

What are the experiences of adults using nutrition mobile apps for weight management?



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Research Showcase
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Background

- In Canada, many adults do not meet nutrition (and physical activity) recommendations (Colley et al 2011; Garriguet et al 2007; Garriguet et al 2007)
 - 2/3 of Canadian adults live with overweight or obesity (2012-13 Canadian Health Measures Survey)
- Approaches (e.g., behaviour self-monitoring, goal setting and tracking, motivation and reinforcement) have been shown to help individuals change their nutrition and physical activity behaviours
 - Mobile apps have increased in popularity to deliver these approaches

Lose Weight With Your Smartphone

By Lolita Carrico | Tuesday, July 20th, 2010 at 7:11 am

Weight loss made easy with smartphone apps

Mom says app helped her to lose weight

Apps can track exercise and count calories

Using Your Phone to Lose Weight

By KAREN BARROW | July 16, 2010, 12:25 PM | [Comments \(65\)](#)

Smartphone app tracks eating habits, helps people lose weight

By Kelli Whitlock Burton | Sep. 24, 2015, 12:00 PM

Nutrition and fitness help is as close as your smartphone

By Mark Lewis | @MLewisWTOP
October 18, 2016 4:12 pm



Eating healthy? There's an app for that

Originally published January 27, 2016 at 7:00 am | Updated January 28, 2016 at 2:02 pm

PATIENT MONEY

Losing Weight the Smartphone Way, With a Nutritionist in Your Pocket

Background

- Reasons for the interest in nutrition mobile apps:
 - Mobile devices and apps are commonly used in the general population
 - Broad reach
 - Versatile
 - Potentially better able to support behaviour change vs. some traditional methods

Background

We conducted a web-based survey of Canadian dietitians in early 2012

- 54.2% of respondents indicated a client had asked them about or used a nutrition/food app
 - 58.7% of these respondents reported seeing these clients 1-2 times/month or more often
 - Weight management was the most common nutrition concern of clients asking about or using nutrition/food apps
- 40.5% of respondents had recommended mobile apps to clients in their practice

Use of Mobile Device Applications In Canadian Dietetic Practice

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Can J Diet Pract Res. 2014;75:41-47

Background

- Several peer-reviewed studies have examined the effectiveness of nutrition mobile apps for behaviour change
- Some common research questions:
 - Does self-monitoring using a mobile app result in more weight loss (or behaviour change) vs. self-monitoring using a paper-record diary?
 - Does using a mobile app result in more weight loss (or behaviour change) vs. other methods (e.g., usual care)?

Background

- Effectiveness studies have been summarized in several literature reviews including...
 - **Flores Mateo et al.** J Med Internet Res. 2015;17(11):e253
 - **DiFilippo et al.** J Telemed Telecare. 2015;21(5):243-53
 - **Aguilar-Martínez et al.** J Telemed Telecare. 2014;20(6):339-49
 - **Stephens and Allen.** J Cardiovasc Nurs. 2013;28(4):320-9
 - **Lieffers and Hanning.** Can J Diet Pract Res. 2012;73(3):e253-60

Background

- Key findings from effectiveness studies...
 - Findings were mixed, but overall these studies suggest that nutrition mobile apps can be effective
 - Poor adherence to nutrition mobile apps is common despite portability
 - Use is higher at the beginning and then drops off over time
 - Law of Attrition (Eysenbach, 2001)
- Few studies in real-world settings

Background

- Few qualitative data are available on user experiences and perspectives with nutrition mobile apps
 - Recent qualitative studies also have limitations such as...
 - samples that only include nutrition students
 - having participants use apps for the purpose of the study
 - combining results for several different types of electronic approaches (e.g., websites, mobile apps, etc.)

This research gap was addressed with the following studies:

- Adult experiences using any publicly available nutrition mobile app for weight management (Study #1)
- Evaluation of Dietitians of Canada's eaTracker® mobile app (Study #2)

Methods – Study #1

■ Eligibility

- Healthy adults ≥ 18 years of age who had used any nutrition mobile app for weight management for ≥ 1 week within the past 3-4 months

■ Recruitment (February-December 2015)

- Community-based recruitment in both southern Ontario and Edmonton, Alberta
 - Recruitment posters in public locations (e.g., libraries)
 - Social media
 - Online classifieds (e.g., Kijiji)
 - Waterloo Region dietitians email list
 - University of Waterloo channels (e.g., posters, email lists)
- Word-of-mouth advertising

Methods – Study #1

- All participants completed a one-on-one semi-structured interview
- Interviews were transcribed verbatim, coded, and organized into thematic categories and subcategories using NVivo 10 (QSR Int, Doncaster Australia)

Results – Study #1

- n=24 participants
 - n=19 were female; n=15 were 18-30y
- Average interview length: ~58mins (range: 35-102mins)
- Nutrition apps most recently used by participants:



MyFitnessPal®
(n=14 participants)



MapMyRide®
(n=3 participants)



S Health®
(n=2 participants)



fitbit®
(n=2 participants)



Fitocracy Macros®
(n=1 participant)



MyNetDiary Calorie Counter PRO®
(n=1 participant)

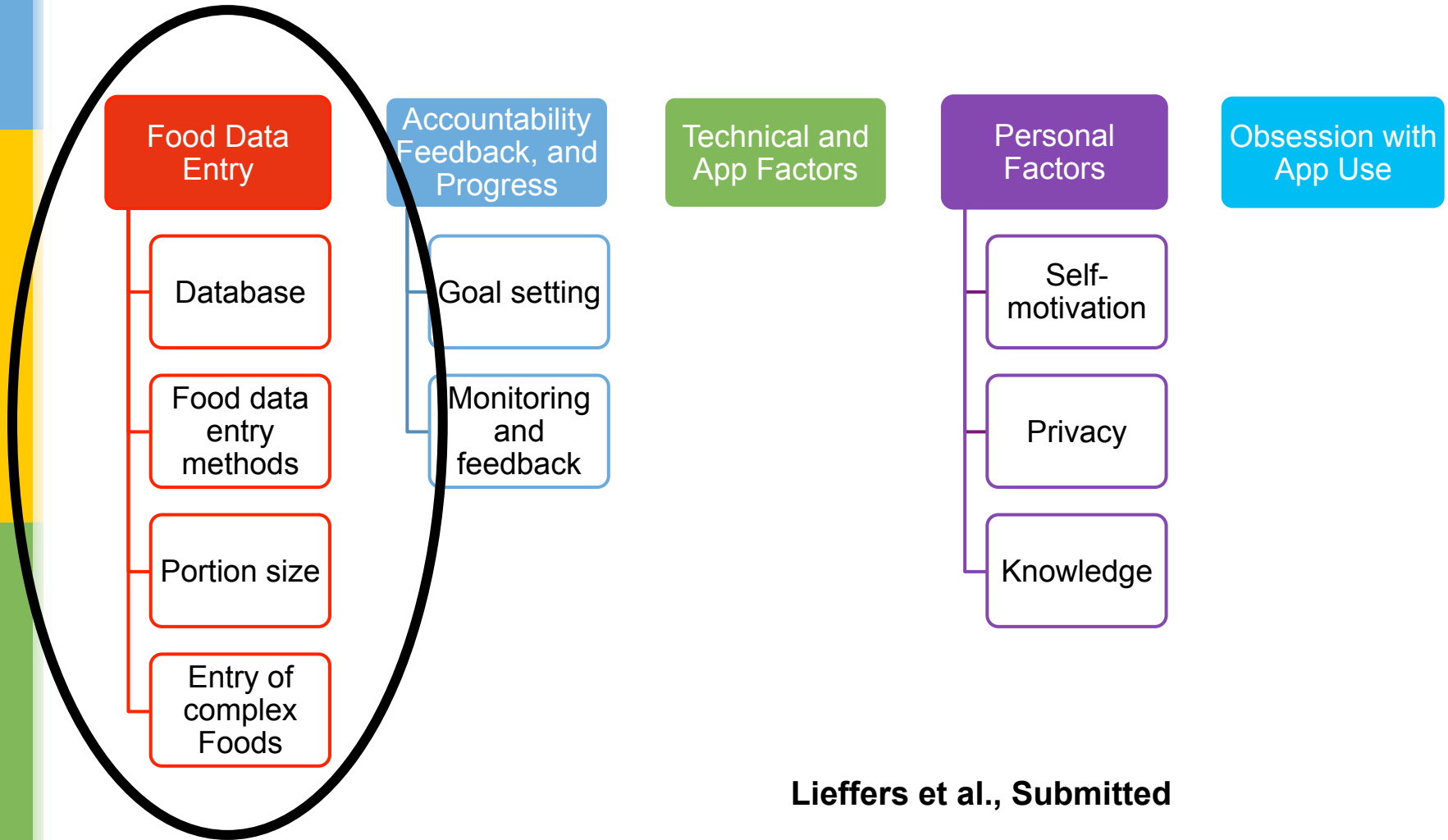


Weight Watchers®
(n=1 participant)

Results – Study #1

- **Finding out about and choosing apps**
 - 11 out of 24 participants only tried one nutrition app

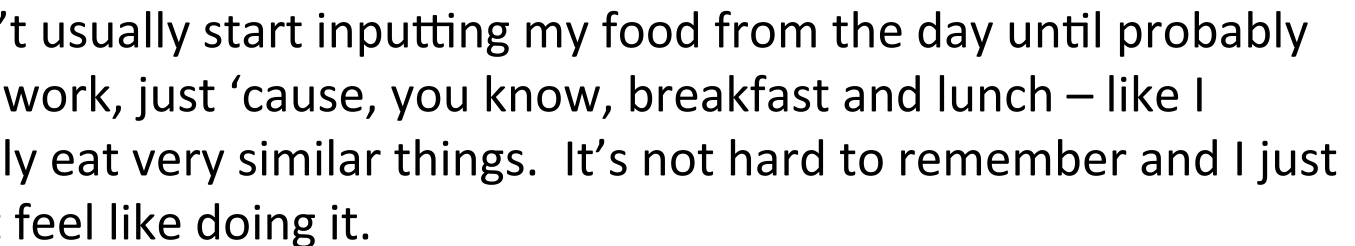
Results – Study #1



Lieffers et al., Submitted

Food Data Entry

- Different patterns of mobile app data entry were reported including...
 - after every eating occasion
 - pre-planning intake
 - end of day



I don't usually start inputting my food from the day until probably after work, just 'cause, you know, breakfast and lunch – like I usually eat very similar things. It's not hard to remember and I just don't feel like doing it.

Food Data Entry

■ Database

- Liked databases that had a large selection of foods
 - Felt they were more convenient, easier to use, and avoided the need to find substitutions compared to when using apps with smaller food databases
 - However, large food databases were sometimes overwhelming

I put, for example, like, bread and it turn out like, a huge list of bread and ...it took me a long time to figure out which one I...I eat so I find it's not very convenient...

Food Data Entry

- **Database (continued)**
 - Mixed feelings on database accuracy
 - Some participants felt mobile app food databases were accurate, trusted them, and had no major concerns
 - Others were unsure about information accuracy/currency or had concerns with data limitations (e.g., only calorie data provided, missing micronutrient data)

...there's some really funny entries on [*name of app*]. Just like, “oh, 300 grams of meat is only 50 calories.” Of course not, right? You know, so like you have to go in with like already a sense of what you’re eating.

Food Data Entry

- **Data Entry Methods**

- Short-cuts (e.g., favourites, multi-add)
 - Well liked and commonly used for foods eaten over and over again (e.g., breakfast)
 - Made apps easier to use over time

Food Data Entry

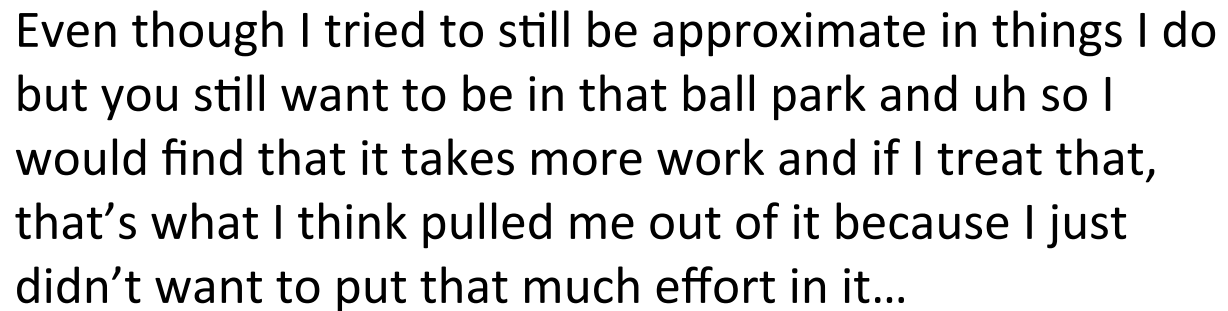
- **Data Entry Methods (continued)**
 - Barcode scanners
 - Overall, barcode scanners were well liked
 - Concerns included...
 - missing foods (e.g., in-store baked goods)
 - only being useful for packaged foods
 - incompatible with their device (e.g., tablet, smartphone with poor quality camera).
 - poor accuracy

The barcode scanner is pretty helpful. But there's a lot of times I found it's not accurate, it'll be close or it'll get something that someone else has put in that maybe you know the product has changed a little bit since then.

Food Data Entry

■ Portion Size

- Portion size was difficult to quantify while using apps



Even though I tried to still be approximate in things I do but you still want to be in that ball park and uh so I would find that it takes more work and if I treat that, that's what I think pulled me out of it because I just didn't want to put that much effort in it...

- Units available for portion size data entry were sometimes limited (e.g., only grams available) which presented a challenge for some users

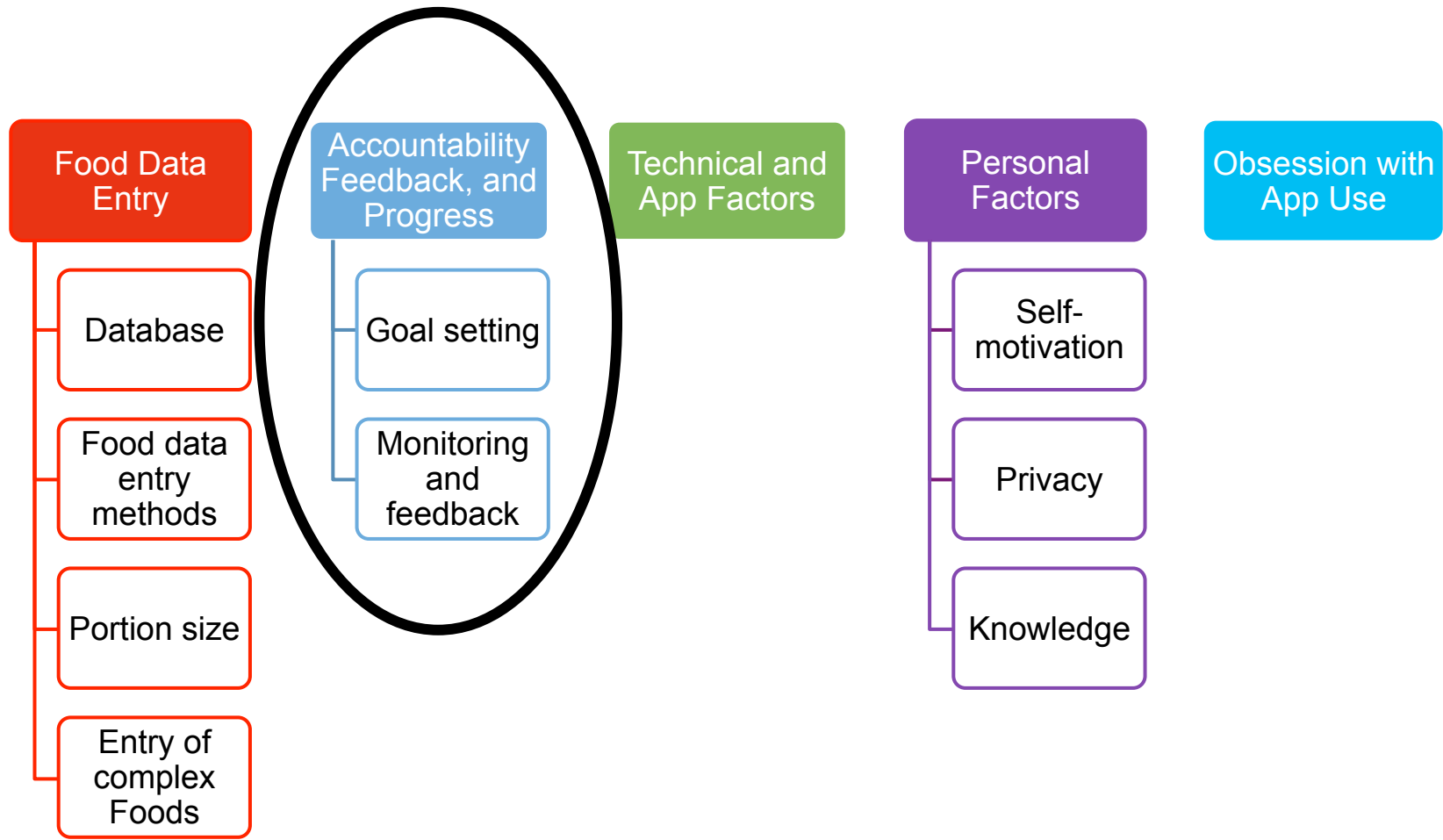
Food Data Entry

■ Complex Foods

- Entry of mixed dishes and foods prepared away from home (e.g., restaurant foods) was a tedious, time consuming, and difficult process for some users
- Reason to stop use for some

...the second you get something that's been like cooked or baked you have to input all the ingredients manually and then it's just, it takes so much longer and it completely demotivates you to record that food.

Results – Study #1



Lieffers et al., Submitted

Accountability, Feedback and Progress

■ Goal Setting

- Generally liked goal setting features in apps
- However, some found goal suggestions inappropriate

I don't trust their calculations. I think, for me, twelve hundred calories is not enough.

Accountability, Feedback and Progress

■ **Monitoring and Feedback**

- Many participants felt that nutrition apps were very helpful for accountability
- Helped them to develop more awareness and consciousness of dietary behaviors, and allowed them to reflect on behaviors

Accountability, Feedback and Progress

- **Monitoring and Feedback (continued)**
 - Used a variety of graphs and numbers to monitor feedback
 - Red/green colour coding and negative messaging had the potential to evoke some negative emotions

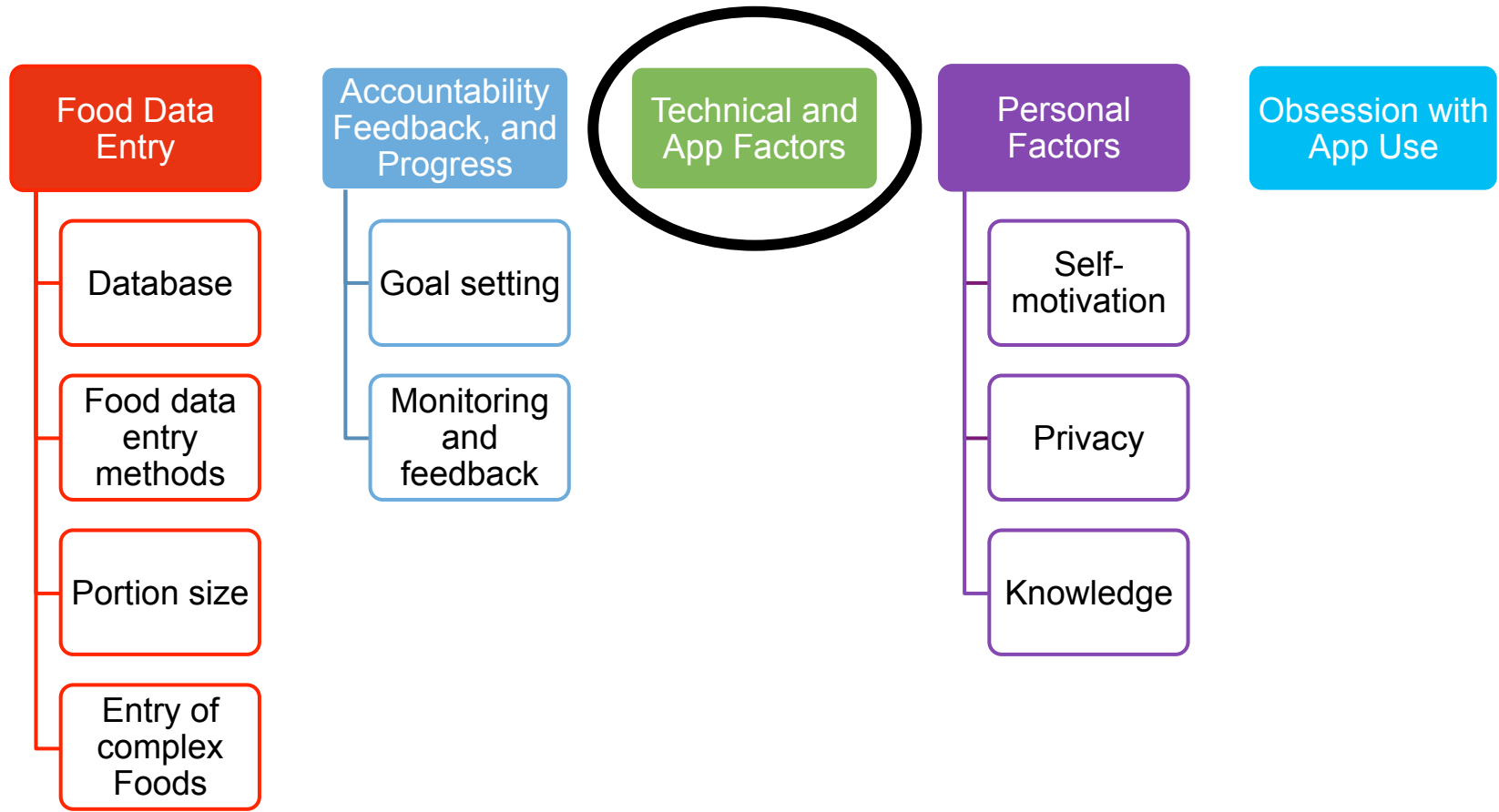
I feel that [*this color coding*] can lead to some really bad like obsessions, it's like negative whatever...

Accountability, Feedback and Progress

- **Monitoring and Feedback (continued)**
 - Some nutrition mobile apps tracked how many days in a row data were recorded
 - Not wanting to lose a data recording streak motivated some participants to continue using the app

...for your streak of a hundred and ninety-five days...they do track it...and then they know around near the middle of the day or end of the day, it's like, "Hey," you know, "you haven't logged anything in. You don't want to lose your streak," or whatever so that was...that was a little bit of...sort of draws a little bit of your competitive nature and going, "Oh yeah, I'm not losing this. I'll take the...the three minutes and plug it all in."

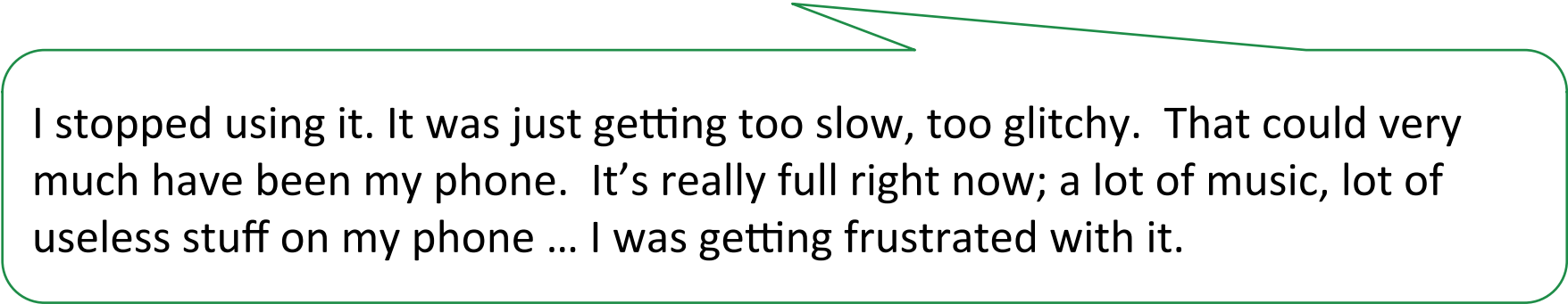
Results – Study #1



Lieffers et al., Submitted

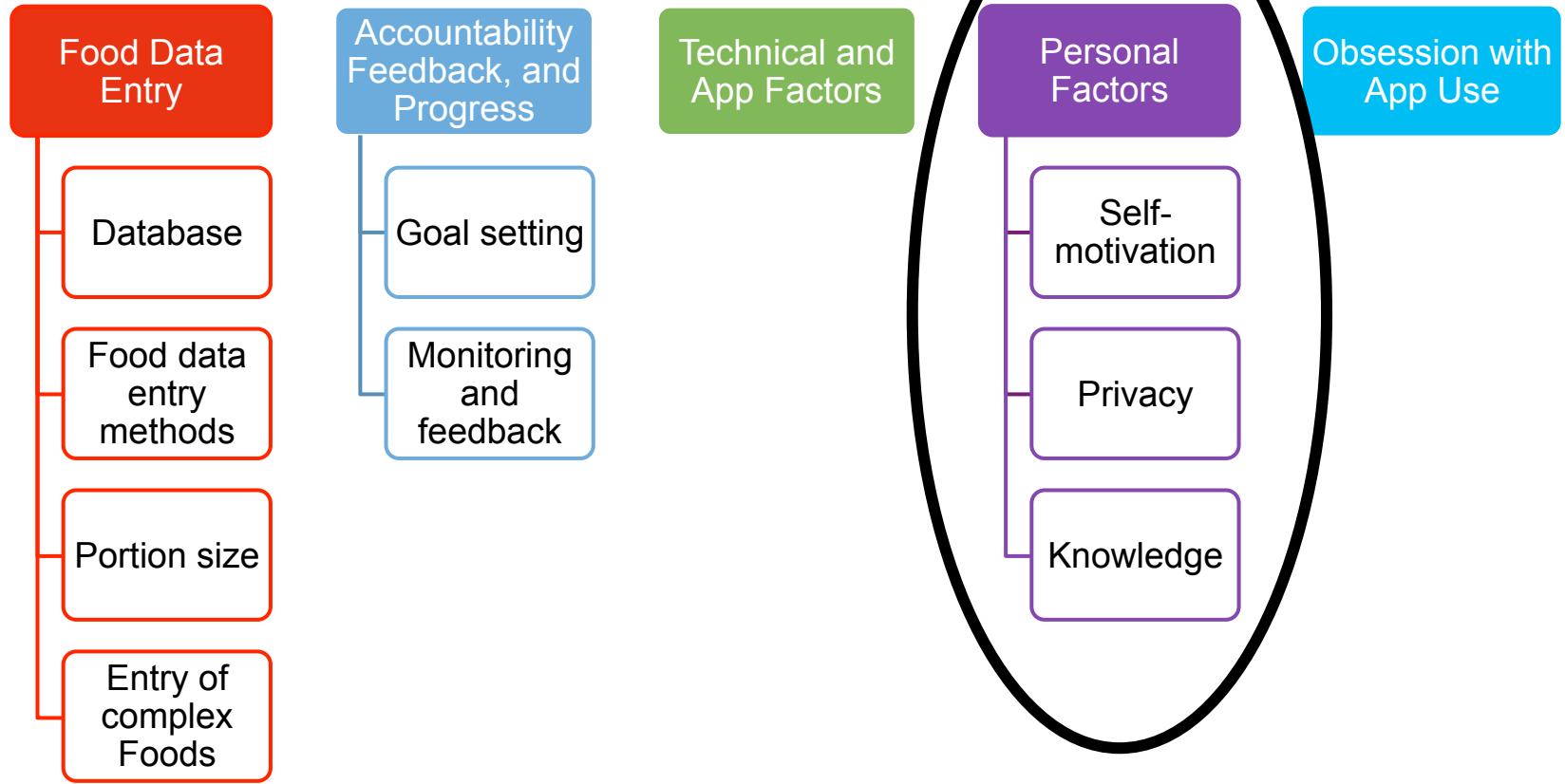
Technical and App Factors

- Affected use for some and included for example...
 - lack of Wi-Fi/cellular data availability
 - broken hardware
 - app complexity
 - crashing/freezing/being slow



I stopped using it. It was just getting too slow, too glitchy. That could very much have been my phone. It's really full right now; a lot of music, lot of useless stuff on my phone ... I was getting frustrated with it.

Results – Study #1

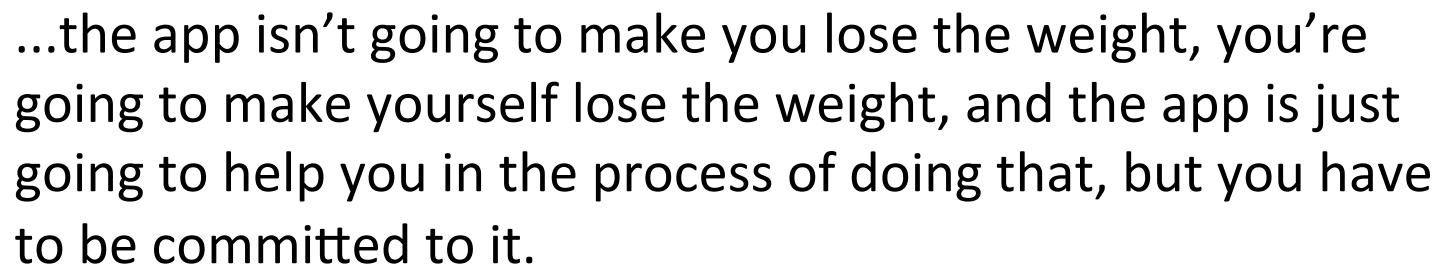


Lieffers et al., Submitted

Personal Factors

■ Self-motivation

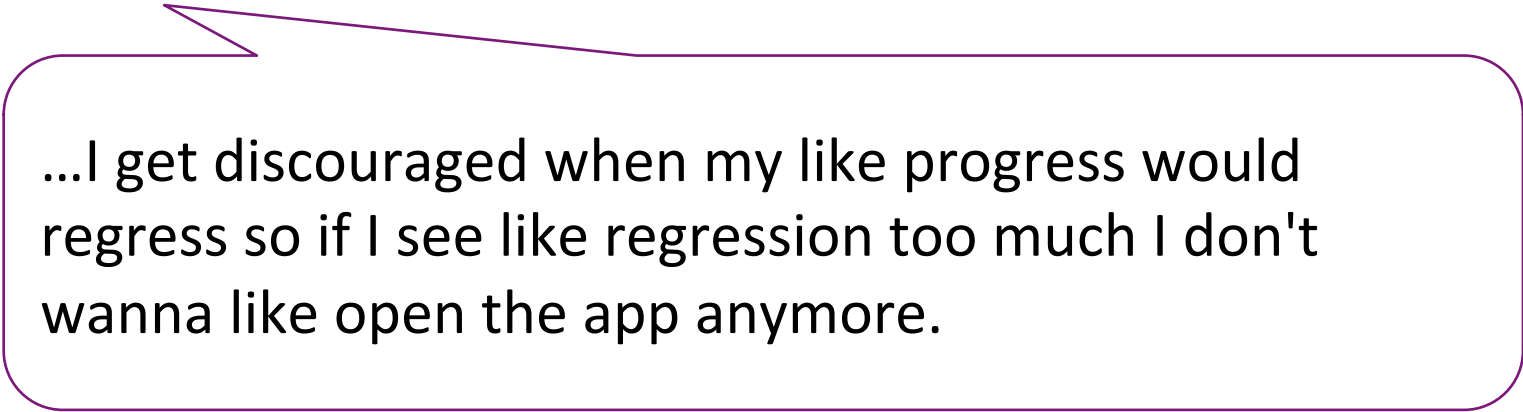
- Self-motivation was needed to...
 - use electronic tools themselves
 - make the behaviour change itself



...the app isn't going to make you lose the weight, you're going to make yourself lose the weight, and the app is just going to help you in the process of doing that, but you have to be committed to it.

Personal Factors

- **Self-motivation** (continued)
 - Seeing positive outcomes (e.g., weight loss) motivated some individuals to continue app use (and vice versa)



...I get discouraged when my like progress would regress so if I see like regression too much I don't wanna like open the app anymore.

Personal Factors

■ Privacy

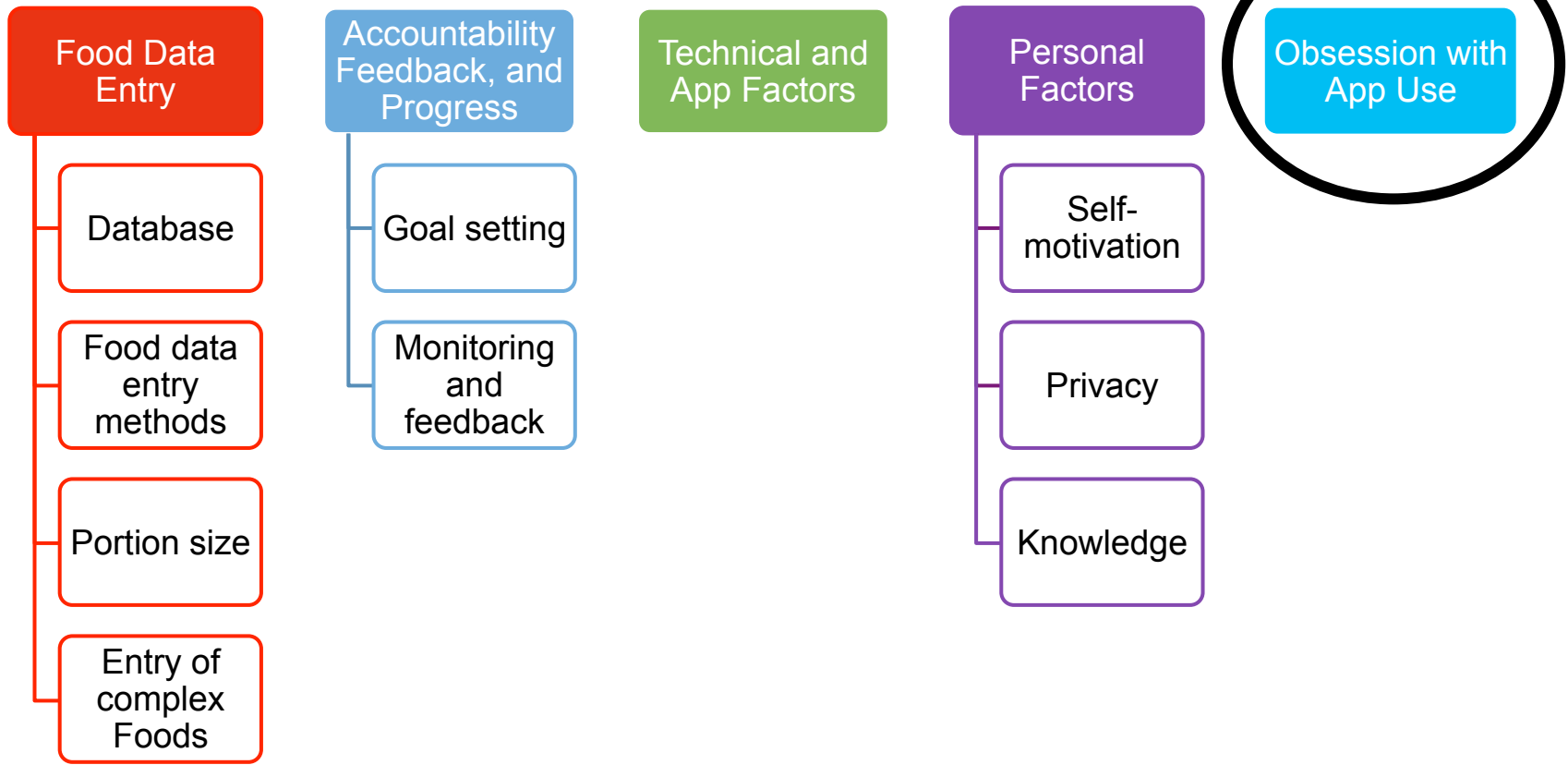
- Did not want others to know they were using nutrition mobile apps
- Very limited use of mobile app social support features (e.g., user groups, social media connections) for nutrition and weight management purposes
- More willing to share information about their exercise

Personal Factors

■ Knowledge

- Participants often reported poor nutrition knowledge
 - Sometimes used social media (e.g., reddit®) and websites to obtain nutrition information
- Participants were often using nutrition apps without professional support
 - However, many were interested in obtaining this support

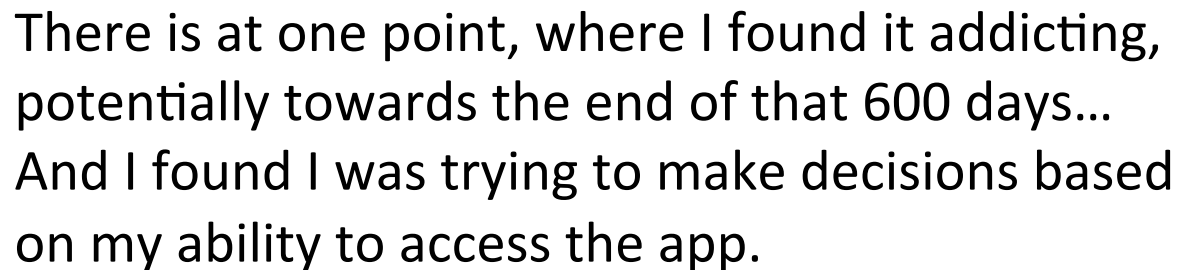
Results – Study #1



Lieffers et al., Submitted

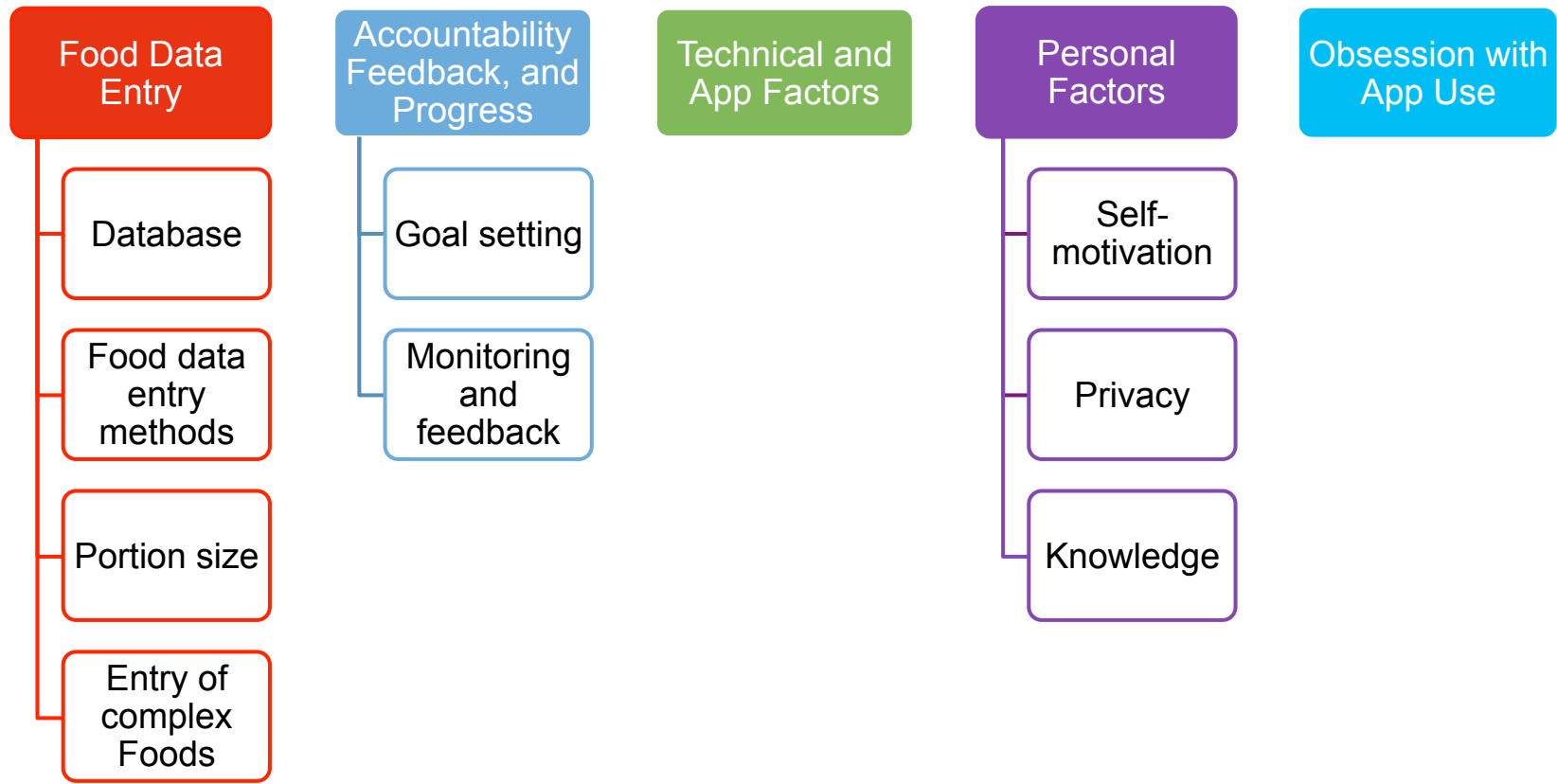
Obsession

- Nutrition mobile app use can be addictive and promote an unhealthy obsession with calories, food, and weight



There is at one point, where I found it addicting, potentially towards the end of that 600 days... And I found I was trying to make decisions based on my ability to access the app.

Results – Study #1



Lieffers et al., Submitted

Background

- Few qualitative data are available on user experiences and perspectives with nutrition mobile apps
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 - having participants use apps for the purpose of the study
 - combining results for several different types of electronic approaches (e.g., websites, mobile apps, etc.)

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Dietitians of Canada's eaTracker®

eaTracker® is Dietitians of Canada's popular diet/activity self-monitoring website and mobile app

<http://www.eaTracker.ca/>

The screenshot shows the eaTracker.ca website interface. At the top, there's a navigation bar with the logo, a 'Help' link, a 'Français' language option, and a 'Connect' button. A 'Logout' button is in the top right corner. Below the navigation bar is a main dashboard with several sections:

- My Profile:** Shows the current date as Sun Feb 28.
- My Food:** A summary row showing current intake for Calories (0), Fat (0g), Protein (0g), Carbohydrates (0g), Vegetables/Fruit (0), Grain Products (0), Milk/Alternatives (0), and Meat/Alternatives (0). Below this is a 'Recommended' row with values: 2134, 47-83g, 63-187g, 240-347g, 8, 7, 2, and 2.
- My Activities:** A search bar labeled 'Enter today's activities'.
- My Recipes:** A search bar labeled 'Enter today's meals'.
- My Coach:** A search bar.

Below the dashboard is a promotional banner for the mobile app, stating 'Now available for Android & iPhone!' and 'Track your eating and activity on the go with the all new eaTracker app for iPhone and Android!'. It includes 'Download on the App Store' and 'GET IT ON Google play' buttons. Two smartphones are shown displaying the app interface.

Below the banner is a section titled 'Today at a Glance' which contains a table of food groups and their intake.

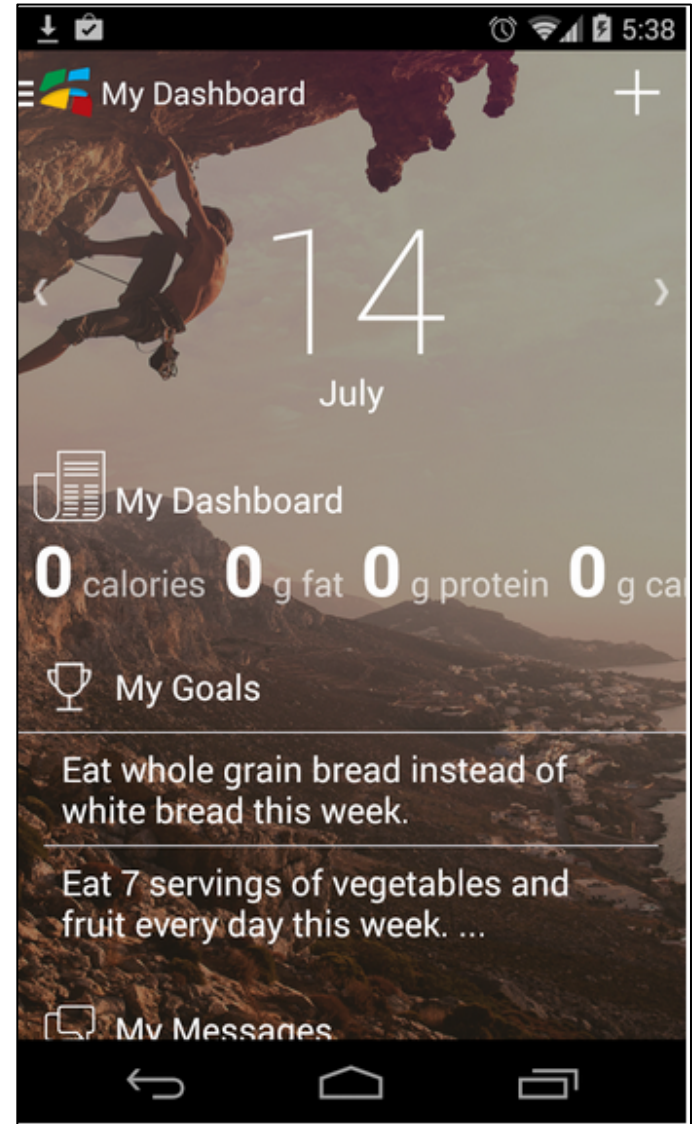
| Food Group | My Intake (number of Food Guide Servings) | Recommended* Number of Food Guide Servings |
|---------------------------------------|--|---|
| Vegetables and Fruit | 0 | 8 |
| Grain Products | 0 | 7 |
| Milk and Alternatives | 0 | 2 |
| Meat and Alternatives | 0 | 2 |

* Based on Eating Well with Canada's Food Guide. The recommended number of Food Guide Servings is an average amount that you should aim for each day. You may need a bit more or less depending on your energy needs.

On the left side of the dashboard, there is a sidebar menu with options: My Dashboard, My Goals, My Eating Targets, My Motivations, My Messages, My Details, My BMI, My Account, and Customize Dashboard. Below the menu is a box for Ontario residents: 'New Feature for Ontario residents: Want to stay on track with your goals? Get weekly motivational messages from EatRight Ontario Dietitians. Sign up here!' with the EatRight Ontario logo and contact information: 1-877-510-510-2, www.eatrightontario.ca.

eaTracker[®] Mobile App

- Add food, activity, and goals
- Track goals
- View progress



Methods – Study #2

- Eligibility
 - Used the eaTracker[®] mobile app for ≥ 1 week within the past 90 days
- Recruitment
 - Participants were recruited via an email blast sent to all active eaTracker[®] users from southern Ontario within the past 90 days

Methods – Study #2

- All participants completed a one-on-one semi-structured interview
- Interviews were transcribed verbatim, coded, and organized into thematic categories and subcategories using NVivo 10 (QSR International, Doncaster, Australia)

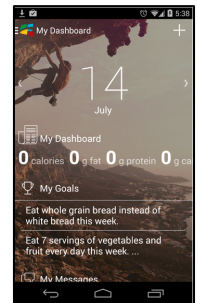
Results – Study #2

- n=26 participants
 - 89% were female
 - 73% were 18-50 years of age
- Average interview length: 36mins (range: 20-64mins)
- ~60% of interviews were done by phone

Results – Study #2

- What eaTracker mobile app users liked...
 - Dashboard displays
 - Dietitians of Canada reputation

I actually trust [*Dietitians of Canada*] so that kind of made me got into that [*eaTracker® mobile*] app...



Results – Study #2

- **What eaTracker mobile app users liked (continued)...**
 - Ease and convenience
 - Multiple ways to enter food portion size
 - Includes both food and physical activity recording

Results – Study #2

- **What eaTracker mobile app users found challenging...**
 - Search feature
 - Limited food database (only ~4,500 available)
 - Time needed for food entry
 - Inability to customize Dashboard displayed variables
 - Inability to access some favourite website features (e.g., reports)

Take Home Messages

- Many factors can affect satisfaction, success, and adherence with mobile apps for nutrition behaviour change
 - Dietitian awareness of these types of factors can help set clients up for success when using nutrition mobile apps
- Professional support is still needed while using these tools
 - Dietitian services are needed to teach users about nutrition while using these tools, help them set quality goals, and guide them on how to use them effectively and safely

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Thank you!

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