

ATTRIBUTES OF FOOD LITERACY LINKED WITH TERTIARY LEVEL STUDENTS IN DHAKA CITY, BANGLADESH

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Abstract

This qualitative study set out to recognize attributes of food literacy linked with tertiary level students, who live independently and manage their own food and living. The purpose was to acknowledge the knowledge, technical skills, and social norms that preserve food literacy from the viewpoint of Bangladeshis. Qualitative data was collected from 31 in-depth interviews with tertiary level students in Dhaka city. To analyze data sets, words were distilled into fewer categories through qualitative content analysis based on previously identified attributes of food literacy from existing literature. This led to separation of ten attributes of food literacy linked with tertiary level students. The key attribute of food literacy identified in the category 'self-controlled attributes' is 'Positive food attitudes'. Within the same category, 'Awareness of food type, ingredients and production environment' as well as 'choosing healthy food options' are some of the useful attributes of food literacy observed in this study. 'Social support to learn and share food' is an attribute of great significance found in the category 'attributes beyond self'. The results indicate that application of food literacy can salvage younger generation's declining connection to food caused by rising popularity of convenience food which in turn can possibly address the increasing trend in overweight and obesity alongside under-nutrition in developing nations, for example in Bangladesh. The findings of this study will facilitate the making of a food literacy implementation guide for Bangladeshis, which would be beneficial to evaluate interventions targeted at improving nutrition.

Keywords: Bangladesh, Food literacy, Nutrition, Public Health, University Students.

1. Introduction

Due to nutritional transition, many developing countries are experiencing a shift from underweight to overweight (Popkin et al, 2012). Over the last two decades, Bangladesh, a low-income country, has experienced a rapid demographic and epidemiological transition (Biswas et al, 2017 from Gortmaker et al, 2011; Rahmouni, et al, 2005). The culture of fast food consumption has replaced the traditional meal among university students and is a great public health concern (Nipun et al 2017). Excessive consumption of fast food is responsible for obesity epidemics and the cause of a dramatic increase of obesity-related diseases (Nipun et al 2017).

Many students pursue their studies away from family, hence the beginning of a very challenging independent life outside the comfort of their home without the care of the parents and other caregivers. Bad eating habits are apparent among tertiary level students (TLS), those who have transitioned to an independent life. A study results demonstrated that approximately 22% of the respondents mentioned that they consumed fast food 4 days per week and more than one-fifth had the meal every day. Fifty four percent of the respondents skipped their breakfast due to a variety of reasons including class pressure and had fast food after finishing their classes, either

from varsity canteens or other fast-food outlets (Bipasha and Goon, 2013). Though 98% of the students were well informed about the negative effects associated with excessive fast food consumption, they were still profoundly addicted to it (Bipasha and Goon, 2013).

Bipasha and Goon (2013) suggested that specific health education programs, dietary guidelines and effective public awareness campaigns could be initiated to address the unhealthy lifestyle of university students and improve their health. So, it is important to recognize the implications of these changes from a public health, environmental, and educational perspective (Demas, 2014).

Many of these problems have coincided with the rise of “nutrition science”, where, the primary focus is on the role of nutrients in disease prevention or control and traditional, culturally-relevant cuisines are rendered invisible (Colatruglio, 2016 from Beauman et al., 2005, p. 783; Nestle, 2013). Although this approach has produced a vast amount of knowledge its inherently reductive focus on nutrients has promised individualistic solutions to complex public health problems, on which it has not delivered (Colatruglio, 2016 from Nestle, 2013, Pollan, 2007; Scrinis, 2008). While nutrition education focuses on food intake and how the body utilizes nutrients for growth, development, and health, food literacy has a wider scope that ranges across food production, procurement, preparation, processing, packaging, and labeling to food choice and consumption (Murimi, 2013). An elaborate definition was given by Desjardins (2013) i.e. “A set of skills and attributes that help people sustain the daily preparation of healthy, tasty, affordable meals for themselves and their families. Food literacy builds resilience, because it includes food skills (techniques, knowledge and planning ability), the confidence to improvise and problem solve, and the ability to access and share information. Food literacy is made possible through external support with healthy food access and living conditions, broad learning opportunities, and positive socio-cultural environments”.

Today, people do not have to spend as much time and energy ensuring a consistent food supply for the family, they have lost the precious connection to food (Demas, 2014). Food Literacy” should be explored, since it embraces the related attributes of confidence, self-efficacy and resilience that are associated with the ability to access and prepare healthy, satisfying meals -- as well as the ability to manage a limited income and deal with life challenges as they inevitably arise (Desjardins (2013). With this intellectual and practical skills as well as confidence, students can make better dietary choices, prepare nutritious meals for themselves, and avoid future health risks such as obesity, diabetes and other diet-related diseases (Demas, 2014). Sadly, most educational institutes do not have food literacy education as part of their curricular agenda (Demas, 2014). To benefit students and families who struggle, food literacy education must emphasize cooking knowledge and include resources like food pantries (Demas, 2014).

It is in this regard that this study aimed to explore the food experience and food related knowledge, skills and attitudes of the TLSs by identifying attributes of food literacy linked with them in order to acknowledge these attributes for promoting the benefits of enhanced food literacy before the global transition in nutrition completes its course in developing nations, Bangladesh for instance, where convenience food is not as widespread as opposed to developed nations.

2. Method

2.1 Materials

In-depth interviewing was used to understand how students of four universities in Dhaka city manage their food after leaving their family of origin homes. This paper will represent the attributes of food literacy linked with TLSs that has been separated through analysis of qualitative data. The data also revealed food literacy attribute descriptors not linked with TLSs which have been identified as **areas** of focus for food literacy implementation (another paper

will report this elsewhere). A semi-structured interview guide was used that was pilot tested on four individuals from the population of interest. A few changes were made to the structure after the completion of pilot testing. Interviews conducted took approximately 20-25 minutes. The participants were given a choice to write down some of the answers if required which took additional 10-20 minutes. Ethics permission was obtained from the Chairman of the department of Food and Nutrition of Bangladesh Home Economics College under the guidelines of University of Dhaka to protect the rights of human participants.

2.2 Participants

The population of interest for this study was similar to that of Colatruglio's (2016), students from four universities in Dhaka city who have newly transitioned into independent living, are responsible for feeding themselves and have financial constraint. Participants were primarily recruited through oral invitation with the help of co-workers, friends, and friends of friends over 18 years of age, who are known to the primary researcher (MMH). All participants signed a consent form prior to the commencement of their interview. A total of 31 interviews were conducted for the collection of data.

2.3 Data Analysis

Food literacy is an emerging concept in the literature and lacks strong theoretical foundations; hence qualitative methods were deemed most suitable (Colatruglio, 2016). This qualitative study used qualitative content analysis method; deductive content analysis is useful when the structure of analysis is operationalized on the basis of previous knowledge (Elo and Kyngas, 2007).

Both inductive and deductive analysis processes are represented as three main phases: preparation, organizing and reporting. The preparation phase starts with selecting the unit of analysis (Elo and Kyngas, 2007 from McCain 1988, Cavanagh 1997, Guthrie et al. 2004). Deciding on what to analyse in what detail and sampling considerations are important factors before selecting the unit of analysis (Cavanagh 1997). Mayring proposed following steps for deductive category development: a) the research question, b) theoretical-based definitions of categories, c) theoretical-based formulation of coding rules, d) the revision of categories, e) the final working through text, and f) the interpretation of results. This paper focuses on the results that have been generated from qualitative data to answer the research question i.e. **'Which attributes of food literacy are linked with tertiary level students?'** The unit of analysis was **'any food literacy attribute descriptor mentioned by Azevedo et al (2017) that is related data'**.

Depending on the aim of the study a structured matrix of analysis was used. After a categorization matrix has been developed, all the data were reviewed for content and coded for exemplification of the identified categories.

Coding in qualitative content analysis can attend to the manifest as well as the latent content meaning of communications (Graneheim & Lundman, 2004). To answer the research question the visible and surface content of texts were coded which is manifest content. Although both grounded theory and qualitative content analysis follow coding processes, content analysis does not focus on finding relationships among categories or theory building; instead, it focuses on extracting categories from the data. The final result was a list of categories with examples as evidence. The interpretation of the result was made through thorough discussion.

3. Results and Discussion

3.1 Demographics

A total 31 TLSs were interviewed concerning their food experience and food related knowledge, skills and attitudes which represented their food literacy. Among the TLSs, 14 (45%) were females and 17 (54%) were males. The range of age with maximum number of TLSs was 20-22 years with a total of 17 (55%) participants. The lowest number of participants belongs in the age range 26-27 years with only 3 (9%) participants. The table 2 shows list of attributes of food literacy linked with TLSs. The attributes are divided into two broad categories, self-controlled attributes and attributes beyond self. The results are validated with participants own words from interview transcripts. Additionally, the gender of TLSs is included with each response.

Table 1 Demographic disposition

	Tertiary level students N=31 Number (%)
Gender	
Male	17 (45)
Female	14 (54)
Age	
20-22 years	17 (55)
23-25 years	11 (35)
26-27 years	3 (9)

Table 2 Attributes of food literacy linked with tertiary level students, categorized by self controlled attributes and attributes beyond self, distilled from qualitative data (N-frequency of the attribute mentioned in interviews).

Broad Category	Attributes of food Literacy linked with tertiary level students (Descriptors)	Responses of tertiary level students
Self-controlled attributes	Awareness of food type, ingredients and production environment (Awareness of the type and /or varieties of foods, environment in which food is produced and knowing the ingredients) N=18	By healthy food I mean small fish, leafy vegetables, fibrous vegetables, local fish, a good amount of meat and pulses that are cooked with sufficient amount of all ingredients. (Male) Foods from outlets are not prepared in hygienic environment. We don't see how they make food. Homemade food can be prepared according to one's own liking and need. (Female)
	Awareness of nutrient function and balanced diet (Awareness of nutrients and their relevance to health and well-being and understanding how foods fit into a balanced diet) N=8	Healthy food is balanced food. We get balanced food when we eat a balanced portion of protein, carbohydrate, vitamins etc. (Male) By healthy food I mean food that is nutritious, food that can not only relief hunger but also can help growth/body building and repair damage. (Female)
	Ability to cook and prepare food (Ability to	I know how to prepare food....I can follow some recipes like biriyani, roast, sweets, chatpati, fochka etc. In the morning, I eat semai, roti, eggs and drink tea. I eat fish/meat/egg, dal and vegetables at lunch and a light meal for dinner. I make all of it. (Female)

	<p>prepare meals; ability to perform cooking tasks and use recipes) N=40</p> <p>Understanding food function and budget (Belief in one's relative ability to basically understand the nature of food and how it is important; and understanding how to select and purchase nutritious foods and meal within a budget in a complex food environment) N=53</p> <p>Kitchen Self-Efficacy (Belief in one's relative ability to prepare food; and confidence to prepare a good-tasting meal from whatever is available) N=10</p> <p>Positive food attitudes (Desire to learn how to prepare food; and developing a positive attitude and healthy relationship towards food) N=68</p> <p>Choosing healthy food options (N=12)</p>	<p>It's really important to eat healthy because without healthy food you may suffer from under nutrition. (Female)</p> <p>Foods that can be purchased on a low budget and are of good quality should be chosen...like vegetables, dal and eggs are of low cost and healthy and can be purchased on a budget. (Female)</p> <p>I cook for myself so even if I eat plain rice and dal I find it satisfying. I like to use more oil to make food tasty. No one taught me how to cook. I learnt by trial and error. I started at 18. I made mistakes and cooked bad food at the beginning but then I got better at some point. I've never used a recipe. I cook from my experience and hunch, I put whatever I feel like I need to mix into a food. I can make my own recipes. (Male)</p> <p>I've learnt to cook myself after transitioning to Sub-let life (independent living in a shared apartment). I think I'm a good cook because I taught myself how to cook. (Female)</p> <p>I'm a lot curious about food preparation and I want to learn about more ways to make food...like desserts or fast food. I want to learn from people I know or from the internet. (Female)</p> <p>I do know how to prepare food, it's an art. I really enjoy preparing food. It's a feeling of great joy. I've never imagined that I will ever prepare food. But now it runs through my veins. (Male)</p> <p>I like fast food but I like homemade food better. Even though homemade food costs more, it retains all the goodness so it's worth it. (Male)</p>
<p>Attributes beyond self</p>	<p>Awareness of healthy food intake (demonstrate self awareness regarding need for healthy food intake) N=5</p> <p>Social support to learn and share food skills (N=11)</p> <p>Household food facility (Capacity to access healthy food, affordable housing, food and cooking equipment) N=16</p>	<p>My mom is a great cook because she can cook delicious meals without using too much oil and spices. (Male)</p> <p>I learnt to cook at 17. My mom taught me. (Male)</p> <p>After SSC (secondary school certificate exam) I went to a congregation called Tablig e jamat where an elderly gentleman taught me how to cook because everyone was responsible for their own food. (Male)</p> <p>I live in a rented room shared with four people. Everyone does their own groceries and cooking. The food I eat is healthy because I make it myself. (Female)</p> <p>The apartment is neat and clean so it's good for healthy eating. We keep things tidy and clean the kitchen every day. We have all the facilities to eat healthy. (Female)</p>

3.2 Self Controlled Attributes

Sixteen self-controlled food literacy attribute descriptors were identified and grouped into following seven categories (i) Awareness of the type and /or varieties of foods, environment in which food is produced and knowing the ingredients; (ii) Awareness of nutrients and their relevance to health and well-being and understanding how foods fit into a balanced diet; (iii) Ability to prepare meals; ability to perform cooking tasks and use recipes; (iv) Belief in one's relative ability to basically understand the nature of food and how it is important; and understanding how to select and purchase nutritious foods and meal within a budget in a complex food environment; (v) Belief in one's relative ability to prepare food; and confidence to prepare a good-tasting meal from whatever is available; (vi) Desire to learn how to prepare food; and developing a positive attitude and healthy relationship towards food; and (vii) Choosing healthy food options. Each of these attribute descriptors were labeled to a smaller term for convenience. Responses of TLSs were coded as exemplification of the identified categories.

3.3 Attributes Beyond Self

Five food literacy attribute descriptors were identified and grouped into following three categories within the broad category Attributes beyond self (i) demonstrate self awareness regarding need for healthy food intake; (ii) Capacity to access healthy food and affordable housing; and (iii) Capacity to access healthy food, affordable housing, food and cooking equipment.

4. Discussion

The findings point to the need to apply food literacy among Bangladeshis who may benefit from enhanced food literacy. Therefore, it is important to put emphasis on these identified attributes of food literacy in order to promote the benefits of enhanced food literacy in context of Bangladesh where the use of the term 'food literacy' has not been reported previously.

An attribute of great significance is **positive food attitudes** which can influence the outcome of other attributes. It is the desire to learn food preparation, developing a positive attitude and healthy relationship towards food. TLSs mentioned their willingness to acquire more food preparation and cooking skills to increase their food options. TLSs expressed their joy in preparing food and demonstrated a healthy relationship with food. Some acknowledged it to be a difficult task but considered it to be useful. They believed it is important to have knowledge of food preparation. To the authors' observation, these attitudes influence their food decisions and will enable them to become more food literate in the future. Although it is a self-controlled attribute, the authors believe family values play an indirect role in creating a positive attitude. TLSs with positive food attitude believed it is urgent for both men and women to have knowledge of food preparation to help each other in the process.

Understanding food function and budget is an important attribute of food literacy found in this study. The importance of eating healthy food and TLSs' perceived understanding of healthy food and how it affects health in general is highlighted in this attribute. Scripa and Vaitkeviciute et al. in particular suggested such knowledge would help individuals understand what makes foods 'healthy' and 'unhealthy. TLSs perceived food consumption from different food groups as healthy and why it's required for the body. It is known that eating many different foods helps maintain a healthy and interesting diet which provides a range of different nutrients to the body. Eating a variety of foods promotes good health and can help reduce the risk of disease. (Better health, Victoria, Government of Australia). TLSs preferred vegetables, pulses, eggs and small fish to eat good on a budget and on a failed budget they would consume a vegetarian diet to eat healthy. Recent studies of the long-term health effects of meat-free, plant-based diets have provided further evidence of their benefits. A study found that vegetarians have the lowest average body mass index (BMI) and meat eaters have the highest BMIs (Rizzo et al,

2013). According to the authors of this paper, participants chose vegetarian diet under unfavorable economic conditions thus it may alter with the increase in financial capacity.

Ability to cook and prepare food is an important attribute of food literacy among self-controlled attributes. TLSs appeared to eat more comfort food when they cooked and prepared food for themselves. Skills related to food selection, preparation, handling and storage were explicitly mentioned as being fundamental to food literacy (E Azevedo Perry et al, 2017). Food literacy is ability to make a good tasting meal from whatever food is available (Vidgen and Gallegos et al, 2014). Female TLSs were at advantage of having basic food skills to cook and prepare food. In Bangladesh, the society trains womenfolk to be engaged in the kitchen for the most part of their lives, hence the authors do not see this as an advantage in an actual sense. However, it is predicted by the authors that with the advancement of society, more women will transition into independent living and become detached from food skills and more people will become dependent on convenience food which is not common in developing nations as opposed to developed nations. Being able to prepare food increases the chance of acquiring food literacy; therefore, it is important to acknowledge this attribute. Empowering people to choose affordable, healthy food and preparing meals at home in order to lower expenses are just two ways that food literacy can help improve our communities (Spencer Sandor, 2016).

Another attribute of great importance in the self-controlled attributes is **awareness of food type, ingredients and production environment**. TLSs were able to identify different types of food from different food groups and harmful ingredients. However, it occurred to the authors that they learnt it in a deliberative process, indicating most of them were not consciously aware. Food safety concerns in Bangladesh have been a major issue for people to demand safer food options. The problem with food preparation in unhygienic environment is well apparent in the country making it a challenge for people to consume safe food on a daily basis. Adulterant in food is also another chief problem. Food adulteration is a growing problem in Bangladesh as large numbers of consumers have become victims of consuming adulterated foods. The newspapers have out and out conferred it, as the ‘silent killer’. (Rahman B, 2017). TLSs expressed their concerns about the unhygienic environments in which commercially prepared food is produced and also their concerns for adulterants in food. The authors believe it is due to overall food hygiene crisis in the country and also due to tremendous food safety concerns propagated by mass media; there were some awkward mentioning of chemicals in food by TLSs. The Institute of Public Health (IPH) in Dhaka and the World Health Organisation (WHO) in their joint study of 1994 on food adulteration tested 52 street vendors and found that, all of the vendors’ food samples were contaminated with different types of disease breeding micro-organisms. TLSs seemed to utilize this knowledge and make healthy food choices.

TLSs chose homemade food over food from outlets which is attributed to the food literacy attribute ‘**Choosing healthy food options**’. The reasons mentioned for this choice are; ingredient quality, price, food safety etc. TLSs indicated that ingredients used in homemade food are of better quality and is made in a healthy way maintaining proper hygiene. Strategies are needed to encourage more cooking among the general population and help infrequent cooks better navigate the food environment outside the home (Wolfson et al, 2014). TLSs viewed fast food and food from outlets as harmful and opined that it should not be consumed. Opinions varied at individual level where some TLSs loved fast food but they preferred homemade food.

Awareness of nutrient function and balanced diet was observed among TLSs but not noticeably. Although TLSs could use the terms ‘nutrition’ and ‘balanced food’, they did not understand the meaning properly, however a few TLSs could accurately comprehend the meaning. The authors of this paper assume that the TLSs became aware of this term at school from general science lessons which is compulsory in Bangladeshi curriculum up to class eight. It

is understandable that they were unable to comprehend what they were taught at school as a result of lack of practical approaches to learning, an apparent education crisis in the country.

Social support to learn and share food is another significant food literacy attribute linked with TLSs. TLSs received early food preparation education from their family members and from their friends and peers. Certain life situations compelled TLSs to learn about food preparation at a time in their lives when they needed it. TLSs shared their experience of learning how to cook as a result of being caught in different situations from individual perspectives.

In spite of the fact that this study adds value to the existing literature by exploring the attributes of food literacy among Bangladeshis, the study has some limitations that requires to be contemplated in the critical exposition of the results. Firstly, the study did not receive any funding, hence there were shortage of equipments that lead to technical difficulties where the primary researcher (MMH) was unable digitally record some interviews. In such cases, the interviewees were requested to write down some answers for the collection of sufficient amount of verbatim quotations. Secondly, Lack of transcribing softwares available in the language of the interviewees' i.e. Bengali, script writing was a strenuous process. Additionally, discrepancies between statements emerged during translation due to language gap between English and Bengali. The authors were prepared for such complications to arise therefore the language issues were minimized to a negligible extent; however a few areas may have remained unnoticed. Lastly, the data was categorized by the primary researcher (MMH), therefore personal biases may have been included in the separated attributes of food literacy. To keep biases to a minimum, the co-author (SAK) reviewed the categorization of the attributes of food literacy. To further increase authenticity, an external auditor with qualitative expertise reviewed a sample of the coding, the analytical procedures and results.

Conclusion

The paper highlights the significance of knowledge, technical skills, and social norms that preserve food literacy. It has been revealed that consumption of healthy and enjoyable food on a student budget was ensured among TLSs with intellectual and practical skills necessary to manage food. It is proposed that student organizations and Universities work with external organizations to promote food literacy in a fun, approachable and practical way to help students become more food- and nutrition-conscious and competent. The authors hope that people's declining connection to food caused by rising popularity of convenience food can be salvaged through enhanced food literacy food which in turn can possibly address the increasing trend in overweight and obesity alongside undernutrition in developing nations, Bangladesh for example, where convenience food is not as widespread as opposed to developed nations. The findings of this study will facilitate the making of a food literacy implementation guide for Bangladeshis which would be beneficial to evaluate interventions targeted at improving nutrition.

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