Research Article

Factors Affecting Food Consumption Patterns and Dietary Practices of Adolescent Girls: An Explanatory Sequential Mixed Method Study

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Abstract

Background: Adolescent years are critical for building good nutritional status through nutritionally wise choices. Various factors influence and shape food consumption patterns of adolescent girls.

Objective: To identify and explore the factors affecting food consumption patterns and dietary practices of adolescent girls.

Methods: An explanatory sequential mixed method study was conducted in Lahore. In the quantitative phase, data from 470 adolescent girls was collected through purposive sampling technique, using validated interview guide. Focus Group Discussions (FGD) methodology was conducted in second phase to collect qualitative data. Adolescent girls of different socioeconomic status (SES) and education level were enrolled in 5 FGD after proper written informed consent. FGDs were audio-taped and noted, followed by transcription, coding and thematic analysis.

Results: The quantitative results showed that adolescent girls who belonged to low SES consumed healthier diets as compared to middle and high SES adolescent girls. Diet staple, eggs consumption, lentils, beans and fruit consumption patterns were significantly associated (p < 0.05) with SES. Qualitative analysis of FGDs outlined five major themes at socio-cultural, personal and economic levels. Food consumption patterns and dietary practices of adolescent girls were found to be determined by Family trends, Beliefs and taboos, Taste preferences, Lifestyle patterns and Finances. Family food practices laid foundation for good eating habits. Lack of finances had a positive impact on dietary intake of adolescent girls as low purchasing power led to lesser spending on junk food and increased consumption of fruits and vegetables.

Conclusions: Healthy and unhealthy dietary patterns and practices are shaped by various factors at sociocultural, personal and economic levels. Taking these contextual factors into account can prove beneficial for programs aimed at improving nutritional status of adolescent girls in Pakistan and similar cultural settings. **Received** [24-01-2019: Accepted] 28-03-2020

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 $Keywords \, | \, adolescent \, girls, healthy \, eating, socio-economic \, status, food \, consumption \, patterns, dietary \, practices$

Introduction

Globalization has brought changes in dietary patterns of adolescents throughout the world. Foods once considered foreign and unacceptable

have found a way into local cuisine and gained immense popularity and acceptance.^{1,2} Arrival of multinational fast food chains in developing countries has also resulted in high popularity of western style diets among youths.³ Like other developing countries food preferences and dietary patterns of Pakistani adolescents have also witnessed a huge shift towards ready to eat fast food.³ As a result, adolescents nowadays are consuming diverse diets which are a blend of traditional dishes and fast food.

The diversity and globalization of diets also calls for a renewed focus while developing dietary guidelines for adolescents. However, before doing so it is necessary to have an insight into factors affecting dietary practices and food choices of adolescent girls. Past studies have shown that food choices and food preferences are considerably influenced by financial status and purchasing ability of an individual.^{2,4,5)}

Therefore, dietary choices an adolescent girl makes are influenced by her socioeconomic status (SES) along with many other contextual factors. Although a considerable body of literature is available on factors influencing food choices and healthy eating among adolescents across the world, little research in this domain so far has been conducted in many developing countries including Pakistan. To bridge this gap, this explanatory sequential mixed method study was undertaken to have an insight into food preferences and dietary practices of Pakistani adolescent girls, besides identifying those factors which play a decisive role in shaping dietary patterns and food habits of the adolescent girls. A focus on the factors influencing food choices and dietary practices of adolescent girls can help plan culturally appropriate nutrition and health intervention programs for adolescent girls and create healthy eating environments to inform policy approaches and dietary guidelines. Qualitative approach was also used for this study because it has been shown instrumental in advancing the understanding of social and behavioral aspects of food and eating.

Constructivist paradigm⁵ to understand and generate a pattern of meaning of adolescent views on dietary practices and food choices was employed. The theory which guided this study was impact of social and cultural environment on health.⁽⁶⁾ Moreover socioecological model (SEM) was also used to guide this research. Stokols' theory emphasizes the importance of environmental and social factors along with behavior change at individual level for health promotion (see Figure 1). This study is reported by using SRQR (Standards for Reporting Qualitative Research) checklist.

Method

An explanatory sequential mixed method study⁵ was conducted in Lahore. In the quantitative phase, data about food preferences and dietary practices of adolescent girls was collected from 470 participants through validated interview guide. Purposive sampling was done to include participants from different socio economic status (SES). The qualitative part was conducted after analysis of quantitative data. Focus group methodology was chosen to collect qualitative data. Focus group discussion (FGD) methodology is a very helpful data collection method in public health researches. It provides a platform for people to talk about different issues of common interest which they might not usually discuss. This was the main reason that focus groups were conducted to gain in depth exploration of factors which affect adolescent girls' food consumption patterns and dietary practices. Ethical approval for the study was obtained from the Institutional Review Board of Shaikh Zayed Medical Complex, Ref Number: F/39/NHRC/Admn/IRB/260.

In the first phase, which consisted of quantitative part of the study, 525 adolescent girls belonging to different SES were recruited through purposive sampling after informed written consent. Their responses about food preferences and dietary habits were recorded through a validated food frequency interview guide. Data collection was carried out from June 2016 to August 2016. The second phase was the qualitative part of the study which was carried out after the analysis of quantitative phase. In this phase, forty two adolescent girls participated in five focus groups in February 2017. Maximum Variation sampling strategy in Purposive sampling technique⁷ was employed to select participants (to capture the diverse characteristics of participants i.e., socio cultural environment, education level and self-reported income). Written informed consent was taken from the participants. Decision on number of FGs was driven by the data saturation⁷ Five focus groups of 7 to 9 participants each, 90 -120 minutes per session were conducted. Adolescent girls from different socio economic class and educational level were invited to participate in these discussions. Two facilitators who had prior experience of conducting focus groups moderated and scribed the focus groups. Both facilitators were experienced researchers, actively involved in teaching and had prior qualitative research experience with adolescent girls. One of the researchers acted as a moderator and the other as a scriber for taking field notes along with managing audio-tape. The moderator explained the aim of the focus groups and took written informed consent along with filling of a brief demographic questionnaire. A predetermined set of questions and probes was used throughout the sessions (Table 3). Two FGDs were conducted at Government Girls High School Model Town, two at Lahore College for Women University and one at a community facilitator's home in Johar Town. Notes and audio records were transcribed in Urdu (local language) and then translated into English by two researchers, followed by discussion and developing consensus on unclear and disputed points. Translation validity was verified by a bilingual expert.

Data Analysis

Quantitative data was analyzed through SPSS version 23. Data was arranged in ascending and descending orders for data cleaning. Incompletely filled forms were not included in final analysis and descriptive analysis was run on sample of 470. Percentages and frequencies were calculated. Chi square was used as a test of association. CI was taken at 95% and p-value(<0.05) was considered statistically significant. For Qualitative part, thematic analysis was done on textual data of transcripts. Scissors-and-cut technique was used for reducing data to codes. Codes were independently identified by both researchers and categorized. Codes were merged where needed. Final

list of codes was developed by consensus between researchers and where needed the third researcher was involved to finalize the dispute. Themes and subthemes were extracted by going through the codes again and again and both researchers checked for common and uncommon themes extracted by them in each FG. For uncommon themes, a debate was done in presence of third researcher ending into consensus. Finally a list of themes and subthemes was prepared after each FG and data saturation started appearing after 3rd FG so 5 FGs were conducted in total. These themes were described and defined using support of quotes from textual data. Analysis was done parallel to data collection so each FG was analyzed before conducting the next so the flaws could be removed and next FGs could be informed.

Results

The results of quantitative part of study showed that adolescent girls were not consuming balanced diet and those who belonged to low SES consumed healthier diets as compared to middle and high SES adolescent girls. Diet staple, egg consumption, fruits, lentils and beans consumption patterns were significantly associated (p<0.05) with SES (Table 1). In qualitative phase of study, five focus groups held with 42 adolescent girls showed that most of the girls lived in a three generation family (i.e., with both or one grandparent). Mean age of participants was 15.7 years (SD \pm 1.9) (Table 2). Various socio cultural and economic factors were found to be influencing food preferences and dietary practices of adolescent girls

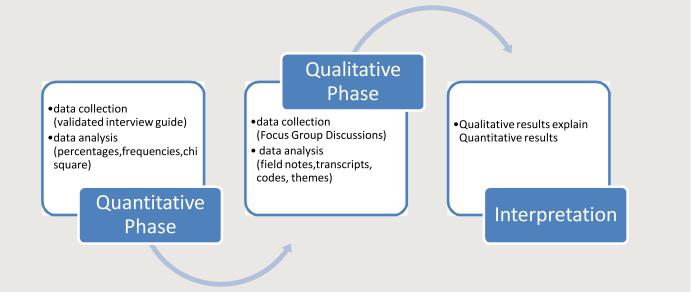


 Figure 1: An Explanatory Sequential Mixed Method Design Study

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Table 1: Dietary Preferences of Adolescent Girls Belonging to Different Socio Economic Statu

(Table 4). These dietary choices and practices were embedded deeply in themes identified as family trends and practices, food taboos, taste preferences, lifestyle patterns and finances (Figure 2). **Table 2:** Socio-demographics of Participants of 5 Focus Groups (N = 42)

Age(years)	Frequency (%) 42 (100%)	
12-15	18 (42.9)	
16-19	24 (57.1)	
Education level		
Upto 10 th grade	18 (42.9)	
Upto 12 th grade	8 (19)	
Undergrad	16 (38)	
Household income		
Low	18 (42.9)	
Middle	14 (33.3)	
High	10 (23.8)	
Type of family		
Joint	25 (59.5)	
Nuclear	17 (40.5)	

Table 3: Key Questions and Probes for Focus GroupDiscussions on Food Consumption Patterns and DietaryPractices of Adolescent Girls in Lahore

Introduction: We would like to get your Opinion and Perceptions on Food Preferences and Dietary Practices of Adolescent Girls and also to Share with us the Factors which Influence Preferences and Practices of girls

Key questions	Probe
What type of dietary practices you have and what are your preferences and why?	Food groups, daily calories, nutrition, balanced intake, meat/ proteins, dairy products, purchasing power/ economics, choices available, preferences
Which factors play a role in determining food prefe- rences of adolescent girls?	Motivation, lifestyle, behavior, upbringing, culture, socio economic status
How much emphasis adolescents lay on healthy food choices?	Awareness, perception of healthy food, concept of health, importance of eating balanced diet

Socio-Cultural factors

Theme 1: Family trends and practices

Family trends and practices were observed to play a decisive role in shaping food preferences of adole-scent girls.

Subtheme1a: Commonly consumed and preferred foods

Adolescents from all FGs shared that wheat and rice were the main staple from cereal group around which

their everyday meals were planned. Some adolescents who belonged to high income families, prefe-

Table 4: Themes and Subthemes from Food ConsumptionPatterns and Dietary Practices of Adolescent Girls in Lahore

Level of hierarchy	Themes	Subthemes
Socio cultural	Family trends and practices	Commonly consumed and preferred foods
		Less income means healthier food choices
		Joint family as a facilitator to healthy eating
		Patriarchal approach
	Beliefs and taboos	
Personal	Taste preferences	Popular and unpopular foods among adolescents
		Preference for unconventional cooking methods
		Fast food consumption
	Lifestyle patterns	Lack of time and motivation
		Unhealthy lifestyle
Economic	Finances	

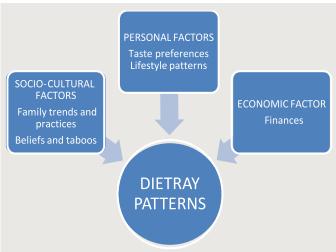


Figure 2: Factors Affecting Food Consumption Patterns and Dietary Practices of Adolescent Girls

rred to eat pasta and noodles instead of traditional wheat and rice. Most of them reported that if provided a choice between wheat bread (roti) and spicy meat rice (Biryani), they would prefer the later one (Table 5). Adolescents preferred chicken over other types of meat because they thought chicken could be incorporated into a variety of dishes as compared to mutton,

Level of Hierarchy	Themes	Subthemes	Exemplary quotes from focus groups
	Family trends and practices	Commonly consumed and preferred foods	"Wheat roti and rice, both are regular items in my home. I like and eat both But if you ask my preference, I'll rather eat roti than rice. Yes, but I'm not going to prefer roti over biryani (traditional spicy rice and meat dish) (laughs)". FGD-3, Participant 4 (middle SES)
		Less income means healthier food choices	"Vegetables are a must for us, we literally snack on vegetables, the radish, you see in winters and cucumber, turnip in summers. And yes, we also use a lot of green chilies and green coriander, do you consider them vegetables? Or just those which are cooked? I am not sure but we use them a lot all year round". FGD-4: Participant3 (low SES):
		Joint family as a facilitator to healthy eating	FGD-5, Participant 7(low SES): "I drink a glass of milk on daily basis because my grandmother says it's good for my health and (I) also happen to like the taste".
		Patriarchal approach	FGD-1, Participant 4 (low SES): "yes, you see my mom always has a ment on rotation; she makes sure that we eat vegetables at least twice a week, but as you see our men don't like plain vegetables, she (mother) puts meat in vegetables so that my father and brothers eat easily".
	Beliefs and taboos		FGD-1, Participant 7(high SES): "I don't prefer chicken because it causes hormonal issues in girls. You see, chickens are injected with all kinds of steroids and then when we eat it, it is transferred in our body causing infertility and related issues".
			FGD-2, Participant 6(low income): "We don't eat white meat i.e., chicken, just fish but that too in winters because you see its "hot" and not safe to eat with milk as it causes vitiligo, if consumed with milk".
Personal			
	Taste preferences	Popular and unpopular foods among adolescents	FGD-5 participant from middle SES shared: "You see, milk has such an awful smell, makes me feel nauseated. However I can take it in form of milkshake but hardly gets time for it. If someone makes it for me, I drink it otherwise do not".
Life style patterns		Preference for unconventional cooking methods	FGD-1, Participant 8 (middle SES): "If you ask me, I don't like or eat vegetables. Perhaps I can eat (vegetables) in salads but that too only cucumber and a little bit of onion, that's it. But usually we don't have salads as a regular feature at our table".
		Fast food consumption	FGD-3, Participant 7 (high SES): "of course you don't drink milkshake with pizza or a burger, the best combination of these foods is with coke".
		Lack of time and motivation	FGD-5, Participant 1 (middle SES): "You see, I do not eat fruits although I like (fruits) because I don't know how to fit those (fruits) in between meals and secondly it takes lot of time to cut or peel them".
		Unhealthy lifestyle	FGD-4,Participant 1(middle SES): "with such a fast paced life, assignments to complete and sleeping late, waking up late, there is hardly any time left to put effort into your food hence (we eat) time saving junk, ready to eat noodles and pasta etc".

Table 5: Themes at Socio Cultural, Personal and Economic Levels of Hierarchy

beef or fish.

Subtheme 1b: Less income means healthier food choices

It was noted that adolescent girls who belonged to low SES had healthier eating patterns as their families had

less money to spend on fast food which is expensive and considered a luxury. Their families mostly preferred foods like beans, legumes, vegetables and fruits because of easy seasonal availability and low prices. The adolescent girls had developed a liking for these healthy foods because of familiarity with such foods since childhood. Sometimes, despite not liking the taste, adolescents from low SES consumed healthy food because they had to eat what was cooked at home (Table 5).

Adolescent girls who belonged to middle or high SES were more selective in eating healthy foods such as legumes, vegetables or fruits. They either resort to ordering fast food deliveries such as pizza or burgers or look for some alternative ready to eat snacks when they didn't want to eat food cooked at home.

Subtheme1 c: Joint family as a facilitator to healthy eating

Joint family was noted as a facilitator to healthy eating as it was noted that adolescents who lived in joint families or had grandparents ate healthier foods. The elders in their families preferred traditional eating patterns which consist of balanced intake of foods from all groups and encouraged consumption of foods like milk, vegetables and fruits on daily basis (Table 5).

Subtheme 1 d: Patriarchal approach

Patriarchal approach was observed among families of some adolescent girls especially those belonged to middle and low SES. Most of the adolescent preferred chicken but had to eat red meat because of their male family members' preference for it, who considered red meat "more powerful" than white meat (Table 5).

Theme 2: Beliefs and taboos

Food preferences of adolescents were also largely determined by their beliefs about certain foods. Whereas some adolescents preferred chicken over red meat because they believed red meat to be unhealthy, others did not eat chicken because they thought chicken consumption might cause hormonal problems for girls as they believed chickens are injected with growth hormones. Similarly due to widespread taboo in Pakistan, people believe fish to be a hot food and it is widely believed to cause vitiligo if consumed in summers. Adolescent girls too did not consume fish during summers and ate it only in winters (Table 5).

Personal factors

Theme1: Taste preferences

Taste preference was the first theme which was outlined at personal level of food consumption patterns. It was observed that most of the adolescents did not consume certain foods because of their taste preferences.

Subtheme 1a: Unpopular foods among adolescents

Certain foods were found to be less popular among adolescents and were being consumed less frequently than others. Vegetables were found to be the least popular food among adolescents from middle and high SES adolescents and the main reason was their bland taste. Milk consumption was also found to be very low among adolescents belonging to middle and high income families. The main reason was dislike for taste and lack of time to drink something they don't like (Table 5).

Subtheme1 b: Preference for unconventional cooking methods

Although adolescents did not like to consume foods like vegetables and milk in conventional forms but said that they could eat selective vegetables if presented in salads or added in shawarma or pizza (Table 5).

Subtheme 1 c: Fast food consumption

Adolescents of high SES preferred pasta, burgers and pizza (fast food) as they had these choices available to them since childhood. They preferred fast food over traditional staple food (Roti). It was also noted that high SES adolescents could easily afford fresh juices and milkshakes but they did not consume these because they liked to drink coke with fast food (Table 5).

Theme2: Lifestyle patterns

Lifestyle patterns emerged as an important theme which influenced food choices and dietary practices of adolescent girls.

Subtheme2 a: Lack of time and motivation

It was noted that adolescent girls' preferred foods which were easily available and could be eaten with lesser hassle. These adolescents were aware of the benefits of eating healthier foods but felt too lazy to make an effort to peel or cut fruits or make milkshake themselves (Table 5).

Subtheme2 b: unhealthy lifestyle

Unhealthy lifestyle was identified as one of the important subtheme which influenced eating patterns of adolescents especially from middle and high SES. The adolescents blamed tough daily routine and changes in sleeping patterns to be major reasons of eating at irregular timings and unhealthy foods (Table 5).

Economic factor

Theme: Finances

Another important theme outlined was finances. It was observed that certain healthy foods though liked by adolescent girls were not being consumed by them because of high prices of these foods. Fresh juice and milkshakes consumption was found to be very low among low and middle income group adolescents because of high costs hence they consumed packaged juice or coke (Table 5).

Discussion

Social, cultural economic factors play an important role in determining food preferences and dietary habits of adolescent girls.⁸ In this study, family trends and practices emerged as important themes at sociocultural level in deciding food preferences of adolescent girls. Those who belonged to low income families had healthier eating habits and consumed more vegetables, beans and fruits as compared to middle and high income girls. Frequent cooking of seasonally available inexpensive vegetables had consequently developed a liking for the taste of vegetables among low SES adolescents. Similar findings were reported by past studies which cited early exposure of children to fruits and vegetables make them more willing to consume these foods.9-11 However, this finding is contradictory to some previous studies which reported that low income families had nutritionally poor diets.^{2,4,12-15}

It was found out that adolescents from all income groups had strong liking for junk food and preferred it over healthier home food. However, adolescents from low income group ate home food out of financial cons-traint. Same findings were reported in a previous study where the adolescents could not afford to purchase fast food but had a strong desire to have the financial resources to purchase.¹² Food taboos refer to the restriction of specific foods as a result of social or religious customs. In many traditional societies, cultural norms and customs govern behaviors.⁸ Various forms of taboos, misconceptions, and cultural beliefs towards certain foods exist in various countries.¹³ The present study observed that in Pakistani culture, food myths were especially apparent in meat consumption patterns. The results of this study are concordant to previous studies which reported different views on consumption of meat, where some participants believed in limiting the use of meat in daily diets whereas others perceived eating more meat as a part of healthy eating.¹⁴

This study observed that adolescents who lived in joint families were eating diverse and healthier diets and followed regular meal timings as compared to those who lived in nuclear families. The adolescents attri-buted their healthy eating habits to the presence of their grandparent. Previous studies were in concordance to the findings of present study on potential facilitator of family in developing healthy dietary practices.¹⁶

Pakistan is by large a patriarchal society, which gives preference to male members of family. This was evident in family meals and dietary choices of adolescent girls from middle and low income groups as their family meal choices were based on food likes and dislikes of their fathers and brothers. A previous study also reported similar finding.¹⁵

Taste preferences and lifestyle patterns were observed other important factors influencing food choices at personal level. This study found out that most of the adolescents did not like healthy foods like vegetables owing to their bland taste. Past studies also reported omitting of healthy foods and consumption of unhealthy foods by adolescents because of taste.^{10,16}

It is generally assumed that with rise in income, better food choices can be made as more money can be spent to purchase nutritionally adequate food especially fruits.^{17,18} However this study observed that adolescents from high income families practiced poor dietary habits and used the money on eating expensive convenience food. Concordant to these findings, a study on dietary pattern of Pakistani population also reported increased trend of consumption of fried and sweet food among Pakistani youth.¹⁸

The present study also found out that adolescent girls preferred unconventional cooking methods for certain foods such as vegetables and milk. The findings are concordant to previous studies which reported eating choices of vegetables are influenced by method of preparation.^{19,20}

Lazy attitude and lack of motivation were two other important factors which effected food preferences of adolescent girls. Adolescent girls usually did not consume fruits either because they found it a time consuming task and did not want hassle of peeling or cutting fruits. This finding is also concordant to a previous study which reported adolescents and children were not willing to sacrifice time to eat healthy foods such as fruit and vegetables, even when liked.⁽²¹⁾

Adolescents especially from middle and high income groups blamed tough routine of studies, sleeping late, meal skipping, unhealthy and untimely snacking and overall trend of metropolitan life as an obstacle in eating healthy and regular meals. This lifestyle led them to choose convenience foods which took less time in preparation and could be eaten easily. Similar findings were reported in previous studies which cited busy and tough schedule of school and work as a reason of preference for convenience foods.^{21,22}

Purchasing power determines to a large extent what type of diet one can afford to eat.^{17,23} It was observed in this study that finances and purchasing power were important economic factors which influence dietary practices and food choices of adolescent girls. Adolescents from low and middle SES at times were unable to consume healthier options like fresh juices and milkshakes because of financial constraints. These findings are in concordance with past studies which cited high cost and lack of financial resources in limiting healthier food choices among adolescents.^{12, 12, 24, 25}

The present study tried to identify and explore factors influencing food preferences and dietary practices of adolescent girls belonging to different SES. These factors are present at socio-cultural, personal and economic levels. Although a few studies have been conducted in the past on dietary patterns of adolescent girls but none of the study was an explanatory sequential mixed method design study according to the knowledge of this author. Quantitative part of the study helped in identifying patterns of food consumption and dietary habits of adolescent girls whereas qualitative nature of the study helped in exploring the views of adolescents about different foods and reasons behind their current dietary intake and practices.

This explanatory sequential mixed method study provides a dimension for future studies on a larger scale besides giving a fresh insight into factors affecting food preferences and dietary practices of adolescent girls.

Conclusion

Food preferences and dietary practices of adolescent girls are determined by various factors at personal, cultural and socioeconomic levels. These factors, which include family trends, taste preferences, lifestyle patterns, finances and beliefs and taboos, play an important role in shaping healthy or unhealthy dietary patterns. Exploration of these influencing factors will benefit future nutritional interventions and education programs aimed at improving dietary habits and nutritional status of adolescent girls in Pakistan.

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References

- 1. Black E. Globalization of the food industry: Transnational food corporations, the spread of processed food, and their implications for food security and nutrition. 2016.
- Ares G, Machín L, Girona A, Curutchet MR, Giménez A. Comparison of motives underlying food choice and barriers to healthy eating among low medium income consumers in Uruguay. Cad Saude Publica. 2017;33(2):e00213315.
- 3. Usman A, Javed M, Amjad A, Jalil A, Shaheen I, Amjad U. Food, City and Young Globavores: perceptions of Pakistani urban youth about food choices and healthy eating. The Anthropologist. 2017;27(3):143-51.
- 4. Turrell G, Vandevijvere S. Socio-economic inequalities in diet and body weight: evidence, causes and intervention options. Public Health Nutr. 2015;

18(5):759-63.

- 5. Creswell JW, Creswell JD. Research design: Qualitative, quantitative, and mixed methods approaches: Sage publications; 2017.
- 6. Hernandez LM, Blazer DG, editors. Institute of Medicine (US) Committee on Assessing Interactions Among Social, Behavioral, and Genetic Factors in Health. Genes, Behavior, and the Social Environment: Moving Beyond the Nature/Nurture Debate. Proc Natl Acad Sci U S A; 2006.
- O'brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. Acad Med. 2014; 89(9): 1245-51.
- 8. Patton MQ. Qualitative evaluation and research methods: SAGE Publications, inc; 1990.
- 9. Korinek EV, Bartholomew JB, Jowers EM, Latimer LA. Fruit and vegetable exposure in children is linked to the selection of a wider variety of healthy foods at school. Matern Child Nutr. 2015;11(4):999-1010.
- Anzman-Frasca S, Ventura AK, Ehrenberg S, Myers KP. Promoting healthy food preferences from the start: a narrative review of food preference learning from the prenatal period through early childhood. Obes Rev. 2018;19(4):576-604.
- Swan E, Bouwman L, Aarts N, Rosen L, Hiddink GJ, Koelen M. Food stories: Unraveling the mechanisms underlying healthful eating. Appetite. 2018;120(1): 456-63.
- 12. Sedibe HM, Kahn K, Edin K, Gitau T, Ivarsson A, Norris SA. Qualitative study exploring healthy eating practices and physical activity among adolescent girls in rural South Africa. BMC Pediatr. 2014; 14(1): 211.
- 13. Higgs S, Thomas J. Social influences on eating. Curr Opin Behav Sci. 2016;9(1):1-6.
- 14. Quiroz D, van Andel T. Evidence of a link between taboos and sacrifices and resource scarcity of ritual plants. J Ethnobiol Ethnomed. 2015;11(1):5.
- 15. Macdiarmid JI, Douglas F, Campbell J. Eating like there's no tomorrow: Public awareness of the environmental impact of food and reluctance to eat less meat as part of a sustainable diet. Appetite. 2016; 96(4): 487-93.
- 16. Hassan F, Asim M, Salim S, Humayun A. House ownership, frequency of illness, fathers' education: the most significant socio-demographic determinants of poor nutritional status in adolescent girls from low income households of Lahore, Pakistan. Int J Equity

Health. 2017;16(1):122.

- Albani V, Butler LT, Traill WB, Kennedy OB. Understanding fruit and vegetable consumption in children and adolescents. The contributions of affect, self-concept and habit strength. Appetite. 2018; 120(1): 398-408.
- 18. Darmon N, Drewnowski A. Contribution of food prices and diet cost to socioeconomic disparities in diet quality and health: a systematic review and analysis. Nutr. Rev. 2015;73(10):643-60.
- Safdar NF, Bertone-Johnson E, Cordeiro L, Jafar TH, Cohen NL. Dietary patterns of Pakistani adults and their associations with sociodemographic, anthropometric and life-style factors. Int J Food Sci Nutr. 2013; 2(1):55.
- Smith TM, Dunton GF, Pinard CA, Yaroch AL. Factors influencing food preparation behaviours: findings from focus groups with Mexican-American mothers in southern California. Public Health Nutr. 2016;19(5):841-50.
- 21. Morgan E, Vatucawaqa P, Snowdon W, Worsley A, Dangour A, Lock K. Factors influencing fruit and vegetable intake among urban Fijians: A qualitative study. Appetite. 2016;101(4):114-8.
- 22. Hilger J, Loerbroks A, Diehl K. Eating behaviour of university students in Germany: Dietary intake, barriers to healthy eating and changes in eating behaviour since the time of matriculation. Appetite. 2017;109(2):100-7.
- 23. Hassan F, Salim S, Humayun A. Assessment of dietary intake of adolescent girls belonging to low socio economic status: a community based study from Lahore. PROG NUTR . 2018;20(1):318-24.
- Evans A, Banks K, Jennings R, Nehme E, Nemec C, Sharma S, et al. Increasing access to healthful foods: a qualitative study with residents of low-income communities. [Int J Behav Nutr Phys Act. 2015; 12(1):S5-S.
- 25. Hassan F, Salim S, Humayun A. Prevalence and Determinants of Iron Deficiency Anemia in Adolescents Girls of Low Income Communities in Lahore. Ann. King Edw. Med. Univ. 2017;23(2):47.
- 26. Tiedje K, Wieland ML, Meiers SJ, Mohamed AA, Formea CM, Ridgeway JL, et al. A focus group study of healthy eating knowledge, practices, and barriers among adult and adolescent immigrants and refugees in the United States. [Int J Behav Nutr Phys Act. 2014;11(1):63.