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# Exploring Young Women's Perceptions of Their Food Skills

## ABSTRACT

Many young adults mistakenly perceive that they have good food safety knowledge and are unlikely to experience foodborne illness. Young women's food skills are of particular importance because women are responsible for most food-related tasks in the home and many children learn food skills from their mothers. This descriptive qualitative study explored young women's perceptions of food skills in three domains: food selection and planning, food preparation, and food safety and storage. Through individual interviews, 30 young women aged 17 to 30 years answered the following three key research questions: (i) What do food skills mean to you? (ii) How did you learn them? and (iii) In what areas are you most and least confident? Few participants mentioned food safety in their top-of-mind definition of food skills. More than half were least confident in the domain of food safety and storage. Fear prompted avoidance of cooking meat – even by those who were not vegan or vegetarian. Food skill interventions or curricula should emphasize food safety and storage so that young adults can reap the dietary and financial benefits of preparing all types of food. Consistent with others' recommendations, the two most important food safety topics for educating young adults should be (i) cross-contamination and sanitation procedures and (ii) safe times and temperatures for cooking or storing food.

## INTRODUCTION

Food skills help individuals plan, prepare, and safely store culturally acceptable and nutritious foods *(15, 35)*. Understanding the specific areas in which people feel least confident can help guide curricula and food skill interventions to enhance individuals' self-confidence in cooking all types of food.

Cooking meals at home has been linked to higher diet quality *(43, 47, 50)* and lower consumption of ultraprocessed foods *(20)*, the latter of which is higher among younger adults than older adults and positively associated with obesity *(34)*. Compared with unprocessed or minimally processed foods (e.g., beef steak, fresh pineapple, whole grain pasta), ultraprocessed foods are typically created by industrial techniques (e.g., plant-based burgers, pineapple-

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flavored drink crystals, powdered "instant" soups), which are often high in fat, sugar, and salt *(32)*. Young adults also report very low ability in planning weekly meals and infrequent meal preparation *(49)*. They also (mistakenly) perceive that they have good food safety knowledge and are unlikely to be at risk of foodborne illness *(17)*; however, low levels of knowledge and confidence in food safety and storage have been documented among young adults *(4, 41)* and specifically among university students *(6, 8, 17, 39)*. Qualitative studies that have explored university students' cooking competencies reported barriers to acquiring food literacy *(7)* and barriers to following a healthy diet *(31)*; however, food safety was not mentioned.

Young adults experience lack of time, money, transportation, education, experience, and self-confidence when trying to engage in home food preparation *(7, 28, 33)*. Lack of experience can be partially explained by the withdrawal of home economics education from many schools *(25, 36)*, as well as dramatic decreases in enrollment where it does remain part of the curriculum *(40)*. In New Zealand, only half of 8,500 secondary school students in a nationally representative survey reported learning to cook at school *(46)*. Furthermore, a large Canadian study of university students ($n$ = 3,354) revealed that parental meal preparation and teen meal preparation were positively associated with higher food skills when students were in university; however, few students participated in food-related activities in their parental home *(37)*.

Cooking confidence has been identified as a core component of cooking and food skill interventions and education *(30)*. Empowering individuals to cook, and attain higher level "food agency," involves teaching them how to successfully navigate barriers so that they can set and achieve food-related goals within the complex physical, economic, social, cultural, and temporal aspects of food environments *(45, 51)*. Food agency builds on the concept of basic food literacy and emphasizes the role of repeated skilled actions that can be used in the face of changing circumstances *(45, 51)*. For example, switching from grilling marinated chicken on an outdoor barbeque (because of inadequate heat) to sauteing it in a pan on the kitchen stove involves improvisation and flexibility, skills that are not typically part of culinary education *(45)*. Overcoming momentary barriers can be easily navigated by some people (i.e., those who have food agency); however, similar situations can be problematic for others *(45)*.

Young women's food skills are of importance because women are responsible for most food-related tasks *(18)* and they self-report better food skills than men *(30, 31, 41, 49)*; however, that may not translate into women actually being more skilled than men in food preparation and provisioning. Furthermore, mothers transfer skills to their children *(21, 39)*; therefore, it is incumbent on educators to take a holistic approach in understanding young women's food skills, particularly in those areas where they feel least confident.

The objective of this study was to obtain a deeper understanding of young women's perceptions of food skills. Key research questions included asking young women what food skills meant to them, how they learned food skills, and the areas in which they were most/and least confident.

## MATERALS AND METHODS

This study used a descriptive qualitative design *(29)*. The research protocol was approved by the Non-Medical Research Ethics Board at Western University, London, Ontario, Canada.

### Sampling

Young women aged 17 to 30 years enrolled at Western University or residing in London were purposively recruited *(27)* to obtain this population's perceptions of food skills. Potential participants who self-identified as female were recruited through posters on campus, as well as at coffee shops, gyms, recreation centers, and libraries in the broader community. To facilitate conversations with participants about their perceptions and lived experiences, all interviews were conducted by the same individual (MMM), who was like the participants in age, sex, and educational status.

### Face-to-face interviews

A semi-structured interview guide was developed by the researchers based on a review of the literature, expert opinion, and previous research with young men *(39, 53)*. It was piloted with three young women who were not part of the final sample. Minor revisions were made before the guide was used in the study. Face-to-face individual interviews were conducted from January to March 2019 in private study rooms on campus or in public libraries. Participants signed a consent form at the beginning of the interview. After the introductory question, participants were provided with a one-page summary of the three domains of food skills—food selection and planning, food preparation, and food safety and storage—adapted from the Food Skills Questionnaire developed by Kennedy et al. *(19)*. This provided a consistent basis for all interviews. Member checking (i.e., periodically summarizing participants' responses and asking for confirmation or clarification) was conducted during the interviews to enhance trustworthiness *(26)*. All interviews were conducted by a young female graduate student with experience in leading basic-level food skill workshops. At the end of the interview, participants were invited to complete a demographic questionnaire and received a $25.00 gift card for their participation.

### Data analysis

Interviews were audio recorded and transcribed verbatim by the graduate student researcher and three undergraduate research assistants. Transcripts were independently and systematically coded line by line by two researchers and

**TABLE 1. Demographic characteristics of young women participants**

| Characteristic | % (No.) of Participants ($n$ = 30) |
|---|---|
| **Age (years)** | |
| 17–24 | 77 (23) |
| 25–34 | 23 (7) |
| **Education** | |
| High school (completed) | 3 (1) |
| College or university or postgrad (completed/currently enrolled) | 97 (29) |
| **Marital status** | |
| Single | 94 (28) |
| Married or common law | 6 (2) |
| **Previous food and nutrition course** | |
| Yes | 50 (15) |
| No | 50 (15) |
| **Primary cook** | |
| Yes | 73 (22) |
| No | 27 (8) |
| **Living arrangements** | |
| University residence or family | 30 (9) |
| With spouse or roommates | 70 (21) |
| **Years living away from home** | |
| 0–9 | 93 (28) |
| >10 | 7 (2) |
| **Access to kitchen facilities** | |
| Yes | 97 (29) |
| No | 3 (1) |

analyzed concurrently throughout data collection by using the constant comparative method (i.e., the systematic categorization and comparison of data through an inductive process) *(12)*. Initial themes were organized in Excel (Microsoft, Redmond, WA) and updated or expanded with subthemes as additional data were collected and analyzed. This process was incremental, iterative, and reflective. It also involved debriefing after interviews and frequent discussions among the researchers to come to thematic consensus (i.e., confirmability and objectivity) *(26)*. Multiple analysts (i.e., the graduate student researcher and her faculty advisor) helped to minimize bias and selective perception (i.e., credibility and internal validity) *(26)*. Trustworthiness was further enhanced by memo writing, which involved documenting emerging interpretations and decisions made throughout the research process (i.e., dependability and reliability), and by in-depth descriptions of both the phenomenon (young women's perceptions of food skills) and the participants, which can help readers determine applicability of the findings in their own context (i.e., transferability and external validity) *(26)*.

Data saturation occurred between participants 23 to 25. An additional five participants were interviewed to confirm the emerging themes. Themes and subthemes that were identified from transcript data are supported by representative quotations from one or more of the participants to add trustworthiness and transparency to the findings *(9)*. Including participants' own voices shows the richness of the data, reinforces the researchers' interpretations, and deepens readers' understanding of participants' perspectives and experiences *(9)*. To protect confidentiality, each participant was assigned a random number between 1 and 30, and, consistent with established guidelines for reporting qualitative research *(44)*, quotations have been labeled with a unique identifier (e.g., P13 = participant 13).

**TABLE 2. Semi-structured interview guide exploring young women's food skills**

| Question type | Question topic |
|---|---|
| **Introductory** | For students: What faculty are you in? For city residents: Where do you work? |
| **Opening** | When we talk about "food skills," it can mean many things. What do "food skills" mean to you?<br>There's been some research in this area, and they've discovered that food skills fall into three key areas. (Participants were shown a list of food skills in three key domains: food selection and planning; food preparation; food safety and storage.) Could you please take a moment to read through this? We're showing you this just so we have a basis for our conversation today.<br>Some people say food preparation takes too much time or too much work, but others say they enjoy it. How do you feel about food preparation? |
| **Transition** | If I asked you to describe "young women and food skills," what would you say? |
| **Key** | How would you describe your level of food skills? (e.g., no food preparation ability to preparing full meals starting from basic ingredients)<br>Probes: How did you arrive at this level? Did/do you feel adequately prepared with your level of food skills when you started/start to live on your own?<br>In which area of food skills do you feel MOST confident and/or competent?<br>Probes: How did you gain confidence/competence in these areas? What was the best way that you learned how to do these specific skills? Why?<br>In which area of food skills do you feel LEAST confident and/or competent?<br>Probes: Why do you feel you are not confident/competent in this/these area(s)? What had the greatest influence on this outcome? Why do you think that is? |
| **Closing** | Is there anything that we haven't talked about today that you would like to share? |

## RESULTS

Thirty young women from Western University and London participated in the study. Participant demographics are presented in *Table 1*. Following the semistructured interview guide *(Table 2)*, interviews ranged from 20 to 60 min. Results are presented in *Table 3*, with examples of participants' comments included both in the text and in a table, according to the three key research questions: (i) What do food skills mean to you? (ii) How did you learn food skills? and (iii) In what area are you most and least confident?

### Meaning of food skills

For the question "What do food skills mean to you?" the main theme of the responses was food preparation skills (e.g., ability to cook, knowledge in preparing a variety of foods, ability to follow a recipe). Preparation skills were mentioned by almost all participants ($n$ = 27; 90%). Only seven participants (23%) mentioned food safety behaviors. Interestingly, after being shown a one-page summary *(Table 4)* of the three food skills domains (i.e., food selection and planning, food preparation, and food safety and storage), some were surprised to see the number of skills listed under food safety and storage or that food safety was considered a component of overall food skills. The majority ($n$ = 22; 73%) agreed that making meals at home helped them to eat healthier; however, as one participant (P5) explained, "That's contingent on the fact that you know how to cook."

A second theme was that young women's food skills in general were often described as insufficient, reflecting activities in the food preparation domain and in food selection and planning. Although some participants described friends who were very skilled, others commented that food skills could be quite variable. For example, some explained that young women may be skilled in food preparation, but not know how to safely store leftovers. Only three (10%) of the participants perceived their own food skills to be low.

### Sources of food skills knowledge

The major theme associated with the question "How did you learn food skills?" was that many participants ($n$ = 12; 40%) recalled learning food skills from their mothers. Seven of them said that they learned food skills by helping with small, basic tasks in the kitchen. Role modeling was a key method of skill transference for two participants. Only two

**TABLE 3. Examples of young women's responses to research questions about food skills**

| Question | Representative Quotes |
|---|---|
| **1. What do food skills mean to you?** | I never thought of it [food safety] as food skill, but I guess it's really important. (P23)<br>[Some young women] may know what to buy and know how to cut up the meat and cook it, but then just leave the cooked food out all night to cool off. (P15) |
| **2. How did you learn food skills?** | My mom is responsible for teaching me what I know. (P4)<br>Apparently if you leave it [frozen chicken] out too long it's bad. You can also freeze and unfreeze meat and then you can't refreeze it again. These are all things I've learned the hard way. (P10) |
| **3. In what area are you most and least confident?** | Domain 1: Food selection and planning<br>I take my grocery bill pretty seriously. I like to know what I'm buying; I never overbuy food. I would rather run out of food than have things expire. (P10)<br>I end up getting over excited when I'm at the grocery store and buying a bunch of stuff. Then I get home and I don't eat it and it goes bad. (P27)<br>Domain 2: Food preparation<br>I did help out a lot at home, so I think I have most of the basic skills that you would need to prepare food … how to clean things, how to dice or chop, stirring, flipping, different things like that. (P6)<br>Food selection and planning and food storage is something you can learn some facts about. You don't need too much experience to do that well. But food preparation is more, 'You have to do it.' (P28)<br>Domain 3: Food safety and storage<br>Subtheme: Not taught/emphasized<br>Food safety and storage to me is something I would have really, REALLY appreciated being taught by the school system in general. (P3)<br>When I'm looking at YouTube or cooking shows, they teach you how to prep, they teach you how to cook, but they don't teach you how to store your food. Most of us don't have as much exposure to that, including myself. (P20)<br>Subtheme: Lack of knowledge/uncertainty<br>When you wipe stuff, you can't really see, 'Is it clean?' [P9]<br>Internal temperatures of meat—definitely don't know that! I know the oven temperature. (P24)<br>I never check that [internal temperature]. You just cut it open and you're like, 'It's done-ish', or just avoid cooking meat and then there is no rule! (P15)<br>I don't know how to properly wash fruits and vegetables because they are all shiny and stuff. They're all greasy, so you may need to soak it. (P13)<br>Some foods have different storage times and different ways to store it. That's what I'm still confused about. I come from a different background where food storage isn't necessary because we can just go to the market every day. So, I lacked that skill when coming to this community. We just cannot go to do groceries every day. So, it's something that I'm not confident in. (P17)<br>Subtheme: Lack of concern/too much work<br>It's just extra effort because you have to Lysol the counter and wash things in a certain order so other stuff doesn't touch this, so ugh! It's a paranoia. I'm like, 'I'm never safe enough.' (P15) |

*(Continued on the next page)*

**TABLE 3. Examples of young women's responses to research questions about food skills (cont.)**

| Question | Representative Quotes |
|---|---|
| **3. In what area are you most and least confident?** | Raw chicken is the only thing I'm always super careful about because that is emphasized everywhere, but putting leftovers in the fridge within 2 h, I just put them in whenever. I don't ever suffer repercussions for it. (P21) |
| | Subtheme: Fear of working with raw meat |
| | Whenever I cook anything with meat, I don't want to touch anything because I'm scared of germs. If I have to wash my hands, I have to turn on the water, and I'm like, 'Oh, now I need to clean that!' I don't really know how to go about it sometimes! (P24) |
| | I've met a couple individuals who don't cook meat because they're scared they're not doing it properly and they'll get sick or something. So, they don't eat meat even though they are not vegetarian or vegan. (P23) |
| | I still cook meat and stuff, but I'm still a little paranoid or not the most confident in how well I cleaned [knife and cutting board]. Even though I washed it, what if there's, like, one molecule of *Salmonella*? (P26) |
| | I avoid cooking a lot of meats. It freaks me out when I touch raw chicken. When [my mom] cooked raw chicken she would be, like, 'I'm cutting chicken, don't come over here, don't use the sink.' I'm really paranoid about the whole contamination and stuff and the microbiology courses scared me. I will definitely cook [chicken] long enough because I am paranoid. (P15) |

participants said they learned from their fathers. Parents however may not have transmitted correct information. When criticizing her peers, one participant (P4) reflected on a rule she learned from her mother: "How do you not know you're supposed to wash the meat first!?" Eleven participants (37%) learned their food skills from living independently, by searching online, or through trial and error. Five participants (17%) learned food skills through food service jobs.

Half of the participants (50%) had taken a food and nutrition class; 10 of them remembered specific learnings from that experience, such as "how do use a knife properly, how to defrost chicken, and all of that stuff" (P11) or the importance of "storing your meat on the bottom shelf and thawing meat properly" (P22). For some, the course was not that helpful. One (P15) admitted, "I have no idea how to cook beef," whereas another commented that the only satisfaction derived from cooking was the outcome; there was no gratification from cleaning.

**Areas of most and /least confidence**

When asked the question "In what areas are you most and least confident?" only three (10%) participants stated that they were confident in all three domains of food skills (i.e., food selection and planning, food preparation, and food safety and storage). These participants loved cooking, learned from family members, and/or had worked in the food industry; however, there were important differences between the three domains.

**Food selection and planning**

Thirteen participants (43%) were most confident in food selection and planning. This domain involved knowing in advance what to buy, following a budget, and purchasing the necessary amount of food (rather than overbuying and having food go to waste). Eight (27%) were least confident in this area, primarily because they did not know how to select appropriate items at the grocery store. Some of these young women admitted that they had never before gone grocery shopping by themselves. Lack of planning skills created unnecessary stress with either too much or too little food purchased at one time, resulting in guilt for overspending or letting food go to waste due to spoilage.

**Food preparation**

Sixteen participants (53%) stated they were most confident in the food preparation domain. This often resulted from helping out at home. Six (20%) were least confident in food preparation, primarily due to lack of experience. The other two domains (i.e., food selection and planning and food safety and storage) were considered easier to learn through books, videos, or observation. Food preparation was the only area where hands-on experience was deemed essential.

**Food safety and storage**

Only seven participants (23%) stated that they were most confident in the domain of food safety and storage. Vegan,

**TABLE 4. One-page summary of food skills in three domains from the Food Skills Questionnaire *(19)***

| Domain | Questionnaire Item |
|---|---|
| **Food selection and planning** | Budget for groceries |
| | Plan meals before shopping |
| | Use a grocery list |
| | Read food labels |
| | Check "best before" date before purchasing |
| | Select fresh vegetables and fruits |
| | Purchase a variety of vegetables |
| | Plan quick, healthy meals with foods available at home |
| | Adjust recipe to make it healthier |
| **Food preparation** | Make home-prepared meals |
| | Make nutritionally balanced meals |
| | Prepare food from basic ingredients |
| | Follow a simple recipe |
| | Use knives in the kitchen |
| | Peel/chop/slice fruits and vegetables |
| | Use vegetables in food preparation |
| | Use beans and lentils in food preparation |
| | Boil, steam, or stew foods |
| | Stir-fry or pan fry foods |
| | Bake, grill, or roast foods |
| | Prepare new food and recipes |
| **Food safety and storage** | Wash countertops before preparing food |
| | Wash hands before preparing food |
| | Wash fruits and vegetables before eating them |
| | Use microwave/fridge/cold water when thawing frozen meat |
| | Keep raw meat/poultry/seafood—and their juices—separate from foods that won't be cooked |
| | Cook foods to the correct internal temperature and serve them immediately |
| | Check that food is reheated throughout when reheating |
| | Put leftovers in fridge within 2 h |
| | Follow instructions for storage on packaged foods |
| | Stay safe in the kitchen (avoid burns and cuts) |

vegetarian, or pescatarian participants stated that they did not have to worry about food safety because they did not handle meat. In contrast with the results for the other two domains, a larger number of participants ($n$ = 17; 60%) were least confident in this third domain of food skills. Given that six other participants said they were least confident in food preparation, the number who were not confident in food safety could be as high as 23 (77%). As one participant (P12) said, "… the safety aspect goes hand in hand with preparation."

Although 15 participants (50%) had taken a food and nutrition course, 10 of them said that they were least confident in food safety and storage. Limited emphasis on, or teaching about, food safety and storage—in cookbooks, on social media, or by parents—also contributed to participants' lack of confidence in this domain. One participant (P29) commented, "I don't know why [parents] wouldn't want to give those skills to their kids. It really helps them in the end."

Four subthemes revealed why participants felt least confident in food safety and storage: not taught or emphasized, lack of knowledge or uncertainty, lack of concern or too much work, and fear of working with raw meat.

**Not taught or emphasized**

Many participants ($n$ = 17; 60%) revealed that food safety and storage was not taught or emphasized during their education. They wanted to be told the importance of checking whether foods were properly cooked, the overall benefits of being skilled in food safety and storage, and how these skills and knowledge could improve their lives, rather than being frightened by being told all the things that could go wrong. Reflecting on the ways in which some of the participants learned food skills, one participant summed up her peers' perceptions of the lack of emphasis on food safety and storage by stating that cooking shows do not teach viewers how to properly store their food.

**Lack of knowledge or uncertainty**

Almost half ($n$ = 14; 47%) of the participants stated that they did not know how to properly thaw, handle, cook, or store meat. These participants were not aware, or unsure of, the correct ways to thaw frozen meat, safe internal temperatures for cooked meat, or how to properly clean food preparation surfaces. Several commented that they knew only basic steps such as washing hands and food. After being shown the one-page list of food skills, a common comment (e.g., by P27) was "Some of these things I just didn't even know." A couple of participants, who were not born in Canada, lacked knowledge about foods available in the marketplace as well as experience in storing foods.

**Lack of concern or too much work**

Eight participants (27%) said that attending to food safety was too onerous or not a concern. Those who were unconcerned believed that their behaviors were within acceptable limits because they had never suffered negative consequences.

A prevailing belief was that they were not "too unhygienic" and that their "natural immune system" (P20) would be sufficient. Some of these participants also described themselves as being too lazy to deal with food safety and storage behaviors because it either took too much time to learn or it was not a priority.

**Fear of working with raw meat**

Eight participants (27%) expressed extreme fear with regard to food safety, using the words "paranoia" or "scared." Even participants who were confident in this domain used these terms due to their fear of illness. The primary outcome of struggling to avoid unhealthy situations was to avoid cooking meat and buy prepared meat dishes; however, this resulted in regret for having spent more money on groceries than planned. Participants revealed that some of their peers, who are not vegan or vegetarian, still avoid cooking and eating meat because of their food safety fears. For two of the participants, throwing out leftovers (or ensuring there were none created during food preparation) was one way to deal with their fear. Participants also talked about the challenges of communal living situations, especially their perceptions that their roommates had fewer food skills than themselves. The constant worry of cross-contamination when food preparation surfaces and utensils were not properly cleaned prevented many from preparing meat. Interestingly, vegan or vegetarian participants perceived that meat was the key concern when discussing food safety issues: "[As a vegan, I believe] contamination of the food supply is always going to happen as long as we eat meat. There's always going to be those outbreaks" (P19).

## DISCUSSION

This exploratory descriptive qualitative study provided a deeper understanding of young women's perceptions of food skills and identified critical areas where they lack knowledge, skills, and confidence. The largest area of concern was food safety and storage. Key reasons for participants not feeling confident in this area included not being taught during their education nor emphasized on cooking shows; lack of knowledge or uncertainty, particularly regarding the handling of meat; lack of concern or too much work; and extreme fear of working with raw meat. These concerns highlight the need for food safety education among young people engaging in food preparation in their own kitchen and reveal that misconceptions identified more than a decade ago still persist.

Participants' failure to include food safety skills in their top-of-mind responses confirms other studies wherein young adults have shown poor food safety knowledge and risky food behaviors, even when they know the correct action *(2, 6, 17, 39)*. Consistent with other research *(7, 28, 33, 39)*, participants revealed time and financial constraints as barriers to engaging in food skills. This is understandable because most participants were between the ages of 17 and 24 years, when many young adults have increased responsibilities and may be pursuing postsecondary education. Most agreed that home food preparation improved diet quality; however, this was dependent on their level of food skills. Reminding young adults that home food preparation can maintain and improve their health and well-being, while also being economical, must be bolstered by practical, hands-on food safety education so that personal health and financial wellness goals are not compromised by foodborne illness.

We concur with Green and Knechtges *(17)* that the two most important food safety topics for young adults should be cross-contamination and sanitation procedures and safe times and temperatures for cooking and storing food. Young men have also stated that food safety skills are one of the most important basic skills to learn *(53)*. Although

participants in this study were aware of cross-contamination, they did not feel confident in their ability to deal with it, or they found the necessary protective behaviors too difficult or confusing to implement. The consequences, particularly for young women, are significant because their fear prevents them from preparing meat dishes at home (even for those who are not vegetarian), which would be more economical than purchasing prepared foods. Interestingly, Australian parents ranked food budgeting skills as the least important topic to be taught to primary school children *(1)*; however, this was a desired topic identified by participants in this study. How young is too young to teach these (and other) food-related skills?

Complementary to the findings of other researchers *(6, 39)*, most participants herein believed they did a better job than their roommates of keeping the kitchen clean. This optimistic bias occurs when people consider themselves less likely to experience a negative event compared with the average person *(13)* and has been identified as a barrier to get consumers to adopt safe food handling practices *(3)*. Only three participants in the current study admitted that their overall food skills were low; however, when asked about the areas in which they felt least confident, lack of knowledge in the critical area of food safety suggests that low food skills were more prevalent than were acknowledged. Young adults often overestimate their actual abilities and best practices regarding food safety *(6, 11)*, and the fact that one in eight Canadians are affected by foodborne illness every year *(14)* confirms this overestimation.

A marginal, but potentially significant, finding was that participants who were vegan, vegetarian, or pescatarian believed that they did not have to worry about food safety because they did not handle meat. Although this warrants further investigation, Worsley et al. *(52)* found something similar: vegetarian diets were negatively related to better food safety knowledge. They surmised that following such diets may lead to more concentration on the diet rather than food safety. It may also be lack of awareness about the sources of foodborne illness. Many participants in this study talked about the risk of foodborne illness from *Salmonella*, primarily through cross-contamination when handling raw chicken; however, following Clean, Separate, Cook, and Chill guidelines (www.fightBAC.org) can prevent most foodborne illness cases. Furthermore, many young people may not know that *Salmonella* is also spread through contaminated water, the environment, other people, and pets *(5)*. Thus, not washing hands after handling pets and allowing pets to walk on food preparation surfaces are risky behaviors. Burke et al. *(2)* found that only 38% of young adults positively identified food safety risks associated with preparing food in a kitchen with a pet present.

From July 2021 to June 2022, of the 68 food recalls related to *Salmonella* in Canada, covering >331 products, only 5 contained chicken *(16)*. Recalled products included peanut butter, organic poppy seeds, various confectionaries, infant formula, sesame seeds and products, onions, salad kits, microgreens, tofu, goreng, cumin powder, ranch seasoning, and various dry goods (as a result of rodent infestation) *(16)*. Food safety education therefore needs to ensure that young people, particularly those who follow vegan, vegetarian, or pescatarian diets and do not perceive themselves at risk, are taught that meats are not the only sources of foodborne illness.

A large percentage of the population continues to wash raw poultry and is not aware that this practice is unsafe *(48)*. The good news is that people often stop this practice when they are informed of the correct behavior. Research also suggests that the messaging around not washing poultry should instead focus on the importance of hand washing and cleaning and sanitizing surfaces *(38)*. This is valuable information that would be beneficial for working with all types of food and should therefore be emphasized in food safety education.

Similar to the findings of other researchers—where having taken a food and nutrition course did not benefit college or university students in terms of risky eating behaviors *(4, 7)*—most of the young women in this study who had taken such a course stated that they were least confident in food safety and storage. Either curriculum is not meeting young people's needs or the information is not being retained. In particular, most participants lacked food safety knowledge about handling meat. Chuang et al. *(6)* found the same knowledge gap. Although some of our participants recognized that thermometers would confirm that meat or poultry was cooked thoroughly, not one admitted to using a thermometer, and several stated that they did not know what correct internal temperatures should be. Similar to findings by Lazou et al. *(24)*, students in the current study also reported using visual cues to indicate the end of the cooking process. This dramatically increases the risk of foodborne illness *(11)*.

The most intriguing finding that contributes new information to the literature is that many young women express extreme fear about working with raw meat. Although young men have reported fear associated with cooking, they were more afraid of being embarrassed for their lack of food skills *(39)*. Fear of working with raw meat however has rarely been reported as a barrier to food preparation. In their exploratory qualitative research with 16 participants, Stead et al. *(42)* categorized approximately half of their participants as taking a fearful but hopeful approach to cooking. Their fears were focused on the task of cooking as well as the planning and organization of meals. No reference was made to food safety. In another small study of barriers and facilitators to cooking from "scratch" *(22)*, only one participant talked about being fearful of working with raw meat. The fact that several young women in the current study independently made the same comments about working with raw meat requires further investigation. As Lavelle et al. *(22)*

explained, this appears to be a form of avoidance motivation *(10)* and prevents young women from learning new cooking skills. Although dietary benefits have been identified as key outcomes of home cooking *(31)*, these benefits are lost if young women are eating less meat because they are afraid to work with it. Furthermore, almost half of the young women said that they learned food skills from their mothers. This is consistent with the literature *(21, 23, 39)*; however, it may be problematic if these young women transmit incorrect information and/or extreme fear of cooking to their children. We concur with Lavelle et al. *(22)* to focus on practical sessions to increase cooking self-efficacy to specifically increase confidence in handling, cooking, and storing meat.

Food agency *(45, 51)* is a valuable approach for cooking interventions, if there are opportunities for young women to become confident in working with raw meat. Byrd-Bredbenner et al. *(3)* summarized reasons consumers mishandle foods; however, avoidance of raw meat is not the same as mishandling it. We concur with their recommendations to boost knowledge, build confidence, and emphasize behavioral control; however, their suggestion to heighten recognition of susceptibility and severity of outcomes *(3)* may exacerbate young women's existing fears. Offering food safety cues to action *(3)* may help consumers take precautions, but it would be unfair, for example, to label only poultry products when many foods can be sources of *Salmonella*. Finally, given that some participants were already fearful, and some followed risky behavior without concern, educators can consider striking a balance: curriculum should identify potentially risky behaviors from all food categories (e.g., meat, poultry, produce), provide actionable advice as to how these risks could be controlled, and motivate people to follow the recommendations by noting the consequences of failure to act.

### Limitations

Although 30 participants are considered a sizeable sample for a qualitative research study *(27)*, we acknowledge that the results cannot be generalized to a broader population. Other limitations include self-selection bias, recall bias, and self-reported data. Young women who worked in the food industry were not excluded; therefore, this may have resulted in significant differences among participants regarding their level of food skills. Although participants were asked their ethnicity, this aspect was not explored. Almost all participants were enrolled in university at the undergraduate or graduate level; therefore, these findings do not represent the majority of young women.

## CONCLUSIONS AND RECOMMENDATIONS

This preliminary exploration of young women's perceptions of food skills through a descriptive qualitative study revealed unique findings regarding this population's lived experiences regarding food skills. These findings have implications for policy, practice, and research. The results provide practical insight and suggestions for both new and existing food skills programs, with specific emphasis on education about food safety and storage. In addition, food skills education targeted towards women of child-bearing age may be particularly important because these results (and others) have indicated that most young women learn food skills from their mothers. These results may also help guide researchers, registered dietitians, and others involved in the development of future food skills programs and policies. Because some of the participants in this study had worked in the food industry, they may have had a more thorough understanding of food safety behaviors; thus, future research should explore the perceptions of young women who do not have this experience. Future research should also include larger and more diverse samples.

Food skill interventions and curricula should emphasize food safety and storage so that young adults can reap the dietary and financial benefits of preparing all types of food. Consistent with others' recommendations, the two most important food safety topics for educating young adults should be cross-contamination and sanitation procedures and safe times and temperatures for cooking and storing food.

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