What Can Speculative Design Teach Us About Designing for Healthcare Services?

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ABSTRACT

Understanding patient needs is an important factor in the design of healthcare services, however ethnographic research methods can be intrusive in sensitive care settings and create privacy concerns such as when researching Type 2 diabetes. We offer the Fiction Probe as a contribution in the form of a field study tool that uses storytelling to allow patients to tell their story from their perspective. We used speculative design and the multi-choice narrative, represented as a pick-a-path storybook, to re-imagine the form and content of field study research tools. With our work, we hope to expand the range of methods used to understand patients in healthcare settings and to also inspire new ways of thinking about field study research tools in sensitive care settings, and more broadly, in ambiguous design contexts.

CCS CONCEPTS

• General and reference~Design • Human-centered computing~Human computer interaction (HCI)

KEYWORDS

Healthcare, Type 2 diabetes, field study research tools, speculative design, cultural probes.

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1 INTRODUCTION

The World Health Organisation (WHO) states that Type 2 diabetes is the fastest growing chronic disease in the world. Patients are increasingly presenting with the condition and as a result this is overburdening the healthcare system (2006). Yet, this chronic disease can be prevented through changes in lifestyle habits that revolve around better diet and the inclusion of exercise. The WHO recommends that practitioners need to move away from a dogmatic prescription of healthcare solutions and towards acknowledging that patients are experts in relation to what is possible in their own lives (2006), and that the successful adoption of long-term healthcare solutions involves changes in lifestyle and behavioural habits that are intertwined with a patient's personal motivations (Ballegaard 2008; Cottam and Leadbeater 2004; WHO 2006). We note that co-design and participatory design are two approaches to designing healthcare services that emphasise understanding and designing for participants' needs (Cottam & Leadbeater 2004; Crabtree et al 2003). We also note that ethnographic research methods have been applied within these approaches to gain insights into the needs of participants, however, there are limitations when applied to ambiguous design contexts such as future healthcare services. This suggests that new research tools complementary to traditional ethnography might be beneficial.

We offer two contributions: our primary contribution is a research method motivated and instigated by healthcare, but not limited to it. We provide detailed descriptions and rationales of our design and development of the Fiction Probe, including rationale around the form, content, and material choices as a way to make explicit the design process and add to the body of knowledge on design research.

Our second contribution is a conceptual ethnographic research tool for use in the co-designing process of ambiguous design settings – we named this tool Fiction Probe. This conceptual

ethnographic research tool represents one enquiry into what these tools could be. The Fiction Probe is an A3 book containing half completed narratives in a comic-style. The reader is expected to fill the blank parts of the pages with their own stories, touching upon the key themes provided by the narrative framework. The fictional narratives are based on informal conversations held with Type 2 diabetes patients and healthcare practitioners. It tells this story through a sensitive, non-judgemental, and informal manner. Our Fiction Probe was designed to:

1. De-alienate healthcare and health conditions
2. Provide insights into patients' experiences of the healthcare system and create meaningful representations of a patient's experience of their condition
3. Be a method for recording and archiving patient's stories
4. Be a playful interactive probe kit

Our research explores what a field study research tool could be. Using a speculative design framework, we experimented with the probe's form and content. We named the artefact Fiction Probe as a nod to the origins of our inspiration – fictional narratives, speculative design and cultural probes.

We believe that the process of participants filling out the Fiction Probe with written and illustrated responses to the questions plays an important role in a patient's ability to make sense of their condition and experience of the associated healthcare system. This idea is central to our investigation and we believe that the form and content of probes can assist patients to visualise their condition and create meaningful representations of their health condition. In turn, patient insights can provide inspiration for designers and stakeholders designing future healthcare services.

In this paper, we do not discuss participant studies and instead we focus on the conceptual design. We do this to make explicit the thinking behind the design and development of the Fiction Probe. We offer this research as contribution to broadening the discussion on Research through Design (RtD) (Swann 2002; Zimmerman et al. 2007) and the discussion around what design can contribute to field study research tools.

2 BACKGROUND

Human-centred design of healthcare

Human-centred design (HCD) focuses on techniques which communicate, interact, empathise and stimulate the people involved (Giacomin 2014). The understanding of HCD has expanded to be concerned less about assuring that artefacts work and towards a design activity that identifies the inherent meaning that the product, system or service should offer people (Krippendorff 2004; Giacomin 2014); this perspective of HCD can underpin the role of design in healthcare settings.

An example of HCD that highlights a need for clinical approaches to be supplemented with an approach that addresses the needs of the patient's interests (Aalokke et al. 2007) is a workshop conducted by Ballegaard et al., (2008). It revealed patients were focused on living a normal life, spending time with family and friends, and continuing the activities they cherished most (p. 1807). "Health and healthcare technology are just small pieces that they [patients] try to fit into the larger puzzle of their everyday routines" (p. 1808). This suggests to us that there needs to be a shift towards developing technology that integrates into everyday life which can allow patients to continue with their everyday activities and activities that they enjoy (Ballegaard et al., 2008).

Co-design and participatory design have become popular approaches used to design for healthcare (Cottam & Leadbeater 2004) because they emphasise understanding and designing for users. Both approaches use ethnographic research as a way to observe and interview users to gather insights into their needs (Crabtree et al. 2003). Interviews and observations lead to qualitative data, and used in conjunction with quantitative data can provide reasons for a given response. However, healthcare problems where sensitive personal health data exists could be classified under the sensitive care setting and conventional observational techniques used in ethnography can be perceived as intrusive (Crabtree et al. 2003). New elicitation methods embedded within a responsive and responsible philosophy of care are needed to unearth and accommodate these individualised needs (2003).

Cultural probes conceived of by Gaver et al in 1999 have been shown to be a very simple but effective mechanism for engaging participants in their own care (p. 53). They are a design-led approach to understanding participants that puts an emphasis on empathy and engagement (Gaver et al. 2004). They are meant to elicit inspirational responses from people and not comprehensive information about them (Gaver et al. 1999, 2004; Sanders & Strappers 2104, p. 7). For this reason, the cultural probe seemed an appropriate starting point for investigating field study research tools to understand the needs of patients with long-term complex health conditions, and eliciting personal and potentially sensitive insights that can inform the design of assistive technology.

We believe that the process of filling out the probe kits can play an important role in a patient's ability to make sense of their condition. This idea is central to our investigation and we believe that the form and content of probes can assist patients to visualise their condition and create meaningful representations of their health condition.

Possible approaches to developing on from Gaver et al.'s work on cultural probes might come from approaches found within design fiction (Bleecker 2009) and speculative design (Dunne & Raby 2013). The role of design fiction, similarly to speculative design, is to open up a space for discussion and not show how things should be (Dunne & Raby 2013, p 51). From this perspective, design fiction is something that creates a story world (Bleecker 2009; Sterling 2009; Lindley & Coulton 2015) and an artefact can act as a prototype within that world (Dunne & Raby 2013) and exist to generate understanding and insights rather than finished products (2015). Story worlds can be created using a variety of media including text, video, objects and graphics. These prototypes and story worlds play with the limitless possibilities of interface, form-factor, user groups, and any other parameters (Lindley & Coulton 2015) to construct technologies or situations that do not currently exist. The Heartband designed by Stead and Coulton (2017) is an example

of a design fiction to provoke debate. This particular prototype was designed to raise questions about health legislations that would need to be addressed before decentralised and autonomous healthcare wearables can enter the market.

The making of probes and prototypes in this context is not limited to the act of production, but rather as a way of constructing and transforming meaning (Sanders & Strappers 2014). In the process of co-making these prototypes and story worlds users of the system have the opportunity to make sense of their experiences, needs and futures (2014) which can lead to design insights and opportunities for developing new healthcare services.

3 DESIGN

We were most interested in designing speculative artefacts which provoked debate, and asked design researchers to question current practices within ethnographic research, specifically the design of ethnographic research tools used to elicit insights into patient needs. We limited our research to designing speculative artefacts to encourage conceptual and "out-of-the-box" thinking, but acknowledge the need to test this artefact through clinical trials and formal participant studies to avoid potential negative ill-effects. The following section outlines in detail the design process, decision-making and rationale underlying the development of the artefact. As part of this Research through Design (RtD) contribution we provide annotated images, as described by Gaver and Bower (2012), to document and describe the design process involved in developing the Fiction Probe. We believe that the research could not have been described through words alone.

Conceptual Direction

This artefact exists to ask the questions: What is a field study research tool? And how can design contribute to ethnographic research tools to elicit insights into patient needs?

The outcome was an artefact we called the Fiction Probe which contains a multi-choice fictional narrative. The narrative tells of the different experiences and decisions that patients encounter while learning to navigate a healthcare system and self-manage their condition.

To counter the potential for participants feeling negative emotions such as hopelessness and depression we developed a fictional narrative with multiple choices and pathways that provided an open-ended and non-judgemental set of "possibilities" rather than "fixed outcomes".

The concept of storytelling to suspend disbelief of change was borrowed from speculative design (Sanders & Strappers 2014) and we felt this approach could help encourage participants to re-imagine what a future healthcare service might be. We posit that the fictional story and pick-a-path book is a playful and delightful experience that encourages participants to think alternatively about their condition.

Design Process

The Fiction Probe was developed over a period of nine months and used a Research through Design (RtD) approach (Swann 2002; Zimmerman et al. 2007), iterative design cycles which included: contextual enquiries and design research, concept generation and ideation, prototyping and testing, reflection, and refinement.

Phase 1: Contextual Enquiry and Design Research

In this section, we describe how informal conversations with patients of Type 2 diabetes and practitioners influenced the design direction of the Fiction Probe.

To develop a fictional narrative that resonated with patients and practitioners we borrowed from the stories shared by patients during our contextual enquiry (fig. 1-3). The informal conversations included patients describing their experience of self-managing Type 2 diabetes and practitioner's everyday experiences and observations of engaging with patients. Patients spoke about personal methods they used to self-manage their condition and practitioners talked about their interaction with patients and how the healthcare system operates.

The participant's personal experiences resonated with us, and their stories became the conceptual framework for the design of the Fiction Probe. These personal experiences were developed further in the design ideation phase and become central themes along with the theme of space travel.

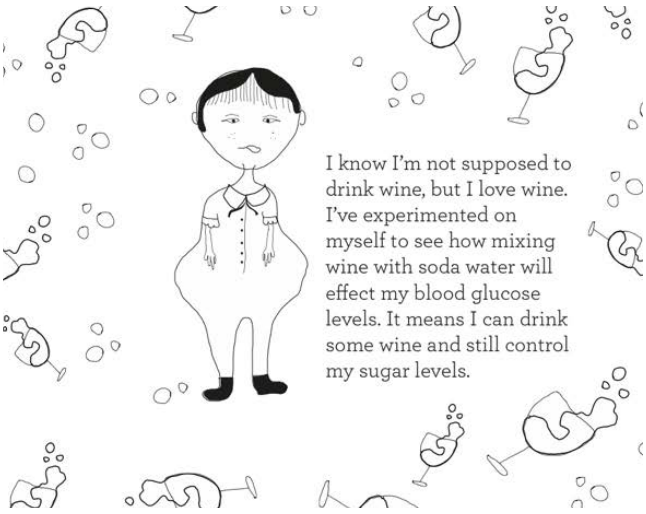

Figure 1: This illustration depicts one patient surrounded by their favourite drink and tells readers how that patient modified their diet to accommodate their favourite beverage yet still meet their dietary needs for their condition.

Phase 2: Design Ideation and Development

The design ideation phase involved: mindmapping, brainstorming, sketching and mocking up concepts (fig. 4-13). One concept that showed merit was the idea of retelling the stories of the participant's experiences in self-managing their condition. We decided to develop a fictional narrative based on patient and practitioner experiences with findings from the literature review. The following are examples of how we combined these stories and findings to develop a fictional narrative. One patient self-managed their condition by modifying their diet to meet both their food cravings and their medical requirements. They mentioned that they mixed their wine with soda water so they could still consume the foods they

enjoyed while still regulating their glucose levels. This conversation was the inspiration for one character in the Fiction Probe (fig. 1).

In another conversation, one practitioner spoke about a patient who continued to consume chocolate, a food that would negatively affect their health, even though they had recently had their leg surgically removed due to diabetes. This influenced the design of another illustrated character (fig. 2).

Figure 2: This illustration depicts one story recounted by a practitioner of an experience they had with a patient who was finding it difficult to self-manage their condition. The charater was created to illustrate the complexity of patient behaviour and lifestyle choices.

Also, WHO (2016) suggested there was a need to redesign the healthcare system and shift it away from a practitioner-centric system and towards acknowledging that patients are experts in context to self-managing their condition. This inspired the creation of a god-like figure used to represent this practitioner-centric healthcare system (fig. 3).

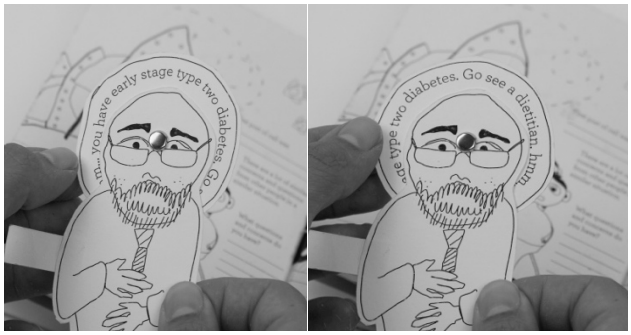

Figure 3: This illustration is an interpretation of the current healthcare system. The god-like figure was inspired by the WHO's (2016) description of the current practitioner-centric healthcare system. The halo of words illustrates the dogmatic and prescriptive nature of healthcare in relation to supporting patients with chronic conditions such as Type 2 diabetes.

In tandem to the contextual enquiry we also investigated ways of visualising the role of service design within healthcare, and the relationship between all the humans and non-human components in the system (fig. 5). This investigation lead to brainstorming ideas based on themes around the relationships within the healthcare system. Figure 4 shows mindmapping and sketching undertaken to document ideas. During this phase ideas are unfiltered to allow unexpected permutations of ideas to occur. Figure 5 shows the development of one idea that was not developed further. The photo documents an early prototype exploring methods to visualise the relationship between some of the components (patients, practitioners, food, family, nutrition, medical devices) within the healthcare system over time.

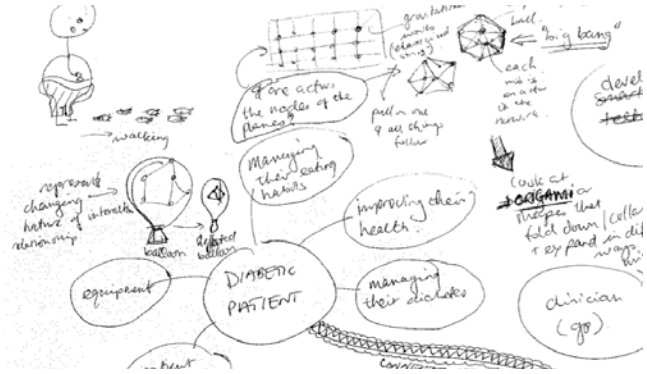

Figure 4: Thumbnails and mind maps were used to document the process and record ideas in the format of a visual journal. This image shows how ideas are noted down as thumbnail sketches or key words and phrases, and demonstrates early stage structuring of information.

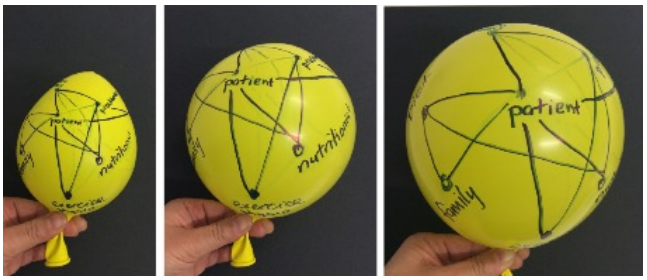

Figure 5: One early mock up used the inflating and deflating of a balloon to explore the changing relationships within the healthcare system over time. This included human and non-human components of the system.

In reviewing the ideas, we realised our initial research question involved investigating human-centred design and therefore the design concepts needed to emphasis this human aspect within the research. From this perspective, the balloon concept was too abstract and, we felt this representation continued to de-humanised the healthcare system. Revisiting our original research topic redirected our research and design direction back towards making explicit the human aspect of healthcare.

We then developed a storyboard around the theme of a healthcare universe and a fictional character which goes on a quest to explore the healthcare universe to understand their health condition (fig. 6-13). The storyboard involved sketches outlining a rough fictional narrative which was inspired by the contextual enquiry. We felt the metaphor of exploring the universe fit well with the process of making sense of a chronic condition. Describing and visualising the healthcare experience from the perspective of the patient helps to humanise Type 2 diabetes and de-alienate the healthcare system.

Figure 6: Storyboard thumbnails. This particular panel represents a question for patients to reflect on. It asks whether death is a possible motivator for changing lifestyle habits.

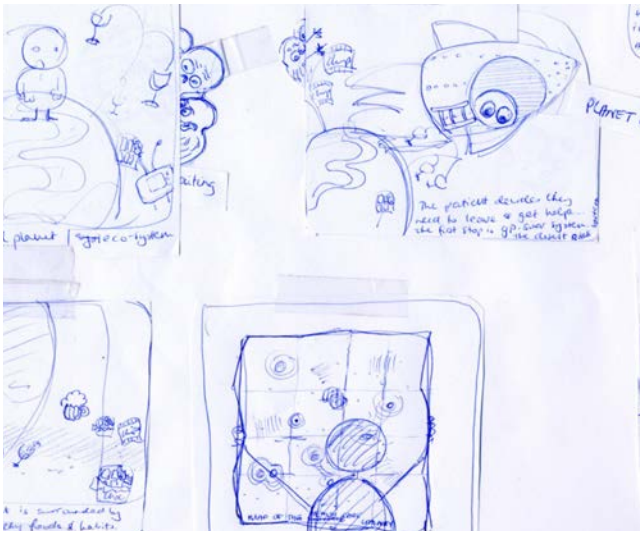

Figure 7: Storyboard thumbnails. These panels depict the beginning of the patient's path along the healthcare system. They decide to leave their planet and enter the healthcare 'universe' to learn more about their condition.

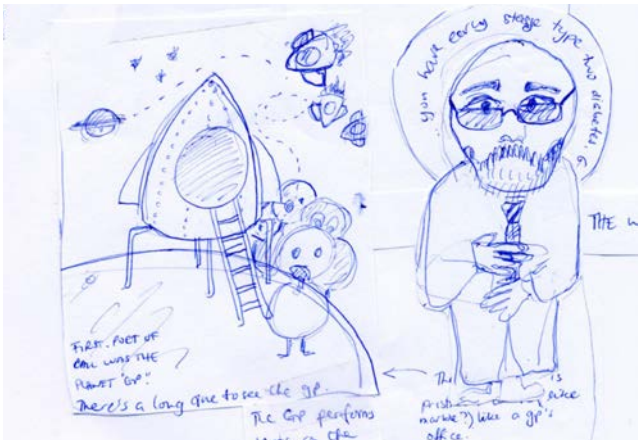

Figure 8: Storyboard thumbnails. This panel represents WHO's (2016) description of the overburdened healthcare system depicted through the line of patients waiting to be diagnosed, more patients arriving, and only one god-like figure asking the same questions.

Figure 9: Storyboard thumbnails. These two panels represent the patient decision-making process. In learning to self-manage their diet, the patient may be tempted to return to their previous lifestyle habits and eat food that may negatively affect their condition. The right panel was later replaced with a more open-ended illustration which asked questions to the patient rather than predetermining their path.

Phase 3: Prototyping and Refinement

Our first prototype (fig. 10-13) was a story book. We were inspired by the book as a format to convey these stories because of two main reasons: the familiarity of a book for storytelling, and the low-fi and tactile qualities of physical paper. We felt it was important to remove any barriers that might hinder engagement and our intention was for the pages within a book to be a space for people to tell their own story of their condition.

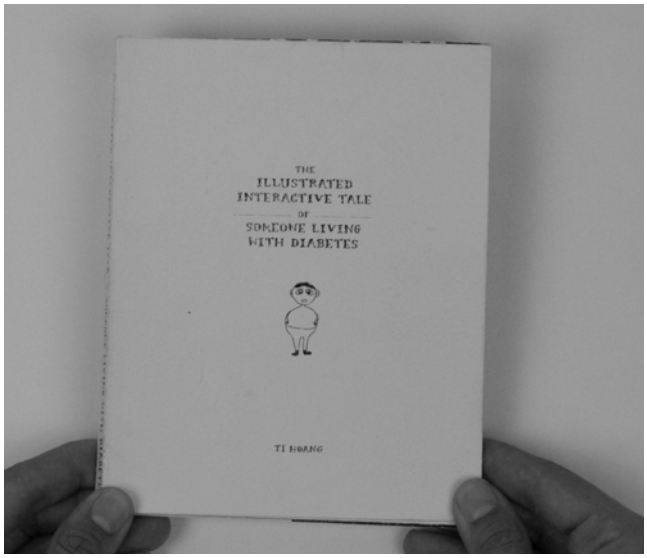

Figure 10: First prototype of the Fiction Probe. The storyboard thumbnails developed into a physical prototyping. This artefact allowed design researchers to discuss the merits and problems of this concept.

We included interactive components to provide and encourage participants to explore and contribute their thoughts. Pull out tabs and fold out tabs provided prospective users with entry points to engage with the content (fig. 11-12). Prototyping the concept allowed us to think through the process of making and provided us with a physical artefact that we could interact with and discuss.

Each design iteration from initial thumbnails to the various physical prototypes allowed use to critique the form, content and aesthetic features. We soon realised the original size (roughly the size of an A5 page) was too small for participants to write comments; the characters needed to appear more human; the story needed to end in an impartial manner and the tone of voice needed to address that specific audience; and the probe needed to ask more questions of the participants.

Figure 11: Inside pages of the first Fiction Probe prototype. The pullout tabs reveal hidden parts of the story. In this image characters are revealed to provoke the patient to consider what motivates their lifestyle choices and habits –is it death, family or practitioner?

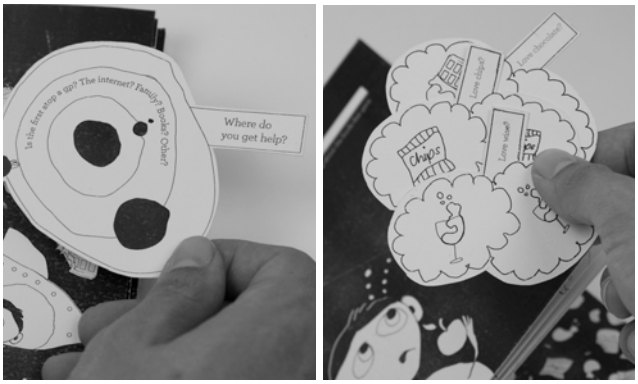

Figure 12: Close up of the pull-out tabs. The left image asks patients where they would seek information about their condition. The right image describes a possible through process that patients might encounter when trying to change lifestyle habits and behaviours.

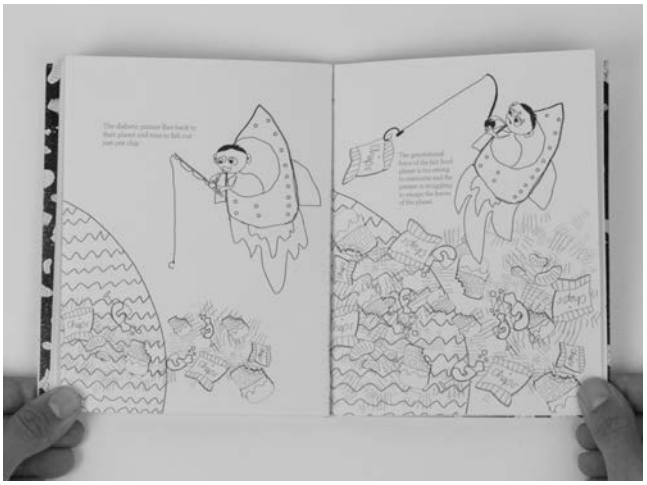

Figure 13: An illustration representing a patient's relationship with the foods they covet. The black hole and its gravitational pull represents the difficulty and choices patients encounter when changing their lifestyle.

Phase 4: Final Concept

The final concept was named the Fiction Probe (fig. 14-16) and it combines a fictional story of a healthcare universe with a series of questions and a set of multiple decision-making options. This combination is designed to encourage participants to provide insights into their experiences, and the branching story lines assist prospective users to consider alternative healthcare options. The inspiration for the story, decision-making options and illustrated characters came from the informal conversations held in the design research phase. We imagine there could be other probes, for example, one probe might be dedicated to understanding elderly patients' needs, while another Fiction Probe might focus on understanding practitioner needs. Each probe would use illustration, fictional stories and language appropriate to that specific audience.

Figure 14: Spreads from the final prototype of the Fiction Probe. This page represents when a patient decides they need to seek medical advice about their condition. The left page focuses on the fictional narrative and the right page contains: questions for the patient to answer, and a decision-making question in the format of a pick-a-path narrative.

Figure 15: A spread showing a decision-making moment where the participant is faced with making a choice: to attempt to retrieve one more chip that is dangerously near the black hole or decide to fly away to safety. The page on the right asks the question: what is going through your mind at this point? Who or what could help you at this point? Can you draw and describe the things that might help you here?

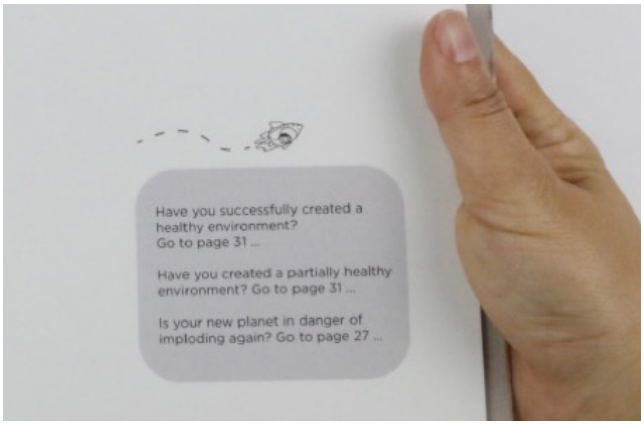

Figure 16: Close up of one set of decision-making options. These options direct you to different parts of the patient journey within the book. It asks: Have you successfully created a healthy environment? Have you created a partially healthy environment? Or is your new planet in danger of imploding again? These questions serve two purposes: to let the participant know there are options and consequences to their lifestyle choices, and the choices can provide researchers with information about decision-making patterns.

Form, Aesthetics and Technical Considerations

The Fictional Narrative

The book is formatted with pages alternating between the fictional story of a patient setting out on a quest to explore the healthcare universe to learn more about their condition, followed by a question that prompts the reader to think about their personal experiences, and finally a decision-making option that is intended to reveal more about the patient's choices and habits.

We chose to de-alienate the healthcare system with the space travel theme because of the playful and imaginative nature of the theme. There is also a poetic relationship between a patient exploring the complexities of their health condition and exploring the frontiers of the universe which we thought would appeal to participants.

Size

The final Fiction Probe is slightly smaller than A3 paper. The intention was to create a sense of scale and possibility and provide functional space for writing and drawing.

The oversized proportion of the book hopefully helps to create a sense of playfulness and appear non-threatening. Furthermore, we hope that these qualities help to disassociate the artefact from a clinical device.

Material

We chose to use paper stock reminiscent of paper used in primary schools - economical paper often called butcher paper – for practical reasons. The rough uncoated stock provides a substrate which allows a variety of mediums to be used from ballpoint pen, markers, crayons or pencils. Glue also adheres to the substrate easily and could allow participants to use a range of materials to convey their thoughts.

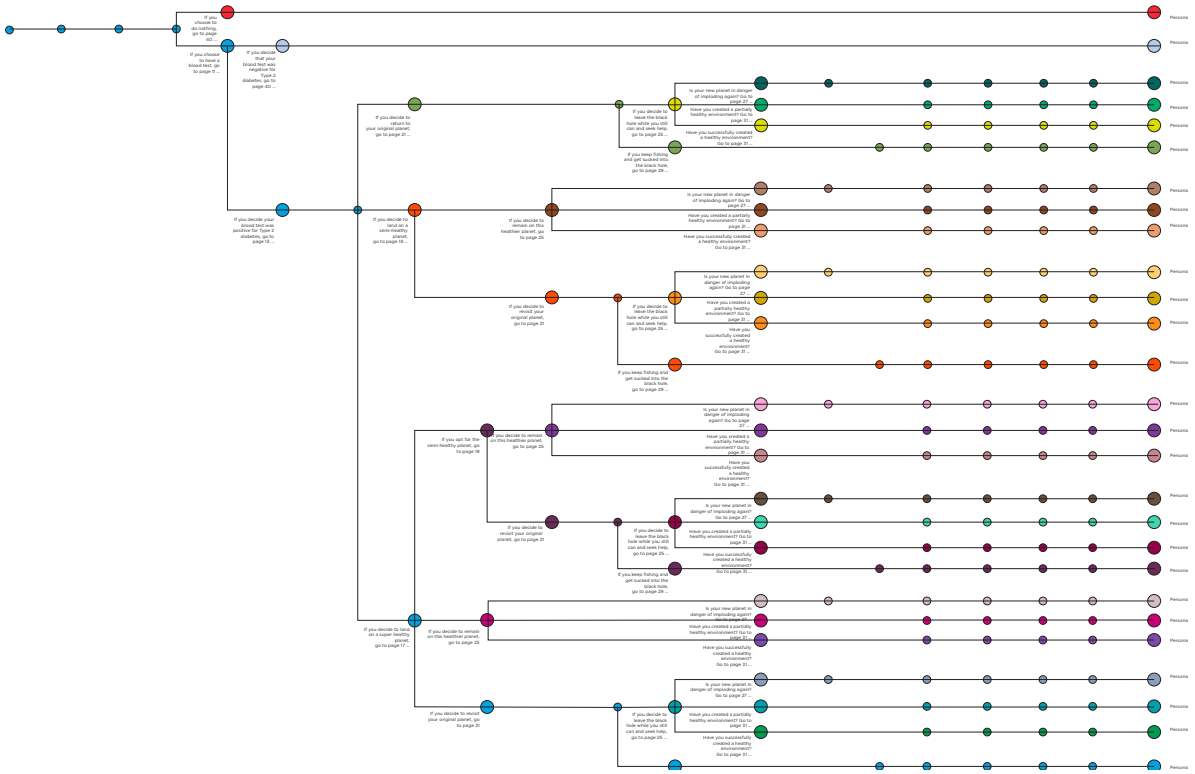

Figure 17: The overall decision-making map. This image outlines all the possible choices patients could make and the paths they take within the Fiction Probe. One possible outcome might be patient pesonas based on the choices they make.

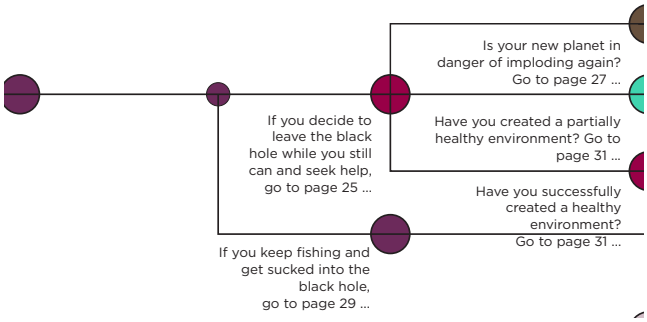

Figure 18: Close up of the choices described in the Fiction Probe. These choices are designed to elicit insights into patient decision-making and lifestyle choices and habits.

Illustration

We intentionally decided to keep the illustrations black and white as a method to impart solemnity and juxtapose the playful and somewhat whimsical illustrations to impart gravitas to the topic. We decided to keep the line work unrefined and loose - as if hand drawn - to convey a sense that the story was unfinished and invited participants to add their perspective to the story. This concept of using hand-drawn illustrations to represent unfinished products has been well-documented by Bill Buxton in his book "Sketching User Experiences: The Workbook" (2007). A study on sketching with others (Tang 1991 in Buxton 2007) indicated that drawing produced graphical objects, often 2-dimensional sketches, to express ideas and create representations of ideas that can encourage dialogue and discussion (2007). We hoped the Fiction Probe would elicit the same response.

Technology

One further important design decision was to produce a low-fi artefact. This was because we were concerned about barriers to accessing the probe. Technology may not be available, we could not be sure of prospective users' software proficiency, abuse of the artefact could be expensive to fix, and expensive equipment might entice theft or misuse of the artefact.

Overall, we felt the form and aesthetics of the Fiction Probe worked together to facilitate an interaction which is both engaging and playful.

Interaction

The book contains several points of interaction and they include: the fictional narrative, the questions designed to elicit qualitative responses, and the multi-choice options. Our intention was that patients would alternate between reading a page of the story, answering the questions listed on the opposing page and documenting their response in the spaces provided in the book, and then finally make a decision based on their personal lifestyle choices and habit to continue the story. The story would unfold in different ways and finish with alternative endings depending on the decisions participants made.

Once finished, participants would have an artefact documenting their personal perspective of their condition. This might elicit personal insight into their lifestyle choices and habits. The

completed artefact could also provide information that may allow design researchers to seek common behavioural and lifestyle patterns and generate patient personas (fig. 17-18).

4 OBSERVATIONS

In designing and developing the Fiction Probe we offer the following observations into what an ethnographic probe could be, methods to assist patients' in visualising and making sense of their health condition, and methods for communicating their experience of the healthcare system to medical practitioners.

We were able to create a prototype of a Fiction Probe which combined attributes of speculative design. The Fiction Probe has the potential to be used as a probe for understanding patient needs of their health condition. The book could also be used to visualise patients' experiences of their condition and help them to make sense of the condition. We limited our research to exploring the two attributes of form and content from speculative design to understand how they could be applied to the design of field study research tools.

The form of the field study research tool became an important design feature of the artefact. The illustrations were kept as line drawings and their loose hand drawn quality conveyed a sense that the book's story was unfinished. This illustration method was a deliberate design choice to encourage participants to feel comfortable in modify the book and contributing their personal experiences of self-managing their condition.

3 DISCUSSION

Our research is inspired by, and develops on from, Gaver et al.'s work on cultural probes. We were inspired by their approach to ethnographic research, and their stance that researchers need to take the time to unpack their assumptions about people (2004). Where this is most pertinent is in the design of healthcare where dogmatic prescriptions of healthcare are recognised as ineffective in relation to curbing the rise of patients presenting with chronic conditions (WHO 2016). The World Health Organisation (WHO) suggests future healthcare systems be co-designed with the users of the system, and those involved in redesigning the healthcare system must acknowledge that patients are experts within the domain of their capabilities to self-manage their condition (WHO 2016).

Our Fiction Probe is a speculative design prototype which uses a co-design approach that guides conversation in a playful and open-ended manner. This aligns with Gaver et al.'s belief that cultural probes provide value by encouraging stories to emerge that are rich and multi-layered (Gaver et al. 2004). Both probes facilitate the "[mingling of] observable facts with emotional reactions" (2004). We favour gathering insights into people using this approach because lifestyle habits and choices have been found to play a significant role in a patient self-managing their condition (WHO 2016), and probe kits focusing on this approach could provide insights into patient decision-making processes by collecting information that "gives [designers and researchers] a feel for the people [we are designing for]" (Gaver et al. 2004) rather than quantitative information. Our Fiction Probe also serves to provoke thought around the assumptions of people by integrating them into the design process and co-designing their future healthcare provisions (Gaver et al. 2004).

Where we differ from cultural probes lies in the questions we ask to elicit insights from patients. We believe that probes need to resonate with participants otherwise they may feel like the process is pointless and subvert the system's intended purpose (participants have used disposable cameras from cultural probes to photograph their own bottoms (Gaver et al. 2004)). While Gaver et al.'s cultural probes intentionally ask open-ended, ambiguous and sometimes borderline absurd questions to breakdown a researcher's preconceived notions, our Fiction Probe asks curated open-ended questions to guide participants to think about future healthcare scenarios, and indirectly asks patients to consider their lifestyle habits and choices. The illustrated universe acts as a metaphor to de-alienate the healthcare system and is intended to encourage creativity and out-of-the-box thinking. The questions guide participants to think about alternative healthcare systems, and the multi-choice options prompt participants to think about the choices they make.

We argue that the value of design fiction in the development of future healthcare systems is its ability to generate speculative worlds where people can suspend disbelief of change to image what could be (Bleecker 2009; Dunne & Raby 2014). As self-diagnosing wearables become increasingly accepted and integrated into people's lives, interaction with these wearables will occur on a daily and continuous basis. Stead and Coulton (2017) provide a design fiction prototype – the Healthband – to provoke debate on the changes required to health regulations to enable open health wearables to exist. Our Fiction Probe exists to highlight the need for end-users to be involved in the development and vision of autonomous healthcare provisions.

If future wearable health products and services are to be widely adopted and have continuous long-term use, it is important that HCI and design researchers focus on understanding what patients need from these self-diagnosing wearables. Additionally, we also argue that those using the healthcare provisions should be active participants in constructing and designing these provisions, and that this approach can provide more sensitive and meaningful autonomous healthcare provisions and services.

We claim that the Fiction Probe is a novel approach to data gathering and visualisation, and aligns with Faisal and Blandford's claims that information visualisation assists patients in perceiving and making sense of their medical condition (2012). The authors acknowledge that patients live with their illness and condition so sense-making not only pertains to medical data but must also include overall life experiences (2012). However, Faisal and Blandford also acknowledged that incorporating life experiences into the design of information visualisation tools would be challenging (2012).

We believe the Fiction Probe could address this concern. We argue that patients engaging with the Fiction Probe could contribute to the co-visualisation of their lifestyle habits and choices which, in turn, reflects and makes tangible the patient's experiences of their health condition. We propose that this approach to data visualisation and sense-making could contribute to a patient's understanding of their health condition.

Limitations and Further Research

The decision to produce a low-fi artefact is not without limitations. Scalability, distribution and analysing the returned artefacts would be time consuming and costly. The addition of interactive technology could potentially mitigate this issue by digitally recording and computationally analysing patient's responses. Additionally, interactive technology could add further dimensions of playfulness through the possible addition of interactive elements.

Using fictional narratives as a method for collecting patient and practitioner experiences could be problematic. Fictional narratives are open to interpretation and storytelling is inherently subjective – the meaning of a story, illustration or question could be interpreted in multiple ways by various participants.

We recognise the need for further research into Fiction Probes, namely the need for user studies to understand how users will interact with the probes. We welcome future research into how Fiction Probes might be applied to understanding patient needs of healthcare technology. Despite this we offer a preliminary enquiry into how speculative design can be applied to the design of field study research tools for ambiguous design contexts. We offer our paper as contribution to insights into the design process.

Future research could include in-depth studies to further explore and understand what role the Fiction Probe's form and content plays in a patient's experience. For example, what would happen if the content was generated completely by the users? What insights might users provide if they were given direct access to designing the content? And could this then remove a degree of subjectivity to the created content? Future prototypes of the Fiction Probe could include investigating how technology could affect user experience with the probe, and what are the implications for researchers in analysing that data? There is potential benefit to patients if field study research tools could be designed to encourage patients to externalise their own healthcare experience by encouraging them to visually represent their personal condition via prompts. This may lead to patients making sense of their condition.

5 CONCLUSIONS

This paper offers two contributions, the first is the Fiction Probe, a speculative design prototype that asks the question: What is a field study research tool? And how can design contribute to ethnographic research tools to elicit insights into patient needs? The second contribution is a research method that adds to the discourse around the value of design research.

Given the experimental nature of this work we focused our research on investigating the form and content of the artefact with the intention of exploring without the restriction of user studies. We acknowledge that user studies are required to test the effectiveness of the Fiction Probe to understand patient needs of healthcare technology, and test whether a digital interface is effective at collecting and analysing a participant's response.

With our work, we hope to expand the range of methods for understanding patients in healthcare settings and to also inspire new ways of thinking about field study research tools in ambiguous design contexts.

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