Low-income workers' perceptions of wages, food acquisition, and well-being

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Abstract

Although studies have demonstrated an association between increased economic resources and improvements in food security and health, there is a paucity of qualitative research regarding the relationships between household resources, food security, and health. Policy changes related to increasing low wages are potential opportunities to understand changes to material resources. The aims of this analysis were to describe how low-wage workers perceive household resources in relation to food acquisition and to explore how workers in low-wage jobs connect food and diet to perceptions of health and well-being. We analyzed 190 transcripts from 55 workers in low-wage jobs who were living in households with children who were part of the Seattle Minimum Wage Study (up to three in-depth qualitative interviews and one phone survey per participant, conducted between 2015 and 2017). We coded and analyzed interviews using Campbell's food acquisition framework and best practices for qualitative research. Participants relied on a combination of wages, government assistance, and private assistance from community or family resources to maintain an adequate food supply. Strategies tended to focus more on maintaining food quality than food quantity. Restricted resources also limited food-related leisure activities, which many participants considered important to quality of life. Although many low-wage workers would like to use additional income to purchase higher quality foods or increase food-related leisure activities, they often perceive trade-offs that limit income-based adjustments to food-spending patterns. Future studies should be specifically designed to examine food choices in response to changes in income.

Keywords:

Nutrition, Food security, Wages, Food acquisition, Health, Policy

BACKGROUND

Social and economic determinants are widely recognized as important drivers of health generally and healthy diets specifically [1]. Poorer populations are much more likely to experience food insecurity, which is a disruption in food intake or regular eating due to lack of money or other resources [2,3]. Negative health outcomes associated with food insecurity include malnutrition, obesity, and depression as well as increased risk for chronic disease, reduced mental well-being, and decreased cognitive or academic performance [4–6].

Implications

Practice: Low-income households may experience restrictions in food choices that affect health and quality of life.

Policy: Policymakers who aim to reduce food insecurity should consider the trade-offs between various food acquisition resources, such as the trade-off between higher income and government food assistance eligibility.

Research: More research is needed to understand the relative effects of income and other food security risk factors as they pertain to food acquisition decisions at a household level.

Increased economic resources improve food security and health among low-income households. For example, expansions of Supplemental Nutrition Assistance Program (SNAP) benefits during the Great Recession were followed by a 2.2% decrease in food insecurity among households eligible for SNAP [7]. A randomized trial found improved diets in SNAP-eligible beneficiaries when simultaneously restricting the range of food purchasing while also discounting fruits and vegetables [8]. A 2014 study of American Indian tribes found that opening or expanding a casino was associated with increased economic resources and a decreased risk of childhood overweight and obesity [9].

Policy changes related to increasing low wages, such as minimum wage policies or improving worker benefits, are potential opportunities to understand changes to material resources from a public health lens, but few of these policies explicitly aim to affect food access or health [10–12]. Since 2014, a record number of cities and counties in the USA have adopted policies to increase the minimum wage, generally with the goal of addressing growing wage inequality and cost of living [11,12]. Evidence evaluating the effect of wage and income policies on health is still relatively nascent and inconclusive, with research examining policy effects on food behaviors, diet, and diet-related health outcomes specifically

being more sparse [13,14]. Although additional income could theoretically be used for food, higher wages could also result in losses of public assistance. Eligibility for SNAP is based on income and assets, and monthly benefit amounts are based on food prices, household size, and income [15].

Evidence examining the association between higher wages and obesity range from modestly negative to modestly positive [13,16–23]. Minimum wage has also been associated with a reduction in the prevalence of underweight in women [23] and markers of malnutrition in children [24]. Two studies have provided countervailing evidence in the evaluation of higher minimum wages and fruit and vegetable consumption, with one concluding it decreases consumption [22] and the other that it increases consumption [25]. Another study examined minimum wage increases across 24 countries and found significant reductions in diabetic and cardiovascular disease mortality [19] whereas another found reductions in heart disease deaths [26]. There is little consensus about how to study the relationship between household resources, food security, and health outcomes with respect to the appropriate population of study and choice of analytical methods [13]. The lack of consistency may, in part, explain the complex array of findings for associations between wages and health outcomes. Moreover, there has been a paucity of qualitative research assessing worker perceptions of low-wage jobs, food acquisition, and worker health and well-being [27]. Little is known about whether or how workers in low-wage jobs consider the quantity or quality of food choices in the context of wage changes. Qualitative research can provide insights to the experiences and coping strategies of low-income individuals and their families, particularly with respect to how workers in low-wage jobs make decisions about allocating household resources to food in a way that quantitative research alone cannot uncover.

To investigate this gap in the literature, this study takes advantage of qualitative interview data collected between 2015 and 2017 from 55 workers in low-wage jobs who were interviewed multiple times during the implementation of Seattle's Minimum Wage Ordinance (hereafter "the Ordinance"), which increased the minimum wage for all workers inside the city to \$15/hr over time [28]. The aims of this analysis were to describe how low-wage workers perceive household resources in relation to strategies for food acquisition, and to explore whether and how workers in low-wage jobs connect food and diet to perceptions of health and well-being. To our knowledge, this is the first study to examine both the social context and the experiential dimensions of food acquisition decisions and food access through interviews with workers as they experienced the implementation of a city-level minimum wage policy. Another goal of this analysis was to consider the

translational implications of how policymakers and employers might affect the context of food access for workers in low-wage jobs.

METHODS

Study design

This analysis used qualitative interview data from the Seattle Minimum Wage Study (SMWS), a multicomponent evaluation of the Ordinance conducted at the University of Washington (UW) [29]. The study enrolled 55 participants in 2015 and aimed to complete three in-depth, in-person interviews and four shorter phone surveys per participant between 2015 and 2017. The goals of the study were to capture worker perspectives on and experiences with work, budgets, and family life. Later, we briefly describe relevant information for this analysis. The full study design can be found elsewhere [29].

Participants and procedures

From February to May 2015, researchers at the UW actively recruited participants at partner organizations in the community, including preschools, social service agencies, and subsidized housing developments. Researchers also provided recruitment flyers to libraries, affordable housing buildings, social service agencies, and more than 40 restaurants, hotels, and bars. A full list of recruitment partners is available in the SMWS 2016 report [27]. A priority of the original study was to capture diverse worker experiences of workers with families who would be affected by implementation of the Ordinance, with a particular focus on the perspectives of immigrant and non-English-speaking workers. The criteria for participant inclusion were designed to recruit families with children that relied on one or more minimum wage workers to make ends meet: an hourly wage of no more than \$15, an annual family income of less than \$50,000, and at least one child under the age of 18 living in the household.

The study participants were offered a \$40 incentive for in-depth interviews and a \$10 incentive for phone surveys. Interviews were conducted in English, Spanish, or in English with live interpretation to Cantonese, Vietnamese, or Somali, depending on the language preferences of the participant. The interviews lasted 60–90 min and were audio recorded. Interview guides had a set of open-ended questions and suggested probe questions to follow-up about work conditions, family budgets, and family life. Food acquisition was not an intentional focus of the interviews, but interviewers consistently asked about SNAP benefits and food security. The respondents also filled out a short survey on their demographic and job characteristics. Research staff conducted a total of four, 5- to 10-min phone surveys between the yearly in-depth interviews. The second phone survey asked explicitly about grocery shopping and eating out. Example questions included "If you knew you

would have \$100 extra in every paycheck in the next year, would it change where or what your family eats, and why?" All interviews and phone surveys were professionally translated (if necessary), transcribed and cleaned of identifying information. All names used in this manuscript are pseudonyms.

Table 1 shows that response rates were high throughout the study, with 80% of participants completing all three waves of in-depth interviews and 71% of participants completing Phone Call 2. More detailed descriptions of the study design, recruitment, and retention are available [27,30].

Data analysis

Our analysis includes all three waves of the in-depth interviews and one wave of phone surveys (Phone Call 2) from the 55 participants, for a total of 190 person-wave observations. To get a sense of the extent to which food and nutrition topics emerged from the data, we examined full sets of interviews from a sample of 15 participants using qualitative data analysis software (Dedoose, version 8.1.9) and coded all quotes relating to food and nutrition. From this sample of excerpts, we used an inductive approach to identify and note patterns. To better address our research questions, we then developed deductive codes using Campbell's food acquisition and food security framework, which is described in further detail later [31]. Variations from this framework were identified inductively as they emerged. We tested and refined the codebook using a sample of transcripts until we determined that all relevant codes were included and thoroughly defined in a manner that allowed for reliable application. Two trained researchers independently double-coded 10% of the transcripts ($n = 19$ transcripts) with at least 90% agreement. The remaining interviews were coded by one researcher.

Table 1 | Number and percent of completed interviews by mode and wave, qualitative component of the Seattle Minimum Wage Study

Mode and wave	Number of completed interviews	% of original sample ($n = 55$)
In depth, in-person 1*	55	100
Brief phone interview 1	38	69
Brief phone interview 2*	39	71
In depth, in-person 2*	49	89
Brief phone interview 3	44	83
Brief phone interview 4	45	85
In depth, in-person 3*	47	92
Completed all waves	44	80
Total person-wave observations analyzed for this study	190	—

Source: Qualitative Component of the Seattle Minimum Wage Study.

*Wave included in this analysis

The food security framework that we adapted for our analysis was part of a paper presented at a 1990 symposium, "Nutritional Assessment and Intervention: Interface of Science and Policy" [31]. In this article, Campbell called for more research that considers both the risk factors (the social context) and the consequences (the experiential dimension) of food access. The framework we are using is Campbell's conceptualization of these factors according to general consensus among researchers. We chose this framework because it captured major themes we identified during our initial inductive analysis and because it organized these themes in a way that helped focus our aims on the relationship between the social context and experiential dimension of food security and food acquisition. Other recent studies have used this framework to examine or define the link between food insecurity risk factors and specific physical or mental health outcomes [32,33]. Figure 1 shows a modified model of the framework with descriptions of key components. Components are divided into the social context of food access, representing the risk factors for food insecurity, and the experiential dimension of food access, representing the consequences of food insecurity. Table 2 describes the key components of the model that were a particular focus of our study. We present our findings in the Results section later using four subheads that correspond with key model components: (a) household resources, (b) food acquisition, (c) food intake and household food supply, and (d) health and quality of life.

RESULTS

Participant sample characteristics

The participant sample was predominantly female (80%) and born outside of the USA (60%). After the USA, Somalia was the most highly represented country of birth (13 participants), followed by China (5 participants) and Vietnam (4 participants). With regard to race/ethnicity, half of the participants identified as Black, 18% as Asian, 13% as Hispanic, 7% as White, and 11% other or biracial. Partner status was evenly split between single and married (42% each), with remaining participants cohabitating (16%). Ages ranged from 24 to 56 years, with a mean age of 38 years at study inception. Household size ranged from 2 to 11 people, with an average household size of 4.1 people. Caregiving and health services were the most common occupation (22%). See Table 3 for further details of the sample's demographic characteristics.

Household resources

Campbell identifies four household resources for food acquisition: (a) money, (b) time, (c) information, and (d) health. In our sample, the workers focused primarily on money and time as key factors affecting

Source: Modified from Campbell [30].

Fig 1 | Modified model of Campbell's framework for food acquisition and food security. Modified from Campbell [30].

Table 2 | Key components adapted from Campbell's framework for food acquisition and food security

Component	Description
Normal food system	Grocery stores, food service operations, or other retail businesses where food is available
Government food assistance	Government food assistance programs, including SNAP, WIC, and the School Lunch Program
Alternate food sources	Private food assistance (from family, friends, or charitable organizations) and food sources outside of the conventional food system (such as gardening, fishing, or scavenging)
Household resources	Earned income, time, health status, and information available for food acquisition
Household food supply	Assessments of the household food supply and strategies to manage the household food supply or food budget
Food intake sufficiency	Assessments of the quantity or frequency of food intake
Food intake adequacy	Assessments of the quality or type of food intake
Health and quality of life	Physical health and subjective well-being

SNAP Supplemental Nutrition Assistance Program; *WIC* Special Supplemental Nutrition Program for Women, Infants, and Children.

their food access, paying far less attention to information or health. Most workers in this sample had income from work earnings and public assistance, including SNAP, complicating the relationship between higher wages and food. Wages were a major focus of the interviews and frequently emerged as a resource for food acquisition. Some participants attributed an adequate food supply to increases in household income due to changes in employment status, hours, or wages. However, more than a third of participants associated increases in income with decreases in funds from government assistance programs or increases in prices for basic needs. Eden, a caregiver with five children, describes the trade-off between higher wages and government benefits for food and housing.

Somehow it is good so you can get big check. You can do for your personal stuff for the kids and everything, helping for your family. The other way is like, when you get the paycheck they're gonna minus it for your food stamp and the housing goes up so you are not saving anything. So for me, it's not like nothing to me.

In particular, participants anticipated that the Ordinance would increase food prices and cost of living offsetting increased wages. For participants like Anh, a new mother working as a caregiver, these trade-offs contributed to a perceived lack of change.

It's still the same. Because when they increased [the minimum wage], the rent also increased. And the food and everything just increased. And we pay more tax. So, everything's just the same.

Responses related to the connection between wages and public assistance tended to portray increasing food prices as a barrier to reaching financial stability. However, some participants found value in relying less on SNAP for food acquisition.

Despite the perceived trade-offs between higher wages, government assistance, and food prices, many participants predicted that additional income would facilitate changes to food choices within the normal food system. The most commonly predicted changes included shopping for higher quality or healthier food, eating out more frequently or eating out at higher quality restaurants. Several participants

Table 3 | Sample demographics (*n* = 55)

	Number (%)
Gender	
Female	44 (80%)
Male	11 (22%)
Partner status	
Married	22 (42%)
Single	22 (42%)
Cohabiting	9 (16%)
Country of birth	
Outside USA	33 (60%)
USA	22 (40%)
Race/ethnicity	
Black	28 (50%)
Asian	10 (18%)
Hispanic	7 (13%)
White	4 (7%)
Other/multiple	6 (11%)
Occupation	
Caregiving and health services	12 (22%)
Childcare and teaching	9 (17%)
Cleaning/janitorial	6 (11%)
Food service	9 (17%)
Reception/admin	5 (9%)
Retail/sales	5 (9%)
Social and human services	4 (7%)
Other	3 (6%)
	Mean (Standard deviation)
Age	38.4 (8.8)
Household size	4.1 (1.8)

Source: Wave 1 demographic information from the qualitative component of the Seattle Minimum Wage Study.

specifically brought up organic food when talking about the types of foods they would like to purchase with additional income. Refer to [Table 4](#) for further examples of illustrative quotes of household resource trade-offs and other key themes.

The timing of pay for work may be more important than the wage rate for some families experiencing food insecurity. A few participants pointed out the urgency of coming up with money for food each day. For Sean, a father of three who worked multiple jobs, lack of money for food was itself a barrier to steady employment.

And when I did find something full-time, I couldn't take it full-time because I needed money that day. Like we had no, we don't have food. I need to feed my family, and I can't say, "Hey, you're gonna get paid this time next week."

Time also factored into participant responses as a resource for food acquisition and intake patterns. Several participants expressed a preference for a work schedule that would facilitate time for eating or preparing meals at home. For example, Califa, a

mother of six, found that operating a childcare business in her own home facilitated more time for meal preparation for her family.

And this job, family always finds me at home. I'm home cooking fresh meals, preparing. I'm home all the time, and it's been good.

Among participants who reported restrictions in the amount or types of food eaten, lack of time was often an important factor. Virtually all of the participants who mentioned time constraints as a barrier to desired food intake patterns were female, but they varied with regard to number of work hours (less than or greater than 30 hr), household size, and marital status.

Although information was not a major theme that participants identified directly as a resource for food acquisition, their descriptions of strategies for managing the household food supply alluded to a variety of skills and information resources. For example, several participants mentioned cooking at home or flexibility in food preparation techniques as strategies for stretching the food budget and described some of these strategies as skills they were either trying to learn or trying to teach to their children. A few participants discussed altering their food choices after learning about nutrition from a class or from experiences at their place of employment. Many participants demonstrated extensive knowledge of a variety of government and private food assistance programs and services. Similarly, health did not emerge frequently in the interviews as a direct resource or risk factor for food security. A few mentioned health conditions or disabilities (either among family members or for the respondents themselves) as a factor in employment opportunities or constraining the types of food they could eat. One participant associated these dietary restrictions with greater transportation costs and more time required to shop for food that fit her health needs. As we discuss later, health and quality of life emerged more as a consequence of food acquisition risk factors.

Food acquisition sources

In accordance with Campbell's framework, we examined three major sources for food acquisition: (a) the normal food system, (b) government food assistance programs, and (c) alternate food sources. Our analysis revealed that the three sources were more interconnected for the sample population than the Campbell's framework suggests, and, importantly, that employment sites may be a fourth source of food acquisition. Many participants explained that they rely on a combination of different food sources and strategies to maintain an adequate food supply, with no single source sufficient to meet all of their needs. Evelyn, a single mother who worked in

Table 4 | Illustrative quotes of key themes

Themes	Sample quotes
Social context	
Household resource trade-offs	<ul style="list-style-type: none">• But they pay me so much that food stamps stopped for me. They were like you're making more money now. So you're not going to get food stamps. I was actually proud. I was like good for me.• I think the ordinance is great. I think it's awesome. The problem is keeping everything else low enough so it works. If there isn't a moratorium or a cap of some sort put on then how's that gonna make everything as affordable at \$15.00 as it was back on \$10.00? To me, that's the biggest question I have of all of this. What's gonna keep the milk and eggs from going up within the city limits? Those are usually the first indicators for food.
Time as a risk factor for food security	<ul style="list-style-type: none">• I find myself buying fast food a lot or getting stuff already made at the grocery stores or coming home and make them something quick. And I feel guilty about that. I want my daughter to eat better and just to have more time to do stuff. We have no time.• I never have time to have breakfast; I don't know why. It doesn't matter if I get up at 6:00 or 5:00. I never have enough time for myself...
Experiential dimension	
Compromises to food intake: adequacy vs. sufficiency	<ul style="list-style-type: none">• We don't ever get totally like we don't have anything at all. We just won't—it'll just get—I don't know. I won't have the things I really wanna cook with like meats or all the fresh vegetables or fruit that I wanna have; those core things. Yeah. Or, I won't be able to buy organic milk; I'll switch to buying the regular milk.• You might only get one waffle instead of two until they run out. Or I will eat all of the food in the cabinets before we try to go buy something else. Let's eat what we have, even though it might not be what you want.
Food activities associated with quality of life	<ul style="list-style-type: none">• I don't know how we ate it, but we ate shrimp, and we had some shrimp with rice and some stuff that you just—I enjoy seafood....—I still, still to this day, I still laugh about some of the things that happened. It was just carefree. I didn't think about the rent. I didn't think about what was due. I didn't think about the bus or getting him, dropping him, or him try to find a job or any of that.• I really like to see my kids happy, so I loved taking them out and going to take them shopping. They're like, "Oh, this is really cool." We even had a couple of times where we got to take them out to dinner. To them, they know that we can't always take them to the Cheesecake Factory. But when we do, they know, "This is really cool. Mom and Dad really did it for us."

retail, described using the food bank to make ends meet after running out of SNAP benefits.

I don't get my stamps until the eighth of each month, which is really late because already a week into the month, so that last week, we're down to beans and rice, or the last little bit of meat I might have, but I do get a delivery from the food bank each week through the U Dub food bank, which is nice...

Government food assistance programs that participants used included SNAP, school lunch programs, and the Special Supplemental Nutrition Program for Women, Infants, and Children. SNAP was a specific focus of interview questions, and it figured heavily in participant discussions of food acquisition. Although participants reported using SNAP at grocery stores within the normal food system, a few participants felt constraints in the places and the types of food they could purchase using SNAP. One participant reported accumulating credit card debt at food service operations when she was not able to get to a grocery store for SNAP-eligible food purchases.

Among participants who experienced changes to eligibility for SNAP or to the amount of benefits

received, some brought up the challenge of adjusting to new budgeting strategies. Nicole, a new mother working in social and human services, expressed frustration that she could not allow her \$15/month SNAP benefits to accumulate to a more meaningful amount.

They sent me a letter when I let it rack up to \$30, talking about, "Oh, you're not using your money." Are you guys serious? I can buy some almond milk for \$4, some broccoli for \$3—you know what I'm saying? I'm going to let it rack up to \$30 so I can maybe get six items, and not have it at \$15.

A few participants reported limiting how much SNAP assistance they sought to reserve it for those most in need. In some cases, participants expressed satisfaction or pride in relying less on government benefits despite a lack of change to overall food spending.

Campbell observed in 1991 that the private food assistance network was rapidly becoming an institutionalized third tier of the conventional food distribution system [31]. The results of our analysis were consistent with this assessment. Most participants reported relying on alternate food sources—especially

community food banks or friends and family—when other resources were exhausted. Among these participants, many expressed a sense of security in having these alternate sources as a safety net. Participants who immigrated to the USA from Somalia were particularly likely to emphasize family and community resources for food. Three of the 13 participants who had immigrated from Somalia noted direct connections between Somali culture and communal food resources. Nassir, a Somali father of four who was working as a driver, described how Somali grocers supported the community.

Well, sometimes we got our local people grocery before. Most Somali communities have. If you don't have money, they give you a whole supply for the month food then you pay them back slowly. They are a helping community ... It's the culture they have.

Places of employment emerged as another significant food acquisition source that expanded the major sources identified in Campbell's framework. Many participants were employed in positions directly related to meal service or preparation, including work in restaurants, grocery stores, and caregiving (Table 2). Other participants worked at employment sites unrelated to food preparation that provided meals to staff. Participants from both of these groups mentioned relying on food acquired through their employment site as part of their regular food supply. Martina, a restaurant cook with a young child, decided not to pursue a higher paying job outside of the food industry to maintain her food supply from work.

The good part about the restaurant is that I can get food in there...Otherwise, if I [work] somewhere else, which is not a restaurant, I have to pay for my food. In this part, it's three days a week I can get food, free food, which is really good. It helps.

Food intake and the household food supply

Most participants reported having an adequate household food supply or enough money for food during the study period. However, many participants described adjustments to food intake in response to restrictions in the food budget or the household food supply. Participants emphasized compromises to the quality and type of food consumed much more frequently than adjustments to the amount or frequency of food intake. Common adjustments to the types of food consumed on a tighter budget included: purchasing inexpensive frozen or processed foods, eating out less frequently, purchasing more fast food, and sacrificing preferred or higher quality foods that are more expensive. Adjustments to the amount or frequency of food intake were described in combination with compromises to the types of

food consumed. Several participants expressed disappointment in not being able to afford foods that are more nutritious. Shanae, a receptionist with two children, associated a stricter budget for food and gas with more limited access to quality foods from grocery stores.

I've just been buying fast food ... And I know that food is garbage, but it's like, okay, do I want to spend \$50 on groceries or just spend \$10 and we ate for the night and everybody's good until we figure out what we're going to eat tomorrow.

A few participants indicated that food was a priority and that they were unwilling to compromise on providing nutritious meals for their families. These participants tended to make adjustments through purchasing affordable dried goods in bulk and preparing meals at home. Several participants mentioned the challenges of making adjustments to the household food supply in a family with children, including pushback from children about the types of food they wanted to eat, a desire to provide children with treats, and the perception that growing or athletic children have big appetites or high intake needs.

Health and quality of life

For our participant sample, health and quality of life in relation to food acquisition and food intake were discussed more frequently with regard to mental health compared to physical health. When asked about times that they felt stressed and times when they felt relaxed or happy, about half of the participants mentioned food and food-related activities in their responses about subjective well-being. Of those who connected food with well-being, most described food-related activities as a way to reduce stress and to bond with family, friends, or coworkers. For some participants, limited income was a barrier to taking part in food-related leisure activities such as eating out at restaurants. Carlo, a custodian with two children, described these constraints as a constant source of stress.

It is difficult because I would like to have fun once every month and go to a restaurant, maybe go to the theater but unfortunately we have to sacrifice that part because we don't have the resources, and we don't have the resources and you live day after day and it affects you, that affects your personal life, that's stressful...

Several participants also associated limited funds and reliance on government assistance with stress. This observation fits with Campbell's framework, in which anxiety is a consequence of food restrictions.

Participants who emigrated from other countries sometimes described more traumatic past experiences of food insecurity compared to their current

experiences. They were more likely to express satisfaction with their current household food supply, even as they described restrictions in food intake.

DISCUSSION

This study identified many ways that household resources, namely income and time, factor into food acquisition strategies among workers in low-wage jobs, and how low-wage workers see food and diet as connected to general well-being. The workers in this study described relying on a combination of wages, government assistance, and private assistance to maintain an adequate food supply; many perceived that policies designed to increase wages could result in decreased eligibility for food benefits and higher prices of food and other essential items. Time for food acquisition and meal preparation also figured prominently in how they think about and choose foods, and some described focusing on immediate needs based on resources available in the very near term. When faced with limited resources, low-wage workers tended to describe changing the types and quality of foods consumed more than the amount or frequency of consumption. Finally, participants discussed explicit ties between food and health fairly infrequently but described mental health and quality of life ramifications more often.

Previous studies have established an indirect relationship between income and food insecurity, demonstrating that economic determinants are important to food security but are complicated by other factors, such as loss of government assistance or changes to costs of healthcare [34,35]. Our analysis is consistent with these observations and provides context on how these risk factors are related. Particularly as states and localities continue to consider economic and wage-based policy changes, the full spectrum of risk factors and their relative impacts on food security must be better understood [31].

One such risk factor is the perceived or actual cost of food. Many participants in our study described increased food prices as an expected trade-off to higher wage rates. Consistent with that anxiety, the SMWS employer survey (not used in this study) revealed that the most common employer response to the Ordinance was to raise prices for goods or services (46%) [30]. However, a 2017 analysis of six supermarket chains in Seattle determined that there were no significant differences between average baseline and follow-up prices [36]. In developing policies that could affect food access or health more broadly, stakeholders must therefore consider both the perceived and actual economic impacts on food prices.

Lack of time resources were another risk factor that came up frequently among study participants. Women working in low-wage jobs may be particularly vulnerable to time constraints, due to relative

lack of flexibility or predictability in work schedules [37]. A 2010 study estimated that the time cost of food is up to 26% higher for those receiving government food assistance based on the opportunity cost of wages and the market price of substitutes for food preparation [38]. Similarly, a 2013 study found that food insecurity was associated with 20% more time spent on meal preparation and 13.4% less eating time among single (vs. married) households [39]. Thus, previous studies have investigated lack of time resources as a possible consequence of food insecurity. Although our analysis provides some context for these observations, future research should consider lack of time as a possible risk factor for food insecurity and how policies may influence time as well as other household resources.

Research regarding the possible psychosocial outcomes of food insecurity is more robust and fits with the quality-of-life outcomes observed by our participant sample. A study of low-income households in Quebec found that consequences of food insecurity included stressful family meal experiences or household dynamics and lack of opportunity to invite friends to dinner [40]. These consequences are similar to some of the challenges reported by participants in our study. Downstream outcomes of these reported stressors to family meals could include an increased risk for disordered eating patterns among children in food insecure households [41]. A study of freshman college students at an Ohio university determined that a history of food insecurity was associated with higher disordered eating scores and higher body mass index, as well as higher levels of stress and depressive symptoms [32]. A 2015 review points out that health variables such as depression are plausible both as predictors and outcomes of food insecurity, and the causal relationship warrants further study [42]. However, Campbell argues that food insecurity is itself an undesirable outcome rather than simply a predictor variable for other negative outcomes [31].

Translational implications

Social policies that affect wages for low-wage workers should be explicitly considered as potential interventions for improving food access and health. In developing state and local wage policies, policymakers should examine expected trade-offs for government food assistance benefits and household budgeting strategies in the context of the cost of living. Employers should consider options to support food access through worksites, such as facilitating connections to community food resources, offering food resources onsite, or organizing company meals as team-building events.

Limitations

A major strength of our study was its rich qualitative data source with 190 interviews and a diverse

pool of participants. Moreover, the interviews were conducted at multiple time points when participants were primed to think about wage implications for key aspects of their lives as Seattle's minimum wage policy was implemented. Nonetheless, several important data and research design limitations are worth noting. We used data collected from a relatively small, non-probability sample of workers in Seattle. The sample was diverse along many dimensions, but not statistically representative of workers in low-wage jobs in Seattle or elsewhere. Furthermore, the sample was restricted to adult workers in formal employment (receiving a paycheck), excluding several important and vulnerable groups, such as undocumented and youth workers. In addition, the qualitative component of the SMWS was not designed to examine questions about food access. As such, some interview questions pertaining to food choices were not consistently asked throughout all interview waves, which limits our ability to compare specific individual responses to food-related questions over time. To the extent that participants offered their perceptions on the relationships between resources and food access, it was done organically without extensive probing. Finally, this is a descriptive qualitative study aimed at understanding the experiences and perspectives of workers in low-wage jobs. The study was not designed to answer causal questions and none of our findings should be interpreted otherwise.

CONCLUSIONS

This study is important for considering how workers in low-wage jobs make decisions about allocating resources, especially income and time, to food acquisition, and how workers view those decisions as connected to health and quality of life. Following low-wage workers over time during Seattle's minimum wage policy phase-in allowed us insights into how this population thought about both theoretical and actual changes associated with wage increases. Although many low-wage workers would like to use additional income to purchase higher quality foods or increase food-related leisure activities, they often perceive trade-offs with other food acquisition resources that prevent noticeable differences in food-spending patterns. To better translate these findings into effective political or behavioral interventions, future studies should be specifically designed to examine food choices and diet-related health outcomes in response to changes in wages or income, specifically in terms of the size of the wage increase, the time period necessary to affect food security and diet-related outcomes, and any unintended consequences.

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Compliance with Ethical Standards

Conflicts of Interest: The authors have no conflict of interest.

Human Rights: The University of Washington Institutional Review Board approved all study procedures and protocols.

Informed Consent: Informed consent was obtained from all individual participants included in the study.

Welfare of Animals: This article does not contain any studies with animals performed by any of the authors.

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