

Factor affecting consumer's online shopping for medical nutrition in Sri Lanka

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Abstract

The current research examines the effect of performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating condition (FC), and anxiety (AX) influencing the consumer's behavior intention (BI) and measuring action (MA) towards the use of digital marketing for purchasing medical nutrition product. The outcome of this study is obtained through an online survey conducted by distributing a structured questionnaire through social media and e-commerce platforms using convenience and snowball sampling techniques in Colombo and Kandy, Sri Lanka. In total, there were 204 data of patients or caregivers and medical nutrition users which were analyzed employing descriptive statistics, Exploratory Factor Analysis, and Structural Equation Modeling. The result of the analyses shows that performance expectancy (PE) and effort expectancy (EE) has a positive and significant effect, while anxiety (AX) has a negative and significant effect on behavioral intention (BI) to adopt digital marketing for purchasing medical nutrition. Additionally, social influence (SI) and facilitating conditions (FC) do not have a significant effect on behavioral intention (BI). The study also found that BI does not have a mediating effect in the relationship between performance expectancy, effort expectancy, anxiety, and measuring action. UTAUT is useful for understanding consumers to use digital marketing for increasing their awareness about medical nutrition. This research would encourage the use of digital marketing platforms by medical nutrition providers to solve malnutrition problems.

Keywords: malnutrition; medical nutrition; digital marketing; UTAUT; Colombo; Kandy; Sri Lanka; consumer awareness; early adoption; wellness; health.

Introduction

Nutrition plays a crucial role in life (Cederholm et al., 2017). During trauma, hospitalization, rehabilitation, and elderly care, malnutrition is a common nutrition-related condition that occurs (Cederholm et al., 2017; Kabashneh et al., 2020; Singer et al., 2019). Malnutrition is a state where people have nutritional insufficiency attributable to either defective assimilation or use of food ingested or inadequate dietary intake (Gallagher-Allred et al., 1996). Most patients are already malnourished when admitted to the hospital or at the outset of their critical illness (up to 60%) and during the intensive care treatment phase (Canales et al., 2018; Kopp Lugli et al., 2019).

Malnutrition could be caused by several reasons which are often related to the disease states, such increase of oxidative stress, excessive inflammation, increased metabolic demands, halting delivery of nutrients for interventional procedures, under-delivery of nutrients from delays in initiating parenteral or enteral feedings, and penetrative underfeeding due to lack of general agreement among healthcare providers (Yeh et al., 2015). It might be due to the pronounced effects of critical illness on the food intake and metabolism with increased catabolism (Cederholm et al., 2017). The consequences of malnutrition include a higher risk of mortality, higher infectious and non-infectious complications, impairs wound healing, a longer length of mechanical ventilator days and hospital stay with delayed recovery, more frequent readmission, and a need for more complex services (Ceniccola et al., 2018; Inciong et al., 2020, Rattanachaiwong et al., 2020). Moreover, the poor clinical outcomes because of malnutrition would eventually lead to a substantial economic burden due to increased healthcare costs (Inciong et al., 2020).

In Sri Lanka, the nutritional status of hospitalized patients are poorly documented. Therefore, there are only limited studies regarding malnutrition in Sri Lanka. According to the published studies conducted in Sri Lanka, it was reported that the prevalence of disease-related malnutrition in older adults (>65 years old) was between 24-71.4%. A higher prevalence was found in the older adults with bronchial asthma (71.4%), followed by chronic obstructive pulmonary disease (66.6%), heart disease (5-25%), and chronic kidney disease (24%). Moreover, a descriptive cross-sectional study was conducted by Jayatissa et al. (2017) in randomly selected 6 tertiary care settings to evaluate the prevalence of malnutrition or its risk among 774 adult patients. They reported that one-fourth of adult patients admitted to tertiary health care settings in Sri Lanka had disease-related malnutrition in which one out of ten of adult patients were severely malnourished. It was found that the prevalence of malnutrition varies according to the type of disease the patients have. The highest prevalence was observed in patients with pulmonary disease (67.7%), followed by oncology (31.%), medical (20.1%), surgical (15.1%), and cardiovascular disease (12.3%) with the lowest prevalence.

In order to treat malnutrition, medical nutrition therapy (MNT) is considered as one of the foundations in critical care medicine (Rattanachaiwong et al., 2020). MNT provides support and education for helping the patients to adopt healthy eating patterns (Davies et al., 2018). According to the current European Society for Clinical Nutrition and Metabolism (ESPEN) guideline, MNT encompasses oral nutritional supplements, enteral, and parenteral nutrition (Singer et al., 2019). In this study, medical nutrition means the oral nutritional supplements in the form of powdered milk for critically ill patients (i.e., cancer, chronic kidney diseases, stroke).

A guideline namely ESPEN Standard Operating Procedures is used to provide the best MNT to critically ill patients. The ESPEN guideline could help the practitioner to define the patients at risk, assess the nutritional status of the patients, define the amount of energy to provide and choose the route and method to adopt according to various clinical conditions (Singer et al., 2019). Furthermore, the patient's individual response to MNT differs depending on the nutritional status and comorbidities (Rattanachaiwong et al., 2020).

According to the study conducted by Bunyani et al (2015), the respondents had poor knowledge of nutrient supplementation including MNT. Adequate nutrition has been shown to improve critically ill patients' outcomes. Moreover, nutritional support has been proven to reduce critical-care-associated infections, duration of mechanical ventilation, and mortality that occurs during the hospitalization of critically ill patients. Therefore, it is critical to increase the awareness of using medical nutrition products for critically ill patients which could be done through marketing.

Marketing is agile, dynamic, and changing due to several reasons such as inflation, high unemployment, dying industries and companies, war, and rapid technological changes including the internet (Bala & Verma, 2018). In 2020, the internet penetration rate in Sri Lanka is around 35 percent (Statista, 2021). The explosion of internet growth and technological innovations led to a major marketing transformation and the creation of a new approach called digital marketing. Digital marketing (DM) is defined as a set of techniques developed on the Internet by using technology to help improve customer knowledge by matching their needs and eventually persuading them to buy a product or service (i.e., marketing activities; Bala & Verma, 2018; Saura, 2020).

Since the beginning of the 21st century, DM has evolved in terms of profitability and use (Saura, 2020). One segment of DM that has helped us enormously is in the business world. Most people use DM through its role as consumers of goods and services since they search for product information and services in addition to communicating with others regarding their experiences (Alghizzawi, 2019). More people have access to the internet resulting in the shifting of power from companies to consumers, enabling consumers to take control. In general, DM enables two-way interactions between companies and consumers which could be a chance for the company to seek a digital and emotional relation with customers that eventually will drive customer's loyalty and advocacy as well as business value. Moreover, DM could be an approach by the companies to reach out the new markets, thereby exponentially increasing companies' brand awareness (Makrides et al., 2019). The use of consumer marketing in the future is expected to be implemented to a large extent in the digital environment using digital marketing platforms, particularly social media and mobile phones (Alghizzawi, 2019).

In this study, quantitative market research was conducted to determine whether digital marketing could be used to introduce medical nutrition products to the public in Sri Lanka, especially those living in Colombo and Kandy cities. The possibility to use digital marketing was measured based on consumers' attitudes on medical nutrition using The Unified Theory of Acceptance and Use Technology (UTAUT) model.

The Unified Theory of Acceptance and Use of Technology (UTAUT) has been widely used to predict and determine factors that affect the acceptance of technology (Ayaz and Yanartaş, 2020; Chao, 2019; Patil et al, 2020). In this study, the UTAUT model will be used to determine the drivers affecting the acceptance of using digital marketing platforms by consumers in Colombo and Kandy, Sri Lanka, to increase awareness about the importance of

medical nutrition as a solution to malnutrition. The UTAUT model comprises several variable constructs including, performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating condition (FC), behavioral intention (BI), and measuring action (MA). One additional key variable, anxiety (AX), will be added to UTAUT as an independent variable since there is a dramatic change in the external environment. There are four moderating variables including gender, age, experiences, and voluntariness of use (Venkatesh et al., 2003).

The study will focus on determining the customer's attitude towards the use of digital marketing to introduce medical nutrition products which are measured based on the UTAUT model. Besides, the study will also aim to know the aspects (PE, EE, SI, FC, AX as independent variables and gender, age, educational level as moderating variables) that can influence consumer's behavior intention (BI) and measuring action (MA) towards the use of digital marketing for medical nutrition.

Conceptual Framework and Research Hypothesis

Previously, many established theories were used to determine the level of acceptance of new technology among users from different approaches such as the in-depth process and others emphasize the relationship between technology adoption and the variables influencing it. The UTAUT model itself focused on the relationship between different variables that are synthesized. Before UTAUT was popular, TAM (Theory of reasoned action) by Davis (1989) was widely used to explore the technology adoption level. However, many recent studies have criticized the use of TAM due to its framework that does not consider more complex variables that are critical in a decision-making process (Marinković et al., 2019). Later, Venkatesh et al. (2003) established the UTAUT model (**Figure 1**) to overcome the constraints of TAM-related studies. Since then, UTAUT has been recognized as one of the most current and commonly used technology acceptance models. The UTAUT model (**Figure 2**) used in this study is established from five key determinants namely, Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Anxiety (AX), and Facilitating Conditions (FC) which are mediated by Behavioral Intention (BI) to predict the measuring action (MA) of digital marketing acceptance level in Sri Lanka. Furthermore, the effects of moderators such as age, gender, and education are also investigated. The effectiveness of the UTAUT framework in predicting technological acceptance has been widely confirmed by numerous studies.

Performance Expectancy

According to Venkatesh et al. (2003), performance expectancy is the degree to which an individual believes that adopting a particular technology will enable them to perform the related task successfully. In this research, performance expectancy is defined as the degree to which the consumers believe that using digital marketing will help them achieve better performance in purchasing medical nutrition. Previous research suggested that PE will enhance consumer satisfaction, thus, increasing their intention to adopt the technology (Marinković et al., 2019). A study conducted by Marinković et al. (2019) reported that performance expectancy was found to be the most influential determinant of mobile commerce adoption among general consumers in Serbia. They argued that this is due to the advantages offered by mobile services which have proven to be critical in customer satisfaction. Another study conducted by Datta (2010), found that PE positively influences e-commerce adoption in developing countries due to the positive perception of eCommerce features towards economic, social, and strategic usefulness. Furthermore, according to Chua et al. (2018), performance expectancy is very critical in the adoption of technology because the customers would not adopt the technology if it is

deemed not useful in performing certain jobs, no matter how easy or how strongly recommended the technology is. Based on these findings, this study hypothesizes as follows:

H1: Performance expectancy positively influences behavioral intention in using digital marketing to purchase medical nutrition among consumers in Sri Lanka

Effort Expectancy

Effort expectancy is equal to perceived ease of use in the TAM model. In the UTAUT model, EE is defined as the perceived level of ease or complexity related to the use of technology in completing related tasks (Venkatesh et al., 2003). In this research, EE is explained as the degree to which digital marketing is perceived to be easy to learn and to use in purchasing medical nutrition. Many studies have proven the important influence of EE on the acceptance level of new technology (Azam et al., 2019; Sivathanu, 2019; Maruping et al., 2016). Cimperman et al. (2016) argued that EE is especially critical when a new technology is just introduced to the customers due to its direct effect on the usage of technology that strongly affects the acceptance behavior. Previous research conducted by Sareen & Jain (2014) concluded that effort expectancy positively contributed to the intention of customers in India to purchase online. They argued that several advantages of online shopping such as the convenience, ease of navigation in the platform strongly influence the EE level, thus affecting the intention to use the online shopping platform. Another study by Shang & Wu (2017) also explained the positive significant effect of perceived ease of use on the continuance intention of eCommerce in China. Therefore, this research hypothesizes as follows:

H2: Effort Expectancy positively influences behavioral intention in using digital marketing to purchase medical nutrition among consumers in Sri Lanka

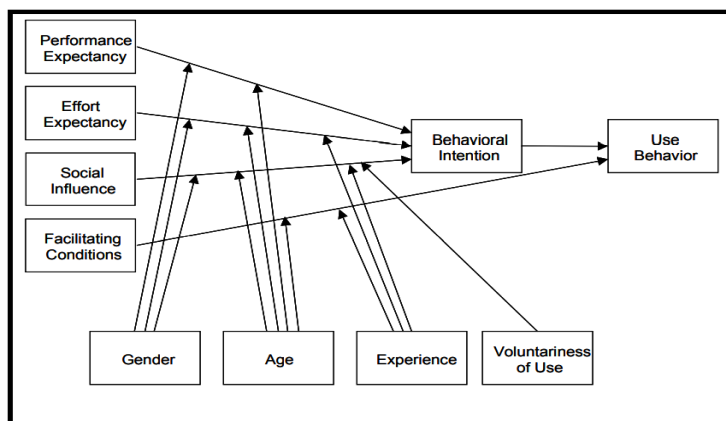


Figure 1. Unified Theory of Acceptance and Use of Technology (UTAUT) Model

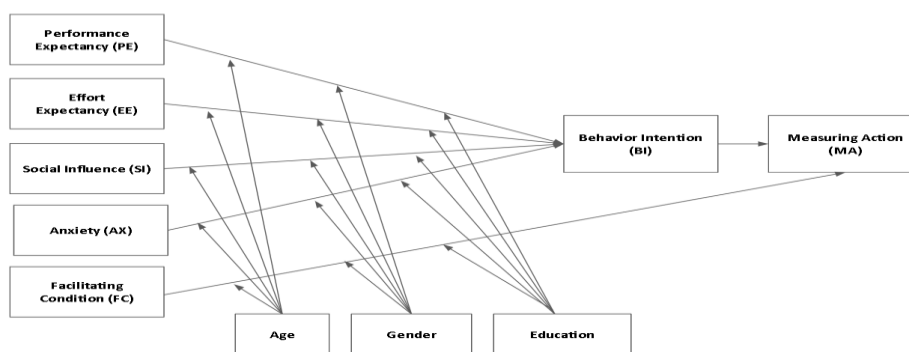


Figure 2. Research model based on UTAUT from Venkatesh et al (2003)

Social Influence

Social influence can be defined as the degree to which an individual perceives that their surroundings encourage them to use the technology (Venkatesh et al., 2003). In this case, SI explained the influence of people who determine the subject's behavior believe that they should buy medical nutrition online. This variable is deemed important, especially in digital marketing where people usually rely on reviews and recommendations when making a purchase decision online. According to Nawaz & Kaldeen (2020), consumers often get interactive recommendations from many sources including social media, families, and friends that might impact their buying intention. A study conducted by Tak & Panwar (2017) found the significant effect of social influence on customers' online shopping intentions in India. This research is also in line with a study conducted by Chua et al. (2018) that confirmed that social influence is the most significant factor influencing the adoption of social networking technology among millennials in Malaysia. Based on these previous studies, this research hypothesizes as follows:

H3: Social Influence positively influences behavioral intention in using digital marketing to purchase medical nutrition among consumers in Sri Lanka

Facilitating Conditions

Facilitating condition is the degree to which an individual believes that a supporting facility is available to adopt the new technology (Venkatesh et al., 2003). Based on that definition, facilitating conditions in this study are defined as the availability of resources, knowledge, and assistance in using digital marketing to purchase medical nutrition. This factor is particularly important in the direct effect towards the adoption of new technologies because, without the proper facility, customers would not be able to use the technologies thus it is critical to be included in the current study. The previous study by Datta (2010), investigated the factors influencing eCommerce adoption in developing countries found out that facilitating conditions are the most critical factor. They explained that FC is also what differentiates the developing countries and developed countries, whereas developed countries facilitating conditions have sometimes been taken for granted. However, in developing countries, any changes in infrastructure and facilities may adversely change the acceptability of customers towards new technologies. Sri Lanka is categorized as a developing country, and in some regions, online shopping and digital marketing are not popular due to constraints in facilities and security (The World Bank, 2021; Datta, 2010). Therefore, the following hypothesis is proposed.

H4: Facilitating Conditions positively influences Measuring Action in using digital marketing to purchase medical nutrition among consumers in Sri Lanka

Anxiety

Anxiety can be defined as the perceived risk associated with the uncertainty aroused from a certain action (Ben Arfi et al., 2021). In this case, anxiety represents the degree to which an individual perceives that buying medical nutrition online is risky and insecure. The reason for anxiety in buying medical nutrition online could arise from various reasons involved during online transactions such as counterfeit products, insecure payment, and delivery issues. Study shows that there is a significant negative impact on anxiety towards eCommerce acceptance which causes a slowdown in the growth of the e-commerce industry (Sharma & Kurien, 2017). Another study conducted by Kamalul Ariffin et al. (2018) also found four factors that influenced perceived risks in association with the online purchase including financial risk, security risk, time risk, and psychological risk; where security risk is stated as the main contributor that causes consumers to deter from online purchasing. Based on these, this study

hypotheses anxiety as a hindrance in digital marketing and online purchasing intention of medical nutrition as stated below.

H5: Anxiety negatively influences behavioral intention in using digital marketing to purchase medical nutrition among consumers in Sri Lanka

Moderation effect

Age, Gender, and education were used as a moderator in the current study. As proposed by existing literature, gender was found to moderate the relationship between variables towards purchase intention (Chen et al., 2021; Zhao & Bacao, 2021). This is due to different attitudes expressed by each gender towards online shopping. Men are found to be more accepting towards electronic retailing, online purchases, and e-payments compared to women. On the other hand, women are more affected by social influence in the online purchasing decision process. Additionally, women have more concerns about privacy in online transactions than men (Kanwal et al., 2021). However, some studies refute the moderating effect of gender on purchase intention. They argued that cultural settings could be the cause of this inconsistency (Pobee & Opoku, 2021). Furthermore, the moderating effect of age has also been investigated in numerous studies (Maruping et al., 2016; Hu et al., 2020; Bawack & Kala Kamdjoug, 2018). Age differences can also affect the motivation towards the adoption of new technologies. This relates to generational differences that cause differences in beliefs, values, and patterns of behavior. This is aligned with a study conducted by Ben Arfi et al. (2021) which discovered that customers behave differently based on their age group. Lastly, education could also moderate the relationship between independent variables and purchase intention. As digital marketing and online purchasing are considered modern technologies, thus, the adoption will require their own individual skills, knowledge, and abilities. Therefore, people with higher education levels are more willing to accept new technologies and are better at responding to risks (Chen et al., 2021). Thus, this research hypothesized as follows.

H6: Gender, Age, and education moderate the relationship between PE, EE, SI, FC, AX, and BI in using digital marketing to purchase medical nutrition among consumers in Sri Lanka

Behavioral Intention as mediator effect towards Action

According to Venkantesh et al. (2003), behavioral intentions have a direct and positive influence on the action. Meaning that once an individual has the intention to use digital marketing to purchase medical nutrition online, they will apply it to action. Therefore, in this study behavioral intention will be considered as a mediator to explain the relationship between PE, EE, SI, FC, and AX towards action. Furthermore, since the concept of digital marketing and online shopping can be considered new for medical nutrition products, it is decided that behavioral intention would be used to investigate the indirect effect of independent variables towards action in this study rather than directly investigate the action itself. There are many studies that explain the mediating effect of behavioral intention towards action (Venkantesh et al., 2003; Venkantesh et al., 2012; Azam et al., 2019). Based on the existing literature, this paper proposed the following hypotheses.

H7: Behavioral intention positively influences Measuring Action in using digital marketing to purchase medical nutrition among consumers in Sri Lanka

H8: Behavioral intention mediates the relationship of PE, EE, SI, FC, AX and Measuring Action in using digital marketing to purchase medical nutrition among consumers in Sri Lanka

Methodology

Data Collection

The conceptual framework in the current research (**Figure 2**) was adapted from the UTAUT model (**Figure 1**) by Venkatesh et al (2003). There are five independent variables including performance expectancy (PE), effort expectancy (EE), social influence (SI), anxiety (AX), and facilitating conditions (FC). The mediating variable is behavioral intention (BI) and the dependent variable is measuring action (MA). PE, EE, SI, and AX have a direct relation with BI. BI and FC have direct relations with MA. The market research was conducted from August to October 2021 in the two districts in Sri Lanka, Colombo, and Kandy (**Figure 3**). Colombo is a district of the Western province of Sri Lanka. It is a commercial capital and the largest city of Sri Lanka by population (Fonseka et al., 2019).

An English-language structured questionnaire was distributed online through social media and e-commerce platforms using convenience and snowball sampling techniques. Convenience sampling is a sampling process where the researcher announces the study and participants self-select if they are willing to participate (Stratton, 2021), while snowball sampling is a sampling process in which the existing study subjects or respondents recruit future subjects among their acquaintances until data saturation (**Figure 4**; Naderifar et al., 2017). A total of 204 valid questionnaires were returned. There were 102 respondents from Colombo and Kandy, respectively. The questions in the survey sought to discover the level of acceptance derived from their experiences in purchasing medical nutrition through digital marketing platforms. The questionnaire was divided into four parts. Section one was for screening purposes which asked whether they are cancer/ chronic kidney disease (dialysis)/ chronic kidney disease (pre-dialysis) patient or caregiver and whether they consumed medical nutrition. The participants who could continue filling the section two of the questionnaire should be a cancer/ chronic kidney disease (dialysis)/ chronic kidney disease (pre-dialysis) patient or caregiver of the patients and user of medical nutrition products. Section two was concerned with gathering respondents' personal information (i.e., name, city, age, gender, education, personal contact, and monthly expenditure). Section three asked for their opinion on the five independent variables (PE, EE, SI, FC, and AX), mediating variable (BI), and dependent variable (MA) which constitute the UTAUT with regard to digital marketing's acceptance for medical nutrition.

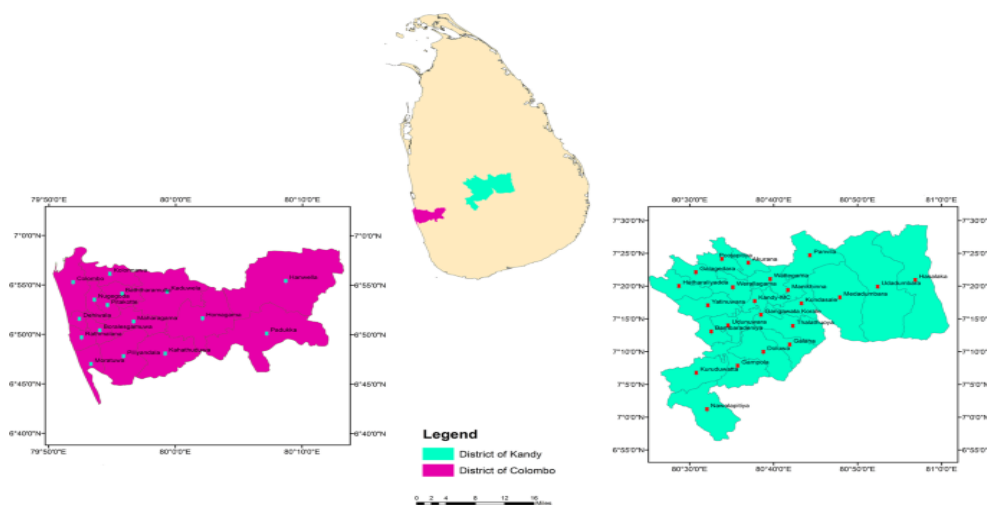


Figure 3. Map of Colombo and Kandy districts, Sri Lanka sourced from Udayanga et al., (2018).

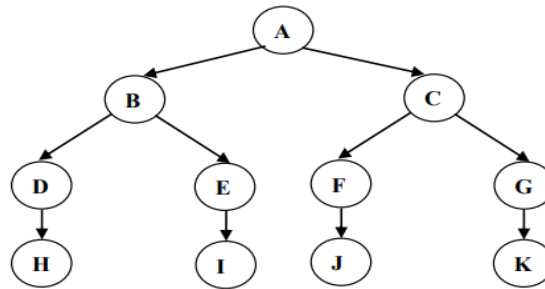


Figure 4. Snowball sampling technique from Khusnul et al (2020).

Constructs operationalisation

The survey was conducted online with a questionnaire. A structured self-administered questionnaire for this study was adapted from UTAUT's questionnaire (Venkatesh et al., 2003), prepared in English, and translated to Sinhala as the primary language in Sri Lanka. Afterward, back translation was conducted to guarantee the quality and accuracy of the translation. The five-point Likert scale was used in which scale 1 means 'strongly disagree' and 5 means 'strongly agree'. In the section three of the questionnaire (**Table 1**), there were nine questions asked to measure Performance Expectancy (PE), four for Effort Expectancy (EE), three for Social Influence (SI), four for Facilitating Conditions (FC), four for Anxiety (AX), three for Behavioral Intention (BI) and three for measuring action (MA).

Data Analysis

The data especially from quantitative market research is analyzed using inferential statistics (i.e., exploratory factor analysis). Exploratory factor analysis (EFA) was conducted using principal component analysis (PCA) and direct oblimin rotation. Prior to EFA, the Kaiser-Meyer-Olkin (KMO) Bartlett's Test of Sphericity (BTS) to check the factorability of the data. KMO was used to measure the sampling adequacy for factor analysis. The sampling is adequate if the KMO value falls in the acceptable range (above 0.50) and the BTS shows a significant p-value ($p < 0.05$; Hair et al., 2019; Hoque et al., 2018). The statistical analysis was conducted using IBM SPSS statistics version 20 software.

After analyzing the data using SPSS, the data is analyzed using Structural Equation Modeling (SEM) with SmartPLS software. In SmartPLS version 3.3.3 software, measurement model analysis was conducted including outer loading, construct reliability and validity, and discriminant validity. Outer loading was computed to show how much observable variable or item contributed to the definition of the latent variable or the construct. The loadings are generally expected to be higher than 0.6 (Dakduk et al., 2019). Regarding the construct reliability and validity, Cronbach's alpha was computed to test the reliability and internal consistency of the data. Cronbach's alpha less than 0.5 indicated low reliability, between 0.5-0.7 indicated moderate reliability, and 0.7 or above indicated high reliability (Ahmed et al., 2020). Composite reliability was tested. The acceptable values of composite reliability are generally considered 0.7 and above (Dakduk et al., 2019). Moreover, the AVE was conducted as an indicator of convergent validity which shows the average amount of variance that a construct is managed to explain (Dakduk et al., 2019; Ringle et al., 2015; Simsek & Tekeli, 2015). The AVE should be more than 0.5 to be sufficient (Dakduk et al., 2019; Simsek & Tekeli, 2015). Other than that, discriminant validity analysis was also conducted to ensure that each construct is unique and that no multicollinearity problem exists in the data set by checking the correlation among each construct and comparing them with Average Variance Extracted (AVE), which must be larger than any intercorrelation between this focal construct and all other constructs (Dakduk et al., 2019; Fornell & Larcker, 1981; Hoque et al., 2018).

Moreover, structural model analysis was conducted after performing the measurement model analysis. In structural model analysis, bootstrapping was conducted in order to get the result of the path coefficient and p-value to observe the relationship between the variables as well as to get the result of the total indirect effect used for the mediation analysis. Moreover, the moderating effect analysis and multi-group analysis (MGA) was also conducted to analyze the moderating effect of age, gender, and education towards the relationship between independent variables and the dependent variables.

Table 1. *Research constructs operationalisation after performing EFA*

No.	Statement
Performance Expectancy (PE 1-9)	
PE 1	I would find website, email, google search are useful to find medical nutrition information.
PE 2	Using website, email, google search enables me to find information of medical nutrition products more quickly.
PE 3	Using website, email, google search enforce me to consumed medical nutrition products to treat my disease.
PE 4	I would find social media (e.g., Facebook, Instagram) Useful to find medical nutrition information.
PE 5	Using social media (e.g., Facebook, Instagram) enables me to find information of medical nutrition products more quickly.
PE 6	Using social media (e.g., Facebook, Instagram) enforce me to consumed medical nutrition products to treat my disease.
PE 7	I would find e-commerce (e.g., Lazada, Shopee, Tiki) useful to enable me to purchase medical nutrition products as an alternative point of purchase.
PE 8	I would find using e-commerce (e.g., Lazada, Shopee, Tiki) makes more comfortable as it would reduce waiting time in pharmacy or hospital.
PE 9	If medical nutrition product are available on e-commerce (e.g., Lazada, Shopee, Tiki), I would buy more medical nutrition product.
Effort Expectancy (EE 1-4)	
EE 1	I would find buying medical nutrition product online is clear and understandable.
EE 2	It would be easy for me to become skillful to buy medical nutrition product online.
EE 3	I would find buying medical nutrition online is easy to use.
EE 4	Learning to buy medical nutrition online is easy for me.
Social Influence (SI 3)	
SI 1	People who influence my behavior think that I should buy medical nutrition online.
SI 2	People who are important to me think that I should buy medical nutrition online.
SI 3	In general, medical nutrition companies has supported the use of the online transaction.
Facilitating Conditions (FC 1-2)	
FC 1	I have the resources necessary to buy medical nutrition online.
FC 2	I have the knowledge necessary to buy medical nutrition online.
FC 3	Buying medical nutrition online is not as easy as buying medical nutrition offline.
FC 4	A specific person (or group) is available for assistance with online transaction difficulties.

Table 1. *Research constructs operationalisation after performing EFA (continued)*

No.	Statement
Anxiety (AX 1-3)	
AX 1	I feel doubt with the idea buying medical nutrition online.
AX 2	It scares me to think that I could experience insecure payment if I buy medical nutrition online.
AX 3	I hesitate with the idea of buying medical nutrition online considering their disadvantages (e.g. fake product, delivery issues).
AX 4	Buying medical nutrition online is somewhat intimidating to me if there is insufficient information on the product.
Behavioral Intention (BI 1-3)	
BI 1	I intend to buy medical nutrition online if it's already available.
BI 2	I intend to buy medical nutrition online if it's already available.
BI 3	I plan to buy medical nutrition online if it's already available.
Measuring action (MA 1-3)	
MA 1	Yes I did. I bought medical nutrition by online before.
MA 2	I have bought medical nutrition by online before.
MA 3	I have experience buying medical nutrition by online before.

Result

Demographic Profile of the Respondents

Regarding the respondents' demographic profiles in **Table 2**, the results illustrate that 38.7% of respondents were cancer patients, 29.9% were chronic kidney disease (pre-dialysis) patients, and 31.4% were chronic kidney disease (dialysis) patients. Regarding medical nutrition consumption, a total of 204 participants (100%) consumed medical nutrition in the past six months. In terms of the city, 50% of respondents lived in the Colombo district and the other 50% of respondents were from the Kandy district. The majority of the respondents (53.4%) were male, while 45.5% were female. The age groups indicate that the highest percentage of respondents (38.2%) fell into the category 30-39 years, followed by the 40-49 age group (27.5%), and the rest, 16.2%, 14.7%, 3.4% pertained to the 50-59, 20-29, and above 60 age-groups. Regarding the last education level, the highest percentage (47.5%) fell into the category of senior high school, while the lowest percentage (2%) fell into the category of elementary school. Information regarding gender, age, and education level was queried to investigate whether they have any moderating effect on the behavioral intention and measuring action towards the use of digital marketing for medical nutrition. Moreover, the majority of respondents (36.8%) spent Rs. 45,000.00 - Rs. 69,999.00 monthly, followed by respondents who spent Rs. 70,000.00 - Rs. 99,999.00 (29.4%), Rs. 30,000.00 - Rs. 44,999.00 (21.1%), Rs. 100,000.00 and above (6.9%), and Rs. 15,000.00 - Rs. 29,999.00 (5.9%).

Table 2. *Demographic profile of the respondents*

Categories	Sub-categories	Frequency	Percent Valid	Mean	SD	
Are you patient OR patient's caregiver of one of this condition? (1 = 'Cancer patient' ... 3 = 'Chronic Kidney Disease (Dialysis)')	Cancer					
	Chronic Kidney Disease (Pre-dialysis)	79	38.7%			
	Chronic Kidney Disease (Dialysis)	61	29.9%	204	1.93	0.836
Do you consume one of this Medical Nutrition in the past 6 months? (1 = Yes, 2 = No)	Yes	64	31.4%			
	No	204	100%	204	1	0
City (1 = Colombo, 2 = Kandy)	Colombo	102	50%			
	Kandy	102	50%	204	1.5	0.501
Gender (1 = Male, 2 = Female)	Male	109	53.4%			
	Female	95	45.5%	204	1.47	0.5
Age (1 = 'Between 20-29' ... 5 = 'Above 60')	Between 20-29	30	14.7%			
	Between 30-39	78	38.2%			
	Between 40-49	56	27.5%	204	2.55	1.037
	Between 50-59	33	16.2%			
	Above 60	7	3.4%			
Education (coded as 1 = 'Elementary School' ... , 4 = University)	Elementary School	4	2%			
	Junior High School	42	20.6%			
	Senior High School	97	47.5%	204	3.05	0.764
	University	61	29.9%			
Monthly expenditure (1 = 'Rs. 15,000.00 - Rs. 29,999.00' ... 5 = 'Rs. 100,000.00 and above')	Rs. 15,000.00 - Rs. 29,999.00					
	Rs. 30,000.00 - Rs. 44,999.00	12	5.9%			
	Rs. 45,000.00 - Rs. 69,999.00	43	21.1%			
	Rs. 70,000.00 - Rs. 99,999.00	75	36.8%	204	3.1	1.005
	Rs. 100,000.00 and above	60	29.4%			
		14	6.9%			

Measurement Model Analysis

As suggested by Pallant (2007), Kaiser–Meyer–Olkin (KMO) and Bartlett’s Test of Sphericity have been conducted prior to Exploratory factor analysis (EFA). The KMO test achieved 0.957 (**Table 3**) which was well above the recommended 0.5, ensuring the sample adequacy. The p-value (0.000) in the BTS is significant ($p < 0.05$) which indicates a high likelihood of successful factorability of the data (Hoque et al., 2018). Having an above-recommended level result of KMO and BTS, EFA was run for testing the convergent validity of the proposed constructs and validating the factor loadings (Hair et al., 1998).

Moreover, the outer loading of all items (**Table 4**) were all above 0.6 except SI1 (0.533), SI2 (0.593), FC3 (0.390), FC4 (0.416), and AX4 (0.336). The items or observable variables among the constructs which have an outer loading below 0.6 were excluded for further analysis due to the low contribution of the respective items to the definition of the construct or latent variable (Dakduk et al., 2019). Therefore, there were nine items to measure

PE (PE 1-9), four for EE (EE 1-4), one for SI (SI3), two for FC (FC 1-2), three for AX (AX 1-3), three for BI (BI 1-3) and three for MA (MA 1-3). In terms of construct reliability and validity (**Table 5**), the cronbach alpha (α) of the constructs of PE, EE, SI, FC, AX, BI, and MA were correspondingly 0.966, 0.953, 1.000, 0.883, 0.935, 0.964, 0.911, i.e.,

Table 3. *The result of Kaiser–Meyer–Olkin (KMO) and Cronbach’s alpha (α)*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.953
Bartlett's Test of Sphericity	Approx. Chi-Square
	df
	Sig.
	7160.938
	300
	0.000

Note: df = Degree of Freedom; Sig. = Significant.

Table 4. *The result of Outer Loading*

Items	Constructs						
	PE	EE	SI	FC	AX	BI	MA
PE1	0.907						
PE2	0.891						
PE3	0.857						
PE4	0.900						
PE5	0.914						
PE6	0.867						
PE7	0.920						
PE8	0.904						
PE9	0.825						
EE1		0.958					
EE2		0.951					
EE3		0.897					
EE4		0.938					
SI1			0.533				
SI2			0.593				
SI3			0.904				
FC1				0.871			
FC2				0.878			
FC3				0.390			
FC4				0.416			
AX1					0.928		
AX2					0.953		
AX3					0.926		
AX4					0.336		
BI1						0.972	
BI2						0.980	
BI3						0.945	
MA1							0.911
MA2							0.930
MA3							0.922

Above 0.7 which means that the constructs have a high reliability (Ahmed et al.2020). Additionally, the composite reliability (ρ) of the constructs of PE, EE, SI, FC, AX, BI, and MA were 0.971, 0.966, 1.000, 0.945, 0.959, 0.977, 0.944 respectively. The composite reliability of

all constructs is 0.7 and above which is considered acceptable (Dakduk et al., 2019). Hence, the internal consistency reliability of the constructs was proved. Regarding the value of average variance extracted (AVE), the value of the constructs of PE, EE, SI, FC, AX, BI, and MA, were correspondingly 0.88, 0.877, 1.000, 0.895, 0.886, 0.933, 0.843 and all values were above the threshold value of 0.5 (Dakduk et al., 2019; Simsek & Tekeli, 2015). Thus, the convergent validity was confirmed.

As suggested by Fornell and Larcker (1981), the AVE of each construct is compared with the respective correlations between the corresponding constructs in order to test the discriminant validity. **Table 6** shows the intercorrelation of the constructs and the diagonal of the matrix signifies the square root of the AVE. As seen in **Table 6**, all of the diagonal values are larger than the correlation of a specific construct with any other construct, suggesting that each construct is unique and that no multicollinearity problem exists in the data set (Hoque et al., 2018). Thus, the discriminant validity is confirmed. By confirming convergent validity and discriminant validity, the construct validity could be confirmed (Dakduk et al., 2019; Hoque et al., 2018). The acceptable result of construct reliability and validity indicated a relatively good fit between the hypothesized model and observed data as well as the overall measurement model passing the validity of the analysis.

Table 5. *The result of construct reliability and validity*

Construct	α	ρ	AVE
PE	0.966	0.971	0.788
EE	0.953	0.966	0.877
SI	1.000	1.000	1.000
FC	0.883	0.945	0.895
AX	0.935	0.959	0.886
BI	0.964	0.977	0.933
MA	0.911	0.944	0.848

Note: α —Cronbach's alpha; ρ —Composite Reliability; AVE: Average Variance

Table 6. *The result of discriminant validity*

	BI	EE	FC	MA	PE	RI	SI
BI	0.966						
EE	0.904	0.936					
FC	0.826	0.888	0.946				
MA	0.239	0.267	0.254	0.921			
PE	0.881	0.861	0.818	0.205	0.888		
RI	-0.874	-0.826	-0.748	-0.118	-0.771	0.941	
SI	0.812	0.840	0.803	0.155	0.777	-0.783	1.000

Structural Model Analysis

Structural equation modeling (SEM) was used in this research to test the hypotheses using SmartPLS software. The SEM shows mixed results in terms of each variable's relationship. As seen from Table 7, the user's behavioral intention is positively influenced by performance expectancy and effort expectancy. The positive relationship is statistically significant with a p-value <0.005. The anxiety, on the other hand, has a negative impact on the user's behavioral intention as shown by the negative value on the path coefficient (**Table 7**). As per Sarstedt et al. (2017), in the SEM analysis, the path coefficient is usually indicated with a -1 to 1 value, with the values closer to 1 suggesting a strong positive association, while the

value closer to -1 suggests a strong negative relationship between variables. Moreover, the relationship between social influence and behavioral intention is found to be positive but not significant as shown by the p -value < 0.05 . The effect of facilitating conditions and behavioral intention towards measuring action is also found positive but unfortunately insignificant at the statistical level. This result means that among the variables tested there is no significant relationship that would explain the factors that encourage the adoption of digital marketing for medical nutrition in Sri Lanka.

Table 7. Hypothesis and the result of structural Model Relationship

Hypotheses	Path coefficient	P-value	Results
H1: PE → BI	0.313	0.000	Supported
H2: EE → BI	0.341	0.000	Supported
H3: SI → BI	0.018	0.757	Rejected
H4: FC → MA	0.179	0.334	Rejected
H5: AX → BI	-0.337	0.000	Supported
H7: BI → MA	0.092	0.599	Rejected

Table 8. Mediating effect of Behavioral Intention

Hypotheses	Path coefficient	P-value	Results
H6a: PE → BI → MA	0.029	0.608	Rejected
H6b: EE → BI → MA	0.031	0.618	Rejected
H6c: SI → BI → MA	0.002	0.883	Rejected
H6d: AX → BI → MA	-0.031	0.607	Rejected

Mediating Effect

In this study the bootstrapping method was used to test the significance of mediation effect using indirect mediation effect on SmartPLS. However, based on the result in **Table 8**, there is no significant medication effect of behavioral intention on the measuring action for all independent variables shown by p -Value > 0.05 . This also means there is no direct or indirect relationship that explains the factors affecting the adoption of digital marketing for medical nutrition in Sri Lanka.

Moderator effect

The moderating effects of age, gender, and education were then tested only for the statistically significant relationships based on the SEM results as shown in **Table 7**. For the moderating effect of age, the actual age numbers were used in the study. The results indicated that there is no moderating effect caused by age on the relationship between performance expectancy, effort expectancy, and anxiety towards behavioral intention (**Table 9**).

Table 9. Moderating effect of Age on the independent and dependent variable relationship

Mediator	Independent Variable	Dependent Variable	P-value	Results
Age	PE	BI	0.424	Rejected
	EE	BI	0.646	Rejected
	AX	BI	0.744	Rejected

For the moderating effect of gender, a multi-group analysis (MGA) was used where two groups were tested, male and female respondents. However, the results show that there is

no significant mediating effect of gender on the relationship between performance expectancy, effort expectancy, and anxiety towards behavioral intention (**Table 10**).

Table 10. *Moderating effect of Gender on the independent and dependent variable relationship (PLS-MGA)*

Mediator variable	Independent Variable	Dependent Variable	P-value new (Female vs Male)	Results
Gender	PE	BI	0.330	Rejected
	EE	BI	0.873	Rejected
	AX	BI	0.629	Rejected

The MGA was also used to investigate the moderating effect of education on the model's relationship. In order to achieve normal distribution of sample size, the samples were split into three groups of education namely primary for Elementary and Junior high school, secondary for senior high school, and university. The result indicates there is a significant contribution of performance expectancy and anxiety towards the behavioral intention of primary and secondary education (**Table 11**). However, there is no significant mediating effect on the other education group. Furthermore, the results also indicate an insignificant mediating effect of effort expectancy on the behavioral intention for all the education groups.

Table 11. *Moderating effect of Education on the independent and dependent variable relationship (PLS-MGA)*

Mediator variable	Independent Variable	Dependent Variable	p-Value new (Primary vs Secondary)	p-Value new (Primary vs University)	p-Value new (Secondary vs University)	Results
Education	PE	BI	0.025	0.609	0.114	Accepted*
	EE	BI	0.443	0.163	0.360	Rejected
	AX	BI	0.048	0.126	0.629	Accepted*

*Hypothesis is accepted for the primary and secondary education moderating effect.

Discussion

The rapid development of digital marketing can be an advantage for many companies to expand their reach and distribution both to the international and local markets. The current study aims to explain the factors that influence the level of acceptance of digital marketing, especially for medical nutrition products in Sri Lanka. Acceptance level analysis of e-commerce and digital marketing for products and services has been widely carried out using behavioral models from previous literature reviews (Chen et al., 2021; Kamalul Ariffin et al., 2018; Pobee & Opoku, 2021). This study was conducted to complete the literature to determine digital marketing acceptance for medical nutrition. Furthermore, to investigate the proposed hypothesis, the UTAUT model was used in this study.

The results of this study show that performance expectancy is one of the important factors that influence behavioral intentions to use digital marketing to buy medical nutrition online in Sri Lanka. This is aligned with the existing literature that explains the importance of performance expectancy in the adoption of new technologies (Venkantesh et al., 2003;

Marinković et al., 2019; Datta, 2010). This result means that customers in Sri Lanka believe that using digital marketing will help them gain more advantages when purchasing medical nutrition. The value of the performance expectancy was constructed from several questions that relate to the usefulness of social media, email, search engines, and eCommerce to find information and to purchase medical nutrition. When digital marketing is deemed to be useful in the overall purchase experience, it will increase customer satisfaction. As explained in the literature review, performance expectancy may enhance customer satisfaction, thus, increasing intention to adopt the new technology. It is stated that customer satisfaction is one of the most important factors that need to be considered in marketing to establish and maintain relationships with customers (Rathnayaka, 2018).

The second factor that positively affects customers' intention to adopt digital marketing for medical nutrition is effort expectancy. This shows that when the customers find digital marketing easy to learn and use they will consider buying medical nutrition through online platforms. This result confirms the research findings of (Azam et al., 2019; Sivathanu, 2019; Maruping et al., 2016). Therefore, companies have to pay attention to the convenience and ease of use, and navigation of the online platform to increase customers' intention to use digital marketing in Sri Lanka.

Moreover, this study also finds a negative influence of anxiety on behavioral intention which confirms the previous literature (Kamalul Ariffin et al., 2018; Hansen et al., 2018; Sharma & Kurien, 2017). The reason is Sri Lanka as a developing country is still lagging in terms of the adoption of eCommerce and digital marketing which is shown by the huge gap between the average online transaction in Sri Lanka which only accounted for 6.2% meanwhile the global average is 76.8% (Kemp, 2021). Therefore, people are still uncertain and afraid of the risk of the online purchasing process. As explained in the literature review, there are many risks associated with online purchasing that might influence their intention to adopt digital marketing for purchasing medical nutrition thus slowing down the advancement in the digital marketing sector. In order to catch up in the development, Sri Lanka can fill the security and technological gap to help customers feel safer when doing an online transaction.

From the SEM results, insignificant relationships were also found between social influence and behavioral intention. This result is different from the available literature (Chua et al., 2018; Tak & Panwar (2017), some of the reasons that may cause this condition is that there is no dependence on the opinions of people around when customers want to buy medical nutrition. It is possible that customers listen more to the doctor's recommendations than the recommendations of those around them. Another possibility is the lack of support from medical nutrition companies to encourage online transactions from the beginning. Furthermore, facilitating conditions were also found to have no significant effect on the measuring action. Meaning that the availability of resources, knowledge, and assistance will not influence people to buy medical nutrition online. This result is not in accordance with the existing literature Venkantesh et al., 2003; Datta, 2010; Tak & Panwar, 2017). According to the literature, generally, developing countries rely heavily on existing facilities to adopt the use of new technologies. However, in this research it is stated otherwise, one of the reasons could be Sri Lanka's unstable situation due to the terrorist attacks in 2019 (Amarasingam & Rizwie, 2020), causing customers to be independent of online facilities. The terrorist attack at that time caused the government to take action to prohibit the use of social media which had a negative impact on the use of digital marketing as an online sales platform. This condition could also explain the nonsignificant relationship between behavioral intention and measuring action. Due to the prohibition against the use of social media that has occurred several times in Sri Lanka in 2018

and 2019 (Amarasingam & Rizwie, 2020), customers are starting to turn away from using online platforms to buy goods. Therefore, even though customers have the intention to use digital marketing in purchasing medical nutrition, they still choose not to make online transactions that are considered unstable and risky.

The effect of mediation by behavioral intention in the relationship between performance expectancy, effort expectancy, anxiety, and measuring action were also investigated to see if there is an indirect relationship that might affect customer's behavior in adopting digital marketing for medical nutrition. However, the results obtained are not in accordance with the existing literature (Venkantesh et al., 2003; Venkantesh et al., 2012; Azam et al., 2019), where no relationship shows the significant effect of behavioral intention as a mediating effect towards measuring action. This could be due to the absence of a direct relationship between behavioral intention and measuring action described in the results of the SEM.

Conclusion

The main theoretical contribution of the paper is to conceptualize and model the factors influencing consumers' behavioral intention and measuring action towards the use of digital marketing for medical nutrition products, including performance expectancy, effort expectancy, social influence, facilitating condition, and anxiety. Moreover, the study also analyzed the mediating effect of behavioral intention ~~as well as the moderating effect of age, gender, and education between the independent and dependent variables.~~

Based on the results, performance expectancy and effort expectancy had a positive and significant effect on the customer's intention to adopt digital marketing for medical nutrition, explaining that using digital marketing will help them gain more advantages when purchasing medical nutrition and the customers find digital marketing easy to learn and use to buy medical nutrition, respectively. Meanwhile, anxiety gives negative effects which means that people are still uncertain and afraid of the risk of the online purchasing process. Nevertheless, social influence and facilitating conditions have no significant effect on customer's intention to adopt digital marketing for medical nutrition, explaining correspondingly that consumers were not really being influenced by the people surrounding them to buy medical nutrition online and the availability of resources, knowledge, and assistance will not influence people to buy medical nutrition online.

Additionally, the behavioral intention was not found to have a mediating effect on the relationship between performance expectancy, effort expectancy, social influence, anxiety, and measuring action, explaining that most likely customers will choose to not make an online purchasing process although they intend to use digital marketing in purchasing medical nutrition due to instability and risk of digital marketing platform.

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