

EXPLORING CONSUMER INTENTION FOR FUNCTIONAL FOOD PRODUCTS IN HUNGARY: THE ROLE OF HEALTH CONSCIOUSNESS, NUTRITIONAL KNOWLEDGE AND ATTITUDES

Abrar Ghaith

University of Debrecen, Faculty of Business Economics

E-mail address: a.ghaith@outlook.com

Abstract:

Background: The potential health advantages of functional food products have increased their appeal. Their reception and implementation are greatly influenced by consumer attitudes and purchasing intentions. The Theory of Planned Behavior (TPB) is used in this study to examine how attitudes toward and intentions to buy functional food products in Hungary are influenced by health consciousness (HC) and nutritional knowledge (KN).

Methods: From March to May 2023, 396 adult Hungarian volunteers took part in an online survey. The poll measured respondents' intentions to buy functional food products as well as their health consciousness, nutritional knowledge, attitudes, and subjective norms (SN). Through pilot research, the questionnaire's reliability and validity were determined. Multiple regression analyses, one-sample t-tests, and Cronbach's alpha were all included in the statistical analysis.

Results: The majority of participants were female, working students. In support of hypotheses H1 and H2, health consciousness significantly influenced attitudes and purchase intentions. H3 and H4 are supported by the findings that nutritional knowledge strongly influenced attitudes and purchase intentions. Both perceived behavioral control and subjective standards had a beneficial impact on purchase intentions supporting H5 and H6.

Conclusion: This study provides important insights into Hungarian consumers' preferences for functional food items. It highlights the beneficial effects of health awareness, information, attitudes, arbitrary standards, and perceived behavioral control on buying intentions. It was discovered that attitudes play an important role in mediating the link between nutritional knowledge, health consciousness, and purchase intentions.

It was discovered that attitudes play an important role in mediating the link between nutritional knowledge, health consciousness, and purchasing intentions. The dynamic functional food market's marketers and legislators should take these findings seriously. The subtleties of these attitudes and their implications for promotional tactics can be explored in greater detail in future research. Promoting healthier food options and informing policy and marketing decisions require an understanding of consumer perceptions and behaviors.

Keywords: Functional food products, Theory of planned behavior, Health consciousness, Nutritional knowledge, Hungary
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INTRODUCTION

The growing interest in functional food products stems from their potential health advantages beyond essential nutrition (Baker et al., 2022). These products are fortified with specific ingredients or formulated to offer additional benefits such as improved digestion, enhanced immunity, and reduced chronic disease risks (Daliri & Lee, 2015; Das et al., 2016; Butnariu & Sarac, 2019). Consumer perceptions and behaviors toward functional food products are pivotal in their acceptance and

adoption since growing consumer awareness of these products' health benefits is driving the global market for functional food products (Daliri & Lee, 2015). Discoveries and results of recent research confirm that nutrition has a significant impact on human health. In Hungary, an increasing number of consumers have recently recognized the significance of healthy eating habits in disease prevention (Nagy, 2010). In their research, Szakály and his colleagues concluded that there is no other choice than to drive the public's attention to food products that possess a nutritional advantage (Szakály et al., 2014). Also, they result

that Hungarians would choose to use functional food products over medication (Szakály et al., 2010). Functional foods are foods that have health benefits and convey a favorable effect on the general state of health. Health is one of the most important values of Hungarian consumers (Nagy, 2010). Functional foods are likely to have a brilliant future and their market is expected to grow remarkably in the coming years. Therefore, comprehending the factors influencing consumer attitudes and purchase intentions towards these products is vital for fostering healthier food choices and guiding policymaking and marketing strategies. The Theory of Planned Behavior (TPB) is a comprehensive framework for comprehending and predicting human behavior (Ajzen, 1991; Conner & Sparks, 2005; Armitage & Conner, 2001; Ajzen, 2011). TPB postulates that an individual's Intention to act is shaped by three core factors: attitude toward the behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). Attitude signifies an individual's overall evaluation of the behavior (Ajzen, 2011), while subjective norms encompass the perceived societal pressure to engage or abstain from the behavior (Armitage & Conner, 2001), and Perceived behavioral control represents the individual's perception of the ease or difficulty of performing the behavior (Conner & Sparks, 2005).

In the context of food products, particular attention is given to the impact of nutritional knowledge about these products and health consciousness on attitudes toward them (Hoque et al., 2018; Nguyen et al., 2019). Nutritional Knowledge of functional food products pertains to an individual's grasp of their benefits, constituents, and uses. Conversely, health consciousness reflects an individual's awareness and concern for their health through dietary choices (Nguyen et al., 2019).

This study hypothesizes that nutritional knowledge about functional food products and health consciousness positively influence attitudes toward these products. Moreover, it is anticipated that attitudes towards functional food products will mediate the association between nutritional knowledge of functional food products, health consciousness, and purchase intentions. This mediating effect implies that attitudes are an intermediate psychological process through which nutritional knowledge and health consciousness influence consumer purchase intentions.

Literature review and hypothesis development

Numerous studies have scrutinized factors impacting consumer attitudes and purchase intentions using the Theory of Planned Behavior (Echchad & Ghaith, 2022). More specifically, the influence of consumers' attitudes toward functional food products on purchase intentions has been firmly established (O'Connor & White, 2010; Bakti et al., 2020; Salmani et al., 2020). While attitude, subjective norms, and perceived behavioral control have been extensively explored within the Theory of Planned Behavior, their application to functional food products remains limited. Further inquiry is required to gauge the extent of their impact on consumers' intentions to purchase such products.

To address this research gap, the current study explores the influence of nutritional knowledge about functional food products and health consciousness on attitudes toward these

products. Additionally, the study aims to investigate the mediating role of attitude in the connection between nutritional knowledge, health consciousness, and purchase intentions. The outcomes of this investigation will enrich the existing understanding of consumer behavior towards functional food products and offer valuable insights to policymakers and marketers aiming to promote healthier dietary selections.

Functional food products

In pursuing advancing human health beyond rudimentary nutritional needs, the notion of functional foods has emerged as a prominent avenue for research and development. These foods are purposefully formulated to confer supplementary benefits that go beyond conventional nutritional value, to enhance health outcomes (Urala & Lähteenmäki, 2003) and mitigate the risk of diseases (Diplock et al., 1999). It is worth noting that functional foods maintain their identity as consumable items and are integral to customary dietary patterns (Diplock et al., 1999). In light of the contemporary prevalence of conditions such as metabolic syndrome and cancer, addressing health challenges has become imperative in the twenty-first century, resulting in substantial attention directed toward creating and promoting functional foods (Bultosa, 2016).

In essence, the positive impact of functional foods on health is achieved by reducing disease-related factors and augmenting immune function and other physiological processes (Bultosa, 2016). This category encompasses various bioactive components with varying pharmacological properties, encompassing immune modulation, anti-inflammatory effects, lipid regulation, and ergogenic capabilities (Galland, 2013). Moreover, the spectrum of functional ingredients extends from phenolic compounds derived from plants and probiotics to non-plant sources like peptides, colostrum, and egg yolk (Galland, 2013).

Theory of planned behavior:

Comprehending the determinants of human behavior, particularly dietary preferences, has been a fundamental pursuit in behavioral science. Introduced by Ajzen in 1991, the Theory of Planned Behavior (TPB) furnishes a comprehensive framework for comprehending behavioral intentions. It posits that the behavioral intentions of individuals are molded by their attitudes towards the behavior, subjective norms linked to the behavior, and their perceived control over executing the behavior (Ajzen, 1991). The TPB has found widespread application in various facets of dietary behaviors and intentions (Riebl et al., 2015), Halal food consumption (Bonne et al., 2007; Shah Alam & Mohamed Sayuti, 2011; Aditami, 2016), food choices prediction (Nardi et al., 2019), and even niche areas such as intentions to purchase organic foods (Arvola et al., 2008; Dean et al., 2012; Al-Swidi et al., 2014; Yazdanpanah & Forouzani, 2015; Scalco et al., 2017; Iqbal et al., 2021; Echchad, 2023; Khan et al., 2023), as well as the narrower context of functional food purchase intentions (Bakti et al., 2020).

With this context in mind, the present study adopts the theory of planned behavior (TPB) as its conceptual framework to elucidate and elucidate the purchasing intentions for functional food products. TPB is an effective tool for understanding behavior across diverse domains, notably within functional

food products. Previous studies that have successfully explained purchase intentions for functional food products have harnessed the TPB framework (Urala & Lähteenmäki, 2004; Landström et al., 2007; Ring et al., 2010; Chen, 2011; Hacıoglu & Kurt, 2012; Cazacu, 2015; Cavaliere et al., 2015; Nguyen et al., 2019; Sadhukhan & Khanolkar, 2021; Karelakis et al., 2020). Despite cultural variations in explaining food choices (Stephoe et al., 1995), relationships between attitudes, norms, and control have been substantiated cross-culturally. Early studies have broadly validated these constructs across various domains (Armitage and Conner, 2001).

While meta-analyses affirm TPB's predictive efficacy, it's acknowledged that supplementary factors like habits and emotional responses can enhance explanatory power (Cooke & Sheeran, 2004). Nevertheless, understanding the factors influencing purchase intentions is crucial to decipher consumer behavior toward functional food products. Against this backdrop, this study aspires to delve into the intricate interplay between health consciousness, nutritional knowledge of functional foods, attitudes towards functional foods, and the pivotal role of attitude, subjective norms, and perceived behavioral control in shaping the purchase intentions of functional foods. By investigating these dynamics within the established framework of the TPB, this research endeavors to uncover the multifaceted determinants steering individuals' propensity to adopt functional foods into their dietary practices.

Attitude toward functional food products

The term "attitude" describes the inherent bias, whether positive or negative, toward an individual, object, or issue (Cachero-Martínez, 2020). In addition, it describes an individual's positive or negative evaluation of an item (Ajzen & Madden, 1986). This assessment is a result of attitudes, sentiments, and behavioral tendencies toward a certain product (Vaughan & Hogg, 2005; Bettiga et al., 2017). Through a process of evaluation that can be either positive or negative, attitude depicts what customers like or dislike (Amoako et al., 2020). One of the most important factors influencing behavior concerning functional food products is attitude; the more positive one's attitude, the more likely one is to purchase the product (Nystrand & Olsen, 2020).

The Influence of Attitude on the Functional Food Products Purchasing Intention:

It became apparent that attitude was one of the most significant predictors of intention, and numerous studies supported the significance of attitude in increasing the purchasing intention for functional food products (Salmani et al., 2020; Ahmed et al., 2021). However, there has been a paucity of research on attitude as a mediator between health consciousness and intention to purchase functional food products.

Health Consciousness:

The definition of health consciousness is the growing attention given to well-being, self-care, and environmental sustainability, which results in the formation of consumer groups that prioritize their health (Su et al., 2022). According to Hansen et al. (2018), it also takes into account how willing customers

are to adopt and identify with health-related behaviors. Within the framework of this study, "health consciousness" refers to the level of concern that consumers show for their health as well as the process of using healthy habits and self-awareness to motivate their health and quality of life (Pahrudin et al., 2021). Health consciousness reflects motivations like longevity and disease prevention vs. Treatment (Gould, 1990). It affects dietary choices like reduced fat intake (Moorman & Matulich, 1993). Health Consciousness as an integral aspect of individual awareness, has been extensively explored in the literature as an individual's propensity to undertake health-related actions (Becker et al., 1977), and has garnered substantial attention due to its association with self-care, wellness, and environmental sustainability, consequently fostering consumer segments that prioritize their health (Su et al., 2022). This phenomenon also encompasses consumers' willingness to embrace health-related behaviors (Hansen et al., 2018). The present research takes a holistic approach to the concept of health consciousness, characterizing it as a combination of consumer concern for their health, which encourages people to participate in health-promoting activities, and self-awareness of their medical condition (Pahrudin et al., 2021). Unlike conventional demographic attributes, health-conscious consumer identification is better accomplished through lifestyle analysis (Parashar et al., 2023), a stance reinforced by previous research indicating the inadequacy of demographics for such categorization.

The influence of health consciousness on functional food products purchasing Intention:

Research has shown that health-conscious consumers can be distinguished by their lifestyles rather than by their demographic traits, which are useless for characterizing this type of consumer (Parashar et al., 2023). Health consciousness has been observed to correlate positively with dietary choices (Gould, 1988, 1990). Diverse levels of health consciousness and corresponding health-oriented lifestyles result in varying attitudes toward functional foods, influencing their adoption (Chen, 2011a; 2013). Extensive investigation has validated the affirmative influence of health consciousness on attitudes toward functional foods (Chen, 2013; Papp-Bata & Szakály, 2020). Consumers exhibiting higher health consciousness tend to perceive functional foods as beneficial due to their awareness of the health-enhancing properties inherent in such products (Labrecque et al., 2006; Chen 2011a; 2013). This construct, notably linked to perception of health, has been explored in depth, and empirical findings indicate that health consciousness significantly contributes to consumers' intentions to purchase functional food (Nguyen et al., 2019). Consumers will view functional meals differently and be less or more willing to use them depending on their level of health consciousness and lifestyle choices (Chen, 2011b). Customers are more likely to plan to buy functional foods if they believe they would improve their health (Rezai et al., 2014; Temesi et al., 2019; Siegrist et al., 2022). Thus, it was hypothesized that:

H1: Attitude towards functional food products is positively impacted by health consciousness.

H2: Functional food products purchase intention is positively impacted by health consciousness.

Nutritional knowledge:

Nutrition educators have described nutritional knowledge as a scientific concept that reflects an individual's cognitive processes regarding food and nutrition-related information (Axelson & Brinberg, 1992).

The Influence of Nutritional Knowledge on the Functional Food Products Purchasing Intention:

A sufficient understanding of nutrition may alter eating attitudes and practices, which in turn may affect the acceptability of the changes (Labrecque et al., 2006; Bhaskaran & Hardley, 2002). An analysis of customer expectations and motives regarding functional foods indicates that the most significant element impacting consumer adoption of these foods is nutritional knowledge (Topolska et al., 2021). Furthermore, a study indicated that consumers' frequency of consuming functional foods was positively impacted by higher levels of nutritional knowledge of health information (Jaeger, 2006). According to La Barbera et al. (2016), customers who possess greater nutritional knowledge regarding functional foods tend to pay higher premium prices for them. This finding is consistent with prior research conducted on the subject. Additionally, several research supported the beneficial impact of nutritional awareness on consumers' acceptance of functional meals (De Jong et al., 2003; Brečić et al., 2014; Schnettler, et al., 2015). Thus, it was hypothesized that:

H3: Attitude towards functional food products is positively impacted by nutritional knowledge.

H4: Functional food products purchase intention is positively impacted by nutritional knowledge.

Subjective norm

One of the key ideas in the theory of planned behavior is the subjective norm, which describes how people believe their peers would evaluate a particular course of action (Hameed et al., 2019). As a result, how someone perceives social pressures affects how they carry out particular activities (Teixeira et al., 2021). According to Verbeke and Vermeir (2006), consumers frequently purchase goods to fulfill other social obligations, preserve their social connections, or respond to peer pressure. People thus develop opinions about what their reference groups will think of them if they engage in particular behaviors, and these beliefs have a big impact on whether or not they intend to buy functional food products. Subjective norm is one of the variables influencing the intention to behave. Ajzen (1991) asserts that a consumer's sense of peer pressure to act or refrain from acting constitutes a subjective norm. We defined subjective norm as Hungarians' impression of functional food consumption based on the reference group that they deem significant, based on the definitions. TPB states that when there was a subjective norm in favor of the intake of functional foods, people would be willing to eat them. Subjective norms and behavioral intention have been shown to positively correlate in several research (Shah Alam & Mohamed Sayuti, 2011; Ajzen, 2015; Bakti et al., 2020). O'Connor and White (2010) have demonstrated the impact of subjective norms on behavioral intention in the context of

functional eating. According to Nguyen et al. (2019), one important factor influencing customers' intentions to purchase functional yogurts is the subjective norm.

The Effect of Subjective Norms on Functional Food Products Purchasing Intention:

Subjective norms hold a significant sway over consumer behavior in the realm of food product purchase, with distinct implications for functional food products. Subjective norms, as a construct within the theory of planned behavior, refer to 'individuals' perceptions of how others, particularly their social circles, view a specific behavior. In essence, these norms encapsulate the perceived societal expectations and pressures surrounding a particular action. The influence of subjective norms on food product purchase intention is well-documented in research (Al-Swidi et al., 2014). Individuals often make purchasing decisions based on their desire to conform to the perceived expectations of their peers and social networks. This phenomenon is particularly relevant in the context of functional foods, where perceived social approval can shape 'consumers' willingness to adopt these specialized products into their diets. For instance, a study investigating consumer attitudes and intentions toward functional foods found that subjective norms played a pivotal role in predicting purchase intentions (Hsu et al., 2017). The study demonstrated that individuals who perceived greater social encouragement and approval for consuming functional foods were more inclined to express a positive intention to purchase them. This underscores the importance of social influences in shaping consumer preferences within the functional food domain. Furthermore, subjective norms can also motivate consumers to align their behaviors with societal values and expectations. In the context of functional foods, where adopting these products might be seen as a health-conscious and responsible choice, the influence of subjective norms can be particularly potent. Consumers who perceive that their social circles value the consumption of functional foods are more likely to develop positive attitudes and intentions toward purchasing these items. To illustrate, a study focusing on the Intention to purchase local food products extended the theory of planned behavior to include moral considerations. The study found that subjective norms and other factors significantly influenced 'consumers' intentions to purchase local food (Shin & Hancer, 2016). This reinforces the idea that 'consumers' perception of what their peers deem acceptable or desirable can sway their purchase decisions.

in conclusion, subjective norms wield substantial influence over 'consumers' intentions to purchase food products, including the distinctive category of functional foods. The societal pressures and perceived expectations surrounding these products can mold 'consumers' attitudes and behaviors, making them a critical factor to consider when designing strategies to promote the adoption of functional foods. Thus, it was hypothesized that:

H5: Functional food products purchase intention is positively impacted by subjective norms.

The Effect of perceived behavioral control on functional food products Purchasing Intention:

Consumer intentions to purchase food products, including functional foods, are evident. It mirrors 'individuals' evaluation of their capacity to surmount challenges and enact the desired behavior. Notably, this significance is amplified in the context of specialized goods like functional foods. Recognizing the impact of perceived behavioral control on consumer behavior can guide strategies aimed at promoting the adoption of functional foods and other health-enhancing products (Nguyen et al., 2019).

Furthermore, empirical investigations within the framework of the theory of planned behavior have consistently supported the importance of perceived behavioral control in determining consumer intentions. For instance, a study aimed at examining the factors influencing the Intention to purchase local food expanded upon the theory of planned behavior, incorporating moral considerations. The 'study's findings demonstrated that attitude, subjective norms, perceived behavioral control, and moral norms all directly or indirectly influenced 'consumers' Intention to purchase local food (Shin & Hancer, 2016). The findings highlight the relevance of perceived behavioral control in shaping consumer choices within the domain of functional foods.

Thus, it was hypothesized that:

H6: Functional food products purchase intention is positively impacted by perceived behavioral control.

Intention

Intention plays a central role in understanding and predicting human behavior, particularly when it comes to consumer decisions related to food product purchases. Intention, as defined by the literature, embodies the plan, commitment, or decision of an individual to engage in a particular action. This action may involve making a purchase, adopting a behavior, or pursuing a specific goal (Madden et al., 1992).

In the realm of consumer psychology, Intention is recognized as a critical precursor to future behaviors. It serves as the bridge between a 'person's thoughts and their actions, reflecting their resolve to carry out a planned behavior. This concept is deeply embedded within the framework of the theory of planned behavior (Ajzen, 1991), where Intention is positioned as a key determinant that directly shapes an 'individual's subsequent behaviors.

Functional food products purchase intention:

Specifically, when considering the purchase of food products, including functional food products, the notion of purchase intention gains prominence. Purchase intention, in the context of this study, is defined as the determination to engage in a specific action with the ultimate goal of making a purchase. It is the conscious decision and willingness of individuals to perform the act of buying a particular product (Ajzen, 1991).

Importantly, purchase intention holds a unique place in the realm of consumer research, as it serves as a direct precursor to the actual act of purchasing. It encapsulates 'consumers' mental commitment to buy a product and signifies their

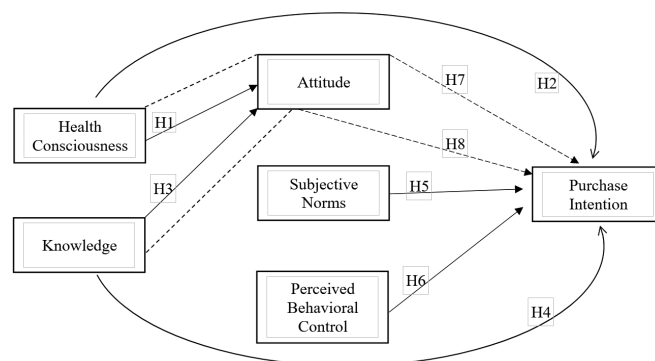
readiness to take that step. In the theory of planned behavior, purchase intention is considered a strong indicator of the likelihood of actual purchase, as it reflects 'individuals' deliberate planning and motivation to engage in the buying process. For instance, a study investigating consumer attitudes and intentions toward functional foods found that purchase intention was significantly influenced by factors such as attitude and subjective norms (Hsu et al., 2017). This highlights the pivotal role of Intention in driving consumer behavior within the domain of functional food products. In conclusion, Intention represents the focal point where cognitive processes and future actions converge. Within the context of a food product purchase, and more specifically functional food products, purchase intention encapsulates 'individuals' conscious decision to engage in the act of buying. Recognizing the power of Intention as a precursor to purchasing behavior can provide valuable insights for marketers and policymakers seeking to understand and influence consumer choices.

Thus, it was hypothesized that:

H7: Functional food products purchase intention is mediated by the health consciousness impact on attitudes.

H8: Functional food products purchase intention is mediated by the nutritional knowledge impact on attitudes.

Figure 1. Study conceptual mode



MATERIALS AND METHODS

Participants

The research was based on information gathered online through a survey that was issued between the first of March 2023 and the first of May 2023. Adults in Hungary made up the target population. The study sample consists of 396 participants (n = 396).

Data collection

A structured survey that was created following a thorough examination of the relevant literature was used to gather the data online (by posting in Facebook groups). The variables identified in the study model were included in the questionnaire, including health consciousness, nutritional knowledge, attitude, subjective norms, perceived behavioral control, and intention to purchase functional food products. Scales with several items

were created to measure the variables highlighted by this research, grounded on recommendations made by (Ajzen, 2002).

A group of statements measuring the variables of this research are presented on a 5-point Likert scale, with 1 representing strongly disagree and 5 representing strongly agree. The constructs of the current investigation were measured using statements from other studies. Thirty people took part in a pilot study to evaluate the 'questionnaire's reliability and validity. Furthermore, reliability was shown to be good and excellent by the Cronbach alpha.

RESULTS

Characteristics of study participants

The study included 396 participants. Most of them were females (n= 319, 80.6%), more than half of the study participants were employed (n= 224, 56.6%), and most were undergraduates (n= 329, 83.1%). The participant's characteristics are displayed in Table 1.

Table 1. Characteristics of study participants

Variable		Frequency	Percent
Gender	Male	77	19.4
	Female	319	80.6
Employment status	Employed	224	56.6
	Unemployed	172	43.4
Educational level	High school graduate	46	11.6
	Undergraduate	329	83.1
	Postgraduate	21	5.3

Based on their responses to the scale's questions, Table 2 illustrates how the study's participants were split up. Using a one-sample t-test, this table shows the mean, standard deviation, and standard error of the mean for each scale item. Item (4) scored the highest overall, according to the results. The statement "I take responsibility for the state of my health," with a mean score of 4.20. The item with the lowest mean score (9) was "I want to buy functional food products in the next two weeks." The dependability of the scale items (Cronbach's alpha) is 0.863.

Table 2. Scale items' scores

Item	Mean	SD	SD error of mean	t	P value	Rank	
1	I reflect on my health a lot	3.96	1.029	.052	76.523	<0.001	4
2	I am very self-conscious about my Health	3.85	1.007	.051	76.017	<0.001	7

3	I am alerted to changes in my health	4.07	.984	.049	82.239	<0.001	3
4	I take responsibility for the state of my health	4.20	1.007	.051	83.100	<0.001	1
5	I think money spent on functional food products is worthwhile	3.58	1.146	.058	62.146	<0.001	9
6	It is important to consume functional food products	3.88	1.073	.054	71.876	<0.001	6
7	It is useful to consume functional food products	4.11	.955	.048	85.603	<0.001	2
8	I know that functional food products are beneficial	3.83	1.135	.057	67.199	<0.001	8
9	I want to purchase functional food products within the next two weeks	2.77	1.412	.071	38.979	<0.001	12
10	I intend to purchase functional food products within the next two weeks	2.88	1.447	.073	39.558	<0.001	6
11	If I wanted, it would be easy for me to buy functional food products	3.89	1.274	.064	60.744	<0.001	5
12	Most people who are important to me think I should purchase functional food products	3.26	1.362	.068	47.650	<0.001	11
13	People whose opinions I value would prefer me to purchase functional food products	3.36	1.286	.065	52.006	<0.001	10

Participants' detailed responses are presented in Table 3.

Table 3. Responses of participants to scale items

Item		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	HC1	11, 2.8%	15, 3.8%	107, 27%	110, 27.8%	153, 38.6%
2	HC2	7, 1.8%	27, 6.8%	112, 28.3%	123, 31.1%	127, 32.1%
3	HC3	8, 2%	14, 3.5%	89, 22.5%	118, 29.8%	167, 42.2%
4	HC4	9, 2.3%	19, 4.8%	57, 14.4%	108, 27.3%	203, 51.3%
5	ATT1	21, 5.3%	43, 10.9%	123, 31.1%	104, 26.3%	105, 26.5%
6	ATT2	12, 3%	27, 6.8%	102, 25.8%	112, 28.3%	143, 36.1%
7	ATT3	5, 1.3%	19, 4.8%	74, 18.7%	128, 32.3%	170, 42.9%
8	KN1	22, 5.6%	24, 6.1%	89, 22.5%	124, 31.3%	137, 34.6%
9	PI1	105, 26.5%	71, 17.9%	97, 24.5%	58, 14.6%	65, 16.4%
10	PI2	98, 24.7%	70, 17.7%	88, 22.2%	63, 15.9%	77, 19.4%
11	PBC1	33, 8.3%	27, 6.8%	66, 16.7%	95, 24%	175, 44.2%
12	SN1	58, 14.6%	54, 13.6%	111, 28%	73, 18.4%	100, 25.3%
13	SN2	42, 10.6%	56, 14.1%	114, 28.8%	85, 21.5%	99, 25%

Note: HC1 for health consciousness question 1, HC2 for health consciousness question 2, HC3 for health consciousness question 3, HC4 for health consciousness question 4 ATT1 stands for attitude question 1, ATT2 for attitude question 2, ATT3 for attitude question 3, KN for knowledge question 1, PI for purchase intention question 1, P2 for purchase intention question 2, PBC1 for perceived behavioral control question 1, and SN1 stands for subjective norms question 1 and SN2 stands for subjective norms question 2.

A statistical correlation between the characteristics of the participants and the scale items is shown in Table 4. The table shows a statistically significant correlation between gender responses to scale items (9) P= 0.017, (10), P= 0.001, (12) P= 0.039, and (13) P= 0.044. Also statistically significant were the scale items (1) P= 0.044 and (4) P= 0.031 for educational level. However, none of the scale items' correlations with employment status were statistically significant.

Table 4. Statistical relationship between participants' characteristics and scale items

Item		Gender		Employment		Education	
		X ²	P-value	X ²	P-value	X ²	P-value
1	HC1	3.274	0.513	9.294	0.054	15.883	0.044

2	HC2	2.699	0.609	7.837	0.098	13.617	0.092
3	HC3	2.561	0.634	4.201	0.379	12.448	0.132
4	HC4	1.143	0.887	8.127	0.087	16.929	0.031
5	ATT1	6.43	0.169	4	0.406	10.94	0.205
6	ATT2	6.218	0.183	4.697	0.320	8.212	0.413
7	ATT3	5.063	0.281	5.552	0.235	7.068	0.529
8	KN1	2.188	0.701	6.074	0.194	7.913	0.442
9	PI1	12.009	0.017	4.605	0.330	8.453	0.391
10	PI2	19.128	0.001	6.958	0.138	1.471	0.993
11	PBC1	2.436	0.656	3.666	0.453	4.235	0.835
12	SN1	10.067	0.039	5.478	0.242	13.2	0.105
13	SN2	9.792	0.044	2.176	0.703	12.084	0.147

Note: HC1 for health consciousness question 1, HC2 for health consciousness question 2, HC3 for health consciousness question 3, HC4 for health consciousness question 4 ATT1 stands for attitude question 1, ATT2 for attitude question 2, ATT3 for attitude question 3, KN for knowledge question 1, PI for purchase intention question 1, P2 for purchase intention question 2, PBC1 for perceived behavioral control question 1, and SN1 stands for subjective norms question 1 and SN2 stands for subjective norms question 2.

Cronbach's alpha was used to analyze the constructs' dependability. Cronbach's alpha for each construct was higher than the necessary 0.700 threshold. The results for the factor loadings, and validity of the items are shown in Table 5. The Fornell-larker criterion was used to assess discriminant validity (Table 6). The table (Table 7) shows that for the construct, the square root of AVE was greater than the correlations between the constructs. The discriminant validity was also evaluated using the Heterotrait-Monotrait Ratio of Correlations (Henseler et al., 2015), with values below the cutoff of 0.90. As a result, the discriminant validity is acknowledged (see Table 5).

Table 5. loadings and validity

	Loadings	Cronbach's alpha	AVE
HC1	.404	0.841	0.174
HC2	.447		
HC3	.426		
HC4	.391		
ATT1	.746	0.864	0.573
ATT2	.769		
ATT3	.756		
KN1	.709	-	0.167
PI1	.765	0.919	0.385
PI2	.756		
PBC1	.436	-	0.063

	Loadings	Cronbach's alpha	AVE
SN1	.619	0.902	0.276
SN2	.668		

Note: HC1 for health consciousness question 1, HC2 for health consciousness question 2, HC3 for health consciousness question 3, HC4 for health consciousness question 4 ATT1 stands for attitude question 1, ATT2 for attitude question 2, ATT3 for attitude question 3, KN for knowledge question 1, PI for purchase intention question 1, P2 for purchase intention question 2, PBC1 for perceived behavioral control question 1, and SN1 stands for subjective norms question 1 and SN2 stands for subjective norms question 2.

Table 6. Fornell-Larker Criterion

	ATT	HC	KN	PI	PBC	SN
ATT	0.757*					
HC	0.868	0.417*				
K	0.832	0.769	0.408*			
PI	0.541	0.668	0.589	0.620*		
PBC	0.488	0.436	0.720	0.777	0.251*	
SN	0.969	0.447	0.641	0.735	0.821	0.525*

*Square root of average

Table 7. HTMT ratio

	ATT	HC	KN	PI	PBC	SN
ATT	1					
HC	0.171	1				
K	0.586	0.206	1			
PI	0.518	0.235	0.491	1		
PBC	0.228	0.157	0.255	0.257	1	
SN	0.333	0.093	0.334	0.438	0.252	1

Note: ATT stands for attitude, HC stands for health consciousness, KN stands for knowledge, PI stands for purchase intention, PBC for perceived behavioral control, and SN for subjective norms.

Assessment of the structural model

The structural model shows the directions that the research framework has hypothesized. On the basis of the R2, Q2, and significance of routes, a structural model is evaluated. The attitude toward functional food products, nutritional knowledge of functional food products, subjective norms, and perceived behavioral control are all responsible for the 37% shift in purchasing intention. The increase in health consciousness and un-

derstanding of functional food products is responsible for a 39% change in perception of these goods. According to Falk & Miller (1992), both R2 values are higher than 0.1. As a result, the ability to predict is established. The model has predictive relevance if Q2 for attitude toward functional food items and Q2 for intention to purchase functional food products is greater than 0. The SRMR value was 0.036, which is less than the necessary value of 0.20 and indicates a good model fit (Hair et al., 2017).

To determine the significance of the association, hypotheses were tested and the goodness of fit was further evaluated. H1 determines whether HC significantly affects ATT. According to the findings, HC has a significant effect on ATT (= 0.122, t = 1.640, p 0.001). H1 was approved as a result. H2 evaluates whether HC significantly affects PI. According to the findings, HC has a significant effect on PI (= 0.170, t = 2.370, p 0.001). H2 was consequently approved. H3 investigates if KN significantly affects ATT. The findings demonstrated that KN has a significant impact on ATT (= 0.592, t = 14.362, p 0.001). H3 was therefore approved. H4 investigates if KN significantly affects the PI. The findings showed that KN has a positive impact on PI (= 0.351, t = 4.518, p 0.001). H5 determines whether SN significantly affects PI. The findings showed that SN affects PI positively (= 0.329, t = 5.741, p .001). H5 was consequently approved.

H6 evaluates whether PBC significantly affects PI. The findings showed that PBC has a positive effect on PI (= 0.228, t = 4.647, p .001). H6 was approved as a result. H6 determines whether SN significantly affects PI. The findings showed that SN effects PI positively (= 0.329, t = 5.741, p .001). As a result, H6 was approved.

Table 8 displays the 95% confidence intervals that the study's 5000 resamples produced. When the confidence interval is not zero, there is a meaningful association.

Table 8. Hypothesis testing results

	B	SD	T	P value	95% CI lower limit	95% CI upper limit
SN>ATT	0.333	0.04	7.019	<0.001	0.202	0.359
HC>ATT	0.122	0.087	1.640	<0.001	-0.028	0.312
KN>ATT	0.592	0.041	14.362	<0.001	0.511	0.673
PBC>PI	0.228	0.044	4.647	<0.001	0.118	0.292
HC>PI	0.170	0.101	2.370	<0.001	0.041	0.436
KN>PI	0.351	0.085	4.518	<0.001	0.218	0.553
SN>PI	0.329	0.071	5.741	<0.001	0.267	0.544
	R ²	Q ²				
ATT	0.370	0.363				
PI	0.397	0.389				

Mediation analysis

The mediating effect of attitudes toward functional food products was evaluated by mediation analysis. The findings (see Table 9) showed that ATT played a mediating function in two different instances: (= 0.157, t = 3.150, p = 0.002) and (=

Table 9. Mediation results

	Total effect	T	Sig	Direct effect	Sig		Effect	T	P value
HC>PI	0.168	2.282	0.023	0.114	<0.027	HC>ATT>PI	0.157	3.150	0.002
KN>PI	0.536	9.200	<0.001	0.421	<0.001	K>ATT>PI	0.607	15.181	<0.001

0.607, $t = 15.181$, $p < 0.001$). As a result, attitudes toward functional foods effectively moderated the link between health consciousness and purchase intent as well as the link between nutritional knowledge of functional foods and the intention to buy them. H7 and H8 were confirmed as a result.

DISCUSSION

Demographic characteristics of respondents and their relationship with functional food purchase intention

The objective of the current study was to look at the features and viewpoints of 396 consumers of functional foods, which have health benefits in addition to their nutritional value (AT & Action, 1999). The results showed that most of the participants were employed women with college degrees. The participants' levels of agreement on several aspects of health consciousness and intended purchases of functional foods were likewise varied. The statement "I take responsibility for the state of my health" had the highest mean score, indicating a high level of personal agency. The response "I want to purchase functional food within the next two weeks" had the lowest mean score, indicating a low tendency for quick use of functional food.

Gender may affect attitudes about functional food intake, according to research that demonstrated statistically significant relationships between gender and several scale items (Landström et al., 2007; Annunziata et al., 2014; and Demir & Karakaya, 2019). Additionally, it was discovered that items 1 and 4 had a substantial link with educational level, suggesting that education may influence health consciousness and individual responsibility for health.

However, there was no statistically significant correlation between work status and the scale items, indicating that employment had little to no influence on the 'participants' opinions regarding consuming functional foods.

The findings of this study provided insight into the personalities and beliefs of the participants regarding the consumption of functional foods.

Future studies could examine the factors affecting these beliefs and what it really means to promote a healthy diet. It would also be advantageous to research any gender disparities in attitudes toward and behaviors linked to functional foods in larger and more diverse populations, given the predominance of women.

Overall, this study contributes to the body of nutritional knowledge by shedding light on the variables influencing "people's attitudes about functional food intake." Additionally, it offers helpful information for medical procedures and initiatives aimed at promoting health and promoting healthy eating habits.

Women are more likely than males to take functional meals, and may even compromise their taste for health, according to

past research (Urala & Lahteenmaki, 2007; Büyükkaragöz et al.; 2014; Bimbo et al.; 2017; Kraus et al., 2017). Young guys are less concerned with functional foods and psychological effects, according to a different study (Kraus et al., 2017). According to Bärebring et al. (2020), gender disparities in health attitudes, motivations, and preferences for functional meals may be the cause of this.

Women might view functional foods as having greater health benefits than men do, or they might be more concerned about their overall health, weight, and looks than men do (Childs & Poryzees, 1998), as well as being more health-conscious (Landström et al., 2007). The results of the current study are consistent with earlier studies that revealed that the consumption of functional foods is positively correlated with education (Demir & Karakaya, 2019). This may be due to the correlation between greater education levels and functional food knowledge, health literacy, and awareness (Büyükkaragöz, 2014).

In addition, those with higher levels of education may be better able to comprehend and assess health claims made on the labels of functional foods or may have greater access to sources of knowledge on these foods (Annunziata, 2014); The results of a study also showed that customers who were least aware of nutrition showed the least acceptance of consuming functional foods. These results suggest that the consumption of functional meals may be constrained by a lack of nutritional awareness. In order to ensure that consumers are aware of the positive health impacts of functional meals, it may be required to apply health claims (Ares et al., 2008). However, none of the scale items' correlations with employment status were statistically significant. This might be because of methodological issues with how employment status and functional food consumption are defined and measured, or with the size and makeup of the sample. For instance, some studies might have used different categories of employment status, such as full-time, part-time, self-employed, or unemployed.

The association between health consciousness, nutritional knowledge, attitude, subjective norms, and perceived behavioral control and the purchase intention of functional food products

In the current study, it was found that the purchasing intentions (PI) of functional food products were positively correlated with health consciousness (HC), nutritional knowledge (KN), attitude (ATT), subjective norms (SN), and perceived behavioral control (PBC). There was also evidence of a mediation effect, where health awareness and nutritional knowledge had a major impact on attitudes toward functional food items and consequently on purchase intentions. This is consistent with the Theory of Planned Behavior (Ajzen, 1991) and previous studies (Chen, 2011a; Dean et al., 2012; Cava-

liere et al., 2015; Sadhukhan & Khanolkar, 2021; Hacıoglu & Kurt, 2012; Landström et al., 2007; Karelakis et al., 2020; Nguyen et al., 2019; Urala & Lähteenmäki, 2004).

The results confirmed earlier studies' findings (Huang et al., 2019; Jung et al., 2020) that attitudes and purchase intentions toward functional food products were positively influenced by health consciousness. According to a study (Huang et al., 2019), health consciousness influences buying intention favorably through attitude. Purchase intentions were also influenced by perceptions of the health benefits of functional foods (Siegrist et al., 2008; Rezaei et al., 2014; Temesi et al., 2019). Gould (1990) underlined the importance of health consciousness in raising people's knowledge of their health state, even to the point of consuming novel functional foods (Ares et al., 2008). Given that buying attitude is positively impacted by health consciousness when it comes to purchasing intention (Huang et al., 2019).

Interesting findings revealed that attitudes mediate the link between health consciousness, nutritional knowledge, and intention to purchase functional foods. This finding supports earlier research (Verneau et al., 2019; Lu, 2015) that indicated health-conscious people were more likely to learn about functional foods, which altered their attitudes and ultimately affected their intention to purchase. Similar to this, nutritional knowledge attenuated the impact of perceived fit on purchase intention (Lu, 2015). According to Menrad (2003), knowledge and awareness are key factors in consumers' favorable assessments and acceptance of new products. However, a conflicting study discovered that consumer awareness, necessity, and safety had a detrimental impact on the intention to purchase functional food (Rasanjalee, 2021).

The study's findings support earlier research (Ahmed et al., 2021; Chen, 2007; Grankvist & Biel, 2007) that shows a favorable association between attitude and the intention to buy food products. The purchase intention of functional food products was also demonstrated to be influenced by subjective standards, and an earlier study supports this finding (Nguyen et al., 2019). Last but not least, perceived behavioral control was identified as one of the factors influencing the intention to buy functional food products, which is similar to findings from earlier studies (Shin et al., 2016).

CONCLUSION

This study looked closely at the traits of consumers of functional food products. It thoroughly evaluated the impact of health consciousness and nutritional knowledge on attitudes toward functional food items in addition to looking at the mediating role of attitudes toward functional food products. Additionally, the effects of subjective norms and perceived behavioral control on purchase intentions were extensively examined. The survey, which was administered in English to 396 adult Hungarian respondents, was completed by them. The study produced a number of important findings. The majority of the participant population consisted of working, college-educated women, necessitating a thorough understanding of the demographic characteristics of the sample. The study found statistically significant connections between a few scale items and gender, which may show that attitudes toward purchas-

ing functional food products are influenced by people's gender. Additionally, this study discovered correlations between particular categories and educational levels, suggesting that education may have an impact on health awareness and individual responsibility for health. Notably, the results showed how attitudes toward functional food products were crucial in mediating the connection between nutritional knowledge and purchase intentions, replicating a relationship between health consciousness and the intention to buy functional food products. The outcomes also demonstrated how attitudes have a big influence on buying intentions. The study also showed that subjective norms and perceived behavioral control influenced purchasing intentions. In conclusion, this study solidly supports the positive influence of health consciousness, nutritional knowledge, attitude, subjective norms, and perceived behavioral control on purchase intentions regarding functional food products, harmonizing with other research. The mediating function of attitudes emphasizes how crucial these categories are in determining consumer behavior. These profound findings greatly advance our understanding of consumer preferences in the dynamic functional food market, which has broad ramifications for marketers and policymakers. This study also provides insightful information on how people feel about consuming functional meals. Future studies could look into the intricate influences of these attitudes and how they impact the promotion of healthier eating habits.

IMPLICATIONS FOR THE FUNCTIONAL FOOD PRODUCTS INDUSTRY AND MARKETERS

1. Understanding the influence of nutritional knowledge on consumer attitudes can help marketers develop effective educational campaigns and provide clear information about the health benefits of functional food products.
2. Recognizing the role of health consciousness in shaping attitudes toward functional food products allows marketers to tailor marketing strategies that appeal to health-conscious consumers.
3. The mediating effect of attitudes emphasizes the importance of cultivating positive attitudes toward functional food products, as it positively influences purchase intentions. Marketers can focus on building favorable attitudes through targeted messaging and product positioning.
4. Considering the impact of subjective norms and perceived behavioral control on purchase intentions, marketers can leverage social influence and emphasize the ease of incorporating functional food products into consumers' daily lives.
5. The findings highlight the significance of gender and education in attitudes toward functional food product consumption. Marketers should consider these demographic factors when developing marketing campaigns and targeting specific consumer segments.
6. The study provides valuable insights into consumer preferences and beliefs regarding functional food consumption, aiding marketers in understanding the complex influences and designing strategies to promote healthier eating habits.

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