



Article

What Determines the Purchase Intention of Liquid Milk during a Food Security Crisis? The Role of Perceived Trust, Knowledge, and Risk

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Abstract: Until today, inadequate food supply, malnutrition, food adulteration, etc., are still the key concern in developing economies. In order to address these issues of food security crisis, and to stimulate a sustainable supply of liquid milk (LM), a consumer behavior model was created, in which consumers' perceived knowledge, trust and risk were the major catalysts. To shed light on this context, the study examined the effect of consumers' perceived knowledge (PK) on their perceived risk (PR) and trust (in information sources and in the product). Further, the influence of consumers' perceived knowledge, risk, and trust on their attitude and purchase intention (PI) were investigated via an exclusive survey design. The survey was conducted in the urban area of Dhaka and Chittagong, Bangladesh. The sample of 712 households was selected randomly and interviewed using a structured questionnaire. The data were analyzed employing descriptive statistics, exploratory factor analysis, confirmatory factor analysis, and structural equation modelling. The results show that during a food security crisis, consumers' perceived knowledge amplifies their perceived risk and their trust in information sources (ISs). During such a period, their perceived knowledge does not induce purchase intention but trust in ISs does. Again, consumers' perceived risk leads to reduced trust in products, and hence in LM, but not reduced trust in ISs. Moreover, a paradoxical influence was found, where consumers' perceived risks had no significant effect on the PI, meaning that they underestimate the risk of purchasing LM. The results also show that when explaining the purchase intention of LM, the effect of 'trust in ISs' was higher than that of their perceived 'trust in the product (LM)' and perceived knowledge.

Keywords: knowledge; trust; risk; liquid milk; purchase intention; emerging market; security crisis; Bangladesh

1. Introduction

After meat and meat products, milk, cheese, and others of dairy products are ranked highest in terms of affecting the environment negatively [1], creating ecologically unsustainable consumption [2]. Research corroborates that, in addition to requiring a heavy input of energy, water and other natural resources, milk and milk products contribute roughly one seventh of the total environmental degradation in the form of acidification, eutrophication, smog and climate downsizing, etc., caused by rapid industrialization [1]. This unsustainability of current schemes stems from the industrialization and globalization of agro-farming and food processing, the heavy dependency on processed products, and the lack of food security, etc. [3] In this context of unsustainability, food security is considered a key issue for environmental degradation (e.g., greenhouse gas emissions) and for achieving sustainable

food consumption. Therefore, food security issues such as food scarcity, safety and food insecurity, which lead to underconsumption in developing regions, need to be confronted urgently [3].

In the Asia-Pacific region, the market for nutraceutical products is expanding at the soaring rate of 16 percent per year [4]. As an emerging market in this region, Bangladesh is expected to face increasing demand for healthy foods in the future. Evidence suggests that keeping pace with the disposable income of consumers [5] and the increased urbanization in this region [6], the demand for functional foods is also increasing [7]. Study also suggests that of all the functional foods, globally, people consume milk the most and milk is the highest marketed processed dairy food product [8]. However, in Bangladeshi 13 L of milk per capita is available per year [9]; as an individual should consume at least 250 mL of milk per day, this indicates a food scarcity [10]. In addition, regrettably, this scarce amount is not safe to drink, meaning that there is a severe food security crisis. Studies reveal that in Bangladesh almost all of milk samples (both raw and processed) are adulterated with either 'water or cane sugar', 'powdered milk', 'starch', 'formalin' or 'sodium bicarbonate' [11], and are highly contaminated with fecal organisms [12]. This unsustainable food condition provides a two-fold challenge to the Bangladeshi dairy sector: firstly, matching the rapidly changing demand for food for a larger and more affluent population with its scarce supply; and secondly, doing so in a way that is environmentally and socially sustainable [13,14]. The literature reports that the study of consumer behavior is vital in guiding the direction of product design and policy measures aimed at stimulating sustainable behavior [14].

After assessing the food security crisis, perceiving the knowledge regarding the quality and other aspects of the product is currently considered vital to stakeholders and policymakers [15]. Evidently, consumers' perceived knowledge about the process and product when purchasing LM contributes to explaining consumer behavior [16,17]. Trust under certainty is comparable to knowledge, and consumers choose products with the help of this knowledge [18]. Therefore, consumers' acquired knowledge and perceived value help to determine the factors underlying their intent to purchase [19]. Additionally, it is evident that consumers' perceived risk is associated with their level of trust, and trust is a vital concept in the area of food security and safety [20]. Therefore, considering a developing country in a security crisis, an urge from the demand side is crucial to assessing consumers' perceived knowledge and risk along with analyzing the effects of perceived knowledge and risk in building trust regarding the purchase intention of LM.

The milk consumption rate has been increasing fast in Asia [21], where 46 percent of the total milk is consumed in liquid form [22]. As an emerging market in Asia, Bangladesh is also experiencing a smooth upward trend in the consumption of LM [23]. Regrettably, the LM available in this country (pasteurized and ultra high temperature (UHT)) is somewhat contaminated; consumers are therefore confused and they have few poise to trust that this available LM is safe and secure to consume. However, among worse alternatives, consumers prefer raw LM to commercially processed LM [7]. Furthermore, consumers in general perceive dairy milk to be a functional food, to be of quality and safe, and therefore do not pay special attention to food safety until a hazard appears [15]. However, consumers trust food producers with regard to food quality and safety, since when purchasing milk it is impossible to evaluate the attributes of LM through their normal judgment. Evidence corroborates that the milk scandal [24,25] in Bangladesh and consumers' low perceived value of the milk and milk products [7] have made them unhappy and, in most cases, caused them to be more conscious about the security and quality of milk. A study reports that consumers perceived knowledge regarding LM are linked inversely with their perceived risk when the evaluation of the perceived risk hazard through moral judgement and discretion is difficult for consumers [26]. The literature lacks information on how the interaction between consumers' perceived knowledge and their perceived risk influence their trust in information sources and in products simultaneously with regard to the purchase intention of LM via attitudinal behavior. Thus, the study aims to fill in this knowledge gap.

Being a functional food, dairy milk has a positive influence on the cognitive behavior of a human, as it is enriched with vitamin D [27]. Given its nutritional value, consumers perceive the

ensuing need to consume LM, propelling the suppliers in the food chain to provide quality and safe milk [28]. Numerous studies suggest that an individual should have a good regular intake of milk in order to reach their genetic potential [29,30]. Furthermore, among other dairy products, milk is considered to be the key functional dairy product for sale [31]. Therefore, it is an interesting behavior analysis to find the extent to which consumers know about LM, and how this perceived knowledge is linked to their perceived risk hazard and trust, and how their perceived risk is associated with their trust of LM. Furthermore, no evidence exists showing how various factors including trust, risk and perceived knowledge influence consumer attitudes and, in turn, the intention to purchase LM. In addition, Shamsuddoha and Edward [32] found that in Bangladesh the dairy sector has not focused on developing the present policies and issues in terms of information and research. Since little is known, the related problems and knowledge gap motivated us to carry out this study. Thus, the objective of the research was to provide information on the relevant issues and to help design sustainable dairy policy by investigating the influence of consumers' perceived knowledge on their perceived risk hazard and trust towards LM, their perceived risk of the trust, and together the effect of knowledge, trust, and risk on their attitude and purchase intention. In doing so, a survey design was used in which participants who were found to be consumers and buyer were asked to fill in a questionnaire including questions about their perceptions of LM attributes. Exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and structural equation modelling (SEM) were the main research methods employed.

The structure of the paper is as follows. The introduction section contains the literature review, development of the hypotheses and the conceptual model, followed by the section on the research methods. Sections three and four contain research results and discussion, respectively. Section five discusses the conclusions, managerial implications and directions for future research.

1.1. Literature Review and Hypotheses Development

Trust is considered a crucial component in predicting the attitudes of consumers and future behavior [33,34]. Trust is also believed to have a significant, positive impact on both the attitude and purchase intention of milk. Additionally, there are a number of researchers investigating the role of trust in the context of risk and food safety issues. When it comes to milk that serves as a functional food, the ever-increasing incidence of the milk adulteration phenomenon coupled with inadequate supply increases the concerns regarding food security as well safety among consumers. As suggested by Grunert [35], when the food insecurity issue stretches throughout society, society is more likely to be exposed to potential hazards and the risk will expand exponentially; this is known as the social amplification of risk. Accordingly, findings of Chanda et al. [11] that almost all of the milk samples tested were adulterated with additives necessitates the conclusion that consumers of Bangladesh have been exposed to hazards. The risk perception of the consumer is dependent on various sources of information ranging from official sources to the personal experiences of friends and family [36]. Consequently, trust can also be shaped by such information sources [20,37].

The interaction between risk and trust is widely acknowledged. For instance, the knowledge which is gained from a source perceived to be more credible to consumers, builds implicit trust [38,39]. Again, the consumers' risk perception and purchase intention can be influenced by the degree of trust that the consumers have in the source of information [40]. Thus, considering the above context, the study focuses on the role of trust, perceived knowledge and risk on consumer attitudes towards LM and on consumers' intent to purchase LM. In doing so, this study develops a conceptual framework using Structural Equation Model (Figure 1).

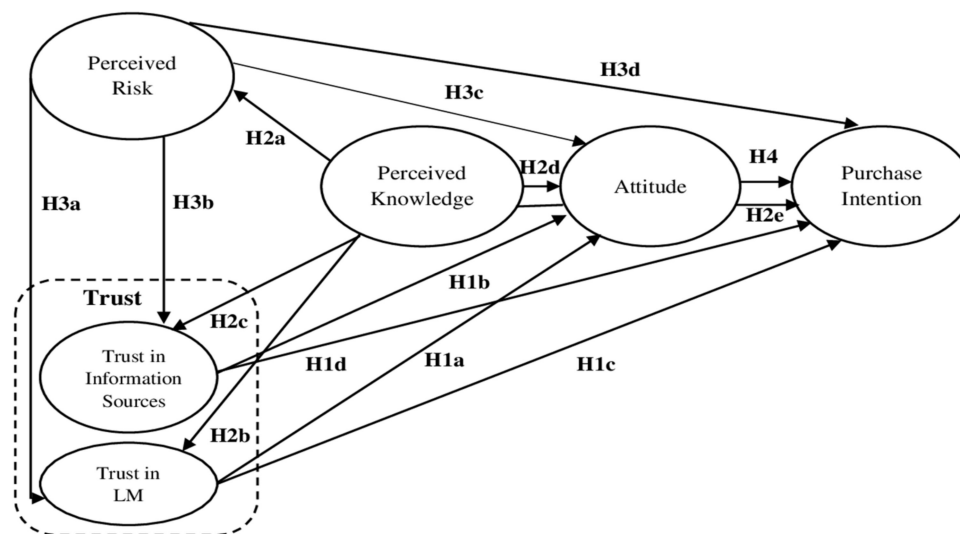


Figure 1. Conceptual Model.

1.1.1. Trust

Trust, which is based on an individual's past experiences, is a combination of a "cognitive process" and "affective influences" [20]. Notably, in many disciplines, including psychology [41], economics [42], social science [43], philosophy [44] and marketing [45,46], trust has been studied extensively. Many scholars define trust from various perspective and trust is a multidimensional construct and therefore cannot be forecast by any single item [47,48].

Studies [49,50] suggest that the information provided by the food supply chain is crucial in determining consumer's perceived risk of the given channel because generally a consumer finds it difficult to assess the related risk hazard when buying foods. Not surprisingly, in an emerging economy like Bangladesh, when consumers buy LM they are exposed to potential risks and hazards. This phenomenon is more concretely illustrated in a recent finding by the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR, B), an international health research organization located in Dhaka, Bangladesh, that more than 75% of all pasteurized milk available on the local market is unsafe for direct consumption [51]. Unfortunately, for general consumers, assessing the risk associated with food is difficult through their normal judgement and discretion, and for this reason a consumer has often to rely on various information sources such as the media, institutions or vendors, etc. Chen and Li [27] define this phenomenon as 'social trust', which suggests the extent to which people rely on experts and institutions when risks proliferate in society and also how the issue should be handled.

Several sources of information for measuring trust are suggested by Lobb [52], such as (a) word-of-mouth; (b) advertising and news; (c) point-of-sale (POS); (d) labels on the product; (e) diet and health guidelines from nutritionists, political parties, and other community actors; and (f) the media. In reference to the previous studies [41,53–56], this study measures trust in 'information sources (ISs)' as well as trust in the 'product itself', hereafter called trust in 'LM'.

Again, trust is a common mechanism that, by lifting the anticipation of a favorable outcome and by reducing the perceived uncertainty regarding the unanticipated behavior of the trustee, helps reduce the perceived risk [57]. However, past behavior may not ensure that the outcome expected from a service provider will be matched. However, trust will be strengthened if the supplier previously behaved according to the expectation [58]. Moreover, the existing literature on food consumption confirms that trust predicts customer attitudes and future behavior effectively [59,60]. Hence, it is projected that trust will signify the consumers' attitudes and purchase intentions for LM. Thus, to investigate the association of trust with attitude and purchasing intention, the following hypotheses were formulated:

Hypothesis 1a (H1a). *Trust in LM will positively affect the attitude towards LM.*

Hypothesis 1b (H1b). *Trust in information sources will positively affect the attitude towards LM.*

Hypothesis 1c (H1c). *Trust in LM will positively affect the purchase intention of LM.*

Hypothesis 1d (H1d). *Trust in information sources will positively affect the purchase intention of LM.*

1.1.2. Perceived Knowledge

The literature on consumer behavior reports two components of knowledge, namely objective knowledge and subjective knowledge [16]. Objective knowledge is the exact and accurate information that an individual bears. On the other hand, subjective knowledge refers to an individual's perception regarding certain attributes and products. The more knowledge consumers perceive about a product, the less risk they are exposed to [27]. Based on these findings, the following hypotheses were drawn:

Hypothesis 2a (H2a). *Consumer knowledge will negatively affect their perception of the risks of LM.*

Doney et al. [61] suggested that trust is influenced by the knowledge by allowing the subject to predict the behavior of others. Moreover, studies report that knowledge is a driving factor in building 'trust' and found a significant relationship between knowledge and trust [62,63]. However, in the literature on LM, this relationship is yet to be investigated. Therefore, the following hypotheses were posited:

Hypothesis 2b (H2b). *Consumers' perceived knowledge will positively affect their trust in the product and hence in LM.*

Hypothesis 2c (H2c). *Consumers' perceived knowledge will positively affect their trust in information sources regarding LM.*

When buying, consumers evaluate the product or services with their discreet judgment, which considers their knowledge regarding that particular choice [17]. For instance, in the case of purchasing milk, consumers may consider the process of collection and the mechanisms of the retail food chain that are required to collect, handle and process the raw milk. Since negative perceptions of the food handling process may negatively influence consumer choices, knowledge of the process and procedure that LM goes through was considered in the study to test whether perceived knowledge had any significant impact on the food consumption decision [17]. Consequently, this study takes into account two aspect of subjective judgment: product knowledge and procedural knowledge. Product knowledge covers the knowledge regarding the sources of collection (raw/processed, etc.), quality, taste, nutritional value, preservation status, etc. [64], while procedural knowledge entails the knowledge about the process by which LM is prepared for consumption as a final product [65]. The literature reports that the final consumption and expertise is highly correlated with consumer knowledge [66,67]. Considering the discussion, the following hypotheses were proposed:

Hypothesis 2d (H2d). *Consumers' perceived knowledge will positively affect their attitude towards LM.*

Hypothesis 2e (H2e). *Consumers' perceived knowledge will positively affect their purchase intention of LM.*

1.1.3. Perceived Risk

The risk perception with regard to a food can strongly influence a consumer's attitude [37] and purchasing behavior [16,67–69]. This risk perception depends on various sources of information ranging from official sources to the personal experiences of friends and family [37]. For instance,

learning about the food safety in an article from a trustworthy source is likely to alter one's level of the information due to his/her level of trust in that particular source. Alternatively, the degree of trust held by an institution such as the producer, supplier, and regulator can drive the consumer's risk perception and influence the purchase intention [41]. Based on the above discussion, the following hypotheses were formulated:

Hypothesis 3a (H3a). *Consumers' perceived risk will negatively affect the trust in LM.*

Hypothesis 3b (H3b). *Consumers' perceived risk will negatively affect the trust in information sources regarding LM.*

Hypothesis 3c (H3c). *Consumers' perceived risk will negatively affect the attitude towards LM.*

Hypothesis 3d (H3d). *Consumers' perceived risk will negatively affect the purchase intention of LM.*

1.1.4. Attitude and Purchase Intention

An individual's response to a particular idea or object, predisposed by an organization of belief, can be defined as attitude [70]. According to Kraus [71], attitude is a durable, pertinent and insoluble psychological construct vital to create a synopsis of any item, event or behavior. Furthermore, a consumers' purchase intention is greatly affected by the attitude towards that particular behavior [72]. For instance, the greater the motivation, the stronger the intention to act. Research corroborates that organic buyers find personal health, well-being, and in a broader context the benefits to the environment to be a strong motivation when purchasing green products and that their purchase intention is largely defined through their perceived attitudes. Another study by Brewer [73], however, suggested that when food safety concerns loom among the consumers, they may not necessarily perceive a strong impulse of taking action to increase their food safety. Furthermore, consumers' attitude towards LM is highly and positively associated with their purchase intention [74]. Therefore, the following hypothesis was posited:

Hypothesis 4 (H4). *Consumers' attitude will positively affect the purchase intention of LM.*

2. Research Methods

2.1. Participants and Procedure

The survey in this study was conducted in two major cities of Bangladesh: Dhaka and Chittagong. Dhaka is the capital city of Bangladesh and Chittagong is the business hub and chief port city of the country. In order to collect primary data, a structured questionnaire was presented in the 712 sampled households who were selected randomly by applying a multi-staged sampling method in the selected urban areas of Dhaka and Chittagong. Secondary data were collected from various sources including referred scientific journals, newspapers, working papers, reports related to food, etc. By the term 'household' we mean those who make purchasing decisions and regulate the other member's meals in the family [75]. Of the 725 respondents interviewed (see Table 1), after excluding incomplete responses, we retained the responses of 362 respondents from Dhaka and 350 respondents from Chittagong. An in-person survey was carried out whereby the respondent, older than the age of 20 and a buyer of milk, was presented with a questionnaire and was asked to fill it in through a direct interview. The cover letter of the questionnaire contained the objective of the study. A set of closed questions were included in the questionnaire in which all questions were scaled on the Likert five-point scale, from 'Strongly disagree' to 'Strongly agree'. The interview took 20 min (approximately) per respondent. The fieldwork was carried out from 1 April 2018 to 2 July 2018. However, a pretest survey was conducted on ten subjects in the same cities in order to ensure that questions were intelligible to the respondents and to ensure that no semantic and measurement problems existed.

A sample size of 150 observations is ideal for a reliable exploratory factor analysis (EFA) [76], and a minimum of 100 samples is recommended for confirmatory factor analysis (CFA) [77]. In another study, Sekeran [78] recommended that an appropriate sample size is between 30 and 500. Hence, with 712 responses, the current study satisfies the minimum requirements. Descriptive analysis, EFA, CFA and SEM were the main statistical tools deployed in this study for the analysis of the data. EFA was used to form the pattern matrix and to determine the optimum number of dimensions and their mutual interrelation based on responses to particular items [79]. Subsequently, based on the pattern matrix of EFA, CFA was used to justify the fitness of our model. Finally, SEM was used to measure the cause-and-effect relationship between the factors.

Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity (BTS) were conducted to verify the factorability of data [80]. The recommended threshold value for KMO is at least 0.60 and BTS must be significant at $p < 0.1$ [81]. The results for both of the tests were found to meet the minimum requirements (see Table 2). Subsequently, EFA was applied to the standardized data for each construct. The measurement model explained 55.66% of the total variance (see Table 3). Table Cronbach's alpha for each construct was calculated in order to validate the reliability and internal consistency of the data (see Table 3). In addition, a composite reliability test was also conducted (see Table 3). The discriminant validity test was conducted using the correlation among the constructs and comparing them with the corresponding Average Variance Extracted (AVE) (see Tables 3 and 4) to ensure the uniqueness of the constructs and to ensure zero multicollinearity in the data set. Finally, the face validity was verified to confirm that the usability of the constructs was achieved.

Table 1. Demographic profile of the respondents.

Categories	Sub-Categories	Frequency	Valid	Mean	SD
Gender (M = 1, F = 2)	Male	449	712	1.37	0.483
	Female	263			
Age (coded as 1 = 'Between 20 and 29', ... 6 = 'Above 70')	Between 20–29	270	712	2.35	1.292
	Between 30–39	117			
	Between 40–49	171			
	Between 50–59	119			
	Between 60–70	29			
	Above 70	6			
Income (1 = '<30,000', ... 5 = 'above 90,000') in BDT *	<30,000	372	712	1.80	1.061
	30,000–50,000	193			
	50,000–70,000	86			
	70,000–90,000	36			
	Above 90,000	25			
Children (under age of 16) (1 = Yes, 2 = No)	Yes	451	712	1.37	0.482
	No	261			
Education (1 = '0–5' ... 3 = '>12')	0–5	89	712	2.56	0.705
	5–12	136			
	12	487			
Family Member (1 = '1–5' ... 3 = 'above 10')	1–5	504	712	5.19	2.318
	6–10	194			
	Above 10	14			
Consumption (1 = 'Several-time/month', ... 5 = 'Several-time/daily')	Several-time/month	270	712	2.32	1.218
	1/month	101			
	Several-times/week	211			
	Daily	105			
	Several/daily	25			
Do you do most of the food shopping for your family? (1 = 'Yes', 2 = 'No')	Yes	503	712	1.29	0.705
	No	209			
I bought milk (at least one time) in the last 4 weeks. (1 = Yes, 2 = No)	Yes	586	712	1.18	0.382
	No	126			

Table 1. Cont.

Categories	Sub-Categories	Frequency	Valid	Mean	SD
I buy milk from ... (1 = 'Farm', ... 4 = 'Retail grocery shop')	Farm	103			
	Super market	122	712	3.08	1.133
	Farm's Agent	105			
	Retail Grocery Shop	382			
I read labelling on LM while purchasing. (1 = 'Yes', 2 = 'No')	Yes	465	712	1.35	0.476
	No	247			
Certification (1 = 'A local authority', ... 6 = 'Not any at all')	A local authority	53			
	A private authority	51			
	A national authority	232	712	3.84	1.450
	An international authority	106			
	All equally	160			
	Not any at all	110			

Note: * USD (US Dollar) 1 = BDT (Bangladeshi Taka) 82 (approximately); M = Male; F = Female; SD = Standard Deviation.

Table 2. Kaiser-Meyer-Olkin (KMO) Test and Bartlett's Test of Sphericity.

KMO and Bartlett's Test		Scores
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.775
Bartlett's Test of Sphericity	Approx. Chi-Square	4391.778
	df	153
	Sig.	0.000

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

Table 3. Measurement model.

Constructs and Items	λ	α	ρ	Eigenvalues	AVE
Purchase Intention		0.85	0.85	4.01	0.65
I want to buy LM next time I buy milk	0.86				0.72
I would like to buy LM next time I buy milk	0.80				0.70
How likely is it that you will buy LM, next time you buy milk	0.75				0.59
Attitude		0.86	0.84	2.53	0.64
My feelings towards taking LM is					
Unfavorable to Favorable	0.86				0.68
Bad to Good	0.76				0.64
Terrible to Great	0.78				0.70
Risk		0.80	0.80	1.89	0.57
If I were to purchase Liquid Milk (LM), I would worry about the product not tasting as good as it should	0.78				0.63
If I were to purchase LM, I would worry about wasting money	0.77				0.55
When I buy LM, I am concerned that it will not be as I expected.	0.72				0.54
Trust in Information Sources		0.73	0.74	1.67	0.49
Television news	0.83				0.70
Television documentary	0.65				0.43
Newspaper	0.59				0.36
Trust in Product		0.70	0.70	1.44	0.44
I trust that LM sold on the market is free from chemical preservatives	0.68				0.48
I trust that LM that I purchase is processed in toxic free environment	0.65				0.42
I trust that LM sold on the market is free from additive substances	0.66				0.49
Perceived Knowledge		0.71	0.71	1.12	0.45
I have in depth knowledge to evaluate LM	0.71				0.52
Compared to an average person, I know a lot about LM	0.67				0.44
Friends consider me an expert in the domain of LM	0.63				0.41
Total variance explained					55.67%

Note: λ —Standardized regression weights; α —Cronbach's alpha; ρ —Composite reliability; AVE—Average variance extracted; LM—Liquid milk.

Table 4. Descriptive statistics and correlations among the constructs.

Items	Mean	SD	Purchase Intention	Attitude	Perceived Risk	Trust in Information Sources	Trust in Product	Perceived Knowledge
Purchase Intention *	3.76	0.93	(0.65)	0.335	0.005	0.076	0.008	0.016
Attitude *	3.46	0.83	0.579	(0.64)	0.000	0.104	0.008	0.006
Perceived Risk *	3.81	0.56	0.069	0.013	(0.57)	0.000	0.089	0.006
Trust in Info. Sources *	3.21	0.84	0.275	0.323	0.017	(0.49)	0.026	0.024
Trust in Product *	2.34	0.76	0.055	0.092	−0.298	0.162	(0.44)	0.063
Perceived Knowledge *	3.22	0.80	0.197	0.127	0.075	0.154	0.063	(0.45)

Note: * measured on a Likert 5-point scale. The diagonal values in the parentheses represents AVE. The lower diagonal values represent the correlation among the constructs, whereas the upper diagonal values represent the squared correlation among the constructs.

2.2. Questionnaire and Measures

The questionnaire was divided into three sections. Section one consisted of questions regarding the measurement of perceived knowledge, perceived risk, and trust. Six questions were asked to measure perceived knowledge, six questions for risk, seventeen questions for measuring trust in information sources, and three questions for trust in LM. Section two included two parts: attitude and purchase intention. In the attitude part, six questions measured the attitude, whereas the purchase intention section consisted of five questions. The questionnaire concluded with section three, wherein the respondent's demographic information including age, gender, income, children, family member, education, profession, shopping, consumption, buying behavior, buying source, food labels, and the question regarding trusted authorities were recorded (see Section 3.1).

The perceived knowledge scale was constructed with the subjective judgement of respondents by using a Likert five-point scale: I have in depth knowledge to evaluate the quality of LM [82], Compared to an average person, I know a lot about LM [65], My friends consider me an expert in the domain of LM [65], I have heard of most of the liquid milk processing methods that are around [82], If I had to purchase LM today, I would need to gather very little information in order to make a wise decision [65]. In the final test of EFA, three questions were selected with good factor loading (see Table 3)

The trust scale was constructed with two categories: trust in information sources and trust in LM. To measure the trust in information sources, the following seventeen sources were selected, namely shopkeepers, supermarkets, friends and colleagues, organic shops, farmers/breeders, processors, doctor/health authority, government, political group, television documentary, television news, television advertisements, newspapers, internet, product labels, and supermarket leaflets; these items were adapted from Mazzocchi et al. [56]. As marketers have been employing social media (Facebook) as a significant source of information, we also added this particular source as a new component under this construct. On the other hand, to evaluate the trust in LM, the items constituting the measurement scale were adapted from the study by Jalal [83] and those items were trusting that the liquid milk (LM) sold in the market is free from chemical preservatives (e.g., formalin), trusting that LM purchased is processed in a toxic-free environment (e.g., bacteria), trusting that LM sold in the market is free from additive substances (e.g., water, colors, flavors). The pattern matrix considered three questions each for both trust in information sources and trust in LM (see Table 3).

The perceived risk scale was constructed with five items adapted from Klerck and Sweeney [16], McCarthy and Henson [68], Yuksel and Yuksel [84], and from Angulo and Gil [85]. The items were: while buying LM, I have concern that it will not be as I expected (functional risk), I worry about losing/wasting money (financial risk), I worry about the product not tasting as good as it should (performance risk), I feel psychologically uncomfortable (psychological risk), I have concerns about the potential long-term risks to my family (physical risk), and purchasing LM is unfashionable (social risk). In the EFA, three items were finally chosen (see Table 3).

Attitude was constructed with six five-point bi-polar scale items adapted from the previous literature [86,87]. The respondents were asked to describe their feelings about LM by circling one option on each scale. The questions were: my feelings towards LM are bad/good, negative/positive, unfavorable/favorable, dull/exciting, terrible/great and unsatisfied/satisfied. Finally, three items were accepted, by testing the factor loading criterion (see Table 3).

The purchase intention scale had five Likert five-point scale questions measuring the intent to purchase. The questions were adapted from Steadman, L., and Rutter, D.R. [88]. The items included: I intend to; I plan to; I would like to; I want to buy LM next time I buy milk, and how likely is it that you will buy LM, next time you buy milk? Accordingly, four items passed the factorability test and were selected for the final construct (see Table 3).

3. Results

3.1. Demographic Profile of the Respondents.

In this study, the majority of the respondents were male (63.1%) and the other 263 participants were female (see Table 1). More than one third of the respondents were between 20–29 years of age, followed by 24% of the respondents who belonged to 40–49 age group. The smallest number of respondents were above 70 years old (0.8%). Almost two-thirds of the interviewees reported that they had an education of above 12 years. On the consumption frequency side, more than one third of the sampled population reported that they consume LM several times per month, followed by roughly 30% of the respondents who consume LM several times per week. More than half of the respondents (382) buy milk from local grocery shop, while the other 122, 105 and 103 respondents preferred the supermarket, farmer's agent and agro farm, respectively.

Of the 712 respondents, 465 read the label on the product when buying LM. Almost a third preferred the 'national authority' as a credible source for certification, less than a fifth chose 'international authority', and a mere 14% opted for 'local authority' and 'private authority'. Interestingly, 22.5% of the population reported that they have faith in 'all equally' and 15.4% didn't have any preferences.

3.2. Measurement Model

We conducted the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity before conducting factor analysis [89]. The result of the KMO test ensured sample adequacy with a value of 0.775 (Table 2), which is well above the minimum cut value of 0.6 [82] and the result of Bartlett's test of sphericity ensured a high likelihood of the successful factorability of data [80], with a significant p-value below 0.01. The measurement model demonstrated excellent model appropriateness, with the data having $\chi^2 = 173.594$, degree of freedom (df) = 114, p-value = 0.000, root mean square error approximation (RMSEA) = 0.027, incremental fit index (IFI) = 0.99, Tucker-Lewis index (TLI) = 0.98, comparative fit index (CFI) = 0.99, goodness of fit index (GFI) = 0.97, and $\chi^2/df = 1.52$. It can be observed that model fit indices passed the adequate threshold level [90] and, hence, it is substantiated that the measurement components corresponded to their underlying latent construct.

Subsequently, EFA was conducted to form the pattern matrix based on the factorability of the data and to ensure the convergent validity of the proposed constructs. The factor loadings took a total of 18 items into consideration (see Table 3). The standardized regression weights (λ) ranged from 0.59 to 0.86, meeting the recommended threshold level of 0.50. Thus, all items were proposed to be significant with regard to their corresponding latent constructs [90]. To verify the internal consistency and strength of the relations of the variables, both Cronbach's alpha (α) and composite reliability (ρ) were calculated and the values for both of the tests met the minimum of 0.70 [90,91] (see Table 3). Further, the values for the average variance extracted (AVE) of each construct were above 0.50, except for a total of seven items from the three construct that scored slightly below than 0.50: trust in information sources, trust in LM, and perceived knowledge (see Table 3). This anomalous lower AVE score might be largely due

to a new measure applied in this particular field of study that takes dairy liquid milk into account in the context of Bangladesh for the first time. However, the convergent validity of the construct is still assured since the composite reliability (ρ) for the constructs was higher than the minimum recommended level of 0.6 [92] (see Table 3). Moreover, in order to avoid any major discriminant validity problems, we discarded those items from the constructs with poor factor loadings and then performed a discriminant validity test [93] (see Table 4). The test results revealed (see Table 4) that the estimates for all variance extracted were greater than their respective squared correlation, suggesting that each construct was unique in nature and the dataset contained no multicollinearity problems.

The theoretical support discussed in this section and the data presented in the table also confirm the face validity. Face validity is a measurement of the subjective judgement that verifies whether the intended goal of measuring a certain construct is achieved. Therefore, construct validity is confirmed, since the convergent validity, discriminant validity and face validity is achieved [93], leading us to conclude that our hypothesized model and observed data fitted well and that the overall measurement model achieved the validity for the analysis.

3.3. Structural Model

3.3.1. Assessment of Fitness for the Structural Model

Several goodness-of-fit test statistics were deployed to investigate the fitness of the model [94]. To measure the impact of perceived knowledge, trust and risk on consumer attitude and purchase intentions, the hypotheses presented in Figure 1 were tested. In addition, the study developed a structural equation model (SEM) to test the hypotheses. The SPSS and AMOS Graphics (Ver 24.00, IBM, New York, NY, USA) were used for the factor analysis and the path model analysis.

The test results reveal that all the indices from each category meet the requirements provided for adequate evidence of model fit (see Table 5), assuring construct validity [93]. In the absolute fit indices category, the values obtained for GFI, AGFI, RMSEA and SRMR meet the recommended threshold level adequately with GFI = 0.98, AGFI = 0.96, RMSEA = 0.03 and SRMR = 0.03. With CFI = 0.91 and Normed $\chi^2 = 1.67$, the model passes the incremental and parsimonious fitness tests. The test results report a chi-square value ($\chi^2 = 139.881$, $df = 95$) of $p = 0.02$. The chi-square result has to be accepted when the p -value is above 0.1 since Chi-square is said to be a badness of fit index. However, Chi-square does have some limitations, including sampling sensitivity [95] and model misspecification norms [96]. Therefore, experts suggest a relative/normed chi-square (χ^2/df) with a ratio below 3 to 5 [93].

Table 5. Goodness of fit indices.

Category	Indices	Recommended Least Value	Attained Value
Absolute Fit	χ^2	$p > 0.05$ [97]	$p = 0.00$
	RMSEA	$p < 0.08$ [92]	$p = 0.03$
	GFI	$p > 0.90$ [98]	$p = 0.98$
	AGFI	$p > 0.90$ [97]	$p = 0.96$
	SRMR	$p < 0.05$ [97]	$p = 0.03$
Incremental Fit	CFI	$p > 0.90$ [97]	$p = 0.91$
Parsimonious Fit	χ^2/df (normed χ^2)	$p < 3-5$ [97]	$p = 1.67$

Note: RMSEA = root mean square error approximation; GFI = goodness-of-fit index; AGFI = adjusted goodness-of-fit index; CFI = comparative fit index; NNFI = non-normed fit index; TLI = Tucker-Lewis index. SRMR = standardized root mean squared residual.

3.3.2. Result of Hypotheses Test and Discussion

First, the study aimed to test the influence of perceived knowledge and risk on trust. Second, the effect of perceived knowledge, trust and risk were tested altogether on the attitude and purchase intention of LM. Further, the intricate relationship between these variables was also investigated.

In doing so, the study established some hypothesized relationships based on the previous literature. Table 6 below shows the results to provide support for the acceptance and rejection of the hypotheses.

Table 6. Results of the structural equation modeling: Standardized path estimates.

Structural Path	Hypotheses	Standardized Path Co-Efficient (β)	SE	CR	<i>p</i> -Value
Trust in LM \rightarrow Attitude	H1a	0.03	0.041	0.689	0.490
Trust in ISs \rightarrow Attitude	H1b	0.20	0.036	5.354	0.000 ***
Trust in LM \rightarrow Purchase Intention	H1c	0.03	0.041	0.868	0.390
Trust in ISs \rightarrow Purchase Intention	H1d	0.08	0.036	2.535	0.010 **
Perceived Knowledge \rightarrow Perceived Risk	H2a	0.07	0.026	1.925	0.050 *
Perceived Knowledge \rightarrow Trust in LM	H2b	0.05	0.035	1.381	0.170
Perceived Knowledge \rightarrow Trust in ISs	H2c	0.12	0.039	3.260	0.000 ***
Perceived Knowledge \rightarrow Attitude	H2d	0.08	0.038	2.274	0.020 **
Perceived Knowledge \rightarrow Purchase Intention	H2e	0.05	0.037	1.549	0.120
Perceived Risk \rightarrow Trust in LM	H3a	-0.21	0.049	-5.72	0.000 ***
Perceived Risk \rightarrow Trust in ISs	H3b	0.01	0.056	0.243	0.810
Perceived Risk \rightarrow Attitude	H3c	-0.005	0.055	-0.132	0.900
Perceived Risk \rightarrow Purchase Intention	H3d	0.05	0.054	1.514	0.130
Attitude \rightarrow Purchase Intention	H4	0.45	0.037	13.521	0.000 ***
Variables		Pearson Correlation	<i>p</i>-Value		
Income and Purchase Intention		-0.08	0.05 *		
Education and Purchase Intention		0.04	0.28		
Age and Purchase Intention		-0.07	0.06 *		
Gender and Purchase Intention (M = 1, F = 2)		-0.08	0.04 **		
Presence of Children and Purchase Intention		0.05	0.15		
Labeling ^a and Purchase Intention		-0.07	0.08 *		

Note. *** Significant at $p < 0.01$; ** Significant at $p < 0.05$; * Significant at $p < 0.10$; SE = Standard Error; CR = Critical Ratio; ^a coded as 1 = read label; 2 = does not read label; M = Male, F = Female, Trust ISs = Trust in information sources.

The results indicate that trust in information sources had positive impact on both attitude and purchase intention of LM as substantiated by hypotheses H1b ($\beta = 0.20$, SE = 0.036, CR = 5.354 and $p < 0.001$) and H1d ($\beta = 0.08$, SE = 0.036, CR = 2.535 and $p < 0.05$), respectively, whereas H1a ($\beta = 0.03$, S.E= 0.041, CR = 0.689 and $p > 0.10$) and H1c ($\beta = 0.03$, SE= 0.041, CR = 0.868 and $p > 0.10$) revealed that trust in LM does not significantly affect the attitude and purchase intention of LM.

From Figure 2 and Table 6, we also found evidence to support H2a, which indicates that perceived knowledge positively signifies the perceived risk of consumers ($\beta = 0.07$, SE = 0.026, CR = 1.925 and $p = 0.05$). H2c ($\beta = 0.12$, SE = 0.039, CR = 3.260 and $p < 0.01$) and H2d ($\beta = 0.084$, SE = 0.038, CR = 2.274, $p = 0.02$) posit that perceived knowledge has a significant positive impact on 'trust in information sources' and on 'attitude', respectively. However, perceived knowledge does not necessarily influence the 'trust in LM' and 'purchase intention' of LM, as reported by H2b ($\beta = 0.05$, SE = 0.035, CR = 1.381 and $p = 0.17$) and H2e ($\beta = 0.05$, SE = 0.037, CR = 1.549, $p = 0.12$), respectively. The impact of perceived risk on both 'trust in LM' and 'trust in information sources' was tested through hypotheses H3a and H3b, respectively. The results revealed that perceived risk negatively and significantly influenced the trust in LM ($\beta = -0.21$, SE = 0.049, CR = -5.72, $p < 0.001$), while no significant impact was observed on trust in information sources ($\beta = 0.01$, SE = 0.056, CR = 0.243, $p = 0.81$). In addition, perceived risk also did not have any significant impact on attitude and purchase intention. Therefore, the structural path estimates for H3c ($\beta = -0.005$, SE = 0.055, CR = -0.132, $p = 0.90$) and H3d ($\beta = 0.05$, SE = 0.054, CR = 1.514, $p = 0.13$) led the hypotheses to not be accepted. Finally, this study found a significant and stronger positive effect of attitude on the purchase intention of LM as tested by H4 ($\beta = 0.45$, SE = 0.037, CR = 13.521, $p < 0.001$).

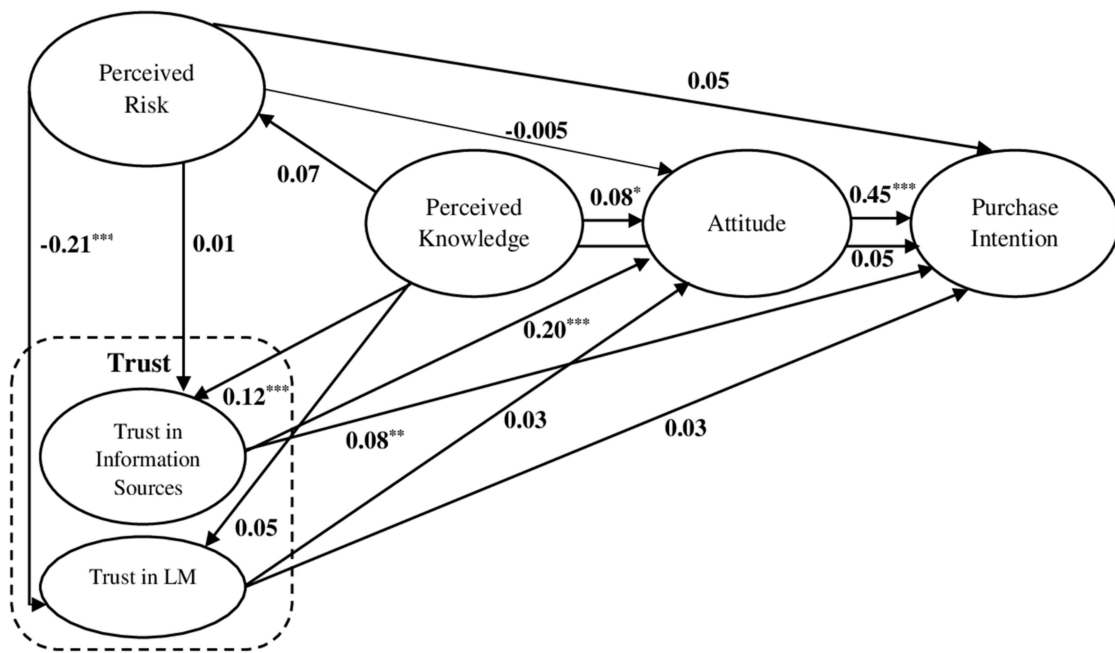


Figure 2. Result of the tested conceptual model.

3.3.3. Mediating Effect of Perceived Knowledge

This study also attempted to explore the mediating effect, if any, among the components. In this test, the influence of a third variable was investigated to determine whether it has any mediating role in explaining the hypothesized relationship between the given independent and dependent variable [99]. To confirm the mediating effect of perceived knowledge on purchase intention via attitude, trust in LM, trust in information sources, and risk, several mediating paths were tested using the Sobel, Aroian, and Goodman tests.

Based on H2a and H1c, H2f was projected:

Hypothesis 2f (H2f). *The relationship between perceived knowledge and purchase intention is mediated by consumers' Trust in LM.*

Again, if hypotheses, H2c and H1d are true, H2g is forwarded:

Hypothesis 2g (H2g). *Trust in information sources regarding LM mediates the relationship between perceived knowledge and purchase intention.*

Assuming a true relation between H2d and H4, H2h is posited:

Hypothesis 2h (H2h). *The impact of perceived knowledge on purchase intention is mediated by attitude towards LM.*

Based on H2c and H1b, H2i is formulated:

Hypothesis 2i (H2i). *Consumers' perceived knowledge has an indirect effect on the purchase intention of liquid milk through their attitude towards LM.*

Finally, the last mediating Hypothesis H2j was predicted based on hypotheses H2a and H3d:

Hypothesis 2j (H2j). *Perceived knowledge can contribute to purchase intention via perceived risk.*

The results reveal that, as seen in Table 7, Hypotheses H2g, H2h, H2i were fully supported and were accepted, while Hypotheses H2f and H2j were found to be statistically insignificant and hence were rejected. The results also indicated that while in Hypothesis H2e, perceived knowledge significantly influenced the purchase intention, the relationship can also be explained via trust in information sources and attitude, with a significant ‘*p*-value’ for Hypotheses H2g ($p < 0.01$) and H2h ($p < 0.05$), respectively. Additionally, in Hypothesis H2i ($p < 0.05$), trust in ISs mediates the relationship between perceived knowledge and attitude.

Table 7. Results of the mediating path.

Mediating Path	Hypothesis	Test	Test Statistics	Standard Error	<i>p</i> -Value
PK → Trust LM → PI	H2f	Sobel Test	0.63	0.002	0.520
		Aroian Test	0.54	0.002	0.590
		Goodman Test	0.81	0.002	0.420
PK → Trust ISs → PI	H2g	Sobel Test	2.89	0.004	0.003 *
		Aroian Test	2.87	0.004	0.004 *
		Goodman Test	2.91	0.004	0.004 *
PK → ATT → PI	H2h	Sobel Test	2.17	0.017	0.030 **
		Aroian Test	2.17	0.017	0.030 **
		Goodman Test	2.17	0.017	0.030 **
PK → Trust ISs → ATT	H2i	Sobel Test	2.72	0.008	0.006 *
		Aroian Test	2.68	0.009	0.007 *
		Goodman Test	2.76	0.009	0.006 *
PK → RiskP → PI	H2j	Sobel Test	0.88	0.004	0.380
		Aroian Test	0.83	0.004	0.410
		Goodman Test	0.93	0.004	0.350

Note: PK = Perceived knowledge; Trust LM = Trust in LM; Trust ISs = Trust in information sources; RiskP = Perceived risk; ATT = Attitude; PI = Purchase Intention; * ≤ 0.01 ; ** ≤ 0.05 .

4. Discussion

In the study, trust was decomposed into two categories, namely trust in the ‘product’ hereafter named trust in ‘LM’ and trust in ‘information sources (ISs)’. In Hypotheses H1a and H1c, trust in LM had a positive effect on the attitude and purchase intention of LM, respectively, but the results were not statistically significant and, thus, were rejected. However, the study confirmed that trust in information sources is a good predictor of consumer attitude and purchase intention in H1b and in H1d. These findings suggest that accurate information from a trustworthy source builds confidence [100]. Of the 17 sources mentioned in the questionnaire, the consumers weighted ‘television news’, ‘television documentary’ and ‘newspaper’ the highest, with higher factor loadings. Wallace et al., [100] in their study reported that among the three major determinants of trust, “gaining information from a credible source” was the factor most likely to build trust because, in a period with food safety issues, trust can be destroyed if the data supplied are “manipulated”, “misjudged” and are not “factual”. Peniak et al. [101] also stressed the significance of trust in information sources by reporting that enthusiastic buyers made the most use of and had the greatest trust in information sources when buying fish.

However, unlike the findings stated in the research of Chen and Li [27], this study revealed that in Hypothesis H2a, perceived knowledge had a positive impact on the perceived risk associated with LM. Further, Hypothesis H3a posits that the perceived risk significantly and negatively influences the trust in LM. It suggests that as soon as people acquire knowledge, their inherent risk stemming from LM increases in terms of functionality, wasting money and taste (performance). Therefore, they lose trust in LM and start to believe that the LM sold on the market is not free from chemical preservatives, additive water, colors, flavors and is not collected or processed in a toxic-free environment (confirmed by the questions asked under this construct, see Table 3). As we can also observe in Hypothesis H2b, perceived knowledge does not help to increase trust in LM, and is hence not supported. Therefore,

we can argue that Bangladeshi consumers have minimum trust in LM and they deem there to be a good risk exposure when buying LM as soon as they gather more knowledge. In support of this argument, Bánáti [102] suggests that when food safety concerns spread among consumers, their confidence starts to melt, propelling them towards more uncertainty, anxiety and to become gradually critical about the safety of their food. Surprisingly, Hypothesis H3b states that perceived risk has a positive, although much weaker, association with trust in information sources. Additionally, H3c and H3d posit that perceived risk does not have any statistically significant effect on attitude and purchase intention, and thus were not accepted. These findings suggest that risk does not play any significant role in predicting the attitude and purchase intention of LM, meaning that consumers underestimate the threat of the perceived risk, and rely on trusted information sources. Based on the information from these sources, their attitude is shaped and the power of the purchase intention is amplified.

Then again, perceived knowledge has a stronger positive association with trust in information sources, as substantiated by H2c. These sort of findings suggest that more knowledgeable consumers rely on information sources and at the time of the food security crisis their perceived risk does not necessarily affect (see Hypothesis H3b) their trust in information sources. Therefore, consumers who perceive that they have better knowledge regarding LM have a stronger trust in information sources, meaning that the channel that they perceive as providing credible information necessarily does so. This corroborates the findings of Frewer [48], who reported that trusted sources were deemed to provide authentic and well-researched information and consumers had a 'knowledge bias' towards these sources. Additionally, distrusted sources were those whose lacked trustworthiness, a good track record, concern for public welfare, commitment, accuracy, and facts [48].

The study also reports that in Hypothesis H2d, the perceived knowledge significantly predicts the attitude towards LM. However, as tested in Hypothesis H2e, perceived knowledge does not statistically signify the purchase intention, but does affect the purchase intention through the mediator of "trust in information sources" (see Hypothesis H2g, Table 7) as well as through the "attitude" (see H2h, Table 7). Moreover, the effect of perceived knowledge on the attitude is mediated by trust in information sources as substantiated in Hypothesis H2i. However, both trust in LM (see H2f, Table 7) and perceived risk (see H2j, Table 7) cannot mediate the relationship between perceived knowledge and purchase intention. These sorts of findings suggest that an increase in knowledge cannot lead to a higher purchasing intention alone, but rather the increased perceived knowledge leads to an increase in the consumers' risk level during a food security crisis and mostly they look for credible information sources. Furthermore, the perceived value of functional food and trust in information sources help to form a positive attitude, which ultimately induces the purchase intention. Chih-Ching Teng and Yu-Mei Wang [62] argue that, in organic food consumption, consumer attitudes are not solely predicted by knowledge; rather knowledge associated with trust can positively signify the attitude towards organic consumption. In addition, previous studies related to food [103–106] suggest that knowledge can positively trigger the attitude only if trust can be established, thus assuring the ensuing influence of trust in the process of consumers' purchase intention of LM. Finally, H4 reports that attitude is a good predictor of purchase intention, which also corroborates with basic attitudinal research that attitude precedes purchase intention [107,108].

Further, the study attempted to explore the impact of controlling variables on purchase intention and the outcomes report that gender had a negative ($\beta = 0.11, p = 0.07$) and the consumption pattern had a positive and significant ($\beta = 0.10, p = 0.00$) influence on the purchase intention of LM, indicating that female consumers prefer to purchase less than their male counterparts. This might be because females do not trust LM because of the adulteration incidents and females are more health conscious than males. The results also show that more consumption leads to a greater intent to purchase LM. Additionally, the study attempted to explore the association of demographic factors with purchase intention (Table 6). Significant negative correlations have been found between income and purchase intention ($r = -0.08, p < 0.10$), between age and purchase intention ($r = -0.071, p < 0.1$), and between labelling and purchase intention ($r = -0.075, p < 0.1$). This indicates that people with a higher income

tend to have a lower intent to purchase, showing a declining marginal propensity to spend on LM. Additionally, people of higher age are not less inclined to consume LM compared to people of younger age. Most importantly, people who read the labelling of certification tend to consume more than those who do not read the labels and certification.

5. Conclusions

The study fundamentally contributed to the field of research in that it conceptualized and modeled factors affecting consumers' purchase intention for liquid milk, specifically in a food security crisis, based on a field survey incorporating perceived knowledge, trust, and risk. The study also revealed the intricate relationship between these variables and hypothesized relationships in order to explain the mutual association between them and the role of these variables in predicting attitude as well as purchase intention. Markedly, this study revealed the effect of perceived knowledge on perceived risk and on trust, which was constructed by two distinct components for the first time in the field of study related to liquid milk. The results of the study posit that consumers' level of trust in liquid milk is too low (mean 2.34/5) followed by the level of trust in information sources and level of perceived knowledge with a mean score of 3.21 and 3.22, respectively. Market practitioners need to understand the ensuing urgency of increasing trust both in liquid milk and in information sources.

First, our study reported that 'trust in information sources' significantly and positively influenced the attitude and purchase intention of liquid milk. Again, perceived knowledge induced the level of trust in information sources. Therefore, the marketers of liquid milk may identify the opportunity to leverage the existing knowledge of consumers in order to build trust in sources, then, in turn, to build purchase intention. In order to remove uncertainty and to manage the risk hazards associated with the product, people often rely on credible information sources [27]. Moreover, knowledge is a driving factor in judging the credibility of the sources and to build trust in that/those particular information source/s [64]. Aiking and de Boer [109] report that ensuring both the credibility of the sources and the cogency of the information are necessary since consumers stress the transparency of suppliers when there are food insecurity issues. However, the lack of openness of the industry may not corroborate with this policy, therefore intensifying the challenge of ensuring sustainability for stakeholders. Hence, a balanced approach from community actors including government, industry, etc., should be taken to address this issue.

Second, an important paradox found in this study is the positive and significant association between perceived knowledge and perceived risk. Chen and Li [27] report that a more knowledgeable individual is expected to bear less risk. However, we found that when consumers gathered more knowledge about liquid milk collected and processed in Bangladesh, their perceived value of the risk hazard related to liquid milk was positively affected due to the food insecurity and safety issues associated with buying liquid milk. They perceive that the liquid milk they buy would not be according to their expectations and that purchasing liquid milk would be a waste of money (substantiated by the questions asked under the construct 'perceived risk', see Table 3). As a consequence, consumers lost trust in liquid milk. The safety aspect of food sustainability states that the health aspect of food is juxtaposed with food security issues and it is unwise to exclude this from the discussion of sustainability [109]. Therefore, dairy policy makers and market practitioners should establish a sustainable milk supply chain focusing on the risk communication tools to reduce the potential risk hazard and to build trust in liquid milk. In doing so, producers should ensure the functionality by assuring no adulteration, as well as good handling and processing techniques in a cost-effective and altruistic manner that is both socially and ecologically sustainable. Additionally, stakeholders must also tailor effective tools to reduce the perceived risk through accessible and understandable objective knowledge, which alleviates consumer concerns.

Third, the study reports that perceived knowledge is a good predictor of attitude. However, knowledge alone cannot signify the purchase intention of liquid milk; instead, trust in information sources is an important mediator in influencing the purchase intention of liquid milk, suggesting that

it takes knowledge as well as trust in information sources to explain the purchasing behavior of liquid milk. Hence, for marketers, these findings may work in terms of gaining a competitive advantage in commercializing liquid milk, since by inducing sustainable purchase behavior, trust is a good catalyst for perceived knowledge [72,110]. The study also reports that consumer trust in information sources can mediate the relationship between perceived knowledge and purchase intention. The trust in information sources also helps to mediate the relationship between consumers' perceived knowledge and their attitude. The evidence revealed that the market for liquid milk is growing and that it is important for producers to satisfy consumer expectations by ensuring trusted information sources like food labels (e.g., sustainability), because food labels help consumers to mediate the association between attitudes and preferences [111,112].

The study helps to frame an effective and sustainable dairy policy in emerging markets by addressing the potentials of the dairy industry for liquid milk and delineating the factors affecting the purchase intention of consumers, especially concentrating on the food security crisis, through developing a conceptual model. However, like most others, this study does not lack limitations. In the light of the following limitations, the future research scope can be identified. Firstly, the study takes into account a single construct of knowledge to measure perceived knowledge. Future studies can incorporate a greater dimension of knowledge, such as basic or inferential knowledge, subjective, and objective knowledge. In addition, due to low factor loading, our study considered three dimensions of risk, whereas the six dimensions of risk can be used, as suggested by Stone and Grønhaug [110]. Secondly, for the same reason, we tested only three sources of information. Future research can amalgamate more related sources. Thirdly, our study was conducted in two major cities of Bangladesh; future research should assess other emerging and developing economies to test the feasibility of the model developed in the present study. Additionally, in the present format, the given model looks complex, testing this model with simplicity in other functional food product categories might be interesting, which would also provide external validity. Moreover, future research can focus on developing an experimental study by employing several other tools such as focus group discussions, and taste-testing, etc., to measure the sophisticated human traits related to consumer behavior. Finally, trust, risk perception and knowledge may be conditioned by more variables not included in the model, such as sensory perceptions, perceived health benefits, and willingness to pay.

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