Journal of Psychiatric Research 168 (2023) 381–391

Contents lists available at ScienceDirect

Journal of Psychiatric Research

journal homepage: www.elsevier.com/locate/jpsychires

The identification and measurement of postpartum anxiety in England: A Delphi survey

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ARTICLE INFO

Keywords:
Postpartum anxiety
Delphi survey
Multi-professional

ABSTRACT

Postpartum anxiety has negative consequences for both mother and infant, so effective identification and measurement is vital to enable intervention. Despite NICE recommendations to prioritise the measurement of postpartum anxiety in mothers, current clinical measurement in England remains both fragmented and flawed. The Postpartum Specific Anxiety Scale [PSAS] offers an alternative, as it measures maternal-focused anxieties which can enable specifically targeted interventions. However, it is only currently used as a research tool and may require modification for clinical use. To inform modification of the PSAS, nineteen stakeholders from a variety of organisations participated in a two-round Delphi consensus survey to measure its clinical relevance and potential for effective identification of clinical anxiety. Descriptive analyses revealed all subscales of the PSAS scored highly across all domains, excluding Practical Infant Care Anxieties. Analyses also indicated good consensus between stakeholders across specific items, suggesting that the some items on the PSAS are relevant and effective at identifying clinical postpartum anxiety. Participants also expressed a need for a shorter version of the PSAS for clinical use, and that additional items may need including. Future research must now adapt the existing PSAS based on the results of this study and pilot the adapted measure in a clinical population.

1. Introduction

Whilst new motherhood can invoke feelings of joy and happiness, for some, it may also represent a lifecourse transition replete with psychological vulnerability (Saxbe et al., 2018). Estimates suggest approximately 20% of women will experience a mental health problem during the first year postpartum (Public Health England, 2019), the consequences of which may include reduced maternal-infant bonding (McNamara et al., 2019), and insecure attachments (Slomian et al., 2019).

Some levels of anxiety during the postpartum may be adaptive (Ali, 2018), however, excessive worries which interfere with normal daily functioning and day-to-day care of the baby are considered maladaptive (Wenzel, 2014). Estimates suggest prevalence of postpartum anxiety are as high as 40% (Field, 2017), yet it remains under recognised and under diagnosed (NICE, 2014). The DSM-5 currently offers no clinical diagnostic criteria for anxiety during this period; the addition of *"with peripartum onset"* added to other mental health disorders does not apply to anxiety (Zappas et al., 2021, p.61). The lifetime economic consequences resulting from postpartum anxiety reach £6.6billion in the United Kingdom, with approximately 60% of this cost relating to negative impacts on children (Bauer et al., 2016). Given this, effective measurement and identification is vital to enable appropriate and timely intervention considering the psychological, social, and economic impacts.

The vast majority of research into postpartum mental health has focused on postpartum depression [PPD]. This has led to under-recognition of postpartum anxiety [PPA] and mis-diagnosis of PPA as PPD (Matthey et al., 2003). Although three items of the EPDS [EPDS-3A] have been used in previous research to measure anxiety, the creator of the EPDS himself maintains the EPDS is not a measure of anxiety and should not be used for this purpose (Cox and Holden, 2003). Similarly, fear of childbirth is a construct of pregnancy-specific anxiety (Sheen and Slade, 2018), therefore there may be overlap between symptoms of post-traumatic stress disorder after birth, and symptoms of PPA. This raises additional considerations for identification and measurement of PPA.

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https://doi.org/10.1016/j.jpsychires.2023.10.041
Received 19 January 2023; Received in revised form 14 August 2023; Accepted 18 October 2023
Available online 6 November 2023

2. Measurement of postpartum anxiety

Current clinical measurement tools are problematic. Firstly, many contain somatic items which present a problem for measuring anxiety given the physiological changes following postpartum (Schiller et al., 2015), which may occur regardless of anxiety. Further, tools validated in general populations do not consider concerns specific to the postpartum period, such as relationships (Wardrop and Popadiuk, 2013; Patel et al., 2007), and infant care (Jones et al., 2019). Following NICE (2014) recommendations, consideration of anxiety during the postpartum period by health professionals (e.g., health visitor, midwife) is to be asked at every contact; this occurs approximately four times during the postpartum period (Department of Health, 2015). The current approach to screening for anxiety in the perinatal period is to use the GAD-2, which, if screens positively, the GAD-7 is used for a more in-depth assessment. However, approximately 1 in 10 women disclose they were not asked about their mental health at these visits (Redshaw and Henderson, 2016).

2.1. Generalised Anxiety Disorder assessment (2-item)

The GAD-2 features only the first two questions on the GAD-7, and assesses symptoms over the previous 14 days on Likert scale from 0 to 3, with excellent sensitivity and specificity at identifying clinically relevant GAD (Kroenke et al., 2007). Further, due to its short length, the tools' ability to identify postpartum anxiety accurately and effectively, can be questioned (Fairbrother et al., 2019). Despite mixed evidence (Fairbrother et al., 2019), the National Institute for Health and Care Excellence and the National Collaborating Centre for Mental Health recommend the use of the GAD-2 (and, if scored highly, the GAD-7) for postpartum anxiety screening (NCCMH, 2018; NICE, 2014), however, the evidence-base for its use is drawn purely from the general adult population and it has been argued this could lead to spurious reliability when used in perinatal populations. Furthermore, the tool generates several false-positive results when used during pregnancy (Nath et al., 2018) and so its accuracy can be questioned. However, the use of the GAD has persisted due to the fact there have been no other, more appropriate tools to use in practice (NCCMH, 2018).

2.2. Generalised Anxiety Disorder assessment (GAD; 7-item)

The 7-item Generalised Anxiety Disorder Assessment (GAD-7; Spitzer et al., 2006) was developed and validated for the measurement of GAD in a general adult population. It features seven items and rates the frequency of anxieties occurring in the previous 14 days. Participants rate on a Likert scale from 0 to 3 (0 = not at all, 3 = nearly daily). The measure has shown to be both valid and reliable in primary care settings (Sapra et al., 2020).

The GAD-7 has since been validated for clinical use in postpartum populations (Simpson et al., 2014), with some suggesting the tool has greater sensitivity than other measurement tools for this population (Matthey, 2008), and so is a suitable tool to measure anxiety accurately in postpartum women. In terms of clinical measurement, Fairbrother et al. (2019) suggest the GAD-7 is not suitable for anxiety screening in this population because it is not broad enough to accurately capture the symptoms of anxiety.

2.3. The Postpartum Specific Anxiety Scale (PSAS)

In response to the lack of adequate tools developed specifically for the postpartum period, the Postpartum Specific Anxiety Scale (PSAS; Fallon et al., 2016) was developed. The PSAS is a 51-item validated research tool used to assess the frequency of maternal and infant-focused anxieties occurring in the previous seven days, for use in mothers of infants up to twelve months old. It is scored on a four-point Likert Scale assessing frequencies of specific anxieties, with consistent response options of 1 = Not at all, 2 = Not Very Often, 3 = Often, and 4 = Almost Always with a cut-off total score of 112+ indicative of clinically relevant anxiety. The order of responses for 27 of the items is randomly reversed to avoid 'yea-saying' bias. The measure has four subscales which can be scored separately (15-items on Maternal Competence and Attachment Anxieties; 7-items on Practical Infant Care Anxieties; 11-items on Infant Safety and Welfare Anxieties; and 18-items on Psychosocial Adjustment to Motherhood). The inclusion of subscales specific to concerns surrounding the postpartum period can encourage mothers to open up about mental health concerns, as items are reflective of their experiences (Fallon et al., 2016).

The PSAS is currently being subjected to translation and validation globally, with approved versions published in French (PSAS-FR; Infante-Gil et al., 2022), Persian (PSAS-IR; Hasanzadeh et al., 2021, PSAS-IR-RSF; Mashayekh-Amiri et al., 2023, PSAS-IR-RSF-C; Mashayekh-Amiri et al., 2023), Chinese (PSAS-CN; Xu et al., 2021), Italian (PSAS-IT; Ionio et al., 2023), Spanish (PSAS-ES; Costas-Ramón et al., 2023); and other translations underway in Dutch, amongst others. The English-language PSAS has also been modified to produce a 16-item research short-form (PSAS-RSF; Davies et al., 2021) and a 12-item research short-form for use in global crises (PSAS-RSF-C; Silverio et al., 2021). However, the PSAS requires modification for use in clinical practice, in part due to its current length. Additionally, insight needs to be gathered from stakeholders, including psychologists, psychiatrists, midwives, and health visitors with expertise in postpartum anxiety, to understand the clinical utility of the tool in its current form to enable suitable modification.

2.4. The current study

Given the lack of appropriate clinical tools to measure postpartum anxiety in the NHS, there remains a need for a different approach. Whilst the PSAS may be a promising alternative tool, it may require modification for use in clinical settings as there is a lack of insight from professionals as to the utility of the measure in these settings. The short-forms of the PSAS (The PSAS-RSF and The PSAS RSF-C) are both research tools, but some of the other items found in the 51-item long-form PSAS may well be more appropriate for the clinical tool, therefore this study assessed the full PSAS rather than its derivatives. Furthermore, with the development of any health-related measure it is essential to gain insight from patients and professionals. Therefore, the current study aims to understand the optimal measurement and identification of postpartum anxiety within the NHS-England healthcare system from stakeholders, such as clinicians and health professionals with experience of postpartum anxiety in clinical settings, to enable modification of the PSAS for clinical use.

To this end, the research aims are to understand the:

1) acceptability and utility of the PSAS for use as a clinical tool in terms of its relevance and potential effectiveness for identification of clinical postpartum anxiety
2) needs associated with modifying the PSAS for use in clinical practice, including the addition or removal of items

We therefore adopted a two-round Delphi Survey method in order to gain consensus from a group of experts about the identification and measurement of postpartum anxiety in England.

3. Methods

3.1. Ethics

The study received full ethical approval from the University of Liverpool Institute of Population Health Research Ethics Committee on March 9, 2022 (Ref: IPH11083). All aspects of the study were conducted in accordance with the latest version of the Declaration of Helsinki.

Written informed consent was gained via an electronically signed form. Participants were fully debriefed upon completion of the survey.

3.2. Participants and recruitment

Participants were recruited via e-mail, following participation in a previous focus group study, which aimed to qualitatively explore the needs associated with identifying postpartum anxiety within NHS England. Participants self-identified as belonging to one of three stakeholder groups: Policymakers, Frontline Healthcare Professionals, or Third Sector Organisations. The first round was accessible from April 1, 2022–May 17, 2022. Two follow-up e-mails were sent to remind participants to complete the survey. The second round was open from May 20, 2022–June 10, 2022. As previously, follow-up e-mails were sent to participants who had not completed the second round. Participants were reimbursed at a rate of £25 for each round of the Delphi survey, totalling £50 upon completion of both rounds.

3.3. Design and procedure

Delphi surveys allow participants to take part in an initial round of ratings blind to the outcomes. In subsequent rounds, grouped responses are anonymously presented alongside the participants' own previous responses, and individual participants are encouraged to gain a generalised consensus (Shariff, 2015). A full outline of the Delphi Survey procedure can be seen in Fig. 1.

Participants therefore registered on the DelphiManager website (www.delphimanager.liv.ac.uk), before rating the Postpartum Specific Anxiety Scale (PSAS; Fallon et al., 2016) on two separate domains of interest for each item, specifically: a) relevance for measuring clinical anxiety; and b) how effectively each item identified clinical anxiety. Here, we establish relevance as the way in which the item measures the construct of postpartum anxiety, whereas efficacy is how well it identifies clinically relevant anxiety.

Round one presented each participant with the full PSAS twice. Participants rated each item on a Likert scale from 1 to 9 (1 = not important; 5 = important, but not critical; 9 = critical), firstly on the items relevance and then how effectively it identifies clinical anxiety.

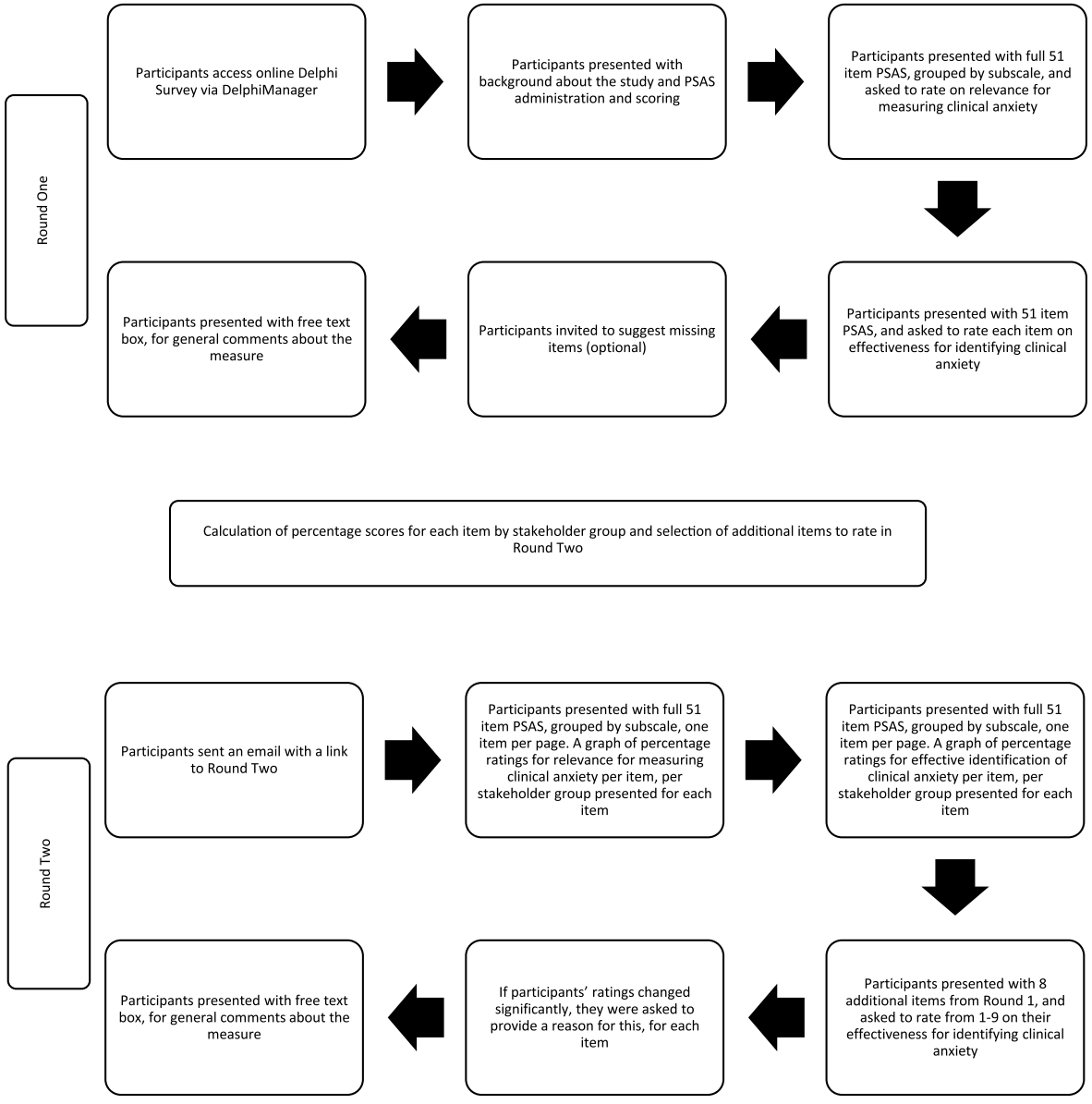

Fig. 1. Delphi survey methodology.

Participants had the ability to provide further feedback on each individual item via a free textbox. Participants were invited to add additional items to the scale, based on their expert opinion. Finally, a free textbox was provided. Prompts were given to direct participants to comment on scoring of the measure, optimal length of a clinical measure, and whether and how functioning with anxiety might be measured in relation to an anxiety measure.

Round two followed a similar format, but participants were presented with three bar charts, representing the percentage of participants who had rated each item from 1 to 9 in the first round (split by stakeholder group), alongside their own rating from Round One. If individual ratings were changed between rounds, participants were asked to give a reason for this change.

3.4. Method of analysis

All analyses were conducted in Microsoft Excel. Descriptive analyses (mean and standard deviation) were calculated for each individual item. Consensus was calculated using the interquartile range [IQR], commonly used in Delphi Surveys (see Rayens and Hahn, 2000). When considering this study, good consensus across items and subscales indicates participants agree an item or subscale is: a) relevant for measuring clinical anxiety; and b) effectively identifies clinical anxiety. As discussed by Rayens and Hahn (2000), cut-offs for consensus vary dependent upon factors such as number of response options, and so requires careful consideration, particularly as consensus measurement for Delphi surveys varies widely (von der Gracht, 2012). However, it is agreed that lower values for the IQR are indicative of stronger consensus. It should be noted that the current study utilised a 9-point Likert scale, and so higher values of the IQR are to be expected (von der Gracht, 2012). For the purposes of this study, we adopt an IQR of 2 or below as good consensus based on the use of a 9-point Likert scale (see Hahn and Rayens, 1999; von der Gracht and Darkow, 2010).

4. Results

4.1. Participants

Nineteen participants completed Round One. Of these, eleven (57.89%) identified as Frontline Healthcare Professionals, one (5.26%) identified as a Policy Maker, and seven (36.84%) identified as being from Third Sector Organisations. Two participants partially completed Round One before the survey closed, and so were invited to participate in Round Two, as they were familiar with the PSAS and the structure of the Delphi Survey at this point. Their partial responses to Round One of the Delphi Survey were not included in the analysis.

Eighteen participants completed Round Two. Of these, eleven (61.11%) identified as Frontline Healthcare Professionals, two (11.11%) identified as Policy Makers, and the remaining five (27.78%) identified as belonging to Third Sector Organisations.

4.2. Round one

The IQR for the whole scale in terms of relevance was 3, indicating some dispersion in responses, however consensus was reached on some individual items. For effective identification, the IQR was 2, indicating strong consensus amongst participants. A summary of Round One and Round Two scores can be found in Figs. 2 and 3.

4.2.1. Maternal competence and attachment anxieties (see Table 1)

In terms of relevance for measuring clinical anxiety, the highest scoring items were *"I have had negative thoughts about my relationship with my baby"* (M = 7.39, SD = 1.65) and *"I have felt that my baby would be better cared for by someone else"* (M = 7.39, SD = 1.50). The lowest scoring item was *"I have worried I will not know what to do when my baby cries"* (M = 5.72, SD = 2.42). The IQR in terms of relevance was 3, indicating that consensus was not reached, although it was on some individual items. When considering effective identification of clinical anxiety, the highest scoring item was *"I have felt that my baby would be better cared for by someone else"* (M = 7.88, SD = 1.31), whilst the lowest scoring item was *"I have worried I will not know what to do when my baby cries"* (M = 5.81, SD = 2.20). The IQR for effective identification was 2, indicating good consensus for the subscale as a whole.

4.2.2. Infant safety and welfare anxieties (see Table 2)

When considering relevance, the highest mean scoring item was *"I have not taken part in an everyday activity with my baby because I fear they may come to harm"* (M = 7.56, SD = 1.50), whilst the lowest mean scoring item was *"I have worried about leaving my baby in a childcare setting"* (M = 4.56, SD = 2.28). The IQR for the whole subscale was 3, indicating lack of consensus for the subscale as a whole. Similarly, in terms of effective identification *"I have not taken part in an everyday activity with my baby because I fear they may come to harm"* was the highest scoring item (M = 7.75, SD = 1.44). The lowest scoring item was *"I have worried about leaving my baby in a childcare setting"* (M = 4.56, SD = 2.22). The IQR for the whole subscale in terms of effective identification was 2, indicating good consensus.

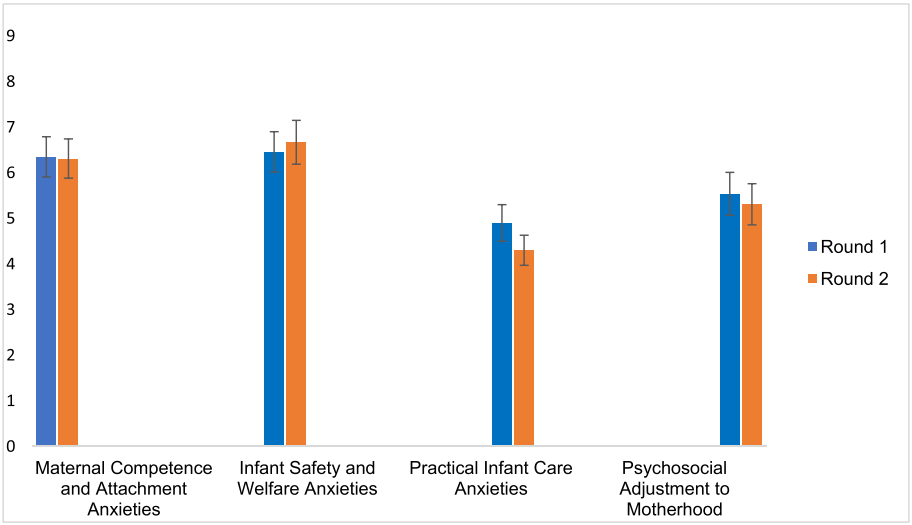

Fig. 2. Mean Relevance Scores for Round One and Round Two, split by subscale. Error bars represent standard error.

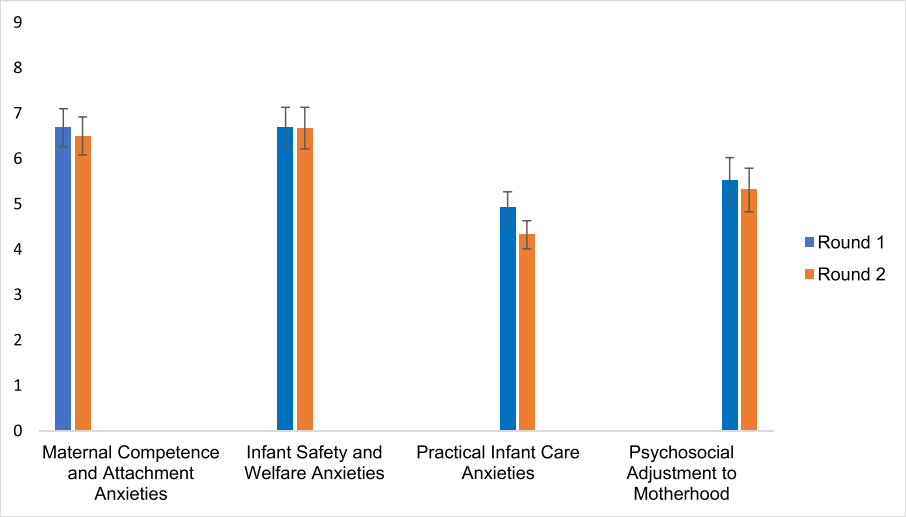

Fig. 3. Mean Effective Identification Scores for Round One and Round Two, split by subscale. Error bars represent standard error.

4.2.3. Practical infant care anxieties (see Table 3)

When considering the mean scores regarding relevance for measuring clinical anxiety, the highest scoring item was *"I have worried about my baby's milk intake"* (M = 5.56, SD = 1.69), whilst the lowest scoring item was *"I have used the internet for reassurance about my baby's health"* (M = 4.00, SD = 1.68). The IQR for relevance was 2, indicating good consensus. In terms of effective identification of clinical anxiety, the highest mean score for a single item was *"I have worried about my baby's milk intake"* (M = 5.29, SD = 1.49). The lowest mean scoring item was *"I have worried about getting my baby into a routine"* (M = 4.06, SD = 1.48). The IQR in terms of effective identification was 2, also indicating good consensus for the subscale as a whole.

4.2.4. Psychosocial adjustment to motherhood (see Table 4)

The lowest mean scoring item in terms of relevance was *"I have worried about returning to work"* (M = 4.06, SD = 1.82), whilst the highest scoring item was *"I have felt isolated from family and friends"* (M = 7.65, SD = 1.41). The IQR for the subscale in terms of relevance was 3, indicating some dispersion. In terms of effective identification of clinical anxiety, the lowest scoring item was *"I have worried about returning to work"* (M = 4.13, SD = 1.82). The highest scoring item was *"I have had difficulty sleeping even when I have had the chance to"* (M = 7.25, SD = 1.88). The IQR for the subscale in terms of effective identification was 3, indicating lack of consensus.

4.2.5. Additional items

Sixteen additional items were suggested by participants at the end of Round One. Items were discussed [VF, SW] as to their appropriateness for adding into the second round. Items were discounted if they already reflected anxieties included in the original PSAS or would not fit with the current scoring system. All authors agreed with this decision, and a total of eight additional items were added to Round Two.

4.3. Round two

The IQR for the whole scale concerning relevance for measuring clinical anxiety is 3, indicating some dispersion in responses. In terms of effective identification for measuring clinical anxiety, the IQR for the entire PSAS was 3. Whilst this indicates dispersed responses, consensus was reached on some individual items. A summary of scores can be found in Figs. 2 and 3.

4.3.1. Maternal competence and attachment anxieties (see Table 1)

For relevance in measuring clinical anxiety, the highest mean scoring items were *"I have had negative thoughts about my relationship with my baby"* (M = 7.44, SD = 1.72) and *"I have worried about the bond that I have with my baby"* (M = 7.44, SD = 1.50). The lowest scoring item was *"I have worried about being unable to settle my baby"* (M = 5.50, SD = 2.07). The IQR for the subscale in terms of relevance was 3, indicating some dispersion in responses, although there was consensus on individual items. In terms of effective identification of clinical anxiety, the highest scoring item was *"I have felt that my baby would be better cared for by someone else"* (M = 8.28, SD = 0.83). The lowest scoring item was *"I have worried that my baby is less content than other babies"* (M = 5.44, SD = 1.65). The IQR for the subscale in terms of effective identification was 2, indicating good consensus.

4.3.2. Infant safety and welfare anxieties (see Table 2)

The lowest mean scoring item for relevance was *"I have worried about leaving my baby in a childcare setting"* (M = 4.00, SD = 1.94) whilst the highest scoring item was *"I have not taken part in an everyday activity with my baby because I fear they may come to harm"* (M = 7.83, SD = 1.76). The IQR for the subscale for relevance was 3.75, indicating lack of consensus, although agreement was reached on individual items. When considering effective identification, the lowest scoring item was *"I have worried about leaving my baby in a childcare setting"* (M = 4.11, SD = 2.05). The highest score was *"I have not taken part in an everyday activity with my baby because I fear they may come to harm"* (M = 8.00, SD = 1.53). The IQR for effective identification was 2, indicating consensus amongst the experts.

4.3.3. Practical infant care anxieties (see Table 3)

In terms of relevance for measuring clinical anxiety, the highest scoring item was *"I have worried about the way that I feed my baby"* (M = 4.94, SD = 1.26). The lowest scoring item was *"I have used the internet for reassurance about my baby's health"* (M = 3.39, SD = 1.09). The IQR for the subscale for relevance was 2, indicating good consensus. In terms of effective identification, the highest scoring item was *"I have worried about my baby's weight"* (M = 4.67, SD = 1.50). The lowest scoring item was *"I have used the internet for reassurance about my baby's health"* (M = 3.50, SD = 1.25). The IQR for the subscale in terms of effective identification was also 2.

4.3.4. Psychosocial adjustment to motherhood anxieties (see Table 4)

The highest scoring item in terms of relevance was *"I have had difficulty sleeping even when I have had the chance to"* (M = 7.83, SD = 1.15). The lowest scoring item was *"I have worried about returning to work"* (M = 4.00, SD = 1.50). The IQR for relevance for this subscale was 3, indicating lack of consensus. For effective identification, the lowest

Table 1
Mean, standard deviation, and consensus (IQR) for Round One and Round Two for the Maternal Competence and Attachment Anxieties Subscale, by Relevance and Effective Identification.

Item	Round 1 Relevance (M ± SD)	Round 1 Consensus (IQR)	Round 2 Relevance (M ± SD)	Round 2 Consensus (IQR)	Round 1 Effective Identification (M ± SD)	Round 1 Consensus (IQR)	Round 2 Effective Identification (M ± SD)	Round 2 Consensus (IQR)
I have had negative thoughts about my relationship with my baby	7.39 ± 1.65	2.75	7.44 ± 1.72	2.75	**7.81 ± 1.38**	**2.00**	**8.06 ± 1.43**	**2.00**
I have felt that my baby would be better cared for by someone else	7.39 ± 1.50	2.75	**7.28 ± 1.27**	**2.00**	**7.89 ± 1.31**	**2.00**	**8.28 ± 0.83**	**1.00**
I have felt unconfident or incapable of meeting my baby's basic care needs	6.72 ± 2.16	4.00	7.06 ± 1.80	3.00	**7.44 ± 2.00**	**2.00**	**7.72 ± 1.74**	**2.00**
I have worried about the bond I have with my baby	7.28 ± 1.49	2.75	7.44 ± 1.50	3.00	7.25 ± 1.53	3.00	7.11 ± 1.45	2.75
I have worried that my baby feels more content in someone else's care	6.22 ± 1.99	3.00	6.67 ± 1.81	2.00	6.81 ± 1.52	0.50	**7.06 ± 1.06**	**1.50**
I have felt that other mothers are coping with their babies better than me	6.50 ± 1.65	2.75	6.28 ± 1.45	2.75	6.63 ± 1.20	1.00	6.61 ± 0.92	1.00
I have felt that I am not the parent I want to be	5.94 ± 1.59	2.00	5.78 ± 1.44	1.00	6.44 ± 1.46	1.50	5.89 ± 1.02	0.75
I have worried that I will not know what to do when my baby cries	5.72 ± 2.42	3.75	5.94 ± 2.46	5.00	5.81 ± 2.20	2.50	5.56 ± 2.06	3.75
I have worried about how I will cope with my baby when others are not around to support me	6.00 ± 1.81	2.00	6.17 ± 1.69	2.00	6.38 ± 1.71	1.25	6.22 ± 1.66	1.00
I have worried about being unable to settle my baby	5.83 ± 2.12	3.00	5.50 ± 2.07	2.00	5.94 ± 2.17	3.25	5.72 ± 1.93	3.00
I have worried that my baby is picking up on my anxieties	6.17 ± 1.72	2.00	6.06 ± 1.21	2.00	6.88 ± 1.71	2.25	6.44 ± 1.62	2.00
I have worried that my baby is less content than other babies	5.89 ± 1.81	2.00	5.61 ± 1.54	1.75	5.94 ± 1.69	2.00	5.44 ± 1.65	2.75
I have worried that other people think my parenting skills are inadequate	6.28 ± 1.56	2.00	5.83 ± 1.34	1.00	6.81 ± 1.47	1.25	6.28 ± 1.53	1.00
I have felt that motherhood is much harder than expected	6.06 ± 2.41	3.75	5.78 ± 2.26	2.75	6.13 ± 2.19	3.50	5.61 ± 1.91	2.75
I have felt that I should not need help to look after my baby	5.83 ± 2.12	2.75	5.78 ± 1.90	2.50	6.00 ± 2.00	3.25	5.56 ± 1.76	2.75

N/B. Items in bold represent Mean scores of above seven on relevance for measuring clinical anxiety or effective identification of clinical anxiety, and meet consensus requirements of IQR scores of 2.00 or below.

scoring item was *"I have worried more about my appearance than before my baby was born"* (M = 4.33, SD = 1.68). The highest scoring item was *"I have had difficulty sleeping even when I have had the chance to"* (M = 7.61, SD = 1.72). The IQR for effective identification was also 3.

4.3.5. Additional items (see Table 5)

The highest scoring additional item was *"I feel worried all the time for no good reason"* (M = 8.78, SD = 0.43). The lowest scoring item was *"I worry that if I do not interact with my baby properly they will be emotionally harmed"* (M = 6.89, SD = 1.60). The IQR for the additional items was 2, indicating consensus amongst the experts.

4.4. General comments about the measure

4.4.1. Scoring

Most participants agreed that the current scoring of a 1–4 Likert scale (1 = Not At All, 4 = Almost Always), should be retained. As one noted *"I like [the Likert Scale scoring] … it has no central item so they can't just sit on the fence"*, with others adding that *"… it replicates the scoring used in other tools so is familiar"*. However, one expert suggested retaining the scoring but changing the wording to be consistent with the GAD-7 (i.e., Not at all, Several days etc.) commenting *"[I would have] the scores named the same as the GAD-7 … especially if this is being asked in reference to a time frame"*.

4.4.2. Optimal length

Some experts were not concerned about the length, as they saw the tool being used as part of a larger conversation about anxieties, with one commenting *"I would rather have a thorough tool that helps me prompt as many issues as possible than a short one that doesn't really tell me anything"*. Interestingly, it may depend on the end goal for use of the tool *"… if it is being used by midwives, health visitors and GPs at routine appointments then it needs to be fairly short … if it is being used by specialists … to screen for PPA then it needs to be more detailed."*

Table 2
Mean, standard deviation, and consensus (IQR) for Round One and Round Two for the Infant Safety and Welfare Anxieties Subscale, by Relevance \and Effective Identification.

Item	Round 1 Relevance (M ± SD)	Round 1 Consensus (IQR)	Round 2 Relevance (M ± SD)	Round 2 Consensus (IQR)	Round 1 Effective Identification (M ± SD)	Round 1 Consensus (IQR)	Round 2 Effective Identification (M ± SD)	Round 2 Consensus (IQR)
I have worried about my baby being accidently harmed by someone or something else	7.22 ± 1.44	2.50	7.61 ± 1.54	3.00	**7.69 ± 1.40**	**2.00**	7.50 ± 1.54	2.75
I have repeatedly checked on my sleeping baby	6.61 ± 1.50	1.75	**7.06 ± 1.47**	**2.00**	7.13 ± 1.71	3.00	7.28 ± 1.93	2.75
I have worried that my baby will stop breathing while sleeping	6.50 ± 1.54	2.50	6.94 ± 1.59	2.00	6.81 ± 1.72	2.00	6.83 ± 1.79	2.00
I have felt frightened when my baby is not with me	6.56 ± 2.04	3.00	7.28 ± 1.56	2.50	**7.19 ± 1.38**	**1.50**	**7.44 ± 1.04**	**1.00**
I have worried about leaving my baby in a childcare setting	4.56 ± 2.28	3.00	4.00 ± 1.94	2.75	4.56 ± 2.22	3.25	4.11 ± 2.05	2.75
I have worried about accidently harming my baby	7.17 ± 1.72	3.00	7.33 ± 1.85	3.00	**7.13 ± 1.71**	**1.25**	6.61 ± 1.79	1.50
I have thought of ways to avoid exposing my baby to germs	6.17 ± 1.69	2.00	6.33 ± 1.91	2.75	6.44 ± 1.50	2.00	6.17 ± 1.72	2.00
I have not taken part in an everyday activity with my baby because I fear they may come to harm	**7.56 ± 1.50**	**2.00**	**7.83 ± 1.76**	**1.75**	**7.75 ± 1.44**	**2.00**	**8.00 ± 1.53**	**2.00**
I have worried about my baby's health even after reassurance from others	6.89 ± 1.28	1.75	7.11 ± 1.64	3.00	6.88 ± 1.26	0.25	6.67 ± 1.37	1.00
I have worried that I will become too ill to care for my baby	5.50 ± 2.36	3.75	5.39 ± 2.15	3.00	5.80 ± 2.01	2.50	5.83 ± 1.65	2.00
I have felt a greater need to do things in a certain way or order than before my baby was born	6.35 ± 1.93	3.00	6.50 ± 2.07	3.50	6.19 ± 2.14	3.50	6.94 ± 2.31	3.75

N/B. Items in bold represent Mean scores of above seven on relevance for measuring clinical anxiety or effective identification of clinical anxiety, and meet consensus requirements of IQR scores of 2.00 or below.

Table 3
Mean, standard deviation, and consensus (IQR) for Round One and Round Two for the Practical Infant Care Anxieties Subscale, by Relevance and Effective Identification.

Item	Round 1 Relevance (M ± SD)	Round 1 Consensus (IQR)	Round 2 Relevance (M ± SD)	Round 2 Consensus (IQR)	Round 1 Effective Identification (M ± SD)	Round 1 Consensus (IQR)	Round 2 Effective Identification (M ± SD)	Round 2 Consensus (IQR)
I have worried about my baby's milk intake	5.56 ± 1.69	3.00	4.83 ± 1.65	1.75	5.29 ± 1.49	3.00	4.61 ± 1.33	1.75
I have worried about my baby's weight	5.33 ± 1.94	3.00	4.67 ± 1.37	1.00	5.12 ± 1.73	3.00	4.67 ± 1.50	2.75
I have worried about getting my baby into a routine	4.56 ± 1.62	1.75	3.94 ± 1.26	2.00	4.06 ± 1.48	2.00	3.72 ± 1.23	2.00
I have worried about the way that I feed my baby	5.33 ± 1.71	3.00	4.94 ± 1.26	1.75	4.94 ± 1.39	2.00	4.56 ± 1.15	1.00
I have worried about the length of time that my baby sleeps	4.83 ± 1.79	2.00	4.11 ± 1.37	1.75	5.06 ± 1.52	2.00	4.56 ± 1.25	1.75
I have used the internet for reassurance about my baby's health	4.00 ± 1.68	1.75	3.39 ± 1.09	1.00	4.82 ± 1.38	2.00	3.50 ± 1.25	1.75
I have worried that my baby is not developing as quickly as other babies	4.72 ± 1.67	1.75	4.22 ± 1.11	2.00	5.06 ± 1.43	2.00	4.61 ± 1.09	1.75

N/B. Items in bold represent Mean scores of above seven on relevance for measuring clinical anxiety or effective identification of clinical anxiety, and meet consensus requirements of IQR scores of 2.00 or below.

Table 4
Mean, standard deviation, and consensus (IQR) for Round One and Round Two for the Psychosocial Adjustment to Motherhood Subscale, by Relevance and Effective Identification.

Item	Round 1 Relevance (M ± SD)	Round 1 Consensus (IQR)	Round 2 Relevance (M ± SD)	Round 2 Consensus (IQR)	Round 1 Effective Identification (M ± SD)	Round 1 Consensus (IQR)	Round 2 Effective Identification (M ± SD)	Round 2 Consensus (IQR)
I have felt resentment towards my partner	5.72 ± 2.11	2.75	5.06 ± 1.76	2.00	5.38 ± 1.93	2.25	5.11 ± 1.81	2.00
I have felt tired even after a good amount of rest	5.83 ± 1.76	2.00	5.39 ± 1.29	1.00	6.31 ± 2.15	1.50	6.11 ± 1.53	2.00
I have worried more about my relationship with my partner than before my baby was born	5.06 ± 1.80	3.00	5.22 ± 1.77	3.00	5.38 ± 2.06	4.00	5.44 ± 1.79	3.00
I have worried that I am not going to get enough sleep	4.56 ± 1.89	2.75	4.17 ± 1.62	1.75	4.88 ± 2.00	3.25	4.89 ± 2.03	2.75
I have worried that my partner finds me less attractive than before my baby was born	4.44 ± 1.79	2.75	4.56 ± 1.50	1.75	4.63 ± 1.82	3.00	4.44 ± 1.72	1.75
I have worried more about my relationship with my family than before my baby was born	4.94 ± 1.63	2.00	4.39 ± 1.14	1.00	5.00 ± 1.83	3.25	4.72 ± 1.41	2.75
I have worried more about my appearance than before my baby was born	4.44 ± 1.62	2.75	4.17 ± 1.54	2.00	4.50 ± 1.90	2.25	4.33 ± 1.68	1.75
I have worried more about completing household chores than before my baby was born	5.06 ± 2.13	2.75	4.33 ± 1.71	2.00	5.19 ± 2.10	2.50	4.78 ± 2.26	2.75
I have had difficulty sleeping even when I have had the chance to	7.44 ± 1.42	2.75	**7.83 ± 1.15**	**2.00**	7.25 ± 1.88	2.25	**7.61 ± 1.72**	**2.00**
I have felt that I do not get enough support	**7.12 ± 1.45**	**1.00**	6.33 ± 1.14	1.75	6.13 ± 1.67	3.25	5.72 ± 1.36	2.50
I have worried more about my relationship with my friends than before my baby was born	4.94 ± 1.34	2.00	4.72 ± 1.23	1.75	4.69 ± 1.45	1.50	4.39 ± 1.09	1.00
I have been less able to concentrate on simple tasks than before my baby was born	5.44 ± 2.18	3.75	5.50 ± 1.98	3.00	5.50 ± 2.25	3.25	5.72 ± 1.99	3.00
I have worried about returning to work	4.06 ± 1.82	2.00	4.00 ± 1.50	2.00	4.13 ± 1.82	2.25	3.61 ± 1.42	1.00
I have felt unable to juggle motherhood with other responsibilities	5.71 ± 1.86	3.00	5.67 ± 1.88	3.00	5.81 ± 2.20	4.00	5.50 ± 2.04	3.50
I have felt that I have had less control over my day than before my baby was born	5.59 ± 2.27	3.00	5.06 ± 2.65	3.75	5.94 ± 2.59	4.25	5.11 ± 2.72	5.50
I have felt isolated from family and friends	**7.65 ± 1.41**	**2.00**	**7.67 ± 1.37**	**2.00**	7.00 ± 1.86	2.25	**7.22 ± 1.70**	**1.00**
I have worried more about my finances than before my baby was born	5.18 ± 1.70	2.00	4.89 ± 1.64	2.00	5.25 ± 2.05	2.75	4.67 ± 1.94	2.50
I have felt than when I do get help it is not beneficial	6.76 ± 1.75	2.00	6.72 ± 1.45	1.00	6.50 ± 2.10	3.25	6.22 ± 1.66	2.00

N/B. Items in bold represent Mean scores of above seven on relevance for measuring clinical anxiety or effective identification of clinical anxiety, and meet consensus requirements of IQR scores of 2.00 or below.

4.4.3. Functioning

Some panellists thought it unnecessary to include frequency within the measure, stating *"Clinical anxiety is not adequately measured by the number/frequency … it is avoidance and safety behaviours that identify clinical anxiety"*. However, the overwhelming majority did express the view that asking about frequency and functioning was necessary stating *"I think frequency is really important because … most women experience most of these things from time-to-time"* but *"… ultimately, I am interested in how much this is impacting them"*. One panellist commented "*Mother's functioning could be assessed by asking questions about being able to carry out daily tasks."* with another adding *"[The measure can] do something similarly to Whooley questions options (all the time/everyday/sometimes/ never)"*.

4.4.4. Subscale comments

Comments about the PSAS more broadly were very positive, including *"I think it's a fantastic tool. I can't wait to be able to use it in my own practice."* However, one panellist commented an ideal measure would not use gender-specific language, stating *"… it would be nice to have a gender-neutral option too"*. Another panellist also requested the measure to be clear about further support and training *"on how to ask the questions (non-judgemental) and how and when to get expert* support *… ?"*.

Table 5
Mean, standard deviation, and consensus (IQR) for Round Two for additional items, by Effective Identification.

Additional Items	Effective Identification (M ± SD)	Consensus (IQR)
I do not know how to interact with my baby	**7.11 ± 1.88**	**1.75**
I worry that if I do not interact with my baby properly, they will be emotionally harmed	6.89 ± 1.60	1.75
I feel my life has less meaning since I had my baby	**7.72 ± 1.74**	**2.00**
My interactions with my baby are not positive	**8.06 ± 1.16**	**1.75**
I have physical symptoms e.g., shakiness; palpitations; sweating; feeling faint	**8.61 ± 0.70**	**0.75**
I feel worried all the time for no good reason	**8.78 ± 0.43**	**0.00**
I have been unable to stop worrying about things that might happen in the future, even if I know they aren't likely	**8.50 ± 1.04**	**0.75**
I am distressed by how anxious I feel	**8.50 ± 0.79**	**1.00**

N/B. Items in bold represent Mean scores of above seven on effective identification of clinical anxiety, and meet consensus requirements of IQR scores of 2.00 or below.

5. Discussion

This study aimed to understand the acceptability and utility of the PSAS for use as a clinical tool in terms of its relevance and potential effectiveness for identification of clinical postpartum anxiety, using a Delphi Survey. Whilst there was some dispersion in responses in terms of the whole scale, certain items achieved excellent consensus amongst participants, which will further inform modification of the PSAS to measure clinical anxiety moving forwards. In terms of descriptive statistics, all subscales scored highly in terms of their Relevance and Effective Identification, excluding the Practical Infant Care Anxieties subscale. Experts also suggested whilst the scoring of the measure should remain unchanged, impact on functioning may be an important element to include.

Unlike current measures used to assess clinical postpartum anxiety, the items in the PSAS are maternal and infant-focused, and were developed in collaboration with mothers (Fallon et al., 2016). Women's experiences need to be at the heart of any measurement development (Jomeen et al., 2013). However, in developing patient-reported outcome measures [PROMs], both stakeholders and service users must be involved (Comins et al., 2021), which this study achieved.

Studies have suggested some women do not disclose mental health difficulties during the postpartum as they *"do not have the vocabulary to articulate them"* (Button et al., 2017, p.697). A tool which focused on symptoms may allow mothers to relate more readily to the concepts of anxiety being measured. This may well lead to a more accurate detection of clinical anxiety, which may otherwise be missed when using existing measures. Anxieties reflected in the PSAS which achieved high consensus on the Delphi survey are widely reflected in qualitative literature, including financial difficulties and baby's health (McCarthy et al., 2021). It has been recommended that measurement of postpartum anxiety should be appropriate for postpartum women, and screening tools should be specific to this population (Ashford et al., 2017). Furthermore, the low ratings for the Practical Infant Care Anxieties subscale in comparison to others may reflect that the clinical measurement of postpartum anxiety does not need to consider adaptive anxieties surrounding infant sleep, feeding, and daily routine.

At present, the 4-point Likert scale scoring of the PSAS does not account for symptom severity, only frequency. Most experts in this study felt the frequency-based scoring of the scale should remain the same. The 4-point scale avoids the use of a midpoint acting as a "*dumping ground*" which might be used when answers may be socially undesirable (Chyung et al., 2017 p.17). Results of this study indicated symptom function severity may be an important concept to include. At present, the GAD-7 and GAD-2 measure symptom frequency. Measurement of both severity and frequency of anxiety symptoms in clinical and non-clinical samples is imperative due to effects on physical health (Norman et al., 2011). Although not a psychometric measure of anxiety, the DePaul Symptom Questionnaire – Short Form (Sunnquist et al., 2019) assesses both frequency and severity of symptoms on a Likert scale from 0 to 4, with frequency and severity appearing side by side, but scored separately per symptom. A similar approach to scoring could be used to appropriately adapt the PSAS for clinical use.

Additional items added by the expert's indicated measurement of physical symptoms, and mother-infant interactions, are important. Physical symptoms of postpartum anxiety include lack of sleep (Okun et al., 2018), and difficulty concentrating (Zappas et al., 2021). Given that lack of sleep is common during the postpartum (McGuire, 2013), and hormonal changes following birth can manifest as physical symptoms (Schiller et al., 2015), the addition of physical symptoms to assess anxiety during the postpartum requires careful consideration. Studies suggest postpartum anxiety reduces the quality and frequency of mother-infant interactions, consequences of which include less emotional expression towards the infant, which can lead to insecure attachments (Ierardi et al., 2019). Given this, assessing difficulties in maternal interactions may be important.

5.1. Strengths, limitations, and future directions

Participants were from a broad range of organisations concerned with postpartum anxiety in England. The use of a Delphi Survey allowed for a generalised consensus to be gathered quickly and effectively. However, experts from regulatory organisations were underrepresented. Further research must modify the PSAS appropriately for clinical use, including reducing length and potential addition of items deemed relevant by the experts. For example, the length of the PSAS needs to be reduced to approximately ten items, and items relating to the Practical Infant Care Anxieties subscale can be completely removed. The purpose of this study was to inform the development and aid us in deciding how best to modify the PSAS for use in clinical settings. Based on the results of this study and others, we are well aware once a clinical version of the PSAS is developed, the next step will be to compare the screening accuracy of the PSAS relative to the current measures used in clinical screening, against a gold standard.

6. Conclusion

This two-round Delphi Survey was used to identify how to appropriately modify the PSAS for the measurement of clinical anxiety in England. Specifically, it measured both the effectiveness and relevance of each item for measuring postpartum anxiety. All subscales of the PSAS scored highly, excluding Practical Infant Care Anxieties. The results of this study will allow us to modify the PSAS appropriately for validation of a clinical version of the PSAS to use in clinical practice in the UK. Consensus was reached across some subscales and individual items, which can further inform modification of the PSAS. Further, participants recommended additional items which assessed physical symptoms. Future research must focus on modification of the PSAS, and piloting of the adapted measure in clinical settings.

Author contributions

Conceptualisation: [VF, SAS]; Methodology: [VF, SAS, SW]; Software: [SW]; Validation: [SAS, VF]; Formal Analysis: [SW]; Investigation: [SAS, VF, EJH]; Resources: [SAS, VF]; Data Curation: [SW]; Writing – Original Draft: [SW]; Writing – Review & Editing: [VF, SAS,

EJH]; Visualization: [SW]; Supervision: [SAS, VF]; Project Administration: [SW, EJH]; Funding: [VF, SAS].

Funding

This project was funded by the University of Liverpool Faculty of Health and Life Sciences Policy Support Fund – a Research England-funded initiative (ref:- JXG13076), successfully awarded to V. Fallon & S.A. Silverio.

Declaration of competing interest

The authors declare no conflicts of interest in relation to this manuscript.

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