ManneqKit Cards: A Kinesthetic Empathic Design Tool Communicating Depression Experiences

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ABSTRACT

While depression is a mood disorder with significant societal impact, the experiences of people living with depression are yet not easy to access. HCI's tenet to understand users, particularly addressed by the empathic design approach, has prioritized verbal communication of such experiences. We introduce ManneqKit, a *kinesthetic empathic design tool* consisting of 15 cards with bodily postures and vignettes leveraging the nonverbal aspects of depression experiences. We report the co-design of ManneqKit with 10 therapists, its piloting with 4 therapists and 10 non-therapists, and evaluation through design workshops with 9 interaction designers and 3 therapists. Findings describe rich metaphorical descriptions of depression experiences and their postures, as well as cards' ability to elicit strong empathy. We discuss the value of these findings for interaction design in terms of novel empathic design tools capturing nonverbal qualities of lived experiences, support for richer understanding of vulnerable users experiencing depression, design ideation underpinned by ethical values, and the need to balance empathy with distancing for designers' wellbeing.

Author Keywords

Affective health; depression; emotional experience; design methods; empathy; postures; body; embodiment; ethics.

CSS Concepts

• Human-centered Computing ~Human computer interaction (HCI); Human-centered Computing

INTRODUCTION

I need to stop working and sit down for a bit. I'm exhausted. I would try to say something or ask for help, but for the moment I will just rest to keep whatever little energy is left. My arms and legs are weak. My neck too, I can't keep my head up. This is why I had to sit down. I wonder what's going on with me today. Thinking about what I'm going through or how I'm going to explain it to my colleagues makes this paralysis worse, so I avoid it for now. I should get up. But I can't. It is as if I was sitting next to this massive black hole that is gobbling down my last drops of energy. If it keeps going on like this, I won't be able to stand up again. This is one of the 15 vignettes of the ManneqKit cards (Figure 1) depicting experiences of depression.

Figure 1 ManneqKit cards showing postures and vignettes

Depression is a mood disorder with significant societal impact involving dysregulation of affect and symptoms such as loss of enjoyment, interest and energy. Over 300 million people [80] live with depression worldwide, whose healthcare cost alongside other affective disorders is estimated to exceed $6 trillion by 2030 [82]. Cost, stigma, and problematic adherence to psychotherapy [74] are key challenges preventing large proportion of people living with depression to access and benefit from treatment [80].

Over the last decade, HCI scholars' engagement with affective health and in particular depression, anxiety and bipolar disorders has seen a steady growth [62] with a predominant focus on understanding the needs of these vulnerable user groups, designing novel digital interventions, or evaluating traditional ones such as computerized Cognitive Behavioral Therapy [62]. Arguably, because of stronger ethical implications, the HCI "seminal commitment" to "*know the user"* [84] weights even more in the context of mental health [62]. However, the lived experiences of people affected by mental illness are not easy to access and potentially difficult to understand by researchers [45]. Empathic design [5][42] and user centered-

experience [84] approaches have led to a range of design methods developed to elicit, capture, and describe users' lived experiences usually in the form of narratives [7][8][17], or role-play [9][14][17] with the aim to foster designers' empathy and inspiration [84]. However, such design methods prioritize verbal communication of lived experiences, and their use in the context of affective health has been limited. We argue that there are opportunities to extend such empathic design methods by leveraging the nonverbal aspects of lived experiences of depression.

We describe the design and evaluation of ManneqKit, a kinesthetic empathic design tool consisting of 15 postures of depression and accompanying vignettes and whose design was informed by relevant research on the role of body in depression [12][48], the importance of embodied, experiential meaning in empathy [18], and the relationship between bodily postures and emotions in relation to depressive symptoms [12][55]. We report co-design workshops with 10 therapists which led to 29 posture-based, representations of depression, which we piloted with 10 non-therapists, and the revised set of 15 postures and vignettes were evaluated through design workshops with 9 interaction designers. We focused on the following questions:

- What are the key lived experiences of depression?
- How can these experiences be represented through postures?
- What value these experiences and their representations for the design of technologies for depression?

The contribution of our work is threefold. First, we provide rich, metaphorical accounts of depression experiences and how they can be represented nonverbally through postures; second, we introduce the concept of *kinesthetic empathic* design tools and illustrate it with the ManneqKit; finally, we reflect on the value of this tool for empathic design approach for understanding users, ethically informed ideation, and the importance of balancing empathy with distancing for designers' wellbeing.

RELATED WORK

HCI Research on Depression

A growing body of HCI work has focused on emotional wellbeing and affective health [62] often through the development of interactive interfaces, [64][73] or without biosensors [20][23][63][73]. Within this context, scholarly work that has focused on depression could be broadly grouped under (i) understanding needs and designing interactive technologies, (ii) developing and evaluating technology-based interventions, and (iii) developing algorithms for diagnosing depression. Work for understanding users' needs has focused both on people living with depression and caregivers [86] and often employed traditional methods such as interviews, scenarios [3], probes [71], or co-design methods [16][34]. Findings within this body of work have shown the value of gestures in processing emotions [65], interactive flowers indicating the need for communication [78], or interactive toys supporting children's emotional regulation [71]. Clinical staff are often included in such studies like in the case of interviewed therapists to explore and design for memory impairments in depression [57]. Most of HCI work on interventions has investigated the provision of support within therapy for instance through 3D games [19], or augmented and virtual reality [11][26][85], albeit the most often intervention has been by far the computerized Cognitive Behavioral Therapy [62]. Given the challenges of working with vulnerable groups, and the emotional taxing aspect of researching and designing for mental health, HCI scholars have also argued for the importance of their sensitive engagement to mitigate their own vulnerability [49][62].

Research on algorithms for diagnosing depression symptoms has built on robust findings on the predictive value of nonverbal audiovisual behavior cues [68] such as head or body movements, facial expression or gaze, and vocal behaviors [13][30][67][76]; and such research suggests the value of multimodal approaches for diagnosing depression [21]. For instance, Canzian and Musolesi [13] employed unobtrusive smartphone-based GPS for tracking people living with depression to extract mobility patterns such as distance covered, maximum distance from home, or number of visited places, showing that reduced mobility predicts depressive symptoms.

To summarize, much research indicates a growing interest in the body [65][78], and behavioral aspects of depression [13][30][67][76], how these could be captured or leveraged in design [3][15][32][71], and the sensitivity needed for designing for depression [49,62]. There is however limited work on design methods tailored to support designer's richer understanding of the bodily experience of depression. To better understand this challenge, we now turn attention to HCI work on empathic design methods.

Empathic Design Methods

Originated from design practice and coined over two decades ago, "empathic design" [42] was intended to foster curiosity, creativity and collaboration for gaining new perspectives on people's emotions and everyday experiences with the aim to inspire design [44]. Key here is *empathic sensitivity*, a skill required from designers which consists of four levels: towards people for making sense of their experiences, design opportunities, techniques for communication and exploration, and towards collaboration [44].

The long-acknowledged importance of empathy in design has been also reflected in the growing number of empathy design methods. In their analysis, Wright and McCarthy [84] argued that these methods should emphasize designer's intention to understand the others, and orientation towards them, in order to better perceive emotional responses and needs. Authors defined such methods as supported by dialogue with users to foster empathy, and grouped them in ethnography-based methods, narrative based methods, and methods for imagining others. The first group consists of methods such as participant observation [16], where researcher observes the lived experiences in situ;

ethnographic vignettes [51] which capture summarized lived experiences most often in text or photos; or cultural probes [29] offering snippets of lived experience captured by users in different formats such as text, images, or multimedia.

The second group of narrative based methods include personae [17] which capture aggregate users brought to life through crafted, life-inspired experiences, scenarios [14] capturing crafted, life-inspired experiences, as do other approaches to scenario-based design methods such as narratives [83], character driven scenarios [52], pastiche scenarios [7], films or documentaries [58]. When users are difficult to reach, other methods engaging imagination could be used such as role-play [9] where designers enact behaviors as if they were the users for instance through props or experience prototype [9] such as wheelchairs to engage in simulated experiences in order to experience disability.

Empathic Design for Health

Despite this rich range of empathic design methods, their use in health context has been limited. A few exceptions include Honary and colleagues' narrative based method consisting of video stories played by actors and capturing lived experiences of people with serious mental illness [32]. Another example is therapeutic role play method [45], developed to access users' experiences in constrained settings such as therapeutic contexts through therapists' roleplaying the interaction with patients, whose findings indicate its support for designers' richer understanding and empathy for such users. Additional empathic approaches have emerged in designing for dementia for instance through probes intended to empathically support both the designer and the person living with dementia to co-design for personhood [77], or art therapy for enabling people to express and share their stories through artwork [40].

To summarize, empathic design [42] methods capture either users' lived experiences through ethnography-based methods [16][51][29], or crafted, life-inspired users' experiences through narrative based methods [9][7][17][14][52][58][83]. While the former tend to engage end users directly, the second also rely on proxies such as therapists or designers to indirectly access users' experiences through craft, imagination or role play. This later aspect is particularly important given the challenges of engaging with vulnerable users such as those living with depression. In both cases however, the common form of capturing consists of verbal communication. In contrast, capturing and communicating nonverbal content of lived experiences has been limited. One aspect of such nonverbal content relates to body [50] and postures, and to better understand its importance we now look at clinical and phenomenological research on the role of body in depression.

The Body and Bodily Postures in Depression

Grounded by James' [36] seminal theory, the connection between emotions and the body, and their mutual reinforcement has long been acknowledged [81]. Emotions are not only expressed, but also altered by the body through changes in facial expressions and postures [37][38]. In regard to depression, the role of body has been explored through both clinical and phenomenological lenses. Findings from clinical research consistently indicated association of depressive symptoms with the moving body [6,46] in terms of increased body tension, muscle and join pains, slowness, inactivity, or ability to control movements [35]. These are also reflected through slumped postures [48], protracted shoulders [9][10][26][27] [28] [43][56][64] [slower walk, or limited up/down movements of upper body [47]. These objective insights from clinical research have been critiqued by their emphasis on the *physical body* instead of the *lived body* [33], and failure to provide an understanding of what depression actually means and feels like by those affected by it. As a result, phenomenological accounts of the lived experiences of depression have started to emerge [13], with the intention to uncover their deeper meaning in order to foster more compassionate understanding [1]. Such phenomenological accounts share the view that the *lived body*, habitually open for spontaneous movement, is fundamentally altered by depression to a constricted slowness leading to a closing feel of the world [1]. Such alteration tends to be hidden to others, and difficult to grasp by people without depressive concerns.

To conclude, the body and its postures [6][46][48], protracted shoulders [9][26][43][56][64] are key to the lived experiences of depression, albeit taken for granted and therefore difficult to capture. Unlike stories, the moving body and its postures represent nonverbal content better captured in nonverbal format like described in our approach.

STUDIES AND FINDINGS

Study 1: Therapists' Co-designing Depression Postures

The aims of the first study was to elicit accounts of lived experiences of depression and to capture them through crafted postures. We reflected whether people living with depression should be the involved in this study. After careful consideration we decided to not involve them, as the in depth discussion of their lived experiences may pose additional challenges to their wellbeing. Hence, we recruited 10 experienced mental health practitioners (P1-P10) through online databases and email advertisements (6 female, 4 male), age range 28-56 (mean = 37), with experience ranging from 3 to 20 years (mean = 8). The case for therapists' involvement in HCI research has been previously made [45], and we provide a more detailed, threefold rationale for this choice. First, through their extensive practice of working with people living with depression, therapists were able to share rich accounts of their experiences of depression from more than just one person. Second, through their professional skills of observation, introspection, and reflection they were in position to abstract key depression experiences and their nuances. Finally, as a tenet of therapeutic alliance, therapists could draw from their embodied empathy [25][69] to identify most communicative postures representing the lived experiences of depression.

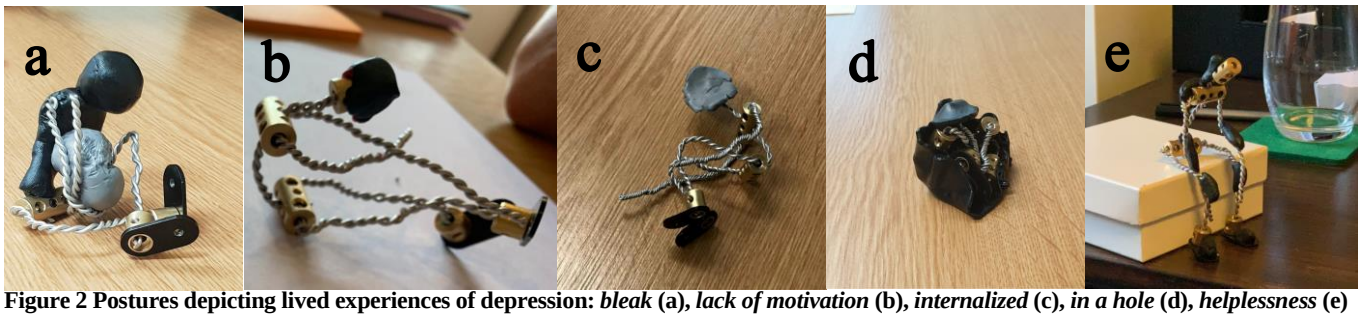

Figure 2 Postures depicting lived experiences of depression: *bleak* (a), *lack of motivation* (b), *internalized* (c), *in a hole* (d), *helplessness* (e)

The study took in average 80 minutes, and each participant was rewarded an Amazon voucher equivalent to 48 USD. The study involved individual workshops consisting of three stages. First, they were asked to *identify three key experiences of depression* and capture them through words on post-its. The aim was to sensitize participants and help them recall lived experiences of depression encountered in their practice. Second, therapists were asked to co-design bodily postures to communicate experiences of depression. For this, they were provided craft materials consisting of an off-the-shelf hand size physical mannequin and colored playdough. We choose the Anibild brand because it is both flexible and robust: its wire limbs and joints can be independently manipulated at ease and with no risk of breaking, allowing for expression of nuanced postures, potentially enriched with the application of colored playdough, a decision inspired by findings on the association of colors and emotions [4][72]. Participants were encouraged to talk aloud about each representation with details of what the depicted person may be thinking, feeling, or doing. Finally, the study concluded with individual semi-structured interviews exploring participants' experience of crafting the postures of depression experiences, their challenges and opportunities, suggestions for improving the kit, and the value of crafted postures. The workshops were video recorded and transcribed. The transcripts were analyzed using Altas/ti software [27] leading to over 200 codes which were iteratively revised. We employed a hybrid approach of theme development [24] involving deductive codes informed by previous work such as: lived experiences, depression metaphors, postures, emotions, colors, objects, and placement. Through analysis of the interviews this was refined and additional codes emerged, i.e. contextual information, novel depression metaphor, and classification of lived experiences of depression.

Therapists' Accounts of Depression Experiences

This section outlines therapists' depictions of lived experiences of depression. A significant outcome is therapists' rich and diverse descriptions of depression experiences employing symptoms of depression (45%), but predominately metaphors (56%) as further described.

Metaphor-based Experiences

Metaphors describing lived experiences of depression include not only the two well-known ones of *depression is black* [59] and *depression is weight* [56], but also a third metaphor which we called "*depression is contraction"* which accounts for half of the metaphorical depictions. This metaphor relates to external forces coming from all directions and closing in one's world illustrated through: "*closed"* [P4], "*internalized"* [P1], "*disabling"* [P6], "*being in a hole"* [P5], "*trapped"* [P6], "*helpless*" [P1], "*lost"* [P5] or "*alone"* [P6]. For instance, force could be physical or emotional symptoms: *"the physical demand leads to feelings of hopelessness and that leads to internalization"* [P1] (Figure 2b). Other description of *depression is contraction* emphasizes tension, as people struggle unsuccessfully to overcome it: *"being stuck in a hole, somebody trying to move back but getting sucked into it and not being able to get out"* [P5] (Figure 2d), which in turn leads to emotional symptoms: *"there's a sense this isn't going to get any better, so that's a body cue for the resignation and pessimism they may feel"* [P4]. *Depression is contraction* metaphor also highlights the internal forces contributing to the experience of closing in: *"with closed, I think there is a protective element to depression where the person is quite careful about what they are feeling, so there is a locking down"* [P4] (Figure 2a). This metaphor can also appear alongside the one of *depression is weight*: *"a crushing kind of quality, in that it takes over, overwhelms every aspect of somebody's life"* [P6] (Figure 3c), or *depression is black*: *"there's a darkness and it is difficult to shift, it is hard to get out of. It is that classic thing of snap out of it, apart from they cannot"* [P5] (Figure 3d). These outcomes are interesting suggesting that force dynamic underpinning contraction are broader than those underpinning weight or black.

Symptom-based Experiences

The identified lived experiences of depressions depicting symptoms have focused mostly on typical emotions and moods such as *"sadness*" [P3, P7, P8, P9], "*lack of enjoyment*" [P8] or *"hope"* [P2, P7], and "*worthless"* [P5], and represent three quarters of the overall experiences described through symptoms: *"they are crying, and they have got their hands over their face. They're sad"* [P7]. The other symptoms used to describe lived experiences of depression are physical ones such as *"lack of energy*" with depression being experienced as "*physically demanding*": *"they are tired; the body is feeling physically drained and this all causes a low motivation inertia"* (Figure 3b), or "*weary"*: *"there is a sense of no real escape, even though they are exhausted they can't really turn off what they are dealing with, so they are feeling weary"*[P4] (Figure 3a).

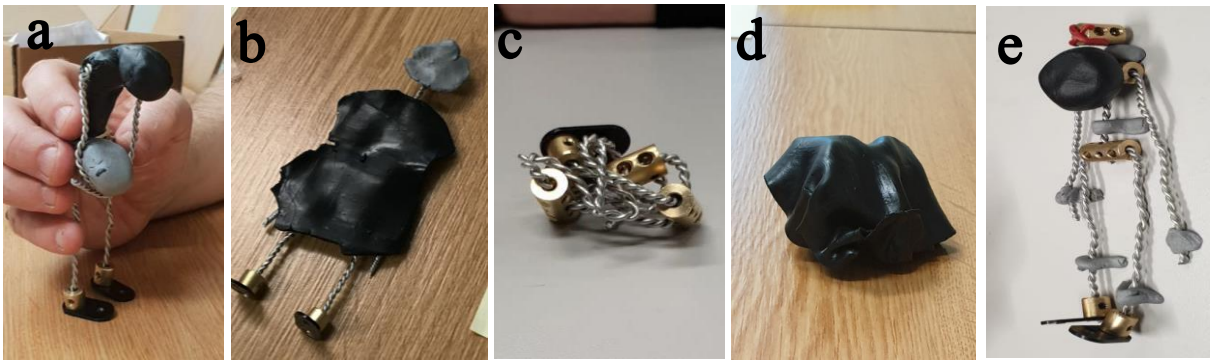

Figure 3 Postures depicting depression experiences: *weary* (a), *physically demanding* (b), *overwhelming* (c), *black hole* (d), *disabling* (e)

Apart from emotional and physical symptoms, the ones regarding "*lack of motivation*": *"I would try and make the character look slumped, head down, shoulders down […] maybe sitting down if they haven't got the energy to stand up"* [P8], or cognitive symptoms have been less employed, arguably because the latter are predominantly internal with less visibility compared to emotional and physical ones.

Co-designing Postural Representations of Depression

Therapists' overall experience with the materials was perceived as playful and creative: *"[the co-designing] was thought provoking actually […] it was interesting to consider people's body language, manner and presentation in this way […] it was quite useful [as] I am quite a visual person"* [P10] as well as requiring them to carefully reflect on how specific experiences of depression can may be materialized though postures: "*the mannequin could not represent […] the words I use […] I had to really think about it"* [P7]. Given the complexity of depression experiences, participants acknowledged that postures may benefit from verbal descriptions in order to disambiguate their intended meaning: *"the fact that you could explain [the posture] helped"* [P8].

We now describe the different types of generated postures. According to a widely adopted classification of basic postures [31], from the total of 29 generated postures (one participant generated only 2), 24 were simple ones such as sitting, standing, or lying down, while the remaining 5 were highly evocative albeit impossible to physically enact (Figure 2d, 3c, 3d). Almost two thirds of postures depicted slumped head, neck and/or back: *"[I'll make the] character look slumped, head down, shoulders down, looking inward avoiding the world"* [P7] confirming previous findings on the emphasis of these postural aspects of depression [40, 47,51,58]. Interestingly, within the generation of postures, we have noticed a tendency to integrate multiple symptoms and metaphors for depicting lived experiences of depression. We now detail four of the postures, to illustrate the range of metaphors, i.e., *black*, *weight*, and *contraction*, respectively; as well as symptoms they build upon, together with the brief narratives that participants employed while crafting them.

1. We start with the lived experience of depression being "physical demanding", emphasizing symptoms of fatigue and lack of energy. The generated posture in Figure 3b shown an almost rigid body with a heavy lead blanket conveying an almost eerie death-like feeling, not reflected however in the vignette which emphasized more mundane aspects such as lack of motivation and mood symptoms: *"Imagine this person has to go to work or pick their child up from school, they're struggling to do that; to physically put one foot in front of the other and get out of bed. They're tired, physically too. They may be quite hard on themselves, thinking they're supposed to but feel hopeless*" [P1].

2. The lived experience of "black hole" which employs the black metaphor was represented through a heavily contorted mannequin shown in Figure 3d, indicating body tension and slowness shown to be postural markers of depression [35]: *"they are retracted, repressed, unbearable to be out in the world. It's like a black smoke that filters into crevices, it reaches all places and they might not expect that"* [P5] which alludes also to contraction and black metaphors, as well as a poignant feeling of suffocation not conveyed in the posture.

3. The lived experience of being "overwhelmed" relied on the weight metaphor for generating the posture shown in Figure 3c: *"they are curled up, hugging themselves. Everything is too much, it's a very basic human protective position. It's the most basic protection we have for ourselves and its' all we have. Overwhelmingness is like a blanket of blackness that is both suffocating and comforting"* [P4]. This description builds also on black and even contraction metaphor, complementing the poignant feeling of pain reflected in the impossible posture, squashed under unbearable, all-encompassing forces.

4. Internalization is a typical lived experience of depression that builds on contraction metaphor, materialized through the posture shown in Figure 2c. Its description however captures also mood symptoms complementing the heightened vulnerability shown in the posture but not in words: *"they are isolating themselves, withdrawal from interacting with others, withdrawal from life. They feel low and helpless, in a state of inertia. There is a disconnection from how they would normally be living their life"* [P1].

Postures' Contextual Information

9 therapists also appreciated the colored playdough for the opportunity to refine the postures, which was used in 23 postures, either by integrating it into the mannequin as part of its body, or by placing it on, or around, the body as separate objects. When the playdough was integrated into the mannequin's body, it was usually applied as small balls depicting the mannequin's head, in black or grey colors [P4,P6,P8,P10] to represent "*lack of motivation"* [P3,P8,P10], "*worthlessness",* "*hopelessness",* "*feeling low"* [P4,P9,P10]; or *"mental fog"* [P1,P8] and "*stress*" [P6] through red playdough. Other placement on the body included flat grey shapes usually placed on chest or torso to represent sadness [P6] (Figure 3e), while blue shape on the torso represented *"a dull ache"* [P9]. The playdough was also used to materialize in creative ways depression metaphors through objects on or around the body such as black hole closing in, on the contorted mannequin who become *"stuck in [and] will be difficult to unravel"* [P5] (Figure 3d). While the prevalence of color black on most of the examples above supports the metaphor of *depression is black*, the metaphor of *depression is weight* has also informed the use of the playdough through objects such as stones [P4] (Figure 2a, Figure 3a), lead blankets [P5] (Figure 3d), or pressure points [P10] (Figure 2e), and also as weight on the chest and restrains on the arms: *"it is the feeling of that weight being on them, and them not being able to do anything about it"* [P6] (Figure 2e). These outcomes confirm the importance of weight metaphor [56], black metaphor [56,59], and their impact on mood [39,79].

Study 2: Exploring Postures' Value for Design

The second study explored the value of the crafted postures for communicating lived experiences of depression, and for interaction design.

Pilot Stage

This study consisted of a pilot stage with the aim to explore if the postures were recognized by other therapists as depicting the experiences they were intended to depict, and if they elicited empathy among non-therapists. 14 participants took part in the pilot: 4 therapists from Study 1, and 10 non-therapists (P11-P20) (mean age = 25, age range 21-28), (4 female and 6 male), recruited through a convenience sample. Findings from 4 therapists show that most postures were correctly identified (70%), while those representing internalization, i.e., Figure 2c or not using playdough were less so. Another important outcome provided by the 4 therapists was the importance of contextualizing the postures with brief textual descriptions. We did this in the second part of the pilot, so that the postures were accompanied by text-based descriptions, prepared by us, on the basis of interview data from Study 1. These were provided to 10 non-therapists through an online form. In order to evaluate their ability to elicit empathy, we compared participants' empathy for the postures with descriptions, to the empathy elicited by emotionally neutral, medical text of depression definition and diagnostic criteria from the DSM-V [2]. Empathy was measured with Shen's 12 item state empathy scale which previous research has shown to be both valid and reliable [70]. A paired *t*-test indicated significant difference ($t(9)=3.88$, $p < .01$), with descriptions and postures eliciting stronger empathy (M=2.67, SD=0.58) compared to the DSM informed descriptions (M=1.93, SD = 0.4). This is a key finding, indicating our material's value to support people without mental health training to develop sensitivity to the portrayed lived experiences of depression, and to strongly empathize with them. Participants were also asked to select the top 3 most effective postures for communicating depression and to explain their reasoning. The three most effective ones were selected because *was relatable* [P13,P14,P20], *reminded them of feeling like that* [P15, P16], and are shown in Figure 2c, 1e, and 3b, with all participants agreeing that the combination of postures and descriptions was more impactful: *"the image would be too open to interpretation and text would be out of context. [Together] both lead to greater understanding [and] stronger sense of empathy"* [P12].

Design Workshops

After the pilot, we run 3 design workshops with the aim to explore the value of a final set of 15 cards for interaction design. The 6 x 4 inch cards consist of 2 parts: the left side showing a photo of posture and the right one the text of its vignette (Figure 1). The included postures, selected among most impactful and unique ones, were photographed professionally, and the text-based descriptions were rewritten as short vignettes in collaboration with a creative writer (mean number of words = 140, range 117-166). They were all written in first person, following a consistent structure focusing on feelings, bodily aspects, metaphors of depression, and the metaphorical role of the different objects depicted through playdough. This ensured that the vignettes were not only beautifully crafted, but also maintained the content from the initial interviews.

Aware of the sensitive nature of the workshop and of potentially strong evocative power of our vignettes, we planned the design workshops after careful consideration. This is important, given the acknowledged challenge faced by researchers and designers of health technologies in general, and those working in the space of mental health in particular [49,62]. Thus, we decided to include in each workshop a therapist who may be able to provide expert knowledge regarding the understanding of the cards and of the experiences they depict. Thus, for this study, 12 participants were recruited through a convenience sample (9 designers D1-9, 3 therapists T1-3), 4 in each workshop: 3 interaction designers with interest in health technologies, (mean age = 29, range age 23-46), (5 male, 4 female), and 1 therapists (average year of expertise = 13), (mean age = 42, age range 39-47), (1 male, 2 female).

The workshops started with the design brief: to design digital intervention for emotion regulation in depression. Then we provided a brief introduction to depression, its definition and

main symptoms as described in DSM-V [2], followed by 5 min exploration of each of the 5 cards. Each participant was given their own set of 5 cards, and these were the same for the whole group. After each of cards was explored, including the DSM-V informed content, participants had 5 minutes to discuss the material in group, and to write their thoughts on post-it notes. This initial exploration stage was followed by the design stage which we further prepare for by providing brief overview of some of the relevant academic and commercial [15][22][75] work (including Headspace app), followed by some broad questions on engagement, compliance and ethics as key aspects of mental health technologies. The design session consisted of 20 min session for developing design concepts, 10 min for identifying criteria, and 10 min to prepare and deliver a group presentation of the developed concepts. This was followed by individual interviews exploring designers' perception of cards, their potential impact on the understanding of depression, and on the design process and generated concepts. The workshops lasted in average 90 minutes, and we followed up to check on all participants if they felt discomfort and require counselling – none of them did. All materials were digitized and interviews transcribed. The latter were analyzed through hybrid approach of theme development [24] using Atlas.ti [27]. This led to over 230 codes including deductive ones such as depression metaphors and postures, as well as inductive ones such as the perception of ManneqKit cards and its components' impact on design, generated design concepts, as well as ethical principles such as autonomy and no harm [6].

The Value of ManneqKit Cards for Designers

We start this section by describing briefly, designers' overall perception of the cards. A key outcome is participants' perception of cards as emotionally powerful: five of them were particularly touched by vignettes [D1, D2, D3, D6, D7]: *"the texts were excellent […] got to me […] images reinforced them, but the texts were very enlightening"* [D1], one by the postures [D2]: *"I'm more visual [so] the postures really came forward for"*, while most recognized that vignettes and postures complemented each other: "*it was very interesting to see not only the text, but how they treated this visual representation of the text. I really liked that* [D6]. Findings also indicate that the ManneqKit cards were much appreciated by all designers as inspiring [D1, D5, D9]: "*the cards are very well designed […] quite inspiring [in] showing depressed people's feeling and their bodily sensations*" [D5], enlightening [D1, D9], well-structured [D7, D8, D9], aesthetic [D6, D8]: *"I really enjoyed the workshop [and] really liked the cards"* [D8], and interesting [D2, D3, D4, D9].

Empathically Rich Understandings of Depression Experience

Findings indicate that the qualities of the cards highlighted above supported designers to gain a particularly rich and empathic understanding of depression: "*These cards really helped being empathetic with the target population, which is something as designers, usually we base our design on our own experience*" [D2]. We further describe three additional means through which the cards supported empath such as emphasizing the body, bringing the experience of depression to life, and contextualizing it. With respect to the role of body in depression, participants mentioned how it allowed them to develop richer understanding of how depression feels in an emotional but also visceral way: "*[Cards were] quite insightful [showing] how people feel when they are depressed […] The cards absolutely [helped my understand depression] because I wasn't fully aware of […] what people feel, like physical pain […] that was quite interesting so we're going to return to [it in the design]"* [D9].

Findings also indicate that the ManneqKit cards conveyed more than the physical, affective or cognitive individual symptoms of depression, but more importantly how they come together to be experienced as a whole [D3, D7, D8, d9]: *"[I understood] how different things are intertwined and influence each other [which] made me very aware of some very different aspects of depression [physical pain and mental pain] and how it all together creates this experience of depression*" [D8]. This increased awareness of the richness of depression experience has been particularly important in shifting designers' understanding of depression and as we show later, approaching the design for depression: *"it's that complex mix of [and] how they interact, that is refreshing. That's what I learned about today. I've certainly taken away some of these vignettes which hopefully I can go away and remember, in the short, medium term"* [D3].

Study outcomes show that the cards brought the depression experience to life through the realism of the depicted content: "*I liked them as I could imagine [the characters] as real people, so to say […] like I didn't perceive them as all this is a weird combination of facts [or] a fake persona. I think they are really well constructed like they felt real [and] complemented each other really well"* [D8]. The realism and perceived authenticity, further supported empathy like in the following illustrative quote: "*Facing the cards, it was […] kind of spiritual. It makes you think, or like, being empathetic to the people that are suffering. I think that's kind of like, when you are faced to the problem; that you know that is real"* [D7]. By enabling access to the felt experiences of depression, the cards provided privileged access to a tacit world of feelings and sensations whose powerful realism supported both empathy and compassion: "*[the cards] really brought a feeling that I understood what the person was feeling [by] explaining really well [...] what they experience [so] was easier for me to be compassionate"* [D2].

The realism of the cards' content was further emphasized through the contextualization of these emotions and bodily sensations in the everyday life: "*the cards [showed] not just [what people] were feeling [but also] things like - I need to go and pick up my children. So it's really grounding back in the real world* [D3]. This quote highlights the value of the specific context in which depression manifests itself, and as suggested by other participants such contexts are both

ordinary to an outside observer and extraordinary from the first person perspective of the depicted characters: "*this person came home from work, and then went down this rabbit hole of negative thoughts, which I found really interesting like it's just one [mundane] activity and then suddenly […] becomes quite extreme"* [D8].

Findings also indicate the complementary value of multiple cards, allowing participants' access to a range of vignettes: "*it was great to have five cards, describing five different persons and the different needs*" [D2]. This range of cards further support participants' understanding of the richness of depression experience across multiple vignettes: "*they also complemented each other really well [and] I liked how they all give different angles of similar topics but allow us to connect them all in this [kind of] framework*" [D8]. This multiple views on depression experience were further supported by discussing the understanding of the cards in groups: *"we were four different people [which led to] interpreting the cards every different way. That was also very interesting: to see different perspectives on how people perceive and depression"* [D6]. Key in these group discussions appears to be the psychotherapists' expertise and they ability to sensitively scaffold designers' understanding of depression: "*The fact that we had a psychotherapist there as well it was incredibly helpful because they were able to bring [expert] knowledge"* [D9], such as "*explanation […] giving name to things [...] and giving sense to what we were coming with"* [D7]. In turn, this frame the group discussion as a safe place: *"[the cards] functioned as a carrier to discuss quite delicate topic so that was really easy for us to communicate about […] I really like that about it*" [D8].

Cards' Value for Informing Design

The above findings indicate ManneqKit cards' value for supporting designers to better understand the rich experiences of people living with depression as target user group. Apart from this explicit value, the cards also appear to have value in informing design. This value is three-fold: sensitizing participants to the experience of depression, supporting the ideation of novel design concepts, and increasing awareness of the relevant ethics principles reflected in these concepts. We now describe each of these.

ManneqKit Cards as Sensitizing Tools

Findings indicate that the ManneqKit cards not only supported richer understanding of depression: *"provide background: both emotional and mental preparation for the design process"* [D5], but they also helped inform the design of technologies for depression through the social aspects contextualizing depression experience: *"all that framing of the problem space is really good*" [D3], and *"[the cards] were useful to identify kind of like the design space, or the scope that we're designing for, like if we didn't have the cards, maybe we wouldn't have come up with these four dimensions that we designed. I feel like they guided the discussion [on design]"* [D7]. This quote suggests cards' potential to sensitize designers of technologies for depression, thus taking on some functions supported by the sensitizing concepts [66], a type of design knowledge that focuses on key social aspects underlying the design space of a class of technologies. More than half of participants provided views on the role of the cards in shaping the design space: "*[exploring the cards] was useful, and then from there, we could hone in, on like what depression is for other people as well as ourselves and relate to our second [design] stage"* [D9]. The framing of the design space was perceived by one of the three groups (Group 2) as tacit "*[the cards] really brought the attention to what was the goal of the workshop. And so even though maybe we didn't discuss them when we're talking about our design solution, we knew what we were targeting"* [D6], and by the other two groups (Group 1 and Group 3) as explicit: *"it was good to be reminded [by cards of] the extreme [emotions such as] heaviness, lack of energy [and also] routines, [so] that kind of stuff just did help me suggest some design ideas"* [D3].

ManneqKit Cards Supporting Ideation

An interesting outcome is that the two groups for which the cards explicitly informed their design, have generated more high level design concepts, while the other group generated more specific ones. We briefly outline the three main design concepts from each of the groups. Group 1 explored the concept of a compassionate communicator "*like a companion, in the house, that would be tangible that you talk to [and] provides listening and compassionate feedback"* [D2], *"but something that actually has that active engagement rather than just passive waiting for you to come to it, [and] is partially context aware"* [D3]. Group 2 described a therapy app inspired by users' lack of motivation, with the aim to track engagement and progress with therapy *"to be supportive [...] almost like a safe haven"* and which "*will be collecting data from [phone] sensing, and surroundings, and all of that"* [D6]. Group 3 has focused on the concept of emotional companion that would help user engage in four available worlds: spiritual, emotional, physical or cognitive, either passively by following a character, or actively by *"undertaking the activities or the experiences as a character […] and the app generates […] coloring to indicate emotions [both] before and after use [to] evaluate [engagement]"* [D8].

All these concepts targeted the body to track emotions and reflection on them: *"when some people experience depression, they don't understand why they're feeling a certain way […] getting them to reflect on this over time [is key]"* [D3]. In addition, the concepts developed by Group 1 and 3 were more abstract as reflected in this quote: "*we were coming up with lots of generalised design elements, [in particular] the compassionate communicator is even a design philosophy, and then trying to grab them all together into a thing"* [D3]. A similar view was expressed in Group 3: *"[we] come to these [four different worlds or lenses] and we really needed the combination of people to have the knowledge, and the examples of the cards to have certain material to start designing for"* [D8].

Awareness of Ethical Implications of the Design Concepts

An important outcome was the social values underpinning the design concepts explored by all three groups. This is important, given the rather limited emphasis on ethics in the design of affective systems [62]. The ethics principles that participants considered in their design exploration were mostly autonomy, benevolence (doing good), and no harm. For instance, the design of compassion communicator highlighted autonomy through issues of tracking of sensitive data and its ownership: "*when we talked about voice assistance, we start talking about Alexa and the ethics of being tied essentially to a financially motivated company*" [D1]. This group also referred to the principle of benevolence through a trusted, soft, and warm companion responding reliably to one's emotional needs: "*input /output which would be in either case a voice [or] tangible […] as in feeling softness [and] when you touch it, it gets warm"* and does limit harm: *"[if it] detected a person may be in danger [of suicide], that is really an ethical concern [that needs addressing]*" [D2].

Similar ethical values were also considered by Group 2 and 3 including additional ones related to autonomy such as choice: "*freedom [through] choice and discovery and exploration [of the four worlds]"* [D9], and self-expression: "*I liked the most that the user was in control [and] the drawing aspect [because] expressing yourself through art […] is quite helpful"* [D9].

Managing Discomfort while Using the MannеqKit Cards

The cards were designed to be emotionally evocative, and findings indicated that they were powerful devices for communicating how the experience of depression feels like. Researching and designing for mental health technologies, can be emotionally challenging [49,62]. We acknowledge this challenge and in order to further address it, we particularly explored participants' discomfort while using the cards in their design workshops.

An important outcome is that while all participants were aware of the challenging, sensitive nature of the cards: *"It didn't affect me personally but sure it's a difficult subject to cover, and [some] vignettes are reasonably strong to remind you how difficult some people have it*" [D3], most of them did not experience discomfort [D3, D4, D6, D7, D8, D9]: "*It's quite a sensitive topic but I didn't feel any discomfort"* [D8].

Particularly interesting are the accounts of four participants [D2, D3, D7, D9] regarding emotional distancing: "*I kind of separate myself from that kind of stuff [so] it was fine"* [D9], which in itself is not trivial to achieve: "*sort of challenging because you have to digest the information without kind of like making you depressed"* [D7]. The support provided within the design group, and facilitated by therapists was important for mitigating such discomfort: *"It really felt like a bit depressing because we were so much empathetic with the person [...] it's okay because it's a workshop and you managed to distance yourself [...] when read the card*" [D2].

DISCUSSION

Lived Experiences of Depression: Metaphorically Rich

The first research question focused on the key lived experiences of depression. Findings indicate that these experiences are complex and nuanced, and their descriptions provided by the therapists are surprisingly rich. While the presence of physical and emotional symptoms of depression is less surprising, what is surprising is the abundant use of metaphors of depression such as *depression is black* [59] and *depression is weight* [56]. A key finding is the prevalence of a new metaphor of depression which we called: ***contraction*** metaphor which involves both external and internal forces, all-encompassing and exercising pressure towards the person living with depression. The importance of this metaphor is also reflected in phenomenological accounts of lived experience of depression [1], in particular their emphasis on the closing of the world and its quality of constricted slowness [1], difficult to understand as it is both hidden to others and strongly unfamiliar to people without depressive concerns. We argue that unpacking and articulating this metaphor in both text- and posture-based descriptions is beneficial in strengthening the communicative power of our cards. Findings also highlighted that the descriptions of lived experiences of depression seldom reflect just one symptom, or one metaphor, but are often described in conjunction with others, or alongside the contextualization of experiences through spatial or temporal details of everyday life.

Postural Representations: Creative and Ambiguous

The second question focused on how lived experiences of depression can be represented through postures. Our work highlights the importance of expertise and materials. Findings indicate that expert therapists are in strong position to articulate such postures, which is an explorative, creative but far from trivial task. The provided materials such as the mannequin and colored playdough were appropriately flexible and open to support this complex task. The process of crafting the postures, was driven by the identified experiences of depression, and it is probably less surprising that the metaphors of depression carried over to postures. Particularly interesting in this respect is that a fifth of the postures were impossible to physical enact. This contrasts stereotypical postures described in clinical research [10][28][41][54][61]. Our postures did not merely capture physical symptoms but also emphasized in powerful evocative ways the richness of depression experiences. Creativity required to generate them can lead to more ambiguous and open for interpretations postures (indicating the importance of accompanying vignettes), but also to more evocative and able to elicit empathy ones.

MannеqKit Cards: Kinesthetic Empathic Design Tool

The third question focused on the value of identified experiences and their representations, for the design of technologies for depression. Here we discuss MannеqKit as a novel design tool supporting empathic understanding, ideation underpinned by ethics, and the empathy paradox, arguing for the need to better support researchers and

designers of mental health technologies through balancing closeness and distancing. Our outcomes contribute to the HCI work on empathic design methods. MannеqKit tool is well positioned within the growing HCI work on emotional wellbeing and affective health [64][73], as well the growing interest in body and embodiment [65][78]. Within the range of current empathic design methods, MannеqKit shares similarities with the narrative based methods that capture crafted, life-inspired users' experiences [7][14][17][52][58][83]. We did not directly engage with people living with depression but with their therapists as proxies, similar to the approach taken in [9]. An important distinction is that our vignettes, which can be seen as short crafted narratives of depression experiences, are provided together with the postures through which they were first elicited. The postures thus become vehicles for communicating in a different modality the alternative, non-verbal aspects of depression experience. We argue that it is within this mix of text and image, complementing and reinforcing each other that the poignant, evocative power of the MannеqKit cards resides. One can imagine ways in which traditional narrative based methods may also be sensitively extended to capture non-verbal aspects of targeted experiences through forms of crafts, for instance such as narrative vignettes [53,84]. In turn, they may be able to communicate more of the *lived body* [33]. We also argue that MannеqKit supports designers' *empathic sensitivity* [44] towards people living with depression, through the generated design concepts informing technologies for depression, through the cards themselves, and their collaborative exploration in design workshops.

Holistic Representations: Understanding Users and Supporting Ideation

We now discuss an important quality of MannеqKit cards, namely their holistic representation of depression experience integrating through postures and vignettes multiple physical, emotional, or cognitive symptoms and metaphors, and how they impact and are impacted by relatable, ordinary daily situations. The cards and their discussion in group, with input from therapists, effectively framed designers' empathic understanding of depression, and informed their ideation underpinned by strong ethical values. A key findings is how the high level design concepts generated by Group 1 and 3, can be seen as design principles reflecting key aspects of novel technologies [62], namely compassionate technologies for depression.

Empathy Paradox: The Need to Balance Closeness and Distancing

An important outcomes is the cards' double edge: being emotionally powerful and able to elicit understanding and empathy among all participants, but at the same time, presenting the challenge of designers experiencing the strong negative emotions depicted by the cards. Only four participants mentioned the ability to experience emotional distancing. Useful here is Stein's model of empathy [46] consisting of three levels: intentionally placing oneself in other's situation; experiencing other's feelings as if they were their own [60]; and finally exiting this state and returning to one's own inner world, while continuing to sympathize but no longer empathize with the other. While much research has focused on supporting empathy and its benefits, particularly in health care, the importance of supporting also the third level of sympathy and self-recovery has been limitedly explored [43].

In HCI, the importance of accounting for researchers' and designers' wellbeing while working with, or for vulnerable users groups such as people living with depression has been already made [49]. Most of such work has focused on better preparation through access to support through peers or counselling [62]. We extend suggestions for further supporting researchers or designers working in this space through the provision of training for balancing empathy with distancing, to ensure progression through all the three levels of Stein's model. Future work should explore how such training can be designed and delivered, both before and after emotionally charged research or design activities. For instance, this may include breaks after exposure to materials like our cards, or purposefully tailored debriefing sessions. Support can also be provided during activities, similar to our decision to include therapists in the design workshops who provided a safe space for the exploration of sensitive material.

CONCLUSIONS

We report MannеqKit, a *kinesthetic empathic design tool* for communicating nonverbal aspects of lived experiences of depression. The tool has been co-designed by 10 therapists with focus on key postures communicating such experiences. Findings indicate that MannеqKit cards are highly evocative, emotionally rich and able to elicit strong empathy. We contribute to the empathic design approach through insights into the metaphorically rich experiences of depression, the value of nonverbal qualities of lived experiences, MannеqKit cards support for understanding users and for informing the ideation process, as well as with the need to balance empathy with distancing for designers' wellbeing.

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