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Patients' drawings of their asthma: adding qualitative specificity to a quantitative measure of illness perceptions

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ABSTRACT

Objective: Patients' perceptions about their asthma can influence behavior, coping and outcomes. Previous studies have also identified that patients' views can differ significantly to that of healthcare professionals. Enhancing current understanding of patients' perceptions can assist in reducing this mismatch. We aimed to utilize the medium of drawings to add qualitative specificity and depth to a quantitative measure of illness perceptions exploring patients' perspectives of their asthma. **Methods:** Eighteen adults with asthma completed the Brief Illness Perception Questionnaire (BIPQ) and participated in a drawing activity. Analysis was based on the participants' transcribed descriptions of their drawing. A coding approach was used to map the data according to the BIPQ items. **Results:** The drawings and subsequent discussions specified the "what," the "how," and the "why" of the experience of living with asthma. Prominent emotional and social elements emerged, with evocative images coupled with expressive and profound language. Use of drawing also revealed additional representations which were outside of the BIPQ scope. **Conclusions:** Using qualitative methods to analyze a novel approach to understanding illness perceptions provided insight into how asthma affects patients' lives personally.

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KEYWORDS

Drawing; asthma; illness perception; patient experience; qualitative; Brief Illness Perception Questionnaire; self-management

Introduction

Illness perceptions are an important factor in how patients self-manage their asthma, for example studies have identified they are associated with patients' coping strategies [1], clinical outcomes [2] and medication adherence [3]. Illness perceptions are patient-built schema of their illness which they draw upon to make sense of and guide behavior aimed at managing their condition [4]. Research exploring the perspective of patients with asthma has provided valuable understanding regarding the factors which influence quality of life for those living with this chronic lung condition [5,6]. Many such studies have also identified that patients' views can differ significantly to that of healthcare professionals [7]. When this mismatch occurs, patients' symptoms or concerns are not addressed [8], thus negatively impacting the communication and rapport between patients and healthcare professionals [9]. Further, current understanding of patients' perspectives can help identify strategies to narrow this gap between patients' and healthcare professionals' perceptions.

The multifaceted nature of illness perceptions suggests the need for adjunctive and alternative data collection methods. Studies suggest that offering patients the opportunity to share their illness experience through creative expression may provide deeper insight into the subconscious aspects of patients' perspectives [10]. A variety of art forms have been employed, such as drawing, photography, drama and music [11,12]. Cognitively, production of art stimulates different areas of the brain compared with verbal communication [13], and visual self-expression has been shown to activate the prefrontal cortex in the brain [14]. Also, practically, art can be useful when people may have difficulty conveying their thoughts verbally due to functional or language barriers [15].

A growing qualitative approach that facilitates the tangible expression of patients' perceptions and experiences of their illness is drawing [16,17]. Drawings are hand-drawn sketches that provide a visible form to a thought, concept or feeling. A recent review of the literature identified that adult patients' drawings revealed new, insightful knowledge about their

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perceptions and experiences in a number of chronic conditions, such as heart disease and chronic obstructive lung disease [18]. Interestingly, characteristics of these drawings, for example, drawing size and pen stroke intensity, were associated with clinical and psychological markers of health. Participant feedback regarding drawing indicated that it related personally and enabled expression and reflection [19,20]. The reviewed studies highlighted that using drawings as a creative outlet for patients to express their lived experience of an illness provided a powerful adjunct to traditional data collection approaches, and demonstrated potential benefits for patients, researchers and healthcare professionals. However, there is currently minimal research in the field of drawings and asthma.

There is no doubt that psychometrically sound and robust quantitative measures of illness perceptions are valuable methods of gaining research data and understanding of patient experiences of chronic conditions. Nonetheless, like all approaches, these measures are not without limitations. A validated quantitative measure widely used in the research of various health conditions is the Brief Illness Perception Questionnaire (BIPQ) [21,22]. A systematic review showed that during the period 2006–2013, 188 published papers utilized the scale in 26 languages across 36 countries [23]. The BIPQ was modified from the Revised Illness Perception Questionnaire (IPQ-R); changes included condensing multiple items into a single question, and altering the scale and anchors from Likert (strongly disagree to strongly agree) to quantity and intensity-based. The review indicated that the questionnaire has good concurrent validity, as demonstrated by moderate to good correlations between the scales of the BIPQ and IPQ-R, and good predictive validity, as the BIPQ predicted a number of key health outcomes [23]. However, the construct validity of the BIPQ, that is, the extent to which the scale assesses what it is intending to measure, was not explicitly investigated. Moreover, although the items were derived from and correlated with the items of the previous version (IPQ-R), these correlations were mostly moderate to good, but some of the associations between BIPQ and relevant IPQ-R items were weak [24]. Indeed, illness perception scale developers have also called for research and commentary on these questionnaires as a means of continual refinement of such measures [25].

Although the BIPQ has been used in many studies as a gauge of patient illness perceptions, given that its psychometric qualities need to be better established, it is important for healthcare professionals and researchers interested in obtaining a detailed depiction of

patients' illness perceptions to use other methods of data collection in addition to the BIPQ or similar questionnaires [26]. Triangulating insights from both qualitative and quantitative data collection approaches has been shown in previous research as a means of enriching the understanding of patients' illness perceptions [27]. In this manuscript we undertook a qualitative analysis of patient drawings which together would provide a greater level of specificity and depth to a commonly used quantitative measure of illness perceptions (BIPQ) exploring patients' perspectives of their asthma.

Methods

Participants and recruitment

This research protocol was approved by the University of Sydney Human Ethics Committee (HREC 2015/876). Recruitment of participants from metropolitan Sydney, Australia occurred through not-for-profit organizations, advertisements at a university, local newspaper columns and passive snowball sampling. Inclusion criteria were doctor-diagnosed asthma, age at least 18 years, and fluency in written and spoken English. Participants took part in a one-on-one, in person session with a researcher. They received an AUD\$50 gift voucher as reimbursement for their time at the end of their session.

Materials and procedure

The sessions were held at the University of Sydney or at participants' homes in metropolitan Sydney during 2016. Participants completed a survey about their illness perceptions and sociodemographic information; this was followed by a drawing activity. Detailed discussion of the findings from the drawing activity have been published [28].

Illness perceptions

The Brief Illness Perception Questionnaire (BIPQ) was used to assess illness perceptions (refer to Supporting Information 1) [24]. The BIPQ is a validated, nine-item short version of the Revised Illness Perception Questionnaire, and its development was drawn from the Common-Sense Model of Self-Regulation (CSM). There is a single item for each of the following dimensions: consequences (to wellbeing and functional status), timeline (expected duration of the condition; acute-chronic), personal control, treatment control, identity (symptoms patients associated with the condition), coherence, concern and

emotional response rated on a scale from 0 to 10, and lastly an open-ended item regarding causal perceptions. Higher scores reflect a more threatening view of the illness [24]. The item pertaining to cause, which required an open-ended response was excluded. It is important to note that illness coherence is not included in the CSM, however scale developers introduced this addition as they were interested in exploring the importance of how patients “make sense” of their illness as a whole and how this relates to response and adjustment [25].

Sociodemographic information

Data regarding gender, age, education, occupation, ethnic origin, age at diagnosis of asthma, and asthma medications (reliever, preventer, other) were gathered.

Drawing activity

Participants were offered blank sheets of artist quality A4 paper and a range of drawing materials (graphite pencils, colored pencils, crayons, ballpoint pen, fine-liner pen, eraser, sharpener). Instructions were provided to participants verbally by the researcher following a standardized script. Participants were asked to freely draw their perceptions and experience of asthma. The researcher reassured participants that artistic skill was not important, rather their views were the focus of this activity. There was no time limit on the drawing activity. The researcher stayed in the room but moved away from participants to give them space.

When participants were finished with their drawings, they were asked to describe their drawings to aid appropriate interpretation. This discussion was guided by Guillemín’s adaptation [17] of Rose’s critical visual methodology framework [29], which explores the process of image production, the composition of the image, and the relationship between the image and the audience. This open-ended framework has been used to assist in the interpretation of participants’ drawings in a range of health conditions [30,31]. From this framework, prompting questions were posed around the drawings’ content, representations, colors, orientation, as well as participants’ thoughts and feelings. Participants’ descriptions of their drawings were audio recorded.

Data analysis

Qualitative data

As drawings can be abstract and interpreted subjectively in multiple ways, the analyses were based on the

Table 1. Characteristics of the participants ($n = 18$).

	Number (%)
Gender	
Men	3 (16.7)
Women	15 (83.3)
Age, mean $\pm$ SD (range)	33.2 $\pm$ 15.7 (19–68)
Education	
Bachelor or higher qualification	9 (50.0)
Certificate or diploma qualification	3 (16.7)
High school qualification	6 (33.3)
Occupation	
Student	7 (38.9)
Teaching	3 (16.7)
Healthcare	2 (11.1)
Art	1 (5.5)
Retired	2 (11.1)
Other	3 (16.7)
Ethnic origin	
Caucasian	8 (44.4)
Asian	7 (38.9)
Other	3 (16.7)
Age at diagnosis of asthma (yr)	
0–11	12 (66.7)
12–18	3 (16.7)
18+	3 (16.7)
Reliever medication use for asthma	17 (94.4)
Preventer medication use for asthma	7 (38.9)
Other medication use for asthma	4 (22.2)

participants’ own descriptions of their images, which were transcribed verbatim (content description). Sections of text were examined alongside the relevant image, and a coding approach was used to map the data (transcribed content descriptions and drawings) according to the eight BIPQ items. Of these eight, six items allude to *cognitive* illness representations (consequences, timeline, personal control, treatment control, identity, coherence) and two items describe *emotional* illness representations (concern, emotional response). The main aspects participants described in their drawings that related to the BIPQ items were coded as “primary mapping.” Those aspects in the drawings which emerged from the primary mapping codes were coded as “secondary mapping” and then similarly as “tertiary mapping.” In addition, representations from the drawings that were not mapped to the BIPQ items were also derived. This process was performed by two independent researchers (MC and LS), and consensus was reached regarding assigned codes.

Quantitative data

The participants’ responses to the BIPQ and sociodemographics were analyzed using the Statistical Package for the Social Sciences (IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.). Medians, interquartile ranges and overall ranges of quantitative variables and frequencies of qualitative variables were calculated to explore sample characteristics.

Results

Participant characteristics

Eighteen people participated in the study. The sample consisted of more women (83.3%) than men (16.7%),

Table 2. Brief illness perception questionnaire (BIPQ) ($n = 18$) median scores.

BIPQ item	Median	Interquartile range	Range
Consequences	5	3	0–9
Timeline	10	0	0–10
Personal control	3	2	0–8
Treatment control	2	3	0–6
Identity	5	3	1–9
Concern	5	5	2–10
Coherence	2	3	0–9
Emotional response	4	4	0–9

Item ranges 0–10, higher scores = more threatening view of the item/illness.

aged between 19 and 68 years, from a range of educational, occupational and ethnic backgrounds. The majority of participants (66.7%) received a diagnosis of asthma between the ages of 0 and 11 years. Reliever medication was used by 94.4% of participants, preventer medication 38.9% and other medications 22.2%. Sample sociodemographic characteristics are summarized in Table 1.

Participant responses to the BIPQ

The scores for illness perceptions, measured by the BIPQ, are presented in Table 2. The scores ranged between low and high for all the domains, which demonstrated the varied perceptions patients had. The medians and interquartile ranges highlighted where

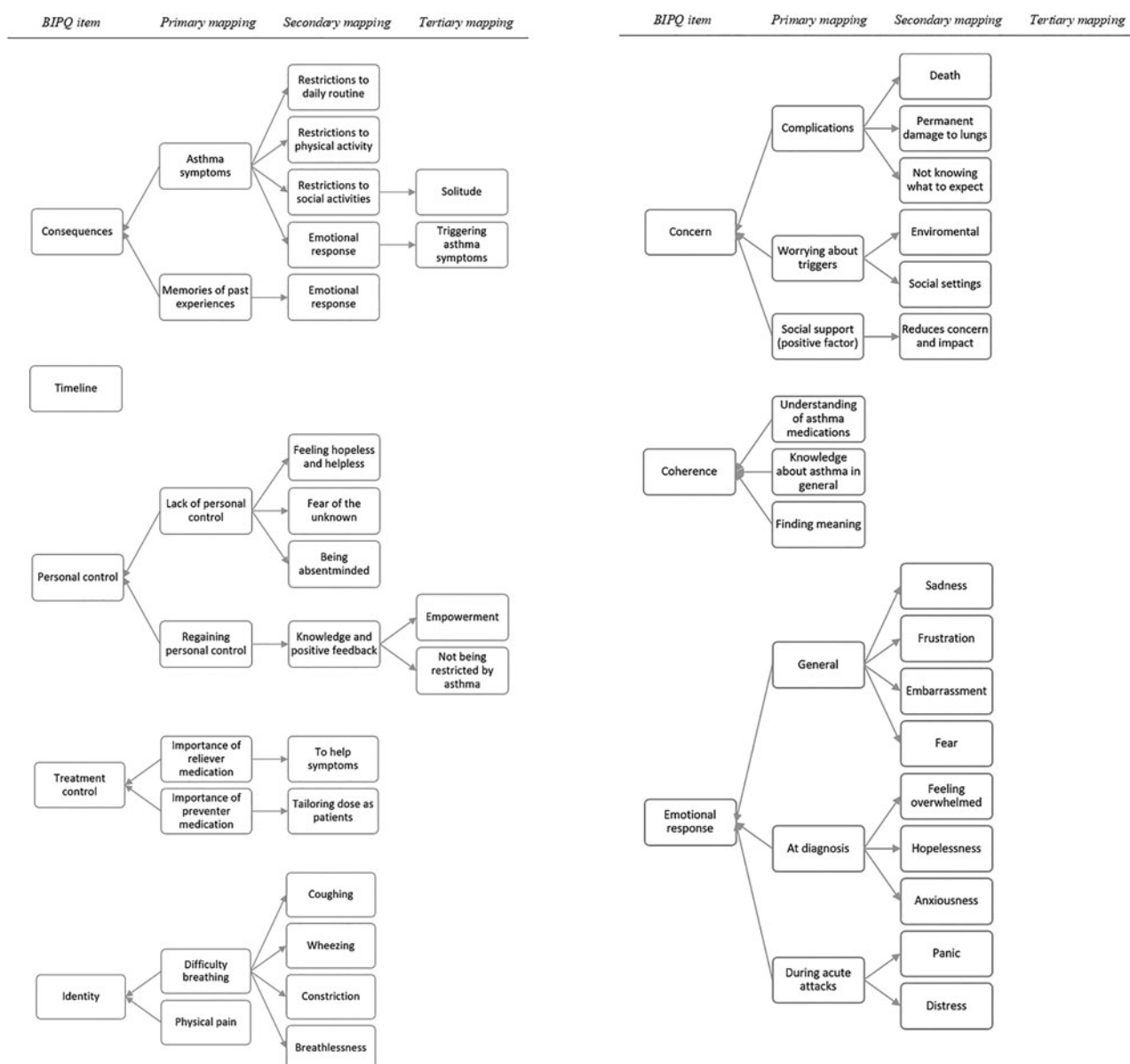


Figure 1. Mapping of content of the drawings to the BIPQ items.

Table 3. Illustrative quotations for the BIPQ items derived from transcribed text describing the drawings.

BIPQ item	Illustrative quotations
Consequences	<i>It affected me greatly when I was a kid, I could not go to play with the other kids. (Female, 32, asthma diagnosis at 2 years)</i> <i>I'm just always the person who needs to stop for a rest all the time ... everyone is walking ahead of me ... and they do not have an issue. (Female, 24, asthma diagnosis between 12 and 18 years)</i>
Personal control	<i>I think I came a long way from where I was because there are definitely answers and at the time when I felt that way I had just the GP. He was okay ... and even specialists at the time, they could not give you much positive feedback, but it has changed a lot and if you feel empowered to do something about it and control, in a way you control the asthma yourself as well, then it is better and you feel better about it. (Female, 63, asthma diagnosis at 18 years)</i> <i>Now I feel that I am so much more clear about what asthma is, what my asthma is, how it defines me and how I have learnt to control it. (Female, 22, asthma diagnosis between 0 and 11 years)</i>
Treatment control	<i>I just forget [the Ventolin] and I am just really absent minded about it. I know it is the one thing keeping me alive. (Female, 24, asthma diagnosis at 14 years)</i> <i>When I get a cough or a wheeze, then straight, straight for the Ventolin. (Male, 37, asthma diagnosis at 8 years)</i>
Identity	<i>A picture of myself. That feels like it is a noose ... around the neck. It is like someone is tightening a rope around your neck and you cannot breathe. (Female, 39, asthma diagnosis between 0 and 11 years)</i> <i>When I have attacks ... the airway feels really cold, hence the blue, and yet my lungs feel very hot. They also feel very heavy, which are the black bits at the bottom. (Female, 24, asthma diagnosis at 14 years)</i>
Concern	<i>That is me here looking frustrated having asthma, the weather change and flowers and, the garden ... if these things are affecting me I need to go to the doctor. (Female, 22, asthma diagnosis between 0 and 11 years)</i> <i>Because all my friends and all my family know I am like this, so I think because I have such a good support network, anything with my asthma is not really that a big deal to me. Because I do not feel like people look at me in a negative way because of it. (Female, 24, asthma diagnosis between 12 and 18 years)</i> <i>It is a mixture of fear of the unknown, a restriction on my daily life and an intrusion on my daily life having to take all the meds and that is really where I am at today. (Male, 68, asthma diagnosis at 45 years)</i>
Coherence	<i>So I understood what [asthma] was, and what it meant, and then what it meant for myself and my future. (Female, 22, asthma diagnosis between 0 and 11 years)</i>
Emotional response	<i>This was me when I was first diagnosed. It is like it broke my heart and ... when I see the sun I am happy, but then it felt like the sun was grieving for me too. Represented myself here ... It [asthma] makes me feel blue, then makes me feel anxious and then it makes me feel like I am hopeless and when you feel hopeless you will die. (Female, 29, asthma diagnosis at 20 years)</i>

the scores clustered for our sample. These differed between items, representing how patients may perceive certain aspects as more threatening than others.

Mapping of participants' drawings and discussion to the BIPQ items

Figure 1 presents the mapping of content of the drawings to the BIPQ items. The number of participants whose drawings coded to each of the BIPQ items are provided in the format of (number/18) in the text below. Whilst the BIPQ provides a rapid, numerical assessment of patients' perceptions of their asthma (Table 2), the drawings and subsequent discussions specify the "what," the "how," and the "why" of the experience of living with asthma from the patient perspective. Illustrative quotations supporting each BIPQ item are presented in Table 3.

The participants' descriptions of their drawings provided insight into how they were affected by asthma. The *consequences* (18/18) of the condition varied from physical and social to emotional. Their drawings included symptoms and the associated restrictions to lifestyle (daily routine, physical activity and social interaction) and how these aspects influenced them emotionally. For several participants, memories of past experiences of asthma often brought about feelings of disappointment and sadness even in the present moment (Figure 2). The recurring

breathing difficulties and pain portrayed in the drawings demonstrated the symptoms participants associated with asthma, that is, the illness *identity* (14/18) (Figure 3). Participants used vivid metaphors, symbolism, colors and language to describe their experiences of these symptoms. This was also reflected when they described their *emotional responses* to asthma (10/18). Emerging from the drawings were specific feelings of sadness, frustration, embarrassment and fear participants experienced living with asthma. During certain situations, these emotions were heightened, for example, feeling overwhelmed, hopeless and anxious at diagnosis (Figure 4), and panic and distress during acute exacerbations.

Participants who felt a lack of *personal control* (7/18) over their asthma shared that they felt hopeless and helpless as a result, feared unknown complications that might occur in the future, and frequently forgot about their asthma. Regaining personal control was aided by increased knowledge about the condition and receiving positive feedback from healthcare professionals. These aspects empowered participants, increased their confidence, and enabled them to feel they were not confined by their asthma. The drawings also included portrayal of the participants' *concerns* (9/18) regarding the possible complications of asthma, which included death, permanent damage to the lungs, and at times, not knowing what to expect. Worrying about asthma triggers in the environment,

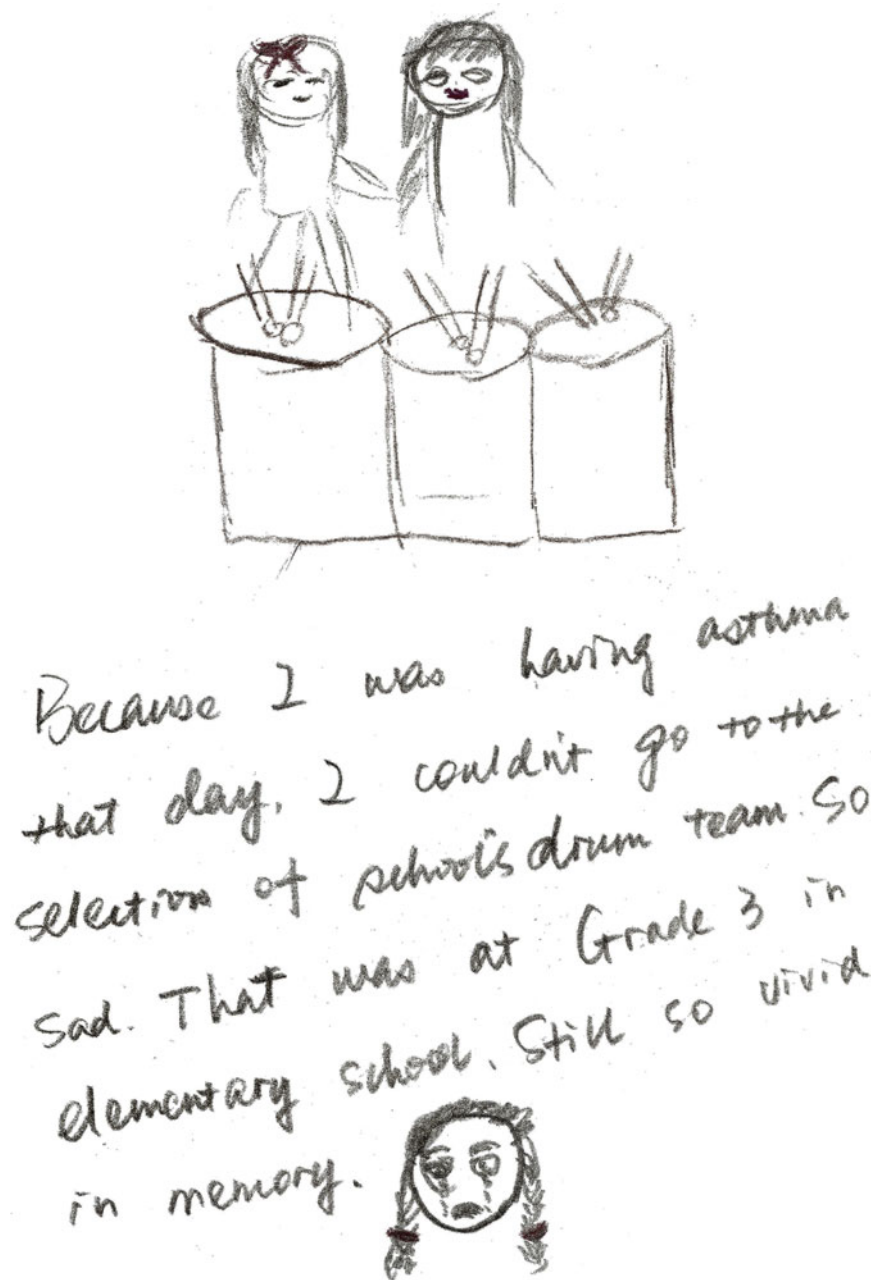


Figure 2. Participant's drawing of how the disappointment of not being able to take part in school activities due to asthma remains in her memory even now (female, 32, asthma diagnosis at 2 years).

such as pollen and weather change, and in social settings, for example cigarette smoke, were also on their minds. A positive factor which reduced concern and the impact of living with asthma was a supportive network of friends and family, who had knowledge about asthma and accepted the participant for who they were. On the same note, *coherence* (2/18) about asthma for the participants themselves was also important in helping them navigate the management of asthma and live well with the condition. Accepting and finding personal meaning and a place for asthma in their lives provided reassurance and led to a more positive outlook for their future.

Despite the majority of participants sharing their perceptions of the symptoms of asthma, there was minimal representation of their view of the effectiveness of treatment (*treatment control*; 4/18). Also, interestingly, no aspect of the drawings was coded to the *timeline* item (0/18), which explores patients' perceptions of the expected duration of asthma. The median BIPQ score for *timeline* was 10, that is, the maximum possible score, which indicated that most participants perceived their asthma as a condition that would last forever.

Illustrative quotations supporting the additional aspects from the drawings that were not mapped to

the BIPQ items are shown in Table 4. For the participants, the journey of living with asthma was dynamic and not static; they shared how memories of both positive and negative experiences influenced their perceptions. This included regaining control over their own lives (as opposed to *personal control* of their condition), and how this affected the extent to which asthma impacted their wellbeing. Another aspect was how receiving a diagnosis of asthma challenged personal identity (different to illness *identity*).

Discussion

This manuscript aimed to utilize the medium of drawings to add qualitative specificity to a commonly used quantitative measure of illness perceptions, enabling a more fine-grained exploration of patients' perspectives

of their asthma. Quantitative measures such as the BIPQ are valuable assets to researchers and healthcare professionals. Our findings offer additional and detailed understanding of patients' illness perceptions



Figure 3. Participant's drawing of how asthma feels like a noose around the neck (female, 39, asthma diagnosis between 0 and 11 years).

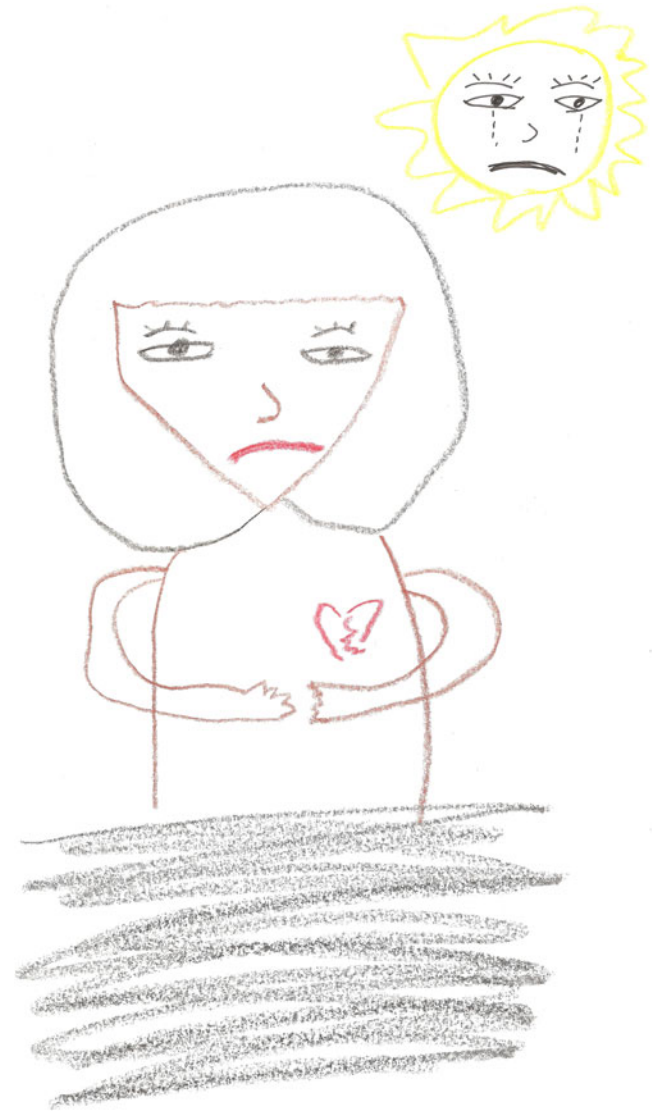


Figure 4. Participant's drawing of her emotional reaction to receiving a diagnosis of asthma (female, 29, asthma diagnosis at 20 years).

Table 4. Illustrative quotations for the aspects in the drawings that were not mapped to the BIPQ items.

Aspect	Illustrative quotations
The journey of living with asthma is dynamic	[The drawing activity] made me think what my journey was with regards to asthma. I think I am going toward the point where I am becoming the victor against asthma. So I say to myself, you [asthma] are not going to control my life, I am going to control my life. (Female, 29, asthma diagnosis at 20 years) I see the past as a very small part of my asthma now ... This is what my life is looking like at the moment ... this is me now, this is me with the smooth breath, this is what I can do now. (Female, 28, asthma diagnosis between 0 and 11 years) Because I know where I stand with my asthma ... now I have got time for so many other things and asthma only plays a tiny little part in everything now. (Female, 22, asthma diagnosis between 0 and 11 years) [The drawing] represents the change over time, how I went from happy to sad and how that impacted asthma. It shows that process over time, how I was emotionally and also how I was with my asthma. (Female, 20, asthma diagnosis between 10 and 12 years)
Personal identity	When I found out [I had] asthma, I felt like I lost my identity, I felt I was just asthmatic. I did not feel I am a mother and young woman, I just felt I am asthmatic ... it affected me, it really affected me. (Female, 63, asthma diagnosis at 18 years+)

of asthma through mapping of their pictorial representations and subsequent descriptions to the BIPQ items. Prominent emotional and social elements were threaded through the findings, with evocative images coupled with expressive and at times quite profound language. Use of drawing also identified additional representations which were outside of the questionnaire's scope.

The drawings provided in-depth understanding regarding the perceptions of patients with asthma and how this has affected their personal lives. The participants' drawings depicted majority of the BIPQ items, with a focus on *consequences*, *illness identity*, *concern* and *emotional response*. Feeling alone and different to people without asthma was a recurrent theme in the drawings, with participants sharing experiences where they have been "stopped" from taking part in a range of activities due to their asthma. The drawings were less mapped to and little was discussed around the *coherence* item. Nevertheless, when participants shared how they "made sense" of their illness as a whole, this offered rich understanding regarding the importance of *coherence* as a positive contributor to accepting and embracing asthma in the lives of these individuals. Previous research has found that *coherence* had fewer significant associations with clinical and psychosocial outcomes compared to the other illness perception items [23]. Given the insightful details coherence has identified in this study, this concept warrants further research and debate within the illness perception arena.

Whilst it is important to explore the aspects which were represented in the participants' drawings, it is also eminent to discuss the items less mapped. There was minimal depiction of how effective participants perceive asthma treatment to be (*treatment control*). This is of particular significance given that medications are one of the core aspects in the treatment guidelines for asthma [32], and a number of studies have targeted adherence to preventative asthma medication as a means of improving asthma control [33,34]. Also, participants' perceptions of the expected duration of their asthma (*timeline*) were not addressed in the drawings. However, the median BIPQ score for *timeline* was 10 (Table 2), which is the maximum possible score for an item on this scale, suggesting that participants perceived their condition will last a long time. If one were to purely look at the responses to the BIPQ, according to the test developers this score would be interpreted as the chronicity of asthma being perceived as a very threatening aspect for patients. The absence of this in the patients' drawings

may suggest that whilst patients were aware of the chronic nature of the condition and rated it as a 10 on the relevant BIPQ item (0–10 scale), they may have accepted this fact and it no longer was a cause of overwhelming worry or concern. An alternative view could be that at a conceptual level "chronic" or "long term" do not necessarily imply threat. Furthermore, given that previous studies have reported that expectations of the duration of the condition are linked with asthma medication adherence [2], patients' perceptions of *timeline* justifies the need for further investigation.

There were aspects that emerged from the drawings which were not captured by the questionnaire items (Table 4). Participants' illustrations and descriptions of their dynamic journey of living with asthma resonates with previous research showing that patients experience ongoing emotional and cognitive adjustment [35]. This suggests that patients may have different support and information needs depending on how they are with their asthma at a particular point in time, and this therefore emphasizes the importance of personalized rather than generic care. In this study, the perception that asthma challenged personal identity was expressed by participants; this is noteworthy as existing literature has proposed that this may influence patients' conceptualization, acceptance and management of their asthma [36]. Discussion around the drawings identified these additional areas which may be "missed" by closed-ended scales.

It is important to note that there are several variables that could influence patients' perceptions and experiences of their condition, for example, the level of asthma control, the standard of healthcare received, as well as age, gender, education, occupation and ethnicity. Research has shown that these social determinants play an important role in how people perceive their level of personal control over their lives [37–39]. Additionally, in our sample, the majority of participants were female and used asthma reliever medication; fewer males and patients with preventive medication participated in the study. These above factors are likely to affect how patients chose to portray their asthma in their drawings. As such, the illness perceptions presented in this manuscript may not be reflective of every patient with asthma. Furthermore, due to the sample size, we were unable to explore subgroup differences for gender, level of asthma severity/control, asthma medication use and other demographics. This study excluded people who were not fluent in English, though drawing could be useful for people who may have difficulty communicating

verbally due to functional or language barriers. A limitation of this study was that most drawings depicted aspects which were likely to be of priority to the patients; however, we did not probe perceptions outside of those mentioned by the patient. In addition to using Guillemin's adaptation [17] of Rose's critical visual methodology framework [29] to guide the discussion around the patients' drawings, general interview questions in relation to the BIPQ could have been included. We also recognize that an alternative method of allowing the themes to emerge from the data (inductive approach), followed by comparison of these themes to those of the BIPQ would have been informative as to not impose the BIPQ onto the data (deductive approach). Future research might explore these alternate approaches to further investigate the differential impact of drawings, verbal discussion and written questionnaires in eliciting patients' illness perceptions.

Nevertheless, our study demonstrated that using a qualitative approach to elicit patient perceptions about their experience of asthma added depth and nuances not able to be captured by a quantitative measure. While the quantitative measure of the BIPQ provided a numerical indication of patients' perceptions of their asthma, the drawings and discussions embodied the rich detail of what was felt and thought regarding each item of the BIPQ. The mapping demonstrated there are interlinked illness perceptions, such as physical asthma symptoms both influencing and being influenced by emotional responses. The drawing activity also captured the temporal dimension of the dynamic nature of participants' perceptions, with several people sharing their changing perspectives in the past and present.

Conclusions

Through the medium of drawings, which can offer a window into how asthma affects patients' lives personally, healthcare professionals can better understand the aspects patients view as important and avenues for improving asthma self-management. For example, participants in this study shared that positive feedback and encouragement from healthcare professionals increased their confidence in the ability to manage and control their asthma; having a social support network reduced concern and social consequences; and knowledge regarding asthma and the medications enabled them to accept asthma as *part* of their life, and not simply their whole life. Strategies for emotional support should thus be considered for

particular time points in the asthma journey, such as at diagnosis and during acute exacerbations. Drawings can provide opportunities for healthcare professionals to initiate discussions with their patients about aspects of the lived experiences of asthma, as well as its management. Example clinical applications of patients' drawings include healthcare professionals, such as nurse practitioners or asthma educators, asking patients to draw their experiences during a clinical encounter. Alternatively, due to time constraints, patients could bring a drawing to a follow-up consultation for discussion, or electronic communication portals may enable this to be forwarded to the healthcare professional prior to a consultation and stored electronically for future reference. Group asthma education workshops for patients are a potential setting for drawing and peer discussion. Also, patients' drawings could be incorporated into university curricula and continuing professional education for healthcare professionals, for example, through workshops, online seminars and reflective activities.

Disclosure of interest

No potential conflict of interest was reported by the authors.

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For the following questions, please circle the number that best corresponds to your views:

7. How well do you feel you understand your asthma?

0 1 2 3 4 5 6 7 8 9 10
Don't understand at all Understand very clearly

8. How much does your asthma affect you emotionally? (e.g. does it make you angry, scared, upset or depressed?)

0 1 2 3 4 5 6 7 8 9 10
Not at all affected emotionally Extremely affected emotionally