Co-Creating Solutions: Affordable Healthy Eating for Individuals Living with Cognitive Disabilities

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A thesis submitted to the University of Ottawa in partial fulfillment of the requirements for the Master's degree in Nutrition and Food Biosciences

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CBPR	Community-Based Participatory Research
CNS	Canadian Nutrition Society
DALYs	Disability-adjusted life-years
DSM-5	Diagnostic and Statistical Manual of Mental Illnesses
GBD 2019	Global Burden of Disease, Injuries, and Risk Study
IPA	Interpretive Phenomenological Analysis
Open	Open Collaboration for Cognitive Accessibility
SDGs	Sustainable Development Goals
SSHRC	Social Sciences and Humanities Research Council
WHO	World Health Organization

ACKNOWLEDGMENTS

This project and thesis are a cumulative effort of several people. I am greatly indebted to my supervisor, Dr. Melissa A. Fernandez, for her support and her confidence in me to take on this project. She has been a guiding light who has always encouraged and steered me towards opportunities to improve my knowledge and skill set. Through her influence, I was able to grow both as a person and researcher over the past two years. I am also thankful to my TAC members, Dr. Claire Tugault-Lafleur and Dr. Jennifer O'Neil for their valuable comments and suggestions during our advisory meetings.

I would also like to extend my sincerest gratitude to Dr. Virginie Cobigo for approaching our lab with this very interesting project. Without her, we would not have been able to be a part of this very important and pertinent initiative. I would also like to give a special thanks to Dr. Munazza Tahir, who was very generous with her time and provided unrestrained guidance throughout these two years. I am also grateful to the Open staff, especially Emily Cliche, for their support and help in facilitating the project and participant interactions. I am also extremely obliged to the lived experience advisors on our steering committee and study participants for their time and essential input. I would also like to extend my sincerest gratitude to the University of Ottawa for their Community-Based Research Grant and the Social Sciences and Humanities Research Council (SSHRC) for their Partnership Engagement Grant that helped made this project possible.

I would also like to thank my siblings for not letting our bond change during the two years that I have been away from home. Lastly, I am extremely grateful for my parents, Dr. Akhtar Hussain and Aisha Akhtar, who have been my biggest strength and supporters since day one. I attribute all that I am and will be to their unwavering love, encouragement and support that shaped me into the person I am today.

Noor Ul Huda

PREFACE

This project was a community-based research collaboration between the research team at the University of Ottawa and Open Collaboration for Cognitive Accessibility (Open). The research team for the project included Dr. Melissa A Fernandez (MAF) (supervisor) as the primary researcher, Noor Ul Huda (NH) (master's student) as the student researcher; and Dr. Sophie Desroches (SD) as the collaborating researcher. Open was represented by Dr. Munazza Tahir (MT), Associate Director, and Dr. Virginie Cobigo (VC), Director. Ethics approval was given by the University of Ottawa's Ethics review board for both phases of community data collection (H-01-25-11149) (H-08-25-11654).

For manuscript one, NH contributed to the ethics applications along with MAF, MT and VC. Furthermore, along with MAF, she also drafted the recruitment documents (invitation letters and consent forms) and the comprehensive interview guide for the interviews. She also sat in on the community interviews as an auditor and asked any follow up questions at the end. She was the principal analyst for the project and primarily drafted the manuscript and accessible summary of the results to be shared with Open and the participants. She also presented the findings from this manuscript at the 3rd International Trainee Symposium in Agri-Food, Nutrition and Health, Canadian Centre for Agri-Food Research in Health and Medicine (CCARM) (2025, October 16).

For the bridging chapter, with MAF, NH drafted the recipe selection checklist based on community insights. She also conducted a website scan of 10 Canadian health organization websites to assess the affordability and healthfulness of the recipes present on them. From the recipes satisfying the criteria outlined in the checklist, she selected and adapted eight recipes into easy-to-read language and an accessible format using participant insights from manuscript 1, feedback from steering committee members, and Open's plain language and easy-to-read guidelines. She also presented findings from this chapter at the 10th World Conference on Qualitative Research (2026, February 5).

For manuscript 2, she contributed to the ethics applications along with MAF, MT and VC. Furthermore, MAF and her also drafted the recruitment documents (invitation letters and consent forms) and the comprehensive interview guide for the interviews. NH was the sole interviewer and the principal analyst for the three interviewer-assisted questionnaires and the semi-structured interviews conducted during this phase. She also primarily drafted the manuscript and presented

a poster with the findings from this manuscript at the Canadian Nutrition Society (CNS) Annual Conference 2026 (2026, May 8-9).

ABSTRACT

Background: Access to safe and nutritious food is a fundamental human right, yet it remains elusive for many, especially those living with cognitive disabilities. Cognitive disabilities affect one's ability to plan, recall information, make decisions, use tools (like recipes), or even stay attentive, making it difficult for them to plan and eat healthy meals. Additionally, this population is also highly vulnerable to poverty and food insecurity, further exacerbating barriers to healthy eating. Therefore, removing barriers impeding affordable healthy eating for individuals living with cognitive disabilities is a pressing need.

Objectives: The goal of this project was to make healthy eating more accessible for individuals living with cognitive disabilities. Our specific objectives were to 1) explore the healthy eating and food preparation barriers faced by individuals with cognitive disabilities; 2) develop recipe selection checklist to select and adapt recipes to easy-to-read language; and 3) evaluate the usability, usefulness and acceptability of recipes adapted into easy-to-read language.

Methods: This three-phase qualitative study uses a Community-Based Participatory Research (CBPR) approach. This project is a collaboration between the academic partners (Fernandez lab and SD), the community partners (Open), and individuals with lived experience of cognitive disabilities to understand and address the community's healthy eating and food preparation needs and challenges. All phases of the study were informed by community insights collected during the interviews and steering committee meetings with advisors with lived experience. Findings from the first phase were used to develop a recipe selection checklist. A website scan was done to collect recipes present on 10 Canadian health organization websites. The checklist was applied to the recipes to evaluate their affordability and healthfulness. An easy-to-read language and an accessible format protocol was also developed to adapt recipes. The adapted recipes were tested by eight participants to evaluate their usability, usefulness and acceptability.

Results: Manuscript one demonstrated that the healthy eating and food preparation barriers faced by individuals living with cognitive disabilities in the current Canadian ecosystem can mainly be categorized into two superordinate themes: 1) *personal circumstances influence healthy eating,* and 2) *food environments lack accessibility.*

In the bridging chapter, an eight-item recipe selection checklist was developed to evaluate the affordability and healthfulness of existing recipes. Applying this criteria to 1313 recipes

available on 10 Canadian healthy organization websites, showed that only 191 (14.5%) of them were actually affordable and nutritionally complete meals. From these 191 recipes, eight were adapted into easy-to-read language and an accessible format.

In manuscript two, recipes adapted into easy-to-read language and accessible format received moderately high to high scores (total scores 32-48; median scores 35-44). The *usability of recipes* was found to be affected by the *practical aspects of recipe, visual presentation of information* and the *organization of information.* The *usefulness of information* was influenced by the *quantity of information* and the *quality of the written content.* Lastly, the *acceptability of recipes* was determined by the *food skills required, cognitive load, and overall appreciation* (taste and texture).

Conclusion: This project used a CBPR approach to provide in-depth community insights into the healthy eating, food preparation and recipe accessibility barriers faced by individuals living with cognitive disabilities in the current Canadian society. The project provides a recipe selection checklist and recipe adaptation protocol. These documents can be used as a guide by recipe developers to align their resources with the needs of individuals living with cognitive disabilities. Utilizing these resources can help reduce healthy eating barriers and facilitate independent food preparation for not only individuals living with cognitive disabilities, but for the general population as well.

CHAPTER 1: GENERAL INTRODUCTION

This thesis covers a multi-phase community-based project that was done in collaboration with Open Collaboration for Cognitive Accessibility (Open). Open is a non-profit national disability organization dedicated to ensuring the equitable inclusion of individuals of all cognitive abilities in every aspect of the society (Open Collaboration for Cognitive Accessibility, n.d-a). They work with a team of over 100 disability advisors, to test and improve the accessibility of products, services and environments. While working with the community, Open recognized the community need for accessible healthy eating resources for which they sought to collaborate with our lab, with its background in public health nutrition and dietetics. With Open's understanding of their community members and our dietetic expertise, we worked together to enhance the accessibility of common healthy eating resources.

The thesis covers two manuscripts with a bridging chapter in between. The first manuscript (Chapter 5) is titled "*Barriers to affordable healthy eating experienced by individuals living with cognitive disabilities*". This manuscript covers a qualitative study that used in-depth interviews to explore the healthy eating and food preparation needs and barriers of the community, addressing the first research question and the first research objective.

The bridging chapter (Chapter 6) describes the second phase of the project, overviewing the process of developing a recipe selection checklist that could be used to identify reliable, affordable and healthy recipes for individuals living with cognitive disabilities. It also outlined a protocol for adapting the affordable, healthy recipes into easy-to-read language and an accessible format. This chapter covers the second research objective.

The second manuscript (Chapter 7) is titled "*Examining the usability, usefulness, and acceptability of easy-to-read recipes adapted for individuals living with cognitive disabilities*". It examines the third phase of the project that dealt with the testing and evaluation of the adapted recipes. This chapter addresses the second research question and the third research objective.

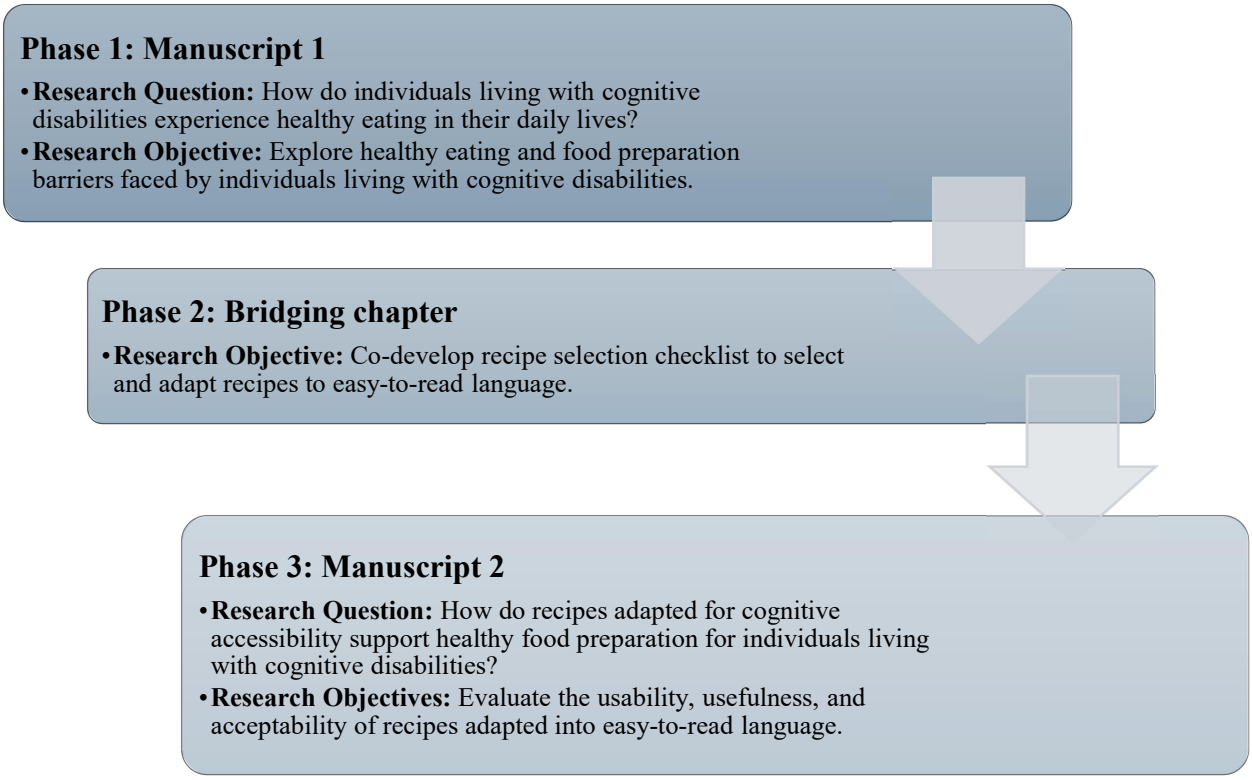

Figure 1.1 Phases of research project and their correspondence to the sections of the thesis manuscript, research questions and objectives

CHAPTER 2: LITERATURE REVIEW

Societal perceptions on disabilities

Historically, societal perception regarding disabilities has been unfavourable. In the chapter "*Understanding the social model of disability: past, present and future*", Barnes highlighted how social acceptance for individuals living with disabilities was at its lowest during the Industrial Revolution with adversities against the community peaking in Nazi Germany with the launch of the mass euthanasia policy for disposing 'useless eaters'. However, the situation improved post-World War II, when governments prioritizing the welfare of veterans disabled during the war (Barnes, 2019). This increased interest in disability issues led organizations to start developing a functional definition for disability (Grönvik, 2009).

Initial definitions focused only on physical ailments, with mental or cognitive ailments being incorporated later on (Barnes, 2019). According to the Canadian Federal Disability Reference Guide, disability is defined as a complex phenomenon, reflecting an interaction between features of a person's body and mind with the features of the society that they live in (Government of Canada, 2013). This definition clearly demonstrates that disability is not only defined by an ailment, but it is also equally shaped by the society.

Cognitive disabilities

Cognitive disability is an umbrella term used to define all conditions that limit cognitive functions such as memory; understanding or processing of information; problem solving; reading; and stimuli response (Koushik & Kane, 2023). They include intellectual disabilities, learning problems (e.g., Dyslexia, non-verbal learning disabilities); developmental issues (e.g., Down's Syndrome, Attention Deficit Hyperactivity Disorder, Autism Spectrum Disorder); psychiatric disorders (e.g., Schizophrenia); acquired brain injuries (e.g., Stroke, Aneurysms); and neurological diseases and neurodegenerative disorders (e.g., Dementia) (Government of Canada, n.d; Fraser, 2018; Olney & Kim, 2001)**.** In Canada, an estimated five million individuals live with cognitive disabilities, representing a substantial and diverse population facing distinct accessibility challenges (Open Collaboration for Cognitive Accessibility, n.d-b).

Individuals living with cognitive disabilities constitute a heterogeneous group that possess a range of co-existing cognitive strengths and limitations that often evolve over time and can be persistent, episodic or temporary (Virginie Cobigo, 2024). Although these conditions differ in

their aetiology, pathophysiology, symptoms, and effects, they are grouped together because of their common impact on cognitive ability (Olney & Kim, 2001). However, the absence of a universally accepted definition has resulted in inconsistencies regarding the use of the term across research and policy. Cobigo et al. in their 2024 scoping review evaluating existing definitions using the Luckasson and Reeves criteria, found none of the current available definitions of cognitive disabilities to be fully appropriate. To remedy this, they proposed a new functional definition based on the Diagnostic and Statistical Manual for Mental Disorders (DSM-5) proposed by the American Psychiatric Association in 2013. They described cognitive disabilities as a situation of disadvantage experienced by individuals living with cognitive abilities that differ from what is considered typical, in one or more of the following domains: (1) attention, (2) executive functions, (3) learning and memory, (4) language, (5) perceptual motor skills or (6) social cognitions (Virginie Cobigo, 2024). Even though this definition also did not fully meet the criteria, it was still more equitable as compared to the other available definitions and was thus used in this project.

Disability support in Canada

In recent years, Canadian federal and provincial governments have demonstrated their commitment towards a more equitable society, through initiatives like the 2022 *Disability Inclusion Action Plan*. This plan aims for social and economic inclusion, poverty reduction, barrier-free environments, consistency in service access, and cultural shifts towards inclusion (Government of Canada, 2022). The implementation of the action plan has led to commencement of various welfare initiatives like 1) *Canada Disability Benefit Act* 2023, 2) *Canada Student Financial Assistance Program*, 3) funding for 100 projects under the *Opportunities Fund for Persons with Disabilities*, and 4) accessibility-focused legislation including the *Accessible Canada Act* (Government of Canada, 2023).

While these initiatives signal progress, structural inequities still persist, particularly in domains related to income security, food access, and everyday autonomy; demonstrating that the existence of policy frameworks alone does not guarantee accessibility.

Healthy eating

According to the World Health Organization (WHO), healthy eating is characterized by consuming a diet consisting of a variety of fruits, vegetables, pulses, whole grains and lean

sources of protein. Even though the composition of a healthy diet changes depending on individual needs and food availability, all healthy dietary patterns should be nutritionally adequate, balanced, diverse and moderate to promote health throughout the life course (World Health Organization, 2026).

Healthy eating is crucial for maintaining overall health and protecting the consumer against malnutrition and non-communicable diseases such as diabetes, heart disease, stroke, and cancer. This was most notably demonstrated by the Global Burden of Disease, Injuries, and Risk Study (GBD). The GBD was a longitudinal study that collected data regarding health outcomes from 204 countries and territories over the span of three decades, 1990-2019 (Murray et al., 2020). Using the data collected by the GBD, Qiao et al. evaluated the global dietary risk for non-communicable diseases on mortality and disability-adjusted life-years (DALYs). In their analysis, they found that in 2019 alone, dietary risk factors attributed to about 7.9 million deaths and 187.7 million DALYs, with high sodium and low fruit and whole grain intake being the leading risk factors (Qiao et al., 2022). Due to this notable influence of diet on morbidity and mortality, the WHO emphasizes that healthy dietary practices should start early in life to foster growth and cognitive development, which can have long-term health benefits (World Health Organization, 2026).

Healthy eating is particularly important for individuals living with cognitive disabilities, because of its positive effects on overall brain health and cognitive functioning. In a 2023 scientific review examining the influence of dietary and nutritional factors on cognitive health, Puri et al. reported that adherence to a healthy, balanced dietary pattern is strongly associated with improved cognitive health and reduced cognitive decline (Puri et al., 2023). Although the review demonstrated strong evidence supporting an association between healthy dietary patterns and enhanced cognitive health, it did not establish a causal relationship due to its reliance on observational and cross-sectional studies. Furthermore, the reviewed studies largely focused on cognitive decline among older adults, limiting their applicability to younger populations and to individuals living with cognitive disabilities that are not associated with progressive cognitive decline.

Adopting a healthy dietary pattern is not just up to the individual themself but is also dictated by the environment. According to Raine's (2005) overview and synthesis of the determinants of healthy eating in Canada, healthy eating is shaped by both individual and collective determinants

(environment and public policies). The article used a public health perspective to illustrate how the act of healthy eating is not only a result of personal conditions, i.e., physiological state, food preferences, nutritional knowledge, perceptions of healthy eating and psychological factors; but rather it is an amalgamation of one's interpersonal, physical, economic, and social environments that are mediated by governmental policies (Raine, 2005). It effectively demonstrated that healthy eating is a collaborative process with individual, social, and governmental players. Therefore, the onus of adopting a healthy diet does not solely fall on the individual but rather on the broader national ecosystem. This was also reiterated by Briazu et al. in their 2024 scoping review that found that barriers to healthy eating related to both the individual and their external environment, emphasizing on the need to shift the focus of healthy eating interventions on making the overall environment more accessible rather than solely focusing on educating individuals (Briazu et al., 2024). Therefore, it can be concluded that healthy eating is a foundational determinant of health, extending beyond individual choice to include structural and contextual influences.

Healthy Eating Challenges for Individuals Living with Cognitive Disabilities

Financial challenges

Individuals living with cognitive disabilities are at a higher risk of experiencing poverty and food insecurity due to their higher medical expenses and inequitable employment opportunities (Hadfield-Spoor et al., 2022; Royer et al., 2021; Schwartz et al., 2019). As per Inclusion Canada, individuals living with intellectual disabilities have the lowest employment rates, with only 25% of the 500,000 working age Canadians living with cognitive disabilities being employed (Inclusion Canada, 2026). Moreover, inflation and food prices are at an all-time high. According to an article by Olga Bilyk for the Bank of Canada, food prices have seen the highest price hike (22%) as compared to all consumer prices (13%) between 2022-25, with inflation rising to 5% in December 2025, the highest it has been since 2023 (Bilyk, 2026).

This combination of lower employment opportunities, inflation, and higher food costs makes individuals living with cognitive disabilities more vulnerable to food insecurity. According to Gupta, et al.'s review of the 2021 Canadian Income survey, the incidence of household food insecurity was twice as high amongst individuals living with disabilities (26%) as compared to those not living with disabilities (13%), with individuals living with cognitive disabilities

(learning, memory and cognition) and visual impairments being the most vulnerable populations (36%) (Gupta et al., 2024). These results were found to be independent of socioeconomic characteristics, highlighting the inequities in food insecurity experienced by individuals living with cognitive disabilities.

Cognitive challenges

Adopting a healthy diet is a complex process that requires effective planning, decision-making, or sustaining attention; which are all affected by cognitive disabilities. Executive functions play an important role in an individual's ability to self-regulate eating behaviours (Dohle et al., 2018). Though not focusing on individuals living with cognitive disabilities specifically, Dohle et al., did demonstrate that executive functions support the regulation of eating by helping individuals align behavior with long-term dietary goals. While the review does not evaluate "cognitive load" specifically, they do mention that cognitive load is a key variable influencing executive functioning and, thus, the self-regulation of eating behaviours.

Additionally, poverty itself also contributes to cognitive challenges. As per the 2023 review article published by Applehans, current scientific evidence shows that poverty has a huge cognitive burden on the individual, temporarily disrupting cognitive functions like planning, problem-solving and future oriented thinking in individuals (Appelhans, 2023). Therefore, individuals living with cognitive disabilities struggle more with healthy eating because of their cognitive challenges and the higher cognitive burden of poverty.

Information and resource challenges

Fletcher et al. in their chapter titled *"Staying healthy",* state that lifestyle changes, like healthy eating, are harder for individuals living with cognitive disabilities because of their greater reliance on resources and support. Thus, the lack of accessible nutritional resources and inadequate support personnel make it difficult for them to make informed decisions or take actions that support a healthy diet (Fletcher et al., 2020). Difficulties in deciphering available nutrition information and using common nutrition aids and tools, like recipes, is a common complaint observed amongst individuals living with cognitive disabilities (Brunosson et al., 2014; Granberg, Brante, et al., 2017; Granberg, Olsson, et al., 2017).

Recipes are a set of minimalistic instructions that offer diverse food and nutritional information to people with different levels of education (Hertzler, 1983). They are one of the most used tools in cooking. However, cooking from a recipe requires several cognitive functions such as attention, learning, memory and language. Limitations in any of these cognitive functions makes it challenging for individuals living with cognitive disabilities to follow recipes (Brunosson et al., 2014; Granberg, Brante, et al., 2017; Granberg, Olsson, et al., 2017).

Brunosson et al., in their 2014 study on the barriers faced by students living with mild intellectual disabilities observing 37 Swedish students, identified the concept of 'recipe literacy': recipe design and recipe purport. Barriers related to recipe design included 1) the separation of linked information, i.e., ingredient information being mentioned at the start and not in the step itself, 2) the density of information in a single instruction, and 3) the lack of instructions based on assumptions regarding the user's previous knowledge. Barriers related to recipe purport were 1) linking previous knowledge with the tasks outlined by the recipe, and 2) vocabulary used (Brunosson et al., 2014). Additionally, in a 2017 observational study on 37 students and in Swedish Home Economic schools, Granberg et al. identified that following recipes requires a level of understanding regarding the numbers, the units of measurements and computing numerical data. Students who did not have prior knowledge regarding these functions struggle with following recipes (Granberg, Brante, et al., 2017). Another 2017 study by Granberg et al., where they conducted 22 qualitative interviews with home economics teachers found that familiarity with language, cooking tools, cooking utensils, cooking techniques and the recipes itself were necessary to execute recipes (Granberg, Olsson, et al., 2017). The findings from these three studies indicate that difficulties with recipes stem not from a single deficit, but from the cumulative interaction of linguistic, numerical, and procedural demands. Therefore, to bring meaningful improvements to recipe accessibility, a holistic approach to intervention, like following universal design, would be needed.

Universal design

Universal design refers to the development of products, services, programs and environments to make them usable for all people, to the greatest extent possible, without adaptations and the use of specialized design (Ostroff, 2011). According to the *Centre for Excellence in Universal Design,* universal design is governed by seven principles, i.e., 1) equitable use, 2) flexibility in

use, 3) simple and intuitive use, 4) perceptible information, 5) tolerance for error, 6) low physical effort, and 7) size and space for approach and use (Centre for Excellence in Universal Design, n.d). One way of implementing universal design is by using easy-to-read language.

Easy-to-read language

Easy-to-read language is a simplified form of language. It significantly enhances the readability and comprehensibility of texts by reducing their linguistic complexity. This simplification makes it easier for individuals to process, perceive, comprehend, and recall information, thereby improving their task motivation (Hansen-Schirra & Maaß, 2020). Easy-to-read documents are mainly targeted towards individuals living with cognitive and communication impairments to make information more accessible for them (Buell et al., 2019). Buell et al. found that the reason why literal comprehension improves with easy-to-read language is because it helps to bridge the gap between the language level of the document and the reading abilities of the users (Buell et al., 2019).

Easy-to-read texts have been found to be more beneficial for reading comprehension as compared to regular texts (Fajardo et al., 2014; Maaß, 2020a). Fajardo et al. showed this in their 2014 study, where they observed the effect of 48 easy-to-read news pieces (following international guidelines for easy-to-read materials) on the reading comprehension in 16 students living with mild intellectual disabilities and low reading skills. They found that the participants had an 80% answer rate, with the students doing better on literal comprehension than inferential questions (Fajardo et al., 2014). Even though this was a study conducted in Spanish, as the principles used were universal, therefore these results can be applied to any document using easy-to-read text, demonstrating the benefits of easy-to-read text for improving literal comprehension.

However, available literature highlights persistent challenges in the development of effective easy-to-read resources. While easy-to-read adaptations are intended to improve accessibility, there remains a lack of consistently applied and empirically validated protocols to guide their development (Sutherland & Isherwood, 2016), resulting in considerable variability in quality and effectiveness. A recent linguistic discourse analysis conducted by Buell et al. on the effect of using easy-to-read language as compared to standard texts showed that even though easy-to-read versions were easier to understand, however, the language adaptation process is still far from

perfect. Language simplification can lead to loss of detail and the use of less empowering and inclusive language can potentially undermine the effectiveness of the resources (Buell et al., 2024). This points towards a critical gap between the goals of accessibility and the actual outcomes of easy-to-read adaptations, highlighting the need for systematic, evidence-based approaches that balance clarity, inclusivity, and informational integrity.

CHAPTER 3: STUDY RATIONALE AND OBJECTIVES

The literature cited above clearly demonstrates that there are several accessibility barriers that make healthy eating inaccessible for individuals living with cognitive disabilities. Resource accessibility barriers and food preparation barriers combined with food insecurity make healthy eating inaccessible for individuals living with cognitive disabilities, putting them at a greater risk of experiencing poor dietary outcomes (Brucker, 2017; Caton et al., 2012; Koritsas & Iacono, 2016; Royer et al., 2021). The importance of this research gap was further cemented by community needs identified by Open: *there is a lack of accessible healthy eating resources, especially recipes, for individuals living with cognitive disabilities.*

This project aimed to remedy this by making healthy eating more accessible for individuals living with cognitive disabilities. We tried to achieve this by answering the following research questions:

1. How do individuals living with cognitive disabilities experience healthy eating in their daily lives?
2. How do recipes adapted for cognitive accessibility support healthy food preparation for individuals living with cognitive disabilities?

Note: This project uses community-based participatory research, which falls under the category of participatory action research (Baum, 2006), and, therefore, has no hypotheses.

The specific research objectives were:

1. Explore healthy eating and food preparation barriers faced by individuals living with cognitive disabilities.
2. Develop recipe selection checklist to select and adapt recipes to easy-to-read language (Maaß, 2020c).
3. Evaluate the usability, usefulness, and acceptability (Saguin et al., 2024) of recipes adapted into easy-to-read language.

CHAPTER 4: METHODS

This project used a Community-Based Participatory Research (CBPR) approach. This approach is characterized by a close partnership between the members of a community, a representative community organizations and researchers to investigate a community concern and come up with solutions for it (Jull et al., 2017). We selected this approach due to its emphasis on leveraging the community's lived experiences and insights as the guiding factor behind research, enabling us to develop practical solutions that will promote inclusivity, enhance community health, and address disparities (Wallerstein & Duran, 2006).

Table 4.1 Integration of CBPR Approach (Collins et al., 2018)

Researcher participant relationship	• We and Open had shared interests in reducing health inequities for individuals living with cognitive disability. • Community members living with cognitive disabilities had official status on the Steering Committee.
Research idea	• The research idea stemmed from a community need identified by Open to reduce healthy eating barriers faced by individuals living with cognitive disabilities.
Funding	• We partnered with Open to secure research funding from uOttawa and SSHRC. Funding was fairly shared between partners to cover all research-related costs.
Oversight	• Approval authorities included the uOttawa Research Ethics Board and the Steering Committee.
Study Design	• The research approach was discussed with Open, and the project description was drafted collaboratively.
Data collection	• Open provided input on all data collection methods. • Open supported data collection (interviews).
Data analysis	• Results from the data analysis were shared with the steering committee.

Steering committee

A steering committee was composed of NH and MAF as the academic researchers; MT and VC as community researchers and one accessibility advisor (V) with lived experience of cognitive disabilities and expertise in accessibility testing in the first study. In the second study, one researcher (SD) and three additional accessibility advisors (MB, M and M) were added to the steering committee. However, one advisor (M) dropped out, leaving us with three advisors on the committee. This steering committee had four 4 ad hoc meetings (November 11, 2024; May 20, 2025; July 21, 2025; and September 22, 2025) to ensure research activities were grounded in

lived experience and provided academic and strategic feedback on current and future projects. Before finalization, all research documents (invitation letters, recruitment letters, consent forms, and interview guides) and resources (recipe selection criteria, and adapted recipes) were reviewed by the committee for their feedback and approval.

CHAPTER 5: MANUSCRIPT 1

Barriers to Affordable Healthy Eating Experienced by Individuals Living with Cognitive Disabilities

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Abstract

Introduction and goal: Approximately five million Canadians live with cognitive disabilities. Cognitive disabilities are situations of disadvantage which can make it difficult for individuals to independently select healthy foods and prepare healthy meals. The goal of this study was to explore healthy eating and food preparation barriers faced by individuals living with cognitive disabilities.

Methodology: This community-based research study was conducted in partnership with Open Collaboration for Cognitive Accessibility (Open). Two in-depth semi-structured interviews were conducted with eight of Open's accessibility testers to gain the community's insights about barriers to affordable healthy eating. Additionally, pictures were also provided by the participants of their food preparation tools, groceries and meals. Interviews were transcribed and analysed using interpretative phenomenology, an approach that extracts meaning from a small sample.

Results: Participants reported various healthy eating barriers. These barriers were characterised into two superordinate themes: 1) *personal circumstances influence healthy eating,* i.e., *struggling and feeling overwhelmed with food related tasks, health status impacts all aspects of food decisions, cooking is a chore,* and *help is needed to eat healthy;* and 2) *food environments lack accessibility*, i.e., *the information environment complicates healthy eating, the consumer environment is hard to navigate,* and *economic resources are insufficient.*

Conclusion: This project revealed recurring individual and environmental barriers that make affordable healthy eating inaccessible for individuals living with cognitive disabilities. Our findings indicate that both resources and environments need to be adapted to make them more accessible for individuals living with cognitive disabilities.

Funding: The project is funded by University of Ottawa's Community-Based Research Grant.

Keywords: Cognitive disabilities, healthy eating, accessible resources.

5.1 Introduction

Access to safe and healthy food is a fundamental human right, as evidenced by its inclusion as the second sustainable development goal (SDG2: Zero Hunger) that the United Nations aims to achieve by 2030 (United Nations, 2025)**.** Healthy eating is the act of consuming a balanced diet rich in fruits, vegetables, whole grains, lean proteins and healthy fats. It is crucial for maintaining overall health and preventing malnutrition and non-communicable diseases (Lawrence, 2024). The WHO emphasizes that healthy dietary practices should start early in life to foster healthy growth and cognitive development, which can have long-term health benefits (Lawrence, 2024). Therefore, adopting a healthy diet is crucial for improving the quality and longevity of life.

Despite the importance and priority attributed to affordable, healthy eating, it is still not universally accessible. One population that especially faces accessibility barriers in this domain are individuals living with cognitive disabilities. Cognitive disabilities are conditions that influence an individual's cognitive functions (Federal Communications Commission, 2016). As cognitive disability is an umbrella term encompassing several different conditions classified using multiple metrics (diagnostic, functional, pathophysiology), no unanimously agreed upon definition exists for the term. However, for the purpose of this study, we used the functional definition proposed by Cobigo et al. in a recent white paper published in 2024. According to this definition, cognitive disabilities are situations of disadvantage faced by individuals whose cognitive abilities deviate from what is typically expected in one or more of the following domains (Cobigo et al., 2024): 1) complex attention, 2) executive functions, 3) learning and memory, 4) language, 5) perceptual motor skills or 6) social cognitions (American Psychiatric Association, 2013).

Cognitive disabilities affect the lives of about five million Canadians (Open Collaboration for Cognitive Accessibility, n.d-b). The disadvantages faced by individuals living with cognitive disabilities on a daily basis can impede their social integration, depending, in part, on the support and adjustments made to help overcome challenges (Cobigo et al., 2016). Healthy eating and independent food preparation are activities that can be influenced by cognitive disabilities.

Adopting and maintaining a healthy diet requires high executive functioning to effectively plan meals, select healthy ingredients, and cook (Dohle et al., 2018). It is a challenge for anyone who has trouble recalling information, planning, decision-making, or sustaining attention; difficulties common amongst individuals living with cognitive disabilities (Federal Communications Commission, 2016). Additionally, individuals living with cognitive disabilities are also at higher risk of experiencing poverty and food insecurity due to financial factors like inflation and limited financial opportunities (Bank, 2023; Hadfield-Spoor et al., 2022; St-Germain & Tarasuk, 2017). Financial stressors coupled with food preparation barriers make healthy eating inaccessible for individuals living with cognitive disabilities (Caton et al., 2012; Koritsas & Iacono, 2016). Therefore, identifying and removing accessibility barriers to affordable healthy food preparation is critical to improving the dietary outcomes and autonomy in individuals living with cognitive disabilities.

Despite the growing body of research on food insecurity and disability, limited attention has been paid to how individuals with cognitive disabilities experience healthy eating in their daily lives and how the accessibility of nutritional resources influences their experiences. This project aims to explore the healthy eating and food preparation experiences of individuals living with cognitive disabilities, in collaboration with Open Collaboration for Cognitive Accessibility (Open). Open is a non-profit organization working to reduce accessibility barriers for individuals living with cognitive disabilities (Open Collaboration for Cognitive Disabilities, n.d-a). Through their work with the community, Open identified a critical community need: there is a lack of accessible healthy eating resources, especially recipes, for individuals living with cognitive disabilities. Considering this need, the project set out to answer the research question: how do individuals living with cognitive disabilities experience healthy eating in their daily lives?

5.3 Methods

Study design and participants

This CBPR study uses a qualitative study design with in-depth interviews (Curry, 2017) to understand the healthy eating and food preparation experiences of individuals living with cognitive disabilities. Semi-structured interviews were conducted with accessibility testers (individuals with lived experience of cognitive disabilities) working with Open. Interpretive

phenomenological analysis (IPA) was the main analytical approach used. Approval for the study was given by the University of Ottawa's Ethics review board (H-01-25-11149).

Sample

Convenience sampling (Golzar et al., 2022) was done amongst Open's pool of accessibility testers, with the first eight being selected for the study on a first-come basis. We chose this form of sampling because accessibility testers are key informants for the community, who have experience of providing rich and detailed information that is representative of the community's experience (Akhter, 2022). A sample size of eight was decided in-line with the best-practice guidelines for IPA (Smith, 2011). Our inclusion criteria were 1) individuals living with cognitive disability and 2) accessibility tester with Open. From our study, we excluded anyone who did not read and speak English.

Recruitment

Recruitment started in March 2025. The accessibility testers were approached by Open via email. The recruitment email contained an information letter (Annex 1) outlining the project and their responsibilities. Participants interested in the project were then sent a consent form (Annex 2) to sign. The information letter and consent form clearly indicated that participation was completely voluntary. Recruitment was stopped after the first eight eligible participants had given their consent.

Open handled all recruitment procedures and participant correspondence. As accessibility testers are a vulnerable population, therefore, it was not appropriate for the researchers to contact them directly. Open, as the community partner, was the best choice for handling participant communications. All recruitment documents and texts were translated into easy-to-read language. Participants were compensated $200 for their time, in line with the industry rates for accessibility testers informed by Open.

Comprehensive interview guide

A comprehensive semi-structured interview guide (Annex 3) was developed by MAF and NH. This was a comprehensive document for the two interviews. The interview guide contained thirty-two semi-structured questions split across two interviews covering six topics. The answers to these questions led to further exploratory questions within the realm of the outlined topics.

These topics were designed to capture needs relating to recipe development by Hertzler (1983) but can also be used to inform nutrition education and general healthy eating needs (Table 5.1).

Table 5.1 Topics covered and the insights sought from expert advisors (Hertzler, 1983)

Nutritional and dietary status	• Health concerns and nutritional concerns. • Common food intolerances, allergies, and medication interactions. • Food preferences and dislikes.
Money	• Budget and acceptable recipe costs.
Equipment	• Cooking methods and equipment that can be used or should be avoided.
Literacy	• Acceptable language and explanations for cooking terminology.
Information and knowledge	• Food and cooking knowledge.
Lifestyle	• Barriers and facilitators to food preparation from a recipe.

Data collection

Semi-structured interviews were conducted in April 2025. Each participant was interviewed twice by an interviewer (EC) trained in accessibility practices with NH observing interviews as an auditor, asking follow-up questions at the end of the interviews. The interviews were conducted virtually using *Microsoft Teams* with the participants choosing their interview slots via *Calendly*. Each interview lasted between 45 minutes to over 60 minutes. The decision to conduct two shorter interviews instead of one long interview was done to reduce the cognitive load on the participants as per the suggestion of the lived experience advisor on the steering committee. Interviews were electronically transcribed using the transcription option on *Microsoft Teams*, with the transcripts being verified and anonymized by NH.

Furthermore, to further reduce cognitive burden and minimize the length of interviews, participants were also advised to provide photographs of their food preparation tools, groceries and meals. The instructions regarding what to photograph and how to take the pictures were provided in the invitation letter and consent form (Annex 1 and 2). The participants sent in their pictures via email to EC, ahead of the first interview. This visual data was used to provide additional context behind the participants' eating habits and adapt questions during interviews. The collection of pictures supplementary to the interview was also proposed by the lived experience advisor on the steering committee.

Analysis

IPA was chosen as the main analytical technique because of its focus on the participant's unique lived experiences (Callary et al., 2015). With its emphasis and acknowledgement on double hermeneutics, i.e., analysis is the researcher's interpretation of the participant's interpretation of their own experiences, it provides an in-built framework for better transparency (Callary et al., 2015; Smith, 2011). IPA allows the extrapolation of a wealth of information from limited interviews while ensuring that the analysis remains 'experience close', keeping it both comprehensive and deeply connected to the participant's personal narratives (Callary et al., 2015; Smith, 2011). Given the immense importance of healthy eating for participants, IPA's emphasis on personal meaning and sense-making made it an ideal choice for this project.

Analytical memos were written after each interview to capture NH's first impressions of the interviews. These memos were shared between NH and MAF. The *Microsoft Word* transcripts and interview recordings were revisited multiple times for better familiarity. The transcripts were read line by line and quotations relevant to the study question were highlighted and isolated into a *Microsoft Excel* table. The unprocessed quotes were condensed into experiential statements, codes, sub-themes and superordinate themes respectively. Coding was an iterative process, with the codes being updated and changed throughout the analysis process.

Reflexive statement

Due to the interpretive nature of IPA, it is encouraged for the researchers to reflect on themselves during the analysis process (Clancy, 2013; Smith, 2016). Therefore, before starting the interviews, NH conducted a bracketing interview (Sorsa et al., 2015) to understand the implicit and explicit biases that she brought to the analysis. NH is an able-bodied female Master's student born and raised in Pakistan, where she grew up in a food-secure household with regular involvement in cooking and food preparation. This background contributed to her implicit assumption that cooking is a routine and uncomplicated activity, limiting her initial sensitivity to food preparation challenges. Additionally, her unfamiliarity with the Canadian context and limited prior interaction with individuals living with cognitive disabilities constrained her early understanding of participants' lived experiences. After identifying her positionality, NH made deliberate efforts to educate herself and deepen her understanding of the experiences of individuals living with cognitive disabilities through formal training with Open, self-directed

learning, and meaningful engagement with advisors. She also adopted a consciously non-judgmental stance during interactions with participants and throughout data analysis and writing. Moreover, she also scheduled regular debriefing sessions with MAF shortly after the interviews to make sense of the data at a rudimentary level. Regular meetings were also scheduled with MT to discuss the interviews.

5.4 Results

All participants resided in Ontario, Canada. They identified predominantly as being female, with one participant identifying as male and one participant identifying themselves as both female and intersex. All participants were legal adults, with the majority being in their middle adulthood (40's and 50's). All participants had completed high school, with most having completed university degrees. The participants had varying living situations, with some residing with their families, housemates or roommates, living independently or living in an assisted living facility with 24-hour support from personal service workers (PSW's). Table 5.2 provides a summary of the participants' characteristics.

Table 5.2 Characteristics of participants (n=8)

Gender	
Female	6 (75%)
Male	1 (12.5%)
Female and intersex*	1 (12.5%)
Age (yrs)	
Mean age (age range)	44 (28-54)
Highest level of education completed	
High school	2 (25%)
Post secondary diploma	3 (37.5%)
Graduate	3 (37.5%)
Living situation	
Alone	1 (12.5%)
Assisted living	1 (12.5%)
With roommates	3 (37.5%)
With family	3 (37.5%)

**"Female and intersex" was how the participant identified themself when they were asked about their gender*

Two overarching superordinate themes were identified, 1) *Personal circumstances influence healthy eating* and 2) *Food environments lack accessibility*. Table 5.3 shows the superordinate themes and sub-themes with their descriptions.

Personal circumstances influence healthy eating

Across interviews, participants described several inter-related personal barriers that shaped their relationship with healthy eating. These barriers were influenced by the participants' personal circumstances and challenges.

Table 5.3 Superordinate themes and sub-themes

Personal circumstances influence healthy eating	• Struggling and feeling overwhelmed with food preparation tasks • Health status impacts all aspects of food decisions • Cooking is a chore • Help is needed to eat healthy
Food environments lack accessibility	• Information environment complicates healthy eating • Consumer environment is hard to navigate • Economic resources are insufficient

1) Struggling and feeling overwhelmed with food preparation tasks

This sub-theme illustrates how barriers to healthy eating begin long before the food ever physically comes into the picture. Participant 1 described menu planning as being a "*struggle"*, with her being dependent on an "*anchor"* or starting point in the form of a recipe or meal kit (see fig. 1) to set the course for her family meals.

> *That's what I find difficult. … It's hard for me to just kind of like, oh, think of something. You know, that's what I love about the HelloFresh™. Whereas [husband name] is more like he can … just have chicken and he can have vegetables and … he can just think of something to do with them. (Participant 1)*

> *"I love it [meal kits] because you have an idea, like you have a meal to prepare" (Participant 1)*

Fig 1. Picture. Chipotle salmon bowl prepared using a meal kit (Participant 1)

In addition to decision paralysis, feeling a sense of overwhelm was a poignant trend throughout our conversations. Participants talked about how they get overwhelmed during various stages of food acquisition and cooking due to the overload of stimuli in their environments. Participant 5 described how she has discontinued going to the grocery store altogether to avoid getting "*overwhelmed by the people and the noise"*. Participant 4 seconded this notion by sharing that she gets "*overwhelmed"* with *"too many choices"*, and that there have been instances where "*I walked into a grocery store and went 'this is too overwhelming' and walked right back out"*. Participant 3 talked about how sometimes "*I tried to call my girlfriend and just like, have her there on the phone"* to get through grocery shopping. This sense of overwhelm is what causes individuals to make "*hasty decisions" (Participant 4),* buying unnecessary or unwanted items. However, the challenges do not stop there. Rather, they continue even after leaving the store, with Participant 4 recounting one especially overwhelming incident where she had to step away because of how negatively the visual clutter was affecting her.

> *I'm more unable to handle the stress of multiple things happening in the kitchen. Like one night we were putting my groceries away, I couldn't focus... There was stuff everywhere. I just [was] like, 'gotta get out of here'. ... I was like, 'I can't deal with that. I have to look away or something. I [have] to look at something more calm or like can I go?' (Participant 4)*

Participants further shared that they tend to get easily distracted, which greatly affects their ability to take on projects. Participant 5 shared how she does not use recipes that have waiting times "*because I don't know in about an hour if I want to still do it"*. Participant 4 added to this by expressing how she needs to have assistance to keep her on track because she tends to get distracted and forget what she was even doing in the first place.

> *I just need to be with someone that keep me on the task. Not. 'Oh, look at that. Oh, look at the music. I'm just gonna go dance to that' ... and there I got a dry pot that was boiling for six hours. (Participant 4)*

Additionally, processing written information was also identified as being a significant struggle. Participant 8 described struggling to absorb instructions, causing her to read recipes multiple times, "*turning a simple 20-minute dish into an hour and a half effort"*. She talked about how tasks that others might consider routine are prolonged for her, prompting her to avoid cooking

whenever possible. Participant 7 similarly highlights how the mental state directly influenced an individual's capacity to engage with information and instructions, talking about how an individual needs to be "*available to absorb information*" for it to "*stick*" in their mind.

> *It [state of mind] has a big impact on someone. Like if they can't absorb, if they're not available to absorb information about a certain topic, they might read it, they might show interest, but it's going to stick less. (Participant 7)*

2) Health status impacts all aspects of food decisions

In addition to cognitive struggles, health conditions and their related barriers further restricted participants' eating and food preparation processes. Chronic diseases like diabetes mellitus strongly dictate eating habits, like the foods consumed, portion sizes and eating times, as in the case of Participant 7 who described the disease as what "*directly impacts*" what she eats.

> *For many, many, many years, I never ate fruit ... and [diabetes] can affect the time that I'm eating at and even the quantity. If my blood sugar is really high, then … I have to be mindful of my blood sugar. So, definitely ... the one thing that like really directly impacts what I'm actually eating is the type 1 diabetes. (Participant 7)*

Mental health conditions, like severe depression, were also mentioned as impacting an individual's ability to cook. Participant 7 talked about the debilitating effects of depression and how it was what was preventing her from cooking.

> *I'm not at that stage of my mental health recovery yet where I'm able to do that [cook]. (Participant 7)*

Binge eating disorder was another struggle brought up during conversations. Participant 3 described their experience as having been "*addicted to food"* causing them to feel like a "*slave"* to it. They described their thought process as being focused foremost on food, with food being their main driving force in life.

> *I had really bad problems with binge eating and so one of the things that [it] really did for me is like before, I … was like constantly thinking about food … because food was kind of like my driving force for a lot of things. (Participant 3)*

Additionally, sensory and textural sensitivities were significant barriers repeatedly mentioned by participants. Participants reported having a severe aversion to textures, with Participant 8

explaining *"I can't stand foods with mixed textures. So… I tend to eat plain but very separate textured foods in an order because I can't"*. Participant 3 described having a sensitive mouth, which caused them to avoid eating foods that are sharp and dry in texture (see Fig 2).

"I don't eat a lot of cereal ... because cereals are very harsh in terms of like the texture. They hurt my mouth a lot" (Participant 3)

"Sometimes I'll even be eating pizza crust and then like it'll kind of scrape some of the skin off the roof of my mouth." (Participant 3).

Fig 2. Picture. Routine groceries (Participant 3)

Chewing difficulties and fragile teeth were another complaint that dictated food choices. Participant 6 recalled an incident where her mom made her flat bread "*a little too crispy, so I ended up breaking a tooth".* She explained that her extreme mouth sensitivity was a side-effect of the anti-epileptic drug Dilantin that really damaged her teeth and gums.

> *As a child I was epileptic. I was on Dilantin. And Dilantin really damages your teeth and gums. (Participant 6)*

Another poignant side-effect of medication observed in participants was their effect on appetite. For those on the ADHD drug, Vyvanse, a key side-effect was its appetite suppressing effects "*that makes me less hungry" (Participant 3).* For others like Participant 4, their medication had appetite increasing affects, causing them to overeat.

> *I took meds that really made me hungry, so I was eating everything like pastas ... And I was eating lots of, like, you know, white food, rice, you know, and, like, porridge and everything. And yeah, I was just growing big. I was pretty big. (Participant 4)*

Another group of health conditions that influenced the diet were gastrointestinal (GIT) problems. These included food intolerances, sensitivities or gut conditions like irritable bowel syndrome that lead to adverse side effects like flatulence, pain, bloating, or even drowsiness. Participant 4 related how her medical condition affects her in the following words,

> *I have irritable bowel syndrome, so … lactose is really bad for me. And um, wheat and gluten is [too]. I get super tired, like I'll have a meal somewhere and … I'm like, oh, I'm so sleepy. Why am I sleepy? (Participant 4)*

Physical conditions also hamper one's ability to perform activities necessary for healthy eating. For example, in the case of Participant 4, she only had *"one hand that works well, so everything is basically one handed"*. For others like Participant 7, using cooking tools like an electric knife are painful because of conditions like "*carpal tunnel release"* and *"psoriatic arthritis"*. For Participant 8, her physical limitations are caused by her "*fine motor skill issues"* that make it difficult for her to handle and clean cooking tools. For Participant 3, their barriers come in the form of extremely sensitive hands that make cleaning dishes painful for them.

> *I don't mind cleaning dishes. But I don't like getting stuff on my hands. So, like I have gloves and stuff, but like also sometimes it's just like a really quick thing. But if I get a lot of dish soap on my hands, they peel really badly. (Participant 3)*

3) Cooking is a chore

Several participants simply did not like cooking. Participant 5 explained she avoids cooking because "*I don't like cooking"* and prefers baking instead. This attitude was corroborated by the pictures that she sent of her meals that contained blueberry banana cake that she reported to have consumed the whole week (see Fig. 3). She further stated that in the absence of any baked goods, she would always prefer to eat "*leftovers"* rather than cooking food herself.

> *If its meal prepare, if I open the fridge and it's already done, I'm going to eat it. Even in the freezer, like if it's in the freezer, if it's a frozen meal, I will eat it. But making it, no. (Participant 5)*

"I added the blueberries to the banana bread ... I ate that for the week" (Participant 5)

Fig 3. Picture. Banana blueberry bread (Participant 5)

Participants also shared that their aversion to cooking was intrinsically linked to their energy levels. Participant 8 shared how individuals with cognitive disabilities find tasks like cooking, a lot more "*exhausting*" than the average adult because of the greater energy that they need to expend to complete tasks.

> *So yeah, it takes a lot of energy out of me. ... I don't have a lot of energy or resources to spare to cook a lot. That probably sounds weird, but I don't. It's like, I don't know if you guys have heard of spoon theory, but it's like it takes me probably five spoons to do something and someone else maybe two to do cooking. So, it's just, I find it utterly exhausting. It's too many sensory things at once. (Participant 8)*

She further explained that if not for external intervention, like her partner or housemate making and serving her cooked food, she would prefer to live on a foraging lifestyle where she only eats basic foods, raw ingredients, or pre-prepped meals (see Fig 4 and 5*)* from the grocery store. She added to this by expressing that if "*I won a lottery, the first thing I'd be doing is getting a chef" (Participant 8).* Participant 4 echoed this sentiment by explaining how chaotic the cooking process is for her with its various components and multitasking.

> *I can't do a meal that you're cooking potatoes and vegetables and the meat no. That does not work well for me. I have to be done ... [in] 30 minutes or an hour. ... When I start doing too many things at a time, it gets very chaotic, so I don't. (Participant 4)*

"I like prepared, pre-cut fruit. I don't like dealing with anything messy. So, if it's prepared or pre-cut, pre-washed, I will eat it." (Participant 8)

"I literally go to the neighboring grocery store and just get like, I don't know, vegetables and dip or a thing of grapes" (Participant 8)

Fig. 4 and 5. Picture. Pre-prepared food (Participant 8)

For other participants, their major cooking barriers were the cooking tools themselves. Some were just scared of using cooking tools (see Fig 6) and appliances as mentioned by Participant 6,

> *I have to say that cooking stuff kind of scares and frightens me because I sometimes [am] not so sure about the stove…. And... my hands will not go towards knives. I'm afraid of cutting myself (Participant 6).*

"I have an apple slicer, which I find very benefi[cial]. ... and same thing with a veggie chopper" (Participant 6)

Fig 6. Picture. Cooking tools used regularly (Participant 6)

For others, like Participant 4, using newer appliances like an air fryer had a learning curve to them, making them difficult to use. She also mentioned that her stove was very old, making it unusable for her.

> *Yeah, I use an air fryer as I've tried chips and. Did I tell you? Yeah, they seem ... usually a little burnt or taste like [they are burnt]. My stove is so old ... if you open it up, the fire alarm will go off. I've cleaned it. Took me one time three days ... to clean it out ... but I still don't wanna use the stove. (Participant 4)*

For others, the kitchen itself was a reason for not wanting to cook. Participant 1 talked about how when things in the kitchen are "*darker and they're not as organized, it's just harder to stay motivated".* Participant 6 talked about space and how cooking in a cramped and crowded kitchen can be cumbersome.

> *When you're living in an apartment building, apartments don't give you that much room especially if you're sharing. I understand it can be lonely living one person, but if you're sharing space with another person, sometimes the kitchen is not always a very big space and can get crowded quite easily. And you're always in each other's arms and you're always like in each other's way or legs. So, it can get a little bit cumbersome. (Participant 6)*

4) Help is needed to eat healthy

When talking about healthy eating in general, several participants shared the various support mechanisms that they had in place in their daily lives. Participants with more support structures like supportive partners, family or friends, relied heavily on them for help while cooking. In case of Participant 3, their partner helps them with "*coupon clipping and meal planning".* Participant 6 called herself *"fortunate and very lucky"* for living with her mother who prepared her food. Participant 1, split her cooking duties with her husband, who she mentioned repeatedly throughout the interviews. When asked about a scenario where she would need to cook with no additional help (meal kit or another person), her plan still included getting help from her husband, indicating the importance of his contribution in her life.

> *I would do like a proposed menu for the week ... with the family and just [ask] 'OK, like, what do you want this night? OK, [husband name], can you cook these nights?' (Participant 1)*

In contrast, participants without adequate help reported food preparation to be a lot harder. Participant 6 talked about how her fellow para-athletes who may live independently "*don't know who else to reach out to [for help]".* In the same vein, Participant 7 mentioned how she *"unfortunately"* does not have access to help within her home and that "*she would greatly benefit from some".* Similarly, Participant 5 mentioned how even though she avoids cooking, it would greatly help if she had someone who could help her out in the kitchen.

> *Yeah, I don't like cooking because it's the steps. It's long preparation. If I would have someone with me to help me like, 'OK, I'm gonna do this'. 'You do that'. OK, you know, help me with the cause [it would be easier].*

However, while most participants greatly appreciated or longed for help, some did mention how people close to them were not supportive, adding to their barriers rather than being helpful. In case of Participant 6, her father's insistence on keeping up a dinner table conversation adds to her burden because her brain "*just can't do [eating and talking at the same time]".* For Participant 3, the role of family was toxic, which led to traumatic food experiences.

> *They [parents] kind of were also really toxic about food and really restrictive. And like I had really bad attitudes to it (food), I ended up like with a lot of food trauma. (Participant 3)*

Food environments lack accessibility

Lack of accessibility of the food environments was a prominent theme brought up by participants when discussing their healthy eating experiences. This lack of accessibility was not limited to only one category, rather it spanned across multiple categories like information environments, consumer environments, and financial environments.

1) The information environment complicates healthy eating

Participants described nutrition information as something they know they should use but rarely can. Rather than supporting everyday eating, resources, like recipes and other commonly available information, were found to have problems that made them difficult to use.

Problems with recipes

When conversing with participants, recipes emerged as a significant food preparation barrier for them. Several participants expressed negative feelings towards recipes like "*I don't like recipes" (Participant 5),* even using strong descriptors like "*hate" (Participant 3)* for them. Participant 3 described recipes as being a "*really good thing for freedom".* However, they found them to be problematic for a lot of neurodivergent people *"because if it's not perfect then it causes us problems".* Expanding more on the reasons why she and other people with cognitive disabilities struggle so much with recipes, Participant 8 said

> *"For me, they [recipes] are instructions and I struggle with reading instructions. So, that's another reason that I don't like to cook is because I have a hard time following instructions ... I can't really follow all the instructions or if there's too many steps to cook." (Participant 8)*

When we delved deeper into why recipes acted more as barriers rather than aids, participants pointed out several problematic aspects that plague commonly available recipes. One common issue was with the units used for measuring ingredients. Some recipes follow metric units like grams, kilograms, liters, and milliliters, while others use imperial units like cups, teaspoons, tablespoons, and ounces. Participants stated that they were mostly familiar with imperial units and were not comfortable using resources containing metric units. Participant 5 was a prime example of this, who exclusively used recipes with metric units.

> *It has to be cups, tablespoons or teaspoons. No milliliter, no grams. I can't. I don't know how to read that. So, I'm still with cups, teaspoons, tablespoons. (Participant 5)*

Other participants talked about how some recipes did not lay out steps in a chronological order. These recipes lumped steps together and mentioned instructions like pre-heating the oven in the middle of the recipe rather than at the top, where it logically should be. Participants 2 and 5 talked about how this is a common enough phenomenon that they now pre-emptively read ahead before starting the recipe for ease.

> *And then sometimes it, you know, like you get to the end. I know now, but it says to the end start the oven at turn on the oven at 350. Now I have to wait till it's warm. Why don't you put it at the top? Like start the oven at 350, then do your ingredients. But now I know. (Participant 5)*

The availability of the tools and ingredients used in a recipe were also factors that influenced recipe usability. Participant 2 talked about how some recipes ask for tools unavailable to him, which cause him to problem solve and change direction during cooking. He shared that he needs to "*read through it [recipe] first to make sure it doesn't ask for something I don't have ... like a slow cooker".* Similarly, Participant 5 explained that any recipe with specialty or unavailable ingredients was a big no for her.

> *If there's a lot of ingredients I get like, nope. Or if there's ingredients that are, I'm going to say, wheat flour or almond flour, something I don't have. I'm just going to skip over it. It has to be simple. And with a few steps. (Participant 5)*

Participants' opinions on online recipes were divided. Proponents of online recipes found them to be "*pretty easy to follow" (Participant 3)* and convenient for finding specific types of recipes like *"lighter recipes" (Participant 1).* However, for others, they were "*frustrating"* and *"annoying"* when they were "*unclear or when there's a lot of ads" (Participant 3)*. Participant 7 complained about the extended length of most online recipes with it taking her "*forever [to] scroll down",* causing her to pivot to some other recipe that is more convenient.

Participants also complained about the small fonts and haphazard arrangement of digitally available information, making it difficult for them to read it. For participant 6, "*small print is harder and harder to read"* because of her declining vision. Participant 4 shared her frustrations with navigating online resources, recounting how during a training session to help others with cognitive disabilities, she herself got so overwhelmed that she wanted *"to throw my computer*

out the window". Participant 5 expanded on this by sharing how not being good with technology, makes it harder for some individuals to follow online recipes.

> *Yeah, lot of people are good with technology and apps. But what about the other people that prefer to look at it [recipe] and check mark. OK, I did this. OK, I did this because sometimes I get very overwhelmed just looking at a recipe I'm going to use a ruler and say OK, I did this because it's like I'm reading it all over again, so I just did this. So next I'm doing the other one next. (Participant 5)*

Furthermore, participants found cooking with phones or laptops in the kitchen to be impractical. Participant 2 talked about how aggravating it is to "*be in front of your computer… [with] your hands dirty"* with him preferring to print recipes out for convenience. Participant 4 further expanded on this by describing her challenges with asking her PSW to follow an online recipe. She described that when she gave an online recipe to her PSW to follow on her phone, the device kept on locking during the cooking process, forcing her to intervene again and again. This repeated *"fuss"* caused so much frustration that eventually the PSW had to abandon the recipe and making up the rest of it on her own.

> *Well, if my worker's cooking something and I'm trying to find a ... 3-ingredient recipe, I can't just take, ... there's no room on my counter for my computer for them to look at. So, then I have my phone and then I'm over here doing something else. And your phone is gone [locked]. Can you add your password again? ... eventually when we can't figure out the recipe on there, they just make up anything anyway. They're like, 'forget that let's just pour stuff on and go. That's what you want. You want hamburger or chicken and vegetables, whatever. That thing is. Let's just make up our own. We don't, we don't need to keep fussing around with the technology to figure [it] out'. (Participant 4)*

Struggling to find accurate information

Finding credible information was a significant struggle for most participants, with participants finding it "*almost impossible" (Participant 3)* to find authentic information. Participant 8 talked about how it is hard to *"sort through so much crap"* to find authentic information. In the same vein, Participant 3 complained about the sheer amount of sponsored content being produced and boosted online, making it super difficult for everyone to discern the truth.

> *It's really hard to like find things that are accurate ... knowing that it's a good resource can be really hard sometimes. Especially because the places that tend to have, like the actual good information, ... they're not spending a ton of money on marketing the thing*

> *... Like generally the places with ... less ulterior motives are a lot more hidden because they're [resources with ulterior motives] in your face trying to make a profit. (Participant 3)*

Participants also emphasized that available nutritional resources like the Canadian food pyramid were generic and often failed to match cultural or health needs. Participant 8, who also works as a social worker, observed that the food pyramid (Canada's food plate) was "*completely unhelpful"* for most individuals living with cognitive disabilities, who report that "*try[ing] to eat healthy ... makes them feel worse".* Delving deeper into the problem, she talked about how this mismatch between the guidelines and their effectiveness for individuals living with cognitive disabilities is a direct result of the under-representation of certain populations in these resources.

> *Yeah, it would be really helpful to have like different backgrounds, different voices [represented], because like I said for myself, my food pyramid ideally would have dairy completely gone. I wouldn't eat anything in that category because I am exceptionally sensitive to dairy. (Participant 8)*

Additionally, access to dietitians, people who can help contextualize the guidelines to meet individual needs, is limited. Participant 8 talked about how difficult it is to access a dietitian for people whose doctors are not connected with a family health team. She explained that her nearby hospital with a dietitian only caters to individuals with eating disorders, lamenting how it makes it difficult for her to get help.

> *I don't have an eating disorder, so how am I getting in? And I'm not waiting two years just to talk to somebody for six sessions (Participant 8).*

Even those struggling with eating disorders, found accessing dietitians to be difficult. Participant 3 recounted their struggles of trying to get help, pointing out the sheer stress on the current system that causes delays in care, making it ineffective.

> *I tried so hard for years. I tried to get help with so many things. I even tried to check myself into like a hospital for eating disorder and then they were like, sorry, we don't have space right now and they called me back like two years later and asked me if I was still interested. (Participant 3)*

2) The consumer environment is hard to navigate

Across interviews, participants described the food environment itself as a significant contributor to their daily struggle of accessing and preparing healthy food. These systemic barriers mostly pertained to ingredient availability and grocery store environments.

Difficulty finding ingredients

Participants described facing challenges accessing ingredients. Participant 2 talked about the difficulties of finding ingredients used in international cuisines (see Fig. 7) that "*you can't always find",* forcing him to amend his plans by either making "*something else... or just plan[ing] to go somewhere else [to buy the ingredient] another day".* Similarly, Participant 3 lamented on the fact that "*a lot of the produce in Canada is really sad"*, which makes finding good quality ingredients hard.

> *I love mango, but the mangos here are just really [low quality] ... Um, sometimes I get dried mango, but it's expensive ... the only place I found that's like decent prices is bulk barn, but like it's not, there's no bulk barn like directly near me. So, I don't go there as often. (Participant 3)*

"Sometimes I like, go out of my way to find ingredients" (Participant 2)

Fig. 7. Picture. Condiments (Participant 2)

Participants also raised concerns about the lack of accessible, healthy pre-prepared foods within grocery stores. Participant 7 observed that some stores prepared ready-made meals while others provided almost no options (see Fig. 8). Additionally, Participant 8 talked about how most of the pre-made options "*could be full of, I don't know, preservatives, chemicals, all this stuff",* making them unhealthy.

"Food basics doesn't tend to ... make up dishes of food and then have them ready" (Participant 7)

"Where I'm shopping depends as well because what they offer varies from store to store." (Participant 7)

Fig. 8. Picture. Pre-prepared meals. (Participant 7)

For those relying on food banks, choices were even more restricted. Participant 4 explained that she "*can't eat half of the stuff they have because it's too much salt"* showing how foods available at charitable food systems often fail to meet nutritional or health needs. Participant 5 also reiterated the point about the limited choices highlighting the limits of the charitable supports available (see Fig. 9).

"That's from the food bank. You go, you choose and then come back. So, ... the choices are limited." (Participant 5)

Fig. 9. Picture. Groceries from the food bank (Participant 5)

Although lack of food accessibility caused problems, participants perceived limited access to junk food to be beneficial. Participant 3, who had experienced living in various countries growing up, shared that while living in Nepal, their consumption of fast food and junk food had reduced significantly because *"there weren't really options [for unhealthy food]"*. They described their time there as being *"like a food rehab"* where they ate more home-cooked meals or healthier food from the local markets as compared to Canada, where a lot of the food is *"prepared without you preparing it at home"*. Echoing the same sentiment, Participant 4 also shared that she had the best time two years ago when she went to the North with her friends. She expressed that she ate mostly healthy back then because she was in a house where she had to *"do*

some climbing to get to the fridge". This increased effort needed to access the fridge caused her to consume less junk food and eat simple meals, which was better for her.

> *My best summer was two years ago when I was just eating very basic food. It was not always fun, but I was happy the most back then. (Participant 4)*

Problems with grocery shopping

Grocery stores, in general, were identified as highly inaccessible. For many, travelling to-and-fro from the store was a big hurdle, irrespective of their mode of transportation. In Participant 5's case, in-store grocery shopping was not feasible because she did not *"drive [or] ... take the bus"*. This made it difficult for her to carry groceries from the store to her home on foot. For Participant 6, getting to the store via bus was not difficult in most cases. However, the situation quickly changed when she had to "*lug like six packs of groceries"*, which made it difficult to carry the goods. Grocery shopping was also not easy for those who had help from friends, as in the case of Participant 4. Even though she was grateful to her friends for giving her a ride to the store and helping her with carrying her groceries, she was not fully happy with the arrangement, expressing that in this case she had to rely "*on other people's schedules"*. For Participant 7, who had her own car, going to the store came with its own set of challenges. Her challenges were mostly associated with tight early morning schedules and carving out the time to go to the store.

> *So, just getting to the store sometimes, it's often not on my mind unless I'm already going out somewhere. I won't often just go like to one place at a time. If I'm leaving the house also I have to drive there. And so the weather I guess could impact that. And also because I am often looking for foods that are half off, I have to go at like 8:30 in the morning. So, if I sleep in or whatever, I will probably not go to the store that day. It's less likely. (Participant 7)*

These challenges were amplified after reaching the store due to the overstimulation caused by the environment, which was discussed earlier under *struggling and feeling overwhelmed.* However, this difficulty is further compounded by the lack of grocery store personnel available to help at the store. Participant 2 talked about how some stores like "*Loblaws, they never put anyone in there"* making it harder for customers to navigate the store. Participant 4 reiterated this sentiment by sharing how she prefers to check out via cashiers but is not always able to because "*people aren't always around".* In contrast, Participant 7 talked about how certain grocery store

personnel can act as barriers themselves, recounting her practice of evading a certain cashier at the store.

> *And then also sometimes the cashier, there's one he's a little too talkative. So, I don't really like going to him because he's more like a depressive talkative. So, I don't like trying to like interact with him. So, like, there's lots of different factors that do come into play. (Participant 7)*

Additionally, participants also mentioned the increasing hostility at grocery stores, that makes grocery shopping more arduous for them. Participant 6 shared that "*a lot more groceries or a lot more stores hire security guards because there seems to be a level of violence that's going up".* She also mentioned that people had become "*so aggressive",* with people often asking her "*to hustle or asking us to like hurry up"* in the checkout line. She further pointed that the rise in *"violence"* caused stores to hire more armed security and change opening hours to ensure safety.

> *I'm seeing a lot more groceries or a lot more stores hire security guards because there seems to be a level of violence that's going up quite high, at least in my end of town ... I see a lot of stuff and I'm seeing a lot of stores change hours to try and accommodate all the violence. (Participant 6)*

The layout of the store also caused additional accessibility challenges. The extent of the inaccessibility of the store floor plan was revealed by Participant 4, who was wheelchair bound in the past. Recounting her time on a wheelchair, she described facing numerous difficulties during routine grocery trips. These included reaching high or low shelves, navigating through crowded aisles and handling heavy items. She further shared that there were instances where she had "*gone without food because the freezer doors were closed and I couldn't get it [to open]".* She also narrated an incident where she needed to loop through the store multiple times on her wheelchair because the basket attached to the front of her wheelchair could not hold everything that she needed.

> *Remember that I would have to go three times in the grocery store to go in with my wheelchair, cause a basket will only hold so much and then I keep the receipt and then I would go back again and I could pack on as much as I could. So I wouldn't have to come back again. It was three times I did that. (Participant 4)*

Even though online grocery shopping is a clear solution to avoid the chaos of the grocery store, it comes with its own set of barriers. Participants described that technical difficulties made using the grocery store websites complicated. Participant 4 stated she does not use the online grocery shopping option because she does not "*know how to use the computer very well".* Participant 5, who exclusively buys groceries online, expressed her frustration with the complicated process of using coupon codes. She complained that the coupons did not work for her every time, forcing her to call customer service. Participant 7 explained that although online shopping makes grocery shopping easy, the pre-order option is not convenient as the in-store buyer tends to substitute items, to her dissatisfaction and frustration.

> *Sometimes I get a little bit through Amazon ... I don't do like pre-orders, like where someone else does my shopping for me. I don't like that. I would like it, but they substitute things. (Participant 7)*

3) Economic resources are insufficient

Money is a resource that determines the availability of almost all resources. Limited income, rising inflation and food prices, and the high cost of supportive services were financial issues that participants felt affected healthy eating for them.

Not having enough money

Participants repeatedly linked inflation or rising prices with increased food insecurity. Participant 6 expressed her concerns regarding rising cost of everything stating that "*inflation is so high, everything is expensive. Absolutely everything is expensive"*. Participants also emphasized that food affordability fluctuated dramatically based on their employment or income stability. After losing research funding and not having full-time employment, Participant 3 found themselves limited to buying only whatever was on sale, noting that although they "*ate enough"*, they no longer had the financial freedom to buy foods they once enjoyed. They further shared that they had become a lot more dependent on sales for affording food, narrating how they worked together with their girlfriend to plan their meals around sale items.

> *So, my girlfriend and I look at the groceries. We look at like what the sales are like, 'Oh, there's a lot of like tortillas on sale' ... So, like, maybe we'll do like some kind of like Taco or burrito thing this week. And so then ... 'let's find a recipe for some like spices and like*

> *things that we can add to this' or just seeing like what's on sale and then like, what kind of works together ... How can we make a meal out of that? (Participant 3)*

For those on fixed incomes or long-term disability benefits, affordability issues forced them to buy stuff that was "*marked half off or on a good sale" (Participant 7),* with most of the half off items having passed their best before dates. Participants also commented on the scarcity of funding in the developmental sector with Participant 4 complaining about the reduced hours that she has been getting, leading to her reduced wages.

> *The developmental sectors really needs a lot of funding, so like I'm supposed to get 5 hours a week and I get one hour every two weeks or so. (Participant 4)*

Food is expensive

A central theme across all participant accounts was the sheer cost of food. Participants repeatedly emphasized that food had become so expensive, prompting major shifts in their shopping habits. Participant 1 described that "*we've changed where we grocery shop",* a change she noted was long overdue. Additionally, participants also lamented on the high price of fresh produce. Participant 8 talked about how processed food is cheaper while fresh fruit like apples are expensive, with three costing "*eight bucks".* Furthermore, Participant 4 expressed that although she loved fish, it was often "*super-duper expensive",* putting it out of her budget.

Small conveniences, like delivery services came with their own price tag. For Participants 3, getting their groceries delivered was a luxury that they were saving "*for a day where, like I really, really need something. And I really, really can't go get it".* Participant 4 recounted having to pay dramatically higher prices, an "*extra $30"* when shopping through Amazon compared to instore shopping, explaining that she sometimes paid the premium for convenience but did so knowing it meant sacrificing spending elsewhere.

> *And you can do online shopping for food. I know that it's a little more expensive and I've done it. I've done it and I've bought less for more. I was like, can't do that anymore. I gotta go to the store ... I have gotten my litter at.... 50 bucks on Amazon, $27 at the grocery store. The same box. For the same box! (Participant 4)*

Difficulty affording services

Financial limitations were not limited to the affordability of food itself but rather extended to the tools, services, and conveniences that could make healthy eating easier. Pre-packed or ready-made foods were a food service that was expensive. Participant 8 noted that these items are "*expensive because they're pre-packed. Someone did it",* which reduces their affordability. Meal kit programs, like *HelloFresh*^{TM}, are another service that is cognitively helpful but financially burdensome. Participant 3 talked about how she "*absolutely love[s] having the meal boxes delivered",* but it was a luxury she could not afford. Participant 1, a routine meal kit user, also described eventually having to scale back on the meal kits and supplement with cheaper produce (see Fig. 10) because the service became too expensive for her family.

> *So, what we what we did with the HelloFresh*^{TM} *is that at first we were getting 4 meals a week for 4 servings. So, Monday to Thursday essentially [HelloFresh*^{TM}*] was our dinners. And then what happened was we found it was getting expensive and we found we had leftover. So, what we decided was we would still get 4 meals a week, so essentially supper, but would get 2 portions. And then what we would do is ... we would go to the grocery store and we would buy extra of the protein or the vegetables or both. (Participant 1)*

"And then the recipe from HelloFresh^{TM} *was Chipotle salmon, Chipotle bowl. So, I said, well, I'm gonna make cornbread [to supplement it]" (Participant 1)*

Fig. 10. Picture. Cornbread (Participant 1)

Additionally, access to professionals like dietitians was also described as being an expensive service. Participant 8 described how guidance from dietitians is so expensive that it is unfeasible for many.

> *I know it's super important to eat healthy. However, with all the misinformation out there, how the heck? Especially when you can't afford, like I have to pay 600 bucks ... to access this dietitian privately ... but that's $600 that a lot of people with disabilities don't have because a lot of us are underemployed. A lot of us are on income supports, so it is difficult. (Participant 8)*

5.5 Discussion

This study explored the healthy eating experiences of Canadians living with cognitive disabilities, identifying key barriers that hinder healthy eating. From our conversations with the participants, we were able to identify two superordinate themes, (1) personal circumstances influence healthy eating, and (2) food environments lack accessibility. These findings correspond closely to the social determinants of healthy eating in Canada outlined by Raine in their foundational paper published in 2005. According to Raine, healthy eating is influenced by 1) personal food choices: individual determinants, i.e., physiological influences, food preferences, nutritional knowledge, perceptions of healthy eating and psychological factors; and 2) collective determinants, i.e., environmental determinants (interpersonal influences, physical environment, economic environment, and social environments), and public policies (Raine, 2005).

Despite the close agreement between the findings in this paper and the Raine framework, there are some aspects in which they differ from each other. Firstly, Raine focused on the determinants of healthy eating for the whole Canadian population, while the focus of the present study was on the barriers to healthy eating and food preparation experienced by individuals living with cognitive disabilities. Secondly, even though the broad categories remain the same, the realities of the population have changed over the two decades between Raine's work and this paper. In particular, the rise and normalization of digital spaces and environments have introduced new facilitators and barriers that influence nutritional knowledge, perceptions of healthy eating, and interactions with food environments (Granheim et al., 2022). Finally, while Raine mostly framed food availability as the main physical environmental factor determining healthy eating, the current paper extends these findings to also highlight additional barriers like impractical layouts and overwhelming grocery store environments as shaping the accessibility of healthy eating for individuals.

Personal circumstances influence healthy eating

Participant accounts illuminated diverse healthy eating challenges some of which were shared by all participants while others were unique to certain individuals. This diversity in experiences shows that individual experiences are shaped by individual realities and circumstances. However, one thing that all participants acknowledged was that the process of healthy eating is extremely complex and has a high cognitive load. Participants reported facing multiple cognitive

challenges, like problems with decision making, attention, memory and multi-tasking, which culminated in the association of negative emotions, like stress and overwhelm, with food-related activities. These challenges can be attributed to the influence of cognitive disabilities themselves which, according to the functional definition by Cobido et al. and the DSM 5, influence cognitive domain like attention, executive functions, learning and memory, language, perceptual motor skills, or social cognitions (Cobigo et al, 2024; American Psychiatric Association, 2013).

Participants reported feeling overwhelmed and exhausted by cooking which they associated with the increased effort needed to complete culinary tasks. This association can be explained by the spoon theory framework that states that individuals living with chronic illnesses have limited energy resources available to them. By using 'spoons' as an allegory for energy, the theory states that limited and fluctuating availability of 'spoons' is the main limiting factor that governs the completion of daily activities for people living with chronic conditions (Harper, 2025). As cognitive disabilities are mostly chronic conditions, this framework helps to explain why tasks like adopting a healthy diet feel more demanding for individuals living with cognitive disabilities, making them more dependent on external support structures for completing tasks.

Additionally, health conditions and medication-related side-effects were also observed to be significant factors that shape and constrain healthy eating in individuals living with cognitive disabilities. Participants' experiences are consistent with extensive literature showing that individuals living with cognitive disabilities face a disproportionate burden of chronic physical and mental health conditions and long-term pharmacotherapy exposure, both of which directly influence their dietary behaviors (Mukherjee et al., 2022; Tondo & Baldessarini, 2022). Antipsychotic drugs are also well documented to disrupt appetite regulation, increase hunger and promote rapid weight gain and metabolic dysregulation, thereby undermining the ability to adhere to recommended healthy eating patterns (Mukherjee et al., 2022; Tondo & Baldessarini, 2022). Additionally, concurrent conditions such as gastrointestinal disorders, dysphagia, epilepsy, obesity, and psychiatric illness also lead to functional eating barriers, including reliance on texture modified or energy dense diets and reduced tolerance for high fiber or nutrient dense foods (Marshall et al., 2003; MHANDi, 2020). Collectively, these intersecting pharmacological, physiological, and cognitive barriers make healthy eating difficult for individuals living with cognitive disabilities.

Moreover, inadequate support structures also contribute to accessibility barriers. This supported scientific literature (Fletcher et al., 2020) that states that individuals living with cognitive disabilities are more dependent on the support of resources and personnel to complete tasks. Therefore, the absence of proper support structure makes it difficult for them to consume and adopt healthy dietary habits.

The food environments lack accessibility

Participants mostly talked about facing challenges with information format and presentation, highlighting the pivotal role of presentation in the accessibility of informational resources. These barriers were in accordance with the common information barriers associated with cognitive disabilities, i.e., complex page layouts, long passages of information, animated or moving images, complex visual designs, math and computation (Government of Canada, n.d).

This was further compounded by the prevalence of food related misinformation and difficulties with vetting the said information, reducing its credibility. This is a newer phenomenon that has risen as a consequence of the digital age and the popularity of social media platforms that have made it easier for the dissemination of information. As food is a universally important for everyone, therefore, there is naturally more interest and dissemination of related information and misinformation on the topic (Diekman et al., 2023; Melios et al., 2025). This sheer bulk of information makes it difficult for individuals to identify and sort information from credible sources, making it harder for them to make well-informed decisions.

Another important finding was the mismatch between the national healthy eating guidelines (Canada's food guide) and the needs of individuals living with cognitive disabilities. Participants felt under-represented in the current Canadian food guide, a resource developed to aide easier access to healthy eating for the whole Canadian population. They disagreed with the current guidelines regarding the consumption of vegetables equal to half of the plate, as they found it to be incompatible with their digestive system and digestive capacities, which is also corroborated by scientific evidence discussed earlier (Marshall et al., 2003; MHANDi, 2020). This is a serious issue that needs attention.

Our conversations also revealed some glaring accessibility issues in the food acquisition environment. Participant narratives highlighted various physical barriers like non-ergonomic grocery store layouts, inaccessible and confusing placement of food items, a lack of support

personnel and over-stimulating store environments. All of these are well documented grocery store barriers that have been recently presented in a report (Cohen et al., 2020). Additionally, alternatives like online grocery shopping are not without their own pitfalls, like complicated website design. This is a well-observed barrier that started gaining traction and being reported on especially after the pandemic in 2020 (Ali et al., 2022). Even though a wealth of research is being published on this topic and guidelines have been provided to improve website accessibility (Web Accessibility Initiative, n.d), however, there is still a long way to go before online grocery shopping can truly become equitable.

In today's day and age, money is the main driving force behind all aspects of life. Given its inter-connection and influence on other components of the food environment, we could have discussed financial barriers within other themes and sub-themes, without discussing them under a separate sub-theme. However, due to the high frequency with which financial constraints were mentioned and the importance that the participants attributed to monetary resources in shaping their healthy eating process, we decided to discuss financial barriers on their own. Participants talked in-depth about the scarcity of financial opportunities. This is in-line with available information present on the lack of adequately paid job opportunities in Canada for individuals living with cognitive disabilities (Inclusions Canada, 2026; Gupta et al., 2024; Hadfield-Spoor et al., 2022). Low income coupled with rising inflation rates (Bilyk, 2026) puts individuals living with cognitive disabilities at a higher risk of experiencing poverty and food insecurity (Gupta et al., 2024; Hadfield-Spoor et al., 2022), making it difficult for them to afford food or supportive services that can aide healthy eating (Hadfield-Spoor et al., 2022; Royer et al., 2021; Schwartz et al., 2019).

Future projects

This project revealed a plethora of accessibility barriers that are hindering healthy eating in individuals living with cognitive disabilities. These findings lay the foundation for several future research projects that can help to improve the lives of individuals living with cognitive disabilities. Firstly, interventions should focus on adapting recipes to make them more accessible and usable for individuals living with cognitive disabilities. Secondly, efforts must be made to improve website design and the format of online resources to make them more cognitive-

friendly. Thirdly, resources, like reliable databases, that can authenticate and provide accurate nutritional information to the population are needed.

Strengths and weaknesses

A key strength of this study is its focus on delving deeper into the healthy eating experiences, especially the barriers that plague individuals living with cognitive disabilities in a Canadian context, a population not often represented in public health nutrition research. Through in-depth cognitive interviews with key informants from the community and using IPA as the analytical approach, this project was able to accurately capture the community's experiences. Furthermore, the focus on community-based research practices like engaging with an inclusive steering committee to guide and validate the research and results, and keeping the participants in the loop by prioritizing to share an accessible version of the results with the participants and community first and foremost, ensured that the working partnership with the community was mutually beneficial rather than exploitative.

However, this project also had some limitations. Firstly, there was a lack of diversity in the sample. By only talking with Anglophones, we excluded Francophones, who make up a significant portion of the Canadian population. However, we do not believe this limitation had a significant impact on the results because some participants, the lived experience advisor on the steering committee, and two members of the steering committee were Francophones. Secondly, as all of the participants were educated and could read and write, we were unable to capture the experiences of individuals with low literacy levels. Furthermore, we did not interact with individuals with other physical disabilities like blindness, hearing loss, and speech impediment; therefore, limiting the findings mostly to the experiences of those with cognitive disabilities. Future research endeavours are needed to capture and understand the healthy eating and food preparation experiences and barriers faced by these populations.

5.6 Conclusion

The project revealed a myriad of barriers that impede affordable healthy eating within the current Canadian food system for individuals living with cognitive disabilities. These barriers, that originate both internally and externally, can have debilitating effects on one's ability to consume a healthy diet. Therefore, a multisectoral approach is required where decision-makers, health organizations, health professionals, researchers, and the community come together to find

practical solutions to mitigate these hurdles. Firstly, decision makers need to prioritize cognitive accessibility when drafting laws and policies. Secondly, health organizations and health care professionals need to be cognisant of accessibility principles and community needs while developing resources for the public. Thirdly, community members and researchers need to work together to explore solutions and develop practical resources that can satisfy the needs of the community. Only through systematic collaboration can actual change come about, thereby, improving equitable access to healthy eating.

CHAPTER 6: BRIDGING CHAPTER

6.1 Developing recipe selection checklist

Participant insights from Chapter 5 highlighted the need for a tool that could be used to identify reliable, affordable, and healthy recipes for individuals living with cognitive disabilities. Literature reviews showed a lack of scientific information about selecting and adapting recipes for different populations. One solution for this is the development of a decision checklist to select recipes based on healthfulness criterion (Rita et al., 2018). Using Rita's 2018 decision tree as the main starting point, an eight criteria checklist was drafted by NH and MAF, in consultation with MT, tailored to the needs of individuals living with cognitive disabilities. This checklist was presented to the steering committee, who reviewed and validated it. After validation, the recipe selection checklist was finalized. The eight criteria that were set for selecting affordable, healthy recipes that meet the needs of the community members were as follows:

1. The recipes should be present on a website from a recognized organization that provides reliable information about food and nutrition;
2. It should take less than 30 minutes to prepare;
    - This includes time expended on non-cooking steps like cutting, chopping, mixing, and resting/proofing/marinating.
3. It should take less than 60 minutes to cook;
    - This included time used to cook, bake, fry, broil the dish on the stove or the oven.
4. It should use no more than 10 ingredients;
    - This does not include oil, salt, and spices.
5. Ingredients should be easy to find at the grocery store;
    - Ingredient accessibility was decided based on availability on the *Canadian Superstore* website.
6. The meal should cost less than $10 CAD per portion;
    - Price was estimated using the *Canadian Superstore* website,

- Regular prices were used rather than sale prices,
- Name brands were used rather than discount brands,
- The smallest package in volume or weight required for the recipe was used,
- Only the amount of the ingredient used in the recipe was included.

7. The meal should contain carbohydrates, proteins and vegetables; and
8. It should make at least 4 portions.

6.2 Applying the checklist

To evaluate recipes using the checklist, a list of 12 websites from 11 trusted Canadian organizations' that provide healthy eating information were scanned. From these, one website was removed due to limited number of recipes. A second website was removed because not all recipes were vetted for health. On the remaining 10 websites (Table 6.1), we found 1313 recipes. The checklist was applied to all recipes, from which only 217 recipes met all criteria. After duplicates (n = 26) were removed, 191 (14.5%) unique recipes were identified that met the needs of individuals living with cognitive disabilities.

Table 6.1 Canadian organization websites scanned

Government of Canada	https://food-guide.canada.ca/en/
Heart and Stroke Foundation	https://www.heartandstroke.ca/healthy-living/
Dietitians of Canada	https://www.unlockfood.ca/en/Recipes.aspx
	https://www.cookspiration.com/home.aspx
Canadian Cancer Society	www.cancer.ca
Canadian Digestive Health Foundation	https://cdhf.ca/en/
Canadian Liver Foundation	https://www.liver.ca/
Celiac Canada	https://www.celiac.ca/
Arthritis Canada	https://arthritis.ca/
Canadian Consortium of Neurodegeneration in Aging (CCNA)	https://ccna-ccnv.ca/brain-health-food-guide/

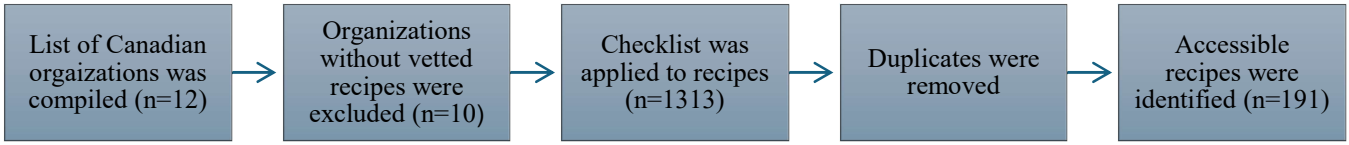

Figure 6.1 Website scan and recipe evaluation using the checklist

6.3 Recipe selection

Eight recipes (Annex 4-11) were selected from the pool of 191 accessible recipes. These recipes were selected based on the diversity of their 1) cooking method, 2) protein source, and 3) carbohydrate source, to provide a variety of recipes that can cater to the varied food skills and dietary habits of Canadians living with cognitive disabilities. The selected recipes are displayed in Table 6.2.

Table 6.2 Selected recipes and reason for selection

Recipe	Source	Carb source	Protein source	Cooking appliance
BCV	https://food-guide.canada.ca/en/recipes/zaatar-chicken-sheet-pan-dinner/	Potatoes	Chicken	Oven
BBRS	https://www.unlockfood.ca/en/Recipes/School-lunches/Souper-Lunch-with-Rice-and-Beans.aspx	Black beans Brown rice	Black beans	Stove
CW	https://www.unlockfood.ca/en/Recipes/Kid-friendly-award-winning-recipes/Chicken-Tzatziki-Tortilla-Roll-Ups.aspx	Tortilla	Chicken	No cook
CS	https://food-guide.canada.ca/en/recipes/crowd-pleasing-chickpea-carrot-salad/	Chickpeas	Chickpeas	No cook
EVQ	https://arthritis.ca/living-well/2025/recipe-video-light-veggie-quiche	Tortilla	Eggs	Oven
TS	https://arthritis.ca/living-well/2024/recipe-videos-vegan-tofu-shakshuka	Pita	Tofu	Stove
TP	https://www.heartandstroke.ca/healthy-living/recipes/fish-and-seafood/penne-with-rapini-and-tuna	Pasta	Tuna	Stove
TC	https://food-guide.canada.ca/en/recipes/turkey-chili/	Kidney beans	Turkey Kidney beans	Stove

1)BCV: baked chicken and vegetable, 2)BBRS: black bean and rice soup, 3)CS: chickpea salad, 4)CW: chicken wrap, 5)EVQ: egg and vegetable quiche, 6)TS: tofu shakshuka, 7)TP: tuna pasta, 8)TC: turkey chili

6.4 Recipe adaptation

The selected recipes were adapted into easy-to-read language and formatted for accessibility. Recipe adaptation and formatting was guided by participant insights from Chapter 5, feedback from advisors on the steering committee, and Open's plain language and easy-to-read guidelines. These changes included:

1. Grade 8 reading level,

2. No hard or technical terms,
3. Font style = Calibri,
4. Font size = 14,
5. Line spacing = 2,
6. Simple, short sentences,
7. Active voice,
8. Remove unnecessary words
9. Breaking steps to ensure that one step includes only one complete action,
10. Chunking related steps together
11. Separating recipe into five sections
    - key info
        i. cooking method,
        ii. cooking time,
        iii. estimated price, and
        iv. portion size.
    - nutritional info
    - ingredients
    - how to cook
    - tips to put the food away
12. Reorganizing recipe steps in chronological order
13. Adding pictures
    - pictures of ingredients, tools and instructions were generated using *Chat GPT Pro,*

- pictures of the completed dish were captured by NH on her phone during recipe testing

14. Adding check boxes to track progress
15. Adding safe food handling and hand washing instructions

CHAPTER 7: MANUSCRIPT 2

Examining the usability, usefulness, and acceptability of easy-to-read recipes adapted for individuals living with cognitive disabilities

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Abstract

Individuals with cognitive disabilities face many barriers to maintain a healthy diet because of the substantial cognitive effort required for meal planning, ingredient selection, and cooking. Although healthy eating resources are widely available, most recipes are not designed to be accessible, limiting their usefulness.

This study aimed to examine the usability, usefulness, and acceptability of recipes adapted for individuals with cognitive disabilities. It was conducted in partnership with Open Collaboration for Cognitive Accessibility and used a convergent parallel mixed-methods design. Eight affordable, healthy recipes selected from trusted websites were translated into easy-to-read language, adapted for accessibility, pre-tested, and validated with an inclusive advisory committee. Eight participants with cognitive disabilities purchased ingredients and prepared three recipes each at home. After making each recipe, participants completed a 10-item, interviewer-administered questionnaire on Teams using a 5-point Likert scale (maximum score = 50), providing additional qualitative details. In the third Teams meeting conducted after testing the last recipe, a semi-structured interview was conducted, in addition to the interviewer-administered questionnaire, to explore the participant's overall recipe testing experiences. Questionnaires were analyzed with descriptive statistics and semi-structured interviews were analyzed using content analysis. Overarching themes were deductively assigned, and inductive coding was used to identify sub-themes.

Total recipe scores ranged from 32-48 (median scores 35–44); with tuna pasta and egg and vegetable quiche ranking the highest, and tofu shakshuka ranking the lowest, driven by lower taste acceptability and intent to remake. Within three overarching themes, eight sub-themes were

identified: (1) usability of recipes (practical aspects of recipe, visual presentation of information, and organization of information); (2) usefulness of information in recipes (quantity of information and quality of written content); and (3) acceptability of recipes (food skills required, cognitive load, and overall appreciation). Participant feedback varied, reflecting heterogeneous needs and viewpoints; for example, some felt the recipes were excessively long, while others found information lacking. The adapted recipes were practical but could be further improved through tailored supplementary resources like pre-prepared ingredients, meal kits, and audiovisual supports.

Easy-to-read language combined with a format to reduce cognitive load enhanced the accessibility of affordable, healthy recipes for individuals with cognitive disabilities. However, complementary resources along with tailored adaptations will also be needed to further support healthy food preparation while mitigating cognitive accessibility barriers.

7.1 Introduction

Disability is a common aspect of the human experience that affects people across all cultures and stages of life. It reflects the diverse ways in which individuals interact with their environment and manage challenges, making it a shared condition that anyone may encounter (Cieza et al., 2018). It is estimated that about 5 million Canadians live with cognitive disabilities (Open Collaboration for Cognitive Accessibility, n.d-b). Cognitive disability is an umbrella term used for several functional limitations, i.e., memory, understanding or processing information, problem solving, reading, or responding to stimuli (Federal Communications Commission, 2016). For the purpose of this project, we used a functional definition for cognitive disabilities proposed by Cobigo, et al. in a recent white paper that defined it as a situation of disadvantage faced by individuals whose cognitive abilities deviate from what is typically expected in one or more of the following domains (Cobigo et al., 2024): 1) complex attention, 2) executive functions, 3) learning and memory, 4) language, 5) perceptual motor skills, or 6) social cognitions (American Psychiatric Association, 2013).

Participating in everyday tasks, such as preparing meals, necessitates a thoughtful evaluation of the effect of these activities on the individual's life (Lutz & Bowers, 2005). The results from Chapter 5 and the social determinants of healthy eating in Canada (Raine, 2005) both show that consuming a healthy diet is a multifactorial phenomenon that is governed by both personal and

environmental factors. Adopting a healthy dietary pattern requires high executive functioning to effectively plan meals, select healthy ingredients, and cook; challenges frequently faced by individuals living with cognitive disabilities (Dohle et al., 2018). Thus, individuals with cognitive disabilities experience food preparation barriers because of their high cognitive demand. Additionally, environmental barriers like inaccessible consumer environments, inflation, inadequate finances (Bank, 2023; Hadfield-Spoor et al., 2022; St-Germain & Tarasuk, 2017) and cognitively inaccessible information resources further complicate healthy eating.

Findings from chapter 5 demonstrate that existing healthy eating resources are not adapted to the needs of individuals living with cognitive disabilities, often making them inaccessible. The availability of resources plays a crucial role in determining how effectively individuals with disabilities can live their daily lives. Resources need to be accessible, practical, and delivered in a way that matches individuals' specific needs (Lutz & Bowers, 2005). When resources are not accessible, individuals with disabilities often depend on the support of family, friends or costly private services, which can reduce the feeling of self-efficacy and create perceptions of being a burden or dependent on one's family or society (Lutz & Bowers, 2005).

Recipes are a set of instructions and ingredients needed to prepare a dish. They can also encompass general guidelines for choosing, buying, storing food, using kitchen tools, and cooking methods (Hertzler, 1983). They are useful in offering diverse food and nutrition information to people with different levels of education (Hertzler, 1983). Cooking from a recipe requires several cognitive functions such as complex attention, executive functions, learning and memory, and language (American Psychiatric Association, 2013). Limitations in any of these cognitive functions, as in the case of individuals living with cognitive disabilities, can make it challenging to follow recipes.

One way of making resources more accessible is by using easy-to-read language. Easy-to-read language is a simplified form of language that significantly enhances the readability and comprehensibility of texts by reducing their linguistic complexity. This simplification makes it easier for individuals to process, perceive, comprehend, and recall information, thereby improving their task motivation (Hansen-Schirra & Maaß, 2020). Easy-to-read documents are mainly targeted towards individuals with cognitive and communication impairments to make information more accessible for them (Buell et al., 2019). However, currently there is no

empirically tested protocol for adapting resources into easy-read language (Sutherland & Isherwood, 2016), leading to a lack of standardization and effectiveness.

Open Collaboration for Cognitive Accessibility (Open), accessibility testers (individuals with lived experience who test products and services for accessibility barriers), and researchers at University of Ottawa and Université Laval collaborated together with the aim to improve the accessibility of recipes for individuals living with cognitive disabilities with the specific objective to evaluate the usability, usefulness, and acceptability (Saguin et al., 2024) of recipes adapted into easy-to-read language.

7.3 Methods

Study design

This study used a convergent mixed methods design (Fetters et al., 2013) to evaluate the usability, usefulness and acceptability of recipes. Mixed methods were chosen because using multiple types of data lends itself to the reconstruction of a more comprehensive picture of the participants lived experiences (Creswell & Creswell, 2017). Both quantitative metrics and qualitative data were collected in parallel, shortly after recipe testing, to reduce the risk of recall bias and minimize the cognitive load on participants.

Participants

For this study, the participants were accessibility testers working with Open. Accessibility testers were chosen because of their status as key informants from the community, who have experience providing rich and detailed information representative of the community's experience (Akhter, 2022).

Sample

Convenience sampling (Golzar et al., 2022) was done amongst Open's pool of accessibility testers, with the first eight being selected for the study on a first-come basis. A sample of eight was decided so that each participant could each test three recipes. Qualitative data collected from key informants provided in-depth insights that helped contextualize the quantitative results.

The study included 1) people living with cognitive disabilities, 2) accessibility tester with Open, 3) wants to cook food, and 4) read and speak English. The participants were compensated $475

for the approximately 9.5 hours that they dedicated to the project, in line with the industry standards for accessibility testers.

Recruitment

The ethical components of this study were approved by the University of Ottawa's Ethics review board (H-08-25-11654). Recruitment started in October 2025 via email by Open. The recruitment email sent to the accessibility testers contained an information letter (Annex 12) outlining the project and the participant's responsibilities. Individuals interested in the project were then sent a consent form (Annex 13) to sign. The information letter and consent form clearly indicated that participation was completely voluntary. All recruitment documents and texts were translated into easy-to-read language. Recruitment was stopped after the first eight eligible participants had given their consent. Open handled all participant recruitment, correspondence, compensation, and managed data collection.

Recipes

Eight diverse recipes (Table 6.2) were selected and adapted into easy-to-read language and formatted for accessibility as described in Chapter 6. They were organized into five sections, i.e., 1) key info, 2) nutritional info, 3) ingredients, 4) how to cook the food, and 5) tips to put the food away. Recipes were tested by NH in the food preparation laboratory at the University of Ottawa in August 2025 and reviewed with the steering committee. Recipes were then updated before being sent to participants (Annex 4-11).

Data collection

A comprehensive interview guide (Annex 14) was developed by MAF and NH and reviewed with MT. This was a comprehensive document that guided the interviewer (NH) throughout the three interviews.

All three interviews contained an interviewer-assisted questionnaire. Interviewer-assisted questionnaires were used in accordance with the advice from the steering committee, to help participants better understand the questions and the scale. The questionnaire contained ten questions on a 5-point Likert scale along with accompanying diagrams, which were drafted by the NH and MAF based on evidence from existing literature (Buykx, 2013; Buykx & Petrie, 2012) to effectively capture the participant's thoughts on the usability, usefulness and

acceptability of the adapted recipes. The Likert scale was designed in a way that the lowest number reflected the best result. Five different sets of statements were used on the Likert scale. These were: 1) 1= very easy, 5= very hard; 2) 1= needed a lot less time, 5= needed a lot more time; 3) 1= very helpful, 5= not helpful at all; 4) 1= I liked it a lot, 5= I did not like it at all; and 5) 1= I really want to make the recipe again, 5= I really don't want to make the recipe again.

The third interview also contained an additional semi-structured portion. This semi-structured interview consisted of six questions designed to get in-depth responses from the participants regarding the recipes in general, their preferences, dislikes and overall recipe testing experience.

The interviews were conducted in November-December 2025. Each participant was interviewed thrice by NH, who was trained by Open in accessibility practices and had experience of auditing interviews previously. The first and second interviews were 10-30 minutes while the third interview was between 30-60 minutes long. The interviews were scheduled using *Calendly* and conducted virtually via *Microsoft Teams*. Interviews were electronically transcribed using the transcription option on *Microsoft Teams*, with the transcripts being verified, edited for clarity and anonymized by NH. Quantitative data was collected using the interview-assisted questionnaires. Qualitative data related to each recipe was collected through participant responses after each Likert scale question and during the semi-structured portion of the third interview.

Analysis

Quantitative analysis

Descriptive statistics were used to analyze the numerical scores for each question. *Microsoft Excel* was used to organize and analyze the data. The scores for each question were flipped to make the highest number (5) the most optimal value as compared to the original (1). This was done to facilitate interpretation. The median was calculated for each score given. Median was used because it is the preferred measure of central tendency for Likert scales because of the ordinal nature of the data (Allen & Seaman, 2007).

Qualitative analysis

Content analysis was used to analyze the qualitative data using deductive-inductive hybrid coding (Kaur et al., 2025). Content analysis was used because of its versatility in helping researchers to better understand the context behind any type of language data (Drisko & Maschi,

2016). Analytical memos were written after each interview to capture NH's first impressions of the interviews. These memos were shared with MAF. Rudimentary analysis was done during regular debriefing sessions between NU and MAF conducted after the interviews. The *Microsoft Word* transcripts and interview recordings were revisited multiple times for better familiarity. In-depth analysis was done for the transcripts in *Microsoft Word*, which led to the development of condensed meaning units (Erlingsson & Brysiewicz, 2017). These condensed meaning units were isolated in *Microsoft Excel*, where NH and MAF worked collaboratively to inductively identify codes and sub-themes. The sub-themes were catalogued under three themes which were deductively identified based on the research objective. Coding was an iterative process, with the codes being updated and changed throughout the analysis process up until the writing phase.

Quantitative and qualitative result integration

To enhance the interpretation of findings, the quantitative and qualitative data for each recipe were first analyzed independently and then integrated into a combined table. The quantitative analysis provided measurable indicators of usability, usefulness, and accessibility; while the qualitative findings offered contextualized insights into participants' experiences and perceptions.

Reflexive statement

Before starting the interviews, NH conducted a bracketing interview (Sorsa et al., 2015) to understand the implicit and explicit biases that she brought to the analysis. NH is an able-bodied female Master's student living independently in Canada. She grew up regularly involved in cooking activities and, at the time of the interviews, cooked food on a daily basis. Due to her familiarity and expertise in cooking and following recipes, she was less sensitive to food preparation challenges. Moreover, she also lacked experience of independently interviewing individuals living with cognitive disabilities. On identifying these biases and deficiencies, NH made deliberate efforts to educate herself and deepen her understanding of the experiences of individuals living with cognitive disabilities through self-directed learning and meaningful engagement with advisors. She was formally trained by MT in accessibility practices to help her adequately interact with the participants. She adopted an empathetic and consciously non-judgmental stance during the interviews and throughout data analysis and writing. Moreover, she also scheduled regular debriefing sessions with MAF shortly after the interviews to make sense

of the data at a rudimentary level. Regular meetings were also scheduled with MT to discuss the interviews.

7.4 Results

The participants were predominantly women, with a limited representation of men. Most participants resided with their families, with others cohabiting with housemates or roommates, and one participant lived independently. More than half of the participants reported cooking regularly, while the rest reported that they cooked occasionally. More than half of the participants reported having food allergies, intolerances or aversions, or both. Majority of the participants reported facing one or more cognitive barriers to food preparation barriers. Table 7.1 provides a summary of the participant characteristics.

Table 7.1 Characteristics of participants (n = 8)

Sex	
Women	6 (75%)
Men	2 (25%)
Living situation	
Alone	1 (12.5%)
With roommates	3 (37.5%)
With family	4 (50%)
Frequency of cooking	
Cooks regularly	5 (62.5%)
Cooks occasionally	3 (37.5%)
Food allergies, intolerances, and aversions	
None	3 (37.5%)
Food allergies and intolerances only	1 (12.5%)
Both food allergies, intolerances and aversions	2 (25%)
Food aversions only	2 (25%)
Experienced cognitive barriers to food preparation	
No	1 (12.5%)
Yes	7 (87.5%)

Quantitative results

Overall, the recipes received relatively high ratings, with total scores ranging from 32 to 48. Median recipe scores ranged between 35 and 44. The baked chicken and vegetables received the lowest median scores, whereas tuna pasta achieved the highest median scores. Question 6, "*how close was the cooking time listed in the recipe to the amount of time it took you to make it?"* yielded the lowest median score (median = two), indicating that participants generally

required more time than the recipe suggested. Conversely, questions 2 "*how easy was it to bring the groceries home?"* and question *8 "how easy was it to find the cooking tools?"* received the highest ratings, with median scores of five.

Participant 3 consistently assigned the lowest overall recipe scores (median = 32). This participant was very familiar with cooking, with them cooking regularly for themselves. Their low evaluations were attributed to their perceptions that the recipes lacked high-quality images, had insufficient accompanying information, required substantially more cooking time than stated, and were not appealing enough to remake. In contrast, Participant 6 provided the highest overall evaluations (median = 46). This participant was highly familiar with cooking, having worked in commercial kitchens and routinely preparing meals for himself and his son. His prior experiences made the recipes easier to follow for him and led to significantly shorter overall cooking times. Additionally, he reported strong enjoyment of the recipe flavors and expressed willingness to incorporate them into his regular meal rotation. The median scores given by the participants are as shown in Table 7.2.

Table 7.2 Summary of participant responses*

Participants	Usability							Usefulness	Acceptability		T. median score (/50)
	Q1	Q2	Q3	Q4	Q5	Q6	Q8	Q7	Q9	Q10	
Participant 1	5.0	5.0	5.0	5.0	4.0	2.0	5.0	4.0	3.0	2.0	43
Participant 2	4.0	4.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	44
Participant 3	4.0	5.0	4.0	4.0	4.0	1.0	3.0	4.0	4.0	3.0	32
Participant 4	4.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	1.0	40
Participant 5	4.0	4.0	4.0	4.5	5.0	4.0	5.0	4.0	4.0	5.0	44
Participant 6	4.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	46
Participant 7	4.0	5.0	4.0	3.0	4.0	2.0	3.0	3.0	4.0	3.0	35
Participant 8	4.0	5.0	4.0	4.0	3.0	2.0	4.0	4.0	4.0	4.0	37
Median	4.0	5.0	4.5	4.8	4.5	2.0	5.0	4.0	4.0	3.5	41.5

**The questions are provided in Annex 14*

The tuna pasta was the recipe that received the highest scores, with a median score of 44. This recipe was rated the higher than other recipes because the participants making it multi-tasked by boiling the pasta while making the sauce, which significantly improved the scores for time efficiency. Furthermore, the participants generally liked the taste of the recipe with two of the

three participants showing eagerness to remake the dish again. In contrast, the baked chicken and vegetables was scored the lowest, with a median score of 35. Low recipe scores were primarily due to the participants substituting large potatoes instead of the baby potatoes asked for by the recipes. This substitution considerably increased cooking times, leading to lower scores for time efficiency. With the inclusion of multiple different components in the recipe, i.e., chicken, potatoes, rapini, dipping sauce; the recipe was also perceived as being overwhelming, which led to lower scores for the participants wanting to remake the recipe. Recipe by recipe median scores are displayed in Table 7.3.

Table 7.3 Summary of median recipe scores*

Recipes	Usability							Usefulness	Acceptability		T. median score (/50)
	Q1	Q2	Q3	Q4	Q5	Q6	Q8	Q7	Q9	Q10	
BCV	4.0	4.0	4.0	4.0	4.0	2.0	4.0	4.0	4.0	3.0	35.0
BBRS	3.5	4.5	4.0	3.5	4.0	2.0	4.5	3.5	4.0	3.5	37.0
CS	4.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	4.0	3.0	42.0
CW	4.0	5.0	5.0	5.0	4.0	3.0	5.0	5.0	5.0	5.0	42.0
EVQ	5.0	5.0	5.0	5.0	4.0	2.0	5.0	5.0	5.0	5.0	43.0
TS	4.0	5.0	4.0	4.0	4.0	2.0	5.0	4.0	2.0	1.0	38.0
TP	3.5	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0	44.0
TC	4.0	4.5	3.5	4.0	4.0	2.5	4.0	3.5	4.0	4.0	38.0
Median	4.0	5.0	4.5	4.5	4.0	2.0	5.0	4.5	4.0	3.8	40.0

1)BCV: baked chicken and vegetable, 2)BBRS: black bean and rice soup, 3)CS: chickpea salad, 4)CW: chicken wrap, 5)EVQ: egg and vegetable quiche, 6)TS: tofu shakshuka, 7)TP: tuna pasta, 8)TC: turkey chili

**The questions are provided in Annex 14*

Qualitative results

Three overarching themes were determined a priori: 1) usability of recipes, 2) usefulness of recipe information and 3) acceptability of recipes, based on the interview-administered questionnaire. Within these three overarching themes, eight subthemes were identified (Table 7.4).

1) Usability of the recipes

Participants discussed recipe usability in terms of the practicality of the recipe, its visual presentation of information and the organization of information.

Table 7.4 A priori themes and sub-themes	
Usability of recipes	Practical aspects of recipe
	Visual presentation of information
	Organization of information
Usefulness of recipe information	Quantity of information
	Quality of written content
Acceptability of recipes	Food skills required
	Cognitive load
	Overall appreciation

Practical aspects of recipe

Participants appreciated how practical the recipes were, specifically with their use of affordable and familiar ingredients. They found the use of common, economical items in the recipe as helpful.

> *It was really good to have a few low cost, high nutrient options (Participant 4).*

Despite the general affordability of ingredients, participants reported significant accessibility barriers during grocery shopping, particularly due to sensory overstimulation and ingredient unavailability. The grocery store was reported to be a busy place with crowds, various sounds and numerous similar products that overloaded their senses, leaving the participants feeling overwhelmed. This contributed to difficulties in locating ingredients in the aisles.

> *Grocery stores are always a bit of a challenge for me. So, like if the visual field is very busy, obviously there's tons of different types of beans. It takes me a while to find something that probably someone else could find pretty quickly. Just because my system gets overloaded. (Participant 5)*

Certain ingredients, such as rapini, were not readily available in local stores due to seasonal fluctuations, causing frustration and additional effort on the part of the participants to source them. However, the recipes did provide broccoli as an accessible substitute, which the participants resorted to in the end.

I couldn't find the rapini anywhere. I ended up using broccoli. (Participant 6)

Lack of substitution options emerged as another usability challenge. Participants noted that the recipes seldom offered alternative ingredients, reducing flexibility and making it difficult to pivot when an item was unavailable, unfamiliar, or personally disliked.

> *Like, I'm thinking now, yeah, I really would. I'd do the pasta with clams, not tuna…. I think adding the options of substitutions would be. It would be helpful. (Participant 4)*

Participants appreciated that the recipes asked for simple utensils and cookware, which made meal preparation feel more manageable to them. However, participants did report facing difficulties estimating the size of the cookware from the pictures alone and lamented on the lack of information regarding cookware capacity.

> *I ended up using a pot that was … a bit too small, so I had to keep topping it up. (Participant 8)*

The clarity of the recipe instructions was an important positive element contributing to overall usefulness. Many participants appreciated the use of easy-to-read language and clear wording, which facilitated comprehension.

> *I like to read the recipes over and over. Yes, and this is easy. I don't get overwhelmed. (Participant 2)*

Despite this, several participants indicated that they occasionally struggled to understand certain instructions. These challenges highlighted the need to further simplify and standardize the language used throughout the recipes.

> *There was one word, one sentence in there that made me confused for a second. (Participant 7)*

Visual presentation of information

Participants' reactions to the visual layout were highly divided. For some, the recipe format was intuitive, with the information being presented in a logical sequence, liking how everything was *"laid out" (Participant 4).* They also appreciated all of the additions made to the recipes, i.e., the pictures, checkboxes and sections that made everything clear and easy to follow.

I really enjoyed the pictures. I like the fact that it [recipe] kind of gave me goalposts [checkboxes]. It was separated into sections. Everything seemed pretty clear about what you should do and when. (Participant 5)

However, others perceived the recipes to be too long, overwhelming, or visually cluttered, expressing a dislike towards the overall layout.

I guess just make it more like visually interesting 'cause... I'm not sure like what kind of program they were laid out in, but it kind of feels like a spreadsheet or something like that … It's OK, but it's kind of crowded and there's too much scrolling ... Whatever you do, try to keep it to 2 pages.… then kind of make it visually balanced. (Participant 1)

Another criticism that the participants had was that the steps were not always explicit about what ingredients were included at different steps, complicating real-time recipe execution.

When I was making the chili, I accidentally added the jalapeno early with all of the vegetables because it just said to add the vegetables and I missed that like it added the jalapeno on its own later. So, like that was a bit confusing. (Participant 3)

However, participants mostly perceived pictures as a meaningful aid in the recipes. They liked having pictures that displayed how to cut the ingredients, commenting on how the images enhanced clarity, making the recipes easier to follow and replicate.

The pictures really helped … Super helpful cause like when they [other recipes] say chop or dice like I …never know what that means. Like what is your version of very small. So, it's helpful with the pictures because I could go OK if I replicate what I think this is, I should be good. (Participant 5)

Despite the positive feedback, some participants noted that the picture size made it difficult to accurately judge the item's dimensions. They mentioned that including a reference object would help put the item's size into perspective and enable them to make more accurate estimates.

The pictures were quite small … I wonder if it would be helpful to give me like a comparison... or even a picture like your... item should be this big and like even if it was like a black dot that says your item should be this big, I feel like that could be really... helpful. (Participant 5)

In addition to the small picture size, the low picture quality was also noted as another weakness of the adapted recipes. The participants expressed that the "*unappealing" (Participant 3)* pictures of the completed dish acted more as a deterrent rather than a motivator to make the dish.

> *Not gonna lie, the picture made it look really unappealing. Like, I think pictures are really important, … I think the pictures need work because upon seeing the picture I was like, 'Oh ... It looks kind of sad and watery' but then like when I made it and I ate it, I was like, 'actually this is pretty good'. (Participant 3)*

Moreover, participants also expressed that it might be *"helpful" (Participant 3)* for them to have companion audiovisual resources, like videos, to better aid understanding. They talked about how linking the recipes to companion videos either via *"barcodes on the recipe itself" (Participant 7)* or a *"Youtube channel" (Participant 8)* can increase their accessibility, making them beneficial for more people.

> *I could see an alternate version, like if you guys had like a YouTube channel or something … or you just send the videos out to people. I could also see that being another alternative. Especially like if you're interested in it going to people with, for example, visual impairments. That would be very helpful for them. (Participant 8)*

Organization of information

Participants generally appreciated the presence of a key information section, with many finding the section to be *"very thorough" (Participant 4).* However, some participants still found the section to be lacking in certain areas, like the language that was used in the section. One example of this was that the participants disliked how we gave an absolute time for the cooking time rather than giving an approximate number that would better represent how it can be different for each individual depending on a variety of uncontrollable factors.

> *There are things where like I think it would be better to have a range for the time because of factors that you're not going to be able to control. Like for example, because I've never made this specific recipe before I was, I went a little slower and like there were steps where I was like, OK, I might not be as familiar with it. So, it took me more time. (Participant 3)*

Feedback on the nutritional information section was also mixed. While some participants found it to be useful, the majority considered it the least important section or even unnecessary for completing a recipe.

> *I don't really look at that [nutritional info table] when I'm looking at a recipe to cook. (Participant 1)*

The ingredients table was another area of mixed satisfaction. Participants liked how ingredient quantities were given in both imperial and metric units. However, they did regret the lack of substitution options provided in the recipes. Furthermore, while most participants liked the structure of the section, suggestions were given to reorganize the section and group like ingredients and suggest where certain ingredients can be found at the grocery store.

> *The only thought I have around that section is like, I don't know if there's a way to kind of help people a little bit on where to find it [ingredients] in the grocery store. So being like you will find this item … in the produce section in the vegetable section of your grocery store ... So, it could be like helpful to be like just to kind of give a little Easter egg. (Participant 5)*

Participants mostly "*liked" (Participant 3)* the food storage tips, though some did disagree with the sentiment, believing that the section was not needed and did not add any meaningful value to the recipes.

> *I mean, I think that stuff is pretty common sense, you know you're gonna put in the fridge, you're gonna freeze it, whatever… I don't think it's needed. (Participant 6)*

2) Usefulness of recipe information

This theme encompassed two subthemes, i.e., *quality of written content* and *quantity of information,* both of which elicited contrasting participant perspectives.

Quality of written content

All participants felt the wording in the recipes was generally "*clear" (Participant 5)* and easy to follow. However, some participants did express dissatisfaction with the phrasing of certain instructions. They stated that the words used in the instructions themselves were not problematic rather it was the phrasing of the instructions that they found *"confusing" (Participant 3).* Therefore, they believed that "*elaborating" (Participant 3)* on certain instructions would help to

improve their clarity. They explained that without additional guidance, it can be difficult to properly follow the recipe, especially for those with limited cooking experience.

> *You put medium high heat [in the instructions], but if you're not used to cooking, you're not gonna know how to determine what medium high heat is and so having like at least like a guide and then but also including the words that are going to appear in like other recipes is really useful because it makes it so that people don't end up dependent on your cookbook. It's like obviously you want people to use it, but like obviously you also want people to feel like they can scale this to be able to use recipes that already exist so that the knowledge is transferable. (Participant 3)*

Quantity of information

Participants' views regarding the amount of detail provided fell along a broad spectrum. Some found the high level of detail to be *"helpful" (Participant 5)*, expressing that the number of steps and additional guidance made the recipes more accessible.

> *It's a super long recipe, but it's really, really helpful. Like, especially around the cooking meat part, the guidelines. It's super, super helpful. Like, I know that probably sounds dumb. It's like, how did someone… become an adult and not be great at this stuff? But it's not my forte at all. So, it's super helpful to have like some of these extra instructions that kind of give you hints about when things are cooked and what it should look like. (Participant 5)*

For others, the recipes were unnecessarily long. Participants complained that the recipes were "*redundant" (Participant 6)* repeating the name of the tool or the ingredient in each step. They asked to remove redundant parts to reduce recipe length to *"no more than two pages" (Participant 1).*

> *It's just it gets redundant saying grab the colander every time, things like that. But it's again, you're trying to make it as simple as possible, so I understand, right? But it is just like a you said it once, do you need to say it again? (Participant 6)*

3) Acceptability of the recipes

Recipe acceptability was influenced by the food skills required, cognitive load, and appreciation.

Food skills required

Some participants found the recipes to be difficult due to their functional limitations. One action that participants struggled with was chopping. Participants shared that chopping was difficult for them due to numerous reasons like *"fine motor skill issues" (Participant 5)* and *"fear of knives" (Participant 3)*. That was why they reported struggling with recipes that required a lot of chopping.

> *Chopping vegetables is something people struggle with because of dexterity or because of like fear of knives or lots of things (Participant 3)*

However, those with more advanced cooking skills shared that they were able to use their experience to simplify or multitask, which helped them to "*save time" (Participant 4)* and make the dishes faster.

> *It was just that I made a few changes like just to save time. I cooked the broccoli in the microwave while I was cooking the pasta instead of waiting until the pasta was finished to use the same pot. (Participant 4)*

When talking about resources that could facilitate cooking for them, participants talked about using pre-prepped food either from the grocery store or from meal kits to make food preparation easier. However, the problem that they had with the pre-prepped options was their high cost which made them unaffordable.

> *Meal kits would be helpful. But the problem I have with meal kits is they tend to be more expensive, right? So, I tend to stay away from those. But you know, just, yeah, having the food, like say, I don't know why the celery comes to mind. It's like you can buy celery that's already cut up. So maybe buying like food like that … would make things just that little bit easier. Um, less clean up, less time needed on the prep and everything. (Participant 8)*

Cognitive load

Most participants felt that the recipes were easy to follow, making the cooking process easy and *'fun' (Participant 2)* for them. Yet others found certain recipes to be challenging and overwhelming, highlighting the need for further amendments and simplification to make recipes more cognitive friendly.

> *I don't think I would (remake the recipe), not exactly like what suggested, … because I found it really challenging with all the, you know, it's like the chicken steps, then the dip*

steps and whatever else there was, you know, it was just, it was kind of like multiple stages and for myself that's a lot. (Participant 8)

Participants also expressed a desire to have multiple versions of a recipe with varying complexity levels to better match the cooking skills and comprehension levels of different individuals. They suggested that offering basic, intermediate, and advanced versions would make the recipes more accessible.

I think [it] could be really nice where you have like the kind of a basic, easy version and then you have like a medium version and then the hard version and like what you do with that is like you have different, slightly different language in each one and slightly different like things that you're communicating in each one. (Participant 3)

Overall appreciation

Taste played an important role in recipe acceptability and adoption. Many participants liked the taste of the dishes and were pleasantly surprised by the flavour combinations for some meals. However, a subset of participants strongly disliked the taste of certain recipes, indicating that personal food preferences significantly shaped their overall acceptability. Participant variation in recipe appreciation is recorded in Table 7.5.

Texture was another aspect that also governed food acceptability. The cooking techniques used in some recipes made them more texturally agreeable for some participants who struggle with food textures.

I have huge texture issues, but the way everything kind of went together ... the tuna, the rapini, the pesto. It all became a sauce ... The textures were all very similar ... when they were cooked down. And so the pasta became like a unique texture within a sauce. So, I didn't have the textural issues. (Participant 5)

However, where the texture made the recipes agreeable for some, it was also a dissuading factor for others.

I struggle with like certain textures and usually the one that really gets me is slimy. And ... the canned tomato pieces ... I find when it's in soup, they're kind of like slippery lumps… I struggled with the lumps of tomato a bit (Participant 3)

Therefore, taste and texture both played a significant role in the participants' acceptability and eventual adoption of recipes.

Table 7.5 Participant feedback regarding the taste of the recipes

Recipe	Positive comments	Negative comments
BCV	*I've never tried broccolini and I never did the one sheet meal. It was easy. … and the dressing using yogurt and spices. It was very good. I never thought that this was going to be good, 'cause I never thought that yogurt with spices was good. (Participant 2)*	*Yeah, personally, I'm not a huge fan of like flavoring my chicken like that. (Participant 8)*
BBRS	*I tend to like simpler flavors, but like, yeah, I enjoyed this. (Participant 5)*	*She [participant] didn't eat it. (Participant 7)*
CS	*It was delicious. (Participant 4)*	*No negative comments regarding taste*
CW	*I liked it a lot. One. Oh, I never had a tzatziki, so I put more than, I put more 'cause I like it very moist. (Participant 2)*	*No negative comments regarding taste*
EVQ	*One (liked the taste very much). And my son asked for it again, so it was good. (Participant 6)*	*I don't think I cared for the … Italian seasoning in it. Because like sometimes I would get little bites of it and it was sort of like overpowering. But the, uh, garlic was really nice. (Participant 1)*
TS	*No positive comments regarding taste*	*I have to say I didn't really like it. I found it bland. (Participant 4)*
TP	*Yeah, this surprised me because I'm not a big tuna fan, but this is good. I like it. (Participant 6)*	*I would put it [taste] at three. It was OK. (Participant 4)*
TC	*I quite actually enjoyed it [taste wise] and I was actually surprised because I wasn't expecting to enjoy it as much as I did. (Participant 3)*	*No negative comments regarding taste*

1)BCV: baked chicken and vegetable, 2)BBRS: black bean and rice soup, 3)CS: chickpea salad, 4)CW: chicken wrap, 5)EVQ: egg and vegetable quiche, 6)TS: tofu shakshuka, 7)TP: tuna pasta, 8)TC: turkey chili

Quantitative and qualitative data integration

Integration of quantitative scores with qualitative feedback revealed clear convergences across usability, usefulness, and acceptability domains, as well as important recipe specific divergences.

The general trend of the recipes and the recipe-to-recipe divergences from the trend are displayed in a data integration table (Table 7.6).

Overall, the recipes scored moderately high (median score range: 40/50), suggesting that they were generally well received. Across recipes, higher quantitative scores were consistently associated with recipes that were reported to have clear instructions, familiar ingredients, and high taste appreciation. For example, all recipes with 40 or higher median scores (chickpea salad, chicken wrap, egg & vegetable quiche, and tuna pasta) were described as easy to prepare, requiring minimal specialized equipment, and offering clear cooking instructions. Participants' narratives emphasized that straightforward assembly, familiar flavours, and the availability of ingredient substitutions supported both usability and acceptability, thereby resulting in higher numerical ratings.

Conversely, recipes with lower scores demonstrated a close correspondence with usability, usefulness and acceptability challenges. The baked chicken and vegetables received the lowest median score of 35/50. Its low score was attributed to the difficulty to locate ingredients (broccolini), need for longer baking times due to the substitution of ingredients (e.g., use of large potatoes instead of baby potatoes) and the lack of reiteration of food safety instructions (hand washing instructions) throughout the recipe. Similarly, the tofu shakshuka (38/50) was scored low because of the difficulty in finding the exact amounts of ingredients stated (tofu), unclear stove-settings (low, medium, high heat) and low taste and texture acceptability.

Comparisons between participants showed that variability in participant scoring criteria also led to recipes being scored higher or lower than expected. For example, in the case of participant 7, scores for ingredient accessibility (Q1) were an automatic 3 if she had to go to the store to buy an ingredient, while others only gave mid to low scores if they had difficulties finding ingredients at the store. Therefore, two of the three recipes that she tested (baked chicken and vegetables and black bean and rice soup) received low median scores.

Participant 3 emphasized the importance of more detailed instructions and therefore assigned lower scores to questions related to ease of comprehension (Q3, Q4, and Q5). They also reported needing longer cooking times, which led to lower scores for Q6. Additionally, they also had difficulty estimating the size of the cooking pots required, which led to lower scores for Q8

(cooking tool accessibility). Therefore, all three recipes that they tested, i.e., tofu shakshuka, turkey chili and black bean and rice soup; received lower scores.

In contrast, Participants 2 and 6 were very generous with their scores, rarely giving scores lower than 5. That is why most of the recipes that they tested, i.e., egg and vegetable quiche, chicken wrap, chickpea salad, and tuna pasta; were highly rated.

Recipe to recipe comparisons also helped us identify several patterns. Firstly, ingredient accessibility emerged as a consistent determinant of usability scores, with difficulty finding ingredients due to seasonal changes (e.g., rapini/broccolini, parsley) and unfamiliarity with items (e.g., tzatziki sauce) corresponding to mid-range usability ratings. Similarly, inconsistencies or omissions in instructions like missing steps (for garlic in the quiche) or unclear instructions (not expressly stating what vegetables to add in the soup) reflected in lower usefulness ratings for recipes. In contrast, recipes offering substitution options or detailed procedural guidance (e.g., broccolini alternatives in pasta, deboning instructions in the chicken wrap) corresponded to stronger usefulness scores and positive feedback.

Acceptability ratings were also generally favourable. However, participants who preferred meat reported lower acceptance of vegetarian dishes, accounting for reduced scores for the chickpea salad and the black bean and rice soup among some individuals. Textural preferences such as aversion to slimy texture of the tomato lumps in the soup, oversized tofu pieces and the acidity of the shakshuka led to lower acceptability ratings. Conversely, recipes with more positive taste appreciation scores (e.g. chicken wrap and tuna pasta) elicited higher acceptability ratings.

Table 7.6 Quantitative and qualitative data integration with the general trend and recipe divergences from the trend

Usability of Recipes	Usefulness of Information	Acceptability of Recipes
General feedback* (median score 40/50)		
• Easy to find ingredients • Very easy to bring ingredients home • Very easy to understand words • Very easy to understand steps • Easy to follow steps • Need a little more time to cook than stated in the recipe • Very easy to find utensils • **Overall, usability was very high**	• The recipes were very helpful • **Overall, usefulness was high**	• Liked the taste of the recipes • Want to make the recipes again • **Overall acceptability was high.**
It was really good to have a few low cost, high nutrient options. Some are, you know, kind of similar to things that I'd make and some are a little different ... I like the combination of how it was laid out. I like the combination of written and visual instructions. Yeah. And I liked how, you know, it was written out because I like scanning things, like looking at something, looking at the whole thing and then having a sense and then going back and looking at it in chunks and I felt that it was it was laid out that way. (Participant 4)		
Baked chicken & vegetables (median score (35/50)		
• Difficulty finding broccolini • Difficulty following the recipe because participants used large potatoes instead of baby potatoes	• Needed more handwashing instructions because it involves handling raw meat	• Cooking process required low involvement • Overwhelming because of the multiple components of the dish • May remake the recipe
The chicken steps, then the dip steps and whatever else there was, you know, it was just, it was kind of like multiple stages and for myself that's a lot. ... I mainly liked the potatoes ... how we cut them in half and cook them in the oven. It didn't need much of my maintenance or time, but ... like the other stage[s] ... [were] just for myself, a lot (Participant 8)		
Black bean & rice soup (median score 37/50)		
• Difficulty finding fresh produce • Difficulty locating beans at the store due to overwhelming field of vision	• Needed reheating instructions	• Difficulty cutting celery • Texture issues caused by tomato lumps in the soup

- Difficulty using leftover celery, because celery is sold in bundles
- Difficulty understanding instructions
- Made generous portions
- Avoided tasting because there was no meat in the dish

I didn't feel very encouraged by the picture, but I found that I liked it a lot more than I thought I would when I had it. But I also made some modifications because I wanted it to be a little bit thicker [because] I struggle with certain textures and usually the one that really gets me is slimy ... I find when it's [canned tomatoes] in soup, they're kind of like slippery lumps. And so, I had to make the soup a bit thicker because I struggled with the lumps of tomato a bit. (Participant 3)

Chickpea salad (median score 42/50)

- Followed general trend
- Wording needs to be amended to reflect no cook nature of the recipe
- Liked the salad a lot
- Disliked food due to lack of meat
- Would remake it again
- May remake salad again

I really, really liked it. Like as I said, I really like chickpea salad anyway, but the fact that it is [a] different combination of things. Yeah, it was delicious. I'm gonna make it again ... on my own and it's gonna be ... a go to. (Participant 4)

Chicken wrap (median score 42/50)

- Difficulty locating tzatziki sauce at the store because of its unfamiliarity with the participants
- Needed exactly the same time to make the dish as was stated in the recipe
- Liked having leftovers
- Participants using the rotisserie chicken liked having detailed deboning instructions
- Participants using other forms of leftover chicken found the deboning instructions to be unnecessary
- Needed reheating instructions for participants using leftover chicken for the wrap
- Difficulty cutting and deboning chicken
- Participants really liked the taste
- Participants needed more seasoning
- Wanted to have a crunchy component in the wrap

[I would] definitely, 100% would remake this again. (Participant 7)

Egg & vegetable quiche (median score 43/50)

- Most participants had trouble locating the circular baking pan
- Use of different cooking vessels led to variable cooking times for the quiche (the quiche was baked quicker)

- The recipe asked for garlic in the ingredients but did not use it in the steps

- Garlic was overpowering
- Liked the taste of the garlic
- Italian seasoning was overpowering
- All participants liked the texture of the dish

I made it yesterday. We ate it yesterday and then I made another one this morning ... [its] very good. Yes, easy to do. (Participant 2)

I've never made a quiche before, so it [recipe] was very helpful ... And my son asked for it again, so it was good. (Participant 6)

Tofu shakshuka (median score 38/50)

- Difficulty finding exact quantity of tofu stated in the recipe
- Difficulty finding the lid for the frying pan which changed the cooking time

- Needed more detailed description regarding the stove settings

- Difficulty cooking and handling tofu
- Tofu chunks were too big to eat
- The dish tasted okay but was bland to taste
- The acidity of the tomato hurt the participant's mouth

I think it came together OK, but it just still kind of tasted like diced tomatoes ... [and] paprika ... Like I cooked it like it said ... but it was still sort of like a watery consistency. (Participant 1)

It's really acidic and normally we put eggs in it. And the tofu didn't like do anything to cut the acidity. Normally the eggs kind of help or like you break the yolk and it helps like make it less sharp. But with the tofu, the tofu doesn't really do that and the tofu didn't taste like anything. It's just kind of these giant blocks of like nothing. (Participant 3)

Tuna pasta (median score 44/50)

- Difficulty finding rapini because of seasonal unavailability but substitute options for broccolini and broccoli were given
- Less cooking time was needed because participants boiled pasta and cooked

- Liked having substitutions for broccoli and broccolini
- Wanted measurements for the pasta in cups not just a box of pasta
- Too much pasta water was added to the pasta sauce

- The recipe tasted good
- Participants wanted to remake the recipe

the broccoli at the same time

Easy, very easy ... there was nothing to question because again, the guesswork was taken out and the substitution was handled in the recipe, there's nothing really to think about. It's pretty straightforward. (Participant 5)

Turkey chili (median score 38/50)

- Difficulty finding beans at the store because of the overwhelming visual field of the bean aisle
- Substitution options were needed for the pepper to adjust the spice level of the dish
- Liked the taste
- Liked the texture
- May make it again

It was really good. But if I weren't doing this as a study, I wouldn't have followed all of the steps the same way. I would have made my own modifications. (Participant 3)

**The general feedback applies to all recipes.*

7.5 Discussion

This study evaluated the usability, usefulness, and acceptability of recipes adapted into easy-to-read language and accessible format. The findings indicate that recipe adaptations substantially improved comprehension and ease of use, which in turn increased the participants' intention to integrate these recipes into their menus. However, participants differed in the extent to which they required or preferred such adaptations, reflecting variation in food agency, cooking experience, and cognitive capacity. This heterogeneity underscores the need for personalized recipe formats that align with diverse skill and comprehension levels.

Participants reported that simplified language and reduced information density made recipes easier to follow. This indicates that easy-to-read language is a universal adaptation that can be applied to recipes to make them cognitively accessible. It is in agreement with available literature that demonstrates the benefits of easy-to-read text for improving literal comprehension in cognitively diverse populations as compared to documents written in regular text (Fajardo et al., 2014; Maaß, 2020a). Easy-to-read language helps to bridge the gap between the language level of the document and the reading abilities of the users. However, these benefits cease to exist when the language level of the text matched the language level of the reader (Buell et al., 2019). This is why participants with better language abilities were not very enthusiastic about the adapted recipes. Furthermore, the length of the adapted recipes and the number of sentences was a strong deterrent for a good portion of our participants, displaying that document length reduces their motivation to engage with the text (Fajardo et al., 2014). Therefore, document length needs to be considered closely while developing resources using easy-to-read language.

Future research should explore systematic methods for developing recipes at varying levels of complexity (e.g., basic, intermediate, advanced) to better match user needs. The use of easy-to-read language is in-line with '*Universal design*' principles. Universal design refers to the development of products, services, programs and environments to make them usable for all people, to the greatest extent possible, without adaptations and the use of specialized design (Ostroff, 2011). However, using easy-to-read language as a one-size-fits-all solution for mass communication does not generally go well, as was evidenced in Germany in 2017. Massive public outcry was seen when trying to distribute election information in easy-to-read language because in trying to help everyone, the document was helping no one. It was mostly available to

people who did not need language simplification while not being available to individuals living with cognitive disabilities (Maaß, 2020b). Therefore, to better align with *Universal design* principles, it might be worthwhile to develop several versions of the same document, meeting the various language and instructional detail requirements of the end-users.

Visual supports were also valued, with several participants expressing interest in additional images or audiovisual tools. Visual components in easy-to-read language are known to enhance processing and recall for all individuals. Images provide a single concrete reference that efficiently helps the reader. However, an overabundance of images provides the reader with too much information, not only overwhelming them but also disrupting the vertical flow of information for them (Maaß, 2020c). Therefore, care needs to be taken when adding images to a text.

Discrepancies between the time needed by the participants to prepare meals and the cooking time given in the recipes were also commonly noted. Participants attributed longer cook times with their unfamiliarity with the recipes, which we observed when comparing the differences between cook times with their cooking frequency. Participants with more cooking experience were able to complete the dishes on time or even before the time stated in the recipe, whereas participants who cooked infrequently or were unfamiliar with the dishes needed a lot more time to cook the same dish. Even though this is a commonly acknowledged phenomenon, very limited research was found on the topic. In a paper published in 2017, when evaluating the stages of expertise development from novices to experts in education, Persky and Robinson found that task familiarity significantly affects the cognitive load associated with an action. They showed that novices carry out tasks slower because of the significant burden of the unfamiliar task on their working memory. However, with task repetition, the cognitive load on the working memory is reduced as the information is stored in the long-term memory, making information retrieval more efficient. This increases the overall efficiency of the task (Persky & Robinson, 2017). Therefore, the unfamiliarity of tasks (recipes/cooking in our case) plays a significant role in its time-efficiency.

Participants also reported difficulties with fine motor tasks such as chopping, a known functional limitation observed in individuals living with cognitive disabilities. Difficulties in fine motor skills are one of the six domains negatively affected by cognitive disabilities as per the functional

definition of cognitive disabilities (Cobigo et al., 2024), based on the Diagnostic and Statistical Manual of Mental disorders (DSM-5) (American Psychiatric, 2013). Meal kits with pre-prepared ingredients were identified as a potential solution to this problem. However, the affordability of commercially available options was a major barrier for recommending such solutions.

Additionally, personal preferences regarding taste and texture were also found to greatly dictate food acceptability. This finding is in line with current available literature that suggests that individuals living with cognitive disabilities like the autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD), often showed unique dietary preferences and sensitivities that can affect their nutritional intake (Ghanizadeh, 2013). Therefore, future research projects should be mindful of the population's preferences.

Strengths and limitations

The major strength of this study lies in its use of community-based participatory approach as the main methodological approach. Engagement with an inclusive steering committee and direct user feedback during research ensured that the research and the interventions proposed reflected community priorities and experiences. Another strength of the study is its focus on improving the accessibility of nutrition resources for individuals living with cognitive disabilities in a Canadian context, a population not often represented in public health nutrition research.

This study also has some limitations. Demographic data was not collected from our participants to reduce the length of the interviews and the burden on the participants. Additional information about income, education, and ability to make ends meet would have enhanced the contextualization of the participants' experiences. Additionally, due to budget limitations, recipes were not professionally designed. Participants commented on the visual quality of recipes, which may have impacted usability and acceptability scores.

7.6 Conclusion

This study demonstrates that combining easy-to-read language with formats designed to reduce cognitive load significantly enhances the usability, usefulness and acceptability of affordable, healthy recipes for individuals living with cognitive disabilities. These findings highlight an important step towards improving the accessibility of nutritional resources and expanding their reach to a broader segment of the population. Nevertheless, simplifying language and optimizing format represent only initial measures. Additional complementary supports, such as audiovisual

materials and tailored adaptations including meal kits, are also needed to further facilitate healthy eating and effectively address persistent cognitive accessibility barriers affecting independent meal preparation in individuals living with cognitive disabilities.

CHAPTER 8: GENERAL DISCUSSION AND CONCLUSION

8.1 General discussion

This CBPR project responded to a community need identified by Open that *there is a lack of accessible healthy eating resources, especially recipes, for individuals living with cognitive disabilities.* Based on this community need and gaps identified in the literature, the project aimed to make healthy eating more accessible for individuals living with cognitive disabilities. Through the project, we answered the following research questions, 1) "*how do individuals living with cognitive disabilities experience healthy eating in their daily lives?"*, and 2) "*how* do recipes adapted for cognitive accessibility support healthy food preparation for individuals living with cognitive disabilities?"

This was done in two manuscripts and a bridging chapter. In chapter 5, the manuscript covered a qualitative study that used in-depth, key informant interviews and photographs to explore the healthy eating and food preparation barriers faced by individuals living with cognitive disabilities. Through this study, it was identified that these individuals face a plethora of healthy eating and food preparation barriers that mainly relate to 1) *personal circumstances influence healthy eating* and 2) *food environments lack accessibility.*

Participants reported four personal circumstance that they felt complicated healthy for them. These were *struggling and feeling overwhelmed with food related tasks*, *health status impacts all aspects of food decisions*, *cooking is a chore,* and *help is needed to eat healthy*. When talking about aspects of the food environment that lack accessibility, it was shared that the *information environment complicates healthy eating, the consumer environment is hard to navigate,* and *economic resources are insufficient.*

Chapter 6 outlined the process of co-developing a recipe selection checklist to select and adapt recipes to easy-to-read language and an accessible format. The checklist was used to select recipes that used healthy, accessible, and affordable ingredients. This checklist was developed by the research team in consultation with MT, using insights from participants living with cognitive disabilities (collected in Chapter 5), advisors with lived experience on the steering committee, and existing literature. It was also reviewed by the steering committee before being finalized. The finalized eight-item recipe selection criteria were used to scan 1313 recipes available on 10 Canadian health organization's websites. Results showed that only 191 (14.5%) of them were

affordable, accessible, and nutritionally complete meals. Out of these 191 recipes, eight recipes were selected to be rewritten and redesigned into a cognitively accessible format, using easy-to-read instructions provided by Open that outlined language and format amendments to improve the accessibility of these recipes.

The manuscript in chapter 7 outlined a convergent mixed-methods study that used interviewer-assisted Likert scale questionnaires and semi-structured interviews after recipe testing to evaluate the usability, usefulness and acceptability of recipes adapted for cognitive accessibility. The recipes were rated moderately high to high (total scores 32-48; median scores 35-44) with varying and oft, conflicting feedback on their usability, usefulness and acceptability. The *usability of recipes* was found to be affected by the *practical aspects of recipe, visual presentation of information* and the *organization of information*. The *usefulness of information* was influenced by the *quantity of information* and the *quality of the written content*. Lastly, the *acceptability of recipes* was determined by the *food skills required*, *cognitive load* and *overall appreciation* (taste and texture).

A finding concurrent through chapters 5 and 6 was the lack of equitable resources, especially affordable, healthy recipes. In the semi-structured interviews, participants highlighted multiple issues like difficulties finding credible nutritional information and vetting misinformation; inaccessible formats of online databases, apps and recipes; difficulties sourcing ingredients and tools for recipes. This was further cemented by the results of the recipe scan that found that only 14.5% of all recipes present on trusted Canadian health organization websites guided the preparation of affordable, nutritionally complete meals made with accessible ingredients. These findings raise a question on how equitable the current Canadian food information environment is for individuals living with cognitive disabilities. Even though the Government of Canada is making efforts through the 2022 *Disability Inclusion Action Plan* (Government of Canada, 2022), targeted efforts are still needed to educate resource developers, like health organizations and health professionals, to be mindful about the accessibility of their resources during resource design.

Ensuring accessibility of resources is not a simple process. This was clearly observed in chapter 7, where participant-to-participant responses for the same recipe were often conflicting. These discordant voices displayed that the accessibility needs of each individual are unique to their own

experiences and realities. Even though definitions of cognitive disabilities clearly state them to be an amalgamation of multiple conditions with a range of co-existing cognitive strengths and limitations (Virginie Cobigo, 2024), most interventions aimed at the population only target specific sub-groups like those with intellectual disabilities, ADHD, ASD or cognitive decline, overlooking others who also fall under the cognitive disability umbrella outside of these conditions. This pigeonholed approach to intervention limits the effectiveness of accessibility efforts that are currently being made (Maaß, 2020b).

Therefore, more community involvement in research is needed to contextualize findings and better align interventions to community requirements. This project achieved this by adopting the CBPR approach. By following and implementing CBPR principles in the study design, the project was able to better identify accessibility concerns of the community and amend research activities to better facilitate the needs of the community. Without community input and accountability, no community-centric research can make meaningful advances in ethically learning the realities of the population in a way that is mutually beneficial rather than exploitative of the community. The CBPR approach gives the population the agency to inform and shape the intervention process, contributing to more inclusive research practices (Abernethy et al., 2020). By involving individuals living with cognitive disabilities in the research process, we ensured that their perspectives and experiences were represented. This inclusivity enhances the validity and relevance of the research findings, as it reflects the diverse needs and experiences of the community.

Strengths and weaknesses

This project has various strengths and weaknesses. The biggest strength of the project is its use of the CBPR approach. Another strength is that the project provides valuable insights into the barriers and facilitators of healthy eating among individuals living with cognitive disabilities, which can inform future research and interventions aimed at reducing health disparities (David & Hamburg, 2013). Additionally, the recipe selection checklist that was developed for the project and the recipe adaptation protocol used are not only beneficial for individuals living with cognitive disabilities but for the general population as well. Children, individuals unfamiliar with cooking, new language learners, people with limited financial resources, and low literacy are populations that would greatly benefit from resources developed using these resources.

Even though this project has multiple strengths, it is not without its limitations. The main limitation of the study was its limited budget. Financial constraints were the reason why a small sample size was imposed, with the sample size being reduced from ten to eight at one point during phase 3 (Chapter 7) to keep it in budget, reduce Open's burden and facilitate advisor participation in the research. This was also the reason why the advisors on the steering committee were consulted sparingly, meeting only four times during the one-year project, rather than being included in the bi-monthly meetings that were scheduled between the research team and Open.

Disciplinary implications

This project is significant because it works to improve the accessibility of healthy eating resources for individuals living with cognitive disabilities, a vulnerable, under-represented population. By improving the accessibility of food preparation resources (i.e., recipes), we are increasing the wealth of usable resources that can help empower these individuals to make healthier food choices, thereby improving their overall well-being. Research has shown that effective food resource management practices can significantly improve healthy eating habits among those with limited resources by optimizing their use of existing resources (Darooghegi Mofrad et al., 2024).

Furthermore, the project also promotes the more equitable integration of a marginalized group, individuals living with cognitive disabilities, in community research. By involving community members and valuing their lived experiences, the project fosters social integration and supports the co-creation of knowledge (Hadfield-Spoor et al., 2022). This approach helps to advance inclusion, autonomy, and overall societal well-being. By addressing food insecurity and promoting social integration, the project contributes to a more equitable and inclusive society (Cooney, 2016).

8.2 General conclusion

This study shows that accessibility of affordable, healthy eating in individuals living with cognitive disabilities is riddled with many barriers. By using a CBPR approach, we were able to work with the community to pinpoint their concerns regarding the inaccessibility of affordable, healthy food and independent food preparation in the current Canadian society. These insights resulted in the development of a recipe selection criteria and a recipe adaptation protocol. These

resources can be used to improve the cognitive accessibility of existing and new recipes and other nutrition-focused literature. These documents will not only benefit organizations working on improving equitable access, like Open, but would also be useful for healthcare organizations, healthcare providers, resource developers and individuals to develop and/or find resources that are usable, useful, and acceptable for many different segments of the Canadian population.

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ANNEX

1. **Information letter manuscript 1**

Hello,

My name is Melissa Fernandez.

I am a researcher at the University of Ottawa.

A researcher studies a subject.

And researcher finds new things.

A researcher also tests new ideas.

I work with my student Noor Ul Huda.

She is a student researcher.

She is doing her master's degree.

We also work with Open.

We are doing research to make healthy eating easier for people with cognitive disabilities.

We want to invite you to take part in our study.

To stay healthy, we need to eat:

- Healthy food

- Fruits
- Vegetables
- Whole grains
- Proteins
- Healthy fats like olive oil

People with cognitive disabilities need info about healthy eating.

We want to learn about this info.

The info can make healthy eating easier for people with cognitive disabilities.

People with cognitive disabilities need tools for healthy eating.

We want to learn about these tools.

The tools can make healthy eating easier for people with cognitive disabilities.

Tools for healthy eating can be recipes.

What is the study about?

Everyone needs food to survive.

Healthy eating can protect us from getting sick.

Cooking at home can help us eat healthy.

Cooking at home can also help us spend less money on food.

People with cognitive disabilities have experiences with healthy eating.

And we want to understand these experiences.

We want to know about any problem you face with healthy eating.

We want to know about the tips you use for healthy eating.

We want to know the tools you use to make healthy eating easier.

We also want to know about the info you need to make healthy eating easier for you.

Your experience with healthy eating is important for us.

You may help us to understand:

1. the problems people with cognitive disabilities face when they eat healthy

2. the needs of people with cognitive disabilities when they eat healthy

3. the changes we can bring to tools to make healthy eating easier for

these people

4. the tools we can develop to make healthy eating easier for these people

Our study will help to develop solutions to make tools for healthy eating.

Our study will also help to develop info easier to use and follow for everyone.

Do you have to be in this study?

No. You decide if you want to participate in our study.

We will not tell anyone if you do or do not want to be in our study.

If you decide that you want to participate in our study:

- We will have 2 meetings.
- We will ask you to take some pictures before the interviews.
    - Take pictures of the food you buy.
    - Take pictures of the kitchen tools you use to make food.
    - Take pictures of your meals and drinks.
    - Do not take pictures of yourself or other people.
    - You can send the pictures to us by email.
- We will meet at times that work for you.

- We will meet by video call or telephone.
    - We can use Zoom or Teams.
    - You can choose the one you prefer.
- We will talk for up to 1 hour each time we meet.
- During our meeting, I will ask you questions:
    - How do you make your food?
    - What problems do you have when making food?
    - What problems do you have when using tools like recipes to make food?
    - What tools do you want to help you eat healthy?
    - What kind of foods do you eat?
- You can answer anything to my questions.
- We want to learn about your experiences.
- You may refuse to answer any of the questions.
- You may stop the interview at any time.
- We will record the interview.
    - We will also type the interview out word-for-word.
    - Your personal info will not be in what we type.
- We will keep your information private.

    - Only our research team can see what you said in our meetings.
    - We will save your personal information for 1 year.
- There is no harm to you when you participate in this study.
- We will share the report of what we found in the study with you.
    - You can choose to email us your thoughts.
    - You do not have to share your thoughts.

If you decide that you do not want to participate in this study:

You do not need to do anything.

If you do not understand this letter and this information:

Call us at: , or email us at:

Or ask someone to explain this letter to you.

If you do not want anyone to know that you will be in this study, it is OK.

We will not tell anybody your name.

We will ask your permission to use the words and information you shared with us during this study.

You can say “no, I don’t want you to use my words and my information”.

If you want to participate in this study.

You can call us at

Or email us at

Your rights in research:

If you have any questions about your rights when you participate in this study,

please call the University of Ottawa Office of Research Ethics and Integrity at 613-

562-5800 extension 5387, or email them at ethics@uottawa.ca

We hope to talk to you soon! Thank you.

Community Researcher: Munazza Tahir

Associate Director, Open Collaboration for Cognitive Accessibility

Email:

Phone:

Researcher: Melissa A. Fernandez

Assistant Professor, University of Ottawa

Email:

Phone:

Student Researcher: Noor Ul Huda

Master's student, University of Ottawa

Email:

Phone:

2. Consent form manuscript 1

Do you have any questions about your rights?

Please call the University of Ottawa Office of Research and Integrity.

They can answer all your questions.

Their phone number is 613-526-5800 extension 5387.

Or email them at ethics@uottawa.ca.

How will you help our study?

Your experience with healthy eating is important for us.

We need your experience to understand these things below.

We need to understand:

1. the problems people with cognitive disabilities face when they eat healthy

2. the needs of people with cognitive disabilities when they eat healthy

3. the changes we can bring to tools to make healthy eating easier for these people

4. the tools we can develop to make healthy eating easier for these people.

Tools can be recipes.

Our study will help to develop solutions to make tools for healthy eating.

Our study will also help to develop info that is easier to use and follow for everyone.

Please Circle Yes or No		
I read the invitation letter about this project.	**Yes**	**No**
I decided that I want to be in this project.	**Yes**	**No**
I know I can stop being in this study if I want to.	**Yes**	**No**
I will do 2 interviews.	**Yes**	**No**
I know each interview may be up to 1 hour.	**Yes**	**No**
I will take pictures of • Groceries that I buy • Tools in my kitchen that I use to cook • Meals and drinks that I have	**Yes**	**No**
I know I will be asked to email the pictures I take.	**Yes**	**No**

I know I can e-mail my answers instead of talking, if I want to.	**Yes**	**No**
I know I can get 200 dollars for my time in the study.	**Yes**	**No**
I know that I will only get the money if I take part in an interview.	**Yes**	**No**
I know I can get the money if I leave my interview early.	**Yes**	**No**
I know I will get the money within one month after the interviews.	**Yes**	**No**
I can stop taking part in the study at any time I want.	**Yes**	**No**
Researchers can use my info if I stop taking part in the study.	**Yes**	**No**
Researchers can record my voice.	**Yes**	**No**
I know that only the researchers will hear my voice.	**Yes**	**No**
I know that the researchers will share the report with me after the study.	**Yes**	**No**

• The researchers can use my feedback in the final report.		
Researchers can tell people about the study.	**Yes**	**No**
Researchers can use my words to tell others about the study.	**Yes**	**No**
Researchers can use my pictures to tell others about the study.	**Yes**	**No**
The student researcher can use my pictures and words to tell people about the study in their thesis. • A thesis is a research report.	**Yes**	**No**
I know the researchers will keep my name and personal info private.	**Yes**	**No**

_____ _____ _____

Name Signature Date

Community Researcher: Munazza Tahir

Associate Director, Open Collaboration for Cognitive Accessibility

Email:

Phone:

Researcher: Melissa A. Fernandez

Assistant Professor, University of Ottawa

Email:

Phone:

Student Researcher: Noor Ul Huda

Master's student, University of Ottawa

Email:

Phone:

3. **Comprehensive interview guide manuscript 1**

Semi-structured telephone / video interview guide with advisors

Ideally split into two interviews

Introduction suggested script for interview 1

Hello, my name is Emily.

I am a Research Assistant at the University of Ottawa.

I am working with Melissa Fernandez at the University of Ottawa and her Master's student, Noor Ul Huda.

We are working on a study to make healthy eating easier for people living with cognitive accessibility.

Thank you for taking part in this study.

Noor is here with me to listen to today's interview.

Housekeeping and informed consent for interviews 1 and 2

This interview will last about up to 1 hour.

There are no right or wrong answers to my questions.

You do not have to answer my questions, and you can stop the interview at any time.

Do you have any questions about the project?

Do you want to start the interview?

Let's begin.

Interview 1

Topic 1: Background information

These questions are about you.

1. How old are you?
2. What is your gender?
    - Male
    - Female
    - Another gender
3. Tell us about your schooling.
    - High school completed
    - Any schooling after high school
4. Please tell us who you live with.
    - Alone
    - With a roommate
    - With spouse / children
    - With other family members

Topic 2: Diet

These questions are about your health and what you eat.

5. Please tell us about the breakfast foods in your pictures.
    - **If not present, ask about normal breakfast.**
        - **Ask if they eat breakfast.**
        - **If no, then why not?**
6. Please tell us about the lunch foods in your pictures.
    - **If not present, ask about normal lunch.**
        - **Ask if they eat lunch.**
        - **If no, then why not?**
7. Please tell us about the dinner foods in your picture.
    - **If not present, ask about normal dinner/supper.**
        - **Ask if they eat dinner/supper.**
        - **If no, then why not?**
8. Please tell us about any drinks in your pictures.
    - **If not present, ask about what drinks they mostly drink and like to drink.**
        - Water
        - Juices
        - Tea/coffee
9. Please tell us about any snacks in your pictures.

- **If not present, ask about what snacks they mostly eat and like to eat.**
    - **Cakes**
    - **Fruits**
    - **Salads**
    - **Chips**

10. Please tell us about any foods that you do not eat.

- Sugar
- Salt
- Nuts
- Eggs
    - **Why do you not eat them?**
    - **Did you never eat them?**
    - **Can you not eat them because of allergies or how they make you feel.**
    - **Do you not eat them because of a disease like diabetes, high blood pressure, heart disease?**

Please tell us about any health-related barriers to healthy eating that you experience?

- **Mental**
- **Physical**

11. Please tell us about any medicines that change what or how you eat?

    - Do they change your appetite?
    - Do they change your weight?
    - Do they change your digestion?

12. Please tell us about anything that could help you eat healthy?

Topic 3: Grocery shopping

These questions are about how you shop for food

13. Please tell us about any help you get when buying food.

    - Family or friends
    - Caregiver
    - Meal delivery services
    - Community programs
    - Assistive technology

14. Where do you get your food?

    - from a grocery store
    - a friend or family member
    - a restaurant
    - a community program

- a delivery app

15. Please tell us about the groceries in your picture.

    - What made you choose the foods
    - Where did you buy them?
    - How did you find the prices?
    - Is there anything else you would have liked to buy?

16. Please tell us about any problems that you have when you buy food or groceries?

    - Finding what you need in a big store
    - Understanding words or numbers on food labels
    - Remembering what you need to buy
    - Asking store workers for help
    - Paying with cash or cards
    - Knowing how much money you can spend
    - Not having enough money to buy food

17. Please tell us about how you deal with any problems buying food.

18. How do you find ways to buy healthy food without spending too much money?

Closing script for interview 1

This is all the time we have for today.

We will chat again on _____ to continue our conversation.

If you have any questions about this study, you may contact us.

The contact information is listed in the information letter.

Thank you for taking the time for talking with us today.

Interview 2

Topic 4: Cooking

These questions are about how you make your food.

19. Please tell us about any help you get to make food.
    - Family or friends
    - Caregiver
    - Meal delivery services
    - Community programs
    - Assistive technology
20. How do you usually cook your food?
    - microwave oven
    - stove top
    - oven

- cold food

21. Please tell us about the kitchen tools in your pictures.

    - How often do you use them?

    - What do you like about them?

22. **Please tell us about any kitchen tools you do not use.**

    - **Why do you not use them?**

    - **Is it because you dont have them?**

    - **Do you not like using them.**

    - **Are they difficult to use?**

    - **Are they dangerous to use?**

23. Please tell us about any kitchen tools you want that would make cooking easier for you.

    - **How do you think they will help?**

    - **Are they safer to use.**

    - **Are they easier to use.**

Additional Question:

Note: If an advisor has alot of support, modify question to

- **What is the minimum support that you need to cook food by yourself, when you do not have your family, friend/caregiver or meal kit service to help you with menu selection, grocery shopping or cooking?**

Topic 5: Healthy eating resources

These questions are about the resources that can help you eat healthy.

Healthy eating resources are things that help you learn about good foods to eat.

They can show you what foods to eat, how to cook them, and how much to eat.

24. Where do you get healthy eating information?

    - Websites and apps
    - Books about food and nutrition
    - Recipes
    - People like dietitians and doctors who can give advice
    - Classes that teach you how to cook and eat better

25. Please tell us about any tips you use to find information/recipes about healthy eating.

26. Please tell us about any problems you have using healthy eating resources.

27. What resources would help make healthy eating easier for you?

Note: If an advisor has alot of support, modify question to

- **As an disability advisor/ individual with lived experience of cognitive disability, what resources do you think will help other individuals with cognitive disabilities to eat healthier?**

Topic 6: Recipes

These questions are about recipes that can help you make healthy food

28. Please tell us how you find recipes?

- In what form are they present?
- Printed on paper
- Online on the internet
- Read to you
- Videos

29. Please tell us what makes you choose a recipe.

- Is it based on
  - **How it is written**
  - **The picture of the food**
  - **The number of ingredients**
  - **The cook time**

30. Please tell us about any problems you have when you use recipes.

- Confusing words in the recipe
- Instructions that are too long or hard to follow
- The picture of the food does not look nice
- The ingredient list not being easy to find or understand
- The number of ingredients

- The cook time is very long

31. What would make recipes easier to use?

32. Please tell us about anything else that would help you use recipes.

Closing script for interview 2

This concludes our interview.

Would you like to share anything else about your experience with healthy eating?

If you have any questions about this study, you may contact us.

The contact information is listed in the information letter.

Thank you for taking the time to share your experiences with us.

We will email you in a few months to give you news of the project.

4. Baked chicken and vegetables

This meal can be eaten for lunch or dinner

Key info about this recipe

- It can take 45 minutes or more to make this meal.
- It is cooked in an oven.
- This recipe makes food for 4 people.
- Making this recipe will cost about $26.00.
    - It costs about $6.50 for one person.

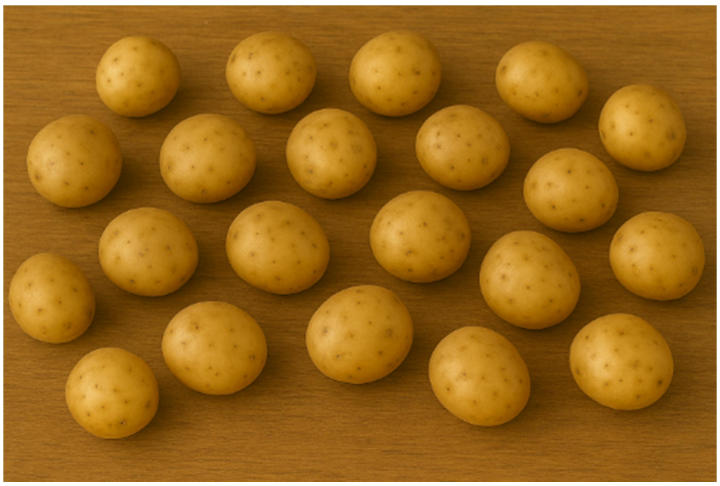
Nutritional info

Eating 1 serving will give you

Nutrient	**Amount**
Calories	463 kcal
Protein	37 g
Fat	22 g
Carbohydrate	72 g
Fiber	7.6 g
Sodium	457.5 mg

To cook this dish, you will need these ingredients:

Ingredient	**How much is needed**
Chicken breast	2 chicken breasts  • 2 chicken breasts are 1 pound or 450 g.
Italian seasoning mix	1 tablespoon of Italian seasoning mix 
Salt	1/2 teaspoon of salt 
Pepper	1/2 teaspoon of pepper

	
Olive oil	3 teaspoons of olive oil  • Each teaspoon will be used for a different step in the recipe
Small new potatoes • New potatoes are a type of small potato • You can use any type of small potato	18 small potatoes 
Plain yogurt	1 and 1/2 cups of yogurt

• Plain yogurt has no sugar. • You can use any type of plain yogurt. • You can use yogurt without fat if you want.	 • 1 and 1/2 cups are 375 ml.
Broccolini • Broccolini is a green leafy vegetable with a stem. • You can also use broccoli, rapini, or collard greens.	1 bunch 
Lemon juice	1 tablespoon of lemon juice 

	• 1 tablespoon is 15 ml.

How to cook food:

Steps	**Check steps that you have completed**
Step 1: Heat oven • Turn on oven to 350 °F.	☐
Step 2: Cut chicken breasts • Take out cutting board and knife. 	☐

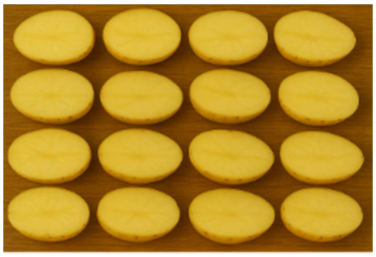
- Put 2 chicken breasts on cutting board. ☐
- Cut chicken breasts in half. ☐

Step 3: Season chicken

- Take a large bowl. ☐

- Put chicken pieces into bowl. ☐

• Add 1 teaspoon of olive oil to bowl. • Add 1 tablespoon of Italian seasoning to bowl. • Use your hands to mix chicken with olive oil and Italian seasoning. • Wash your hands with soap and water.	☐ ☐ ☐ ☐
Step 4: Prepare potatoes • Wash cutting board and knife with soap and water. • Rinse 18 small potatoes with water. • Put potatoes on cutting board. • Cut each potato in half.	 ☐ ☐ ☐ ☐

 • Put potatoes into a new bowl.	☐
Step 5: Season potatoes • Add 1 teaspoon of olive oil to bowl with potatoes. • Mix potatoes with olive oil.	☐ ☐
Step 6: Prepare food for oven • Take out a sheet pan. 	☐

• Put a large piece of parchment paper on sheet pan. o You can also use foil paper.	☐
• Add chicken pieces to one side of pan.	☐
• Add potato pieces to other side of pan. o Put flat side of potatoes face down on pan.	☐
• Sprinkle 1/2 teaspoon of salt over potatoes and chicken.	☐
• Sprinkle 1/2 teaspoon of pepper on potatoes and chicken.	☐
Step 7: Bake chicken and potatoes	
• Put pan in oven.	☐
• Set timer for 20 minutes.	☐

Step 8: Prepare greens • Rinse 1 bunch of greens with water. • Add broccolini to empty bowl used for potatoes. • Add 1 teaspoon of olive oil to bowl. • Mix greens with olive oil. • Wait for timer to ring.	 ☐ ☐ ☐ ☐ ☐
Step 9: Bake greens • When timer rings, take chicken and potatoes out of oven. • Put greens on top of with chicken and potatoes. • Put pan back in oven.	 ☐ ☐ ☐

• Set timer for 10 minutes. • When timer rings, take food out of oven. o Check greens with a fork to see if they are soft. o If they are not soft, put them back in oven for 5 minutes. • Add 1 tablespoon of lemon juice over broccolini.	☐ ☐ ☐
Step 10: Make dipping sauce • Take a small bowl.  • Put 1 1/2 cups of yogurt in bowl.	☐ ☐

• Add 2 teaspoons of dried oregano. • Mix with a fork. • Serve sauce with food.	☐ ☐ ☐
Your food is now ready to eat	

Tips to put food away

- Put leftovers into an air-tight container.

- Put container in fridge within 2 hours of cooking.
    - Food in fridge should be eaten within 5 days.
- Reheat food before eating.
- After reheating food, throw away leftover food that you don't eat.

5. Black bean and rice soup

This soup can be eaten as a meal for lunch or dinner

Key info about this recipe

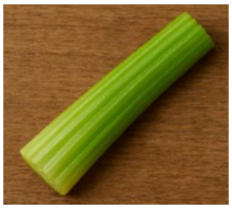
- It can take 65 minutes or more to make the soup.
- It is cooked on a stove.
- This recipe makes food for 8 people.
- Making this recipe will cost about $15.00.
    - It costs about $1.87 for 1 person.

Nutritional info

Eating 1 cup of soup will give you

Nutrient	**Amount**
Calories	154 kcal
Protein	6 g
Fat	3 g
Carbs	27 g
Fibre	6 g
Sodium	620 mg

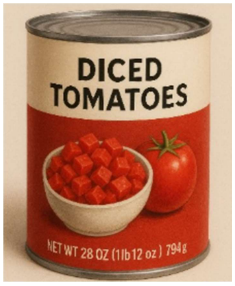
To cook this dish, you will need these ingredients:

Ingredient	**How much is needed**
Celery	1 stalk of celery 
Onion • You can use any color of onion.	1 onion 
Garlic	1 clove of garlic 

Fresh parsley	2 sprigs of parsley 

Vegetable Oil
 	
• You can use any other oil.
  o Olive oil
  o Canola oil
	1 tablespoon of vegetable oil
	 
	• 1 tablespoon is 15 ml.

Dried oregano	1 teaspoon of oregano 

Vegetable broth • You can use low sodium vegetable broth	6 cups of vegetable broth  • 6 cups are 1.5 litres. • You will need to buy 2 containers
Canned diced tomatoes	1 can of diced tomatoes  • 1 can is 28 ounces or 794 g.
Canned black beans	1 can of black beans

	 • 1 can is 19 ounces or 540 g.
Brown rice	1/2 of brown rice 
Ground black pepper	1/4 teaspoon of black pepper 

How to cook food:

Steps	**Check steps that you have completed**
Step 1: Cut celery	
• Take out cutting board and knife.  	☐
• Rinse celery stalk with water.	☐
• Put it on cutting board.	☐
• Cut celery in small pieces.	☐

 • Put cut celery on a plate. 	☐
Step 2: Cut onion • Put onion on cutting board. • Take its skin off. ○ Use a knife. • Cut onion into small pieces.	☐ ☐ ☐

 • Put cut onion onto plate with celery.	☐
Step 3: Cut garlic • Put one clove of garlic on cutting board. • Take its skin off. o Use a knife. • Cut garlic into very small pieces.  • Put cut garlic onto plate with celery and onion.	☐ ☐ ☐ ☐

Step 4: Cut parsley • Rinse parsley with water. • Put it on cutting board. • Cut parsley into very small pieces.  • Put cut parsley onto plate with celery.	☐ ☐ ☐ ☐
Step 5: Opening cans • Open can of tomatoes with a can opener.	☐

 • Open can of black beans with can opener. o Drain liquid from black beans in a large colander.  o Rinse beans with water. ♣ Shake off any extra water.	☐ ☐
Step 6: Cook the soup • Put a large pot on stove.	☐

- Turn on stove to medium high heat. ☐
- Add 1 tablespoon of oil to pot. ☐
- Let oil get hot. ☐
- Add vegetables from plate to pot. ☐
- Add 1 teaspoon of oregano to pot. ☐
- Cook vegetables for 5 minutes. ☐
    - Set a timer for 5 minutes.
    - Stir vegetables.
    - If they are still hard after the timer rings, set timer again and cook them for 5 more minutes.

Step 7: After 5 minutes.	
• Add 6 cups of vegetable broth to pot.  	☐
• Add can of tomatoes with liquid to pot.	☐
• Add beans to pot.	☐
• Add 1/2 a cup of brown rice to pot.	☐
• Add 1/4 teaspoon of black pepper to pot.	☐
• Let liquid in pot start boiling. o Boiling is when liquid starts to bubble in pot.	☐

Step 8: After boiling	
• Turn stove to low heat.	☐

• Let food cook for 45 minutes.
  o Set a timer for 45 minutes.
  o Stir the pot every 5 minutes.
  o If the rice is not soft after cooking for 45 minutes
  ▪ Set the time for 10 minutes more minutes and cook some more.
	☐

Your food is now ready to eat	

Tips to put food away

- Put leftovers into an air-tight container.

- Put container in fridge or freezer within 2 hours of cooking.
    - Food in fridge should be eaten within 5 days.
    - Food in freezer should be eaten in 3 to 6 months.
- Reheat food before eating.
- After reheating food, throw away leftover food that you don’t eat.

6. **Chickpea salad**

This is a salad that can be eaten as a meal for lunch or dinner

Key info about this recipe

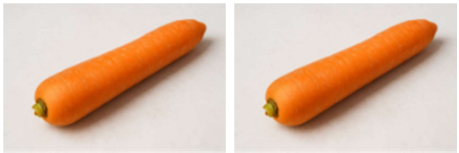
- It will take 10 minutes or more to make salad.
- It does not need any cooking.
- This recipe makes food for 6 people.
- Making this recipe will cost about $16.
    - It costs about $2.67 for 1 person.

Nutritional Info

Eating 1 serving of this salad will give you

Nutrient	**Amount**
Calories	94 kcal
Protein	3.6 g
Fats	2.7 g
Carbs	15.5 g
Fiber	3.9 g
Sodium	118 mg

To cook this dish, you will need these ingredients:

Ingredient	**How much is needed**
Cucumber	1 large cucumber 
Dried dill weed	1/2 teaspoon dried dill weed 
Carrots	2 carrots 

Canned chickpeas	1 can of chickpeas  • 1 can is 19 oz or 540 ml.
Grape tomatoes • you can use cherry tomatoes	1 pint of grape tomatoes  • 1 pint is about 283 g.
Balsamic vinegar	3 tablespoons of balsamic vinegar 

	• 3 tablespoons are 45 ml.
Basil pesto	1 tablespoon basil pesto  • 1 tablespoon is 15 ml.
Olive oil	2 teaspoons of olive oil  • 2 teaspoons are 10 ml.
Garlic	1 clove of garlic 

Ground black pepper	1/4 teaspoon of ground black pepper 

How to cook food

Steps	**Check steps that you have completed**
Step 1. Cut cucumber • Take out cutting board and knife. 	☐

- Rinse cucumber with water. ☐
    - If you want, you can take skin off the cucumber.
    - Use a peeler.

- Cut cucumber into slices. ☐

- Put cucumber into a big bowl. ☐

 • Add 1/2 teaspoon of dried dill to cucumbers. • Mix cucumber with dill.	☐ ☐
Step 2: Cut carrots • Wash 2 carrots. • Take their skin off. o Use a peeler. • Cut carrots into very small pieces. 	☐ ☐ ☐

• Add carrots to bowl with cucumber.	☐
Step 3: Cut tomatoes • Rinse tomatoes in water. • Cut each tomato in half.  • Add tomatoes to bowl with cucumber and carrots.	☐ ☐ ☐
Step 4: Add chickpeas • Open can of chickpeas using a can opener.	☐

- Drain liquid from chickpeas in a large colander.

- Rinse chickpeas with water. ☐
  - Shake off any extra water.
- Add chickpeas into bowl with cucumber, carrots and tomatoes. ☐

Step 5: Cut garlic

• Put a clove of garlic on cutting board. • Take its skin off. • Cut garlic into very small pieces. 	☐ ☐ ☐
Step 6: Make salad dressing • Take a small bowl.  • Add 3 tablespoons of balsamic vinegar to bowl.	☐ ☐

• Add 1 tablespoon of pesto to bowl.	☐
• Add 2 teaspoons of oil to bowl.	☐
• Add garlic to bowl.	☐
• Add 1/4 teaspoon of pepper to bowl.	☐
• Mix everything in bowl with a fork or a whisk.	☐
	
Or	
	

Step 7: When serving	
• Add mixture in the small bowl to the big bowl with chickpeas and vegetables.	☐
• Mix well with a large spoon.	☐
Your food is now ready to eat	

Tips to put food away

- Put leftovers into an air-tight container.

- Put container in fridge within 2 hours of making.
    - Food in fridge should be eaten within 5 days.

7. Chicken wrap

This is a meal that can be eaten for lunch or dinner

Key info about this recipe

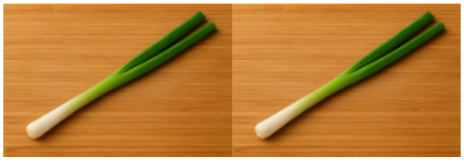
- It will take 15 minutes or more to make wraps.
- You do not need to cook these wraps.
- This recipe makes food for 4 people.
- Making this recipe will cost about $17.00.
    - It costs about $4.25 for 1 person.

Nutritional Info

Eating 1 wrap will give you

Nutrient	**Amount**
Calories	369 kcal
Protein	31 g
Fats	18 g
Carbs	21 g
Fiber	2 g
Sodium	399 mg

To cook this dish, you will need these ingredients:

Ingredient	**How much is needed**
Cooked chicken • Rotisserie chicken • Leftover chicken	2 cups of chicken. 
Bell pepper • You can use any color	1 small bell pepper 
Green onion	2 stalks of green onion 
Grated cheddar cheese	1/2 cup of grated cheddar cheese

• You can also use low fat or light cheese	
Tzatziki sauce	4 tablespoons of Tzatziki sauce  • 4 tablespoons are 1/4 cup or 60 ml.
Medium flour tortillas • you can also use corn tortilla**s**	4 tortillas 

How to make food:

Steps	**Check steps that you have completed**
Step 1: Cut green onion	
• Take out a cutting board and knife.  	☐
• Rinse 2 stalks of green onion in water.	☐
• Put the green onion on cutting board.	☐

• Cut them into small pieces. 	☐
• Add green onion to bowl. 	☐
Step 2: Cut green bell pepper	
• Wash one bell pepper.	☐
• Put it on cutting board.	☐
• Cut bell pepper into small pieces.	☐

 • Add it to bowl with green onion.	☐
Step 3: Prepare rotisserie chicken • Let rotisserie chicken cool down. • Use scissors to cut the string from chicken.  • Take the skin off from the chicken with a fork or your hands.	☐ ☐ ☐

• Use your fingers to take the meat off the bones.
  o Throw out fat
  o Throw out skin
  o Throw out bones
	☐

• Rip chicken into small pieces with your hands.	☐
• Measure 2 cups of chicken meat 	☐
• Add chicken to bowl	☐
• Wash hands with soap and water	☐
Step 3: Make mixture • Add into bowl with chicken and green onion,	

o 1/2 cup of cheddar cheese	☐
o 4 tablespoons of tzatziki sauce	☐
Step 4: Make tortilla roll	
• Put a tortilla on a plate	☐
• Add 1/2 cup of chicken mixture to the tortilla.	☐
• Spread mixture on tortilla.	☐
• Roll tortilla.	☐
Your food is now ready to eat	

Tips to put food away

- Put leftover chicken mixture or wraps in air-tight container.

- Put container in fridge within 2 hours of preparing.
    - Food in fridge should be eaten within 5 days.

8. Egg and vegetable quiche

This is a quiche that can be eaten for breakfast, lunch, or dinner

Key info about this recipe

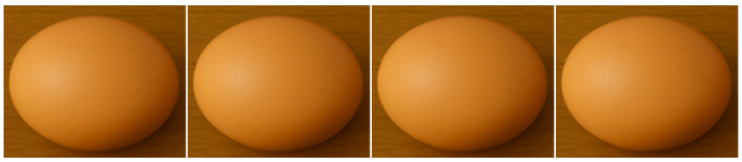
- It can take 30 minutes or more to make this quiche.
- It is cooked in an oven.
- This recipe makes food for 4 people.
- Making this recipe will cost about $10.
    - It costs about $2.5 for 1 person.

Nutritional Info

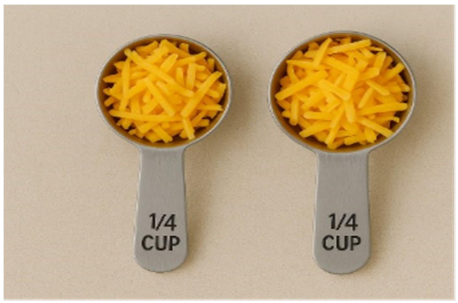
Eating 1 serving of quiche will give you

Nutrient	**Amount**
Calories	444 kcal
Protein	16.5 g
Fat	22.5 g
Carbohydrate	42 g
Fiber	9 g
Sodium	472.5 mg

To cook this dish, you will need these ingredients:

Ingredient	**How much is needed**
Small whole wheat tortillas	3 
Olive oil	1 tablespoon of oil  • 1 tablespoon is 15 ml.
Large eggs • You can use any kind of eggs	4 eggs 

Half and half cream	1/3 cup of half and half cream  • 1/3 cup is 83 ml.
Green onion	1 stalk of green onion 
Italian seasoning	1/4 teaspoon of Italian seasoning 
Frozen Broccoli	2 cups of frozen broccoli

	
Grated cheddar cheese	1/2 cup of grated cheddar cheese • You will need to separate the cheese into two • Each portion will be 1/4 cup 
Salt	1/2 teaspoon of salt

	
Ground black pepper	1/4 teaspoon of black pepper 

How to cook food:

Steps	**Check steps that you have completed**
Step 1: Heat oven • Turn on oven to 400°F.	☐

Step 2: Cut vegetables

- Take out cutting board and knife. ☐

- Take out frozen broccoli from the freezer.
- Take out 2 cups of broccoli.
- Measure out 2 cups of frozen broccoli ☐

- Put it into a microwave safe bowl ☐

- Microwave broccoli for 1 minute.
    - Take broccoli out of the microwave.
    - Drain water from broccoli using a big colander.

☐

- Cut broccoli into small pieces.

☐

- Put it on a plate

☐

Step 3: Cut green onion • Wash 1 stalk of green onion. • Put the green onion on cutting board. • Cut green onion into small pieces. 	☐ ☐ ☐
Step 4: Make egg mixture • Take out bowl. 	☐

• Crack eggs into bowl. o Hold 1 egg gently in one hand so that it doesn't break. o Tap the middle of the egg gently on the edge of the bowl. ♣ You want to crack it but not smash it. o Use your thumbs to pull the egg apart where the crack is. o Let the egg fall into the bowl. ♣ Take out any eggshell that falls inside the bowl. o Do this for each egg.	☐
• Add 1/3 cup of half and half cream to bowl.	☐
• Add 1/2 teaspoon of salt to bowl.	☐
• Add 1/4 pepper to the bowl.	☐

• Add 1/4 teaspoon of Italian seasoning to bowl. • Mix everything using a fork or whisk.  Or 	☐ ☐
Step 5: Mix vegetables and cheese • Add broccoli and green onion to bowl with eggs.	☐

• Add a 1/4 cup of cheese to bowl with eggs. • Mix everything using a spatula. 	☐ ☐
Step 6: Make quiche in pan • Take out a baking pan.  • Add 1 tablespoon of oil to pan. o Spread it all over pan • Place 3 tortillas in pan.	☐ ☐ ☐

○ Cover base of pan with tortillas. • Pour egg mixture over the tortillas. • Spread 1/4 cup of cheese on top of mixture.	 ☐ ☐
Step 7: Bake quiche • Put pan in oven. • Bake for 20 minutes. ○ Set timer for 20 minutes. • Take pan out of oven after timer rings. ○ Wear oven mitts. ○ Check to see if egg is cooked. ♣ If it is firm, it is done. ♣ If the egg is still runny, put it back in oven for 5 minutes.	 ☐ ☐ ☐

Step 8: Remove quiche from pan
 	
• L et quiche cool down for 30 minutes.
  o This will help it stay firm and not fall apart.
 	
• Loosen the quiche from the pan
  o Use a spatula to gently go around the edges of the quiche, between the pan and the tortilla
  o Slide the spatula under the quiche
 	
• Using the spatula lift the quiche carefully onto a plate.
 	
• Cut into 4 slices.
	☐
	
	☐
	
	☐
	
	☐

Your food is now ready to eat • You can reheat it in the microwave if you want.	

Tips to put food away

- Put leftovers into an air-tight container.

- Put container in fridge or freezer within 2 hours of cooking.
    - Food in fridge should be eaten within 5 days.
    - Food in freezer should be eaten in 3 to 6 months.
- Reheat food before eating.
- Throw away any leftover food that you don't eat after reheating food.

9. Tofu shakshuka

This is a dish that can be eaten as a meal for lunch or dinner

Key info about this recipe

- It can take 40 minutes or more to make this dish.
- It is cooked on a stove.
- This recipe makes food for 4 people.
- Making this recipe will cost about $12.50.
    - It costs about $3.13 for one person.

Nutritional info

Eating 1 serving of shakshuka with pita bread will give you

Nutrient	**Amount**
Calories	403 kcal
Protein	21.5 g
Fat	13.2 g
Carbohydrate	52 g
Fiber	7.3 g
Sodium	550 mg

To cook this dish, you will need these ingredients:

Ingredient	**How much is needed**
Firm tofu	1 pound block of firm tofu  • 1 pound is 454 g.
Vegetable oil • You can also use o Olive oil o Canola oil	1 tablespoon + 1 teaspoon of oil.  • 1 tablespoon is 15 ml. • 1 teaspoon is 5 ml.

Onion • You can use any color	1 onion 
Red bell pepper	1 red bell pepper 
Garlic	3 cloves of garlic 
Canned diced tomato	1 can of diced tomatoes

	 • 1 can is 28 oz or 794 ml.
Paprika	2 teaspoons of paprika 
Ground cumin	2 teaspoons of ground cumin 
Chilli powder	1/4 teaspoon of chili powder

	
Pita bread	4 pita breads 

How to cook food:

Steps	**Check steps that you have completed**
Step 1: Cut onion • Take out cutting board and knife.	☐

- Put onion on cutting board. ☐
- Take skin off onion. ☐
    - Use a knife.
- Cut onion into small pieces. ☐

- Put cut onion on a plate. ☐

	
Step 2: Cut red bell pepper • Rinse red bell pepper with water. • Put it on cutting board. • Cut pepper into small pieces.  • Add to plate with onion.	☐ ☐ ☐ ☐
Step 3: Cut garlic	

• Take skin off garlic. o Use a knife. • Put them on cutting board. • Cut garlic into very small pieces.  • Add to plate with onion and pepper.	☐ ☐ ☐ ☐
Step 4: Cut tofu • Put block of tofu on cutting board. • Take some paper towels. o Use to dry tofu.	 ☐ ☐

• Cut tofu into 9 equal pieces. 	☐
Step 5: Open can • Open can of diced tomatoes with a can opener. 	☐
Step 6: Cook tofu • Put a large non-stick frying pan on stove.	☐

- Turn stove to medium-high heat. ☐
- Add 1 tablespoon of oil to pan. ☐
    - Let it get hot.
- Add tofu pieces to pan. ☐
- Let tofu pieces become brown. ☐
    - Let tofu become light brown on one side. ☐
    - Turn each piece of tofu with a spatula. ☐
    - Do this till the tofu pieces are brown on all sides. ☐

• Take tofu out of pan and put onto a clean plate.	☐
Step 7: Cook vegetables	
• Add 1 teaspoon of oil to hot pan.	☐
• Add onion, bell pepper and garlic to pan.	☐
• Set timer for 5 minutes o Stir vegetables in pan	☐
Step 8: Cook with tomatoes and spices	
• After timer rings, add can of diced tomatoes to pan.	☐
• Add 2 teaspoons of paprika to pan.	☐
• Add 2 teaspoons of ground cumin to pan.	☐
• Add 1/4 teaspoon of chili powder to pan.	☐

• Stir everything with spatula. • Put lid on pan. • Turn heat to low. • Let the food cook for 10 minutes. o Set timer for 10 minutes. o Stir from time to time. o If onion and bell peppers are still hard, set timer for 5 more minutes.	☐ ☐ ☐ ☐ ☐ ☐ ☐
Step 9: Add tofu • Turn off heat after the vegetables are soft. • Add fried tofu to pan. o Mix with vegetables.	 ☐ ☐

• Put lid on pan. o Set a timer for 10 minutes. o Leave it sit for 10 minutes.	☐ ☐
Your food is now ready to eat • Eat shakshuka with pita bread.	

Tips to put food away

- Put leftover shakshuka into an air-tight container.

- Put container in fridge or freezer within 2 hours of cooking.
  - Food in fridge should be eaten within 5 days.
  - Food in freezer should be eaten in 3 to 6 months.
- Reheat food before eating.
- Throw away any leftover food that you don't eat after reheating food.

10. Tuna pasta

This pasta can be eaten as a meal for lunch or dinner

Key info about this recipe

- It can take 50 minutes or more to make this pasta.
- It is cooked on a stove.
- This recipe makes food for 8 people.
- Making this recipe will cost about $11.
    - It costs about $1.38 for 1 person.

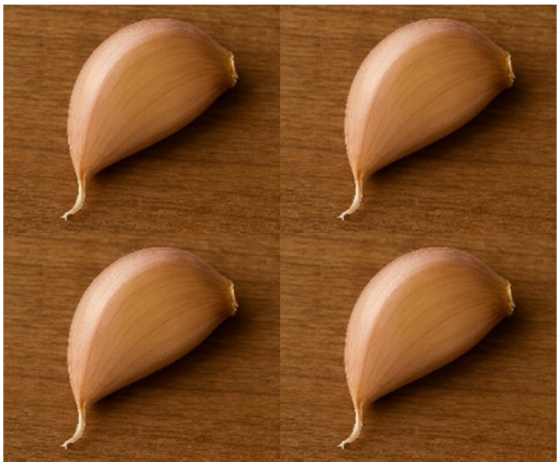
Nutritional Information:

Eating 1 bowl of pasta will give you

Nutrient	**Amount**
Calories	235 kcal
Protein	17 g
Fat	3 g
Carbohydrate	38 g
Fiber	6 g
Sodium	87 mg

To cook this dish, you will need these ingredients:

Ingredient	**How much is needed**
Broccolini • You can also use	1 bunch of broccolini

rapini or broccoli	
Garlic	4 cloves of garlic 
Hot pepper flakes	1/2 teaspoon of hot pepper flakes 
Tomato pesto	2 tablespoons of pesto.

• You can also use sundried tomato pesto	 • 2 tablespoons are 30 ml.
Olive oil	1 tablespoon of olive oil  • 1 tablespoon is 15 ml.
Canned diced tomatoes • Use the juice in the canned tomatoes as well.	1 cup of canned diced tomatoes  • 1 cup is 250 ml.

Canned tuna • You can use tuna with less salt	2 cans of tuna  • 1 can is 170 g.
Penne pasta You can also use • Whole wheat pasta • Any shape of small pasta	1 box of pasta  • 1 box of pasta is between 340 g and 410 g.

How to cook food:

Steps	**Check steps that you have completed**
Step 1: Cut rapini	
• Take out cutting board and knife.  	☐
• Rinse rapini with water.	☐
• Put it on cutting board.	☐
• Cut rapini into small pieces.	☐

Step 2: Cook rapini

- Take a large pot. ☐

- Fill pot with water. ☐
- Turn on stove to high heat.
- Boil water. ☐
    - Boiling is when water starts to bubble.
- Add rapini to boiling water. ☐

- Boil rapini for 10 minutes.
    - Set timer for 10 minutes. ☐
    - Stir it occasionally with a spatula. ☐

- Turn off heat after 10 minutes. ☐
- Drain water from boiled rapini.
    - Put a large colander in the sink. ☐

    - Put on oven mitts

○ Pour pot of water and rapini into colander ○ Keep your hands and face away from the hot water and steam.	☐ ☐
Step 3: Cutting garlic • Put 4 cloves of garlic on cutting board. • Take their skin off. ○ Use a knife. • Cut garlic cloves into very small pieces. 	☐ ☐ ☐
Step 4: Opening cans • Open can of diced tomatoes with can opener.	☐

 • Open 2 cans of tuna with can opener. o Remove liquid from tuna.	☐ ☐
Step 5: Cook tuna mixture • Take out a large non-stick frying pan.  • Put 1 tablespoon of olive oil into frying pan. • Put frying pan on stove. o Turn on stove to medium heat.	☐ ☐ ☐

• Add boiled rapini into pan. • Add chopped garlic to pan. • Add 1/2 teaspoon of hot pepper flakes to pan. • Cook all ingredients. o Set a timer for 4 minutes.	☐ ☐ ☐ ☐
Step 6: After the timer rings • Add 1 cup of diced tomatoes to pan. • Add 2 tablespoons of pesto to pan. • Add tuna to pan. • Stir everything with a spatula. • Cook for 10 minutes. o Set a timer for 10 minutes.	☐ ☐ ☐ ☐

• After timer rings, remove pan from stove.	☐ ☐
Step 7: Cook pasta • Take same large pot used for boiling rapini. • Fill pot with water. • Put the pot on the stove. o Turn stove to medium high. • Boil water. o Boiling is when water starts to bubble. • Add pasta to boiling water. • Cook pasta for 10 minutes. o Set a timer for 10 minutes. o Stir with spatula from time to time.	☐ ☐ ☐ ☐ ☐ ☐ ☐

• Turn off stove when the timer rings. • Take out 1/2 cup of pasta water. • Drain pasta. o Put a large colander in the sink. o Put on oven mitts o Pour pot of pasta into colander o Keep your hands and face away from the hot water and steam.	☐ ☐ ☐ ☐ ☐
Step 8: Cook pasta with tuna mixture • Add pasta to pan with tuna mixture. • Add 1/2 cup of pasta water to pan. • Mix everything with a spatula.	 ☐ ☐ ☐

• Turn off stove.	☐
Your food is now ready to eat • You can add parmesan cheese to your pasta if you want.	

Tips to put food away

- Put leftovers into an air-tight container.

- Put container in fridge or freezer within 2 hours of cooking.
    - Food in fridge should be eaten within 5 days.
    - Food in freezer should be eaten in 3 to 6 months.
- Reheat food before eating.
- Throw away any leftover food that you don't eat after reheating food.

11. Turkey chili

This chili can be eaten as a meal for lunch or dinner

Key info about this recipe

- It can take 40 minutes or more to make this chili.
- It is cooked on a stove.
- This recipe makes food for 8 people.
- Making this recipe will cost about $17.
    - It costs about $2.13 for 1 person.

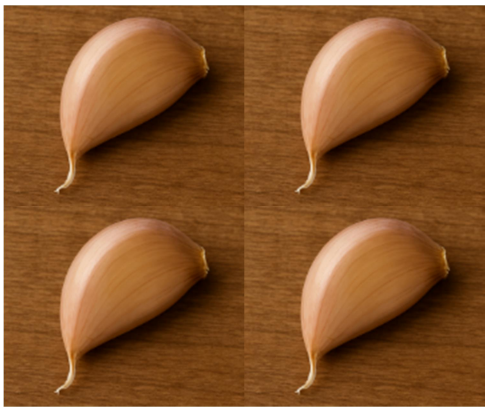
Nutritional info

Eating 1 serving of chili will give you

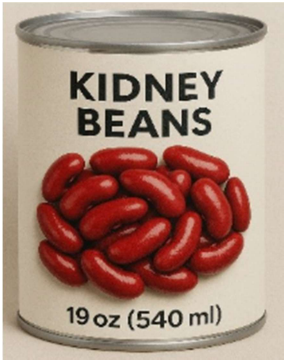
Nutrient	**Amount**
Calories	185 kcal
Protein	16 g
Fat	5 g
Carbohydrate	19 g
Fiber	6 g
Sodium	325 mg

To cook this dish, you will need these ingredients:

Ingredient	**How much is needed**
Ground turkey • You can also use ground chicken	1 pound of turkey  • 1 pound is 450 g.
Vegetable oil **You can also use** • Olive oil • Canola oil	2 teaspoons of oil.  • 2 teaspoons are 10 ml.
Onion	1 onion

• You can use any color of onion.	
Green bell pepper	1 green bell pepper 
Garlic	4 cloves of garlic 

Chilli powder • Use less if you do not like food that is spicy	1 tablespoon of chili powder 
Dried oregano	2 teaspoons of dried oregano 
Ground cumin	1 teaspoon of ground cumin 
Canned diced tomatoes	1 can of diced tomatoes

	 • 1 can is 28 oz or 794 ml.
Canned kidney beans	1 can of kidney beans.  • 1 can is 19 oz or 540 ml.
Tomato paste	1/4 cup of tomato paste.

	
Vegetable broth	1/2 cup of vegetable broth  • 1/2 cup is 125 ml.
Jalapeno pepper	1 Jalapeno pepper 

Bay leaves	2 bay leaves 

How to cook food:

Steps	**Check steps that you have completed**
Step 1: Cut onion • Take out cutting board and knife.	☐

- Take skin off onion. ☐
    - Use a knife.
- Cut onion into small pieces. ☐

- Put it on a plate. ☐

Step 2: Cut green pepper
 	
• Wash green pepper.
 	
• Put it on cutting board.
 	
• Cut green pepper into half.
  o Remove seeds from green pepper.
  o Cut green pepper into small pieces.
 	
 
 	
• Add it to plate with onion.
	☐
	
	☐
	
	☐

Step 3: Cut garlic • Take skin off 4 cloves of garlic. o Use a knife. • Put them on cutting board. • Cut garlic into very small pieces.  • Add garlic to plate with onion and bell pepper.	☐ ☐ ☐ ☐
Step 4: Cut jalapeño pepper • Wash 1 jalapeño pepper. • Put it on cutting board.	☐ ☐

• Cut jalapeño pepper into half. o Take out seeds and throw them away. o Cut the rest into very small pieces.  • Put them in a small bowl.	☐ ☐
Step 5: Open cans • Open can of diced tomatoes with a can opener.  • Open can of kidney beans with can opener. o Drain liquid from kidney beans in a large	☐ ☐

colander.  o Rinse beans with water in colander. o Shake the water from the kidney beans. • Open can of tomato paste ☐ o Measure out 1/4 cup ☐  	
Step 6: Cook vegetables • Put large saucepan on stove. ☐	

 • Turn stove to high heat. • Add 2 teaspoons of oil to pan. • Add vegetables from plate to pan. • Stir vegetables in pan with a spatula.  • Cook for 3 minutes until vegetables are soft. o Set a timer for 3 minutes.	☐ ☐ ☐ ☐ ☐ ☐
Step 7: Cook turkey	

• After the timer rings, add 1 pound of ground turkey to pan.	☐
• Stir turkey and vegetables. o Cook turkey until there is no pink. o Cook it until it is a little brown.	☐
• Add 1 tablespoon of chili powder to pan.	☐
• Add 2 teaspoons of dried oregano to pan.	☐
• Add 1 teaspoon of cumin to pan.	☐
• Add jalapeño pepper to pan.	☐
• Stir everything in pan.	☐
• Cook for 1 minute. o Set a timer for 1 minute.	☐ ☐

Step 8: Cook tomatoes and beans	
• Open a carton of vegetable broth.	☐
o Measure 1/2 cup of vegetable broth.	☐
	
• After the timer rings, add to pan	
o 1/2 of vegetable broth,	☐
o 1 can of diced tomatoes,	☐
o 1 can of kidney beans,	☐
o 1/4 cup of tomato paste.	☐
• Add 2 bay leaves to pan.	☐

• Cook until you start to see bubbles in pan.
• Cover pan with lid.
• Turn heat low.
• Cook for 20 minutes.
  o Set a timer for 20 minutes.
  o Stir from time to time.
	☐
	☐
	☐
	☐
	☐
	☐

Step 9: After the timer rings • The chili will become thick. • Take bay leaves out of the pan with a spoon.	 ☐ ☐
Your food is now ready to eat	

Tips to put food away

- Put leftovers into an air-tight container.

- Put container in fridge or freezer within 2 hours of cooking.
    - Food in fridge should be eaten within 5 days.
    - Food in freezer should be eaten in 3 to 6 months.
- Reheat food before eating.
- Throw away any leftover food that you don’t eat after reheating food.

12. Information letter manuscript 2

October 2025

Would you like someone to read this info to you?

Call us at:

Who are we?

My name is Melissa Fernandez.

I am a researcher at the University of Ottawa.

- A researcher studies a subject.
- And a researcher learns new things.

A researcher also tests new ideas.

I work with my student Noor Ul Huda.

- She is a student researcher.
- She is doing her master's degree.

We also work with Open.

We are doing research to make cooking easier for people with cognitive disabilities.

We got money to do this research from the Social Sciences and Humanities Research Council.

- They are a Canadian group that gives money to researchers to learn new things.

We want to invite you to take part in our study.

What are we doing?

We want to see if easy-to-read recipes can make cooking easier for people with cognitive disabilities.

We have made healthy recipes that are

- easy to read.
- easy to follow.
- low cost.

We want you to cook food using our recipes.

We want to know what you think about using our recipes.

We will ask you:

- Do you think the recipes are easy to understand?
- Do you think the recipes are easy to follow?
- Do you think the recipes are useful?

- Do you like the recipes?

Your experience is important for us.

Your experience will help us understand how to make our recipes better.

Do you have to be in this study?

No. You decide if you want to take part in our study.

We will not tell anyone if you do or do not want to be in our study.

You do not need to do anything if you do not want to take part in our study

What will I need to do in the study?

Make recipes

- You will get up to 3 recipes by email.
- You will get $50 to buy ingredients to make each recipe.
- You will cook food using the recipes we send you.
- You will cook in your own kitchen.

Talk to us about after you make each recipe.

- We will meet at times that work for you.
- We will meet 1 or 2 days after you make each recipe.
- You may refuse to answer any of the questions.

- You can answer anything to the questions.
- You may stop the meeting at any time.

We will meet by Teams or telephone.

- You can choose the one you prefer.
- You can email us your answers instead of talking.

Read documents about the study

- We will share a booklet with all the recipes at the end of the study.
- We will share the results of the study.
- You can choose to email your thoughts about these documents.
- You do not have to email your thoughts.

What are the dangers?

You may get some cuts or burns while making the recipes for this study.

How much time will the study take?

It will take you at least 3 weeks to do all the activities.

- You can make up to 3 recipes
- You can have up to 3 meetings

You will have 6 weeks to finish all the activities.

You will only make 1 recipe per week

- Making each recipe can take 2.5 hours

You will only have 1 meeting per week

- The first meeting will be 30 minutes long.
- The second meeting will be 30 minutes long.
- The third meeting will be 1 hour long.

What will I get for my time in the study?

For the first recipe, you will get

- $125 to make the recipe
- $25 to meet with us for 30 minutes

For the second recipe, you will get

- $125 to make the recipe
- $25 to meet with us for 30 minutes

For the third recipe, you will get

- $125 to make the recipe
- $50 to meet with us for 1 hour

The money you get is income.

What will you do with my info?

We will record the meetings on Teams.

We will delete the video recordings.

- You can turn your camera off if you do not want to be in the video.
- We will save the voice recordings for more than 5 years.

We will type out what we hear word-for-word.

- We will keep your words in files.
- We will study these words.

Files with your words will be saved for more than 5 years.

- These files will never have your name or any personal info.
- Files with your words can be shared with others.
- Files with your words can be posted online.

Your words can be used to tell others about studying

- In writing
- In an oral presentation

The student researcher can use your words to tell people about the study in their thesis.

- A thesis is a research report.

Will my info be kept private?

If you do not want anyone to know that you will be in this study, it is OK.

We will keep your info private.

- We will not tell anybody your name.
- Your name and personal info will never be shared with others.
- Only our research team will know what you said in our meetings.
- We will never share your voice recordings with others.
- We will only use your words in this study.

We will delete your personal info after 1 year.

How do I participate in this study?

You can call us at

Or email us at

We will ask your permission to use the info you share with us during this study.

Can I change my mind about being in your study?

Yes. You can leave the study at any time.

If you leave the study before you start any activities,

- You will not receive any money.
- We will delete all your info.
- We will not contact you again to get more info.

If I leave the study after you do some activities,

- You will get money for the activities that you did.
- Any voice recordings we made will stay in the study.
- We will not contact you again to get more info.

Your rights in research:

Do you have any questions about your rights?

Please call the University of Ottawa Office of Research and Integrity.

They can answer all your questions.

Their phone number is 613-526-5800 extension 5387.

Or email them at ethics@uottawa.ca.

Do you need help understanding this info?

If it's confusing, call us at:

Or email us at:

Let’s talk soon! Thank you.

Community Researcher: Munazza Tahir

Associate Director, Open Collaboration for Cognitive Accessibility

Email:

Phone:

Researcher: Melissa A. Fernandez

Assistant Professor, University of Ottawa

Email:

Phone:

Student Researcher: Noor Ul Huda

Master's student, University of Ottawa

Email:

Phone:

13. Consent form manuscript 2

October 2025

Would you like someone to read this info to you?

Call us at:

Do you have any questions about your rights?

Please call the University of Ottawa Office of Research and Integrity.

They can answer all your questions.

Their phone number is 613-526-5800 extension 5387.

Or email them at ethics@uottawa.ca.

How can you help our study?

We have made healthy recipes that are

- easy to read.
- easy to follow.

We want you to cook food using our recipes.

We want to know what you think about using our recipes.

We will ask:

- Do you think the recipes are easy to understand?
- Do you think the recipes are easy to follow?
- Do you think the recipes are useful?
- Do you like the recipes?

Your experience is important for us.

Your experience will help us understand how to make our recipes better.

1. Please Circle Yes or No		
I have read the invitation letter about the study	Yes	No
I have decided to be in the study.	Yes	No
I know I can get hurt when I cook. • I might cut myself • I might burn myself	Yes	No
I can stop taking part in the study at any time I want.	Yes	No
Researchers can use my info if I stop taking part in the study. • Any info already recorded will be kept. • Researchers will not contact me to get more info.	Yes	No

• I will still get money for any activities I did.		
2. Please Circle Yes or No		
I will buy the ingredients needed to make recipes • I will get $50 to buy ingredients for each recipe. • I will get a total of $150 to buy ingredients if I make all 3 recipes. • I will get the money before I go to the store to buy the ingredients. • The money I get to buy ingredients is not income.	Yes	No
I will cook food using the recipes. • I will get up to 3 recipes • I will only make 1 recipe per week	Yes	No
I will use my kitchen to cook from these recipes.	Yes	No

3. Please Circle Yes or No		
I will have 3 meetings to talk about making the recipes.	Yes	No

• All meetings will be on Teams. • A meeting will be scheduled after I make a recipe.		
Researchers can record our meetings on Teams. • I know they will save the recording of my voice for at least 5 years. • They will write out what I say word-for word. • They will study the words. • I know that only the researchers will hear my voice. • I know they will delete the video recording after the meeting. • I know I can turn off my camera if I do not want to be video recorded.	Yes	No
I know I can e-mail my answers instead of talking, if I want.	Yes	No

4. Please Circle Yes or No		
I know how much time the study will take It will take at least 3 weeks to do all the	Yes	No

activities. • Make at most 3 recipes • Have at most 3 meetings I will have 6 weeks to finish all the activities. I will only make 1 recipe per week Making each recipe can take 2.5 hours I will only have 1 meeting per week • The first meeting will take 30 minutes • The second meeting will take 30 minutes The third meeting will take 1 hour		

5. Please Circle Yes or No		
I know I can get up to $475 for doing the study. • I know I will only get money for activities that I do.	Yes	No

If I make the first recipe, I will get • $125 to make the recipe • $25 to meet for 30 minutes If I make the second recipe, I will get • $125 to make the recipe • $25 to meet for 30 minutes If I make the third recipe, I will get • $125 to make the recipe • $50 to meet for 1 hour I know that the money I get is income.		
I know the money is for • Making the recipe • Cleaning up after I make the recipe • Meeting with the researcher to share my experience	Yes	No
I know I can get the money if I leave my interview early.	Yes	No
I know I will get the money on the 15th of the month after each interview.	Yes	No

6. Please Circle Yes or No		
I know that the researchers will share with me the • recipe booklet • report of the findings.	Yes	No
I know that I can share my thoughts about the booklet and the report by email. • I know that researchers can use my thoughts about the report in the study. • I know I do not have to share my thoughts about the report.	Yes	No

7. Please Circle Yes or No		
Researchers can use my words to tell others about the study. I know my words might be shared • in writing.	Yes	No

• during an oral presentation. I know my words will be saved in files • these files can be shared with the others. • these files can be posted online.		
The student researcher can use my words to tell people about the study in their thesis. • A thesis is a research report.	Yes	No
I know the researchers will keep my name and personal info private. • Any files with my personal info will be deleted within 1 year. • I know my name or personal info will never be used to tell others about the study. • I know my name and personal info will never be used in files that are shared with others.	Yes	No

Do you understand this form?

If it's confusing, call us at

Name	Signature	Date

To keep a copy of this form

- You can print it.
- You can save it on your computer.

Community Researcher: Munazza Tahir

Associate Director, Open Collaboration for Cognitive Accessibility

Email:

Phone:

Researcher: Melissa A. Fernandez

Assistant Professor, University of Ottawa

Email:

Phone:

Student Researcher: Noor Ul Huda

Master's student, University of Ottawa

Email:

Phone:

14. Comprehensive interview guide manuscript 2

Meeting Guide: Making Recipes Easier

Telephone meeting guide with advisors to understand their experience of using adapted recipes

Meeting 1

Introduction

Hello [participant first name] my name is Noor Ul Huda. I am a Master's student at the University of Ottawa.

I work with Melissa Fernandez. She is my supervisor. She is a professor at the University of Ottawa.

We are working with Open on a study to make cooking easier for people with cognitive disabilities.

We have made healthy recipes that are easy to read and easy to follow.

You got 3 of these recipes to test.

In today's meeting, I will be asking you about your experience making the first recipe.

Your experience is important for us.

Your experience will help us understand how to make our recipes better.

Housekeeping and informed consent

This meeting will last about 30 minutes.

There are no right or wrong answers to my questions.

You do not have to answer my questions.

You can stop the meeting at any time.

You can leave the study at any time.

- The data we collect from you before you leave the study will still be used.
- We will not contact you again if you want to leave the study.
- You will still get some money for the activities you did in if you leave the study early.

This meeting will be recorded.

- Your voice will be saved.
- The video recording will be deleted.
- You can turn off your camera if you do not want to be seen in the video.

Do you have any questions about the study?

Do you want to start the meeting?

Let's begin.

Questions:

What recipe did you make this week?

1. On a scale of 1 to 5, how easy was it to find all the ingredients for the recipe?
    - 1 means very easy
    - 5 means very hard

2. On a scale of 1 to 5, how easy was it to bring all the ingredients home?

- 1 means very easy
- 5 means very hard

3. On a scale of 1 to 5, how easy was it to understand the words used in the recipe?

- 1 means very easy
- 5 means very hard

4. On a scale of 1 to 5, how easy was it to understand the steps in the recipe?

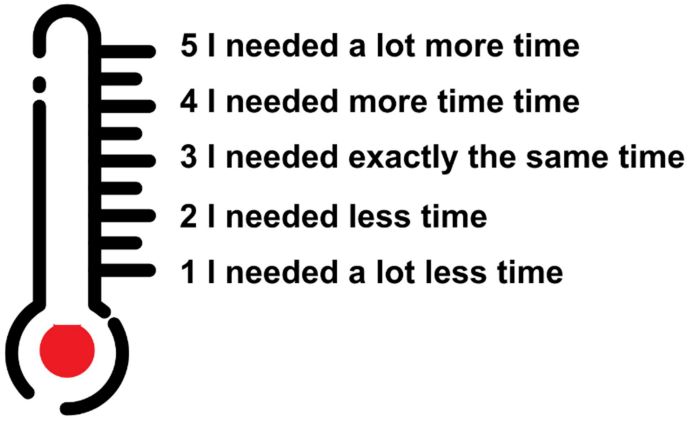
- 1 means very easy
- 5 means very hard

5. On a scale of 1 to 5, how easy was it to follow the steps in the recipe?

- 1 means very easy
- 5 means very hard

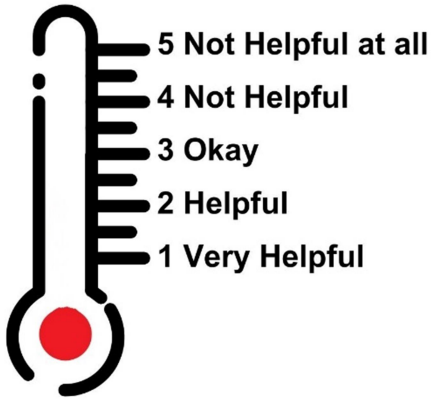
6. On a scale of 1 to 5, how close was the cooking time listed in the recipe to the amount of time it took you to make?

- 1 means more than enough time
- 5 means not nearly enough time



7. On a scale of 1 to 5, how helpful was the recipe?

- 1 means very helpful
- 5 means not at all helpful

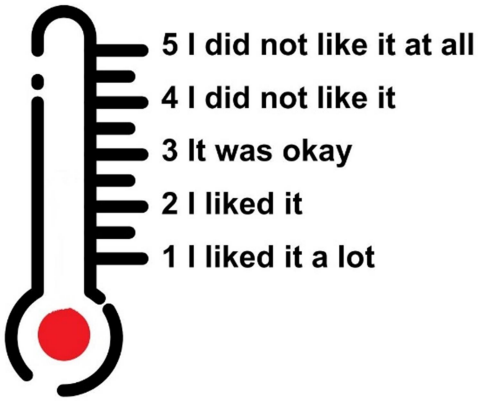


8. On a scale of 1 to 5, how easy was it to find the kitchen tools needed to make the recipe?

- 1 means very easy
- 5 means very hard

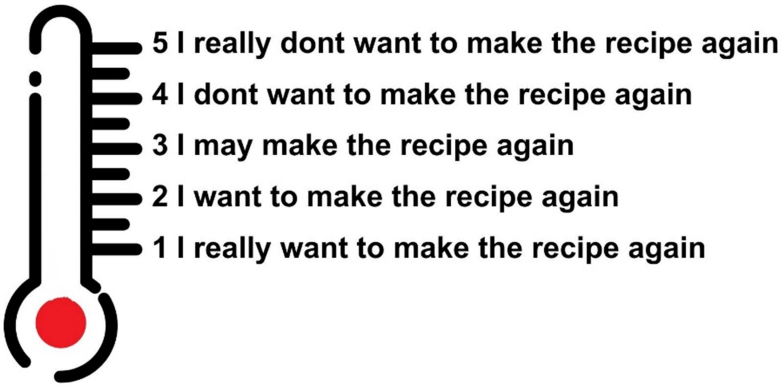
9. On a scale of 1 to 5, how much did you like the food that you cooked?

- 1 means I liked it a lot
- 5 means I didn't like it at all



10. On a scale of 1 to 5, would you make this recipe again?

- 1 means I would really want to make the recipe again
- 5 means I would really don't want to make the recipe again



Closing for meeting 1

This brings us to the end of our meeting.

Would you like to share anything else?

If you have any questions about this study, you may contact us.

The contact information is listed in the information letter.

Thank you for taking the time to talk with me today.

We will meet again on [Insert Date] to talk about the second recipe.

Meeting 2

Hello [participant first name].

Thank you for meeting with me again today.

Today, I will be asking you about your experience making the second recipe.

Housekeeping and informed consent

This meeting will last about 30 minutes.

There are no right or wrong answers to my questions.

You do not have to answer my questions.

You can stop the meeting at any time.

You can leave the study at any time.

- The data we collect from you before you leave the study will still be used.
- We will not contact you again if you want to leave the study.
- You will still get some money for the activities you did in if you leave the study early.

This meeting will be recorded.

- Your voice will be saved.
- The video recording will be deleted.
- You can turn off your camera if you do not want to be seen in the video.

Do you have any questions about the study?

Do you want to start the meeting?

Let's begin.

Questions:

What recipe did you make this week?

1. On a scale of 1 to 5, how easy was it to find all the ingredients for the recipe?
    - 1 means very easy
    - 5 means very hard

2. On a scale of 1 to 5, how easy was it to bring all the ingredients home?
    - 1 means very easy
    - 5 means very hard

3. On a scale of 1 to 5, how easy was it to understand the words used in the recipe?

- 1 means very easy
- 5 means very hard

4. On a scale of 1 to 5, how easy was it to understand the steps in the recipe?

- 1 means very easy
- 5 means very hard

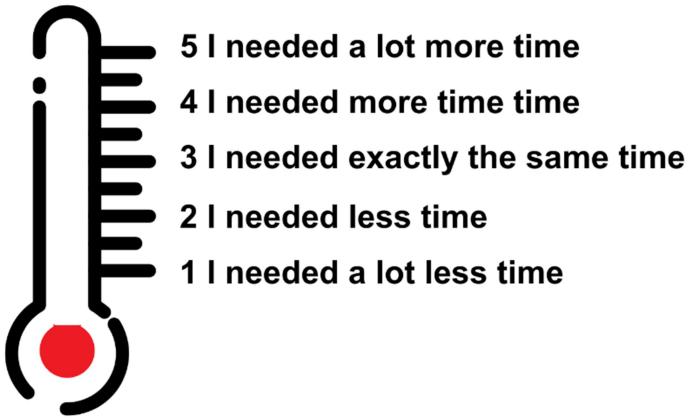
5. On a scale of 1 to 5, how easy was it to follow the steps in the recipe?

- 1 means very easy

- 5 means very hard

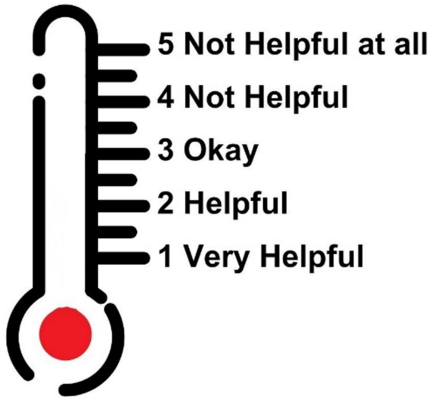
6. On a scale of 1 to 5, how close was the cooking time listed in the recipe to the amount of time it took you to make?

- 1 means more than enough time
- 5 means not nearly enough time



7. On a scale of 1 to 5, how helpful was the recipe?

- 1 means very helpful
- 5 means not at all helpful

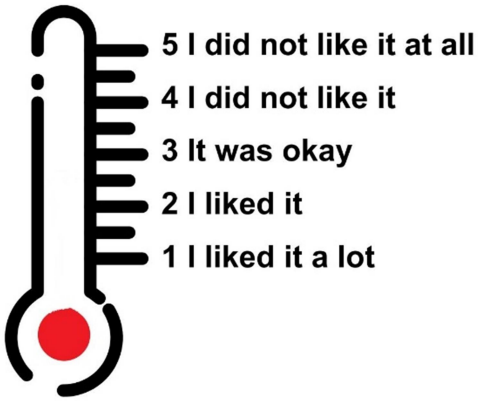


8. On a scale of 1 to 5, how easy was it to find the kitchen tools needed to make the recipe?

- 1 means very easy
- 5 means very hard

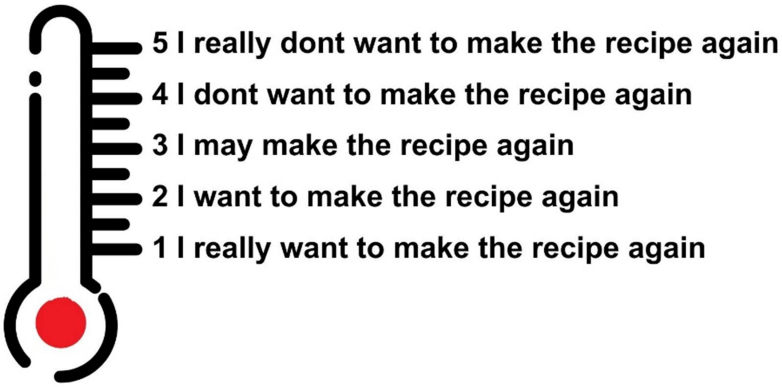
9. On a scale of 1 to 5, how much did you like the food that you cooked?

- 1 means I liked it a lot
- 5 means I didn't like it at all



10. On a scale of 1 to 5, would you make this recipe again?

- 1 means I would really want to make the recipe again
- 5 means I would really don't want to make the recipe again



Closing for meeting 2

This brings us to the end of our interview.

Would you like to share anything else?

If you have any questions about this study, you may contact us.

The contact information is listed in the information letter.

Thank you for taking the time to talk to me today.

We will meet again on [Insert Date] to talk about the third recipe.

We will also talk about what you think about all the recipes.

The next meeting will last 1 hour.

Meeting 3

Hello [participant first name].

Thank you for meeting with me again today.

Today, I will be asking you about your experience making the third recipe and what you think about all our recipes.

Housekeeping and informed consent

Today's meeting will last about 1 hour.

Today, I will first ask your experience

- making the third recipe.
- using all the recipes.

There are no right or wrong answers to my questions.

You do not have to answer my questions.

You can stop the meeting at any time.

You can leave the study at any time.

- The data we collect from you before you leave the study will still be used.
- We will not contact you again if you want to leave the study.
- You will still get some money for the activities you did in if you leave the study early.

This meeting will be recorded.

- Your voice will be saved.

- The video recording will be deleted.
- You can turn off your camera if you do not want to be seen in the video.

Do you have any questions about the study?

Do you want to start the meeting?

Let's begin.

Questions:

Questions about recipe 3:

What recipe did you make this week?

1. On a scale of 1 to 5, how easy was it to find all the ingredients for the recipe?
    - 1 means very easy
    - 5 means very hard

2. On a scale of 1 to 5, how easy was it to bring all the ingredients home?
    - 1 means very easy

- 5 means very hard

3. On a scale of 1 to 5, how easy was it to understand the words used in the recipe?

- 1 means very easy
- 5 means very hard

4. On a scale of 1 to 5, how easy was it to understand the steps in the recipe?

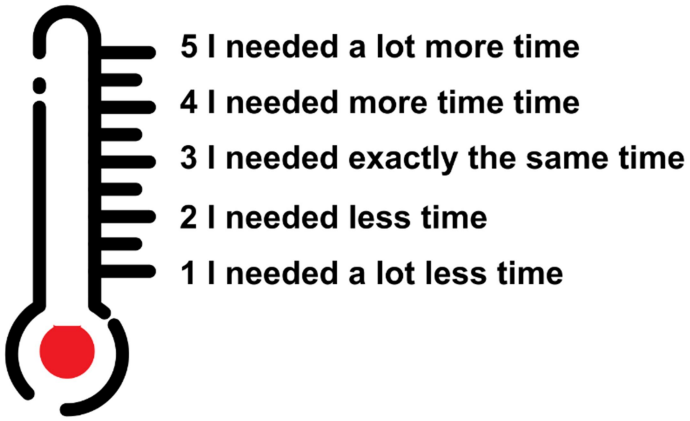
- 1 means very easy
- 5 means very hard

5. On a scale of 1 to 5, how easy was it to follow the steps in the recipe?

- 1 means very easy
- 5 means very hard

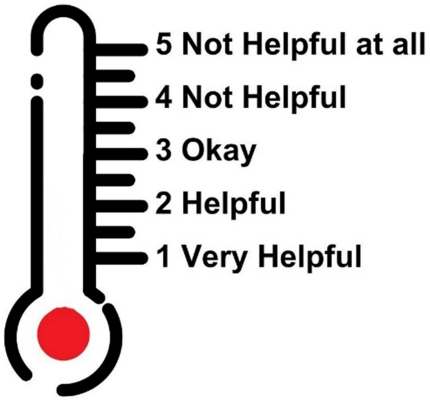
6. On a scale of 1 to 5, how close was the cooking time listed in the recipe to the amount of time it took you to make?

- 1 means more than enough time
- 5 means not nearly enough time



7. On a scale of 1 to 5, how helpful was the recipe?

- 1 means very helpful
- 5 means not at all helpful

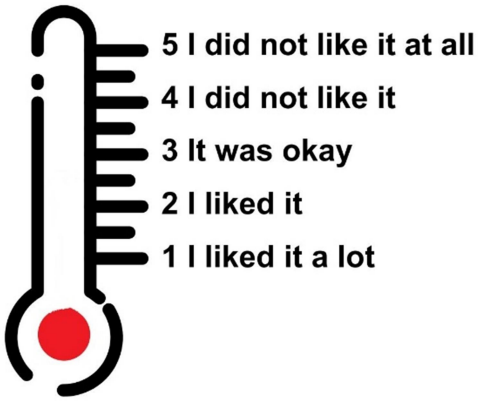


8. On a scale of 1 to 5, how easy was it to find the kitchen tools needed to make the recipe?

- 1 means very easy
- 5 means very hard

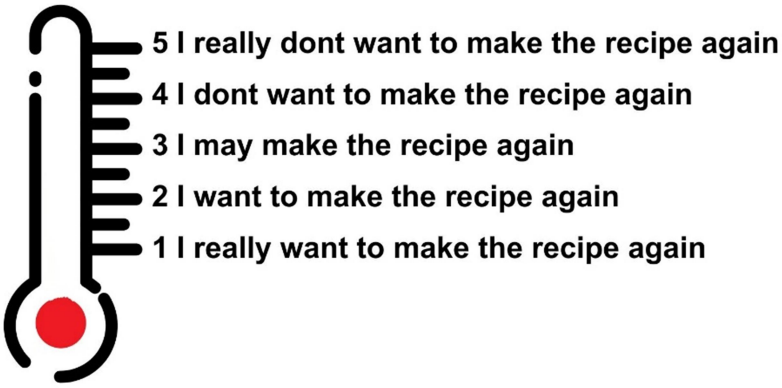
9. On a scale of 1 to 5, how much did you like the food that you cooked?

    - 1 means I liked it a lot
    - 5 means I didn't like it at all



10. On a scale of 1 to 5, would you make this recipe again?

    - 1 means I would really want to make the recipe again
    - 5 means I would really don't want to make the recipe again



Questions about all 3 recipes:

Now, I have some follow-up questions about the three recipes you made.

11. How easy were the recipes to use?
    - Prompts based on answers from previous questions.
    - Prompt: easier/harder than other recipes
12. How did you like the recipes?
    - Prompts based on answers from previous questions.
    - Prompt: what did you like the most/ the least
    - Prompt: ingredients, taste, how the information is written
13. How useful were the recipes?
    - Prompts based on answers from previous questions.
    - Prompts:
        i. key info about the recipe
        ii. the nutritional info
        iii. the ingredients table,
        iv. the number of steps in the recipe
        v. the tips to put food away
    - Prompt: more useful/less useful than other recipes
14. What other information would you want to see in our recipes?
15. What do you think we can do to make our recipes better?
16. Optional questions (time providing).

- What other tools would make cooking easier for you?

Closing for meeting 3

This brings us to the end of our meeting.

Would you like to share anything else about your experience cooking with the recipes?

We will email you in a few months to share

- a booklet of all the recipes
- a report of the results from the study

You can email us your thoughts about the booklet and the report

- you do not have to email us your thoughts.

If you have any questions about this study, you may contact us.

The contact information is in the information letter.

Thank you for sharing your experience with us.