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Impact of school and work status on diet and physical activity in rural Guatemalan adolescent girls: a qualitative study

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In low- and middle-income countries, gender norms and access to energy-dense, nutrient-poor foods are well-studied determinants of food and physical activity choices for adolescent girls. However, most work has been done in urban and school settings. In many settings, a large proportion of the adolescent population is rural or not enrolled in school. We conducted in-depth interviews with 20 adolescent girls (ages 15–19) in Tecpán, Guatemala, a rural, largely indigenous Maya community. Interviews were coded and themes analyzed for insights into eating habits, food choices, and physical activity. Twelve participants were enrolled in school and eight were employed and not in school. Girls enrolled in school had more disrupted eating schedules and consumed more energy-dense, nutrient-poor foods. Girls not enrolled in school had fewer opportunities for physical activity and were more sedentary. To our knowledge, this study is the first in a low- and middle-income country to consider diet and physical activity of adolescent girls enrolled and not enrolled in school. Key implications include (1) the need to reduce exposure to nutrient-poor foods and promote healthy eating schedules in schools, and (2) the need to create community-based opportunities for the activity for girls no longer enrolled in school.

Keywords: diet; physical activity; Guatemala; adolescent; girl; school; work

Introduction

The health and well-being of adolescents is an important global priority.[1] Adolescence is a time of great change. Childhood behaviors are substantially modified, often leading to new patterns of dietary choices and physical activity that may persist into adulthood. There is an extensive literature on the social and environmental factors that impact adolescents' decision making around diet and activity.[2–9] In particular, the school environment has been well studied, both as a formative environment shaping diet and activity behaviors and, consequently, a potential site for interventions designed to promote healthy behaviors.[10–12] Additionally, much literature is devoted to differences in activity and diet in adolescent boys and girls. Although diet quality, meal structure, and physical activity often deteriorate or decline during adolescence, these changes can be more pronounced for adolescent girls.[13,14]

Research on adolescent diets and activity comes mostly from high-income countries (HICs), relatively a few focus on the needs of those in low- and middle-income countries (LMICs).[15,16] Nevertheless, several have highlighted important themes in LMICs. For example, junk food vendors in close proximity to schools are important drivers of adolescent diet quality in Brazil[17] and Guatemala.[18,19] In addition, family or community gender norms as well as differential opportunities

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for girls to participate in sports both in community and school venues are important determinants of physical activities disparities in Guatemala,[20] Nigeria,[21] India,[22] and Costa Rica.[23] Similarly, differential responsibility for domestic chores has been reported that adversely affect lifestyle habits for girls in several settings.[15,20,24]

One final issue pertinent to the study of adolescent's diet and activity (particularly adolescent girls) is that there have been very few studies in LMICs in indigenous populations or among those living outside major urban centers. In these populations, a considerable percentage of adolescents may be obligated to combine school with work or not attend school for work or other reasons. Therefore, understanding the impact of out-of-school (e.g., due to work and motherhood) status on adolescent behaviors in an LMIC setting is an important research priority. In Guatemala, around half of adolescents and young adults (aged 15–24) are out of school. Girls are more likely to be out of school (55%) than are boys (49%).[25] These differences are further amplified by ethnicity. For example, in one representative national survey, the mean number of years of schooling was 6.9 and 6.4 years for nonindigenous adult men and women compared with 4.6 and 3.4 years for their indigenous counterparts, respectively.[26] In addition, Guatemala has one of the highest rates of teen pregnancy in the region. Approximately one-fifth of all 17-year-old girls are pregnant or have given birth[27] and 9 out of 10 girls who become pregnant drop out of school.[25] Adolescent pregnancy rates are slightly higher among indigenous (21.2%) than nonindigenous girls (20.2%).[28] Finally, given the high rates of poverty in Guatemala, many adolescents feel compelled to balance school and employment. In the indigenous Maya population, which lives primarily outside of major urban areas, this is particularly the case. In these settings, more than 400,000 adolescents aged 15–19 (41.4%) are employed in either the formal or informal economies.[28]

Therefore, to address the impact of out-of-school status on diet and physical activity, we conducted a series of qualitative interviews with adolescent girls from one midsized, largely indigenous Maya town. We hypothesized that in-school status would result in higher exposure to lower quality and processed foods, but more opportunities for physical activity than for those who are out of school or working.

Materials and methods

Study context

The study was conducted in the municipality of Tecpán, Chimaltenango. Tecpán is a midsized municipality with a population of ∼150,000. Approximately 20% of the population lives in the municipal town center and the remainder in surrounding agricultural clusters. It is located 34 miles west of the capital of Guatemala, Guatemala City. More than 90% of the population is indigenous Maya, and the rate of poverty is much higher than the national average (70.2% versus 54.3%). Similarly, the rate of primary school completion is lower (73.6%) than the national average (86.3%).[29]

In Tecpán, as in most of Guatemala, secondary school schedules accommodate the needs of students who have significant domestic responsibilities or who both work and study. Therefore, all secondary schools in Tecpán—both public and private—consist primarily of half-day sessions (either morning or afternoon), with occasional full-day activities. There are a few differences in scheduling or resources available to students between public and private school settings. However, most private schools are religious in nature and provide additional religious instruction classes.

Schools do not typically provide any food services to their student bodies. Therefore, they must either bring their own meals, purchase foods from stores or restaurants near the school campuses, or eat at home if the timing for home and commute time to school permit. Finally, all secondary schools in Tecpán are located in the municipal town center. This means that students from Tecpan's peripheral agricultural communities must commute, usually on public buses, with a one-way commute time of typically 15–60 min (5–20 km).

Study procedures

If participants were younger than 18, signed informed consent was given by a parent or legal guardian and verbal assent was obtained from each participant. For those older than 18, signed informed consent was obtained. The study was approved by the Wuqu' Kawoq | Maya Health Alliance Institutional Review Board (WK-2017-007). The CORE-Q checklist for reporting qualitative studies was used in drafting this manuscript.[13]

Research assistants worked with the study coordinator (L.M.) to purposively identify subjects to participate in the qualitative interviews based on their school status and solicited their participation by a phone call or a home visit. A minority of individuals approached to participate based on their in-school status were also working simultaneously and were included in the sample. In total, 24 girls aged 15–19 were approached (10 enrolled in school and unemployed, 4 enrolled in school and employed, and 10 not enrolled in school and working). Four approached for interviews declined to participate (two enrolled in school and unemployed and two not enrolled in school and working).

Interviews were conducted by the study coordinator (L.M.), a female native Spanish speaker with a master's degree in cultural anthropology. One of the two female research assistants (native Spanish and Kaqchikel Maya speakers) was also present, in order to assist with Kaqchikel interpretation, as needed. However, all subjects preferred to be interviewed in Spanish. Participants were previously unknown to the study coordinator but had interacted with the research assistants. At the start of the interviews, subjects were told that L.M. was an anthropologist working to develop a deeper understanding of the social factors affecting their diet, physical activity, and daily routines.

Interviews were primarily conducted alone in the participants' home in a private location and were documented through audio recording. For those who were students, interviews were sometimes conducted at their schools in a private setting (empty classroom). Other interview locations included participants' workplace (e.g., bakeries and bookstores) while interviewees were alone on work breaks. One interview only was conducted with each participant. Interviews ranged from 20 to 60 min and were conducted between March 15, 2018, and July 30, 2018.

We developed an interview guide with the entire research team to gather information on adolescent girls' educational and work occupations. The guide consisted of open-ended questions, which queried about the household economy, eating behaviors, physical activity routines, and environmental influences (Supporting File S1, online only). The research coordinator and assistants regularly discussed data saturation and, after 20 interviews, felt that no new major themes were emerging with new interviews.

Data analysis

Recorded interviews were transcribed verbatim. Transcription accuracy was spot checked by L.M. An initial codebook was developed by L.M. using inductive thematic analysis to identify dominant themes in five randomly selected interview transcripts. An initial round of coding was then conducted by L.M., with two more rounds of coding by S.K. and P.R. Several additional minor themes were identified during these subsequent rounds, with new codes added to the codebook. Coding discrepancies were reviewed together by the three coders until consensus was achieved. All coding was conducted using the Dedoose software platform (www.dedoose.com). The codebook is provided as Table S1 (online only). Transcripts and codes were not returned to participants to check for accuracy.

Results

In total, 20 subjects were interviewed, with a good representation of school enrollment and work status. Basic sociodemographic characteristics of participants are given in Table 1. Thematic analysis provided insights into the factors influencing adolescent girls' eating habits, food choices, and physical activity. Narrative analysis of these themes is discussed below (see Table S2, online only, for coding frequencies).

Eating habits and dietary decisions

Eating schedule

Many participants discussed factors influencing meal frequency and structure, including "meal skipping." Overall, more individuals enrolled in school as opposed to those not enrolled but working either in or out of the home reported an irregular and disrupted eating schedule (92%). In particular, given the demands of school schedules, many students described skipping or rushing meals due to a limited amount of time:

> *Even though my mom prepares breakfast for me, I do not always have the time. Sometimes I have to skip breakfast because I have to leave early for classes and I do not have the time to sit down and eat. For lunch, I have a little more time because I enter classes a little bit later in the afternoon* (ID16, enrolled in school, not employed).

In contrast to students, a few less participants not enrolled in school (75%) discussed disruption to their daily eating schedules. One individual

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Table 1. Sociodemographic characteristics of study participants

Characteristic	*n* (%)
Current occupation	
Enrolled in school, not employed	10 (50)
Enrolled in school, working	2 (10)
Not enrolled in school, working	8 (40)
Marital status	
Married	1 (5)
Single	19 (95)
Has children	
Yes	5 (25)
No	15 (75)
Age group, years old	
15–16	4 (20)
17–18	14 (70)
19	2 (10)
Ethnicity	
Indigenous	18 (90)
Nonindigenous	2 (10)
Simple poverty score, median (interquartile range)[a]	47 (38–56)
Household size, median (interquartile size)	6 (4–8)

[a]Poverty likelihood score calculated using Guatemalan data at www.simplepovertyscorecard.com. Lower scores represent a higher likelihood of poverty (possible range 0–100). A score of approximately 42 represents a 50% chance of a family living below the Guatemalan national poverty line.

out-of-school and working in the family business reflected on her new schedule as compared with when she was in school:

> *When I was studying, I barely ate lunch because classes would start in the afternoons. But now that I am at home, I always eat lunch at the right hour* (ID6, not enrolled in school, employed in the home).

The finding was not, however, universal, as some individuals employed and not enrolled in school also reported eating schedule disruption, especially right after starting a new job or other major life status change, such as a pregnancy:

> *Since starting my new job this year, I rarely have breakfast on a regular basis" (ID8, not enrolled in school, employed out of the home).*

For individuals experiencing schedule disruption—either due to school or work obligations—another very common reinforcing theme was that busyness frequently led to lack of appetite, leading to more meal skipping or irregular snacking:

> *I hardly eat breakfast. I find it difficult to eat early in the mornings and so I barely eat anything then* (ID15, enrolled in school, not employed).

In addition to disruptions in eating schedule due to work or school obligations, one minor theme mentioned by a few (20%) participants was that family and friends' comments about participants' physical appearance influenced reported eating schedules and led to food restriction and meal skipping. One participant expressed:

> *I asked my sister-in-law if I was putting on weight and she said yes. I did not like that and so before when I was eating about four tortillas I would only try and eat two. But because I was feeling rushed, I just stopped eating lunch all together to get skinny* (ID2, not enrolled in school, employed in the home).

Food sources

For all participants, most meals were prepared at home, either by themselves or by family members. For a minority—particularly those traveling far for school or work or with particularly demanding schedules—prepared food was taken with them for the day. Most others, however, made efforts to return home for meals, especially for lunch, which in rural Guatemala is typically the main meal of the day. Despite the preponderance of homemade foods, both participants enrolled (58%) and not enrolled (75%) in school mentioned regular exposures to street food vendors, store-bought and energy-dense, nutrient-poor foods.

For those enrolled in school, many (63%) described buying snacks from small kiosks or corner stores around schools. These snacking behaviors were especially important for those whose schedules did not allow them to pack homemade foods or who were skipping meals due to busy routines. One student described:

> *I buy a snack here (food stand at school). Sometimes I buy an empanada or a bag of mangos. Other times I will buy stuffed bread during our break* (ID9, enrolled in school, not employed).

Another student shared a similar account:

> *I do not have time to pack myself a snack for school (from home) and so I will buy something at the nearby store that is out in front. Sometimes I will buy fruit juice with cookies or some chips. Those are the only options that they have* (ID16, enrolled in school, not employed).

In contrast, participants not enrolled in school and working purchased processed food less often (50%)

and tended to mention purchases for special occasions, typically to be shared at home with the rest of the family, rather than as an "on-the-go" meal substitute. For example, one participant shared:

> *On Saturdays, we will sometimes buy fried chicken for lunch from Pinulito* (fast-food chain) (ID2, not enrolled in school, employed in the home).

Other factors affecting food choices

In addition to the impact of business and the school environment on meal schedule and food choices, other minor themes emerged affecting food choices, although these did not show any clear pattern by school enrollment. For example, many participants discussed the impact of discussions with friends or family on their ideas about healthy food choices.

> *My friends and I talk a lot about the foods we eat or do not eat. Sometimes my friends tell me not to eat pizza because that is what makes you fat. Or same with chocolates or other sweets. Even though every Sunday we eat pizza at home* (ID13, enrolled in school, not employed).

Similarly, another participant shared:

> I felt that I was putting on weight and so I started to diet. My mother noticed that I was then losing a lot of weight and told me that was not healthy to be too skinny and not eat. But now even now with whatever food I eat, I cannot gain back the weight! Sometimes I am also just not hungry. I tell my sisters-in-law, 'I will have a month where I eat and then another month where I won't (ID02, not enrolled in school, employed in the family business).

Some participants further elaborated on certain medical conditions or advice given by health professionals about nutrition as another factor in their dietary decisions:

> *I used to eat sausage and cream for breakfast. But now I cannot eat too much fat anymore because of my acne. I went and had some tests done and the doctor told me to not eat as much fat* (ID14, enrolled in school, not employed).

Another one similarly described a more serious health condition that influenced her dietary decisions:

> *I have a cerebral condition where I get seizures. So, the doctor recommended that I do not eat too much fat. Because of that, I mainly eat vegetables. My mom mainly gives me vegetables, because I should not eat meat* (ID08, not enrolled in school, employed outside the home).

Physical activity

School enrollment as a facilitator for exercise

Interview results showed that participants enrolled in school engaged in much more physical activity than those not enrolled (50% versus 25%). First, the former were more likely to engage in medium-intensity physical activity, principally walking while commuting to school. One student described this activity as part of her daily routine:

> *Leaving school, I have to walk a bit more to take the bus that is further away* (ID16, enrolled in school, not employed).

In addition, participants described engaging in high-intensity physical activity with schoolmates. As one student expressed:

> *My friend invited me to play for the community team. We got to the semifinals. We played game after game. I am not playing on that team anymore; our last game was on Saturday. But I love it. Saturdays and Sundays, I will go play with my cousins or friends from school. Just us ladies, we will get together and championship soccer games* (ID18, enrolled in school, not employed).

Several participants who were employed and no longer enrolled in school reminisced about the exercise opportunities they had enjoyed while in school and subsequently abandoned:

> *I would go with a few friends from school to a soccer field. We would go there and we would play for like 2 or 3 hours. We would pass the ball around and laugh* (ID5, not enrolled in school, employed in the home);

> *I loved practice. When I was still studying, I would play two to three times a week. At school, there were always championships and I would participate in those* (ID6, not enrolled in school, employed in the family business).

Finally, in addition to these informal activities, such as running with friends or playing a pick-up soccer game, participants enrolled in school described their involvement in team sports as a motivating factor to exercise:

> *I started playing basketball when I was 6 years old for a team at school. I have loved playing; my dad also plays basketball so we sometimes go out and train together. I have had the opportunity to play in different departments and also in the Capital. I have traveled a lot with my team, I love that part of the sport* (ID20, enrolled in school, not employed).

Despite the clear role of school enrollment in facilitating access to both formal and informal physical activities, those in school sometimes still did experience challenges. For example, a few students

noted that intense periods of school activity limited their time for engaging in regular physical activity:

> *This year I just didn't have the time. Sometimes at night, I would try to do a little bit of exercise, the basics. I would just get really tired. It is different when I am having to do homework—I get easily tired and am hungry more often and do not have the energy to also exercise* (ID13, enrolled in school, not employed).

In addition, not all school experiences were equal, with some expressing frustration over the lack of resources at their schools:

> *We wanted to play basketball, but there are no basketball courts and it is very difficult to get together and practice* (ID11, enrolled in school, not employed).

Finally, some students simply lacked interest in physical activity, despite the availability of existing opportunities:

> *To be honest, exercise just does not come to my attention. I am very closed off in terms of sports* (ID15, enrolled in school, not employed).

The challenges of out-of-school status

In contrast to the activities of participants enrolled in school, none of those not enrolled took part in any form of regular physical activity other than light-intensity chores. As one out-of-school participant who dedicated her time to managing a bookstore for her extended family remarked:

> *Outside of working at the bookstore, I help prepare lunch at home and do most of the house cleaning* (ID3 not enrolled in school, employed outside of the home).

For many of these participants not enrolled in school, a significant life change, such as getting married, family financial strain, or becoming pregnant, led to their change in school and employment status and impacted their ability to exercise:

> *I used to play basketball. But to be honest, I hardly can go anywhere anymore. I have to care for my two babies now and so it is difficult. The only time I leave the house is for errands* (ID5, not enrolled in school, employed in the home).

Another major barrier was the limited time in the day after accounting for both domestic and work responsibilities:

> *I just don't have time to exercise. First, I have my job, then I have to go home fold the laundry, and take care of my daughter. The day goes by and I have no time* (ID3, not enrolled in school, employed out of the home)."

Finally, out-of-school participants were more likely to engage in sporadic exercise, often prompted by weight gain, but these activities were rarely sustained given time constraints. For example, one participant remarked:

> *When I feel like I am putting on some weight, I do some exercises at night with my sister who is in shape and likes to exercise. But I only do that once in a while, not always* (ID8, not enrolled in school, employed out of the home).

Discussion

Recent literature from LMICs has begun to explore how the school environment is an important modifier of food and physical activity choices for adolescent girls, similar to well-established findings from HICs.[5,6,15,16] However, most of this work has been conducted in large metropolitan settings (including in Guatemala) and much less is known about the choices of adolescent girls from outside these areas.[18,20] In addition, comparative work on the choices of out-of-school girls has not been conducted, despite the importance of this issue in LMICs, where many adolescents are not enrolled in school due to multiple reasons, including work and pregnancy. Our qualitative interviews with adolescent girls either in or out of school and working from a midsized, predominantly indigenous Maya town address these issues.

According to our findings, adolescent girls in school report significant disruption to their daily eating schedules due to school-related time constraints. In addition, they were more likely to skip meals compared with their out-of-school counterparts. Time constraints from school and their impact on girls' eating schedules are commonly reported in the literature from other countries in both high- and low-resource settings.[30,31] They also reported higher exposure to energy-dense, nutrient-poor foods around their schools and more frequent snacking. These findings are similar to urban Guatemalan schools and described how, in that setting, energy-dense snacks and sugar-sweetened beverages available at kiosks around schools comprise a large proportion of the school food environment.[18–20,32]

Even though out-of-school and working adolescents seem to have less eating habit disruption, they struggled to find time for physical activity and therefore had a much more sedentary lifestyle than their counterparts enrolled in school. They

identified home and work responsibilities, significant life changes (e.g., pregnancy) triggering transition out of school, and access to opportunities afforded by the school environment as limiting factors to exercise. Studies in other settings have also highlighted the school environment as a facilitating environment for engagement in physical activity.[33] In addition, within Guatemala, female adolescents in metropolitan school districts have reported that chores and other domestic responsibilities are barriers to engaging in physical activity.[20] Our findings are consistent with other work on time demands in the regional literature. For example, using a nationally representative data set, Gammage found that women in Guatemala, especially from poor and rural homes, perform a disproportionate amount of unpaid labor and are more likely to experience more "time poverty" and less leisure than men.[34] In a complementary fashion, Dammert has shown that preteenage girls in Guatemala and Nicaragua assume a disproportionate burden of domestic work as family size increases compared with boys.[35]

Our findings are also consistent with a few others from LMICs showing that schools can be an important site for promoting physical activity in adolescents, just as they are in HICs.[2,16,21,23,36] For those enrolled in school, physical activity was promoted in multiple ways, including moderate-intensity activity while commuting to school (e.g., walking to the bus) and formal (physical education and team sports) and informal (with friends) higher intensity physical activity. But there are also some barriers as not all students experience the same degree of access to sports opportunities based on facility limitations. However, interestingly, we found only limited evidence of gender-based disparities, with few participants expressing their options for physical activity were limited by community expectations about appropriate behavior or because of the prioritization of boys' sports.[20,22]

Finally, although not the primary focus of this study, an important theme, which emerged in several of the interviews, was sensitivity to perceptions of overweight or concerns about weight gain—often mediated by comments from friends or family members—among participants. There is limited research on weight perception in Guatemala, but several important studies on stigma and stress related to body image (both under- and overweight) have recently been published, and this is an important area for future research in our population as well.[37–39]

This qualitative study is, to our knowledge, the first in an LMIC to differentially consider the diet and physical activity patterns of adolescent girls enrolled and not enrolled in school. As such, our data provide insights into the role of school and employment status on diet and exercise. However, our findings should be considered in light of some limitations. The sample size was relatively homogenous and was from one Maya community in central Guatemala. Given this, the findings may not be generalizable to other socioeconomic communities in Guatemala or LMICs. In addition, although located in a rural area of central Guatemala, Tecpán is a midsized town with relatively developed infrastructure, and so our results may not adequately reflect the experiences of girls living in the most remote areas of the country.

In conclusion, we found that adolescent girls enrolled in school had more disrupted eating schedules, more energy-dense, nutrient-poor food consumption, and more snacking than girls not enrolled in school. On the other hand, girls not enrolled in school had fewer opportunities for physical activity and were more likely to be sedentary. From a policy and research standpoint, important implications of this work include research within Guatemala on how to incentivize school leadership and food merchants to provide healthier food options near schools, and how to modify school schedules to permit regular meals. In addition, the study highlights the until now largely ignored problem of the lack of opportunities for physical activity for girls, once they are no longer in school, since most participants (both in and out of school) regarded the school environment as a major promoter of physical activity. Possible solutions would include working with Guatemala's decentralized municipal governments to construct or expand access to sports facilities or creating community-based peer groups and safe social spaces for adolescent girls that are not structured around school infrastructure.

Finally, three of our interviews with girls out of school showed that pregnancy was a common life change associated with the out-of-school transition. As Guatemala has one of the highest rates of adolescent pregnancy in Latin America, this

emphasizes the pressing need to develop effective public health solutions to reduce adolescent pregnancy in Guatemala, one of the highest rates in all Latin America.[25] At the same time, however, two girls in school also had children but did not explicitly identify this as a major factor impacting their life habits; additional resources are needed to explore which supportive factors can contribute to educational success for girls after a pregnancy.

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Author contributions

S.K. coded data and drafted the manuscript. L.M. designed the study, conducted interviews, coded data, and drafted the manuscript. V.C. designed the study and critically revised the manuscript. J.B. designed the study and critically revised the manuscript. P.R. designed the study, coded data, and drafted the manuscript.

Supporting information

Additional supporting information may be found in the online version of this article.

Supporting File S1. Interview guide

Table S1. Detailed qualitative codebook

Table S2. Coding frequencies by school/ employment status.

Competing interests

The authors declare no competing interests.

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