
- [5] V. Ganesan, Malaysia E-Shopping King of the Region, 9 Out of 10 Online by End-2021. *The Edge Markets*, 2021. Retrieved from, <http://www.theedgemarkets.com>.
- [6] F.E. Christy, Indonesia Dengan Muslim Terbesar Di Asia Tenggara, 2019. <https://data.tempo.co/data/480/indonesia-dengan-muslim-terbesar-di-asia-tenggara>.
- [7] Kristina, 3 Negara di Asia Tenggara dengan Penduduk Mayoritas Islam, 2021. www.detik.com/edu/detikpedia/d-5718027/3-negara-di-asia-tenggara-dengan-penduduk-mayoritas-islam.

- [8] S.K. Ariffin, I. Ismail, K.A. Mohammad Shah, Religiosity moderates the relationship between ego-defensive function and attitude towards advertising, *Journal of Islamic Marketing* 7 (1) (2016) 15–36.
- [9] A. Khan, M.K. Azam, M.Y. Arafat, Does religiosity really matter in purchase intention of halal certified packaged food products? A survey of Indian Muslims consumers, *Pertanika J. Soc. Sci. and Hum.* 27 (4) (2019) 2383–2400.
- [10] S. Sharma, G. Singh, L. Gaur, R. Sharma, Does psychological distance and religiosity influence fraudulent customer behaviour? *Int. J. Consum. Stud.* 46 (4) (2022) 1468–1487. <https://doi-org.libezp2.utar.edu.my/10.1111/ijcs.12773>.
- [11] R. Yahaghi, S. Ahmadi, R. Fotuhi, E. Taherkhani, M. Ranjbaran, Z. Buchali, R. Jafari, N. Zamani, A. Shahbazkhanian, H. Simiari, et al., Fear of COVID-19 and perceived COVID-19 infectability supplement theory of planned behaviour to explain Iranians' intention to get COVID-19 vaccinated, *Vaccines* 9 (2021) 684, <https://doi.org/10.3390/vaccines9070684>.
- [12] T. Tanadi, B. Samadi, B. Gharleghi, The impact of perceived risks and perceived benefits to improve an online intention among Generation-Y in Malaysia, *Asian Soc. Sci.* 11 (26) (2015) 226–238.
- [13] J.H. Hashim, M.A. Adman, Z. Hashim, M.F. Mohd Radi, S.C. Kwan, COVID-19 epidemic in Malaysia: epidemic progression, challenges, and response, *Front. Public Health* 9 (2021), 560592, <https://doi.org/10.3389/fpubh.2021.560592>.
- [14] H.M. Aji, I. Berakon, M. Md Husin, COVID-19 and e-wallet usage intention: a multigroup analysis between Indonesia and Malaysia, *Cogent Business and Management* 7 (1) (2020), 1804181, <https://doi.org/10.1080/23311975.2020.1804181>.
- [15] S. Candra, M. Ayudina, M.A. Arashi, The impact of online food applications during the covid-19 pandemic, *International Journal of Technology* 12 (3) (2021) 472–484.
- [16] S. Hidayat, W. Wibowo, Y.E. Gunawan, G.C. Dewi, M. Wijayaningtyas, Factors influencing purchase intention of healthcare products during the COVID-19 pandemic: an empirical study in Indonesia, *Journal of Asian Finance, Economics and Business* 8 (6) (2021) 337–345, <https://doi.org/10.13106/jafeb.2021.vol8.no6.0337>.
- [17] M.S.A. Latip, F.T. Newaz, R. Ramasamy, S.A. Tumin, I. Noh, How do food safety knowledge and trust affect individual's green considerations during the covid-19 pandemic in Malaysia? *Malaysian Journal of Consumer and Family Economics* 24 (2020) 261–285.
- [18] S.M. Pang, B.C. Tan, T.C. Lau, Antecedents of consumers' purchase intention towards organic food: integration of theory of planned behavior and protection motivation theory, *Sustainability* 13 (9) (2021) 5218.
- [19] L. Alexa, A. Apetri, J. Sapena, The COVID-19 lockdown effect on the intention to purchase sustainable brands, *Sustainability* 13 (6) (2021) 3241.
- [20] J. Koch, B. Frommeyer, G. Schewe, Online shopping motives during the COVID-19 pandemic—lessons from the crisis, *Sustainability* 12 (24) (2020), 10247.
- [21] J. Moon, Y. Choe, H. Song, Determinants of consumers' online/offline shopping behaviours during the COVID-19 pandemic, *Int. J. Environ. Res. Publ. Health* 18 (4) (2021) 1593.
- [22] T.K.P. Tran, Critical factors affecting masks purchasing intention of consumers during COVID-19 pandemic: an empirical study in vietnam, *The Journal of Asian Finance, Economics and Business* 8 (5) (2021) 1011–1017.
- [23] H. Lai, Y.T. Zhuang, Comparing the performance of group-buying models-time based vs. quantity-based incentives, in: *Proceedings of the Third Workshop on Knowledge-Economy and Electronic Commerce*, National Central University, Taiwan, 2006.
- [24] L. Sutanto, W. Lukito, R.W. Basrow, *Nutrition Interventions for Healthy Ageing in Indonesia*, 2020, <https://doi.org/10.20473/amnt.v4i1SP.2020.1-5>.
- [25] T.S.H. Teo, J. Liu, Consumer trust in E-commerce in the United States, Singapore, and China, *Omega* 35 (2007) 22–38.
- [26] N. Delafrooz, L.H. Paim, A. Khatibi, Understanding consumer's internet purchase intention in Malaysia, *Afr. J. Bus. Manag.* 5 (3) (2011) 2837–2846.
- [27] M. Salehi, Consumer buying behavior towards online shopping stores in Malaysia, *Int. J. Acad. Res. Bus. Soc. Sci.* 2 (1) (2012) 393–402.
- [28] M.T. Liu, J.L. Brock, G.C. Shi, R. Chu, T.H. Tseng, Perceived benefits, perceived risk, and trust: influences on consumers' group buying behaviour, *Asia Pac. J. Mark. Logist.* 25 (2013) 225–248.
- [29] B. Sindhav, A.L. Balazs, A model of factors affecting the growth of retailing on the internet, *J. Mark.-Focused Manag.* 4 (4) (1999) 319–339.
- [30] S. Mohezar, S. Zailani, Z. Zainuddin, *Halal* cosmetics adoption among young Muslim consumers in Malaysia: religiosity concern, *GJAT* 6 (1) (2016) 47–59.
- [31] K.H. Kim, D.H. Kim, Research reports: a study on the attitude toward make-up cosmetics by fashion leadership -ranging in silver generation women, *Journal of the Korean Society of Design Culture* 16 (4) (2010) 52–68.
- [32] Yao-Hua Tan, Walter Thoen, Toward a generic model of trust for electronic commerce, *Int. J. Electron. Commer.* 5 (2000) 61–74.
- [33] Ian MacInnes, Damani Musgrave, Jason Laska, *Electronic commerce fraud: towards an understanding of the phenomenon*, Former Departments, Centers, Institutes and Projects (2005), <https://doi.org/10.1109/HICSS.2005.227>.
- [34] T. Zhou, Understanding users' initial trust in mobile banking: an elaboration likelihood perspective, *Comput. Hum. Behav.* 28 (4) (2010) 1518–1525.
- [35] T. Roselius, Consumer rankings of risk reduction methods, *J. Marketing* 35 (1) (1971) 56–61.
- [36] R.A. Bauer, Consumer behavior as risk taking, June 15, 16, 17, in: *Proceedings of the 43rd National Conference of the American Marketing Association*, American Marketing Association, Chicago, IL, 1960.
- [37] V.-W. Mitchell, Consumer perceived risk: conceptualizations and models, *Eur. J. Market.* 33 (1/2) (1999) 163–195.
- [38] J. Wang, N. Xiao, H. Raghav Rao, Research note—an exploration of risk characteristics of information security threats and related public information search behavior, *Inf. Syst. Res.* 26 (3) (2015) 619–633.
- [39] J. Bryce, J. Fraser, The role of disclosure of personal information in the evaluation of risk and trust in young peoples' online interactions, *Comput. Hum. Behav.* 30 (2014) 299–306.
- [40] A. Popli, S. Mishra, Factors of perceived risk affecting online purchase decisions of consumers, *Pacific Business Review International* 8 (2) (2015) 49–58.
- [41] R.N. Stone, K. Grønhaug, Perceived risk: further considerations for the marketing discipline, *Eur. J. Market.* 27 (3) (1993) 39–50.
- [42] D. Barnes, M. Hinton, Developing a framework to analyse the roles and relationships of online intermediaries, *Int. J. Inf. Manag.* 27 (2) (2007) 63–74.
- [43] H. Celik, What determines Turkish customers' acceptance of internet banking? *Int. J. Bank Market.* 26 (5) (2008) 353–370.
- [44] M.C. Lee, Factors influencing the adoption of internet banking: an integration of TAM and TPB with perceived risk and perceived benefit, *Electron. Commer. Res. Appl.* 8 (3) (2009) 130–141.
- [45] A. Kesharwani, S.S. Bisht, The impact of trust and perceived risk on internet banking adoption in India, *Int. J. Bank Market.* 30 (4) (2012) 303–322.
- [46] A. Kesharwani, T. Tripathy, Dimensionality of perceived risk and its impact on internet banking adoption: an empirical investigation, *Serv. Market. Q.* 33 (2) (2012) 177–193.
- [47] V. Shankar, G.L. Urban, F. Sultan, Online trust: a stakeholder perspective, concepts, implications, and future directions, *J. Strat. Inf. Syst.* 11 (3) (2002) 325–344.
- [48] S. Yang, Y. Lu, S. Gupta, Y. Cao, R. Zhang, Mobile payment services adoption across time: an empirical study of the effects of behavioral beliefs, social influences, and personal traits, *Comput. Hum. Behav.* 28 (2011) 129–142.
- [49] J. Nielsen, *E-commerce usability Improvements*, 2011. <https://www.ngroup.com/articles/ecommerce-improvements/>.
- [50] B. Vatanasombut, A. Stylianou, M. Igarbaria, How to retain online consumers, *Commun. ACM* 47 (6) (2004) 65–69.
- [51] J.S. Chiou, C.C. Shen, The antecedents of online financial service acceptance: the impact of physical banking services on internet banking acceptance, *Behavior and Information Technology* 31 (9) (2012) 859–871.
- [52] P.C. Wu, G.Y.Y. Yeh, C.R. Hsiao, The effect of store image and service quality on brand image and purchase intention for private label brands, *Australasian Marketing Journal (AMJ)* 19 (1) (2011) 30–39.
- [53] G. Rezaei, Z. Mohamed, M.N. Shamsudin, Assessment of consumers' confidence on halal labelled manufactured food in Malaysia, *Pertanika Journal of Social Science & Humanity* 20 (1) (2012) 33–42.
- [54] U. Maman, A. Mahbubi, F. Jie, Halal risk mitigation in the Australian – Indonesian red meat supply chain, *Journal of Islamic Marketing* 9 (1) (2018) 60–79.
- [55] J. Hwang, J. Choe, Exploring perceived risk in building successful drone food delivery services, *Intrnational journal of contemporary hosp. Management* 31 (8) (2019) 3249–3269.
- [56] H.G. Olya, A. Al-Ansi, Risk assessment of halal products and services: implication for tourism industry, *Tour. Manag.* 65 (2018), 279–21`.

- [57] N.M. Asri, A.A. Aziz, Halal dietary supplement products in Malaysia, in: *Management of Shari'ah Compliant Businesses*, Springer, Cham, 2019, pp. 133–138.
- [58] H. Mohsen, N. Yazbeck, A. Al-Jawaldeh, N. Bou Chahine, H. Hamieh, Y. Mourad, M. Hoteit, Knowledge, attitudes, and practices related to dietary supplementation, before and during the COVID-19 pandemic: findings from a cross-sectional survey in the Lebanese population, *Int. J. Environ. Res. Publ. Health* 18 (16) (2021) 8856.
- [59] M.A.B. Ab Halim, K. Miabm, M.M.M. Salleh, N.B. Nordin, A.B.M. Husni, Halal Pharmaceuticals. *Social Sciences*, 2015 (*Pakistan*).
- [60] N. Sobari, H. Usman, S. Sunarmo, Halal Supplement: A Perspective of Muslim Millennial Generation, ICSGS, Jakarta, Indonesia, 2019, 2018, October 24–26.
- [61] W. Ahmed, A. Najmi, H.M. Faizan, S. Ahmed, Consumer behaviour towards willingness to pay for Halal products: an assessment of demand for Halal certification in a Muslim country, *Br. Food J.* 121 (2) (2019) 492–504.
- [62] A. Ali, M. Sherwani, A. Ali, Z. Ali, S. Sherwani, The moderating role of individualism/collectivism and materialism: an application of the theory of planned behaviour (TPB) in halal food purchasing, *J. Food Prod. Market.* 26 (9) (2020) 581–599.
- [63] G. Mortimer, S.M. Fazal-e-Hasan, M. Grimmer, L. Grimmer, Explaining the impact of consumer religiosity, perceived risk and moral potency on purchase intentions, *J. Retailing Consum. Serv.* 55 (2020), 102115.
- [64] S. Samad, M. Kashif, S. Wijeneyake, M. Mingione, Islamic religiosity and ethical intentions of Islamic Bank managers: rethinking theory of planned behaviour, *Journal of Islamic Marketing* 13 (11) (2022) 2421–2436.
- [65] S. Yousaf, M. Shaikat Malik, Evaluating the influences of religiosity and product involvement level on the consumers, *Journal of Islamic Marketing* 4 (2) (2013) 163–186.
- [66] P.R. Stephens, N. Gottdenker, A.M. Schatz, J.P. Schmidt, J.M. Drake, Characteristics of the 100 Largest Modern Zoonotic Disease Outbreaks, vol. 376, *Philosophy Transaction Royal Society B*, 2021, 20200535, <https://doi.org/10.1098/rstb.2020.0535>.
- [67] S.Z. Syed Marzuki, H. Abdullah, R. Ab Halim, S.Z. Buyong, M. Zreik, Purchasing behaviour on halal food products during movement control order (MCO): quantitative evidence from covid-19 pandemic, *ASEAN Entrepreneurship Journal (AEJ)* 6 (2) (2020) 16–21.
- [68] R. Brackey, The Largest Muslim Country Is Not in the Middle East, *International Mission Board (IMB)*, 2018.
- [69] P. Arsil, Y.S. Tey, M. Brindal, C.U. Phua, D. Liana, Personal values underlying halal food consumption: evidence from Indonesia and Malaysia, *Br. Food J.* 120 (3) (2018) 2524–2538.
- [70] M.A. Memon, H. Ting, J.H. Cheah, R. Thurasamy, F. Chuah, T.H. Cham, Sample size for survey research: review and recommendations, *Journal of Applied Structural Equation Modeling* 4 (2) (2020) 1–20.
- [71] S. Forsythe, C.L. Liu, D. Shannon, L.C. Gardner, Development of a scale to measure the perceived benefits and risks of online shopping, *J. Interact. Market.* 20 (2) (2006) 55–75, <https://doi.org/10.1002/di>.
- [72] T. Hansen, J.M. Jensen, H.S. Solgaard, Predicting online grocery buying intention: a comparison of the theory of reasoned action and the theory of planned behavior, *Int. J. Inf. Manag.* 24 (6) (2004) 539–550, behavior. *Journal of Environmental Treatment Techniques*, 8(1), 13–22.
- [73] S.M. Parvin Hosseini, M. Mirzaei, M. Iranmanesh, Determinants of Muslims' willingness to pay for halal certified food. *Journal of Islamic Marketing*, ahead-of-print (ahead-of-print) (2019), <https://doi.org/10.1108/jima-02-2018-0043>.
- [74] N. Akhtar, S. Jin, T.H. Alvi, U.I. Siddiqi, Conflicting halal attributes at halal restaurants and consumers' responses: the moderating role of religiosity, *J. Hospit. Tourism Manag.* 45 (2020) 499–510.
- [75] H. Celik, Customer online shopping anxiety within the unified theory of acceptance and use technology (UTAUT) framework, *Asia Pac. J. Mark. Logist.* 28 (2) (2016) 278–307.
- [76] X. Qi, H. Yu, A. Ploeger, Exploring influential factors including COVID-19 on green food purchase intentions and the intention-behaviour gap: a qualitative study among consumers in a Chinese context, *Int. J. Environ. Res. Publ. Health* 17 (19) (2020) 7106.
- [77] A.H. Ngah, J. Jeevan, N.H.M. Salleh, T.T.H. Lee, Willingness to pay for halal transportation cost: the moderating effect of knowledge on the theory of planned behavior, *Journal of Environmental Treatment Techniques* 8 (1) (2020) 13–22.
- [78] J.F. Hair Jr., G.T.M. Hult, C.M. Ringle, M. Sarstedt, N.P. Danks, S. Ray, *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook* (P. 197), Springer Nature, 2021.
- [79] J.F. Hair, J.J. Risher, M. Sarstedt, C.M. Ringle, When to Use and How to Report the Results of PLS-SEM. *European Business Review*, 2019.
- [80] A.R.S.I. Ali, W.D. Dahana, What inhibits consumers in emerging countries from engaging in status consumption? A latent class conjoint analysis approach, *Int. J. Emerg. Mark.* (2020), <https://doi.org/10.1108/IJOEM-02-2021-0223> ahead-of-print No. ahead-of-print.
- [81] N.H. Marmaya, Z. Zakaria, M.N.M. Desa, Gen Y consumers' intention to purchase halal food in Malaysia: a PLS-SEM approach, *Journal of Islamic Marketing* 10 (5) (2019) 1003–1014.
- [82] S.S. Alam, N.M. Sayuti, Applying the theory of planned behaviour (TPB) in halal food purchasing, *Int. J. Commer. Manag.* 21 (1) (2011) 8–20.
- [83] A.M. Bashir, A. Bayat, S.O. Oluatase, Z.A. Abdul Latiff, Factors affecting consumers' intention towards purchasing halal food in South Africa: a structural equation modelling, *J. Food Prod. Market.* 25 (1) (2019) 26–48.
- [84] M.A. Javid, M. Abdullah, N. Ali, S.A.H. Shah, P. Joyklad, Q. Hussain, K. Chaiyasarn, Extracting travelers' preferences toward electric vehicles using the theory of planned behavior in lahore, Pakistan, *Sustainability* 14 (1909) (2022), <https://doi.org/10.3390/su14031909>.
- [85] M.H. Hanaifah, N.A.A. Hamdan, Determinants of Muslim travellers Halal food consumption attitude and behavioural intentions, *Journal of Islamic Marketing* 12 (6) (2020) 1197–1218.
- [86] G. Annweiler, M. Corvaisier, J. Gautier, V. Dubée, E. Legrand, G. Sacco, C. Annweiler, Vitamin D supplementation associated to better survival in hospitalized frail elderly COVID-19 patients: the GERIA-COVID quasi-experimental study, *Nutrients* 12 (11) (2020) 3377.
- [87] F.N. Annisa, I. Nurmala, Influence perceived benefit and perceived self efficacy with intention of adolescent girls in consuming Fe tablet, *Indian Journal of Public Health Research & Development* 9 (4) (2018) 326–329, <https://doi.org/10.5958/0976-5506.2018.00307.8>. Number:.
- [88] M.F. Jayadi, M. Ariyanti, The effect, perceived quality, perceived risk, perceived value, on bag purchase intention in visual, *International Journal of Economics, Business and Management Research* 3 (7) (2019) 41–54.