

Factors Inducing Consumers' Abandonment of Unhealthy Foods Consumption in Ramadan: A Study on Fasting Muslim Consumers in Bangladesh

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Abstract: *This paper aims at identifying the factors inducing Bangladeshi fasting muslim consumers' abandonment of unhealthy foods consumption in ramadan. To conduct the study data were collected from 150 fasting muslim respondents who have abandoned the consumption of unhealthy foods in ramadan. A self-administered questionnaire was used for collecting data from the respondents. Inferential statistical tool named factor analysis is employed for data analysis. Twenty(20) variables related to unhealthy foods abandonment behavior of consumers have been identified. After conducting factor analysis this study finds that seven (7) factors induce fasting muslim consumers to abandon unhealthy foods consumption in ramadan. The factors identified are: no or low health benefits, inadequate carbohydrates in food items, potential health hazard, lack of energizing food values, low vitamin enrichment, consumer awareness about unhealthy foods, and physical discomfort. This study offers two-folded implications for the marketers: first, it will help marketers learn fasting muslim consumers' abandonment behavior of unhealthy foods in ramadan and second, it will help food marketers introduce new types of nourished food items for the fasting muslim consumers in ramadan for healthy living.*

Keywords: *Unhealthy Foods, Inferential Statistics, Factor Analysis, Nourished Food Items*

1. Introduction

Fasting during the month of ramadan is obligatory for all adult muslims with few exceptions. The person observing fast does not eat, drink, and smoke from dawn to dusk (Laway and Ashraf, 2015). E-bulletin (2012) published that to continue fasting throughout the month of ramadan, it is important for the muslims to stay healthy. And to remain healthy in ramadan fasting muslims should have a balanced diet and hygienic food. The Daily Star (2018) presented that fasting for long hours in this month of ramadan requires muslims to have more balanced foods such as items that are rich in

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calcium, chloride, magnesium, phosphate, potassium and sodium. Taking abundant fluids during sehri and iftar is also essential to our body during this month.

In Bangladesh people are more accustomed to eating spicy, oily, junk, soft drinks and pungent foods all the year round. These items are unhealthy in nature due to lack of nutritional values. These unhealthy items contain fatty and oily foods such as samosas, pakoras and sugary foods like burfi, jalebi etc. These fatty or oily items may cause problems in digestion or weaken health (Clinical Commissioning Group, 2018). Moreover, unhealthy foods consumption such as fatty food, refined foods, sweets, junk food may cause under-nutrition, physical unease, digestion problems and other problems to the fasting people in ramadan (E-bulletin, 2012).

Since every muslim adult, either male or female has to perform sawm or fasting in the form of refraining from eating or drinking from dawn to dusk for one month they need to be more conscious about their food habits in this month. They should avoid foods that cause stomach upset, flu, or any worsening problems (E-bulletin, 2012). Instead, in Sehri and Iftar they should eat fiber, protein, carbohydrate, minerals, vitamins enriched food items that may include whole grains, fruits, vegetables, and drink plenty of water.

Hopefully, Bangladeshi muslim people are changing their food habits by dropping unhealthy items from their ramandan food menus. According to Islam (2017) muslim people who fast in ramadan in Bangladesh are actively considering health benefits while consuming foods. They are dropping spicy and junk items and taking healthy items since consumption of these unhealthy items pose harmful effects on health. Similar kind of study conducted by Philips (2014) published that people are becoming more health conscious than before regarding the consumption of foods in the month of ramadan. It also found that about 75% of muslims are highly concerned about the nature of food items they consume in breaking fast in Ramadan. A study conducted in Egypt, Malaysia, Saudi Arabia and Turkey resulted that 84% muslims of these countries have changed their eating habits in ramadan. 61% of Muslims in Malaysia showed positivity towards consuming healthier items in ramadan.

Shovon (2017) found that Bangladeshi fasting people are now avoiding heavy and fatty oily food items to keep them healthy and fit for the fasting day. They have started adopting new healthier, easy to digest, high calorie-enriched food items. They are now more aware about healthy food consumption in ramadan. The muslims are now avoiding or reducing consuming unhealthy food items such as deep fried, fatty foods like biriyani, pakoras, samosas, parathas, oily curries and greasy pastries, foods containing too much sugar, tea, coffee etc and others in sehri and iftar. Instead of consuming these unhealthy items people are consuming more fruits and vegetables, breads, cereals and potatoes, fish, egg and alternatives, milk and dairy foods, foods containing fat and sugar, chapattis made without oil, baked or grilled meat and chicken (Swansea, 2017).

This study is undertaken to identify the factors that induce these Bangladeshi fasting muslim consumers to abandon consuming unhealthy foods in ramadan. The research is highly related with consumer health protection, food values and physical comfort. This paper will strive to gather insights from respondents on healthy eating, vitamin intake food habits, negative impact of unhealthy foods and finding a way to remain healthy in ramadan. The researchers believe that identification of the factors that induce fasting muslims to abandon unhealthy foods will help marketers to change their current traditional, low health-valued food marketing strategy by offering healthier, easily-digestible and quality food items to consumers for utmost consumer health benefits.

2. Literature Review

Fasting for the muslim during the month of ramadan is as one of the five basic sacred rules of Islam and while fasting muslims refrain from taking foods, drinks, and smoking from dawn to sunset (BaHammam, 2003). As fasting continues a muslim experiences some changes in food habits and lifestyle. Hosseini and Hejazi (2016) stated that, ramadan brings changes in lifestyle such as alterations in water and food intake, dietary patterns, daily physical activity, and sleep cycle. In this month, a muslim has to fast for 12-15 hours in a day. In ramadan, a muslim needs lots of energy to body to fast in ramadan. This long period of fasting require people to replenish energy (Ramadan Health Guide, 2018).

Clinical Commissioning Group (2018) found that, to remain healthy in ramadan people need to take balanced foods from all food groups. They also need to drink plenty of water in sehri and iftar to maintain water balance in body. In another study Ramadan Health Guide (2018) stated that people can preserve their health in ramadan if they follow the correct dietary patterns. Precisely, people should spend some valuable time in deciding on the type and quantity of food they will consume in ramadan. People should pick up less than a normal amount of food but make sure that the foods are exorbitantly balanced to keep healthy and active during the month of ramadan.

Alarmingly, a significant portion of the Bangladeshi muslims are seen consuming unwholesome and unhealthy foods in ramadan that may cause serious health hazard to the people who consume it. According to Hoque (2015) these unhealthy food items such as pastry cake, cream, chocolate, biscuit, cola, tea, and coffee contain less food values consumed in ramadan may create some major problems in health may bring in more water-loss in body and reduces energy level of takers.

Shovan (2017) found in a study that most of the foods that Bangladeshi muslim consumers consume in sehri and iftar in ramadan contain either fatty or fried items and these items are detrimental to health. According to Swansea (2018) deep fried foods, fatty foods, high sugar foods, heavily processed foods, caffeine based drinks can be called as

avoidable or unhealthy foods in ramadan. Clinical Commissioning Group (2018) presented nearly the same views like Swansea that oily foods that have high fat level and foods containing high sugar may be the potential sources of unhealthy foods.

This study strives to find out what induce fasting muslim consumers to abandon this unhealthy food items in ramadan. In this perspective, Food-chart in Ramadan (2017) presented in a report that deep fried, highly burnt, highly spicy items consumed in iftar and sehri can create physical discomfort, digestion problem, gastric and over-weight problem for the people fasting in ramadan. In another study Hashem (2017) found that, high sugary, deep-fried biriyani items may cause constipation, physical weakness, dehydration, headache and sudden low or high pressure problem for the consumers fasting in ramadan.

Hasin (2017) came up with similar types of findings and found that, fried and fatty foods like parathas, highly oily curries and greasy pastries, foods containing too much sugar can create gastric, ulcer or digestion problem. Ashfaq (2013) proposed the same view and stated that an unbalanced diet, artificial colored juice and sweets with added sugar and fried items, lack of vegetables and fruit intake at iftar, sehri and dinner have been found to be unhealthy and they may bring in gastric irritation, discomfort for the abdomen, heartburn, nausea, belching and bloating of stomach, constipation, overweight and laziness.

Thus, fasting muslims may be induced to abandon consuming unhealthy foods for a number of pother reasons. Osman (2015) found in a study that, consumers should drop samosas, springrolls, pakoras, fried dumplings, fried chicken, french fries, wings, etc from their meals in ramadan because these items can lead to slow digestion, stomach cramping and bloating. Shovan (2017) also suggested that during ramadan consumers should avoid consuming these highly oily, spicy, fatty food items such as biriyani, tehari, nehari, roasted items to avoid digestion problem. Rayhan (2017) mentioned that, people need to shun drinking artificially colored harmful fruit juices marketed commercially because it may be source of health problems, moreover deep fried items need to be avoided since it causes digestion problem.

The notion of abandoning unhealthy foods is also supplemented by Ramadan Health Guide (2018) as it stated that, people should avoid heavily-processed, fast burning foods such as sugar, white flour as they contain low complex-carbohydrates and fibers that turn them into unhealthy foods. Fayeze and Afroze (2017) recommended in this perspective that Bangladeshi fasting muslims should avoid unhealthy foods as they do not contain micro-nutrients, potassium, magnesium, calcium, zinc and vitamins that are essential to the body. Islam (2017) found that, people become aware about unhealthy food items in

ramadan through mass media promotion, social networking sites, and their high literacy rate along with knowledge on health protection. He also found that hot weather, long fasting hours and low digestibility of food items are some of the catalysts that induce people to avoid consuming unhealthy foods.

The citations of the literatures help the current researchers come up with the fact that, to remain healthy in ramadan fasting muslim people should take some healthy food intakes that help continue long fasting hours soothingly. Regarding healthy meals, Hoque (2015) suggested that, instead of consuming unhealthy foods, people can eat baked samocha, grilled meat, hotpotch, vegetables, dairy items, eggs and pudding to remain healthy in ramadan. Moreover, as part of healthy diet choice in ramadan the muslim can take whole grains with potato, yogurt, baked samosas instead of fried, boiled dumplings, oil less chapattis, baked or grilled meat and chicken. Homemade pastry item is also a healthy option. Food-chart in Ramadan (2017) stated that, corn flakes, atta, roti, milk, semai, meat and eggs can be a good source of carbohydrate and protein for the body. These food-values help people continue fasting for long hours with ease.

Hashem (2017) found that dates, natural lemon sorbot, complex carbohydrate-enriched vegetables, protein, vitamin and calcium enriched foods such as sour card, milk, meat, fish and eggs provide more energy, more food values and physical comfort to fasting muslims. Shovan (2017) came up with the same notion and suggested that fasting muslim people in ramadan should replace their traditional unhealthy meals by including starch-filled items such as barley, lentils, atta, meat, roti, meat, fruits, fish, oats, beans as they contain more carbohydrates, fibers and proteins.

The literatures reviewed above can be combined and compared to get insights on what induce Bangladeshi fasting muslims to abandon consuming unhealthy foods in ramadan. The views of the literatures can be summarized in the manner that consuming unhealthy foods in ramadan may cause a number of problems for the fasting muslims such as water-loss in body, high level of fat, physical discomfort, digestion problem, gastric and overweight problem, constipation, physical weakness, dehydration, headache, high pressure, gastric, discomfort for the abdomen, heartburn, nausea, belching and bloating of stomach, overweight and laziness etc. Based on the review of literatures the study presents the following hypothesis:

H₀: *There is truly no significant difference among all the factors inducing fasting muslim consumers' abandonment of unhealthy foods in Ramadan.*

H₁: *There is truly significant difference among all the factors inducing fasting muslim consumers' abandonment of unhealthy foods in Ramadan.*

3. Objectives of the Study

The objective of this study is to identify the key consumer behavioral factors that induce Bangladeshi fasting muslim consumers to abandon consuming unhealthy foods in ramadan. Besides, the study has the following specific objectives:

- ◆ To give an overview on fasting and food patterns of fasting muslims in ramadan.
- ◆ To identify the typical unhealthy foods consumed by Bangladeshi fasting muslims in sehri and iftar in the month of ramadan.
- ◆ To present implications of the study based on research findings.

4. Methodology

This study is quantitative in nature. Quantitative technique is employed here since it tries to quantify certain behavioral factors of consumers related to foods consumption in a certain month. The design of this research is justified by the work of Cresswell (2014) as he found that quantitative strategies involve complex experiments with many variables and treatments such as factorial designs. Babbie (2010) also mentioned that quantitative technique of research emphasizes objective measurements and the statistical, mathematical, or numerical analysis of data collected through polls, questionnaires, and surveys, or by manipulating pre-existing statistical data using computational techniques. It also focuses on gathering numerical data and generalizing it across groups of people or to explain a particular phenomenon.

Sample size

This study chooses 150 respondents as sample for data collection purpose in this study. The size of the sample was determined taking the research precedents of Hatcher (1994) and Gorsuch (1983). According to Hatcher (1994) to obtain reliable results, the minimal number of participants providing usable data for the analysis should be the larger of 100 participants or 5 times the number of variables or items being analyzed. Besides, Gorsuch (1983) recommended that at least 100 samples be appropriate for this type of research. According to these guidelines, 100 samples might have been adequate for this research considering 20 items included in questionnaire. Alternatively, Hatcher (1994) recommended that selection of more samples may produce better results. Being motivated, this study selects one hundred and fifty (150) respondents as sample for this study. No sampling frame was found to select the respondents.

Data Collection

Data were collected from samples using convenience sampling method of non-probability sampling technique. Malhotra and Dash (2011) stated that this type of sampling

technique enables researchers to quickly reach desired number of participants from the nearby population. The study uses both primary and secondary data.

The researcher employed personal interview form of survey method to collect primary data from the respondents. Personal interview survey is preferred for this study since it has the advantage of exploring the responses of the people to gather more meaningful and deeper information (Explorable, 2018). Moreover, the response rate is usually high and also more complex questions designed to elicit detailed information can be possible (Statistical Training Unit, 2010). A structured questionnaire was used as the instrument to gather data from the samples. Cyfar (2018) wrote that use of questionnaire in personal survey is a good technique as responses can be analyzed with quantitative methods by assigning numerical values to a scale. Moreover, results are generally easier to analyze. Regarding the use of questionnaire Akinci and Saunders (2015) mentioned that questionnaire is a good instrument to collect data about opinions, behaviors, and attributes from a large number of people. Valuable secondary data were collected from sources like journal, books, articles, websites, and reports etc.

In the questionnaire 5-point Likert scaling was used: where Strongly Disagree equals to (1), Disagree (2), Neutral (3), Agree (4), and Strongly Agree (5). Brendan (2013) found that Likert-type scales are useful in the time of measuring characteristics of people such as attitudes, feelings, opinions, etc. It is also useful to measure unobservable individual characteristics as no concrete, objective measurement is existent. Likert-type or frequency scales use fixed choice response formats and are designed to measure attitudes or opinions (Bowling, 1997).

Data Analysis

Data is analyzed using the Statistical Package of the Social Science (SPSS) software. The demographic data of the samples have been analyzed using frequency distribution. Besides, factor analysis is used to identify key factors inducing fasting muslim consumers to abandon consumption of unhealthy foods in ramadan in Bangladesh. Principal Component Analysis (PCA) using Varimax with Kaiser Normalization method of Factor Analysis has been used in the study.

5. Analysis and Findings of the Study

Frequency Distribution of the demography of the respondents

Table 1: Frequency Distribution of the Respondents' Demographic data

Respondents' Gender	Gender	Number of respondents	Frequency
	Male	85	57%
	Female	65	43%
	Total	150	100%
Respondents' Age	Age	Number of respondents	Frequency
	Below 25 years	20	13%
	26-35 years	60	40%
	36-45 years	30	20%
	46-55 years	25	17%
	Above 55 years	15	10%
	Total	150	100%
Respondents' Education	Education	Number of respondents	Frequency
	SSC	15	10%
	HSC	25	17%
	Graduation	55	47%
	Post-Graduation	30	20%
	Below SSC or no education	25	17%
	Total	150	100%
Respondents' Profession	Profession	Number of respondents	Frequency
	Student	20	13%
	Business	30	20%
	Service	70	47%
	Housewife	20	13%
	Other	10	7%
	Total	150	100%

Table 1 presents the gender, age, educational qualification and profession of the respondents observed by this research. Gender distribution shows that more males (57%) have abandoned consuming unhealthy foods in ramadan than females (43%). The age

distribution reveals that young-middle aged (age between 26 to 45 years, 60% altogether) consumers are more intended to avoid unhealthy foods whereas senior citizen (age of or above 45 years, 27% altogether) are also in the category of dropping unhealthy foods in ramadan.

An important indication of the education level distribution of the respondents is that consumption of unhealthy foods are less common among the highly educated groups (67% altogether whose education is equal to or higher than graduation or post-graduation level). This implies that high literacy rate may increase awareness about healthy diets among the consumers. People engaged in service sector (47%) are more susceptible to stop consuming unhealthy meals in ramadan whereas businessmen (20%) also show positivity towards dropping unwholesome foods from their ramadan meals.

This study presents a major consumption related behavior of consumers. This paper tries to identify the factors that induce fasting muslim consumers to abandon or stop consuming unhealthy foods in ramadan. Factor analysis has been utilized to conduct the study and the use of factor analysis has been justified by KMO and Bartlett's Test of Sphericity.

Reliability of Data

Table 2: Reliability Statistics

Cronbach's Alpha	No of Items
.611	20

The Cronbach's Alpha is a measure of reliability of the statistics. According to Hair et al. (1998) Alpha value of 0.70 and higher is often considered the criterion for internally consistent established factors. Alternatively, Nunnally (1978) suggested that, Alpha value of 0.50 and 0.60 is also acceptable in the early stages of research. Since, this study has Cronbach's Alpha value of 0.661 with internally consistent 20 variables or items, which is higher than the acceptable limit of 0.50 or 0.60. Therefore, the present study may reliably go further with this Alpha value as justified by the preceding literatures.

KMO and Bartlett's Test of Sphericity

Table 3: KMO and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.647
Bartlett's Test of Sphericity	Approx. Chi-Square	623.130
	Df	190
	Sig.	.000

Burton and Mazerolle (2011) stated that, to examine the sampling adequacy and data suitability for factor analysis some tests must be required to administer. These tests are to be conducted before extraction of the constructs. Besides Netemeyer, Bearden and Sharma (2003) mentioned that, researchers can go ahead with factor analysis for their research since KMO indicates sample adequacy and Bartlett's Test of Sphericity indicates that item correlation matrix is not an identity matrix.

The adequacy of the sample can be assessed by examining the Kaiser-Meyer-Olkin (KMO) (Kaiser, 1970). KMO measure ranges from 0 to 1. But 0.50 is also a suitable measure for Factor Analysis validated by Hair et al, (1995). In addition to the previous literatures Netemeyer, Bearden and Sharma (2003) also found that, Factor Analysis output with a correlation above 0.60-70 is adequate.

The Kaiser-Meyer-Olkin (KMO) measure seen from the following table is 0.647 which is well above of 0.50. This indicates that this measure is adequate, well-accepted and good to conduct the Factor Analysis in this study.

To make the chi-square output significant, Bartlett's Test of Sphericity (Bartlett, 1950) is viable. This test verifies that correlation matrix is not an identity matrix and is significant when the p value is less than 0.05 in Factor Analysis (Hair et al., 1995).

According to Malhotra and Dash (2011) Bartlett's Test of Sphericity is a test statistic used to examine the hypothesis that the variables are uncorrelated in the population that means population correlation matrix is not an identity matrix.

The approximate Chi-Square statistic for this research is 623.130 with 190 degrees of freedom that is significant at the 0.05 significance level. This infers that the null hypothesis, that the population correlation matrix is an identity matrix, is rejected by Bartlett's Test of Sphericity (Malhotra and Dash, 2011). This also infers that there is truly significant difference among all the factors inducing fasting muslim consumers to abandon consumption of unhealthy food items in ramadan.

Once it has been stipulated that factor analysis is appropriate for this research, the next thing is to select an appropriate method of extracting factors. Principal Components Analysis (PCA) can be used as a commonly studied method of factor extraction (Tabachnick and Fidell, 2001).

Principle Component Analysis (PCA) is used since it is appropriate when no prior theoretical basis or model exists (Gorsuch, 1983) and also when researchers have initially developed an instrument with several items and are interested in reducing the number of items (Netemeyer et al., 2003).

This study uses Kaiser Normalization (K1) method developed by Kaiser (1960) to choose constructs based on Eigenvalues. Regarding K1 approach, Malhotra and Dash (2011) stated that in K1 approach Eigenvalues greater than 1.00 are retained and other values less than 1.00 are excluded.

Communalities

In Principal Component Analysis (PCA) communality is used to measure the ratio of an item's unique variance to its shared variance, known as its communality (Samuels, 2016). Child (2006) stated that item of factor analysis having communality score of less than 0.20 is advisable to be removed from the research.

According to Costello and Osborne (2005) researchers coming up with items with low communality scores commonly 0.40 or less than that are small scores. In this case the researchers are suggested to explore additional factors for further studies.

The communality table (*see appendix, table 4*) presents communality scores of all 20 items of this study. The extracted communality scores show that all the values are greater than 0.20 or 0.40. This concludes that variables are well-fitted with the factor analysis, and thus variables are appropriate to be kept for this research.

Total Variance Explained

Total Variance Explained

Table 5: Total Variance Explained in Principal Component Analysis (PCA) of Factor Analysis

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.749	18.745	18.745	3.749	18.745	18.745	2.530	12.648	12.648
2	2.000	10.002	28.747	2.000	10.002	28.747	1.983	9.916	22.564
3	1.616	8.079	36.826	1.616	8.079	36.826	1.870	9.348	31.912
4	1.444	7.218	44.044	1.444	7.218	44.044	1.640	8.198	40.110
5	1.349	6.743	50.786	1.349	6.743	50.786	1.557	7.783	47.893
6	1.128	5.639	56.426	1.128	5.639	56.426	1.473	7.363	55.256
7	1.017	5.086	61.512	1.017	5.086	61.512	1.251	6.256	61.512

Extraction Method: Principal Component Analysis.

IBM (2018) mentioned that, the Total column gives the Eigenvalues or amount of variance in the original variables that is accounted for by each component. The % of Variance column gives the ratio, expressed as a percentage, of the variance accounted for by each component to the total variance in all of the variables. The Cumulative % column gives the percentage of variance accounted for by the first n components. Hafez (2014) stated that, Eigenvalues are the indicator of how much of the total variance of all variables are covered by the factor.

According to Kaiser's criterion (Kaiser, 1960), factors that have Eigenvalues of 1.00 and greater than 1.00 are extracted for further research. The results of principal component analysis of this study find that, there are seven (7) factors whose Eigenvalues are greater than 1.00 and these factors explain 61.51% of the total variance cumulatively. Here, the first factor explain 18.75% and the other six factors explain 10.00%, 8.08%, 7.22%, 6.74%, 5.64%, 5.09% respectively. The percentage of variance of all 20 variables cumulatively makes 100%. The study applies Kaiser's criterion and Cattell's scree test to extract the first 7 factors.

The above table also depicts the extracted sum of squared loadings for the 7 factors. Malhotra and Dash (2011) mentioned that, extracted sum of squared loadings provide the variances associated with the factors that are retained. It is found by dividing the associated Eigenvalues by the total number of variables and multiplying by 100.

This research finds a cumulative variance of 61.512% for the extracted sums of squared loadings with 7 factors retained. Solaiman, Rana and Hasan (2015) indicated that, rotated sums of squared loadings present the distribution of the variance after the rotation of Varimax. Varimax rotation

is done to maximize the variance of each of the factors so the total amount of variance accounted for is to redistribute the total variance over the extracted factors. This study shows a cumulative 61.512% of variances in rotated sums of squared loadings which is same as extracted sums of squared loadings with 7 factors retained.

Scree Plot

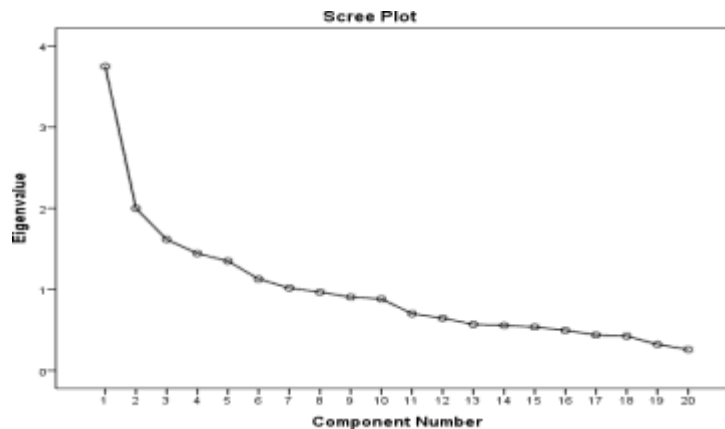


Figure 1: Scree Plot

To determine how many factors are to be retained in factor analysis, a popular rule of thumb is plotting all the Eigenvalues in their decreasing order in scree. The plot is like a mountain side, and scree refers to the fallen debris from a mountain that is lying at its base. So, the scree test calls for to stopping analysis at the point the mountain ends and the debris begins (Janda, 2003).

In another ways to plot the visual exploration of a graphical representation of the Eigenvalues a scree plot is highly effective (Cattell, 1966). In Principal Components Analysis (PCA) and factor analysis, scree plot is used to visually assess which components or factors explain most of the variability in the data. The ideal pattern in a scree plot is a steep curve, followed by a bend and then a flat or horizontal line. The rule of thumb is that only those components or factors are retained in the steep curve before the first point that starts the flat line trend (Minitab, 2018).

This scree plot of this study shows that seven (7) factors explain most of the variability as a distinct break happens at factor 7. The other remaining factors contribute a very mere proportion of the variability and may be considered as less important variables.

Rotated Component Matrix

Rotated Component Matrix^a

Table 6: Rotated Component Matrix using Varimax with Kaiser Normalization method in Principal Component Analysis (PCA)

	Component						
	1	2	3	4	5	6	7
Difficult to absorb the oily food items into the body	.703						
Insufficient nutritious values	.659						
Zero or low health values of packaged juice items	.655						
Contain the risk of gastric and ulcer	.492						
Difficult to fast for long hours consuming low calorie foods. Low containment of complex carbohydrate in food items		.710					
Risk of health hazard		.704					
Low digestibility			.629				
Contain harmful chemicals and artificial colors			.581				
Inadequate fluids in food items			.415				
Do not have sufficient energy to continue fasting				.572			
Contain low vitamins				.512			
Humid weather call for more vitamins to heath to fast					.769		
Mass media promotion on unhealthy foods consumption					.732		
High literacy rate among consumers						.776	
Information provided by social media on unhealthy foods						.743	
Health consciousness of the fasting muslims						.741	
Result in unfit health						.557	
Uncomfortableness in saying tarabi prayer							.815
							.614

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization

a. Rotation converged in 7 iterations.

This study has used Principal Component Analysis (PCA) of Factor Analysis with Kaiser Normalization method of Varimax rotation. According to Taherdoost, Sahibuddin and Jalaliyoon (2014) Varimax rotation is the most common form of rotational methods for exploratory factor analysis and will often provide a simple structure.

Abdi (2003) found that, Varimax rotation results in factors with small number of large loadings and a large number of zero (or small) loadings. The factors are to be interpreted from the opposition of few variables with positive loadings to few variables with negative loadings.

Before interpreting the factor loadings of Rotated Component Matrix researchers need to fix the cut-off for statistically meaningful rotated factor loadings (Yong and Pearce, 2013). For determining cut-off for rotated factor loadings, Tabachnick and Fidell (2014) suggested that factor loadings with an absolute value less than 0.32 should be ignored. Taking this suggestion workable, Samuels (2016) recommended ignoring factor loadings less than 0.3. For this study, factor loadings with an absolute value equal to or more than 0.40 is utilized.

The above table shows that the Rotated Component Matrix has extracted seven (7) rotated factor loadings related to consumers' abandonment of unhealthy foods consumption in ramadan named respectively as *Factor 1*: no or low health benefits, *Factor 2*: inadequate carbohydrates in food items, *Factor 3*: potential health hazard, *Factor 4*: lack of energizing food values, *Factor 5*: low vitamin enrichment, *Factor 6*: consumer awareness about unhealthy foods and *Factor 7*: physical discomfort.

No or low health benefits factor positively correlates with V1 (Difficult to absorb the oily food items into the body), V2 (Insufficient nutritious values), V3 (Zero or low health values of packaged juice items) and V4 (Contain the risk of gastric and ulcer). This factor indicates that fasting muslim consumers' decision to abandon unhealthy foods in ramadan is influenced by their understanding of that these foods have no or low health benefits.

Inadequate carbohydrates in food items factor has positive correlation with V5 (Difficult to fast for long hours consuming low calorie foods) and V6 (Low containment of complex carbohydrate in food items) and thus interpreted that fasting muslim consumers are induced to drop unhealthy foods because of their inadequate containment of carbohydrates.

Potential health hazard factor has positive correlation with V7 (Risk of health hazard), V8 (Low digestibility) and V9 (Contain harmful chemicals and artificial colors). This

infers that possible health hazard from unhealthy foods induce fasting muslim consumers to abandon consuming these detrimental food items in ramadan.

Lack of energizing food values factor positively correlates with V10 (Inadequate fluids in food items) and V11 (Do not have sufficient energy to continue fasting). This factor indicates that fasting muslim consumers' decision to abandon unhealthy foods in ramadan is influenced by consumers' knowledge that these unhealthy food items lack energy producing ingredients and food values.

Low vitamin enrichment factor indicates that fasting muslims drop unhealthy foods from their meals as the food items are low vitamin enriched. This is justified by its positive correlation with V12 (Contain low vitamins) and V13 (Humid weather call for more vitamins to health to fast). *Consumer awareness about unhealthy foods* factor has high positive correlation with V14 (Mass media promotion on unhealthy foods consumption), V15 (High literacy rate among consumers), V16 (Information provided by social media on unhealthy foods) and V17 (Health consciousness of the fasting muslims). Thus it indicates that fasting muslim consumers have abandon consuming unhealthy foods because they are more aware of their health and conscious of taking healthy food in ramadan than before.

Physical discomfort factor is positively correlated with V18 (Result in unfit health) and V19 (Uncomfortableness in saying tarabi prayer). This indicates that fasting muslim consumers abandon consuming unhealthy foods, that can cause discomfort to body, in ramadan since they consider their physical comfort as important in this month.

V20 (Recommendation of health nutritionist) does not show any correlation with any other variables in the analysis and also possesses very poor loading scores. As a result this variable or item may be ignored or dropped in from this research.

6. Implications of the Study

The research is undertaken to identify the factors inducing fasting muslim consumers' abandonment of unhealthy foods consumption in ramadan in Bangladesh. The findings of the study reveal that seven factors induce Bangladeshi fasting muslim consumers to abandon consuming unhealthy foods in ramadan. The study brings forth some implications significantly relevant with the food marketers, the fasting muslim consumers, and the researchers. The implications are presented in the following manner:

Implications for marketers

- ◆ This study will help food marketers understand consumer food habits in ramadan. This learning will help them run a healthy foods marketing program in ramadan for the fasting muslims.

- ◆ Marketing firms can find new avenue for creating awareness on healthy foods in ramadan for muslims. They can promote to encourage consumers to avoid consuming unhealthy foods and choose the healthy items marketed by the firms.

Implications for consumers

- ◆ This research shows how unhealthy foods consumption in ramadan can be hazardous to health. Moreover, it presents healthy eating choices among the fasting muslim consumers.
- ◆ Marketers' awareness creating program on Consumers' intention towards purchasing healthy foods in ramadan may be increased by different campaigns carried out by the food marketers on healthy foods consumption.
- ◆ This study is believed to be enriching fasting muslim consumers' knowledge on healthy eating habits, healthy food preferences, health protection and choosing balanced diets in the month of ramadan.

Implications for academicians

- ◆ Since this is a new kind of study conducted on foods consumption habit of fasting muslims in the month of ramadan in Bangladesh it will add new dimensions to existing literatures on food habits and healthy foods consumption. The findings of this study will also be valuable inputs to academicians who want to conduct research on this field.

7. Conclusion

This paper presented that consumption of unhealthy foods can be detrimental to the health of fasting muslim consumers and aimed at identifying the factors that fasting muslim consumers consider to abandon consuming these unhealthy foods in ramadan. The study uses principal component analysis of factor analysis to identify the factors. The study reveals that: no or low health benefits, inadequate carbohydrates, potential health hazard, lack of energizing food values, low vitamin enrichment, consumer awareness about unhealthy foods and physical discomfort induce fasting muslim consumers of Bangladesh to abandon consuming unhealthy foods in ramadan. Findings of this study will enormously contribute to consumer behavior research field. The findings of this research will help marketers to market consumer-demanded nourished, vitamin-enriched, energized food items. These healthy foods will ensure health benefits, food-values, energy, comfort and easy digestibility to the consumers.

8. Limitations and Future Direction of Research

The study faced the following limitations:

- ◆ Convenience sampling method used in this research bear the risk of selection bias or non- representativeness issues.

- ◆ No well-defined sampling frame was found. If found, data collection process might have faced less hardships.
- ◆ This study picks up a sample of 150. For more representative results large sample size may be recommended.

This study finds only handful literatures on this research field. As a result, more research on this field may be undertaken further to tap into these consumer behavior change issue. Moreover, items or variables used in this type research may be enlarged to make the results more effective and significant.

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Appendix**Table 4: Communalities in Principal Component Analysis (PCA) of Factor Analysis**

Communalities		
	Initial	Extraction
Result in unfit health	1.000	.709
Recommendation of health nutritionist	1.000	.753
Mass media promotion on unhealthy foods consumption	1.000	.706
Information provided by social media on unhealthy foods	1.000	.671
Health consciousness of the fasting muslims	1.000	.584
High literacy rate among consumers	1.000	.646
Risk of health hazard	1.000	.618
Contain harmful chemicals and artificial colors	1.000	.596
Humid weather call for more vitamins to health to fast	1.000	.704
Contain low vitamins	1.000	.442
Low digestibility	1.000	.461
Contain the risk of gastric and ulcer	1.000	.587
Uncomfortableness in saying tarabi prayer	1.000	.660
Zero or low health values of packaged juice items	1.000	.563
Insufficient nutritious values	1.000	.562
Difficult to absorb the oily food items into the body	1.000	.566
Do not have sufficient energy to continue fasting	1.000	.681
Inadequate fluids in food items	1.000	.572
Low containment of complex carbohydrate in food items	1.000	.595
Difficult to fast for long hours consuming low calorie foods.	1.000	.626

Extraction Method: Principal Component Analysis.

