

1 Full-time employment, diet quality and food skills of Canadian parents

2 Abstract

3 **Purpose:** To explore the associations between full-time employment status, food skills and diet
4 quality of Canadian parents. **Methods:** A representative sample of Canadian parents ($n = 767$)
5 were invited to complete a web-based survey that included sociodemographic variables,
6 questions about food skills and a validated food frequency questionnaire. Results were analyzed
7 with linear and logistic regression models, controlling for sociodemographic variables. **Results:**
8 After controlling for covariates and multiple testing, there were no statistically significant
9 differences in foods skills between parents' employment status. Time was the most reported
10 barrier for meal preparation, regardless of work status, but was significantly greater for full-time
11 compared to other employment status ($p < .0001$). Additionally, parents who worked full-time
12 had lower odds of reporting food preferences or dietary restrictions ($p = .0001$) and health issues
13 or allergies ($p = .0003$) as barriers to food preparation, compared to parents with other
14 employment status. These results remained statistically significant even after controlling for
15 covariates and multiple testing. **Conclusions:** Overall, food skills did not differ significantly
16 between parents' employment status. Time, however, was an important barrier for most parents,
17 especially those working full-time. To promote home-based food preparation among parents,
18 strategies to manage time scarcity are needed.

19

20

21

22

23

24 **Introduction**

25 The determinants of home cooking and their relationship to healthy eating are complex;
26 however, numerous studies have reported associations between cooking skills, time availability
27 and employment, and home-based cooking (1). Over the years, the time women spend on
28 housework including core tasks such as cooking has declined while men's has increased, but not
29 to the same extent, resulting in an overall decrease in time households spend on domestic chores
30 (2). Less time spent cooking has been associated with employment status, particularly among
31 women (3, 4). Despite increased participation of fathers in domestic tasks (2, 5, 6), 80% of
32 women in Canada are primarily responsible for household meal planning and preparation (7).
33 Women have progressively taken on jobs with greater responsibility and pay (8), which is
34 attributed to reduced time availability for cooking and food preparation (7). Greater time
35 availability and employment have been identified as important determinants of home cooking
36 (1).

37 In addition to changes in the labor force, there have been shifts in the food environment, which
38 have led to increased availability, variety, and abundance of processed foods (semi-prepared,
39 ready-to-eat, and take-out foods) (9). Increased reliance on processed foods provides fewer
40 opportunities to transfer food preparation knowledge and abilities to children (10-12). Changes
41 in home-based food preparation have been attributed to the normalization of processed foods
42 (13) and increased demand for convenience foods that are easy and quick to prepare (14),
43 particularly among busy parents (15). Consumption of ultra-processed foods is a predictor of
44 poor diet quality in Canada, whereas increased consumption of home-made meals is thought to
45 improve the diet (16). Time, however, remains a major limitation to home-based food
46 preparation (7, 17-19).

47 A Synthesis Paper identified the need for better understanding of the determinants of cooking
48 and food preparation skills in Canada (7). The present study aligns with the recent conceptual
49 framework developed by Mills et al. (2017) on the determinants and outcomes of home cooking
50 (1). As such, we expect this study to contribute to a greater understanding of the relationship
51 between the food skills needed for home food preparation and potential time constraints of
52 working parents. The aim of this study was to examine associations between food skills and
53 employment status in a sample of Canadian parents through exploratory analyses of a secondary
54 database. The overarching hypothesis is that parents who work full-time have less time to
55 prepare meals and have fewer food skills, ultimately resulting in a poorer diet quality.

56 **Methods**

57 *Recruitment and data collection*

58 As part of an evaluation of Health Canada's Eat Well Campaign: Food Skills (2013/2014), a
59 representative sample of Canadian parents were recruited by a professional firm using random-
60 digit-dialing. The inclusion criteria for the study were: adults (≥ 18 yo), having ≥ 1 child (2 - 12
61 yo), living with child(ren) $\geq 50\%$ of the time and being responsible for meal preparation $\geq 50\%$
62 of the time, being a Canadian Citizen, understanding either French or English, having access to
63 the Internet, and having a valid e-mail address. Parents who participated were entered into a
64 draw to win one of three iPads. Surveys were completed between April and August 2014.
65 Parents who met inclusion criteria and agreed to participate were sent a consent form containing
66 a link to a web-based survey by e-mail and provided informed consent by activating the link.

67 ***Ethics approval***

68 Approval was obtained by the *Comité d'éthique de la recherche avec les êtres humains de*
69 *l'Université Laval* (#2013-055) and the *Comité d'éthique de la recherche en santé de Université*
70 *de Montréal* (#13-118-CERES-R).

71 ***Description of variables***

72 The survey included questionnaires that collected: 1. Sociodemographic information (i.e., age,
73 gender, language, region, number of children, family type, employment status, education,
74 income, and religious beliefs); 2. Dietary data through a validated food frequency questionnaire
75 (FFQ) (20). Diet quality was calculated from the FFQ using a healthy eating index (HEI) adapted
76 to the Canadian Food Guide (21) and; 3. Food skills questions that were taken from the Canadian
77 Community Health Survey (CCHS) Rapid Response Annex on Food Skills (22, 23). Questions
78 regarding common food skills, barriers to meal planning, and strategies for meal preparation
79 identified in key Canadian food skills resources were also included (18, 24). For the purpose of
80 this study, we will be using “food skills” to refer to the concept of “food literacy”(25, 26) as
81 defined by Pat Vanderkooy (27). Variables were categorized according to components from
82 Vanderkooy’s (27) definition of food skills adapted by Health Canada (28). For the purpose of
83 this study, these components included:

- 84 1) *Food and nutrition knowledge*; Canadian Food Guide and nutrition label use
- 85 2) *Meal planning*; using a grocery list, budget, or planning meals before going to the
86 grocery store, and planning meals within the last 6 months
- 87 3) *Mechanical cooking skills*; Chopping skills, cooking meat/fish, making soups/stews and
88 cakes/muffins from scratch

89 4) *Food conceptualization*; using whole ingredients, having advanced cooking skills, and
90 modifying ingredients (salt, fat, sugar, fruit, vegetables, and whole grains) to make
91 recipes healthier

92 5) *Social aspects of food*; eating family meals and including children in grocery shopping,
93 meal suggestions, preparation, and cooking.

94 ***Data analysis***

95 All statistical tests were conducted with SAS 9.4 (Carey, North Carolina). Employment status
96 was dichotomized into full-time and other employment status (part-time, stay-at-home,
97 unemployed, unable to work, undefined work status and retired). Most dependent variables were
98 dichotomous (yes = 1 and no = 0), and nominal variables were dichotomized for logistic
99 regression. For example, the variable “Currently plan meals” was dichotomized with 1 = “I have
100 been planning our family meals for longer than six months” and “I have been planning our
101 family meals for less than six months” and 0 = “I do not plan our family meals, but think I may
102 start to in the next six months”, “I do not plan our family meals, and do not think I will start to in
103 the near future”, and “I do not plan our family meals, but think I may start to in the near future”.
104 Additional details describing the coding for each variable can be found in Supplemental Table 1.
105 The HEI score was treated as a normally distributed continuous variable, controlling for age and
106 sex.

107 Logistic regression models were adjusted by controlling for gender, age, education, income,
108 language (English or French), region (British Columbia, the Prairies, Ontario, Quebec, and the
109 Maritimes), number of children, and family type (single-parent, two-parent, or step-family).
110 Employment status according to gender that was used in subgroup analyses is described in
111 Supplemental Table 2. Parents with full-time employment were compared to part-time, stay-at-

112 home, and auxiliary employment status (unemployed, unable to work, undefined work status,
113 and retired). Only significant models of subgroup analyses were reported in the text but results
114 from all models are found in Supplemental Tables 3 and 4. Mothers working full-time were
115 compared to mothers with other employment status and results resembled those for all parents
116 (results not shown). There were too few fathers in the sample who worked part-time (n=18) to
117 conduct separate analyses. For all analyses, the level of significance was set at $p < .05$ and then
118 adjusted with the Benjamini-Hochberg false discovery rate to correct for multiple testing (29).

119 **Results**

120 *Sociodemographic variables and diet quality*

121 There were 2201 eligible participants that were recruited for the study and received the links to
122 the web-survey. Of eligible participants, 1286 responded or started the questionnaire and 767
123 participants (34.8%) completed all questions used for analyses. Of respondents, 58.9% reported
124 full-time employment and 81.4% were mothers. There were significant differences in work-
125 status (full-time employment vs. other employment) according to gender, language, region,
126 number of children, income, and education (Table 1). The mean HEI score was 76.6 (standard
127 deviation=10.6). Based on the HEI score, employment status was not associated with diet quality
128 ($p = .38$).

129 *Food skill components*

130 Parents working full-time had lower odds of planning meals ($p = .01$), having good or very good
131 skills in baking muffins or cake from scratch ($p = .01$), making changes to recipes ($p = .04$), adding
132 more fruits and vegetables to make a recipe healthier ($p = .02$), compared to parents with other
133 employment status (Table 2). After adjusting for sociodemographic variables, differences

134 between employment status for making changes to recipes ($p=.11$) and making muffins or cake
135 from scratch ($p=.14$) were attenuated, while planning meals remained significant ($p=.01$) and
136 cooking main meals mostly with whole and basic foods became significant ($p=.02$) (Table 2).
137 After controlling for multiple testing with the false discovery rate, there were no longer any
138 statistically significant differences in food skills between parents with full-time employment and
139 other employment status. Additionally, in subgroup analyses, none of the models reached
140 statistical significance after controlling for the false discovery rate, comparing full-time
141 employment to part-time, stay-at-home or auxiliary employment groups (Supplemental 3).

142 ***Meal planning barriers and meal preparation strategies***

143 Limited time, lack of ideas, and food preferences were the most common barriers for meal
144 planning reported by participants (Figure 1a), whereas shopping to ensure having all ingredients,
145 planning meals ahead, and using simple cooking methods were the most frequently reported
146 strategies to facilitate meal planning (Figure 1b). Full-time parents had significantly lower odds
147 of reporting family food preferences or dietary restrictions ($p<.0001$), family health issues
148 ($p=.001$), and financial resources ($p=.004$) as barriers to meal planning, but greater odds of
149 reporting time as a barrier ($p<.0001$), compared to parents who did not work full-time. After
150 controlling for covariates, financial resources was attenuated; however, the other associations
151 remained unchanged (Table 3). After controlling for multiple testing with the false discovery
152 rate, in fully adjusted models, differences between full-time and other employment status
153 remained statistically significant for lack of time (OR=3.22; CI 2.25, $p<.0001$), food preferences
154 (OR=0.57; CI 0.41-0.79, $p=.001$) and health issues (OR=0.48; CI 0.30-0.78, $p=.003$).

155 In subgroup analyses, in fully adjusted models, after controlling for multiple testing, there were
156 no statistically significant differences between full-time and part-time employment groups for

157 any meal planning barriers. However, there were statistically significant differences between
158 full-time and stay-at-home parents for lack of time (OR=3.82; CI 2.44-5.99, $p<.0001$), food
159 preferences (OR = 0.55 CI 0.36-0.85, $p =.007$), and health issues (OR=0.39; CI 0.22-0.70,
160 $p=.001$), after controlling for covariates and multiple testing. There was also a statistically
161 significant difference for lack of time (OR=3.54; CI 1.85-6.77, $p=.0001$) between the full-time
162 and auxiliary employment groups, after controlling for covariates and multiple testing. There
163 were no statistically significant associations in subgroup analyses for strategies to facilitate meal
164 preparation (Supplemental Table 4).

165 **Discussion**

166 *Diet quality*

167 This study investigated the associations among food skills, diet quality and employment status.
168 Contrary to our overarching hypothesis, diet quality, was not associated with employment status
169 in this study, but this has also been observed in Australia. A study examining diet quality in a
170 sample of Australian working mothers, found that usual working hours had little impact on their
171 diets. Authors suspected that more education and knowledge of working women might offset
172 barriers such as time ([30](#)). Our sample was primarily composed of women and the majority of
173 participants working full-time also lived in households with higher income. Therefore, these
174 households may be able to afford better quality foods, potentially offsetting any negative impacts
175 of time availability on diet quality related to food skills.

176 *Food skills*

177 No statistically significant associations between food skills and employment were observed in
178 this study. The majority of Canadians may already possess the “basic” food skills that were

179 examined. The CCHS Rapid Response Food Skills annex (2013), which included a national
180 representative sample of over 9000 Canadians (>12 years old), reported that 63% of respondents
181 could prepare most dishes, especially with a recipe, and the proportion was as high as 72% for
182 women (22). Similarly, over 70% of adults in the region of Waterloo in Ontario reported being
183 able to prepare cakes/muffins and soups/stews from scratch (31). The sample of parents in our
184 study was relatively homogenous composed mainly of mothers responsible for meal preparation
185 in their household at least 50% of the time; therefore, likely possessed “basic” food skills. In our
186 sample, 94% of respondents reported being able to prepare most dishes, especially with a recipe
187 and 88% reported being good or very good at making muffins and cakes with a recipe. With this
188 in mind, it is possible that food skills in our sample were better than the general population, and
189 it may be difficult to distinguish differences between groups who were already skilled.
190 Additionally, it is possible that the questions used in this study that were derived from the CCHS
191 did not use enough categories to distinguish between different skills. For example, nearly all
192 respondents (91%) in our study reported planning meals before going to the store; however, the
193 question does not permit us to distinguish between planning frequency or how far in advance
194 parents plan. There is a need to develop and validate tools to assess different aspects of food
195 skills.

196 *Meal preparation barriers and meal planning strategies*

197 More frequent meal preparation is associated with consumption of a healthier diet (32), however
198 employment presents a barrier to cooking (33). One study reported that mothers who worked 8
199 h/d, spent on average 38 minutes less preparing food than mothers not working (34). Our study
200 results suggest that regardless of employment status, time is a major constraint for Canadian
201 parents who want to cook for their families, but is a more significant barrier for parents

202 employed full-time, compared to stay-at-home or auxiliary employment status. While planning
203 helps parents manage time pressures by doing activities like shopping for groceries on work
204 breaks and packing leftovers for lunch, these activities are also time-consuming (35). Meal
205 preparation and planning involve a complex set of activities (36) that take time, which may not
206 be a realistic expectation for certain groups that experience time scarcity as a barrier to healthy
207 eating (37-39).

208 People react to time scarcity differently, therefore, recognizing which groups can use
209 organizational skills and self-efficacy to manage time is key to understand food choices and
210 identify practical solutions for healthy food provisioning (40). Greater understanding of the
211 interactions between time scarcity, time management, and self-efficacy is extremely relevant
212 when attempting to promote food skills. Given the time scarcity parents experience, particularly
213 employed mothers (41), coping strategies are needed to help parents integrate food preparation
214 into their family life. [Storfer-Isser and Musher-Eizenman \(42\)](#) suggest that interventions
215 designed specifically for the needs of overloaded parents may help these parents prepare simple
216 and fast meals for their families. A similar suggestion to tailor interventions to different types of
217 parents was made by [Dwyer, Oh \(19\)](#). Both time constraints and the burden of meal preparation
218 have been cited as barriers to family meals and tailored solutions to address the realities of time
219 constrained parents have included engaging youth in meal preparation and delivering
220 interventions remotely or through the workplace (19).

221 In our study, it is unclear why food preferences or dietary restrictions and health issues or
222 allergies of a family member were more important meal preparation barriers for parents who
223 stayed-at-home compared to parents working full-time. Dietary preferences of family members is
224 a commonly reported barrier for food preparation (3, 12, 33) and we can speculate that stay-at-

225 home moms may have more available time than employed parents and put more energy into
226 accommodating family preferences or dietary restrictions. It is possible that family health issues
227 were the reason that parents stayed-at-home; however, we did not have details about the health
228 issues of family members to understand why it is such an important barrier for stay-at-home
229 parents.

230 *Limitations and strengths*

231 This study has some limitations associated with data collection and tools. As the questionnaires
232 were not validated and did not include exhaustive lists of all food skill components, we cannot
233 ensure content or face validity. Furthermore, the questions themselves obtained from the CCHS
234 were not explicit and may have been subject to interpretation by respondents. Categorical data
235 made statistical analysis challenging and several multivariate models were not valid. While
236 random-digit-dialing was used to recruit participants and the sample was geographically
237 representative of Canadian parents, there was a much higher proportion of university-educated
238 parents and a lower proportion of visible minorities than in the general population indicating a
239 selection bias. Despite limitations, the study sample was sufficiently large to control for multiple
240 covariates. Furthermore, by controlling for multiple testing with the false discovery rate, we can
241 be confident in the robustness of the results. To our knowledge, the present study is the first to
242 investigate the association between employment status and multiple components of food literacy
243 in a national Canadian cohort.

244 **Conclusion**

245 While this study did not find any statistically significant associations between food skills and
246 employment status among Canadian parents, study limitations prevent us from drawing a firm
247 conclusion that there are no associations in this population. Formative research is needed to

248 uncover determinants and drivers of food literacy among key populations such as parents. Our
249 study, however, did find that time is a major barrier for food preparation for all parents
250 regardless of work status. Furthermore, time was consistently a more important barrier for full-
251 time working mothers and parents compared to parents with other employment status. These
252 results indicate that while work status may not be associated with foods skills, reduced time
253 availability related to working full-time is an important barrier. To promote home-based food
254 preparation and family meals, our results suggest that food literacy interventions may need to
255 focus on coping strategies to reduce time-related barriers.

256 **Relevance to practice**

257 Future research should investigate time scarcity, time management, and self-efficacy in relation
258 to food skills in order to optimize interventions promoting home-based meal preparation. Until
259 further evidence is amassed, clinical dietitians need to be conscious of clients/patients' time
260 constraints when proposing dietary counseling that involves home-based food preparation, and
261 public health nutritionists should prioritize promoting dietary practices that are easy to integrate
262 within the reality of a working parent's busy lifestyle. To advance the field of food literacy, there
263 is a need to develop and validate tools to assess and monitor food skills.

264

265

266

267

268

269 **References**

- 270 1. Mills S, White M, Brown H, Wrieden W, Kwasnicka D, Halligan J, et al. Health and
271 social determinants and outcomes of home cooking: A systematic review of observational
272 studies. *Appetite*. 2017;10.1016/j.appet.2016.12.022.
- 273 2. Bianchi SM, Milkie MA, Sayer LC, Robinson JP. Is anyone doing the housework? trends
274 in the gender division of household labor. *Soc Forces*. 2000;79(1):191-228.
- 275 3. Slater J, Sevenhuysen G, Edginton B, O'Neil J. 'Trying to make it all come together':
276 structuration and employed mothers' experience of family food provisioning in Canada. *Health*
277 *Promot Int*. 2012;27(3):405-15.
- 278 4. Mancino L, Newman C. Who has time to cook? How family resources influence food
279 preparation. Department of Agriculture/USDA; 2007.
- 280 5. Chesley N, Flood S. Signs of change? At-home and breadwinner parents' housework and
281 child-care time. *J Marriage Fam*. 2017;79(2):511-34.
- 282 6. Bianchi SM, Milkie MA. Work and family research in the first decade of the 21st
283 century. *J Marriage Fam*. 2010;72(3):705-25.
- 284 7. Chenhall C. Improving cooking and food preparation skills: A synthesis of the evidence
285 to inform program and policy development. Ottawa: Her Majesty the Queen in Right of Canada;
286 2010. p. 1-36.
- 287 8. Statistics Canada. Full-time and part-time employment by sex and age group. Ottawa
288 (ON): Statistics Canada; 2017.
- 289 9. Serecon Management Consulting Ltd. Canadian Food Trends to 2020 - A Long Range
290 Consumer Outlook. Ottawa (ON): Agriculture and Agri-Food Canada; 2005.
- 291 10. Braun J, Beckie M. Against the odds: The survival of traditional food knowledge in a
292 rural Alberta community. *Canadian Food Studies*. 2014;1(1):54-71.
- 293 11. Moision R, Arnould E, Price L. Between mothers and markets. *Journal of Consumer*
294 *Culture*. 2004;4(3):361-84.
- 295 12. Simmons D, Chapman GE. The significance of home cooking within families. *Br Food J*.
296 2012;114(8-9):1184-95.
- 297 13. Halkier B. Normalising Convenience Food? *Food Cult Soc*. 2017;20(1):133-51.
- 298 14. Chu YL, Farmer A, Fung C, Kuhle S, Storey KE, Veugelers PJ. Involvement in home
299 meal preparation is associated with food preference and self-efficacy among Canadian children.
300 *Public Health Nutr*. 2013;16(1):108-12.

- 301 15. Szabo M. The challenges of "re-engaging with food" connecting employment, household
302 patterns and gender relations to convenience food consumption in North America. *Food Cult*
303 *Soc.* 2011;14(4):547-66.
- 304 16. Moubarac J-C, Batal M, Louzada ML, Martinez Steele E, Monteiro CA. Consumption of
305 ultra-processed foods predicts diet quality in Canada. *Appetite.* 2017;108:512-20.
- 306 17. McCloat A, Mooney E, Hollywood LE. Have Irish parents put cooking on the back
307 burner? An Island of Ireland study of the food skills, cooking confidence and practices of
308 parents. *Br Food J.* 2017;119(5):992-1002.
- 309 18. Aube J, Marquis M. Attitudes and habits of Canadians in relation to planning and
310 preparing meals at home. *Can J Diet Pract Res.* 2011;72(2):70-5.
- 311 19. Dwyer L, Oh A, Patrick H, Hennessy E. Promoting family meals: A review of existing
312 interventions and opportunities for future research. *Adolesc Health Med Ther.* 2015;6:115-31.
- 313 20. Labonté M-È, Cyr A, Baril-Gravel L, Royer MM, Lamarche B. Validity and
314 reproducibility of a web-based, self-administered food frequency questionnaire. *Eur J Clin Nutr.*
315 2012;66(2):166-73.
- 316 21. Dubois L, Girard M, Bergeron N. The choice of a diet quality indicator to evaluate the
317 nutritional health of populations. *Public Health Nutr.* 2000;3(3):357-65.
- 318 22. Slater J, Mudryj A. Self-Perceived Eating Habits and Food Skills of Canadians. *J Nutr*
319 *Educ Behav.* 2016;48(7):486-95.
- 320 23. Slater J, Mudryj A. Nurturing future generations: Household food practices of Canadian
321 children and family meal participation. *Can J Diet Pract Res.* 2016;77(3):113-8.
- 322 24. Morin P, Demers K, Turcotte S, Mongeau L. Association between perceived self-efficacy
323 related to meal management and food coping strategies among working parents with preschool
324 children. *Appetite.* 2013;65:43-50.
- 325 25. Azevedo Perry E, Thomas H, Samra HR, Edmonstone S, Davidson L, Faulkner A, et al.
326 Identifying attributes of food literacy: a scoping review. *Public Health Nutr.* 2017:1-10.
- 327 26. Vidgen HA, Gallegos D. Defining food literacy and its components. *Appetite.*
328 2014;76:50-9.
- 329 27. Vanderkooy P. Food skills of Waterloo Region adults [PowerPoint presentation].
330 University of Ottawa Fireside Chats; 2010. Available from: www.chnet-works.ca.
- 331 28. Health Canada. Healthy Eating and Education Awareness Initiative: Phase 3 - Healthy
332 eating and healthy weights: A focus on food skills to support healthy eating and healthy weights.
333 Ottawa, ON: Health Canada; 2013. p. 1-31.

- 334 29. Glickman ME, Rao SR, Schultz MR. False discovery rate control is a recommended
335 alternative to Bonferroni-type adjustments in health studies. *J Clin Epidemiol.* 2014;67(8):850-7.
- 336 30. Miller J, Chan L, Mehta K, Roberts R, Dickinson KM, Yaxley A, et al. Dietary intake of
337 working women with children does not appear to be influenced by hours of employment: A
338 secondary analysis of the Australian Health Survey (2011-2013). *Appetite.* 2016;105:106-13.
- 339 31. Howard A, Brichta J. What's to eat? Improving food literacy in Canada. Ottawa, ON:
340 Conference Board of Canada; 2013.
- 341 32. Wolfson JA, Bleich SN. Is cooking at home associated with better diet quality or weight-
342 loss intention? *Public Health Nutr.* 2015;18(8):1397-406.
- 343 33. Wang MC, Naidoo N, Ferzacca S, Reddy G, Van Dam RM. The role of women in food
344 provision and food choice decision-making in Singapore: a case study. *Ecol Food Nutr.*
345 2014;53(6):658-77.
- 346 34. Sliwa SA, Must A, Peréa F, Economos CD. Maternal employment, acculturation, and
347 time spent in food-related behaviors among Hispanic mothers in the United States. Evidence
348 from the American Time Use Survey. *Appetite.* 2015;87:10-9.
- 349 35. Devine CM, Jastran M, Jabs J, Wethington E, Farrell TJ, Bisogni CA. "A lot of
350 sacrifices": Work-family spillover and the food choice coping strategies of low-wage employed
351 parents. *Soc Sci Med.* 2006;63(10):2591-603.
- 352 36. Short F. Domestic cooking skills - what are they? *Journal of the HEIA.* 2003;10(3):13-22.
- 353 37. Jabs J, Devine CM. Time scarcity and food choices: an overview. *Appetite.* 2006;47:196-
354 204.
- 355 38. Djupegot IL, Nenseth CB, Bere E, Bjornara HBT, Helland SH, Overby NC, et al. The
356 association between time scarcity, sociodemographic correlates and consumption of ultra-
357 processed foods among parents in Norway: a cross-sectional study. *BMC Public Health.*
358 2017;17:8.
- 359 39. Venn D, Strazdins L. Your money or your time? How both types of scarcity matter to
360 physical activity and healthy eating. *Soc Sci Med.* 2017;172:98-106.
- 361 40. Jabs J, Devine CM, Bisogni CA, Farrell TJ, Jastran M, Wethington E. Trying to find the
362 quickest way: employed mothers' constructions of time for food. *J Nutr Educ Behav.*
363 2007;39(1):18-25.
- 364 41. Strazdins L, Griffin AL, Broom DH, Banwell C, Korda R, Dixon J, et al. Time scarcity:
365 another health inequality? *Environment and Planning A.* 2011;43(3):545-59.
- 366 42. Storfer-Isser A, Musher-Eizenman D. Measuring parent time scarcity and fatigue as
367 barriers to meal planning and preparation: Quantitative scale development. *J Nutr Educ Behav.*
368 2013;45(2):176-82.

Table 1. Characteristics of parents according to employment status

Variable	Total (%)	Full-time employment (%)	Other employment* (%)	P-value
	n = 767	n = 452 (58.9)	n = 315 (41.1)	
Parent				<0.0001
Mother	624 (81.4)	327 (52.4)	297 (47.6)	
Father	143 (18.6)	125 (87.4)	18 (12.6)	
Age (mean, SD)				0.92
Years	39.7 (6.1)	39.7 (5.7)	39.7 (6.5)	
Dominant official language				0.002
English	606 (79.0)	340 (56.1)	266 (43.3)	
French	161 (21.0)	112 (69.6)	49 (30.4)	
Region				<0.0001
British Columbia	104 (13.6)	47 (45.2)	57 (54.8)	
Prairies (Alberta, Saskatchewan and Manitoba)	130 (17.0)	59 (45.4)	71 (54.6)	
Ontario	319 (41.6)	203 (63.6)	116 (36.4)	
Quebec	152 (19.8)	101 (66.5)	51 (33.6)	
Maritimes (New Brunswick, Nova Scotia, Prince Edward Island)	62 (8.1)	42 (67.7)	20 (32.3)	
Ethnicity or culture				0.36
Caucasian	662 (86.7)	393 (59.4)	269 (40.6)	
Black	15 (2.0)	9 (60.0)	6 (40.0)	
First Nations, Métis or Inuit	14 (1.8)	4 (28.6)	10 (71.4)	
Asian	37 (4.8)	22 (59.5)	15 (40.5)	
Arab	10 (1.3)	6 (60.0)	4 (40.0)	
Other/no answer	29 (3.8)	18 (62.1)	11 (37.9)	
Number of children				<0.0001
1	162 (21.1)	111 (68.5)	51 (31.5)	
2	388 (50.6)	240 (61.9)	148 (38.1)	
3	164 (21.4)	86 (52.4)	78 (47.6)	
≥ 4	53 (6.9)	15 (28.3)	38 (71.7)	
Family structure				0.80
Two parent	669 (87.2)	395 (59.0)	274 (41.0)	
Single parent	61 (8.0)	37 (60.7)	24 (39.3)	
Step-family	37 (4.8)	20 (54.1)	17 (46.0)	
Household income				<0.0001
< 40 000	65 (8.5)	13 (20.0)	52 (80.0)	
40 000 to 79 999	179 (23.3)	95 (53.1)	84 (46.9)	
> 80 000	417 (54.4)	288 (69.1)	129 (30.9)	
no answer	106 (13.8)	56 (52.9)	50 (47.2)	
Level of education completed				0.02
Primary or secondary	125 (16.3)	60 (48.0)	65 (52.0)	
College	202 (26.3)	120 (59.4)	82 (40.6)	
University	440 (57.4)	272 (61.8)	168 (38.2)	
Religious affiliation				0.45
Christian	478 (62.3)	280 (58.6)	198 (41.4)	
Other faith	40 (5.2)	27 (67.5)	13 (32.5)	
None	209 (27.3)	125 (59.8)	84 (40.2)	
No answer	40 (5.2)	20 (50.0)	20 (50.0)	
Diet quality (mean, SD)				0.38
Healthy eating index score	76.6 (10.6)	76.9 (10.6)	76.2 (10.4)	

* Other employment status includes part-time, stay at home, unemployed, unable to work, retired, and unspecified employment status.

Table 2. Food skills of Canadian parents with full-time employment compared to parents with other employment status*

Variable	Crude model			Adjusted model†		
	OR	95% CI	P-value	OR	95% CI	P-value
<i>Knowledge components</i>						
Sometimes use recommendations from Canada's Food Guide	0.87	(0.65, 1.18)	0.38	0.97	(0.68, 1.38)	0.86
Sometimes select foods based on nutrition labels	0.75	(0.51, 1.09)	0.13	0.72	(0.46, 1.12)	0.14
<i>Planning components</i>						
Currently plan meals	0.54	(0.34, 0.84)	*0.007	0.49	(0.29, 0.82)	*0.006
Plan meals before going to the store	0.88	(0.53, 1.45)	0.61	0.67	(0.37, 1.20)	0.17
Sometimes have a budget when shopping for groceries	0.8	(0.60, 1.07)	0.13	0.85	(0.59, 1.21)	0.35
Sometimes use a written grocery list§	1.11	(0.57, 2.15)	0.77			
<i>Mechanical skills</i>						
Very good or good skills in peeling, chopping, or slicing vegetables§	1.13	(0.61, 2.10)	0.69			
Very good or good skills in cooking a piece of raw meat, chicken or fish	1.15	(0.71, 1.88)	0.58	1.32	(0.75, 2.31)	0.34
Very good or good skills in cooking a soup, stew or casseroles from scratch	0.73	(0.50, 1.13)	0.16	0.67	(0.40, 1.12)	0.12
Very good or good skills in baking muffins or cake from scratch with a recipe	0.55	(0.34, 0.89)	*0.01	0.66	(0.38, 1.15)	0.14
<i>Food conceptualisation</i>						
Cook main meals mostly with whole and basic foods	0.81	(0.58, 1.11)	0.19	0.64	(0.44, 0.94)	*0.02
Can prepare most dishes or frequently prepare sophisticated dishes using basic ingredients§	1.02	(0.75, 1.40)	0.88			
Ever made changes to a recipe to make it healthier	0.63	(0.40, 0.97)	*0.04	0.66	(0.40, 1.10)	0.11
By reducing its fat content§	1.05	(0.78, 1.40)	0.75			
By reducing its salt content	1.01	(0.76, 1.35)	0.94	1.00	(0.72, 1.40)	0.98
By reducing its sugar content	0.75	(0.56, 1.01)	0.06	0.77	(0.55, 1.09)	0.14
By adding more fruits or vegetables	0.69	(0.50, 0.95)	*0.02	0.90	(0.62, 1.30)	0.56
By choosing whole grain options	0.79	(0.59, 1.06)	0.11	0.82	(0.59, 1.14)	0.23
<i>Social aspects</i>						
Eat main meal every day or almost every day with family at home	0.85	(0.58, 1.25)	0.40	0.71	(0.45, 1.12)	0.14
Children make suggestions for family meals	0.7	(0.46, 1.07)	0.10	0.86	(0.70, 1.93)	0.56
Children participate in shopping for groceries	1.13	(0.83, 1.56)	0.44	1.24	(0.85, 1.79)	0.26
Children help prepare meals or cook foods	0.94	(0.69, 1.27)	0.67	1.05	(0.74, 1.49)	0.80
Children prepare or cook meals by themselves	0.77	(0.57, 1.04)	0.08	0.88	(0.61, 1.26)	0.48

* Other employment status includes part-time, stay at home, unemployed, unable to work, retired, and unspecified employment status.

†Adjusted model controlled for age, sex, education, income, number of children, family type (two-parent, single parent or step-family), language and region

§ Multiple logistic regression models resulted in poor model fit ($p > .05$) and are not reported.

* The false discovery rate (Benjamini-Hochberg procedure) was used to adjust for multiple testing. The level of significance for each model tested is different and depends on its p -value. Using this procedure, none of the models tested in the Table 2 met the criteria for statistical significance, despite presenting p -values $< .05$.

371

372

Table 3. Meal planning barriers and preparation strategies of Canadian parents with full-time employment compared to parents with other employment status*

Variable	Crude model			Adjusted model†		
	OR	95% CI	P-value	OR	95% CI	P-value
<i>Meal planning barriers</i>						
Lack of time	2.35	(1.73, 3.18)	*<.0001	3.22	(2.25, 4.63)	*<.0001
Food preferences or dietary restrictions of family members	0.53	(0.39, 0.70)	*<.0001	0.57	(0.41, 0.79)	*0.001
Health issues or allergies of a family member	0.48	(0.32, 0.73)	*0.001	0.48	(0.30, 0.78)	*0.003
Financial resources	0.59	(0.41, 0.85)	*0.004	1.08	(0.68, 1.72)	0.74
Access to a variety of fresh and affordable foods	0.74	(0.50, 1.11)	0.14	0.73	(0.46, 1.18)	0.20
Responsibilities not shared between family members	0.96	(0.67, 1.38)	0.83	1.18	(0.78, 1.80)	0.43
Lack of ideas	0.90	(0.67, 1.20)	0.46	0.91	(0.65, 1.27)	0.57
<i>Meal preparation strategies</i>						
Planning meals ahead	0.74	(0.52, 1.04)	0.08	0.69	(0.46, 1.03)	0.07
Shopping to ensure have all ingredients [§]	0.82	(0.53, 1.25)	0.35			
Cooking meals in advance	1.04	(0.78, 1.39)	0.78	0.90	(0.64, 1.26)	0.54
Involving other family members in meal preparation	1.04	(0.77, 1.39)	0.81	1.30	(0.56, 3.00)	0.61
Using simple cooking methods [§]	0.94	(0.68, 1.31)	0.67			
Combining fresh food with prepared/processed foods	0.84	(0.61, 1.14)	0.26	1.02	(0.71, 1.46)	0.91
Freezing meals	0.75	(0.56, 1.01)	0.06	0.71	(0.51, 1.00)	0.05

* Other employment status includes part-time, stay at home, unemployed, unable to work, retired, and unspecified employment status.

†Adjusted model controlled for age, sex, education, income, number of children, family type (two-parent, single parent or step-family), language and region

§ The false discovery rate (Benjamini-Hochberg procedure) was used to adjust for multiple testing. The level of significance for each model tested is different and depends on its p-value. Using this procedure, tests with the 4 smallest p-values in crude models and 3 smallest p-values in adjusted models met the criteria for statistical significance.

373

374

375

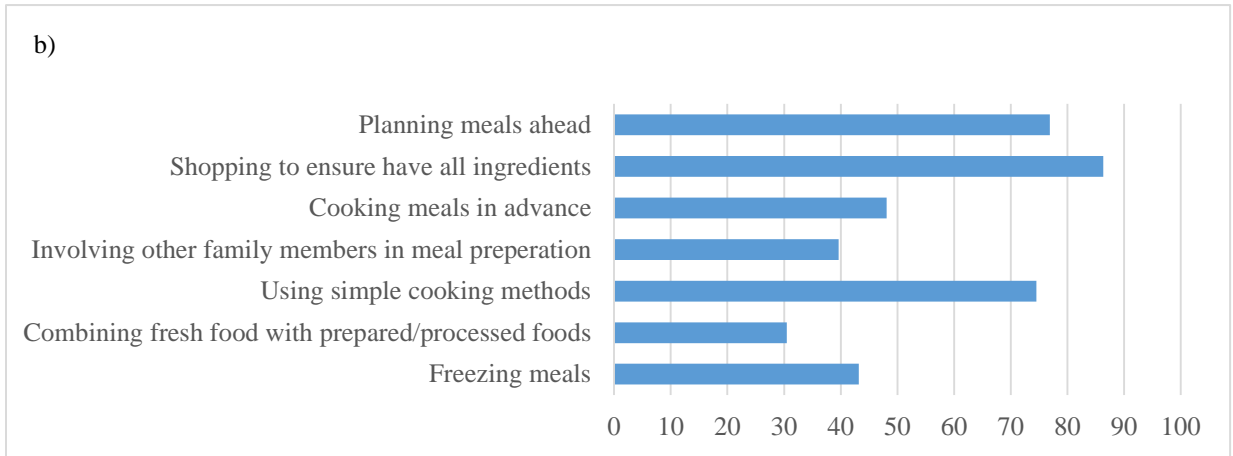
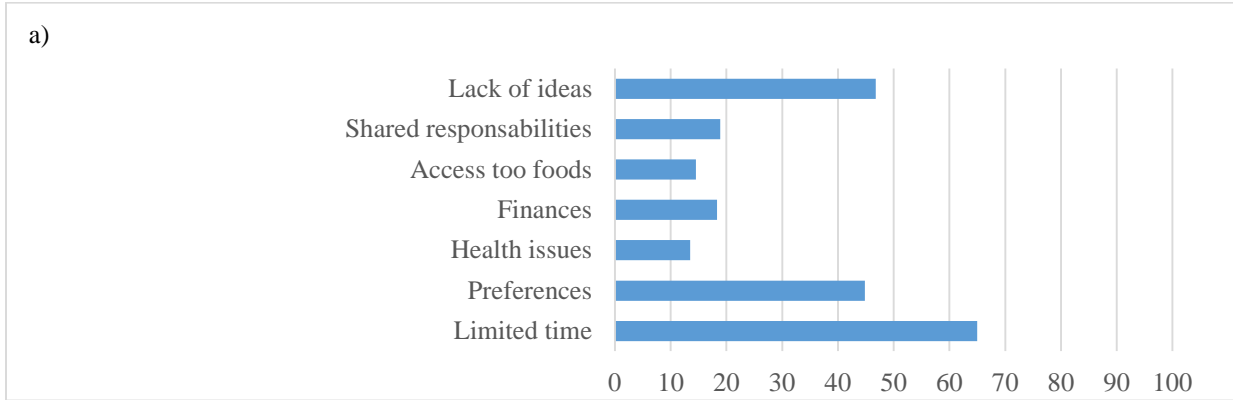
376

377

378

379

380 **Figures**



383 Figure 1. Meal planning barriers (a) and strategies to facilitate meal preparation (b) reported by
384 Canadian parents (%)