How to Fit In? Acculturation and Risk of Overweight and Obesity. Experiences of Australian Immigrant Mothers From South Asia and Their 8- to 11-Year-Old Children

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Abstract
This study of 14 Australian immigrant mothers from Bangladesh, India, and Pakistan and their 12 children aged 8 to 11 years aims to explore the interplay of cultural and social processes that might elevate the risk of obesity. Mothers and their children were asked in semi-structured, face-to-face interviews about changes in their diet and physical activities after immigration to Australia. Thematic analysis of these interviews showed a transformation in immigrant families’ diets and physical activities as they transitioned from their traditional lifestyles to an Australian pattern. Both mothers and their children recognized the problem—and causes—of obesity. However, different frames of reference—origin countries for mothers and Australian peers for children—resulted in generational disjuncture about healthy bodyweight and the strategies to achieve it. Mothers’ cultural values and high social status associated with overweight and obesity in origin countries led them to struggle to adapt to new health behaviors in Australia. In contrast, their children preferred to eat Australian foods and have high physical activities to fit in with their Australian peers. Children with higher body weights were commonly ridiculed and were unpopular among their peers. Our findings reveal that the social status of food and physical activity reflects cultural meanings from both origin and host countries, creating contradictions and tensions for immigrants that public health campaigns will need to help them navigate.

Keywords
acculturation, immigrants, intergenerational, obesity, qualitative research

Immigrants from low- and middle-income countries (LMICs) are generally healthier on arrival than their counterparts in high-income countries (HICs) such as Australia (Hauck et al., 2011; Kennedy et al., 2015; Ro, 2014). However, this health advantage is lost within one generation (Dean & Wilson, 2010; Menigoz, 2019). The main reason for this deterioration is a rapid transformation from the pre-immigration diet and activity levels that are common in agriculturally based economies, to the unhealthy diets and sedentary lifestyles of host HICs (Popkin, 1994; Popkin et al., 2012; Satia, 2010; Satia-Abouta et al., 2002). Immigrants and their children who are born or raised in HICs experience a corresponding increase in health risk (Renzaho et al., 2009; Zulfiqar, Strazdins, Dinh, et al., 2018). These trends warrant further investigation.

Despite significant investments in public health campaigns to address overweight and obesity (henceforth referred to as overweight/obesity), recent Australian reports show that one in four Australian children and adolescents are overweight/obese (Australian Institute of Health and Welfare, 2017; Whelan et al., 2015). The prevalence of overweight/obesity has stabilized (but not declined) among Australian children in the last decade (Olds et al., 2010, 2011). However, the prevalence is still increasing among specific populations such as children of immigrants from LMICs (Australian Institute of Health and Welfare, 2017; Zulfiqar et al., 2019; Zulfiqar, Strazdins, Banwell, et al., 2018; Zulfiqar, Strazdins, Dinh, et al., 2018). Understanding processes that increase

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overweight/obesity risk among immigrants and their children is essential to develop culturally specific preventive health strategies for them.

Acculturation theory explains the psychological, behavioral, and attitudinal changes that occur when culturally dissimilar people come into prolonged first-hand contact with each other (Alidu & Grunfeld, 2018; Redfield et al., 1936). This contact straddles cultural meanings, understanding, customs, and social behaviors from both dominant and minority groups (Alidu & Grunfeld, 2018; Berry, 2005; Redfield et al., 1936). This theory was first adapted from anthropology to psychology and is now increasingly used in public health research to elucidate the determinants and consequences of health disparities in minority populations such as immigrants (Berry, 2005; Fox et al., 2017a, 2017b; Lopez-Class et al., 2011). Acculturation theory is rooted in the concept of cultural identity—a complex set of beliefs and attitudes that people have about themselves concerning their cultural group membership (Berry, 2001). The theory explains various pathways that immigrants follow to maintain or adapt their cultural identity when they move to a society with a different culture (Schwartz et al., 2010). Acculturation theory is, therefore, of critical importance to understand the choices immigrants make when they navigate the health behaviors in the host society.

Food is a primary and important marker of cultural identity. Therefore, dietary adaptation is central to acculturation theory (Satia, 2010). A review of dietary habits of immigrants shows that they retain many of their traditional dietary and food practices, but also adopt some from the host countries (Burns, 2004). These dietary changes are guided by the cultural meanings and value of food related to cultural identity and status in origin and host countries (Popovic-Lipovac & Strasser, 2015; Satia, 2010). In many agriculturally based low- and middle-income economies, traditional everyday meals are mainly rich in vegetables, fruits, and whole-grain staples, with occasional meat. In contrast, calorically rich foods, high in carbohydrates, animal proteins, sugar, and fat are consumed by the wealthy (Cyril et al., 2017; Gerber et al., 2012; Renzaho et al., 2012, 2017) or reserved for special occasions such as weddings or festivals (Renzaho et al., 2017). After immigration, migrants generally decrease their consumption of plant-based foods, which are associated with being poor and increase their consumption of festive foods because they are affordable and reaffirm their original cultural identity (Azar et al., 2013; Renzaho et al., 2017; Satia-Abouta et al., 2002).

Children of immigrants are at higher risk of overweight/obesity, as they adopt the unhealthy dietary behaviors of their host country, as well as their parents’ country of origin (Alidu & Grunfeld, 2018; Renzaho et al., 2012; Rhodes et al., 2016). These children are more acculturated than their parents, particularly if they are born or arrive in early infancy or at preschool age (Popkin & Udry, 1998; Rhodes et al., 2016). Due to being bicultural, these children adopt foods and dietary practices from the host country that are heavily marketed in the media and are popular with their peers (Alidu & Grunfeld, 2018). At the same time, their families also switch to more calorie-dense traditional festive foods instead of eating traditional healthy meals (Renzaho et al., 2012; Rhodes et al., 2016), which further increase their overweight/obesity risk. A better understanding of these intergenerational acculturative processes is required to understand the food behaviors and choices of immigrants.

Relatively little research investigated the acculturation of physical activities among immigrants. Evidence shows that immigrants have lower physical activities compared with the Australian-born population (Dassanayake et al., 2011). Female immigrants have lower physical activities than males, especially if they arrive from Southeast Asian, Middle Eastern, Southern, and Eastern European countries, compared with Australian-born people and immigrants from New Zealand, the United Kingdom, and Ireland (Dassanayake et al., 2011). Low physical activities among these immigrants may be due to the meaning of these activities in their origin countries, where sedentary activities are associated with higher social status and wealth (Ford et al., 2017). In many LMICs, physical activities are particularly discouraged among women (Renzaho et al., 2012) due to cultural and religious restrictions on dress, and movement (Gerber et al., 2012; Renzaho et al., 2017; Van Hook & Baker, 2010). Although the physical activities of immigrant men and women increase after immigration, they are still lower than the host population (Gerber et al., 2012).

Children of immigrants are also more physically inactive than their Australian counterparts (Zulfiqar, Strazdins, Dinh, et al., 2018; Zulfiqar et al., 2019), due to cultural and religious restrictions, cost, lack of awareness of the benefits, parental emphasis on education, and religious classes and fear of bullying (Murphy et al., 2017; Renzaho et al., 2012). Status may also be an influence as parents restrict physical activities of children to gain weight and have heavier bodies that are considered high status in their origin countries (Renzaho et al., 2012). It seems that immigrants’ adoption of health behaviors in their host country is guided by “deference, prestige or social recognition” of these behaviors (de Garine, 1976), in the origin and host countries (Fershtman & Weiss, 1993; Gerber et al., 2012; Renzaho et al., 2012).

Australia is a country of immigrants. According to the Australian census (2016–2017), approximately half of the Australian population are either born overseas or have parents who were born overseas (Australian Bureau of Statistics, 2018). As a large proportion of the Australian population arrived from Great Britain and Europe between 1788 and 1970, Australian culture mainly comprises of practices commonly observed in these countries (Krupinski, 1984). After the introduction of humanitarian and skills-based visas, people from diverse cultural and ethnic backgrounds from LMICs began settling in the country (Bastian, 2012). At present, immigrants from more than 180 countries live in
Australia. Two thirds of recent Australian immigrants are from non-English-speaking countries, such as China, India, and other Southeast Asian countries (Australian Bureau of Statistics, 2018). Recent immigrants have transformed Australia into a diverse, multicultural society.

South Asian immigrants and their children are known to have a higher risk of overweight/obesity after immigration to HICs (Banerjee et al., 2015; Hudda et al., 2018; Lu et al., 2015; WHO Expert Consultation, 2004). The immigrants from these countries share many cultural and linguistic similarities, on account of their similar colonial histories (Bose & Jalal, 2017). However, there is little research that provides an in-depth description and understanding of the dietary and physical activity adaptations among these immigrants and their children as they settle in Australia. Our study addresses this knowledge gap.

The present qualitative study aims to understand how immigration to Australia acts to alter dietary and food practices, activity levels, and overweight/obesity risk among children of immigrants from LMICs of South Asian origin, through childrens’ and mothers’ accounts. We have included children’s voices to address the so far largely adult-centric understanding of how immigration shapes overweight and obesity risk. Our sample includes children aged 8 to 11 years because, at this age, they begin to develop independent attitudes and behaviors toward food and body weight (Harcourt & Einarsdóttir, 2011).

Method

Design and Recruitment

Those invited to participate in the study were immigrant mothers from India, Pakistan, and Bangladesh, residing in Australia for at least 1 year, with a child aged between 8 and 11 years, who were the primary meal preparers in their household and could communicate in English. This immigrant group was chosen because they comprise the second largest group of recent Australian skilled immigrants (Australian Bureau of Statistics, 2018). The children were also invited to participate in the interview with their mother’s consent. Mothers were the primary participants based on their leading role in shaping children’s dietary behaviors and practices (Rhodes et al., 2016).

Snowball-sampling, a nonprobability technique to identify traditionally hard-to-reach populations (Sadler et al., 2010), was used to recruit participants. The first mother was identified through a local community contact, who then identified other mothers from her contacts and provided them the email and telephone number of the first author (T.Z.). T.Z. sent participant information sheets and consent forms to the interested mothers. A week later, T.Z. phoned the potential participants to schedule face-to-face interviews. Flyers advertising the study were also posted and emailed to the local community websites, religious centers, and Indian/Pakistani/Bengali grocery stores. However, the researchers failed to recruit any mothers using this latter method.

The present study was approved from the ANU Human Ethics Committee (Protocol No. 2016/473).

Interview Process

Fourteen mothers (four Bangladeshi, five Indian, and five Pakistani) and 12 children (three Bangladeshi, four Indian, and five Pakistani) were interviewed from March 2017 to September 2017, mainly at the respondents’ house at the convenience of the participating mothers and their children. Most of interviews were conducted on weekends, when children were home. Three interviews were conducted during weekdays at local cafes, when the mothers were on their lunchbreak.

To minimize threats to authenticity and validity of interviews, maternal and child interviews were audio-recorded with their consents. To establish reliability of responses, notes were taken of maternal and child interactions around diet and physical activities and matched with their interview responses. Mothers and children were assured that their identities would remain confidential and not known to anyone except T.Z.

Mothers and children were provided with an opt-out option at any stage of the interview. The structured interviews were conducted in English. Mothers were interviewed first. Approximately 15 min were spent collecting the sociodemographic data that included information on the length of stay in Australia; partnership status; socioeconomic status, including maternal education levels, household income, and house ownership; religion; and work status. Information collected on the study child included date and place of birth, number of siblings, primary language spoken at home with parents and siblings, and ethnicity of closest friends.

An interview guide was used to steer the discussion around body weight, diet, and physical activities in maternal origin countries and in Australia. Mothers were asked about their diet and physical activities before and after immigration to Australia, their opinion about healthy and unhealthy dietary practices, physical activity patterns, body weight, and cultural identity. They were also asked about their child dietary and physical activity preferences, their perception of healthy and unhealthy dietary practices, activities, and body weight for children. The interview guide offered more flexibility than a formal list of questions allowing to follow-up participants’ comments and seek a deeper understanding (Tracy, 2013). As mothers were the primary respondents and answered sociodemographic questions in addition to the main interview questions, these interviews each lasted for approximately an hour. Children were also asked about their diet, physical activities, body weight, and cultural identity. The children’s interviews were conducted in maternal
presence and lasted for approximately 20 min. Upon conclusion, mothers received AU$15 supermarket voucher to compensate for their time.

**Data Analysis**

T.Z. transcribed three maternal and three child interviews verbatim, with the rest being transcribed by an agency (www.rev.com). To ascertain the reliability and authenticity of the transcriptions, all the 11 transcriptions completed externally were checked by T.Z. with the audio-recording of the interviews. We used ATLAS.ti v8 for managing coding and to assist with the analysis simultaneously alongside data collection. Thematic analysis was conducted to capture important themes and patterns relating to the research questions (Braun et al., 2014). We constructed a codebook based on interview questions and a literature review. New codes and concepts were also inductively identified from transcripts (Saldaña, 2015). Broad common themes were identified by using the method of constant comparison (Saldaña, 2015). Maternal and child interviews were analyzed separately and then compared, to understand similarities and differences in behaviors and practices around diet and physical activities across generations. Interviewer observation notes were also utilized. Transcripts of maternal and child interviews were emailed to the mothers, to give them and their children an opportunity to comment.

**Results**

All the participant mothers immigrated to Australia between the ages of 20 and 30, as the spouses of skilled immigrants (Table 1). The average duration of stay in Australia, to the time of the study, was 12 years, with a range of 3 to 18 years. All Indian mothers were Hindu. Pakistani and Bangladeshi mothers were Muslim. On average, the participants lived in four-bedroom houses, with a range across the study of two- to four-bedroom homes. Approximately one third were living in rental properties. Majority \(n = 12\) spoke mixed (native and English) language with their children. According to self-reported weight and height, half of the mothers \(n = 7\) were of normal weight, one was overweight, and the remaining 43% \(n = 6\) were obese.

Eight participant children were Australian-born and four were born overseas. Of these four, one arrived as a newborn, whereas the other three arrived between the ages of 4 and 7. The majority of children \(n = 9\) communicated only in English with their siblings. According to maternally reported height and weight of the children, most children \(n = 10\) were of normal weight, and two were overweight/obese.

We report the results separately for mothers and children, as different themes were apparent for each. Maternal themes centered on (a) their experiences of changes to diet and physical activity, (b) social integration, and (c) health concerns for themselves and their children. Children’s themes centered on

| Characteristics | Mothers | N (%) |
|-----------------|---------|-------|
| Age in years (M ± SD) | 39 (4.2) |       |
| Self-identified ethnicity |       |       |
| Pakistani | 5 (35.7) |       |
| Indian | 5 (35.7) |       |
| Bangladeshi | 4 (28.6) |       |
| Arrived before 2009 | 10 (71.4) |       |
| Arrived during or after 2009 | 4 (28.6) |       |
| BMI (kg/m²) (M ± SD) | 26.6 (4.8) |       |
| Normal weight (18.5–24.9) | 7 (50.0) |       |
| Overweight (25.0–29.9) | 1 (7.1) |       |
| Obese (>30) | 6 (42.9) |       |
| Education |       |       |
| Secondary school education | 1 (7.1) |       |
| Bachelor-level degree | 8 (57.1) |       |
| Master’s-level degree | 5 (35.8) |       |
| Religion |       |       |
| Islam | 9 (64.3) |       |
| Hinduism | 5 (35.7) |       |
| Work status |       |       |
| Not in workforce | 5 (35.7) |       |
| Part-time | 4 (28.6) |       |
| Full-time | 5 (35.7) |       |
| Number of children (M ± SD) | 2 (0.47) |       |
| Housing |       |       |
| Rental | 5 (35.7) |       |
| Own | 9 (64.3) |       |
| Ethnicity of close friends |       |       |
| Similar ethnicity (Indian/Pakistani/Bangladeshi) | 12 (85.7) |       |
| Mixed (Australian/other ethnicities) | 2 (14.3) |       |
| Language spoken at home |       |       |
| English | 12 (85.7) |       |
| Mixed (English and native language) | 2 (14.3) |       |
| Native only |       |       |
| Children |       |       |
| Age (M ± SD) | 10.1 (1.4) |       |
| Girls | 3 (25) |       |
| Boys | 9 (75) |       |
| Country of birth |       |       |
| Australia | 8 (67) |       |
| Overseas | 4 (33) |       |
| Language spoken at home among siblings |       |       |
| English | 9 (75.0) |       |
| Mixed language (English and native language) | 3 (25.0) |       |
| Ethnicity of close friends |       |       |
| Of parental ethnicity | 6 (42.9) |       |
| Mixed (Australian/ other ethnicities) | 8 (57.1) |       |
| Children weight status |       |       |
| Normal weight | 10 (83.3) |       |
| Overweight/obese | 2 (16.6) |       |

**Note.** Maternal and child weight statuses were calculated by maternal self-report of height/weight for herself and her child, and calculating BMI as weight/height squared (kg/m²) according to International Obesity Task Force classification. BMI = body mass index.
(a) conflicts between their home and external environment and (b) perceptions of food and activity levels (Figure 1).

**Maternal Experiences of Dietary and Physical Activity Changes**

Mothers’ narratives revealed the strong sociocultural influence of their origin countries. Mothers spoke their traditional language at home and they preferred wearing traditional clothes, eating traditional foods, watching television from their origin country, and socializing with their compatriots. They gave the origin country as their primary identity. More than half of the mothers spoke with their families located in their origin countries daily, while others spoke once or twice monthly. The majority of families ($n = 8$) visited their origin countries annually; a few ($n = 4$) visited every couple of
years and two have not visited in the past 5 years due to travel costs.

**Food Practices**

Mothers found it difficult to adapt their diets to their new country. They struggled with the purchase and cooking of food in the initial period post-immigration. Many ethnic ingredients were unavailable and mothers were unfamiliar with local produce. However, ethnic food availability has improved over time following immigration.

Despite satisfaction with the quality of food in Australia, many craved the flavors and tastes of their origin countries. They considered their traditional diet healthier and preferred to feed it to their families on most days.

Due to household help available in their origin countries, many of the mothers, before they were married, were unfamiliar with the skills required for cooking. In addition, many mothers did not have a sound concept of healthy or unhealthy foods or cooking techniques. A Pakistani mother aged 42 stated,

> When we were young, we never considered which food is healthy, which food is not healthy. We never ever were concerned about what we are eating. We used to eat pakoras or samosas (deep fried foods) but we never thought it was unhealthy. Similarly, coke, Fanta, Rooh Afza (sugary ethnic drink) no one told us it is unhealthy. We were never concerned about the food colouring or the labelling.

Traditional dietary patterns transformed more rapidly for children and immigrant men, compared with the women, especially stay-at-home mothers. For example, although, all the Indian (Hindu) mothers in our sample refrained from eating meat for religious reasons; partners and children of four of them changed their dietary habits after immigration to Australia and started eating poultry and fish. The dietary practices of Muslims did not change due to the wide availability of halal foods. Some dietary religious prohibitions such as beef among Hindus and pork for Muslims were strictly followed.

Immigration to Australia and exposure to Australian media and health providers changed the maternal perspective on healthiness. Children and schools were important sources of nutrition and health information. This information led to reduction of the amount of oil, spices, salt, and sugar in their food. Portion sizes were also smaller compared with those in the origin country. Most mothers cooked daily and spouses helped on social occasions. Dinner was a family meal and comprised traditional foods. Working mothers cooked the main dishes for lunch and dinner on weekends and cooked staples (bread or rice) daily:

> Here I come home from work and prepare dinner. So our items are rice, vegetable, fish, or chicken. So one protein and one veggie. But in Bangladesh we ate a lot of curries, so daily vegetable, fish, meat, either chicken or beef curry . . . but that has changed here. We do not have rice every day. Sometimes, we have pasta, we have veggies, meat, pasta, mixed sauce put together. So it’s changed a lot. And we used to eat a lot of spices, hot stuff, oil, which is changed now. (Bangladeshi mother aged 37 years)

**Physical Activity**

A sedentary lifestyle was viewed by mothers as a sign of affluence. Mothers reported that people preferred motorized transportation in their origin countries over walking and cycling, which was considered an activity for the poor. Women found physical activities challenging in their origin countries due to safety and proprietary concerns, and a lack of parks and open spaces. Boys were encouraged to participate in sports but not girls, who only did so at educational institutes. Parents tended to focus more on academic achievement and less on sports:

> Our parents never told us to do any physical activities. All we were supposed to do was study, study. So my physical activity as a kid was always just go out in the evening for 10-15 minutes at a friend’s place and just talk to them. So I never had any physical activities. I didn’t bike, didn’t do any swimming . . . So when I say that we go to the pool, I just walk laps, I can’t swim. (Indian mother aged 39 years)

Only three mothers enjoyed physical activities and were actively participating in planned exercise such as yoga, Pilates, swimming, walking, and cycling during the last 6 months. Seven mothers moderately enjoyed physical activities and the rest (n = 4) did not enjoy them at all. For these mothers, household chores and grocery shopping were sufficient exercise.

All the mothers intended to increase their physical activities. Time pressures due to employment and household chores, cost, age, safety, fear of racism, laziness, lack of energy, bad weather, dislike for exercise, and unavailability of women-only places for exercise were commonly reported reasons for inactivity.

At the time of immigration, only one mother was overweight. However, all the mothers gained weight despite saying that they had healthier diets and higher activity levels than their counterparts in origin countries. Mothers knew little about obesity prevention at the time of immigration and suggested that early information on arrival may have helped them. Some mothers thought that their weight gain might be due to the “superior quality of food ingredients in Australia.” Their strategies to prevent weight gain was to restrict the consumption of sugary and high-fat foods rather than increasing physical activity. Their frequent consumption of festive dishes, which replaced everyday meals in many households, was considered an important cause of weight gain. An Indian mother aged 32 years stated,
Since we don’t have much celebration of our own here, so we treat our family much more than they deserve, may be that is why we gain weight here.

Social Integration

Immigrant mothers, especially the stay-at-home mothers, reported that they socialized with people from similar ethnicity, culture, language, and religion. Many Indian, Pakistani, and Bangladeshi participants were friends or had common friends. Families interacted socially at least fortnightly, at parties, at friend’s houses, or at places of worship. Traditional festive foods were an essential part of these gatherings.

Despite their preference to live near their ethnic communities; most mothers lived in mixed neighborhoods, due to proximity to their children’s schools. All the mothers found Australians friendly, but there was minimal or no interaction with neighbors from other ethnicities. Mothers thought their different culture, appearance, language, racism, and mutual lack of trust were barriers for neighborhood interactions. There was little knowledge about Australian foods or Australian ways of cooking. The “Australian way of cooking” was perceived as boiled vegetables, pies, mashed potatoes, eggs, sausages, packaged ready made food, or barbeques. Immigrant mothers perceived Australian foods unhealthy because they thought that “they (Australians) do not put more effort” in making the food delicious and nutritious.

Health Concerns

Health concerns dominated the discussion around the changes in diet and activity levels among mothers. Experience of new and unprecedented chronic health conditions in close family members increased awareness and motivated a shift to a healthier diet and higher physical activities among immigrants. Immigrant mothers thus compared their parents’ lifestyles with their grandparents, and many attributed the changes to their parent’s health to a poor lifestyle:

My grandfather died at the age of 95. My grandma, the day she died, she still had cooked lunch that day. Both side of my grandparents (were) very healthy. Whereas my dad, 67, is on dialysis three times a week and has got so many problems. If you think of what changed in his food apart from eating more from outside, not much. He was still eating same pea and protein diet, from a vegetarian family. He was a banker, so he (had to) sit all day, in comparison to his father, who used to go up (and walk), because there were no trains or something. (Indian mother aged 37 years)

Mothers observed a change in discourse about obesity in their origin country from being healthy to being diseased. Previously only seen among rich and middle-aged people, every mother interviewed in our study had at least one obese close family member. Mothers noted an increase in health consciousness and a recent trend of walking, jogging, and exercise in gyms or exclusive clubs for young people from middle- and high-income classes in their origin countries to stay fit.

Mothers Views of Raising Children in Australia

Raising children in Australia was strongly connected to notions of cultural identity and social status from origin countries. Parents encouraged frequent contact of their children with their families in origin countries, to familiarize them with their language, religion, and customs. Yearly visits to origin countries became regular as the children grew older, to increase bonding and connection with their “roots.” During these visits, children met their extended families and consumed traditionally celebratory, often high-fat foods and sugary drinks. Children from Muslim backgrounds reported higher consumption of International fast foods in their parent’s origin countries, as it was halal, popular, and considered high status.

Children’s Eating Practices

There was a consensus among mothers that their children were “eating sensibly” compared to their counterparts living in the origin countries, with less sugar and fats and higher fruit and vegetable consumption. They also ate smaller portion sizes and less frequent meals. Although only two mothers reported fast-food consumption in their children in Australia, many spoke about frequent fast-food consumption and obesity among other immigrant children. Mothers considered that their home-cooked meals provided their children with healthier eating habits. Children were often involved in daily meal planning in an attempt to reduce unhealthy food and snacking, although this appeared to be an ineffective strategy.

Since immigrating to Australia, many mothers observed a shift toward unhealthy dietary practices in their origin countries. They could see new interactions between status and culture emerging, noting how children from middle- and high-status families “back home” now preferred burgers or pizzas from international fast-food chains. School canteens in their origin countries also sold burgers, pizzas, and other high-fat and sugary foods to children. Mothers reported that despite the rise in body weights in their origin countries, obesity is not a common condition and is still considered the “English medium school syndrome” or a “disease of the rich.” The discourse about healthy eating in origin countries was not directed toward children, as “some weight” was considered healthy and protective against illnesses.

Mothers were ambivalent about Australian schools’ influences on their children’s diet and physical activities. They were aware that the dietary preferences of their children shifted toward Australian norms when they transitioned from the home to school environments. Peer influence was important in shaping the children’s dietary preferences; some mothers
noticed that their children consumed food in school (such as broccoli), which they normally refused at home; however, they also wanted to eat the same sort of (unhealthy) food as did Australian peers. Popular canteen items at schools included pizza, meat pie, hot pasta and spaghetti, or other mainstream foods that were popular with their peers:

Initially, he used to take Indian food more, but then . . . he started saying, no, I’m not taking any Indian food there (to school). People ask me a lot of questions. This is happening with my second one as well. They are only taking that food, which is acceptable in school with kids such as a sandwich or pasta. (Indian mother aged 38 years)

Mothers were unhappy about their children’s refusal to eat traditional food at school. They struggled to balance popular and cheaper Australian food and what they considered to be healthy home-cooked traditional food:

There’s so much more processed food available here, which is so much cheaper . . . I am consuming more of that packaged stuff. Then at the same time we have this healthy awareness thing going on like cooking healthier, having more vegetables . . . We’re doing both in this house right now. (Bangladeshi mother aged 42 years)

None of the mothers knew about dietary guidelines in their origin countries. In contrast, most mothers (n = 10) had heard about Australian dietary guidelines; however, none could report correct fruit and vegetable servings for their children.

Children’s Physical Activities

Mothers considered that children raised in Australia were more active than their counterparts in their origin countries. Children’s physical activities in origin countries varied by social status, where children in low socioeconomic status families were more active compared with the children of the middle- or high-income families. Mothers considered themselves to be from upper-middle-income families in their origin countries and reported higher screen time, and other indoor sedentary activities such as board games, in children of their origin countries.

Only half of the mothers had heard about Australian physical activity guidelines for children aged 8 to 12 years and none reported them correctly. None of the mothers knew about physical activities guidelines in their origin countries.

Cultural influences from origin countries dominated the children’s physical activities. Education, religious and language classes were prioritized over physical activities. However, parents encouraged participation in sports that were popular in their origin country, such as cricket and football. Although mothers denied gendered views and standards, they favored sports participation for boys. As a result, organized sports participation increased with age for boys but not for girls. For instance, a 38-year-old Pakistani mother reported that she is unable to take her daughter for sports:

because I am working on weekends. She sits home and just read books and helps my mother with the household chores.

However, in case of her son, she managed to organize his sports:

sometimes drop him off before I run to work. Then my father picks him up or he is picked and dropped by his team members.

Mothers provided similar reasons for nonparticipation of girls in sports in Australia and their origin countries: safety, security, and religious and cultural norms where it was considered more appropriate for girls to help mothers in domestic chores or concentrate on their studies.

Social Integration of Children

In contrast to their mothers, children interacted socially with others of diverse ethnicities. Interactions with children from their same ethnic backgrounds occurred at least weekly or fortnightly, which was usually at a family or religious gathering. In these social gatherings, they consumed unrestricted amounts of sugary drinks and ate traditional festive foods and sweets. They tended to interact in largely sedentary ways, such as board games, television, and computer games, unable to play outside because gatherings were mostly in the evenings:

The social events happen in the evenings. I always put forward the idea that these gathering should be in the morning so that kids play outside . . . but I think most of the people are grocery shopping or other similar activities in the morning. (Indian mother aged 39 years)

Children tended to be more physically active if children of a similar ethnicity or close family members lived nearby. Only two mothers reported that their children played with neighboring children of different ethnicities. Social interaction with children of other ethnicities most often occurred at birthday parties or sporting events organized by schools or clubs. Some mothers discouraged socializing with Australian children due to concerns that children may eat restricted foods (pork for Muslims and meat or beef for Hindus). One mother was moving to Sydney to live in an ethnic enclave to avoid such occurrences:

And he wants his friend to come to the house and I say, “if you want them to come, yes, they can come,” but when he wants to go to their house, I have to think about what he’ll eat if he goes, so there are a lot of restrictions . . . That’s why it’s better he stays home . . . I don’t want him to eat something forbidden. (Bangladeshi mother aged 38 years)
Health Concerns for Children

Their children’s health was not an immediate concern for mothers unless the child had specific health issues. For example, one mother enrolled her overweight child with high cholesterol in swimming classes when he was only 3 years old. The child developed obesity and metabolic syndrome when he was 9. His mother thought that their strong family history of diabetes and her inability to adapt the Australian dietary instructions to their traditional foods were the reason.

Children’s Experiences of Dietary and Physical Activity Changes

Conflicting Home and External Environment

Children lived in a culturally conflicted environment. At home, their lives mirrored the lives of their parents, however, in school they followed an Australian lifestyle. They were aware of their cultural differences from their Australian peers and felt more comfortable with children of their parent’s ethnicities as they have a “lot in common” such as food and language. Children acknowledged food restrictions, which were mainly around meat consumption. Muslim children preferred halal meat and did not eat pork, whereas Hindu children preferred vegetables, or chicken/fish and eggs and refrained from beef.

Despite the strong influence of maternal origin countries, children appeared highly integrated into Australian society. Everyone watched Australian TV, spoke English as a primary language, preferred Western clothing, and had multi-cultural friends. All the children reported Australia as their primary identity and considered their parental ethnicity as their secondary identity. An 11-year-old immigrant of Pakistani origin described his identity in the following terms:

I consider myself to be an Australian because 90% of my life . . . like 85% of my life I’ve lived in Australia. The rest I am from Pakistan.

Children’s Perceptions of Their Food and Activity Levels

Children’s narratives revealed that they considered eating healthy food and participating in sporting activities as an Australian way of life. Children connected consumption of unhealthy foods and nonparticipation in sports with obesity and low status. Children who were overweight or obese were unpopular among their peers and were commonly ridiculed. The participant children described children who were overweight/obese as “unfit and slow and not that smart,” and unable to “play cricket and run fast.”

Schools and teachers played an integral part in shaping the children’s views on unhealthy diets and sedentary activities. Children shared this information with their families and persuaded their parents to follow them at home.

All children considered “salads,” “fruits,” “vegetables,” and “meat-based” dishes as healthy because they were high in “calcium,” “nutrients,” and “protein.” However, their food choices were largely based on “taste” rather than healthiness. Most children liked the “taste” of their traditional food at home. However, they ate “Australian food at school” as these were “yummy” and “popular” with their peers.

Sugary, fried, processed, and fast food were considered unhealthy. However, children liked some fast food because they got “a toy” with it. Children often ate fast food while traveling, at birthday parties, or after attending religious ceremonies at the temple or mosque if nothing was cooked at home. Traditional festive foods were often eaten on cultural celebrations and frequent ethnic social gatherings. Many reported that they also ate traditional festive foods a few times a week for their daily meal. The most popular food among all children was paratha (fried bread), often consumed daily.

Despite participation in some school sports or weekend club-based activities, children wanted to be more physically active, particularly because sports participation was associated with popularity among peers. Children who participated in sports were regarded as “super-fast” and “strong” and muscular (having “six packs of muscles”). Sport was a medium to socialize and “to meet children from a variety of countries.” In many cases, children chose which sports they played. However, they reported many barriers to participating fully and were unhappy with their sedentary lifestyles. For example, a boy of Indian origin aged 10 years stated,

I wish I could go out more, because usually I just stay in the house. I don’t do much; I just try to run around a lot. But since my mum says there’s furniture around, don’t run around a lot, so I often get bored.

Sport participation in children followed a gendered pattern. For example, cricket was most popular among boys, followed by football. Girls played badminton, Taekwondo, netball, and Ping-Pong. Swimming and karate were equally popular in both genders. Children were aware of gender differences in physical activities and reported lower sports participation in girls compared with boys. Immigrant girls considered themselves to be less active than Caucasian Australian girls.

Discussion

This qualitative study explored how settling in Australia influences diet, activity, and overweight/obesity risk in children of immigrants from three LMICs who share a similar history, language, and cultural practices around diet and physical activities (Bose & Jalal, 2017). We found that immigrant mothers and their children were bicultural—they followed dietary and physical activity practices of both origin country and Australia. Our results showed some protective effects of acculturation among immigrant mothers and their...
children, as living in Australia raised their awareness about obesity and obesity-related diseases, and the importance of healthy food and physical activities in obesity prevention. Children were more integrated into the Australian diet and lifestyle than their mothers, who held more traditional values. The perception of what constituted healthy food and physical activity differed between mothers and their children—mothers compared diets and activity levels with origin countries, whereas for children, the reference point was Australian peers. Our results show that acculturation of food, activity levels, and weight have connotations beyond simple health and nutrition. Their meanings are imbued with both cultural identity and social status among immigrants from their origin countries and may contradict their meanings in host countries, creating tensions and disjunctions culturally as well as generationally.

The diets and activity levels of our study participants suggested that they were not as healthy as they thought. The healthiness of home-cooked meals was offset by increased consumption of traditional festive foods. Consumption of festive foods is considered beneficial for mental health as it conveys ethnic identity, promotes social connectedness, and helps immigrants manage the loneliness and stress of adapting to a new culture (Azar et al., 2013). However, at the same time, higher consumption of these traditional festive foods increases the risk of cardiometabolic disorders among immigrants due to their high sugar and fat content (Azar et al., 2013). Health promotion strategies for new immigrants focused on ways to make traditional meals and festive foods healthy may be a way to promote healthy dietary acculturation.

Lifestyles in origin countries of immigrants have also become unhealthier over the past decade (Popkin et al., 2012). Mothers affirmed that this health transition was more pronounced in the urban upper and middle socioeconomic class—which was the social class to which they had belonged in their origin countries. These changes in the origin countries might explain why immigrants adopt unhealthy behaviors readily after immigration, responding to its signaling of social status rather than the health-related risks (Dinsa et al., 2012; Renzaho et al., 2017; Satia-Abouta et al., 2002).

Children’s and their mother’s accounts revealed that their ethnic foods were not well accepted by their peers in schools. These findings were congruent with other studies showing that given a choice, children of immigrants prefer food options and activities popular with their peers, and resist their parent’s wishes to follow traditional foods and engage in sedentary activities (Burns, 2004; Renzaho et al., 2012; Rhodes et al., 2016; Wilson & Renzaho, 2015). Intergenerational acculturative conflicts and low parental knowledge about the determinants and implications of obesity were found to increase children’s risk of obesity in these studies (Burns, 2004; Renzaho et al., 2012; Rhodes et al., 2016; Wilson & Renzaho, 2015). In contrast to previous evidence, mothers in our study were aware of obesity and its determinants. However, they were unable to fully translate this knowledge to prevent the risk of obesity in their families. For successful obesity prevention strategies, these intergenerational conflicts and contradictions among immigrants must be accounted for.

Evidence of gender-based restrictions on physical activities and obesity among immigrants is mixed (Ghuman, 2000;  

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**Figure 2.** Conceptual diagram of factors leading to child overweight/obesity in the present study.
Gualdi-Russo et al., 2014; Van Hook & Baker, 2010); some studies report no gendered restrictions (Green et al., 2003), while others indicate that girls have higher restrictions due to safety, security, and religious reasons that impede after-school activities and promote a sedentary lifestyle (Ghuman, 2000; Gualdi-Russo et al., 2014; Renzaho et al., 2012). In our study, there were hints of gendered favoritism for boys regarding physical activities, although mothers seemed oblivious to them. This favoritism may be due to gendered social inequalities in origin countries, which could result in a failure of immigrant parents to identify the need for equal opportunities for these girls. Mistrust of the host society and other intersectional factors such as religion, color, immigrant background, and language may add to this unconscious gendered partiality. Maternal physical activity was also generally incidental and household-related and this had both health and acculturation consequences. Despite being knowledgeable about the benefits of planned physical activities, mothers reported many barriers, often cultural, which they also applied to their daughters (Gerber et al., 2012). Public health strategies to promote physical activities among immigrant women need to be mindful of these influences. Trust-building initiatives aimed to empower immigrant women must include steps to ensure safety and cultural appropriateness of sporting activities and facilities, for example, establishing women-only gyms and swimming pools.

Despite the deep engagement of immigrants in their religious activities, religion did not emerge as a strong determinant of dietary and activity choices in our study. Our findings affirm studies that show that among Hindu immigrants, there is a gradual transition toward the inclusion of higher amounts of animal products and highly processed food, replacing plant-based diets (Thomas, 2016). Similarly, our study also confirms evidence that the dietary practices of Muslims do not change after immigration (Aljaroudi et al., 2019). This may be particularly true in Australia, where halal goods are widely available (Voloder, 2015). Religion was also not considered the main barrier to physical activities, especially among girls, in contrast to previous evidence (Ghuman, 2000). Our results identify that places of worship may provide an important venue for culturally specific health promotion activities for immigrants.

Mothers’ and children’s obesity prevention strategies were focused more on diet (sugar-sweetened beverages and fatty-food) than physical activities, which reflects the diet focus of most public health campaigns. Similar to other research, we also found that awareness about obesity was insufficient to lower overweight/obesity risk among immigrants unless it can easily translate into healthy practices (Hart et al., 2015). The cultural and status contradictions between country and generation hampered this translation and may, therefore, be an important mechanism explaining why these children face a heightened overweight and obesity risk.

The recently reported plateauing of overweight/obesity in Australia reflects the success of health interventions promoting a healthy diet and higher physical activities (Olds et al., 2010, 2011). However, our results indicate that more effort is required to lower the obesity rates among immigrants. Health promotion strategies should focus on developing culturally sensitive public health messages that address the specific needs of the immigrant population with respect to promoting healthy lifestyles. These messages need to be simple, easy to understand language, and must be rooted in the traditional values of the immigrants.

**Strengths and Limitations**

To the best of our knowledge, this is the first Australian study to explore intergenerational acculturative conflicts of diet and physical activity among mothers from India, Pakistan, and Bangladesh and their 8- to 11-year-old children. The inclusion of children’s views and voices in our study helped us understand the perspective of children and their position in decision-making that affects their lives (Harcourt & Einarsdóttir, 2011). Despite the small sample of mothers and children, the interviews provided us with the rich detail of what is a complex, often contradictory and conflicting acculturation process and how this interacts with mothers’ and children’s health practices.

We advise caution in the generalizability of our results due to a number of limitations. The first limitation is that our study sample was small and only included mothers from three LMICs and their children, which restrict the generalizability of the results to immigrants from other countries. Furthermore, the immigrant mothers in our study belonged to middle socioeconomic class in their origin countries and in Australia and had good English-speaking skills. Therefore, caution is advised when interpreting the results for immigrants from the low socioeconomic class with poor English-speaking skills. The snowball sampling may also have introduced selection bias. However, as the majority of recent Australian immigrants are skilled and educated and belong to the upper and middle socioeconomic classes in their origin countries, it is likely that the acculturation experiences of many will be similar. Furthermore, the results of our study affirmed findings from other studies on immigrants’ health, which identified intergenerational conflicts around diet and activity levels among immigrants and their children, which increase their risk of overweight/obesity. In addition, the immigrant mothers and their children were residents of Canberra, which is the national capital and one of the healthiest and wealthiest cities in Australia (ACT Health, 2018). Therefore, our results may not be generalizable to immigrants living in other cities.

Due to the small sample size of children and an even smaller sample of girls, we were unable to identify gender-specific variations around diet and activity levels from children’s narratives. However, maternal narratives provided insights into how gender plays a role in negotiating diet and physical activities among children of immigrants. Despite all these limitations, our study complements scarce evidence on the acculturative process of immigrant mothers and their
children, which would be helpful for culturally sensitive obesity prevention strategies.

Conclusion

In conclusion, we found that an interplay between social status and cultural identity in origin and host countries influences the diet and activity-level adaptations among immigrants. Immigrant mothers and their children were bicultural in our study; however, children were more integrated with the host culture compared with their mothers. This disjunction of acculturation levels between mothers and children due to varied frames of the reference-origin country for mothers and host for children increased the risk of obesity in this population. Understanding the strong role of culture of origin countries in shaping the diet, physical activities, and socializing among immigrants is important. Children of immigrants face a double predicament; they desire to fit in to the host society and adopt practices popular with their peers, but at the same time want to keep their parental cultural identities intact. This dilemma is stronger for girls. Our findings suggest the need for an intergenerational approach in dealing with the complex and highly sensitive acculturation process for immigrant parents and their children.

The increased obesity awareness in our study population indicates the success of public health campaigns in Australia. However, to prevent obesity among immigrants and their children, it is imperative that public health communication must be built on a deeper understanding of the cultural and social influences shaping their health choices. The public health policies must be more nuanced culturally acceptable and gender specific. The health policies must also account for the intergenerational acculturative differences between immigrant parents and their children, cultural inconsistencies in the home and school environment, media and peer influence, safety, and security issues, to name just a few.

Our results identify a challenge for developing a unified Australian national obesity strategy that acknowledges the disadvantages faced by immigrants and handles gender, culture, and status-related meanings of food, physical activities, and body weight in a way that helps immigrants understand healthy behaviors without undermining their cultural identities.

Acknowledgments

We want to thank the participants of the study for allowing us to interview them. Without their support, this research would not have been possible.

Author Contributions

T.Z. developed the original idea and plan the study. She led the analysis, interpretation of results, and write-up of the article. C.B. and L.S. contributed to the idea and planning, writing and interpretation of results, and reviewed and approved the final manuscript.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research and/or authorship of this article.

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Availability of Data and Materials

The data that support the findings of this study are available from the authors upon request.

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