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*Article*

# Factors Influencing Purchase Intention of Organic Food among Individuals with Chronic Diseases

Yam B. Limbu \*, Christopher McKinley, P. Ganesan, Tianfu Wang and Junzhou Zhang

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**Abstract:** The objectives of this study are threefold. First, we evaluate the applicability of the information–motivation–behavioral skills (IMB) model for predicting organic food purchase intention (OFPI) in adults with chronic conditions. Second, we examine the indirect effects of organic food knowledge, attitudes toward organic food purchase, and subjective norms on OFPI through self-efficacy. Third, we examine whether these indirect effects are moderated by gender and educational attainment. Data were collected from Indian adults with chronic conditions using a self-administered questionnaire. The results show significant indirect effects of organic food knowledge, attitude toward organic food purchase, and subjective norm on OFPI through self-efficacy. Moreover, the mediating effect of knowledge was moderated by gender and education attainment, with the effect being stronger for females and among individuals with a lower level of education. Organic food marketers, social marketers, and public health agencies promoting organic food consumption to people with chronic conditions should aim to increase their confidence in comprehending organic food. This study contributes to the literature by assessing the applicability of Fisher and Fisher's (1992) IMB model in understanding behavioral intention toward organic food.

**Keywords:** organic food knowledge; attitude toward organic food purchase; subjective norm; organic food purchase intention; organic food purchase self-efficacy; gender; education

## 1. Introduction

Organic foods are produced following the practice of organic farming, including the application of organic fertilizers; inter-cropping with nitrogen-fixing trees, legumes, or other synergistic crops; biological pest control; locally adapted seeds/breeds; and the reintegration of animals into farms (Adamtey et al., 2016). Organic foods are grown without the use of synthetic chemicals, such as human-made pesticides and fertilizers, and do not contain genetically modified organisms (Duram, 2019).

Regulators around the world certify organic foods according to local standards. For example, the organic foods certification of the United States Department of Agriculture emphasizes production, including soil quality, animal raising practices, pest and weed control, and additives. Production should use natural substances and physical, mechanical, or biologically based farming methods to the fullest extent possible (USDA, 2019). In India, organic foods are defined as products of holistic agricultural practices, focusing on biodiversity, soil health, chemical-free inputs, etc., with an environmentally and socially responsible approach (Jaivik Bharat, 2022). The European Union's comprehensive rule not only limits organic farming's environmental impact but also encourages a high standard of animal welfare (European Commission, 2022).

Although the meanings, definitions, and certifications of organic foods are specific and diverse (Hughner et al., 2007), consumers are motivated to purchase and consume organic food because they are perceived to be safe, nutritious, healthy, and nature-friendly choices (Basha et al., 2015; Nasir and Karakaya, 2014; Pino et al., 2012; Singh and Verma, 2017). Organic foods are more natural and more sustainable for the environment. Consumption of organic food may help prevent chronic disease (Ludwig-Borycz et al., 2021).

The global organic food market reached \$221 billion in 2021 and is expected to grow at a double-digit CAGR (The Business Research Company, 2021). The COVID-19 pandemic has also boosted the

organic food market because consumers have been attracted to organic foods to improve their immunity (The Business Research Company, 2020).

Given the importance of the organic food market, it is crucial to understand why consumers buy and consume organic foods. Researchers have paid considerable attention to this topic and have uncovered a broad spectrum of variables influencing consumers' organic food purchase intention (OFPI). Rana and Paul (2017) provided a comprehensive review and identified several clusters of consumer factors that influence OFPI, including health consciousness, expectations of well-being, environmental friendliness, ethical consumerism, and social consciousness. However, the literature calls for examining these factors using various theoretical frameworks (Zayed et al., 2022). Therefore, we adopted the information–motivation–behavioral Skills (IMB) model (Fisher and Fisher, 1992) to examine how and when organic food knowledge, attitude toward organic food purchase, and subjective norm influence organic food purchase intention among adults with chronic conditions. More specifically, the objectives of this study are threefold. First, our study evaluates the applicability and robustness of the IMB model in predicting and explaining the OFPI of individuals with chronic conditions. Second, this study examines the impacts of organic food knowledge, attitudes toward organic food purchase, and subjective norms on organic food purchase intentions through the mediating effects of organic food purchase self-efficacy. A rationale for examining self-efficacy as a mediator is that extant literature has reported mixed findings regarding the influences of IMB exogenous variables (e.g., attitude, subjective norm, information) on OFPI. For example, some studies found a significant positive relationship between subjective norm and OFPI (Rana and Paul, 2017; Carrión Bósquez et al., 2023), but other studies did not find such an association (Yadav and Pathak, 2016; Zayed et al., 2022). These inconsistent results might have occurred due to the exclusion of intervening variables that might have affected the relationship between subjective norm and OFPI. Third, Zayed et al. (2022) indicate that more research is needed to examine how some demographic characteristics, such as age, gender, and level of education, impact the consumption of organic foods. Prior studies show that socio-demographic factors can moderate the relationship between consumer attitude and OFPI (Eberle et al., 2022). Thus, we examined gender and education as moderators of these mediated relationships to estimate the conditional indirect (moderated mediation) effects. Finally, the current literature has yet to explore the factors affecting the organic food purchase intentions of people with chronic diseases. Thus, this study aims to fill this gap by surveying a sample of individuals with chronic illnesses.

From a theoretical perspective, this study was an initial attempt to extend the IMB model to understand factors influencing behavioral intentions toward organic foods. The insights gained from this study also provide important managerial implications. The evidence may help organic food marketers understand how the knowledge and motivation of individuals with chronic conditions influence their OFPI. Moreover, the results may provide insights into the potential roles of gender and education in enhancing OFPI. The findings of this study may help governments and organic food marketers better understand the key factors predicting the OFPI of Indian people with chronic conditions to develop campaigns to encourage them to purchase organic foods.

## 2. Literature Review

Researchers have long been interested in uncovering the factors that influence consumers' OFPI (Beharrell and MacFie, 1991; Davies et al., 1995; Sandalidou et al., 2002; Hughner et al., 2007; Paul and Rana, 2012; Carrión Bósquez et al., 2023). The extant literature shows that OFPI is influenced by a cluster of factors, including attitude, subjective norm, nutritional and health information, knowledge, ethical consumerism, social demographics, safety, taste, and availability (Eyinade et al., 2021; Hemmerling et al., 2015; Rana and Paul, 2017, 2020). Research shows that attitude is one of the most influential factors motivating OFPI (Honkanen et al., 2006; Rana and Paul, 2017; Eberle et al., 2022). Attitude is a mental and emotional entity that inheres in or characterizes a person, and it is based upon an individual's valuation of any emotional object (Eyinade et al., 2021). Subjective norm was another frequently examined determinant of OFPI. Subjective norms are the perceived social pressure to undertake or not undertake a behavior, which reflects the beliefs about how others would view

such a behavior (Eyinade et al., 2021). The literature offered mixed empirical evidence. While several studies reported a significant relationship between subjective norm and OFPI (Rana and Paul, 2017; Carrión Bósquez et al., 2023), other did not find a significant influence of subjective norm on OFPI (Yadav and Pathak, 2016; Zayed et al., 2022). Thus, there is a need for research examining when subjective norms influences OFPI.

While attitude and subjective norms determine what consumers like and what is desirable to do, consumer perceptions about organic foods determine what consumers think is true (Eyinade et al., 2021; Srinien and Thapa, 2018). Consumers incorporate their knowledge and inputs from external sources to form their perceptions about organic foods (Xie et al., 2015).

The existing research has also identified the influence of social demographics of consumers, such as age, gender, income, and education, on OFPI (Katt and Meixner, 2020; Torjusen et al., 2001; O'Donovan and McCarthy, 2002; Dettmann and Dimitri, 2009). On the contrary, a few studies have revealed little or no statistically significant influence of demographic factors on OFPI (Wilkins and Hillers, 1994; Thompson and Kidwell, 1998; Rimal et al., 2005). For example, Thompson and Kidwell (1998) found that age, gender, and education had negligible effects on OFPI. Other studies reported that gender (Chen et al., 2014; Irandoust, 2016; Tan et al., 2022) and education (Rimal et al., 2005; Chen et al., 2014; Tan et al., 2022) had no significant effect on OFPI. Such scattered and mixed findings suggest that the effects of factors that influence OFPI may not be straightforward and motivate us to include them in our conceptual model.

From the aforementioned discussion, the extant literature has primarily focused on the factors that directly influence OFPI. However, little attention has been paid to the mediating and moderating mechanisms underlying these relationships (Kushwah et al., 2019). Thus, the current investigation examines the indirect effects of organic food knowledge, attitude toward organic food purchase, and subjective norm on OFPI, and whether these indirect effects are moderated by gender and education attainment.

Researchers have also made efforts to adopt diverse theoretical models and frameworks to help better interpret OFPI in a process (Rana and Paul, 2017). The classical theory of reasoned action and the theory of planned behavior (TPB) and its extended form, that is, the theory of bounded rational planned behavior, have been used to understand OFPI (Al-Swidi et al., 2014; Ashraf, 2021; Paul et al., 2016; Tarkiainen and Sundqvist, 2005; Carrión Bósquez et al., 2023). These frameworks take attitude and subjective norms into account to explain OFPI. In addition, TPB and its extensions also incorporate perceived behavior control or self-efficacy. Although these frameworks show explanatory power, all these factors enter into the model in a linear form that limits its functional flexibility.

Zepeda and Deal (2009) link the value-belief-norm theory and the attitude-behavior-context theory as a framework to analyze organic food purchases. The resulting alphabet theory incorporates a comprehensive set of factors, including attitudes, knowledge, information, demographics, context, and habits. These theoretical frameworks provide explanations for OFPI from a general consumer choice perspective. However, it is also important to note that organic food consumption is health-related behavior. Food safety and lifestyle-related diseases are critical motivations for consumers to choose organic food over conventional food (Paul and Rana, 2012). Prior research has shown that organic food consumption is associated with a lower risk of chronic diseases, including obesity (Kesse-Guyot et al., 2017) and Type 2 diabetes (Kesse-Guyot et al., 2020). Therefore, our investigation applies the IMB model as the theoretical framework to understand the factors influencing OFPI of patients with chronic diseases.

### 3. Theoretical Framework and Hypotheses

The information-motivation-behavioral skills model was initially proposed to study interventions targeting risky sexual behavior and drug use practices related to AIDS (Fisher and Fisher, 1992). This model has been generalized to understand a broader scope of health behaviors (Chang et al., 2014; Limbu et al., 2020). The IMB model comprises three primary sets of constructs that influence a health behavior: (1) information and knowledge about a behavior; (2) the individual's

motivation to perform the behavior; and (3) the behavioral skills essential for performing the behavior. Chang et al. (2014) indicate that the IMB model is an appropriate theoretical framework for understanding health behaviors of individuals with chronic diseases. Therefore, in this investigation, we studied the organic food purchase behavior of patients with chronic diseases using the IMB framework (see Figure 1).

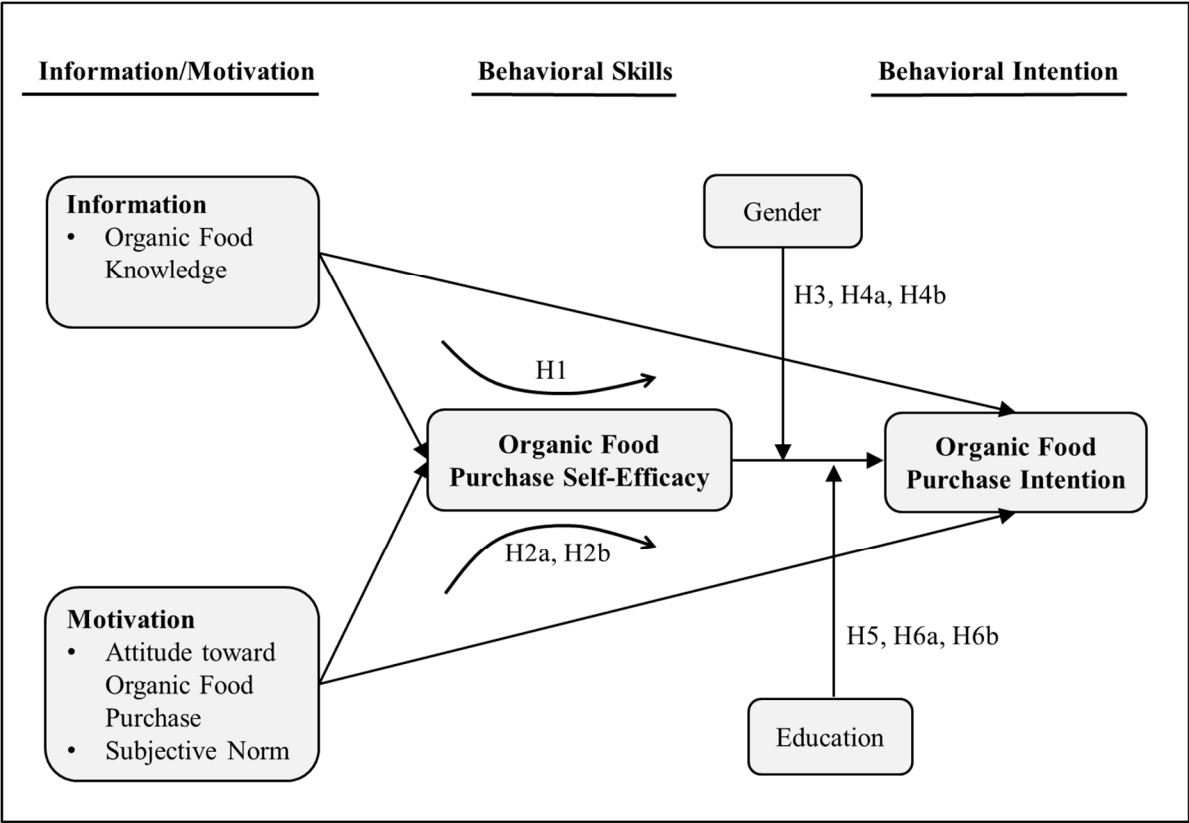


Figure 1. Theoretical framework.

3.1. Mediation effect of self-efficacy

To evaluate the applicability of the IMB model on consumers’ behavioral intentions toward organic food purchases, we followed the literature to operationalize the IMB constructs. First, consumers need to be informed and knowledgeable about organic food. Second, consumers need to be motivated through a combination of attitudes toward purchasing organic food and subjective norms or social pressure to buy organic food. Third, with appropriate information and motivation, consumers will apply behavioral skills or demonstrate their self-efficacy in purchasing organic food (Tuthill et al., 2017). To conclude, the IMB model indicates that organic food self-efficacy can mediate the influences of knowledge, attitude, and subjective norm on OFPI (John et al., 2017; Limbu et al., 2019).

Along this line, the extant literature has also revealed the mediating impact of behavioral skill on the relationships among the IMB exogenous constructs (information and motivation) on consumer behavioral intentions in several areas, including diet and exercise behaviors (Osborn et al., 2010), fruit and vegetable consumption (Fleary et al., 2020), food label use (Limbu et al., 2019), dietary supplement usage (Limbu et al., 2020), and green or sustainable cosmetics (Limbu et al., 2022). Limbu et al. (2022) demonstrated that consumer’s self-efficacy mediated the effects of consumers’ knowledge about green cosmetics and motivations (attitude toward purchasing green cosmetics and subjective norms) and green cosmetics purchase intention. Therefore, in line with the IMB model and the aforementioned literature, we proposed the following hypotheses.



**H1:** *Self-efficacy mediates the relationship between organic food knowledge and organic food purchase intention, indicating that knowledge positively predicts self-efficacy, which in turn positively predicts purchase intention.*

**H2a:** *Self-efficacy mediates the relationship between attitude toward organic food purchase and organic food purchase intention, indicating that attitude positively predicts self-efficacy, which in turn positively predicts purchase intention.*

**H2b:** *Self-efficacy mediates the relationship between subjective norm and organic food purchase intention, indicating that subjective norm positively predicts self-efficacy, which in turn positively predicts purchase intention.*

### 3.2. Gender as a moderator

Extant literature has highlighted the roles of consumer demographics in organic food consumption (Hughner et al., 2007; Dettmann and Dimitri, 2009; Katt and Meixner, 2020; Xie et al., 2015; Zepeda and Deal, 2009). Prior research has shown that males and females differ with respect to organic food knowledge, attitudes, and behaviors (Gundala et al., 2022); compared to men, women are more aware about organic food (Fatha et al., 2023) and have better preferences towards consuming organic food (Napolitano et al., 2010). Females are often positively associated with stronger purchase intention and higher willingness to pay for organic food as they are more health conscious (Diamantopoulos et al., 2003; Hemmerling et al., 2015; Oroian et al., 2017). Chen et al. (2014) revealed that gender moderated the relationship between attitudes and OFPI. Moreover, Gundala et al. (2022) found that compared to males, female consumers' attitudes toward organic food had a stronger impact on OFPI. This may suggest that the indirect effects of information and motivation on OFPI through self-efficacy may vary by gender. Therefore, we proposed the following set of hypotheses regarding the conditional indirect effects.

**H3:** *Gender moderates the mediation effect of self-efficacy between organic food knowledge and organic food purchase intention.*

**H4a:** *Gender moderates the mediation effect of self-efficacy between attitude toward organic food purchase and organic food purchase intention.*

**H4b:** *Gender moderates the mediation effect of self-efficacy between subjective norm and organic food purchase intention.*

### 3.3. Education as a moderator

Similar to gender, education is another demographic variable commonly studied in organic food purchase behavior. The extant literature suggests that education is often positively associated with OFPI (Katt and Meixner, 2020; Rana and Paul, 2017, 2020). Consumers with high levels of education are more likely to purchase organic food (O'Donovan and McCarthy, 2002; Dettmann and Dimitri, 2009). Thus, we examine whether the relative impacts of knowledge, attitude, and subjective norm on OFPI will be different among individuals with different levels of educational attainment. Therefore, we proposed the following hypotheses.

**H5:** *Education moderates the mediation effect of self-efficacy between organic food knowledge and organic food purchase intention.*

**H6a:** *Education moderates the mediation effect of self-efficacy between attitude toward organic food purchase and organic food purchase intention.*

**H6b:** *Education moderates the mediation effect of self-efficacy between subjective norm and organic food purchase intention.*

## 4. Methodology

### 4.1. Sample and Data Collection Procedures

Data were collected from a convenience sample of adults with at least one chronic disease through a self-administered survey from India. In this study, a chronic disease refers to a condition, such as diabetes, cancer, and heart disease, that lasts a year or more and requires ongoing medical attention and/or limits activities of daily living (Warshaw, 2006). The rationale for choosing participants with chronic diseases is that this population is one of the target markets of the organic food industry, and the sample is ideally suited to the context of this study. People with chronic conditions are health-conscious and motivated to buy organic foods over conventionally grown foods because organic foods are perceived to be safe, nutritious, and healthy (Rana and Paul, 2017; Pino et al., 2012; Singh and Verma, 2017). Moreover, India is the home to the largest number of organic food producers and one of the largest markets for organic food consumption worldwide (Statista, 2023).

The potential participants were contacted using the snowball sampling technique, where the invited participants were requested to refer their contacts. A questionnaire was originally prepared in English, which was translated into Hindi and ensured quality translation and comprehensibility by two bilingual experts. The Hindi version was then translated back into English following Brislin's (1990) back-translation method by a different translator to ensure semantic equivalence of the constructs and compared with the original English version. We repeated the process until the original and back-translated versions agreed. The questionnaires rendered in Hindi were pre-tested on six adults for ambiguity, content, and clarity.

Of the 265 completed questionnaires, five were removed due to incomplete responses. Thus, the final sample consisted of 260 individuals. The average age of the sample was 47.37 years. The majority of the respondents were married (74.2%) and women (56.2%). The participants suffered from various types of chronic conditions, including blood pressure (36.5%), diabetes (25.8%), cholesterol (13.9%), asthma (12.3%), breast cancer (3.9%), thyroid issues (1.2%), and others (6.4%). A little over one-half of the sample (53.5%) had a college degree, and 25.4% of them had completed a high school degree. Over 40% of them had full-time jobs, and 30.4% had part-time jobs.

### 4.2. Measures

To measure organic food knowledge, we adopted seven items from Alba and Hutchinson (1987), Aertsens et al. (2011), and Chang et al. (2014). The items included phrases such as "I am familiar with organic food", "In comparison with an average person, I know a lot about organic food", and "I stay up to date about organic food". The answer options ranged from 1 (strongly disagree) to 5 (strongly agree). The factor loadings ranged from .73 to .82. The scale had good reliability ( $\alpha = .94$ ).

We asked the respondents to indicate their general attitudes towards purchasing organic food on a 5-item Likert scale (ranging from 1 = strongly disagree to 5 = strongly agree). The six-item scale which was adapted from previous studies (Ajzen, 2002; Arvola et al., 2008; Yazdanpanah and Forouzani, 2015). The items included phrases such as "I think that purchasing organic food is a good idea", "I think that purchasing organic food is important", and "I think that purchasing organic food is beneficial". Factor loadings ranged from .65 to .79. The scale had good reliability ( $\alpha = .91$ ).

To measure subjective norm, a four-item measure was adopted from previous studies (Ajzen, 2002; Arvola et al., 2008; Yazdanpanah and Forouzani, 2015) and included items such as "My family thinks that I should buy organic food rather than non-organic food" and "Most people I value would buy organic food rather than non-organic food". The answer options ranged from 1 (strongly disagree) to 5 (strongly agree). The factor loadings ranged from .55 to .74. The scale had good reliability ( $\alpha = .84$ ).

Self-efficacy was measured with a three-item measurement on a 5-point scale (1 being strongly disagree and 5 being strongly agree) that was adopted from previous studies (Ajzen, 2002; Arvola et al., 2008; Yazdanpanah and Forouzani, 2015). This measurement assessed the respondents' perceived confidence in their ability to buy organic food. The items included phrases such as "If I wanted to, I

could buy organic food instead of non-organic food” and “I think it is easy for me to buy organic food”. The factor loadings ranged from .58 to .73, and the reliability of the scale was good ( $\alpha = .79$ ).

To measure the respondents’ organic food purchase intention, we used a four-item measurement adapted from Shaharudin et al. (2010). The items included phrases such as “I am willing to buy organic food products” and “I intend to purchase organic food produce within the next fortnight”. The answer options ranged from 1 (strongly disagree) to 5 (strongly agree). The factor loadings ranged from .54 to .77. The scale had good reliability ( $\alpha = .80$ ).

4.3. Data Analysis

The data were analyzed using Hayes's (2013) PROCESS macro for SPSS. The procedure was found to be useful in testing complex mediation and moderated mediation effects. The procedure provides bootstrapped confidence intervals for the conditional effects. Prior studies (e.g., MacKinnon, 2008; Preacher and Hayes, 2008) have recommended that bootstrapping is an appropriate procedure for testing mediation effects.

5. Results

5.1. Preliminary Analyses

Table 1 presents the descriptive statistics and correlation matrix. Organic food knowledge, attitude toward organic food purchase, and subjective norm were significantly and positively correlated with self-efficacy and purchase intention ( $p < .01$ ).

Table 1. Means, standard deviations, and correlations between study variables.

	N = 260	M	SD	1	2	3	4	5	6	7
1.	Knowledge	3.228	1.081	1	.692**	.674**	.643*	.603**	-.322**	.236**
2.	Attitude	3.633	.912	.692**	1	.614**	.637**	.666**	-.358**	.372**
3.	Subjective norms	3.541	.927	.674**	.614**	1	.591**	.571**	-.324**	.309**
4.	Self-efficacy	3.724	.883	.643**	.637**	.591**	1	.610**	-.396	.331**
5.	Purchase Intention	3.609	.919	.603**	.666**	.571**	.610**	1	-.320**	.340**

Note. \*\*  $p < .01$  (two-tailed).

5.3. Hypothesis Testing

5.3.1. Testing Mediation Effects

The hypotheses associated with mediation effects were tested using PROCESS macro with Model 4. Hypothesis 1 predicted that self-efficacy would mediate the relationship between organic food knowledge and purchase intention. The results show that organic food knowledge was significantly and positively related to self-efficacy ( $\beta = .526$ ,  $S.E. = .039$ ,  $t = 13.496$ ,  $p < .001$ ) and purchase intention ( $\beta = .305$ ,  $S.E. = .051$ ,  $t = 5.927$ ,  $p < .001$ ) (see Table 2). In addition, self-efficacy significantly and positively predicted organic food purchase intention ( $\beta = .395$ ,  $S.E. = .063$ ,  $t = 6.258$ ,  $p < .001$ ). As shown in Table 3, the indirect effect of knowledge on purchase intention through self-efficacy was estimated as .207, with a 95% bias-corrected confidence interval at .11 and .30. Thus, the indirect effect was statistically significant, as the bias-corrected confidence interval did not include zero (Preacher and Hayes, 2008). Therefore, Hypothesis 1 is supported, suggesting that organic food knowledge is positively related to self-efficacy, which in turn positively impacts organic food purchase intention. However, given that organic food knowledge remained a significant predictor of purchase intention, the results only reflect partial mediation.



Table 2. Direct effects and interaction effects.

	Self-efficacy		Organic food purchase intention	
	$\beta$	95% CI [BLLCI, BULCI]	<i>B</i>	95% CI [BLLCI, BULCI]
<b>Model 1</b>				
Knowledge	.526*** (.039)	[.45, .60]	.305*** (.051)	[.20, .41]
Self-efficacy	-	-	.395*** (.063)	[.27, .52]
Gender	-	-	-.1155* (.459)	[-2.06, -.25]
Self-efficacy * Gender	-	-	.229* (.116)	[.001, .46]
$R^2 = .471, F(4, 255) = 56.758, p < .001$				
Education	-	-	.477** (.165)	[.15, .80]
Self-efficacy * Education	-	-	-.101* (.047)	[-.19, -.01]
$R^2 = .476, F(4, 255) = 57.947, p < .001$				
<b>Model 2</b>				
Attitude	.617*** (.047)	[.53, .71]	.471*** (.161)	[.36, .58]
Self-efficacy	-	-	.325*** (.06)	[.21, .44]
Gender	-	-	-.236 (.438)	[-1.10, .63]
Self-efficacy * Gender	-	-	.005 (.109)	[-.21, .22]
$R^2 = .512, F(4, 255) = 66.771, p < .001$				
Education	-	-	.234 (.160)	[-.08, .55]
Self-efficacy * Education	-	-	-.049 (.045)	[-.14, .04]
$R^2 = .5086, F(4, 255) = 65.977, p < .001$				
<b>Model 3</b>				
Subjective norm	.563*** (.048)	[.47, .66]	.321*** (.322)	[.21, .43]
Self-efficacy	-	-	.436*** (.060)	[.32, .55]
Gender	-	-	-.766 (.458)	[-1.67, .14]
Self-efficacy * Gender	-	-	.129 (.115)	[-.10, .36]
$R^2 = .458, F(4, 255) = 53.852, p < .001$				
Education	-	-	.381* (.167)	[.05, .71]
Self-efficacy * Education	-	-	-.081 (.047)	[-.17, .01]
$R^2 = .458, F(4, 255) = 53.946, p < .001$				

\* $p < .05$ , \*\* $p < .01$ , \*\*\*  $p < .001$ ; Numbers in parentheses are standard errors; NS = Not significant; BLLCI = Boot lower level confidence interval; BULCI = Boot upper level confidence interval.

Table 3. Indirect effects (n=260).

Relationship	$\beta$	Boot SE	Boot 95% CI (L-U)	
Knowledge → self-efficacy → purchase intention	.207	.049	.109	.301
Attitude → self-efficacy → purchase intention	.201	.048	.111	.300
Subjective norm → self-efficacy → purchase intention	.245	.047	.147	.333

Hypothesis 2a predicted that self-efficacy would mediate the relationship between attitude toward purchasing organic food and organic food purchase intention. The results show that attitude was significantly and positively related to self-efficacy ( $\beta = .617$ ,  $S.E. = .047$ ,  $t = 13.27$ ,  $p < .001$ ), and self-efficacy had a strong direct effect on purchase intention ( $\beta = .325$ ,  $S.E. = .06$ ,  $t = 5.47$ ,  $p < .001$ ). In addition, the indirect effect of attitude through self-efficacy on purchase intention was significant (see Table 3) ( $\beta = .201$  and 95% CI (.111, .300)). This suggests that attitude toward purchasing organic food positively predicts self-efficacy, which in turn positively predicts organic food purchase intention. However, given that attitude remained a significant predictor of purchase intention, the results only reflect partial mediation.

Hypothesis 2b predicted that self-efficacy would mediate the relationship between subjective norm and organic food purchase intention. The results show that subjective norm was significantly and positively related to self-efficacy ( $\beta = .563$ ,  $S.E. = .048$ ,  $t = 11.78$ ,  $p < .001$ ) (see Table 2), and self-efficacy was significantly and positively related to organic food purchase intention ( $\beta = .436$ ,  $S.E. = .06$ ,  $t = 7.227$ ,  $p < .001$ ). As shown in Table 3, the indirect effect of subjective norm on purchase intention through self-efficacy was significant ( $\beta = .245$  and 95% CI (.147, .333)), suggesting that subjective norm positively predicts self-efficacy, which in turn positively predicts organic food purchase intention. Thus, Hypothesis 2b is supported. However, given that subjective norm remained a significant predictor of purchase intention, the results only reflect partial mediation.

5.3.2. Testing Moderated Mediation Effects

Hypothesis 3 predicted that gender would moderate the mediation effect of self-efficacy between organic food knowledge and purchase intention. The bootstrapping method of 5000 resamples using Hayes's (2013) PROCESS macro for SPSS with Model 14 was employed to test the hypothesis. The results show that knowledge was a significant predictor of self-efficacy ( $\beta = .526$ ,  $S.E. = .039$ ,  $t = 13.496$ ,  $p < .001$ ) and purchase intention ( $\beta = .304$ ,  $S.E. = .053$ ,  $t = 5.766$ ,  $p < .001$ ). The results also show that the interaction of self-efficacy and gender ( $\beta = .229$ ,  $S.E. = .116$ ,  $t = 1.975.27$ ,  $p < .05$ ) was a significant predictor of purchase intention (see Table 2). As shown in Table 3, self-efficacy was a significant mediator between knowledge and purchase intention. However, the conditional indirect effect of organic food knowledge on purchase intention via self-efficacy was significant only among females ( $\beta = .21$ ,  $S.E. = .055$ , 95% bias-corrected CI = .10 to .32) (see Table 4). The results suggest that the magnitude of the mediating effect was stronger for females than for males. Therefore, the data provide support for Hypothesis 3.

**Table 4.** Conditional indirect effect of organic food knowledge, attitude toward purchasing organic food, and subjective norm between males and females.

Variable	.Moderator: Gender		B	SE	95% CI [BLLCI, BULCI]
<b>Independent variable: Knowledge</b>	Males	1	.094	.059	[-.02, .21]
<b>Mediator: Self-efficacy</b>	Females	2	.214	.055	[.10, .32]
<b>Dependent variable: Purchase intention</b>					
Independent variable: Attitude	Males	1	.172	.056	[.06, .28]
Mediator: Self-efficacy	Females	2	.175	.063	[.05, .30]
Dependent variable: Purchase intention					
Independent variable: Subjective norm	Males	1	.166	.056	[.05, .27]
Mediator: Self-efficacy	Females	2	.239	.057	[.12, .34]
Dependent variable: Purchase intention					

Hypothesis 4a predicted that gender would moderate the mediation effect of self-efficacy between attitude toward purchasing organic food and organic food purchase intention. The results show that attitude was a significant predictor of self-efficacy ( $\beta = .62$ ,  $S.E. = .047$ ,  $t = 13.27$ ,  $p < .001$ ). However, the interaction of self-efficacy and gender ( $\beta = .005$ ,  $S.E. = .109$ ,  $t = .043$ ,  $p > .05$ ) was not a significant predictor of purchase intention (see Table 2). The magnitude of the mediating effect did not differ across gender lines. Therefore, the data do not provide support for Hypothesis 4a.

Hypothesis 4b predicted that gender would moderate the mediation effect of self-efficacy between subjective norms, and purchase intentions. The results show that subjective norm was a significant predictor of self-efficacy ( $\beta = .563$ ,  $S.E. = .048$ ,  $t = 11.78$ ,  $p < .001$ ). However, the interaction of self-efficacy and gender ( $\beta = .129$ ,  $S.E. = .115$ ,  $t = 1.119$ ,  $p < .05$ ) was not a significant predictor of purchase intention. The results suggest that the magnitude of the mediating effect does not differ across gender lines (see Table 4). Therefore, the data do not provide support for Hypothesis 4b.

Hypothesis 5 predicted that educational attainment would moderate the mediation effect of self-efficacy between organic food knowledge and purchase intention. The bootstrapping method of 5000 resamples using Hayes's (2013) PROCESS macro for SPSS with Model 14 was employed to test the hypothesis. As shown in Table 2 Model 1, the results show that knowledge was a significant predictor of self-efficacy ( $\beta = .526$ ,  $S.E. = .039$ ,  $t = 13.496$ ,  $p < .001$ ) and purchase intention ( $\beta = .477$ ,  $S.E. = .165$ ,  $t = 2.886$ ,  $p < .01$ ). In addition, the interaction of self-efficacy and education was a significant predictor of the purchase intention ( $\beta = -.101$ ,  $S.E. = .047$ ,  $t = -2.167$ ,  $p < .05$ ). The indirect effect test showed that self-efficacy was a significant mediator between knowledge and purchase intention (see Table 3). The conditional indirect effect of organic food knowledge on purchase intention via self-efficacy was significant at low (-1SD:  $\beta = .23$ ,  $S.E. = .053$ , 95% bias-corrected CI = .13 to .37), moderate (mean:  $\beta = .18$ ,  $S.E. = .047$ , 95% bias-corrected CI = .08 to .27), and high levels of education (+1SD:  $\beta = .12$ ,  $S.E. = .055$ , 95% bias-corrected CI = .01 to .23) (see Table 5). Overall, the results of Model 4 (mediation) were successfully replicated in the moderated mediation analysis. Specifically, the results suggest that the magnitude of the mediating effect was stronger among individuals with a lower level of education than a higher level of education. Therefore, the data provide support for Hypothesis 5.

Hypothesis 6a predicted that education would moderate the mediation effect of self-efficacy between attitude toward purchasing organic food and organic food purchase intention. While attitude was a significant predictor of self-efficacy ( $\beta = .62$ ,  $S.E. = .047$ ,  $t = 13.27$ ,  $p < .001$ ), the interaction of self-efficacy and education ( $\beta = -.049$ ,  $S.E. = .045$ ,  $t = -1.082$ ,  $p > .05$ ) was not a significant predictor of purchase intention. The magnitude of the mediating effect did not differ across different levels of education. Therefore, the data do not provide support for Hypothesis 6a.

Hypothesis 6b predicted that education would moderate the mediation effect of self-efficacy between subjective norms, and purchase intentions. The results show that subjective norms were a significant predictor of self-efficacy ( $\beta = .563$ ,  $S.E. = .048$ ,  $t = 11.78$ ,  $p < .001$ ). However, the interaction of self-efficacy and education ( $\beta = -.081$ ,  $S.E. = .047$ ,  $t = -1.717$ ,  $p > .05$ ) was not a significant predictor of purchase intention. The results suggest that the magnitude of the mediating effect did not differ

across different levels of educational attainment. Therefore, the data do not provide support for hypothesis 6b.

**Table 5.** Conditional indirect effect of organic food knowledge, attitude toward purchasing organic food, and subjective norm at different levels of education.

Variables	Moderator: Education		B	SE	95% CI [BLLCI, BULCI]
<b>Independent variable: Knowledge</b>	Mean -1 SD	3.20	.230	.053	[.13, .37]
<b>Mediator: Self-efficacy</b>	Mean	4.23	.175	.047	[.08, .27]
<b>Dependent variable: Purchase intention</b>	Mean +1 SD	5.25	.121	.055	[.01, .23]
Independent variable: Attitude	Mean -1 SD	3.20	.224	.058	[.11, .34]
Mediator: Self-efficacy	Mean	4.23	.193	.047	[.10, .29]
Dependent variable: Purchase intention	Mean +1 SD	5.25	.163	.052	[.06, .26]
Independent variable: Subjective norm	Mean -1 SD	3.20	.273	.055	[.16, .38]
Mediator: Self-efficacy	Mean	4.23	.226	.042	[.14, .31]
Dependent variable: Purchase intention	Mean +1 SD	5.25	.179	.051	[.08, .28]

6. Discussion

6.1. Theoretical contributions

Although multiple factors, including social demographics, nutritional and health information, and subject norm, have been found to be associated with organic food purchase (Eyinade *et al.*, 2021), few studies have investigated multiple factors together in an integrated framework. The present research contributes to the IMB model (Fisher and Fisher, 1992) by assessing the predictive utility of the theory in the organic food setting from a social marketing perspective. We integrated the informational and motivational components of the IMB model with people's self-efficacy and behavioral intentions with regard to purchasing organic food. In particular, we tested the role of self-efficacy underlying the relationships between organic food purchase intention and organic food knowledge (i.e., an informational component), attitude toward organic food purchase (i.e., a personal motivational component), and subjective norms (i.e., a social motivational component). Additionally, we tested an extended IMB model in which gender and education attainment were posited to moderate the proposed mediated relationships. Overall, our results provide strong support for the pathways identified in the IMB model and the extended IMB model in the field of organic food buying for adults with chronic conditions.

First, our findings stress the importance of self-efficacy in the organic food consumption setting. Beyond the significantly direct effects of organic food knowledge, attitude toward organic food purchase, and subjective norm on an individual's organic food purchase intention, we found that one's self-efficacy significantly mediates all three pairs of relationships. These findings suggest that both the effects of informational and motivational components on one's behavioral acts are partially carried through one's self-efficacy appraisal processes. Second, the aforementioned mediation effects of self-efficacy were further moderated by social demographics, but the moderated mediation effect varied across the different pairs of relationships. Specifically, we found support for the significant moderating role of gender on the mediating effect of self-efficacy from organic food knowledge to organic food purchase intention, but we did not find a significant impact of gender on the mediation effects for the variables of attitude toward organic food purchase and subjective norm. Further, the results suggest a significant moderating role of educational attainment in mediating the impact of organic food knowledge on purchase intention, but not for the effects of motivational variables on purchase intention. Overall, these findings suggest that gender and educational attainment moderate the influence of information on behavioral intentions but not the motivational components of the IMB model.

## 6.2. Practical and social implications

Our research findings provide valuable insights and implications for food marketers, social marketers, and other stakeholders. Overall, our results evidence the practicability of applying the IMB model in predicting organic food purchase intention, indicating that the IMB model can be used as a framework for the development of educational interventions promoting organic food among individuals with chronic diseases. Our study also provides a more robust understanding of how the informational and motivational components of the IMB model contribute to organic food purchase intentions with self-efficacy's presence. Broadly speaking, organic food marketers targeting patients with chronic conditions should focus not only on providing information about organic food and enhancing their personal and social motivations to use organic food but also on enhancing their confidence in buying organic food.

Specifically, first, the present study reaffirms the importance of both informational and motivational components of consumers in influencing organic food purchases. With self-efficacy and other social demographic variables introduced, we still found significant direct effects of organic food knowledge, attitude toward organic food purchase, and subjective norm on OFPI, respectively. Among the three factors, knowledge of organic food and subjective norms play an important role in influencing organic food purchase intentions, while attitudes toward organic food purchase appear to have a relatively higher predicting power (e.g., about 55% higher). These results indicate that organic food marketers may consider placing their emphasis more on patients' attitudes toward purchasing organic food when developing educational interventions. For example, policymakers and organic food marketers can use both traditional and digital media to promote the benefits of organic food to achieve a better perception of organic food.

Second, our research findings highlight the importance of self-efficacy in promoting organic food purchases. Self-efficacy is a vital self-appraisal process that focuses on the assessments of one's own capabilities to control his/her behavioral acts. Many existing studies have suggested that self-efficacy is positively related to an individual's overall well-being (Tamannaefar and Motaghedifard, 2014). Across the three studied pairs of relationships, self-efficacy mediates these relationships, indicating a critical role as a potential educational intervention in promoting organic food purchases. In other words, patients' understanding and perceptions of how organic food improves their health outcome influence their confidence in organic food consumption and further drives their organic food purchase behavior. These findings suggest that policymakers and organic food marketers may reach a better organic food promotion outcome through educational interventions, such as training and workshops on the understanding of organic food's working mechanism for improving personal health. Although we found significant partial mediation effects for all three sets of relationships, the magnitude of the mediation effects varied. Specifically, the results show close values of the mediation effect for organic food knowledge and attitude toward organic food purchases but suggest a higher magnitude of the mediation effect for subjective norm. Therefore, to improve one's self-efficacy and in turn enhance the organic food promotion outcome, for example, the targeted educational materials may consider incorporating and reflecting the focal patients' family and friends' value system, utilizing these social influences to encourage more positive responses from the focal consumer.

Additionally, our research has also revealed important implications of gender and educational attainment. In testing the relationships, we found that both gender and educational attainment significantly moderated the mediation effect of organic food knowledge on OFPI but not for the variables of attitude toward organic food purchase and subjective norm. Specifically, females exhibited a stronger magnitude of the mediating effect than males, and a lower level of educational attainment showed a stronger mediating effect than a higher level of education. These findings provide organic food marketers with more precise information in operating marketing segmentation. For example, gender disparities and educational differences should be given full consideration in educating patients about organic food information and its benefits. However, when focusing on the improvement in attitude toward organic food purchase and how to utilize social influence from the focal patient's social circle, gender disparities and educational differences may not matter that much. In such cases, gender and education segmentation may not be necessary.



### 6.3. Limitations and future research

There are a few limitations of this study that call for more future research on this topic. First, this study is essentially a cross-sectional design. We can only conclude the association of the studied variables, not the causality. Therefore, future studies may consider other study designs, such as a field experiment to examine the hypothesized relationships. Second, although our participants represent an understudied population, we recruited the participants from one developing country (i.e., India). The generalizability may be applicable to other developing countries with similar economic and social situations but the results cannot be generalized to developed countries. We call for future researchers to investigate these relationships in relatively more advanced nations. Third, the selected population in this study was a unique group. All participants reported at least one chronic disease. Therefore, the findings may need to be carefully interpreted to apply to general consumers. The replication of this study in those who do not suffer from chronic diseases warrants future research.

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