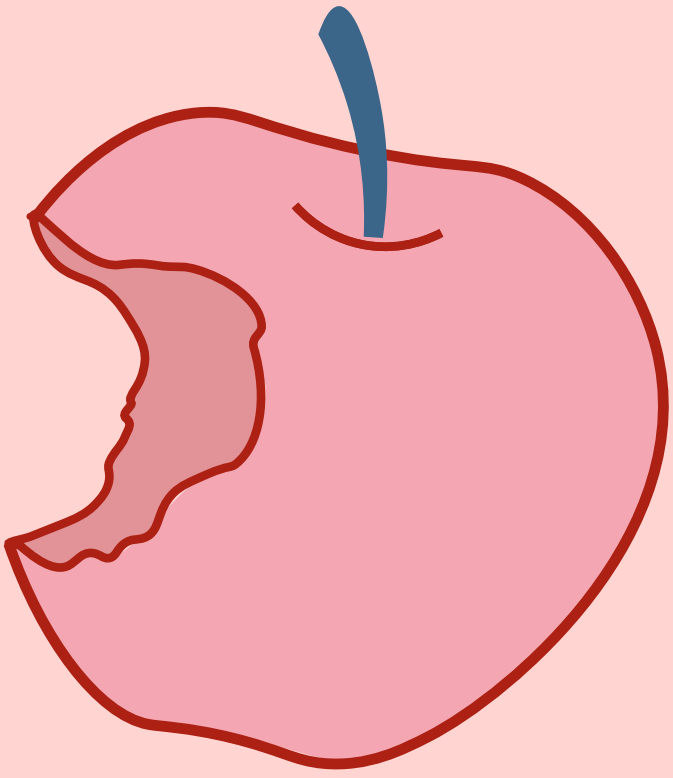
FEMINIST NUTRITION INTERVENTIONS IN CARDIAC REHABILITATION



Master Thesis

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To troublesome women; may we be them, know them, raise them & pay them.

FOREWORD

This master thesis report is the culmination of a 5 month long graduation project at the masters of Industrial Design at Eindhoven University of Technology. This project builds upon my work over the previous two semesters, which has given me the time to intimately understand the design space I am working in.

During my m2.1 semester, I saw part of my vision on the role of the designer come to life; bringing expertise from across disciplines together in order to tackle a multifaceted and complex challenge. This was gratifying, but something just did not *feel* right. While presenting my project to friends, family and colleagues, we would all publicly agree that it was great to work towards a utopian reality where food tracking is technologically burden free. However, off the record, my conversations (mostly with women) would almost always end with "*...but I couldn't/wouldn't want to do it though, it _____*". The blank being filled with similar stories of " *it makes me feel super crap and guilty", "it triggers my disordered eating history", "it never works anyway".*

I felt this way too.

This prompted a period of reflection which ultimately boiled down to realizing that I don't want to be designing technologies that give women another reason to feel crap about themselves! How can we be designing for women's "health" while ignoring these very real lived experiences of technology? The fierce, feminist values which I champion in my personal life were not being represented in the design work I was producing. I made it my mission to make my graduation project truly representative of who I am and what I believe in.

To start, I went desperately searching for others who are grappling with how to align design and HCI with feminist values, and found Søndergaard's (2020) work titled "Troubling Design: A Design Program for Designing with Women's Health". This approach completely re-energized me in terms of what design can be; both for the world, and for me as the designer.

This project has been a catalyst for me to evolve as a designer, pushing myself to a level where I can combine a feminist perspective with my knowledge about health care, emerging technology, and design research. With my passion and design activities aligned, I am very excited to begin a PhD in the fall within Philips design. This is especially exciting as working with Phillips has the potential to investigate the issues I highlight in this project on a fundamental level and improve health on a global scale.

Happy reading!

Daisy

Abstract

Gender disparity permeates all moments of the cardiac care pathway, including life saving cardiac rehabilitation. To question this status quo, I have been using the feminist design practice of Troubling Design (Søndergaard, 2020) to explore how a feminist nutrition intervention could look like for women in cardiac rehabilitation programs. I begin by assessing my own prior work with food tracking technologies through the lens of feminist values. This critical reflection is supplemented by women sharing their lived experiences with nutrition and cardiac rehabilitation, as well as interviews with a cardiac nurse and cardiologist, a Health at Every Size coach, a fat activist and a fat, queer, body positivity coach.

To re-think how technology can acknowledge women's lived experience and support women in their relationship with nutrition during cardiac rehabilitation, I have designed a platform introducing Intuitive Eating. Through ten modules, women are supported in re-meeting their bodies, divesting from diet culture and discovering life beyond constant yo-yo dieting. A chatbot function supports women while they learn to tune back into hunger and fullness cues, using the hunger scale to foster trust in the intuitive knowing of the body.

Through this design experiment, we can enhance our understanding of the interplay between the healthcare environment, technological health interventions, and value based health outcomes for women. Ultimately, I want to spark critical conversation about the ethics and impact that nutrition tracking interventions have on the women we design them for, and how technologies can instead become champions of feminist liberation.

Introduction

Cardiovascular diseases (CVD) are currently the global leading cause of death, accounting for 31% of all deaths worldwide (World Health Organization, 2017). An estimated 80% of these deaths are preventable through the adoption of a healthy lifestyle (Virani et al., 2020), which among other factors includes exercising regularly, quitting smoking, reducing stress and eating a heart healthy diet (Virani et al., 2020; Ambrosetti et al., 2020). To support patients in establishing these healthy habits, lifestyle management interventions are increasingly common in preventative cardiovascular healthcare. Cardiac rehabilitation (CR) programs specifically developed to improve a patient's cardiovascular risk profile have become a standard component of treatment guidelines for CVD in most Western countries (Knuuti et al., 2019; Abreu et al., 2019). These programs have been shown to be a cost effective treatment (Shields et al., 2018; Edwards et al., 2017), positively impacting survival rates of participants (Suaya et al., 2009; Anderson et al., 2016), with Dutch patients seeing a survival benefit of up to 4 years after participation (de Vries et al., 2015).

It is important to note that while this project uses the gendered language "women", I acknowledge that gender goes far beyond the binary. All participants are reported using self-identified terns.

However, despite being found to have poorer cardiovascular risk control, women still receive less robust clinical intervention for managing CVD (Garcia et al., 2016), even though sex specific analyses show that female and male participants achieve similar physical and mental health improvements after CR (Gupta et al., 2007). In particular, successful completion rates of CR among women are extremely low (Supervia et al., 2017). This has been connected to multiple factors: not only are women less likely to be referred to a CR program (Colella et al., 2015; Kotseva et al., 2017), but they are less likely to enroll even when referred (Way & Reed, 2019) and more likely to drop out after enrollment (Resurrección et al., 2018). Women report increased barriers to participation in CR programs, which are complex and multiple, traversing all levels of the ecological model of health (Vidal-Almela et al., 2020). These include logistical barriers (Rao et al., 2018; Resurrección et al., 2018; Marcuccio et al., 2003), but also that women find that CR is not tailored to their lived experience (Way & Reed., 2019; Supervia et al., 2017) or aligned with their values (Sanderson et al., 2010; Cooper et al., 2005).

The shift towards delivering CR remotely through digital platforms poses an exciting opportunity to offer alternatives to traditional CR programming. Digital technologies have shown promise in reducing the burden on care pathways (Park et al., 2019); reducing costs (Garg et al., 2018), as well as improving patient satisfaction (Helsel et al., 2018) and participation (Williams, 2012). Alternative programming has been explored for stress reduction through meditation apps (Barton & Mikan, 2020), and offering varied, enjoyable forms of physical activity such as yoga (Murphy et al. 2021) or cultural dance (Maskarinec et al., 2014), however little research has focused specifically on alternative digital interventions for nutritional care.

Improving nutrition is a key component of improving cardiac health and nutrition education is recommended in most CR guidelines. However, despite this, not all patients are referred to the dietician. In a review of CR programs, Brouwers et al. (2020) found that only 25% of patients visited a dietician during CR. For those who do meet a dietician, the interventions prescribed to support them are increasingly centred around technology-enabled food intake tracking (Dor-Haim et al., 2019, Yudi et al., 2016). These food tracking applications ask patients to continuously monitor and manually input everything they consume. For health care professionals, this can offer a more

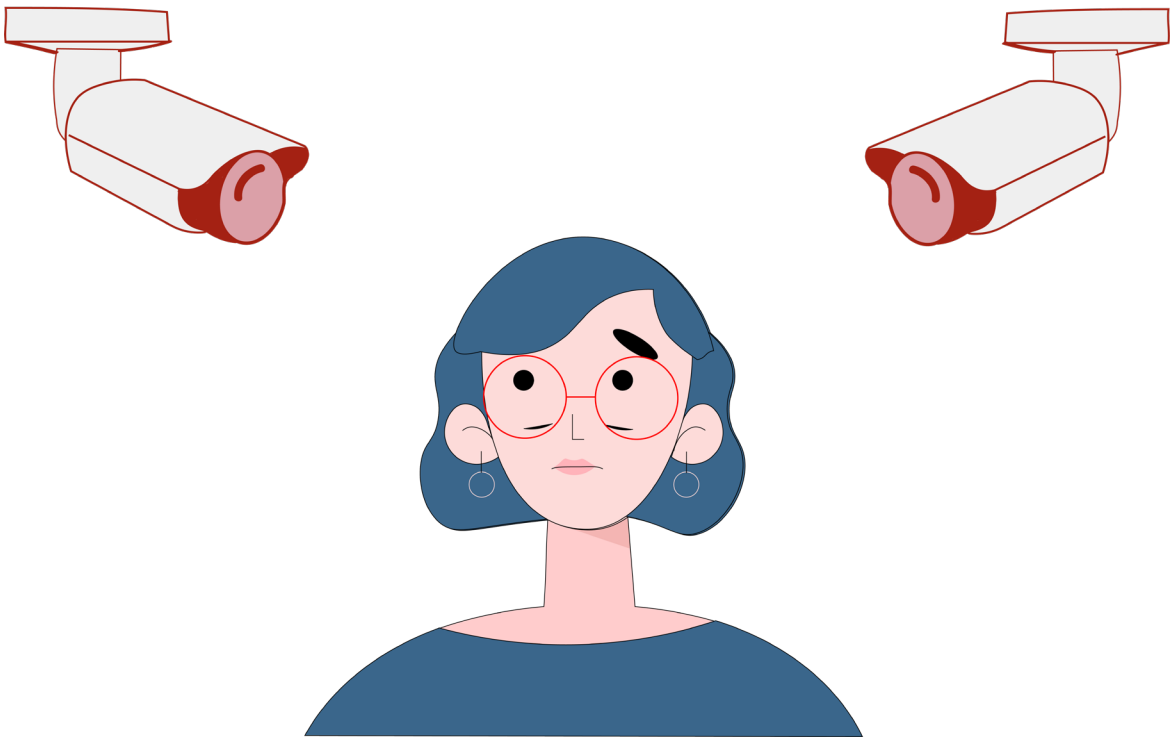
detailed glimpse into the nutritional habits of a patient (England et al., 2015; Aberegg et al., 2020), however food tracking has also been shown to contribute to a variety of harmful behaviours such as disordered eating (Eikey & Reddy, 2017) and obsessive food monitoring (Levinson et al., 2017). Food tracking is also incredibly burdensome (Cordeiro et al., 2015), and I argue that this burden comes not only in the form of being time consuming and monotonous, but also in the form of the emotional labour it requires to engage and critically assess your eating behaviour day in, day out. Particularly relevant to the cardiac context is that women report feelings of guilt and shame (Cordeiro et al., 2015), as well as increased stress related to food tracking (Orji et al., 2018). This is especially undesirable in the context of CR since reducing stress is critical to cardiac recovery (Chauvet-Gelinier & Bonin, 2017).

With this understanding, we can begin to recognize that food tracking in its current form does not align with supporting women to live fuller, less stressful lives, but rather perpetuates the systems of oppression which women's bodies exist in. When we design nutrition intervention technologies, it is important to acknowledge the complicated relationship and deeply entrenched history that many women have with diet culture, their bodies and their eating behaviour. It is naïve and irresponsible to operate under the assumption that when a major health event such as a heart attack strikes, this history simply disappears. This means that when a woman enrolls in cardiac rehabilitation, and we only offer restrictive, self-policing of diet and digital tools which perpetuate that, we disregard lived experience and fail women yet again.

"A culture fixated on female thinness is fixated on female obedience."

- Naomi Wolf

These technologies contribute to the increasing medicalization and problematization of women's bodies, weaponizing the fear of fatness and mortality to demand that women exert impossible levels of self discipline to control their bodies. By being prescribed within health care pathways, these technologies place expectations of the model "healthy citizen" onto women in order to be contributing, worthy members of society. This results in women engaging with technologies because they feel they have to, not because they want to.



This is not to say that technology does not offer exciting opportunities for supporting women, but to materialize them, we must ask ourselves how these technologies can instead become champions of feminst liberation. Feminist design approaches to women's health have offered a pathway toward this future. Feminist design practices bring "feminist values and theories into conversation with design research and practice, questioning what it means to design for ,and with, people whose lives are affected, and the role that technologies play herein" (Søndergaard, 2020). In particular, feminist design practices have encouraged me to move away from problem solving and towards staying with the trouble (Haraway, 2016). By using Søndergaard's (2020) design program for Troubling design, I have been able to explicitly grapple with trouble and include troubling as an implicit condition and action of designing with the intimate area of women's nutrition.

I began with *"staying with the wrong''* through critically reflecting on my own positionality. To do so, I compiled feminist values and critical reflection questions, then evaluated my prior work on food tracking for cardiac rehabilitation through their lens. I then began a process of *"curious visiting"*; beginning by interviewing a cardiac nurse and cardiologist about their interactions with women in CR, and about the ways in which CR is currently tailored to women. From there, I sought to center alternative knowledge production and *women's ways of knowing* (Smith, 1987) with the aim of understanding and highlighting the realities of women's everyday nutrition and beyond. To do so, I listened to women's lived experiences in cardiac rehabilitation support groups and surveyed them about their personal experience with CR, as well as interviewing a Health at Every Size coach, a fat activist and a fat, queer, body positivity coach.

Based on their inputs, I began my phase of *"collective imagining"* by translating hopes, dreams, and concerns into still possible futures. My design explorations resulted in the proposal of a mobile application platform that supports women in learning about intuitive eating through ten modules that follow the structure of Tribole and Resch's (2012) work. Intuitive eating is closely aligned with feminist values and is not a diet. It is intended to free people from rumination about food and the constant cycling of dieting by relying on hunger signals to determine when, what and how much to eat. Intuitive eating has not only been shown to improve body image (Linardon et al., 2021) and reduce disordered eating behaviours (Hazzard et al., 2021), but also to improve long term health (Bacon et al., 2005) and reduce weight cycling (Tylka et al., 2020).

After learning that determining if you are hungry is one of the hardest parts of intuitive eating, I saw an opportunity to explore how my work with chatbots can support this future scenario. I designed a chatbot feature which leads you through exercises to help tune back into hunger and fullness cues using the hunger scale (Tribole & Resch, 2012), and builds a personal library of hunger and fullness cues.

These technological design experiments have been valuable for exploring the socio-technical context of the cardiac care pathway. Through these explorations, we can enhance our understanding of the interplay between the healthcare environment, technological health interventions, and value based health outcomes. To do so, I conclude this report by contextualizing the digital intuitive eating intervention for women within the cardiac care pathway.

In this report, I combine my feminist perspective with my knowledge about health care, emerging technology and design research. Ultimately, I aim to spark critical reflection and debate about the impact that nutrition tracking technologies have on the women we design them for.

Background

Women's Journey in the Cardiac Care Pathway

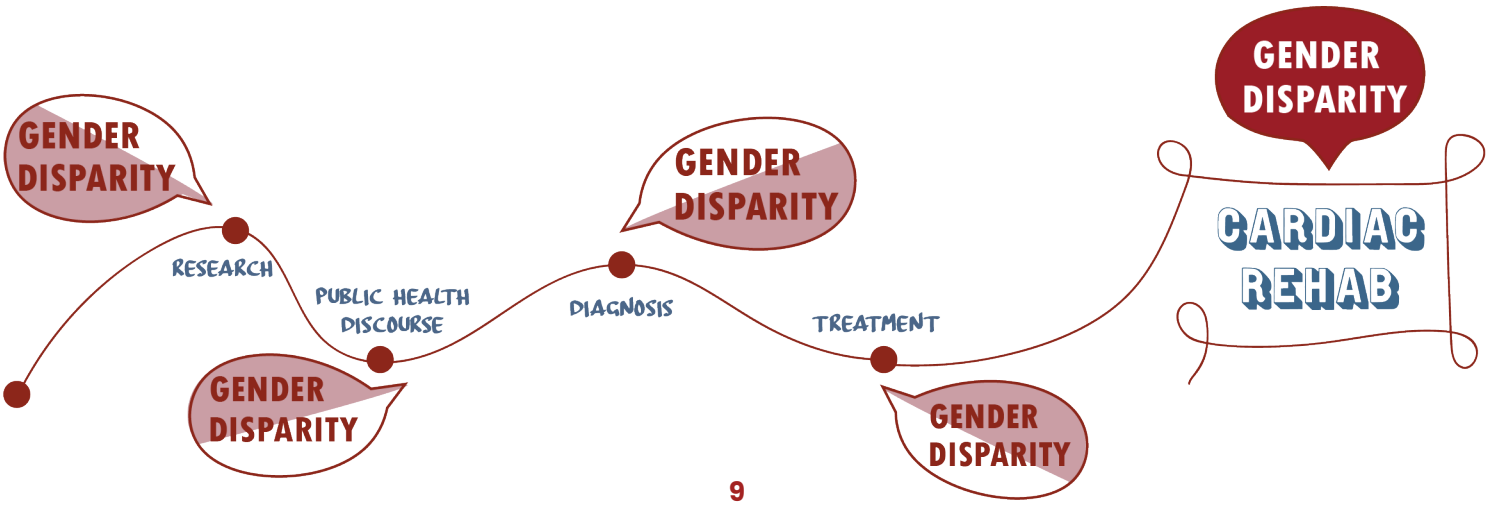
To understand why far fewer women are successfully completing CR programs, we must zoom out to understand the landscape. The field of cardiac care has had a fraught relationship with women, with gender disparity permeating nearly all moments of the cardiac care pathway. Starting at the level of research and including public health discourse, prevention, diagnosis, treatment and rehabilitation. A normative approach to cardiology, where the male heart is the norm, and heart attacks are a man's disease underlie many of the misconceptions in cardiac care for women. To read more about the disparities in health outcomes for women during the cardiac care pathway, please read Appendix A.

Women in Cardiac Rehabilitation

If a woman has successfully undergone treatment for the immediate dangers of a heart attack, the long term treatment and rehabilitation options further disadvantage women. Women are less likely to be prescribed drugs which reduce the chance of having a second heart attack (Wilkinson et al., 2019) and are less likely to be referred to lifesaving CR programs (Colella et al., 2015). One study found that one third of physicians showed evidence of gender bias, judging female patients less likely to benefit from cardiac rehabilitation compared to male patients with comparable characteristics (Backstead et al., 2014). This is further compounded along the lines of intersectional identities, where women with lower socioeconomic status, level of education and non-white race are referred at even lower rates (Mochari et al., 2006; Suaya et al., 2007; Mead et al., 2010).

Even if a woman has successfully received a referral to CR, she is less likely to enroll (Way & Reed, 2019) and more likely to drop out before completing the program (Resurrección et al., 2018). Women report increased barriers to participation in CR programs, which are complex and multiple, traversing all levels of the ecological model of health (Vidal-Almela et al., 2020). Research has found that logistical barriers include lack of time due to caregiver roles (Rao et al., 2018) and work responsibilities (Resurrección et al., 2018), as well as lacking access to transportation (Marcuccio et al., 2003). Women also report feeling uncomfortable (Plach, 2002; King & Lichtman, 2009), and experiencing feelings of embarrassment and shame (Sanderson et al., 2010; Cooper et al., 2005), as well as finding CR programming dominated by older men (Rao et al., 2018, Resurrección et al., 2018), and tailored primarily to their needs (Way & Reed 2019; Supervia et al, 2017). For women with a minoritized ethnic background, as well as fat women, an added barrier of negative experiences with the healthcare system have been reported (Chauhan et al., 2010; Lee & Pausé, 2016).

Tailoring gender-specific interventions to promote access has the potential to drastically improve women's health outcomes (Khan et al., 2018). Examples of this tailoring are most frequently seen for the delivery of physical activity in CR. These alternative interventions focus on implementing varied, enjoyable physical activity alternatives for women such as dancing (Belardinelli et al., 2008), group walking (Vidal-Almela et al., 2020), and Yoga (Murphy et al., 2021). Murphy et al. (2021) demonstrated that offering women-only yoga-based CR is appealing to women and could improve women's CR completion and continuation rates. Conboy et al., 2020 reported similar findings for introducing Thai Chi exercise during CR, reporting that participants enjoyed, felt confident and felt safe doing it. Maskarinec et al. (2014) found that



integrating traditional Hawaiian hula-hooping into cardiac rehabilitation not only improved health outcomes but encouraged "ownership" of the therapy through connecting participants to their cultural heritage, and fostering a connection between body, mind, and spirit (Maskarinec et al., 2014). These alternatives have been shown to be successful, however require increased resources which can prohibit wide-scale implementation.

Digital Nutrition Interventions in Cardiac Rehabilitation

With the shift towards cardiac rehabilitation being increasingly offered remotely via online and mobile platforms (O'Doherty, 2021), there are exciting ways to use technology to offer these alternatives in a cost effective way. Athilingam and Jenkins's (2018) systematic review of mobile applications to support self-care following heart failure showed that they had a positive impact, were cost-effective, and promoted patient engagement at home. Another review by Piette et al. (2015) on mobile health technologies for CVD management found that mHealth interventions improved cardiovascular-related lifestyle behaviors and disease management. Digital interventions not only have the potential to overcome logistical barriers for women, but also to offer alternatives to traditional CR which more closely align with an individual's values. For nutrition, little research has focused specifically on how this could be done in an alternative digital intervention.

As nutrition is an integral part of cardiac health, most CR guidelines recommend including nutrition education and guidance in the program (Ambrosetti et al., 2020; Mehra et al., 2020). Education has traditionally been delivered via paper pamphlets (Beswick et al., 2005; Cavallero, 2004), or through in-person guidance from a dietician either one-on-one or in a group setting (Timin et al., 2002). Recently, with the switch to remote CR, nutrition interventions are increasingly centred around technology-enabled food intake tracking (Wongvibulsin et al., 2021). This is usually offered via a digital tracking app which asks patients to manually record everything they consume throughout the day. It has been reported that tracking food intake raises the self awareness of the patient if they are engaged in the process and provided with an overview of results (NVVC-CCPH, 2010; Davies et al., 2010), and it can be a tool for health professionals to make more accurate judgements of a patient's diet (England et al., 2015; Aberegg et al., 2020).

However, while short term tracking can provide valuable insight for healthcare professionals to aid in diagnosis and treatment (Grimshaw et al., 2014; Karkar et al., 2017), critics highlight that food tracking applications have not been reliably shown to improve long term health outcomes (Chen et al., 2019; Dodd et al., 2018). One major discrepancy is that most food tracking research is based on capturing "millions of unverified verbal and textual reports of memories of perceptions of dietary intake" (Archer et al., 2018). Additionally, manually tracking detailed food intake is time consuming, tedious and burdensome (Cordeiro et al., 2015). This burden has led to underreporting of intake in various studies (Ahmad et al., 2016; Subar et al., 2003; Tooze et al., 2004). Women especially have been found to under-report or report in socially desirable ways, with Lara et al. (2004) reporting that 68% of women declared an intention to mis-report when self tracking.

In addition, there are also very few long-term studies evaluating the use of digital nutrition tracking tools (Holzmann & Holzapfel, 2019), especially under non-compulsory circumstances (Hingle & Patrick, 2016). This is especially problematic when the primary success criteria is most often measured in weight lost, which is not a reliable success indicator since weight loss is very rarely sustained longer than 5 years (Loveman et al., 2011; Wing & Phelan, 2005) with weight cycling being shown to be dangerous for your health (Madigan et al., 2018). Using weight lost as a success indicator also disregards the fact that people can be both fat and healthy (Nuttall, 2015).

Additionally, food tracking has also been shown to lead to obsessive behaviour and the development of disordered eating habits (Levinson et al., 2017; Eikey & Reddy, 2017). Particularly relevant to the cardiac context is that women report increased stress related to food tracking (Orji et al., 2018), which is especially undesirable since reducing stress is critical to cardiac recovery (Chauvet-Gelinier & Bonin, 2017).

Women's Bodies as Problems

Women's bodies have become increasingly medicalized and problematized throughout history; unreliable, hysterical, leaky things that need to be fixed and shaped, unworthy unless they are under constant (de)construction. They are used as pawns in politics, capitalism and patriarchy. Fat bodies in particular, and the fear of them, are weaponized by capitalism to keep women consuming diet, beauty and wellness products, with the patriarchy demanding that women exert impossible levels of self discipline to control their bodies. Dieting attempts begin extremely young, and women's discontent with their bodies continues throughout their adult life. Although it has been previously believed that body image concerns and body dissatisfaction would decrease with age, mounting evidence suggests that this is not true (Roy & Payette, 2012; Carrard et al., 2021). In a study of 1,849 women aged 50 and over, it was found that 71.2 % of participants reported unhealthy eating behaviours and were still actively trying to lose weight (Gagne et al., 2012).

These expectations now extend beyond beauty to also encompass health. The pressure and expectation on women to be healthy in order to be contributing, worthy members of society means that women are expected to extend their bodily regulation and surveillance in the name of public health (Sanders, 2017). Especially with the construction of an "obesity epidemic", thin bodies have been positioned as both an aesthetic and a medical goal. That the so-called 'healthy citizen', as she is now called in public health discourse, is one who sees health more as a 'way of life' than an aspect of experience that comes into focus during times of illness (Coveney, 1998). As critics have pointed out, health promotion serves as a means of citizen self-regulation by urging a project of body monitoring and self-checking. From this, attaining the healthy body has been layered on top of attaining the beautiful body to become a matter of perpetual self-maintenance.

Feminist Perspectives on Self Tracking Technologies

To achieve these ideals of health and beauty, women are expected to hyper-surveil their bodies, which is made ever more accessible through the design of self tracking technologies. As Crawford et al. (2015) summarized, "digital self-tracking devices enhance not only women's sense of obligation, but also their ability to engage in increasingly finely tuned self-perfection projects". While self-tracking can provide empowering insights into biological patterns such as menstruation (Epstein et al., 2017) and correlations between behaviour and symptoms such as in the case of food allergies (Karkar et al., 2017) or irritable bowel syndrome (Karkar et al., 2015), self tracking technologies also shift the responsibility of health onto the individual and make individual bodies "more amenable to regulation, promote normalization, and lead individuals to adopt self-disciplinary mentalities" (Sanders 2017).

In the fields of Feminist HCI and women's health, critical discourse has begun about self tracking technologies for women's health. More and more research focuses on designing in domains which have long been marginalized and considered taboo such as menopause (Bardzell, 2019; Homewood, 2019), intimate self-discovery (Almeida, 2016), and menstruation (Søndergaard & Hansen, 2016; Fox et al., 2018). However, there is also critique of the prevalence of self-tracking technologies for these intimate experiences. In the context of motherhood Davendorf et al., 2021 argue that these "optimizing technologies serve performative roles as "evidence" or "props" to demonstrate that we are adhering to socially constructed roles". Homewood (2019) reflects on her decision not to design self-tracking technologies for menopause, arguing that it would be "fundamentally inappropriate" since it both essentializes and medicalizes a non-medical process. In the context of motherhood Davendorf et al., 2021 argue that these "optimizing technologies serve performative roles as "evidence" or "props" to demonstrate that we are adhering to socially constructed roles".

Intuitive Eating

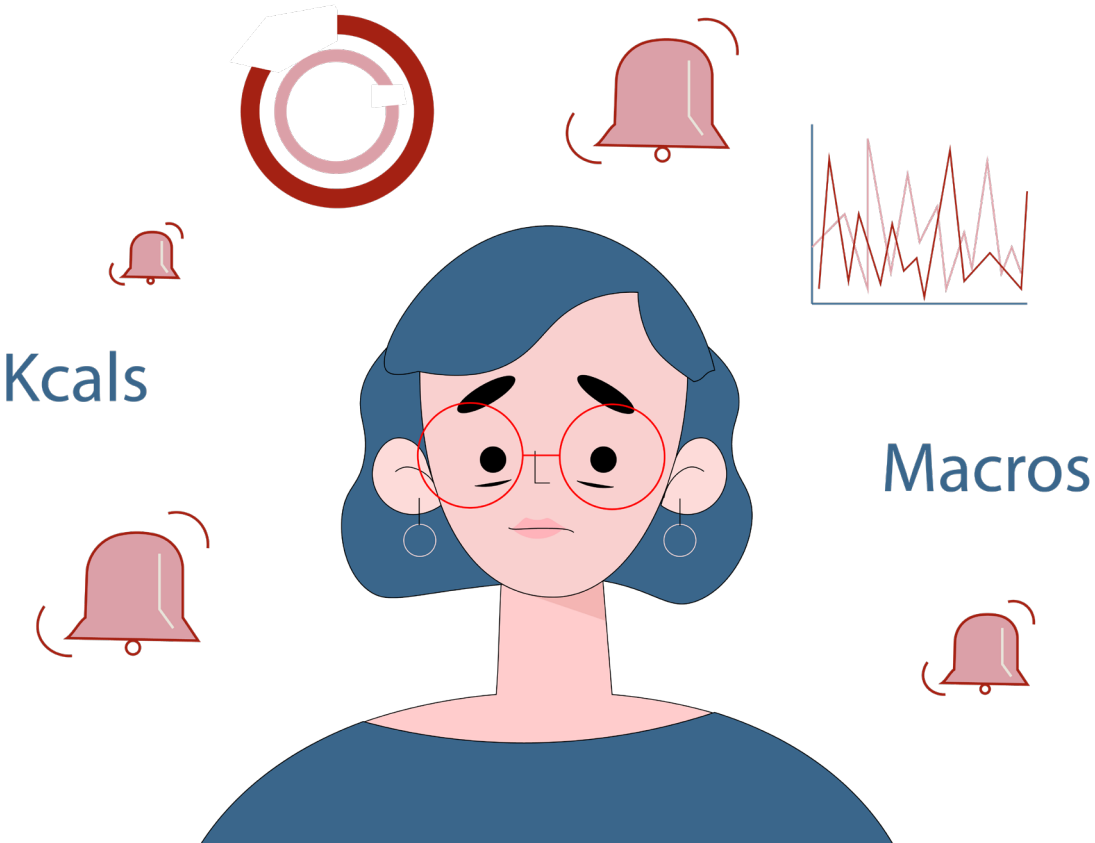
An increasingly proposed alternative to restrictive diets and rigid self tracking is intuitive eating. Intuitive eating has been found to support long term health better than when compared with restrictive dieting (Bacon et al., 2005), promotes greater weight stability (Tylka et al., 2020) and is considered a

valuable intervention for improving psychological health and reducing disordered eating behaviors, particularly binge eating (Hazzard et al., 2021). Intuitive eating is also positively associated with numerous positive psychological constructs, such as positive body image, self-esteem, and wellbeing (Linardon et al., 2021). It is also consistently shown to be associated with lower levels of psychological distress (Homan & Tylka, 2018; Augustus-Horvath & Tylka, 2011). Importantly, these associations have been found to be reproducible across many different gender, ethnic, and cultural identities, age groups and weight categories (Bruce & Ricciardelli, 2016).

Few digital tools designed specifically to support intuitive eating exist (Lyzwinski et al., 2018). Some, such as Outland (2018), claim to design mobile applications to support intuitive eating, however they take a weight loss based focus which is counter to the fundamental approach of intuitive eating. Boucher et al. (2016), developed a web-based intuitive eating intervention for women called "Mind, Body, Food" which followed a module based learning format. They report significant decreases in binge eating and improvement in general mental health (Boucher et al., 2016). The video content on the platform was especially appreciated by the participants. Interestingly, the self monitoring aspect of the platform which tracked hunger was only considered useful by 16% of participants. 80% of participants reported that a mobile application version would be quite or extremely useful to them.

Applications to support mindful eating, a closely related approach, have also been emerging. Mindful eating also adopts a "non-dieting" approach, applying mindfulness practices to internal sensations of hunger (Kristeller et al., 2006) and aims to identify emotional or external triggers for eating (Masuda & Hill, 2013). A review of mindful eating mobile applications by Lyzwinski et al. (2019) found that most focused solely on timing eating, or writing in a food diary, and reported that the quality of information was very low. They encouraged future mindful eating applications to deliver engaging education through diverse media, provide personalized messages specific to mindful eating, and to provide research-supported information (Lyzwinski et al., 2019). Mobile applications seem to be a feasible way to introduce and support intuitive eating.

By introducing technologies which support mindset shifts and the development of resilience skills, we provide women with resources which they can draw from long term. Leveraging technology to support this resource development, as opposed to relying on short term behavioural change techniques and prescriptive technologies, is an important and exciting way forward for digital health interventions.



Method.

For this project, I based my design process on the method of ***A Troubling Design Program for Women's Health*** by Søndergaard (2020). Troubling Design centers *trouble* as an implicit condition of designing ethical and responsible technologies for women's health, encouraging designers and researchers to develop knowledge embedded in criticality and questioning the status quo (Søndergaard, 2020). By doing so as designers, we can expand our perspective on designing with intimate bodily experiences.

Søndergaard proposes three key elements of a Troubling Design Program for Women's Health:

(1) **Definitions** of what is designed, how it is designed, for whom it is designed, and with what intentions.

(2) **A specific worldview** from which the designer operates, including core beliefs and context;

(3) **Design experiment(s)** that characterize what a design might look like within the design program.

For the first element of developing definitions, Søndergaard outlines 3 key practices:

(i) staying with the wrong, (ii) curious visiting, and (iii) collective imagining.

Staying with the wrong "explores and exposes the social and moral order and normative ideas of the present, in order to suggest critical alternatives to what is perceived by society as wrong" (Sondergaard 2020). This practice is very self reflective and focuses on the designer's subjectivity, positionality, and willingness to make trouble.

To stay with the wrong, I compiled a list of feminist values which I then took as a foundation during this project. I used those values to critically reflect on my own previous work: "Foodsy: a Chatbot for Tracking Nutritional Intake in Cardiac Rehabilitation' (O'Neill, 2021). This provided a medium to reflect on the current state of the art within the domain of technologies for nutrition tracking and explore my own role and positionality. This process allowed me to outline my specific world view, including the core beliefs of my design program.

Curious visiting "seeks to challenge techno-optimistic and simplistic views of technology toward a more nuanced appreciation of the opportunities and more problematic aspects of technology in the context of women's health" (Søndergaard, 2020). Curious visiting brings attention to lived bodily experiences which are currently not present in design and research on women's health. When practicing curious visiting, the designer is encouraged to seek beyond their own world view and "actively and carefully listening to multiple voices and stories of pain and pleasure" (Søndergaard, 2020).

To curiously visit the lived experiences of women, I listened to women's experiences with nutrition after a cardiac event in Facebook support groups, surveyed 20 women who had attended CR about their experience, interviewed a Health at Every Size coach, a fat activist and a fat, queer, body positivity coach. I also interviewed a cardiac nursing specialist and a cardiologist about their existing practices with women in CR. This process also contributed to further defining and understanding the context of my design program.

Collective imagining "seeks to develop alternative futures in order to identify what is desirable/ undesirable and take those learnings back to the design processes for women's health in the present" (Søndergaard , 2020). The practice of collective imagining explores and expresses still possible futures through design, telling other possible stories across the social and cultural contexts of women's health in order to work towards the futures we want to bring to life.

Through inquiring about hopes, dreams, and concerns for the future, I began translating them into designs for still possible futures which aligned with the feminist values I had defined. This resulted in a design experiment of the Intuitive Eating platform and a chatbot feature which supports tuning into hunger and satiety cues.

1. World View

Søndergaard (2020) includes reporting on the context of the worldview as an important component of a troubling design program, as "It is important to state and reflect on the specific local context in which the design program and design experiments have been developed, since this shapes the program's worldview." The design program I report on here is inevitabley rooted in my own experience as a white, cis-gender, queer woman living in The Netherlands, while maintaining close ties to the Canadian context. This program must also therefore be read through the lens of my own bodily experiences and the context in which I have designed.

The Netherlands is a progressively liberal country, with progressive women's rights and gender equality laws. In the Dutch context, attention in healthcare is increasingly focused on providing personalized care, with gender-sensitive health care having been identified as a priority issue within current Dutch gender equality policy. Sex and gender in medicine has recently been added to the Dutch Emancipation Policy (CR&CA, 2019) in response to calls to action against unequal health outcomes for women. This requires that the healthcare sector must take differences between genders into account to provide them with the best care possible. However, this is not yet accomplished, as women in the Netherlands are still sorely under-represented in medical research and have poorer health outcomes across many health domains (ZonMw, 2017).

Also relevant for this project is the state of socio-cultural awareness of weight neutral care approaches, body positivity and the general cultural attitude towards fatness in the Netherlands. Within the Dutch healthcare system, a weight neutral approach is rare, with doctors promoting weight loss frequently as a way to improve health, and health discourse centering the so-called 'obesity epidemic'. Body positivity is not yet as widely adopted and promoted in the Dutch socio-cultural sphere as compared to North America or the UK, especially among older generations. This is theorized to be because of the absence of body positive material available on the internet in Dutch. The majority of body positive literature and social media content is currently published in English which remains inaccessible for many. My exposure to body positivity and fat activism has primarily been through English language social media and in the Canadian context where it is an increasingly prevalent approach. From the perspective of Dutch culture, fatness and health are inextricably socially linked. Dutch rhetoric around fatness over the past 10 years has been prevalent in public health discussions, with fatness often conceptualized in Dutch media and public opinion as being in opposition to "Dutchness" (Ochterski, 2013).

This design program works from the beliefs of body positivity. Body positivity was born out of the work of black, fat activists in the 1960s and says that all bodies are good bodies regardless of shape, size or ability.

Thus, my design program as it is articulated in this report must be understood through this contextualized worldview.

2. Design Experiment

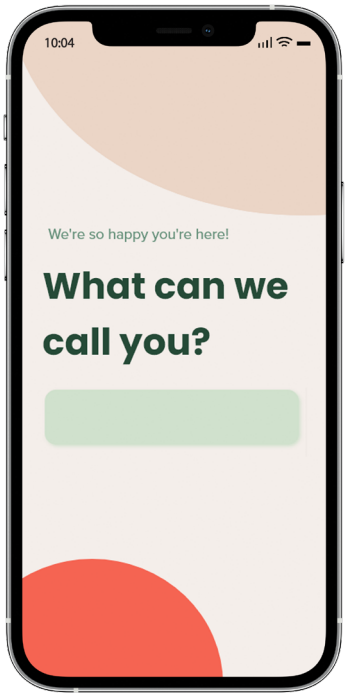
Intuitive Eating App

Overview

The Intuitive Eating mobile application is an educational platform which leads the patient through 10 modules introducing the concept of intuitive eating. These 10 modules are based on the 10 principles of intuitive eating outlined in Tribole and Resch's (2015) work. In each module, the patient is introduced to a topic through a variety of mediums such as educational videos and texts, as well as exercises to complete. There are also external resources provided, such as links to podcasts, blogs and active online support groups. The first modules focus on moving away from dieting and divesting from a diet culture mentality which foregrounds restriction and weight loss. Once this foundational mindset shift has been introduced, the patient is then introduced to gentle movement and nutrition. Gentle nutrition centers on choosing foods which support your body to feel good and nourished so you can do the things you want to do as opposed to restricting certain food groups in order to lose weight.

Welcome screen

Personal information page



Passcode page for privacy

10 Modules

1. **Rejecting Diet Mentality**

   Get angry at diet culture that promotes constant pursuit of weight loss and learn about diet lies.

2. **Honour your Hunger**

   Honour your biological signals to rebuild trust in yourself and food.

3. **Make Peace with Food**

   Give yourself unconditional permission to eat to challenge the scarcity mindset.

4. **Challenge the Food Police**

   Reject unreasonable rules that diet culture has created and attaching moral value to foods.

5. **Discover the Satisfaction Factor**

   Reclaim the pleasure and satisfaction that can be found in the eating experience.

6. **Feel your Fullnes**

   Tune in to body signals which tell you you are hungry or full.

7. **Cope with Emotions with Kindness**

   Discover sustainable ways to cope with difficult emotions and emotional hunger

8. **Respect your body**

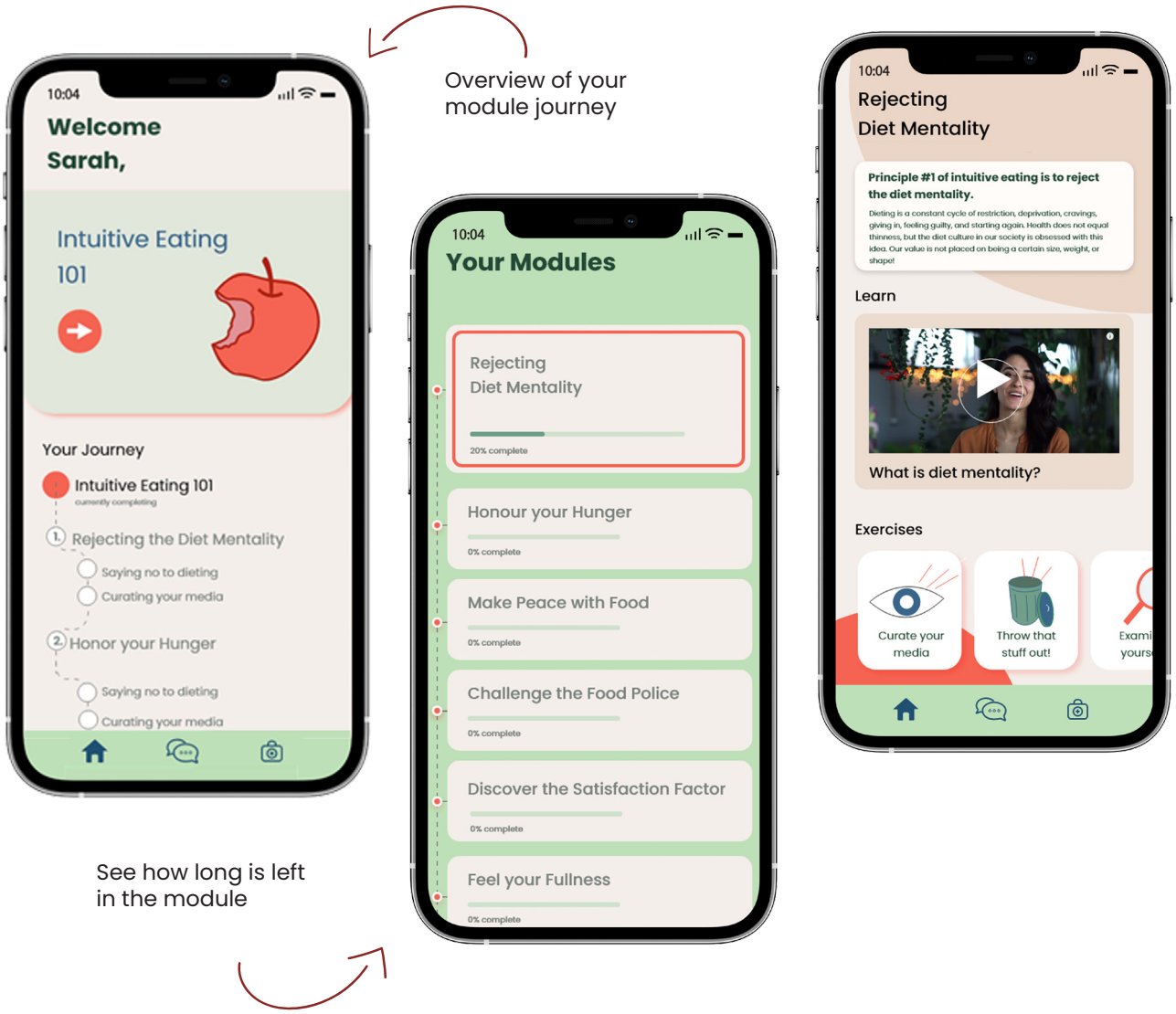
   Listen to your body, care for it, and appreciate your body as it is right now.

9. **Movement - Feel the difference**

   Finding the ways you want to move your body, not the ways you "have to" or "should" do.

10. **Honour your Health - Gentle Nutrition**

    Using nutrition from a place of self care rather than a place of control and restriction.

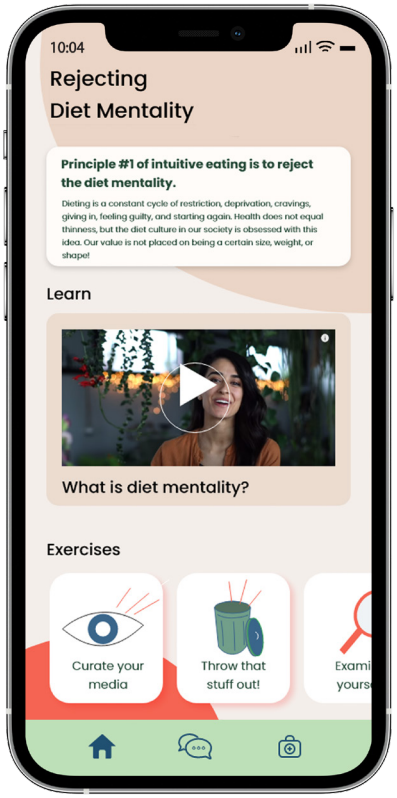


Module Considerations

The information is delivered through a variety of mediums, including video and text.

The videos acknowledge the reality of divesting from diet culture is difficult and emotional work, as well as a process which takes time.

Exercises, such as curating your social media feed, are concrete, actionable steps to engage the patient.



The videos should include diverse women, including fat women.

Resources should be written to connect with women, using relatable language and humor when appropriate.

The modules are based on reliable research, and the articles referenced should be made accessible to readers who want to know more via the app, as well as explained in a clear way for those who that is inaccessible for.

Design Decision *not* to Track

There was an explicit decision made in the designing of the platform not to track any behaviour. Even though, for example, you could track lengths of meals to promote slower, more mindful eating, or track the timing and rhythm of hunger, this can promote a mentality that there is a "right" way to do these things when there is really not. I made the intentional decision to leave out a tracking aspect in order to completely step away from oppressive self tracking. How to track eating data without perpetuating a mentality of "doing it right" is an interesting design research opportunity for the future.

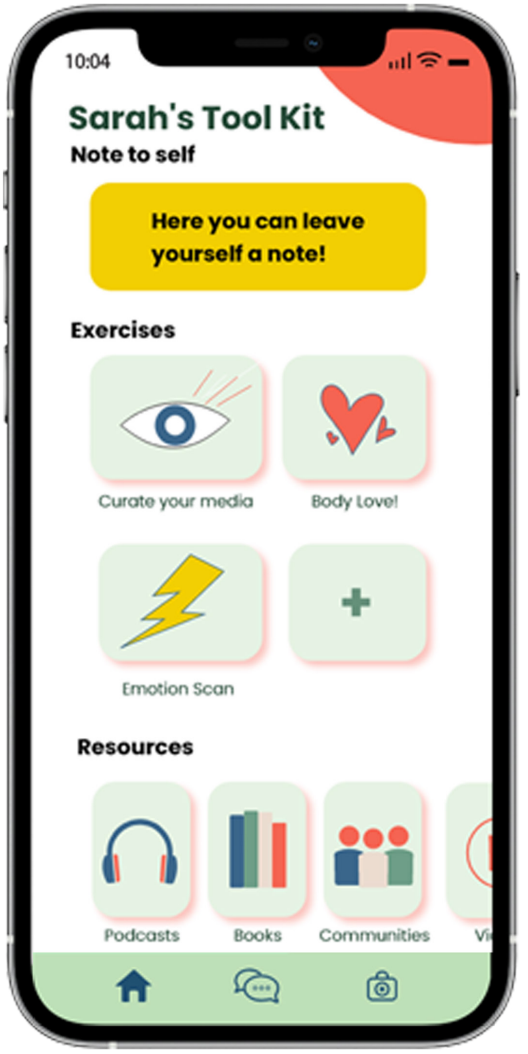
Tool Box

The tool box is where patients can save snippets of text, exercises or videos which resonate with them. This focuses on building life-long skills and coping mechanisms, and collecting them to draw upon as a resource in the future. By doing so, the design acknowledges the reality that things won't always go linearly while learning about intuitive eating and that experiencing difficulties along the way are an inherent part of the process.

Customize your toolkit and write your personal intention front and centre.

Here you can save things that you like while completing other modules such as excersizes or key concepts that you want to bookmark.

Here are links and reccomendations to external resources, such as podacts, books, communities or research.



Use your toolkit in times of doubt or need, or when you need a refresher. The skills you learn here are skills for life!

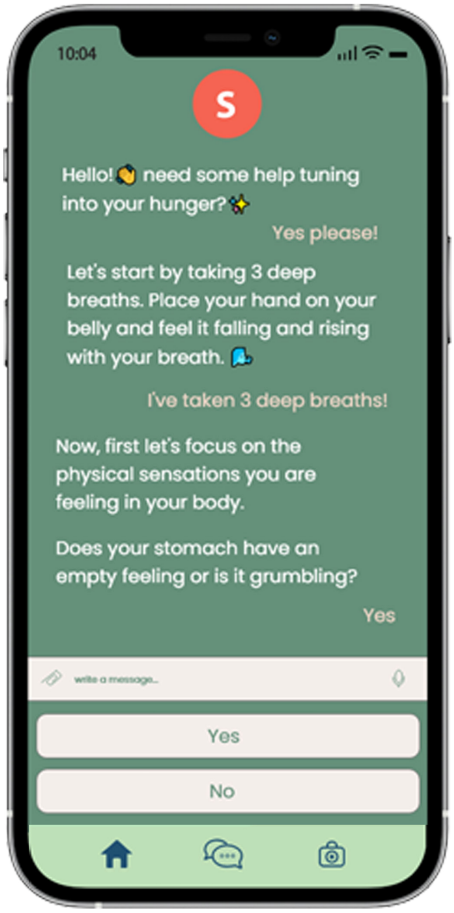
Add snippets directs from the main module, or through a search function from the toolkit.

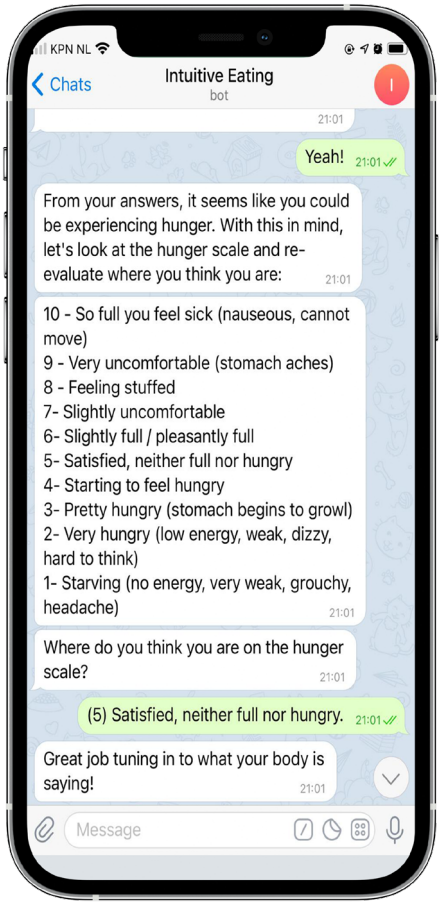
Including links to outside resources, this makes it easier for patients to find their own communities and relatable experiences which align with their values and interests. For example, podcasts with and for LGBTQ2+ people, BIPOC, or fat women.

Chat Bot Feature

The chatbot feature of the app is designed to be a companion while users re-meet their bodies. Tuning back into your body and learning how to notice when you are hungry or full is one of the most difficult parts of intuitive eating. The chatbot leads you through an exercise by first focusing on your body and then asking a series of questions about your physical, mental and emotional states to notice hunger and fullness cues. These include sensations such as a growling or empty feeling in your stomach, being grumpy or irritable or feeling weak in your body as a baseline (full script can be seen in Appendix B). However, since everyone's hunger and satiety cues are unique, you are able to add your own sensations to build your personalized library. This helps you to learn about your body and increase trust over time. Going through this simple question routine helps develop a personal mental routine or checklist which you can eventually do by yourself without the chatbot.

A modern, clean and bold take on the chatbot interface





Using the Hunger Scale to rate hunger helps to fine tune awareness of biological signals

Hunger

While everyone is different, a good first step is to aim to start eating when you reach a 3-4 on the scale. By not waiting too long, it can make it easier to thoughtfully choose what you'd like to eat and eat until you are satisfied, rather than overly stuffed.

Fullness

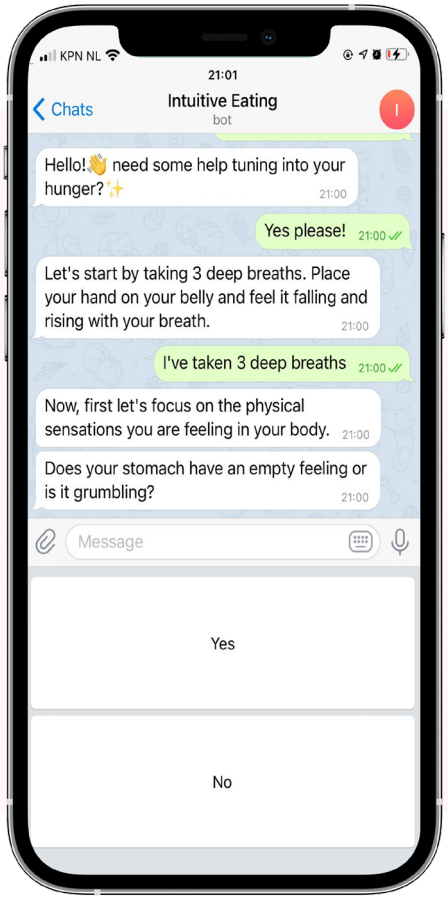
Once you reach a 5 on the scale, you would be just about satisfied. Within 15-20 minutes, you will likely be at a 6, full but not uncomfortable. So around a 6 can be a good time for your to stop eating.

Testing

To test the intuitive eating chat bot, I used it for myself for a period of 3 days. The Telegram chatbot that I coded can be seen to the right (code and full script in Appendix C). Using the chat bot made me significantly more aware of my hunger cues, which remained even after only using it for 3 days.

I discovered that using the chatbot for fullness was less practical, as fullness can occur mid-meal and it is not a convenient time to use your phone. However, using the app before a meal did make me more aware of my bodily signals while I was eating.

My main insights were that I wanted to add more personal hunger cues which I experienced such as a headache, losing concentration or thinking more often about food. This led me to include a “personal library” feature in the final concept for the chatbot.




10:04
Loading...
Welcome to Intuitive Eating
Begin
We're so happy you're here!
What can we call you?
Set your new passcode so you can login
Welcome Sarah,
Intuitive Eating 101
Your Journey
Intuitive Eating 101
Rejecting the Diet Mentality
Saying no to dieting
Curating your media
Honor your Hunger
Saying no to dieting
Curating your media
Your Modules
Rejecting Diet Mentality
Honour your Hunger
Make Peace with Food
Challenge the Food Police
Discover the Satisfaction Factor
Feel your Fullness
S
Hello! need some help tuning into your hunger?
Yes please!
Let's start by taking 3 deep breaths. Place your hand on your belly and feel it falling and rising with your breath.
I've taken 3 deep breaths!
Now, first let's focus on the physical sensations you are feeling in your body.
Does your stomach have an empty feeling or is it grumbling?
Yes
Yes
No
Rejecting Diet Mentality
Principle #1 of intuitive eating is to reject the diet mentality.
Learn
What is diet mentality?
Exercises
Curate your media
Throw that stuff out!
Sarah's Tool Kit
Note to self
Here you can leave yourself a note!
Exercises
Curate your media
Body Love!
Emotion Scan
Resources
Podcasts
Books
Communities

3. Definitions

3.1 Staying with the Wrong

Exploration of Feminist Values in Design

To ground my project in feminist values, I began by diving into feminist (HCI) literature. As I read, I compiled a list of feminist values and dimensions to consider when designing feminist technologies. I collected 34 unique values which characterize a feminist design practice and research. From those 34, I clustered related values into 9 dimensions to implement or practice when designing (as can be seen in Appendix D)

These characteristics can be considered across three dimensions of design, how they apply and impact (1) the designer themselves by changing who they are and how they engage with design and the world; (2) the process of designing by influencing who is involved, and what is prioritized; and (3) the final design by the who's experience is represented and supported by design choices and the impact it would have if it were set free in the world.

01. Pluralism

Grouped with

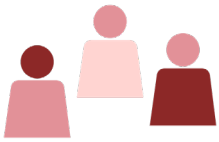
Equity | Subjectivities | Rethinking Binaries

Pluralist designs acknowledge the diverse realities of the human experience, and are more human centred than universal design. Pluralist design encourages foregrounding (cultural) difference, engaging with diversity and embracing the margins. Pluralistic approaches center more *equitable* outcomes by not only catering to a singular dominant narrative or experience, and by *re-thinking binaries*.

02. Participation

Grouped with

Engagement with Participants | Empathic Approach

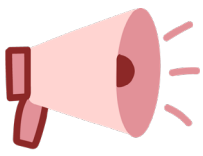


Participation and *engagement with participants* during the design process centers the sharing of lived experiences by the humans you are designing with (not for). By including multiple and varied voices into the active process of designing, we can "avoid the scientific distance that cuts the bonds of humanity between researcher and subject, preempting a major resource for design (empathy, love, care)" (Bardzell, 2010). By creating a design process around inclusivity, we distribute the responsibility and authority of decision making.

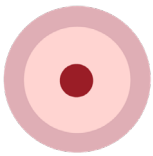
03. Advocacy

Grouped with

Capacity for Empowerment | Demanding of Justice | Women's Rights into Perspective | Break Down Hierarchy



Advocacy has long been a central tenant of a feminist existence. In design, this means that feminist design practices are *demanding of justice*, actively working to make the world a more *just* place through our designs. This includes taking *women's rights into perspective* while designing, and *breaking down hierarchical structures* which exist in our design practice, our ways of knowing, and in society at large.



04. Ecology

Grouped with

Temporalities | Situatedness

Considering *ecology* means integrating an awareness of the effects of your designs in their broadest contexts. This includes the impact that they have on all stakeholders both during the design process, and when the design exists in the world. By zooming out, we are able to consider *temporalities*; acknowledging that futures are multiple and situated in the social, historical, and ecological context, as are experiences of time.

05. Embodiment

Grouped with

Regards Bodily Integrity | Agency | Respect choice of the individual

Embodiment focused on the bodily experience of the user, bringing attention to and involving lived bodily experiences and their influence on creating meaningful interactions. By doing so, we must respect the *bodily autonomy and integrity* of the user.

06. Troublesome

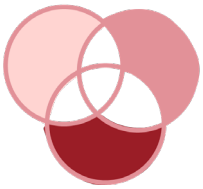
Grouped with

Friction | Resistance | Queerness | Failure

In feminist and queer theory, trouble is considered integral to ethical and liberatory designing. It means staying with the trouble (Haraway 2016) and sitting in the discomfort of engaging with uncertainty, complexity, and *friction*. Feminist design(er)s can also create trouble by challenging others to engage with discomfort or even get the designer *into* trouble. *Troublesome* design also does not shy away from *failure* but rather celebrates (and reports on) it as an inherent part of designing.

07. Self-disclosure

Self disclosure in design (research) is the practice of the designer sharing their position in the world, their goals, and their intellectual beliefs. This first requires a reflection on positionality, bias and privilege. These things inevitably influence a design, so disclosing these things to others allows for a contextualized reading.



08. Intersectionality

Grouped with

Humanist

Intersectionality, coined by Kimberley Crenshaw in 1989 refers to the way in which several different types of oppression can intersect and interact, influencing one's social position (Crenshaw, 1989). Considering the intersectional experience of our designs aligns them closer with realities.

09. Inclusion

Grouped with

Diversity

These two values can be distributed across the others and considered in the context of each characteristic.

Inclusion in design goes beyond simply trying to achieve diversity. *Diversity* remains performative unless we honestly acknowledge the historical realities of "othered" experiences and take well-resourced actions in the present to include these realities in our designs. This humanistic approach centers the human experience and the uniqueness of that, looking to honour and acknowledge difference rather than flatten it.

3.1 Staying with the Wrong

Evaluating Previous Work

I used these values to evaluate my previous work in food tracking, the design of Foodsy, the food tracking chatbot (description below). This cycle of reflection helped me to articulate where my previous design fell short in terms of aligning with my feminist vision, and where food tracking technologies were not supporting value based care for women. Ultimately, this exercise showed me that by only offering prescriptive food tracking technologies in cardiac rehabilitation, we are actually perpetuating systems of oppression where women are expected to be constant projects of improvement. I discovered that if I wanted to align my FMP with my feminist values, I needed to to zoom out to situate my design in the border experience of women, nutrition and their relationship to diet culture.

The Foodsy Chatbot can be considered as representative of many technologies currently being designed for tracking food intake. Thus, it provides an appropriate medium for reflection on the domain state of the art of in the following reflection.

Foodsy Chat Bot
OVERVIEW

Tracking

Users track their intake by clicking on the emoji associated with that food group each time they consume it.

Progress

Users are shown their progress at the end of each day through a graph showing whether their consumption was above or below their baseline.

Goal Setting

The core of the Foodsy chatbot focuses on setting a healthy eating goal related to one of the food groups important for a heart healthy diet.

Positioning

By positioning the use of chat bot in the ≈ 2 week waiting period before rehabilitation starts, patients can already begin making changes to their diet while their motivation is high.

Pluralism

During the designing, I used a persona which tries to capture a universal user, and interviews from a very homogeneous group of patients. I did not consider edge cases, and while the final design was open enough to be used in many ways, it could not capture the experiences that make us unique. For example, it did not account for varied cultural diets, for those who do not have access to all food groups, or for women who have a complicated relationship with food.

Participation

During designing, participation came mainly from second hand knowledge of medical professionals, who projected their ideas, values and priorities onto patients. The interview data which I used, as well as most of the research literature I based my decisions on were primarily reporting the experience of men. The approach was more technocratic: "how can we use a chatbot in this domain?" than participatory. The design was meant to facilitate more active participation in care, through setting personal goals, etc, however, the way of participating was predetermined by the design.

Advocacy

During the design, I did not center the need for justice. I did not actively work to break down the hierarchy of "valid" knowledge, honouring (patriarchal) scientific knowledge over lived experience and embodied knowing. I took doctors and peer reviewed research as the "most valid" knowledge. The technocratic approach of finding an application for the technology also played into patriarchal and capitalist hierarchies. On top of this, I witnessed a lot of fatphobic rhetoric in the medical community during the design process and did not advocate against it.

Ecology

Considering the ecology I was working within as a design student, there would have been a substantial added burden on making a project which challenges the ableist, fatphobic atmosphere that is often present in nutrition projects at the department. Being connected to a project which is trying to build a relationship with medical professionals, there is a tendency to work towards their goals of wanting a very detailed insight into diet. While the final design was positioned and examined in the broader context of the cardiac care pathway, it was not positioned in the broader context of women's experiences with nutritional behavioral change and the societal expectations of diet culture, nor did it truly acknowledge the temporal emotional experiences (fear, dread, stress) that accompany a cardiac event.

Embodiment

During the designing, the body was not considered. The mind was the starting point that needed to be "conquered" in order to change eating behaviour. The end result, a quantitative food tracker, did not encourage the patient to listen to their embodied knowing. The final design did not have a weight loss focus, nor did it suggest that the user should use it to lose weight. However, this technology did not support agency, but rather perpetuated an expectation to comply with self monitoring and nutritional guidelines to be a healthful citizen.

Troublesome

In this project, I shied away from the trouble and friction. I did not challenge the status quo of designing for food and eating behavior on a departmental level nor a societal one. There was a friction between designing a "novel" food tracking technology which could theoretically support nutritional behavior change... and then everyone (professionals, designers, friends, family, myself) saying ugh, but doesn't food tracking just suck? However, staying with the trouble requires time and space for processing which a typical design project does not always have.

Self Disclosure

From the perspective of designer self-disclosure, I did not actively disclose my positionality and experience. From the perspective of technology self-disclosure, the chat bot copy did not self disclose that it was a robot, and using the "eetscore" is not self disclosing as people cannot understand their score intuitively and it is not explained.

Reflection of values across (1) the designer, (2) the designing, (3) the design.

3.2 Curious Visiting

To curiously visit the lived experiences of women, I listened to women's experiences with nutrition after a cardiac event in Facebook support groups, surveyed 20 women who had attended CR about their experience, interviewed a Health at Every Size coach, a fat activist and a fat, queer, body positivity coach. I also interviewed a cardiac nursing specialist and a cardiologist about their existing practices with women in CR. This process also contributed to further defining and understanding the context of my design program.

01.

Questionnaire

about women's experiences in CR

- 20 respondents

02.

Impact Insights

of dieting on women in CR

- 5 Facebook groups

03.

Cardiac Specialists

specialized in cardiac rehabilitation

- Cardiologist
- Cardiac Nursing Specialist

04.

Body Positivity

experts and activists

- Health at Every Size Coach
- Fat Activist
- Body Positivity Coach

3.2 Curious Visiting

Questionnaire

A questionnaire asking about women and non binary peoples's experiences in Cardiac Rehabilitation was distributed among Dutch facebook support groups for women (ER approval in Appendix G. 27 women (0 non-binary people) responded, of which 7 had not participated in cardiac rehabilitation and were not considered in the analysis below. 17/20 respondents had attended CR in the past 5 years. Ages of respondants varied from 56 years old to 77 years old.

20 had participated in CR — 7 had not

> "It was generic care. As a younger woman in my mixed group it was mostly old men and catered to experience of male 75+"

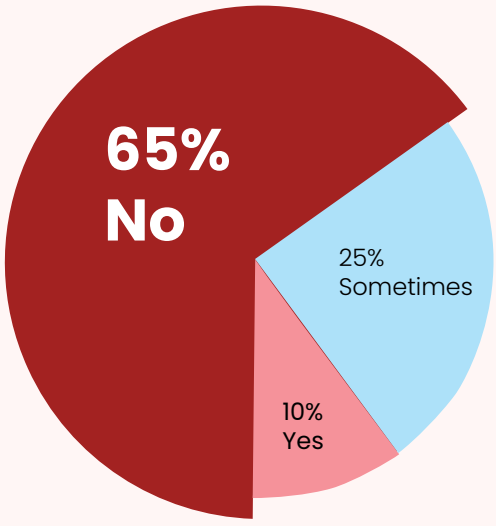
60%

were not satisified with their CR program

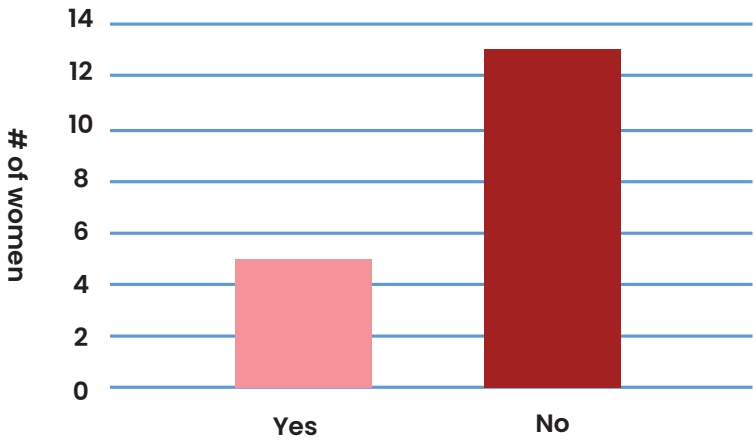
65%

did not feel in control of their care

Did you feel that CR was designed with your gender in mind?



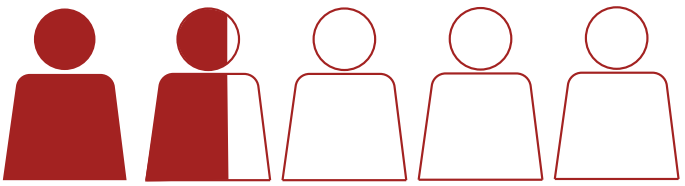
Did you feel taken seriously and respected during CR?



Questionnaire

Results about Nutritional Behaviour

Only 35% (n=7)
of respondents recieved nutritional support in CR



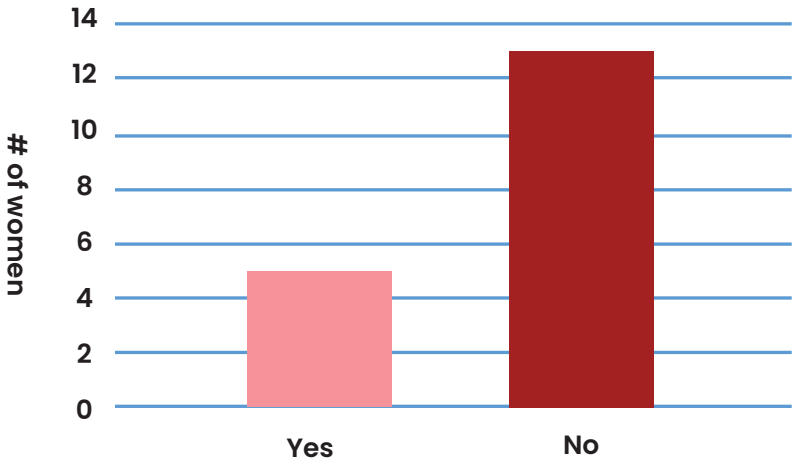
Only 1 of those 7 thought the tools provided helped to change their long term eating behaviour

67%

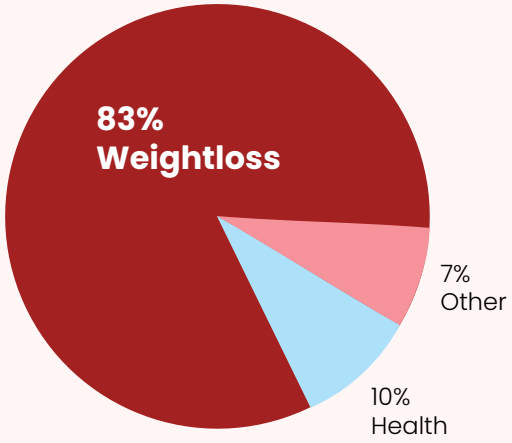
feel guilt or stress about their eating behaviour since their cardiac event

> "When I really focus on eating healthy I feel great. All other times, like a failure."

Do you think your health care professional understands how difficult it is for you to change your eating bahaviour?



Main motivation for changing eating behaviour after CR



Women's Facebook Groups

To understand the experiences of women after a cardiac event, I reached out to women's groups through Facebook. The groups were women-only spaces for those who have experienced a cardiac event. I requested permission to enter the groups through conversations with their admins about my research. They were enthusiastic about the research topic and supported research which focused on women's unique experiences since they felt unseen in many ways during their own experiences. After joining, I used the search terms diet(ing), eat(ing), food and nutrition to find related posts. I anonymized the posts and inductively clustered them into 11 themes.

Themes

* See clustering in Appendix E

- Increased burden and negative mental health impact
- Emotional or stress eating
- Fear of eating behaviour
- Technology
- Guilt
- Negative body image
- Fat shaming
- Feelings of exhaustion

01. Increased burden and negative mental health impact

Women report that the pressure to change their eating behaviour or go on a "diet" after their cardiac event increases their burden and stress levels, as well as negatively affects their mental health. As one woman shares *"...depriving yourself of the foods you enjoy makes your journey that much more difficult"*. Others echo the sentiment with feelings of sadness (*"I'm just sad. I miss eating!"*) and overwhelm (*"I get overwhelmed thinking too much about it."*). Depressive feelings after feeling forced to restrict their diet were also reported *("I just eat. I've given up so much it's depressed me so bad. I just eat.")*, along with the sentiment that focusing on all the food they shouldn't eat leads them to despair (*"The more we hone in on all the don't do this, this is bad, you shouldn't do that, bla bla bla... we'd probably wish we were dead."*). For others, the pressure they feel to change their eating behaviour makes them angry, and feel further isolated *("I hate my diagnosis! I hate what I have to do and the loss of the ability to just grab something to eat. Now when my family goes out to eat I stay home. Already feeling isolated, this only adds to that")*.

02. Emotional or stress eating

Many women report a cycle of restricting and bingeing, most often referred to as cheat days, (*"I do a cheat meal once a week if not I'd go insane"*, *"I'll eat everything I shouldn't eat for one day. Then I jump back on my bandwagon and behave.")*. Others within the group often lament their "emotional eating", referring to periods of time where they eat higher quantities of food that they find comforting in response to stress and difficult emotions (*"I think the stress is making a lot of us eat"*, *"anyone else have problems with emotional eating? What did you do?"*). Emotional eating is most often referred to as something that needs to be fixed or reduced, however some women in the group mourn the loss of eating for comfort (*"I am ONE HUNDRED percent emotional eating. And now I'm angry because I can't emotional eat like I could before...because I know the harm I can cause my body.")*.

03. Fear of eating behaviour

The fear of eating behaviour contributing negatively to physical health is a common theme. Women in the group share their fears about eating the wrong things and being responsible for doing more damage to their bodies (*"What do you ladies eat? I'm so scared I'm gonna eat the wrong thing in be back in the hospital I just don't know what to do." ; "I think I'm terrified of eating to much of the wrong things & do more damage as well."*). They also feel that even when they follow advice, they cannot "do it right", as one women shares through her experience at the endocrinologist (*"I went to the endocrinologist for an appt, we talked about weight and I explain I eat carrots now as a go-to food... she frowned and says carrots are high in natural sugar.. I GIVE UP!"*). Some women turn to technology to track

04. Technology

their food intake, but find it "*frustrating*" and that "*they never work that well*". Others who report app use also share that they set dangerously low calorie intakes ("*I use a calorie cycling application with my days from 650-1,000 calories.*") and that their ability to track their food determines whether they eat it or not ("*Not one single thing goes in my mouth until it is logged.*", "*If I cannot track it, it does not go in my mouth.*").

05. Guilt

06. Negative body image

For some, these experiences lead to increased feelings of guilt for not trying hard enough, ("*I have not changed habits completely or have tried all that hard. I am stuck in guilt mode.*"). For others, the effects of centering weight loss in their recovery has devastated their body image, self worth and mental health ("*Weighing myself everyday only confirms that I am fat and therefore ugly!*"; "*I hate myself sometimes. I get so tired of watching every little thing I eat or drink. I feel like crap and honestly don't have the desire to fix it.*") One woman reports that the pressure to lose weight is so much that she would have rather died than go through the process ("*it is enough to make me stay in bed all day to avoid mirrors. I find myself wishing that I had just died and got it over with rather than this long drawn out process*").

07. Fat shaming

This self loathing is perpetuated by fat shaming and fat-phobic rhetoric which they encounter both from health professionals ("*She (the nurse) said to me "you need to lose weight, the only way to beat this thing is to eat clean..." First of all, There isn't a cure, so no one has won, and I am eating great.*") and from the people around them. Women discuss that they are sick of people assuming that having a cardiac event is immediately related to poor food choices ("*I am sick of people assuming I eat too much. Quite the opposite is true.*"; "*My heart issues came from a VIRUS, not donuts (I don't even eat donuts). I am so pissed off that people associate poor food choices with heart disease!!*").

08. Feelings of exhaustion

The overwhelming sentiment among the group is that women are tired. They are tired of not eating foods they enjoy ("*gave up all the foods I love..getting tired of pretty much not eating!*"), tired of being told what they can and cannot eat ("*I am so sick & tired of: you cant eat this, you shouldn't eat that, stay away from those & don't dare drink that > etc. etc. etc.*"). They are also physically, mentally and emotionally exhausted. Experiencing a major health event is exhausting and for many, the overwhelming majority of the energy they do have is being spent on losing weight and monitoring what they eat. This exhaustion leads to more guilt; feeling guilty that they are too tired to cook from scratch ("*I have just started back at Slimming World but am really struggling. Mainly because I am so utterly exhausted, that I am too tired to cook from scratch.*") or feeling disappointed that they have gained weight back after losing it ("*I did great to start with. Quit smoking, watched my diet, got my pacemaker defibrillator, gained all the weight back... But I do not have the energy either.*")
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Design Insights

- The design should ultimately aim to not put further pressure on women to severely restrict their diet and should consider ways to reduce the negative mental health impact of dieting on women.
- The design should take into account the emotional side of nutrition
- The design should not use fear as a tactic to persuade women to change their diet.
- The design should not focus on technologies which center self-tracking behaviour
- The design should take into account women's body image
- The design and content should never focus on blaming women for their eating behaviour or shaming them for their body size.
- The design should acknowledge the reality that women recovering from a cardiac event might not immediately have the capacity or energy to begin.

3.2 Curious Visiting

Cardiac Specialists

Nursing Specialist

- Nursing Specialist at Cardiac Rehabilitation MMC Eindhoven
- Doctoral Candidate

+

Cardiologist

- Cardiologiest at Cardiac Rehabilitation MMC Eindhoven
- Assosciate Professor TU/e

Key Insights

- Currently they do not tailor any differences in CR between women and men.
- Women most often set goals about losing weight.
- There is such a fear of being fat that women do not want to stop smoking (extremely harmful for cardiovascular health) because they suspect they will gain weight.
- Nurses do not believe fat patients when they tell they have a healthy diet or practicing a healthy lifestyle.
- The social experience women have with dieting is not considered.
- Funding has been applied for to research the preferences of women in cardiac rehabilitation but it has not been granted.
- The cardiologist is in support of de-centering weight and shifting the focus to healthy lifestyle behaviours.

3.2 Curious Visiting

Body Positivity Interviews

In my design processes, I prioritized speaking with women who hold valuable knowledge in the field of women's health, especially when it comes to experiences with nutrition, but who are often not considered scientific, "authorized" knowers. Including these perspectives are important to a feminist design practice. I interviewed a Dutch fat activist (P1), a Dutch fat, queer, body positivity coach (P2) and a Health at Every Size coach originally from America, but educated in the Netherlands (P3). Their interviews were very powerful and offered a look into the realities of being fat women in the Netherlands, and their experiences with the health care system, nutrition and dieting.

Demographics

P1	P2	P3
Body Positive Coach	Fat Activist	Health at Every Size Coach
• Fat, queer woman	• Fat woman	• Straight Sized Woman
• Dutch	• Dutch	• Nutrition Education in NL
• 30+ years old	• 50+ years old	• American Background

Our interviews all began with discussing their own journey toward body positivity or body neutrality. Diet culture, and its effect on them as individuals was a common theme. They shared how they had held the belief, as many do, that weight loss was the cure-all and that life would be infinitely better if they lost weight. This thought consumed all their energy and time, with P3 sharing that she believes it is one of the biggest time wasters for women across generations. Beyond a waste of time, they told of the devastating impacts that constant dieting had on their mental health. They shared how they considered the impact of diet culture, and dealing with its ramifications as trauma (P1) and how unfortunately, the stigmatization takes a long time to go away (P2).

Interactions with healthcare have been particularly traumatizing for the two interviewees who are fat. They spoke of a cognitive dissonance that you experience as a fat person interacting with a medical system that says that they are there to help and do no harm, but then the care you receive feels very far away from that (P1). They shared their experiences, and the experiences of other fat women they know, of not feeling respected by doctors and frequently having health care professionals not respect their boundaries, for example, telling them their weight even when they ask specifically not to know. They expressed that they feel unseen that they must endure unsolicited advice for diet and movement even when coming to the doctors office for completely unrelated complaints. They explained how even basic care becomes inaccessible when you are not being believed that you are experiencing pain, or that you have been following the prescribed diet regime, or that you are struggling with an eating disorder. At a systemic level, they experience that healthcare is held hostage to them until they have lost an arbitrary amount of weight, despite this being against European law. Understandably, for many fat women, this makes them scared and apprehensive about engaging with health care systems, alienated by a medical system which is discussing the dangers of

"obesity" but never the impact of the stigma, such as women avoiding health care all together.

Finding body positivity (P2,P3), body neutrality (P1), health at every size (P1,P2,P3) and weight neutral care (P1) helped them to exist in the bodies they have without shame or guilt, to reclaim space, and to find joy in food and movement again. All came into contact with these movements through social media. It is important to note that the resources and communities they found online were all in English, with very few Dutch resources available. When they themselves wanted to interact with practitioners and coaches which implemented these mentalities, they had to search abroad. They shared with me that in the Netherlands, it has not yet picked up steam among care professionals like it has in North America and in the UK, with there being currently no Health at Every Size practitioners in the Netherlands. They also shared that resources not being in Dutch are a real barrier for some, especially older women who are less proficient with English. Important books about the movements have not been translated to Dutch, and there are far fewer social media and blog resources in Dutch (although P1 and P2 are trying to change that).

When asked how we could improve nutrition without perpetuating this cycle, they shared their experiences with intuitive eating. They all say their quality of life has drastically improved since they were able to find freedom through intuitive eating and that two of them now incorporate it as suggestions to others that they coach towards body positivity or neutrality. They expressed that they appreciated that intuitive eating gave them permission to make changes slowly, to focus on joy again, and to reconnect with their bodies. All 3 shared that the beginning was very difficult because they had to tune back into hunger and fullness cues.

When asked about cardiac health, and how intuitive eating could support heart healthy nutrition, P2 shared that *"first you must deal with the food obsession, if you're still obsessed with food and it complicated for you, you cannot make the choice for cardiac health because it will always secretly be about other things which don't really align with health".*

Through a discussion about how technology can support body liberation instead of perpetuating cycles of oppression, it became clear that they felt current nutritional technologies were a slippery slope to disordered eating and obsession. They felt that current nutrition tracking apps were easy to abuse, or as P2 pointed out *"abuse might not be the right word, because they use them exactly as intended".*

*"Getting in touch with your body,
how to feel when you're hungry,
how to feel when you fall when you've had enough.... That was such a revelation,
to feel and just to focus on getting in touch with yourself.*

Because all this time I was trying not to feel this, this part from the neck down" -p3

Design Insights

1. The imagery, language and representation you use in your content is extremely impactful.

- Do not use terms such as “overweight” or “obese”. These terms are loaded and therefore are microaggressions.
    - Alternative language to use can include fat, larger bodies, or higher weight.
    - Of course, *language is always changing* so you should read materials coming from the communities you wish to address to find the most current language of choice.
- It is important to provide this content in Dutch since it is not currently available.
    - We should be supporting Dutch activists to create this content
- Include imagery of real, diverse, fat women.
    - Fat women should be represented in all ways and include them living rich, active, happy lives; not only as “before” pictures.
    - Avoid tokenism such as only including one fat person, or always positing the fat person as a supporting image.
    - This is especially relevant when discussing nutrition.

2. Actively involve fat women in the creation of content.

- There should be fat people involved in the delivery of nutrition education, not just straight sized allies *(you need both)*.
- You should hire sensitivity readers with lived experience to review material.
- Providing links to the outside resources made by fat women such as podcasts or groups allows women to find communities which resonate with them.

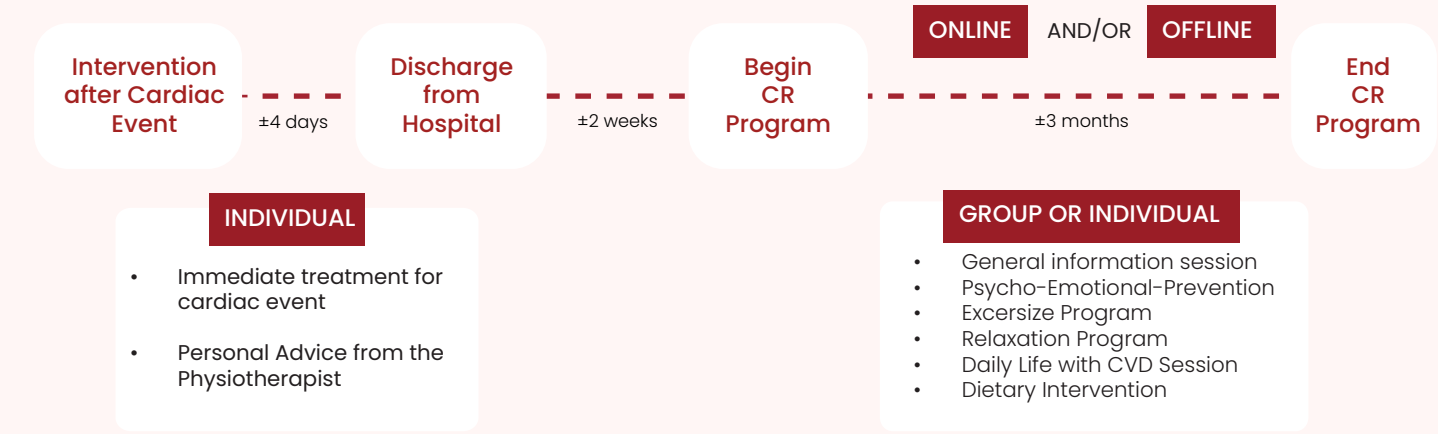
3. Technology focusing on nutritional self-tracking behaviour is harmful.

- Intuitive eating is a viable alternative to dieting and should be offered in mainstream health care and is currently widely unsupported by technologies.
    - Design should support long term skill development to have your “tool-box” for the rest of your life because divesting from diet culture is not linear and can take a long time.
    - Design should support tuning back into the body to notice hunger and fullness cues because this is one of the most challenging parts of intuitive eating.

“We will not be healthier, both psychologically and physically, about our food until we learn to love it more, not less … with relaxed, generous, unashamed emotion.”

Michelle Stacey

Positioning in the Context



Between discharge from hospital after a cardiac event, and the start of a rehabilitation program, there is an approximate two week wait. During this period with no contact, participants can become demotivated and fail to enrol in the program. Currently, patients are not sent home with nutritional guidance, although this is something they can realistically begin working on right away. At the Maxima Medical Center in Eindhoven, patients receive directions to install an administrative app before leaving the hospital which has been successful, suggesting that installing the Intuitive Eating Application would also be possible at this moment. Having the technology introduced by a care professional can increase user's trust and motivation to use the intervention, and supports those less familiar with technology to get started.

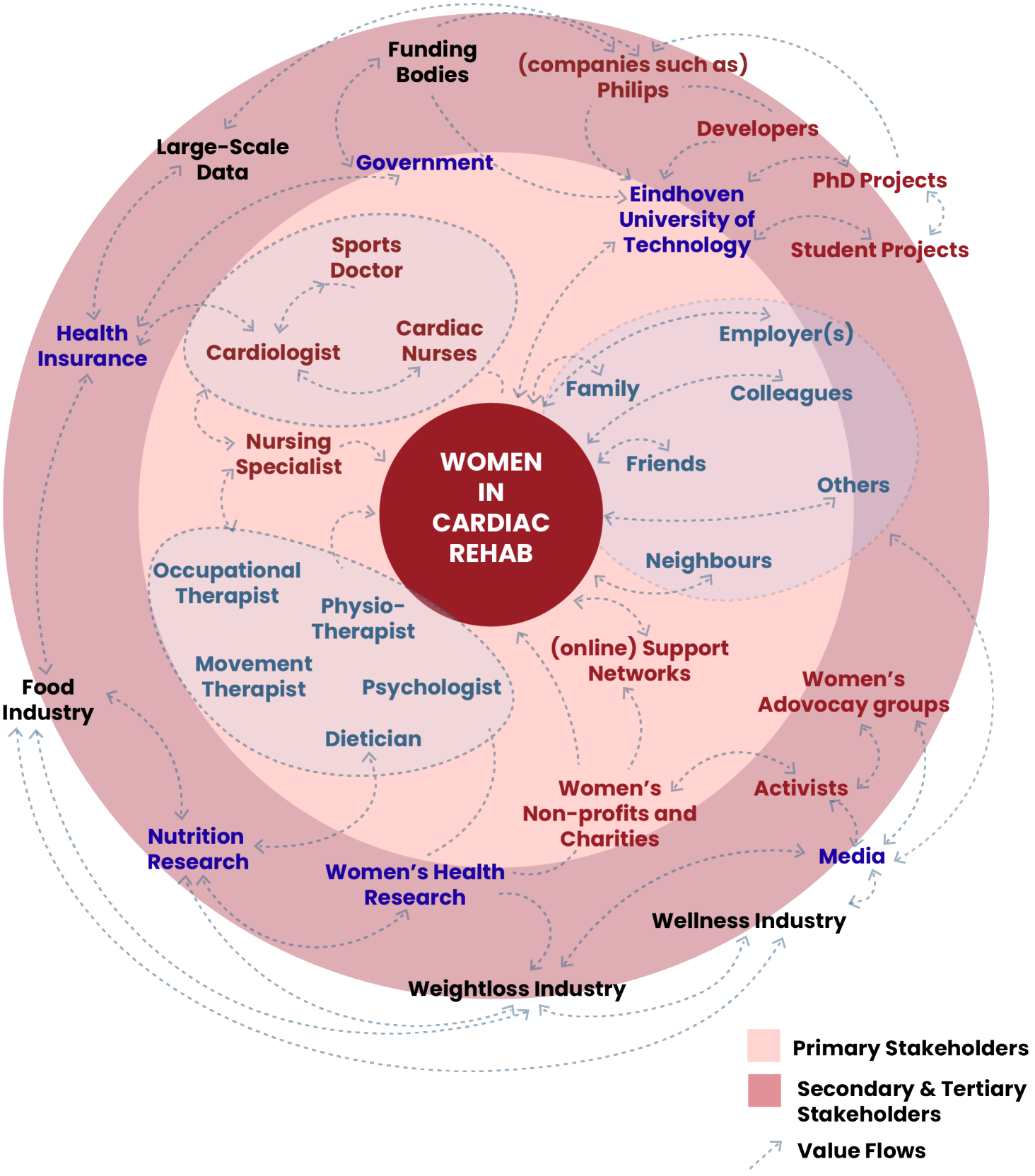
The Intuitive Eating application is intended to be offered as an alternative to food tracking technologies, rather than a replacement. While this design project has demonstrated that there is a need for alternative nutrition programs for many women, this does not mean that intuitive eating is better for all women. Ideally in the future, there would be a variety of approaches to nutrition which patients can choose from to experiment with and see which suits them and their bodies the best.

To implement an intuitive eating application into the cardiac care pathway in reality, there are a few barriers which would first need to be addressed.

Primarily, more research is needed. The long term health outcomes of cardiovascular patients who receive intuitive eating support through a mobile application need to be clinically evaluated. In particular, comparing women's long term mental and physical health when practicing intuitive eating against the effects of restrictive dieting. Current intuitive eating research has not been performed with women in cardiac rehabilitation. When testing mobile applications in health care, it is very important that designers are involved, as technological burden from poorly designed and executed applications can majorly impact research outcomes.

From a design perspective, this would require more research focusing on embodied ways of knowing and fostering trust in intuition in the healthcare domain; shifting away from extrinsic goals towards intrinsic engagement. This would require a re-evaluation of where funding is allocated. Currently, short term health behaviour change projects receive a lot of funding and attention. These projects are easier to demonstrate positive results since short term behaviour change is nowhere near as difficult as long term, however long term research is necessary and important to truly design for sustained health.

Value Flows in the Context



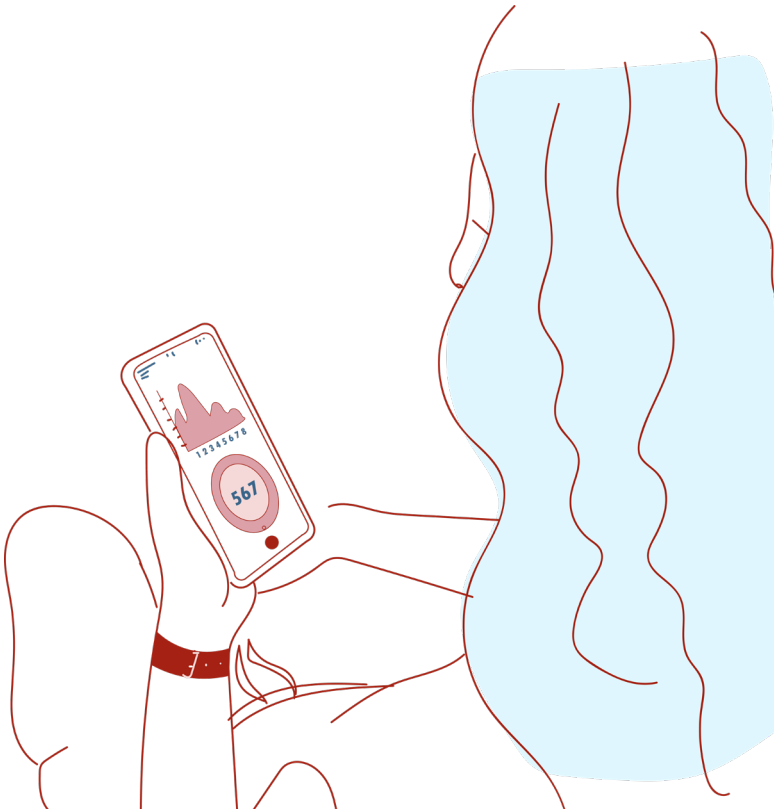
Discussion

This project articulates and outlines how digital nutrition interventions can better align with the lived experiences and values of women in CR. The interview and questionnaire results further highlight how women feel under-served by current nutritional program offerings in CR, and that there is a misalignment of self-tracking technologies with women's values.
The proposed intuitive eating mobile application and chatbot demonstrate an alternative to the current prescriptive self tracking technologies and highlight how design of technologies can take a feminist approach to re-centering the intuitive knowing of the body. This project has also demonstrated that designing from a feminist perspective provides opportunity for designers to critically reflect on their own positionality and engage with the troubling aspects of technology and socio-technical systems.

The insights from women's cardiac rehabilitation support groups, and the survey about their experience in CR, support the claim that women do not feel that cardiac rehabilitation has been designed to meet their personal needs. Women reported not feeling understood by their health care professionals, with 90% reporting that they felt their CR program was not always designed with their gender in mind, including nutritional programming. These results support the findings of Way & Reed (2019) and Supervia et al. (2017) who found that women do not feel CR is for them, and demonstrates that their findings extend to nutrition programming in CR.

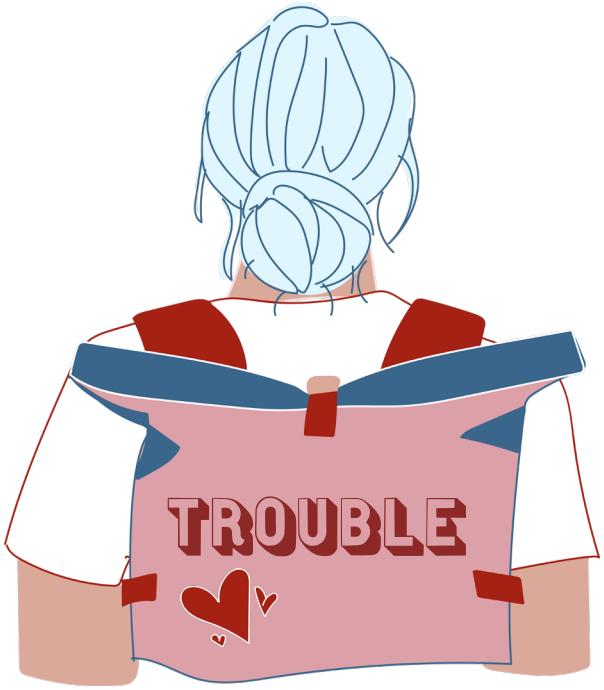
This project also supports the findings of Cordeiro et al., 2015 who report women feeling guilt, shame (Cordeiro et al., 2015) and increased stress (Orji et al., 2018) related to food tracking. This project contextualizes this in the cardiac care pathway, and shows that these findings hold true even after a major health event. The findings also show that weight loss remains the primary goal for most women when changing their diet, even after a cardiac event. When we consider that weightloss does not last long term (Loveman et al., 2011; Wing & Phelan, 2005), nor is it a reliable indicator of health (Nuttall, 2015), we realize that we must acknowledge and work to counter the societal pressures and expectations of thinness and performative health if we want to truly improve women's health with our designs.

For designers, the project outcomes highlight that we cannot neglect the socio-cultural dimensions of women's lived experience with food. Intuitive eating offers an interesting avenue to achieve this. Technologies to support intuitive eating provide exciting design opportunities to explore ways to build resilient, life long skills. It is important to note that intuitive eating is not the one-stop-shop, perfect solution. Intuitive eating (or parts of it) might not be suitable for some, including (1) women who are currently experiencing, or in recovery from, an eating disorder, (2) women who take medications which suppress the body's appetite or satiety cues (3) women who have a disability, illness or allergy which requires them to eat or avoid certain foods. Being able to practice intuitive eating can also be considered a privileged position, as it assumes that one has access to a variety of foods that they enjoy and that are nutritious. This is not always possible, due to, for example, having a restricted food budget, being supplied with food by others, or living in a food desert. As such, it should never be offered as the only option.



To take the development of an intuitive eating platform further, the app should be tested in terms of user experience, as well as in a long term trial to see if it supports long term impact. When considering which success indicators to measure long term impact with, focus should be placed on measuring stress reduction around food, as well as measuring improvements in body image and intrinsic motivation to select foods which support heart health. When measuring nutritional behaviour change as an outcome of intuitive eating, researchers should be aware that asking participants to simultaneously track and self-report food intake while practicing intuitive eating would be counterproductive and affect the validity of outcomes. This is because research participants cannot completely divest from dieting whilst simultaneously using such self tracking technologies or questionnaires during the study. This presents an interesting research challenge.

The approach of using a feminist, Troubling Design approach has shown to support engagement with the uncomfortable complexities of women's nutrition for which there is no immediate solution, or even problem definition. This process has demonstrated that the Troubling Design Program for Women's health proposed by Søndergaard (2020) is also relevant to exploring the intimate area of women's nutrition. While previous work in feminist HCI has focused on menstruation (Søndergaard & Hansen, 2016; Fox et al., 2018), menopause (Bardzell, 2019; Homewood, 2019), and intimate self-discovery (Almeida, 2016), nutrition tracking as a women's health issue has been left out. This project demonstrates that similar cultural expectations and taboos permeate the topic of dieting and nutritional behaviour change for women, and should thus be further researched as a feminist issue in HCI.

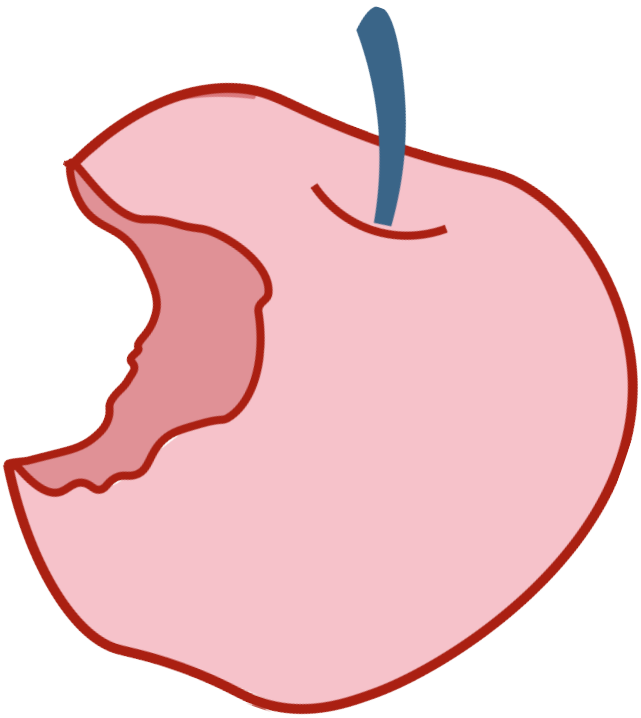


Conclusion

This project has served to question the status quo of nutrition interventions in cardiac rehabilitation through a feminist design program of Troubling Design (Søndergaard, 2020). Through critically reflecting on the state of the art of nutrition tracking technologies, it becomes clear that the current direction of the field does not align with feminist values. Instead, the technologies we are designing perpetuate systems of oppression and damage women's physical and mental health outcomes. To counter this, this project has connected with and listened to a varied group of women's lived experience, including alternative sources of knowing such as activists.

The designed platform introduces Intuitive Eating. Through ten modules, women are supported in re-meeting their bodies, divesting from diet culture and discovering life beyond constant yo-yo dieting. The chatbot function supports women while they learn to tune back into hunger and fullness cues, using the hunger scale to foster trust in the intuitive knowing of the body. Supporting intuitive eating offers an exciting design research opportunity going forward. This includes focusing on how technologies can support the intuitive knowing of the body rather than override it, and how to foster engagement with technologies because women want to, not because they feel they have to.

This project enhances our understanding of the interplay between the healthcare environment, socio-cultural systems, technological health interventions, lived experience, and value based health outcomes for women. It also further demonstrates the value of a troubling design approach for women's health and positions technologies for women's nutritional behaviour as a feminist design issue within design and HCI which warrants further research. Ultimately, this project starts a critical conversation about the ethics and impact that nutrition tracking interventions have on the women we design them for, and how technologies can instead become champions of feminist liberation.



Thank you

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those who are working for change,
those who support me daily,
And those who have worked tirelessly to forge the way for centuries.

Thank you to the 13:00 Stand Up crew for my favourite 3 minutes of the day.

& finally, I am thankful to myself ,
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Appendix

Appendix A

A Women's Journey in the Cardiac Care Pathway

The field of cardiac care has had a fraught relationship with women, with gender disparity permeating nearly all moments of the cardiac care pathway. Starting at the research level and including public health discourse, prevention, diagnosis, treatment and rehabilitation. A normative approach to cardiology, where the male heart is the norm, and heart attacks are a man's disease underlie many of the misconceptions in cardiac care for women.

This begins at the level of research, with two thirds of all clinical research having been carried out on men (Nguyen et al., 2018), and women having been massively under-represented in cardiovascular clinical trials (Scott et al., 2018). The female body is missing in research as far back as animal testing, with researchers favouring male mice over female mice since hormone cycles are more difficult to contend with in delicate trials. This is not unique to the field of cardiovascular health, but is a reality that women must contend with in many areas of health care (Greige et al., 2021; Zucker & Prendergast, 2020). This has resulted in our understanding of risk factors, diagnostic techniques, and treatment options being overwhelmingly based on the experience of men and the male body. This means that not only is there a possibility that diagnostics and treatments are unknowingly less effective in women, but that also possibilities where the treatment might have worked better in women have been discarded for not working in men.

At the level of public health discourse, women are poorly educated about the prevalence and risk factors unique to them. It has been found that CVD risk factors such as physical inactivity, hypertension, diabetes mellitus, and poor mental health (anxiety, depression, and perceived stress) have a greater impact on women's cardiovascular health when compared with men (Way & Reed, 2019), leading to women actually having an "excess" risk when compared with men. Female specific risk factors which have been reported more recently are also widely unknown. These include having a history of polycystic ovary syndrome (Oliver-Williams et al., 2020), preterm delivery (Kessous et al., 2013) or a hypertensive pregnancy disorder (Bellamy et al., 2007), having developed gestational diabetes mellitus (Vrachnis et al., 2012), having received radiotherapy for breast cancer (Darby et al., 2013), or having undergone surgical menopause at a young age (eg. for having a BRCA mutation) (Rivera et al., 2009). Overall, it has been found that women dramatically underestimate their personal risk of heart attack (Hammond et al., 2007).

Women are also poorly informed about the signs and symptoms of heart attacks in women (Bairey Merz et al., 2017). Ultimately, this results in women delaying medical help longer than men (Nguyen et al., 2018). Since recognizing the gender gap, there has been a new pervasive narrative that women experience different or "a-typical" symptoms when compared to men. New research has shown however that while women have some symptoms presenting more frequently, for example reporting pain radiating to the jaw or back, and experiencing nausea (women: 33% vs men: 19%), the most common symptom for both men and women is chest pain (93% of both men and women), with pain radiating down the left arm (women: 49% vs. men: 48%) (Ferry et al., 2019). This challenges the narrative that women's "a-typical" symptoms are mainly responsible for the gender gap in accurate, timely diagnosis of heart attacks. Women are less likely to receive aspirin, be resuscitated or be transported to the hospital in ambulances using lights and sirens than men (Lewis et al., 2019). These delays have serious consequences for women's survival rates, with delayed treatment by as little as 30 minutes reducing life expectancy by one year (Rawles, 1997).

If a woman has recognized her symptoms and has arrived at hospital, she is then 50% more likely to receive an incorrect initial diagnosis (Wu et al., 2018). Recent research has found that the blood test most often used to help diagnose heart attacks by measuring a protein called troponin (which is released by the heart when it is damaged), has historically had incorrect thresholds for women, who typically have lower troponin levels during a heart attack than men (Shah et al., 2015). Using the new threshold for women can double the number of women diagnosed with a

heart attack when they would have been otherwise told they were fine (Shah et al., 2015). It is interesting to note that women report often being misdiagnosed first with stress, panic or anxiety (playing into the old trope of hysterical women).

If a woman has been accurately diagnosed, she is then confronted with poorer treatment. While most health care professionals have the best interest of their patients at heart, deep seated unconscious bias against women is prevalent. A study which reported on "quality indicators" recommended by the European Society of Cardiology found that women were less likely to receive 13 out of 16 treatments recommended for every patient presenting to hospital with a suspected heart attack (Wilkinson et al., 2019). For example, it was reported that women are 34 per cent less likely to receive a coronary angiography (a critical step in deciding heart attack treatment) within 72 hours (26), despite it being recommended by the European Society of Cardiology guidelines (26).

If a woman has successfully undergone treatment for the immediate dangers of a heart attack, the longer term treatment also disadvantages women. Women are less likely to be prescribed drugs which reduce the chance of having a second heart attack (Wilkinson et al., 2019) and are less likely to be referred to a cardiac rehabilitation program (Colella et al., 2015). One study found that one third of physicians showed evidence of gender bias, judging female patients less likely to benefit from cardiac rehabilitation compared to male patients with comparable characteristics (Backstead et al., 2014). This is further compounded along the lines of intersectional identities, where women with lower socioeconomic status, level of education and non-white race are referred at even lower rates (Mochari et al., 2006; Suaya et al., 2007; Mead et al., 2010).

Appendix B

https://tuenl-my.sharepoint.com/:b:/g/personal/d_oneill_student_tue_nl/EeWZCLfEukxIgB-bhZn9rrXkB_qvqdd6fB1Ox_AApAFtccg?e=TaguW5

Appendix c

START SCRIPT

Chat bot says	Human Says		
Hi! I'm Intui, your intuitive eating chatbot (1)			
Intuitive eating can be a challenge at first, but it gets easier with practice.			
I'm here to help you get to know your body again and listen to your hunger cues.			
Are you ready to learn more? (3)			Chat bot says
	Button [Yes!] (a)	Button [No] (b)	---------- Okay, I'll ask again later (b1)
To start eating intuitively, we need to reconnect with our body so that when it tells us it's hungry or full, we know how to listen. This sets the stage for rebuilding trust in yourself and in food.			
Let's start by taking 3 deep breaths. Place your hand on your belly and feel it falling and rising with your breath.			
	Button [done] (a)	Button [ ] (b)	
Now, try to focus on how your stomach is feeling. Does it feel uncomfortably full, completely empty or somewhere in between?			
	Uncomfortably Full	Completely Empty	I cannot tell: Chat bot says
	Somewhere in between	I cannot tell	---------- It can be hard to figure out if we are hungry, especially if we have ignored it for a long time.
It's great that you can recognize that!			
Feeling so full that it makes you feel sick, or feeling so starved that you will eat whatever you can get your hands on are two opposite ends of the spectrum. Many people swing between the two, feeling guilty after eating so much that they restrict all day until they are so hungry that they binge eat. Intuitive eating can help you learn to trust your body again so that you do not feel either extreme as often.			A handy tool for intuitive eating is the hunger scale:
A frequently used tool for listening more closely to your body is the hunger scale:			
10 - Extremely stuffed, nauseous 9 - Stuffed, very uncomfortable 8 - Overfull, somewhat uncomfortable 7- Full but not uncomfortable 6- Satisfied, but could eat a little more 5- Starting to feel hungry 4- Hungry, stomach growling 3- Uncomfortably hungry, distracted, irritable 2- Very hungry, low energy, weak, dizzy, hard to think 1- Starving: no energy, very weak, crabby, headache			
Where do you feel that you are on the scale?			
	1,2,3,4,5,6,7,8,9,10, I don't k		
Okay, I understand you are at a: *** Is that correct?			Chat bot says
	Button [Yep]	Button [Nope]	---------- Okay, let's try again. What number do you feel you're at?
Take a moment to make a mental note of what you feel in your body.			
What other sensations told you how hungry you were? Perhaps you felt your concentration has been low or that you have been thinking alot about lunch for example			
	got it!		
So now that you know where you are roughly on the hunger scale, what can you do with it?			

	While everyone is different, a good first step is to aim to start eating when you reach a 3-4. By not waiting too long, it can make it easier to thoughtfully choose what you'd like to eat and eat until you are satisfied, rather than overly stuffed.			---	A 3 is: A 4 is:
		Got it!	What's a 3-4 again?		
	Once you reach a 6, you would be just about satisfied. Within 15-20 minutes, you will likely be at a 7, full but not uncomfortable. To make this a bit easier, check in with your hunger cues before and/or during meals and snacks				
		Got it!	What's a 6-7 again?		
	While these are some suggestions, it is important to remember that there is no "right way" to do intuitive eating. A great example is birthdays; You might not be hungry, but if the cake is delicious and celebrating with a slice makes you happy, then go for it!				
	If you're having difficulty figuring out if you are hungry, you can always reach out to me by saying /help and I can guide you through some questions to ask yourself!				
		Thank you!	Help!		

Chat bot says		Human Says	
		Help!	
Hello! need some help tuning into your hunger?			
		Yes please!	
		No, not right now	
Let's start by taking 3 deep breaths. Place your hand on your belly and feel it falling and rising with your breath.			
		I've taken 3 deep breathes	
Now, first let's focus on the physical sensations you are feeling in your body			
Does your stomach have an empty feeling or is it grumbling?			
		yes/no	
Are you feeling weak or shaky in your body			
		yes/no	
Okay, now let's tune into your feelings.			
Are you feeling low on energy?			
		yes/no	
Are you feeling irritable or grumpy?			
		yes/no	
And finally, let's pay attention to our thoughts,			
Have you been thinking more about food?			
		yes/no	
From your answers, it seems like you could be experiencing hunger. With this in mind, let's look at the hunger scale and re-evaluate where you think you are			
10 - Extremely stuffed, nauseous 9 - Stuffed, very uncomfortable 8 - Overfull, somewhat uncomfortable 7- Full but not uncomfortable 6- Satisfied, but could eat a little more 5- Starting to feel hungry 4- Hungry, stomach growling 3- Uncomfortably hungry, distracted, irritable 2- Very hungry, low energy, weak, dizzy, hard to think 1- Starving: no energy, very weak, crabby, headache			

Where do you think you are on the hunger scale?			
		1,2,3,4,5,6,7,8,9,10, I don't know	
You seem to be hungry! By aiming to start eating when you reach a 3-4, you can avoid waiting too long and feeling so hungry that you eat more than is comfortable for you.			
You seem to be very hungry! In the future you could try to notice when you reach a 3-4, instead of waiting until you are very hungry. This gives you more time to make something that you want, is tasty and feels good.			
Tip! Try checking in with yourself and your hunger every couple of hours while you are learning to pay attention to your body. This will help you to notice the changes you feel when you're getting hungry. You can read more about this in module 2!			

Khovanskaya, V., Dombrowski, L., Harmon, E., Korn, M., Light, A., Stewart, M., & Vrooda, A. (2019). Designing against the status quo. Interactions, 27(2), 64-67.

Woman-Centered Design through Humanity, Activism, and Inclusion (Almeida et al., 2020)

Feminist HCI: Taking Stock and Outlining an Agenda for Design (Bardzell, 2010)

formgiving to feminist futures as design activism (Heidaripour & Forlano, 2018)

Feminisms through design: a practical guide to implement and extend feminism: position. (Chivukula 2020)

- What's at stake? Now, what else?
- Whose status quo? What should be destabilized?
- Who gives permission? Who disagrees? According to whom? Who else?
- What makes a good change? How does (can) change happen?
- What is my positionality, power, potential leverage?
- How can we overcome inertia, dislodge the sediment of history?
- What are the limits of design?

resistance (marie louise sondergaard

1. Humanistic
1.agency
1.Activism
1.break down heirarchy
1.regards bodily integrity
1.intersectional
1.capacity for empowerment

1.takes women's rights into perspective
1.empathic approach (mcarthy and wright)
1.Troublesome
1.demanding of justice
1.engagement with participants
1.Inclusivity
1.Pluralism (Bardzell)

ecology (Bardzell)
embodiedment (Bardzell)
self disclosure (Bardzell)
participation (Bardzell)
advocacy (Bardzell)
friction
identity and the self
equity
social justice
empowerment
diversity
fulfillment

temporalities
subjectivities
hack-abilities
situatedness

willfullness
queerness
failure

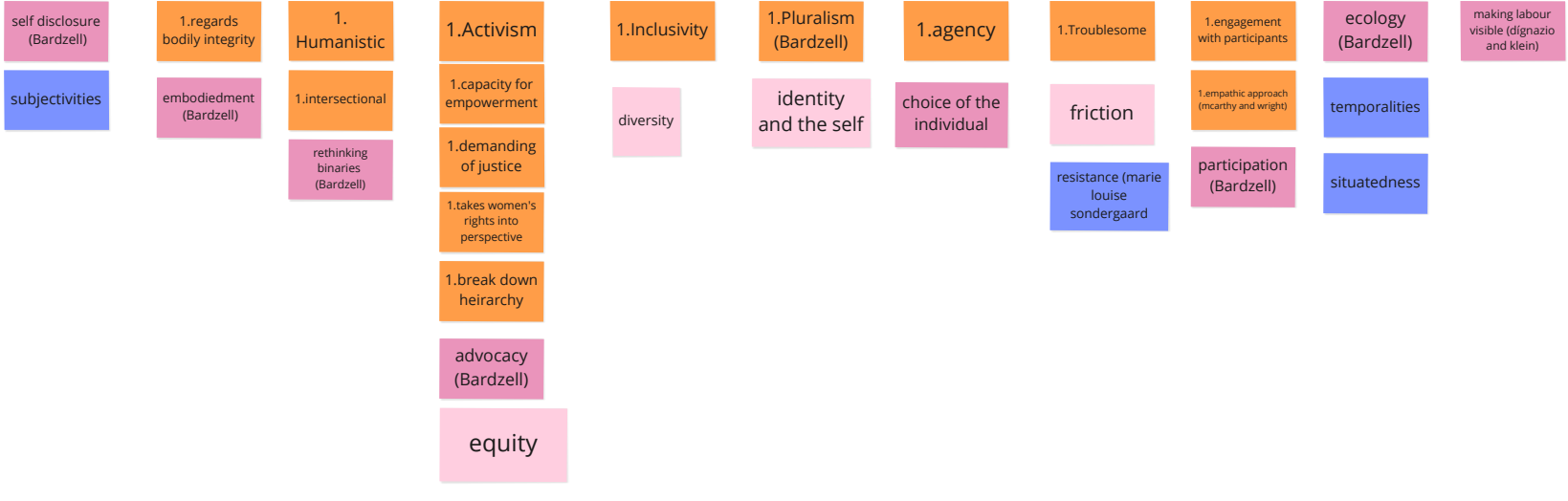
what are the hegemonic structures being questioned or critiqued through your research?

do our designs help women to get to know themselves better?
does our design advance equity
does our work seek to reduce disparities

To apply these concepts to our study, we think about the "who questions" as intersectional. That is, the title and who speaks for women regarding their safety and who is allowed to design how women ensure safety.)

Appendix D

Feminist Values



Doing Design centered in feminist values

why this is hard

1.engagement with participants

advocacy (Bardzell)

reflection

self disclosure (Bardzell)

friction/ troubling

QUESTIONS TO ASK

ecology (Bardzell)

1.Pluralism (Bardzell)

being a woman doing this :

process

staying with the wrong

curious visiting

collective imagining.

or more broadly support design against the status quo (Khosravi&aya et al. 2018).

do our designs help women to get to know themselves better?

does our design advance equity

does our work seek to reduce disparities

what are the hegemonic structures being questioned or critiqued through your research?

To apply these concepts in our study, we think about the "who questions" as suggested by Nuller (15): We ask who speaks for whom about what kind of safety and who is allowed to design how women ensure safety. (

(1) a set of sociocultural values, beliefs, and definitions for what (Norm), how (practice), and for whom (users) the design program is practiced

(2) a specific worldview including core values, beliefs, and theories, and

(3) a set of design experiments that visualize and bring shape to the design program.

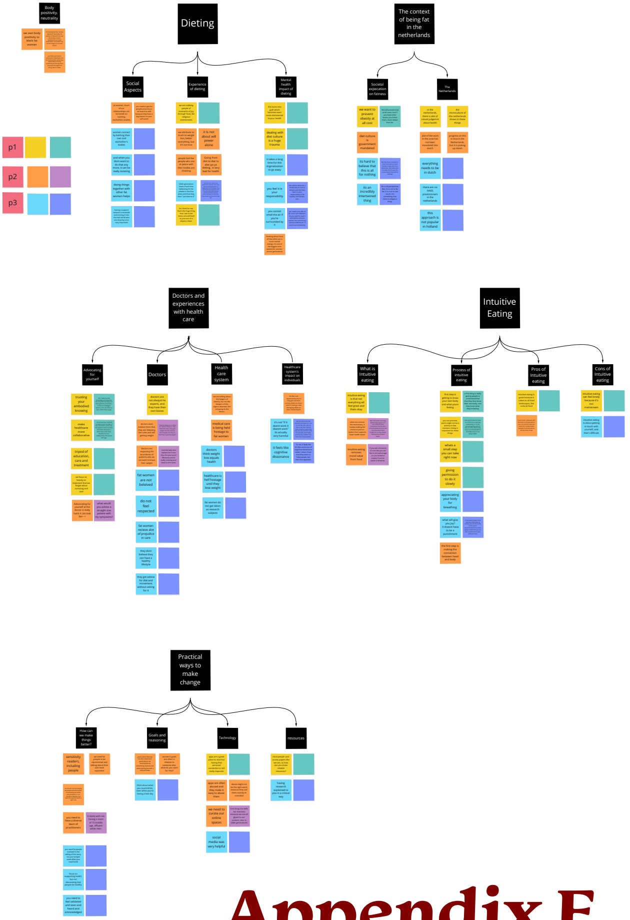
can I curiously visit facebook?

New table

DIMENSION	The Designer	The Designing	The Design
Pluralism equity diversity Building on feminist standpoint theory, this quality argues that human experience is too varied to be captured within the concept of universalism, thus pluralism, or heterogeneity, in design is of critical importance to HCI work.		During the designing, I used a persona which tries to capture a universal user All of my interviews were with white, middle to upper class, highly educated people. I did not imagine pluralistic experiences or edge cases while I was designing	the final design was open enough to be used in many ways, however it could not capture the expereinces that make us unique The design was not assessed for use by people with visual or motor impairments. The design assumed that those using it had access to all food groups The design did not account for varied (cultural) diets The design did not account for previous experiences with disorder eating
Participation engagement with participants empathic approach (mcarthy and wright)	Not having engaged with participants first hand meant that it was more difficult to work from a place of understanding of lived reality	During designing, participation came mainly from second hand knowledge of medical professionals, which projects ideas and values onto patients the approach was more technocratic "how can we use a chatbot in this domain" than participatory The interviews which I used with permission from previous research were all with men	The design meant to facilitate more active participation in care, through setting of personal goals, etc. The design did acknowledge that change is difficult in the copy of the chat bot but did not acknowledge that tracking is also hard (lack of empathy)
Advocacy Capacity for empowerment Break down heirarchy Demanding of justice Takes women's rights into perspective	During the design, I did not center the need for justice despite wanting to. I did not actively work to break down the hierarchy of "valid" knowledge between lived experience and embodied knowing, and that which has been found in patriarchal systems. The approach was technocratic which plays into patriarchal hierarchy. I Was bystander to fatphobic rhetoric in the medical community during the design process	A needs analysis did not critically look at "whos needs" doctors and peer reviewed research was taken as the "most valid" knowledge	The design did not actively advocate for justice. The perscriptive food tracking approach actually perpetuated systems of oppression where women are expected to be constant projects of improvement The video used a very typical "goal" of a woman which revolved around her family rather than herself.
Self-disclosure	I did not actively practice self-disclosure during my interactions with professionals nor in my report.	During designing, self-disclosures were not made to participants. During design, I did begin to reflect on my own positionality and experience with the technologies.. perhaps it was a a prior step of disclosure to self?	The final design was self-disclosing (in the sense of transparency) in it's simplicity. You could understand how your score went up or down, based on how many categories you ate. Using the "eetscore" is not self disclosing as people cannot understand their score intuitively and it is rarely accessibly explained The chatbot did not self disclose that it was a robot
Ecology temporalities situatedness	If I consider the ecology I was working within to asses the "design reasoning, decision-making, and evaluation", then there is an added burden on making a project which challenges the ableist, fatphobic atmosphere that can be present in nutrition projects.	A larger systemic overview was made, and the technology was positioned in the wider context, for example considering the correct moment to introduce the technology based on the experience at that moment in the care pathway It is interesting to look at the situatedness of the designing. Being in a squad which is trying to build a relationship with medical professionals, there is a tendency to work towards their goals of wanting a very detailed insight into diet. The temporalities of the designing were that there was interest in creating a chat bot and seeing how it could support design for nutrition	The final design was not positioned in the broader context of women's experiences with nutritional behavioral change and the societal expectations of diet culture The final design did not truly acknowledge the temporal emotional experiences (fear, dread, stress) that accompany having a cardiac event
Embodiment 1.regards bodily integrity		During the designing, the body was not considered. The mind was the starting point that needed to be "conquered" in order to change eating behaviour	The end result, as a food tracker, did not encourage the patient to listen to their embodied knowing The end result did not have a weightloss focus, nor did it suggest that the user should use it to lose weight.
Intersectional Humanistic rethinking binaries (Bardzell)	for me as a designer, I began to rethink the binaries of what "successful" food tracking looked like. For example, I began to realize that periods of non-use are normal and valid.	During the designing, an intersectional approach was not used extensively.	The design did consider lower-literacty levels and aimed to reduce the burden of tracking The tracking was quite focused on binaries, if you eat a certain amount=good and a certain amount= bad The design did not take into account how the intersectional identity of the individual would influence the experience. For example, being only accessible through smartphone assumes access to technology. The design did not take the humanistic qualities of failure or grief after the health event into account.
Agency choice of the individual	Since I had been working with the chat bot, and then working with the cardiologist, I felt that I had diminished agency in the directions I could choose. I realize that this was more self-imposed		The design let people set their own goals that they wanted to work towards while the design was not proposed as a "mandatory" part of the care pathway, it should be noted that it was the only solution envisioned in the pathway. The design let people choose which food group they would like to focus on tracking for that week The design aimed to give patients more agency over their own nutritional behavior change by offering a technology which supported them. However... I now realize that this technology did not support agency, but rather perpetuated an expectation to follow nutritional guidelines to be a health citizen
Troublesome friction resistance (marie louise sondergaard	In this project, I shied away from the trouble and friction. I did sit with the trouble for long enough for it to birth my next project I shied away from challenging the status quo of food and eating behavior having moral value There was a friction between designing a "novel" food tracking technology which could theoretically support nutritional behavior change... and then everyone (professionals, designers, friends, family, myself) saying ugh, but doesn't food tracking just suck?	The processes did not have the time or space to sit with the trouble Sitting with the trouble requires time and space for processing which a typical design project does not have. It is almost like this first project acted as a time to analyze the status qup which then allowed me to explore the trouble.	The final design did not acknowledge the friction of the topic
questions to ask			
do our designs help women to get to know themselves better?	This design did help me to get to know myself better as both a designer and a human (can these two even be mutually exclusive?) I learned a lot about the values that I want to promote with my designs, and how I can make that happen within the design world and design education that I work within. (and how I want it to happen in the future)		The design offered insights into their nutrition habits But the final design did not actively provide any insights beyond surface level nutrition such as asking any questions about why certain foods are eaten or how they mad them feel
does our work seek to reduce disparities	As a designer, I did not actively work to reduce disparities during this project		The design hopes to offer all patients access to a more personalized diet advice/experience → In it's final form it did not really achieve this.
what are the hegemonic structures being questioned or critiqued through your research? (https://dl.acm.org/doi/10.1145/3427338) Whose status quo? What should be destabilized?	for me as a designer, this design was upholding the expectation that more technology = more better. Despite believing that this was approach was mostly ineffective, I did not want to challenge what a project at id about nutrition should look like. The belief that designers cannot use their lived experience, especially that women in design cannot, should be de-stabilized It is the status quo of the ID department to work from a healthist and fatphobic position for nutrition tracking	Without the input of women, the design process upholds the status qup that others know better about their bodies.	The design is perscriptive on what a person must eat. The design is upholding the status quo that we are creatures that need to be monitored and regulated The design upholds the individualized view of health and what healthy eating is
• Who gives permission? Who disagrees? According to whom? Who else?	As students, we are given permission to work from validated research, however for women, research is often under representative and not asking the questions of value.		Doctors give permission (what is the unique position of a doctor?)
question for the next round What's at stake? Now, what else?	Passing or not passing a project is a high stake for a design student to engage critically with topics For designers, engaging with these topics have alot of funding, so taking a critical approach can put funding or opportunities at stake.		With the current design, the physical and mental health of the patient is at stake.
• What is my positionality, power, potential leverage?	After this project, my positionality has changed to include a body positive, feminist stance on food tracking. In simple terms, this means that I do not believe that meticulous self tracking is the answer to supporting women in long term health. I take a position of anti-diet, body positivity/body neutrality, anti-racist, weight neutral, feminism I have a position of privilege's in my intersectional identities, especially when it comes to being white middle class and highly educated and straight sized. I can use this as leverage for engaging in conversations around our values in design	In the designing, I do not want to shy away from the trouble. I want to be able to stay with it and be in trouble if nessecary. In my design practice I would ike to include voices and experts on lived experience that are not typical for this domain, such as fat activists.	I have power in having deep knowledge about the existing strategies and designs that we use in this area I can leverage this by working "from the inside" to change the system since I have the knowledge and experience to be in those spaces with confidence I want my design to really reflect my positionality

Appendix E


Deprivation of food makes your journey even harder and effects your mental health
I just eat. I've given up so much it's depressed me so bad. I just eat.
I do a cheat meal once a week if not I'd go insane.
I'm just sad. I miss eating!
I get overwhelmed thinking too much about it
I seriously think the more we hone in on all the dont do this, this is bad, you shouldn't do that, bla bla bla, we'd probably wish we were dead.
If you deprive yourself of the foods you enjoy you just made your journey that much more difficult. I'll eat everything I shouldn't eat for one day. Then I jump back on my bandwagon and behave. I give myself permission to do this so I don't consume myself with guilt. Guilt never goes well with a much needed food binge.
am ONE HUNDRED percent emotional eating. And now I'm angry because I can't emotional eat like I could before CHF because I know the harm I can cause my body.
Emotional Eating or stress eating
any one else have problems with emotional eating? What did you do?
I think the stress is making a lot of us eat.
am ONE HUNDRED percent emotional eating. And now I'm angry because I can't emotional eat like I could before...because I know the harm I can cause my body.
Fear of eating behaviour
What do you ladies eat? I'm so scared I'm gonna eat the wrong thing in be back in the hospital I just don't know what to do
I've always struggled with diets & now that I truly need to diet it seems impossible! I think I'm terrified of eating to much of the wrong things & do more damage as well, but you made a valid point! Thank you!
am ONE HUNDRED percent emotional eating. And now I'm angry because I can't emotional eat like I could before CHF because I know the harm I can cause my body.
Guilt
I find I eat LESS food in the day (good start) and do drink less, but have not changed habits completely or have tried all that hard. I am stuck in guilt mode.
I'll eat everything I shouldn't eat for one day. Then I jump back on my bandwagon and behave. I give myself permission to do this so I don't consume myself with guilt. Guilt never goes well with a much needed food binge.
Gaining weight
Same position. Did great to start with. Quit smoking, watched my diet, got my pacemaker defibrillator, gained all the weight back... But I do not have the energy either
Fat shaming
. However the lady said something to me that didn't sit to well, and I know she meant well. She said to me.. the only way to beat this thing is to eat clean. First of all, There isn't a cure, so no one has won, and I am eating great
ong story short, my news feed is filled with people who feel the need to share how awful it is that a company gives donuts, because they lead to "heart disease". My heart issues came from a VIRUS, not donuts (I don't even eat donuts). I am so pissed off that people associate poor food choices with heart disease!! There is so much more to the complexity of the heart!! I exercised and took care of myself and got sick.
I am sick of people assuming I eat too much. Quite the opposite is true.
Hating body
Weighing myself everyday inly confirms that I am fat and therefore ugly! The thought of looking in a mirror every morning yo see if my middle is "fluffy" is enough to make me stay in bed all day to avoid mirrors. I find myself wishing that J had just died and got it over with rather than thus long drawn out process. I know that this is a bad attitude but Nevertheless it is how I feel.
gh, Hate myself sometimes. I get so tired of watching every little thing I eat or drink. I feel like crap and honestly don't have the desire to fix it. It's really sad.
Feeling isolated
hate my diagnosis! I hate what I have to do and the liss of the ability to just grab something to eat. Now when my family goes out to eat I stag home. Already feeling isolated this only adds to that.
Disordered eating trying to lose weight
I find I eat LESS food in the day (good start) and do drink less, but have not changed habits completely or have tried all that hard. I am stuck in guilt mode.
"Screw it" mentality
Nope gonna have bacon and olives and onions and pepperchinis mushrooms everything lol. Live it up who wants to die eating broccoli lol
I do a cheat meal once a week if not I'd go insane.
If you deprive yourself of the foods you enjoy you just made your journey that much more difficult. I'll eat everything I shouldn't eat for one day. Then I jump back on my bandwagon and behave. I give myself permission to do this so I don't consume myself with guilt. Guilt never goes well with a much needed food binge.
did the same with carrots, went to the endocrinologist for an appt I had we talked about weight I explain I eat carrots as a go to food she frown and says carrots are high in natural sugar.. I GIVE UP!
I'll eat everything I shouldn't eat for one day. Then I jump back on my bandwagon and behave. I give myself permission to do this so I don't consume myself with guilt. Guilt never goes well with a much needed food binge.
Exhausted with it
I have just started back at Slimming World but am really struggling. Mainly because I am so utterly exhausted, that I am too tired to cook from scratch.
gh, Hate myself sometimes. I get so tired of watching every little thing I eat or drink. I feel like crap and honestly don't have the desire to fix it. It's really sad.
Same position. Did great to start with. Quit smoking, watched my diet, got my pacemaker defibrillator, gained all the weight back... But I do not have the energy either
am so sick & tired of: you cant eat this, you shouldn't eat that, stay away from those & don't dare drink that > etc. etc. etc. Yes I have made some serious adjustments to my daily diet, in hopes of living longer while being plagued with CHF > but I also refuse to have to mentally phsych myself out into believing that something which has no flavor is GOOD *so that I can eat it* >
I am sick of people assuming I eat too much. Quite the opposite is true.
I so Agree! I gave up all the foods I love..getting tired of pretty much not Eating!
am so sick & tired of: you cant eat this, you shouldn't eat that, stay away from those & don't dare drink that > etc. etc. etc. Yes I have made some serious adjustments to my daily diet, in hopes of living longer while being plagued with CHF > but I also refuse to have to mentally phsych myself out into believing that something which has no flavor is GOOD *so that I can eat it* >
Quality over quantity
ongevity is the key, but without quality...its not a win. Before getting sick, I struggled to follow a diet. I'm dont see myself as a dieter but I do see myself implementing life changes. And on this journey I think it's the worst thing to say to anyone...give up everything you love...why? I could eat perfect everyday and exercise 8 hours a day and be shot down. If longevity is promoted bbn without quality..its not a win.
Technology
I follow a pretty strict diet. Low carb, low saturated fat, low calorie, low sodium. I incorporate intermittent fasting, so I eat 2 meals between 11am and 7pm. And I also calorie cycle my days from 650-1,000 calories. Two days at 650, two days at 1,000, repeat with whatever numbers make sense. I've lost 50 pounds and have 20 to go. Once I'm at maintenance weight, then I'll recalculate everything to a more "normal" daily routine.
Yes, I have cravings but very seldom give in. If I do, I forgive myself and get back on track the next day. I know cheating is a slippery slope and dropping pounds feels a hell of a lot better than eating something that's not going to help me reach my goals.
Bottom line, tracking my food intake with an app is how I've lost weight.
I use a calorie cycling application with my days from 650-1,000 calories.
Not one single thing goes in my mouth until it is logged.
If i cannot track it, it does not go in my mouth


Body positivity. neutrality
Dieting
The context of being fat in the netherlands
Social Aspects
Experience of dieting
Mental health impact of dieting
Societal expecation on fatness
The Netherlands
p1
p2
p3
Doctors and experiences with health care
Intuitive Eating
Advocating for yourself
Doctors
Health care system
Healthcare system's impact on individuals
What is Intuitive eating
Process of intuitive eating
Pros of Intuitive eating
Cons of Intuitive eating
Practical ways to make change
How can we make things better?
Goals and reasoning
Technology
resources

Appendix F

Appendix G

Ms. D. O'Neill

d.o'neill@student.tue.nl

EINDHOVEN UNIVERSITY OF TECHNOLOGY

Date
June 3, 2021

Reference
ERB2021ID54

Ethical Review Board TU/e

T +31 (0)40 247 6259
ethics@tue.nl

intranet.tue.nl/ethics

Ethical review research proposal

Dear Ms. O'Neill,

It is a pleasure to inform you that the local Ethical Review Board (ERB) from the Industrial Design department has discussed and approved your application "Feminist perspectives on the future of cardiac rehabilitation".

The Board wants to draw your attention to the terms and conditions in the appendix.

Success with your research!

Sincerely,

Prof. dr. ir. A.C. Brombacher

Enclosures
1

The ERB retains the right to revise its decision regarding the implementation and the WMO[1]/WMH[2] status of any research study in response to changing regulations, research activities, or other unforeseen circumstances that are relevant to reviewing any such study. The ERB shall notify the principal researcher of its revised decision and of the reasons for having revised its decision.

[1]WMO: Law on Medical Scientific Research involving Human Beings (in Dutch: Wet medisch-wetenschappelijk onderzoek met mensen)

[2]WMH: Medical Device Directive (in Dutch: Wet op de medische hulpmiddelen)

APPENDIX 1

Terms and conditions

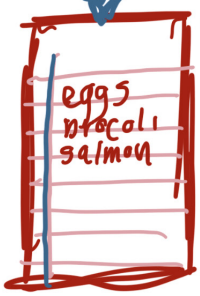
Amendments
When considerable amendments are made to the design of the study or educational activity, or when the time period between ERB approval and start of the study is longer than one year, please consult the ERB.

Privacy and research data management
The ERB would like to point out that collecting, handling and storing personal information is subject to the General Data Protection Regulation. Please visit TU/e intranet for the latest information and regulations on www.tue.nl/rdm

BRAINSTORMING FOR A SELF EXPERIMENTATION PLATFORM

Keep track of what you've tried

MAKE A LIST AHEAD OF TIME



Suggestions of things to try

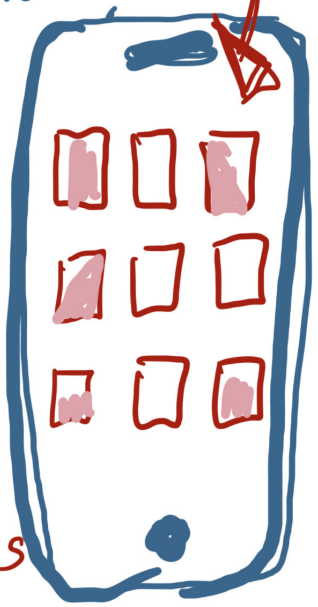
figure out what works for you!

Example:

LEAVE YOUR YOGA MAT where you can see it

ASK A FRIEND TO COME

Get access to a ton of approaches

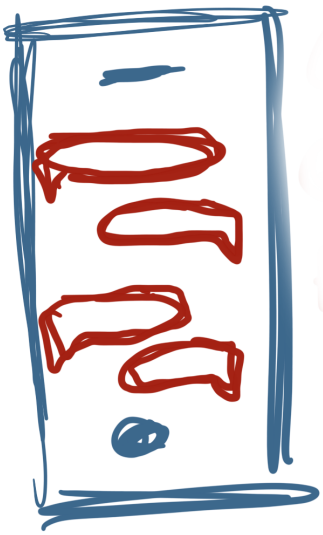


How can AI/ML SUPPORT?

- personalized suggestions
  - ↳ based on:
    - food pref.
    - budget
    - cultural foods
    - restrictions

HOW DO WE PROMOTE AGENCY FOR WOMEN IN CR?

Who else can answer these?



COLLECT QUESTIONS THROUGHOUT THE WEEK

Provide specific Gender /sex related info platform

- Hormones
- menopause
- BRCA
- Intimacy
- med side effect

Is it safe to ANSWER SOME PUBLICALLY?

can a dietician moderate a facebook group to resist fake news?

ACKNOWLEDGE. LIVED EXPERIENCE

Tailor modules based on intersectional identity?