







# Reaching experts for enhanced referral (REFER) to pain psychology: a modified Delphi approach with multidisciplinary paediatric pain providers at a specialised center in the USA

Lea Schemer <sup>1</sup>, Lauren E Harrison <sup>2</sup>, Courtney W Hess <sup>2</sup>,  
Alexandra J Neville <sup>2</sup>, Nicole Jehl,<sup>2</sup> Ryan S L Ma <sup>2</sup>, Julia A Glombiewski,<sup>1</sup>  
Laura E Simons <sup>2</sup>

**To cite:** Schemer L, Harrison LE, Hess CW, *et al*. Reaching experts for enhanced referral (REFER) to pain psychology: a modified Delphi approach with multidisciplinary paediatric pain providers at a specialised center in the USA. *BMJ Paediatrics Open* 2024;**8**:e003020. doi:10.1136/bmjpo-2024-003020

► Additional supplemental material is published online only. To view, please visit the journal online (<https://doi.org/10.1136/bmjpo-2024-003020>).

Received 3 September 2024  
Accepted 9 December 2024



© Author(s) (or their employer(s)) 2024. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ Group.

<sup>1</sup>Department for Clinical Psychology and Psychotherapy, Rheinland-Pfälzische Technische Universität (RPTU) Kaiserslautern-Landau, Landau, Germany

<sup>2</sup>Department of Anesthesiology, Perioperative, and Pain Medicine, Stanford University School of Medicine, Stanford, California, USA

## Correspondence to

Dr Lea Schemer; [lea.schemer@rptu.de](mailto:lea.schemer@rptu.de)

## ABSTRACT

**Background** To minimise the referral gap to pain psychology, the purpose of this study was to describe clinician-perceived patient suitability for pain psychology referral, develop a referral plan and outline essential elements of a referral conversation via a modified Delphi approach with multidisciplinary paediatric pain providers.

**Methods** We employed a three-round modified Delphi approach consulting multidisciplinary paediatric pain providers (n=18) including physicians, psychologists, physical therapists, occupational therapists and nurse practitioners (PT, OT, NP). Based on the responses to an online survey (Round 1), initial statements regarding the pain psychology referral process were developed. These statements were revised in three separate panels (MD panel, PSY panel, PT, OT, NP panel; Round 2). A priori consensus criteria were verified for each statement within and between groups using anonymous responses to a concluding online survey (Round 3).

**Results** Approximately one-third of the statements (35%) reached consensus across all panels. For example, paediatric pain providers agreed that referrals should be communicated verbally, along with written materials, and that pain should be explained early from a biopsychosocial perspective. Paediatric pain providers also suggested minimising barriers through a flexible, stepped-care approach that adapts the delivery of pain psychology beyond traditional models. However, most statements reached consensus in only one or two panels (52%), indicating a lack of consensus across disciplines. The data suggest that it was comparatively easier to reach an overall consensus on statements formulating an ideal referral process to pain psychology (50%) than on statements characterising patient suitability (13%).

**Conclusions** Paediatric pain providers developed an actionable plan for pain psychology referrals. This plan could bridge referral gaps and improve access to pain psychology treatment. Given the low provider consensus on patient suitability, further research is warranted to understand pain psychology referral decision-making, including differing perceptions of patient suitability across disciplines.

## WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Pain psychology is considered a fundamental part of a multimodal treatment approach for youth with chronic pain.
- ⇒ Despite its benefits, only a small number of patients are referred to pain psychology in both clinical practice and clinical trials.
- ⇒ This referral gap may prevent youth from accessing evidence-based care and may contribute to sample bias in research studies.

## INTRODUCTION

Pain psychology is considered an integral part of multimodal treatment for youth living with pain and is known to significantly reduce pain-related impairment and distress.<sup>1 2</sup> According to the pain prevention model, psychological factors should be targeted at all stages of primary, secondary and tertiary pain prevention.<sup>3</sup> Despite its clear benefits for pain prevention and management, pain psychology is underused, with few patients being referred. In primary care, health education or counselling is prescribed in only 20% of medical visits for patients with chronic musculoskeletal pain (<25 years of age).<sup>4</sup> Among youth with pain presenting to neurology, only one quarter (24%) of patients screened as medium or high risk on a pain risk screening tool are referred for additional pain management services.<sup>5</sup> As a result, youth experience substantial delays in receiving evidence-based pain care, particularly pain psychology.<sup>6</sup>

These data from routine clinical care also mirror the experience in our recent randomised clinical trial comparing graded exposure treatment (GET Living) to pain management-focused cognitive-behavioural

## WHAT THIS STUDY ADDS

- ⇒ A three-round modified Delphi approach was conducted with highly trained, multidisciplinary paediatric pain providers to better understand, from a clinician's perspective, which patients are considered suitable for pain psychology and describe an ideal referral process.
- ⇒ Paediatric pain providers developed an actionable plan, including key elements and sample referral conversation formulations.
- ⇒ However, the Delphi process also revealed potential factors that may contribute to the referral gap, including different perspectives between disciplines on which patients are considered suitable for pain psychology.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ Dissemination of the action plan to referring providers could help reduce the referral gap in both clinical and research contexts.
- ⇒ For example, paediatric pain providers agreed that referrals should be communicated verbally, along with written materials, and that pain should be explained early from a biopsychosocial perspective.
- ⇒ To minimise the referral gap, they suggested making referrals according to a flexible, stepped-care approach that adapts the delivery of pain psychology beyond traditional models.
- ⇒ Future research is warranted to further explore how different perspectives between disciplines exacerbate the referral gap.

therapy (CBT).<sup>7 8</sup> While GET Living aimed to improve functioning by exposing patients to avoided activities, CBT treatment focused on teaching patients pain coping skills. This trial offered gold-standard biopsychosocial pain care with 6 weeks of pain psychology and physical therapy to families, regardless of the treatment arm. Most patients (n=270, 69%) were screened out by clinicians prior to referral because of concerns about treatment fit. Overall, a referral gap appears to prevent youth living with pain from receiving pain psychology as an evidence-based treatment. In the context of a research study, problems in the referral process could also potentially contribute to a sample bias.

While research on the referral gap to pain psychology is scarce, one reason may be that referring providers are uncertain about when and how best to refer patients to pain psychology. In a large-scale survey of referring providers, pain specialists and adult patients in the USA,<sup>9</sup> medical providers reported that their patients were reluctant to see a psychologist (37%). Interestingly in the same study, patients reported being unaware of pain psychology as a treatment option (37%) and believing that their pain was not psychological (17%), suggesting both a lack of awareness of its existence and a lack of understanding of its purpose. Similarly, paediatricians struggle to discuss psychological factors contributing to pain, despite the belief that these factors are important.<sup>10</sup>

Aligned with a team science approach,<sup>11</sup> the present study aimed to better understand how multidisciplinary paediatric pain providers describe an ideal referral process to pain psychology. In doing so, we assumed that the referral process has a quantitative dimension/goal that more patients who are likely to potentially benefit are

referred to pain psychology and a qualitative dimension/goal that patients are approached in a way that makes them more receptive. We aimed to elicit clinician perceptions on both goals by having paediatric pain providers: characterise patients they consider appropriate for pain psychology in general (Aim 1a) and graded exposure treatment more specifically (Aim 1b), develop a concrete action plan for an ideal referral process (Aim 2a) and identify essential elements of a referral conversation along with sample formulations (Aim 2b).

## METHODS

### Study design

We employed a three-round modified Delphi approach<sup>12</sup> consulting multidisciplinary paediatric pain providers including physicians (MD), psychologists (PSY), physical therapists (PT), occupational therapists (OT) and nurse practitioners (PT, NP). The Delphi approach is a structured method for achieving consensus among experts on a specific topic when knowledge is incomplete or uncertain, based on the assumption that group judgements are more valid than those of individuals.<sup>12</sup> The details of the Delphi procedure were preregistered in the Open Science Framework (<https://osf.io/4sdfv>). The procedure was carried out in accordance with the ethical principles of the Declaration of Helsinki, and the study was compliant with the Institutional Review Board of Stanford University. Based on the responses to an online survey (Round 1), initial statements were developed including the formulation of an example referral conversation. Both were revised in three separate REFER panels (MD panel, PSY panel, PT, OT, NP panel; Round 2). A priori consensus criteria were verified within and between groups using anonymous responses to a concluding online survey (Round 3).

### Patient and public involvement

For this Delphi process, we involved paediatric pain providers to develop an ideal referral plan from their perspective. However, patients and/or the public were not involved.

### Setting

The Paediatric Pain Management Clinic (PPMC) at Stanford Medicine Children's Health is a tertiary pain clinic that houses multiple disciplines, including physicians (MD), NP, pain PSY, PT and OT, which offer treatment to children and adolescents who experience chronic pain (ie, persist or recurrent for >3 months). Patients are referred to the PPMC by other treatment providers such as paediatricians, rheumatologists, neurologists and orthopedists. Initial evaluations are conducted collaboratively by the multidisciplinary team. Following the initial evaluation, an individualised biopsychosocial treatment plan is rendered. Treatment occurs at the outpatient or intensive outpatient level and typically consists of pain psychology, physical therapy medical intervention and

medication management. Pain psychology consists of cognitive-behavioural interventions focused on (1) pain management and (2) graded exposure to avoided experiences, with a specific focus on functional goals to increase movement, self-regulation and cognitive interventions focused on identifying and addressing negative thoughts and feelings that arise in the context of ongoing pain and related impairment. Group interventions are also offered to patients in the PPMC.

### Paediatric pain providers

Based on decades of experience treating youth with chronic pain at the PPMC, with pain psychology as a cornerstone, we considered the paediatric pain providers at this site to be experts who could share their knowledge about an ideal referral process to pain psychology. We invited all paediatric pain providers in the PPMC (n=20) with the aim of recruiting at least half. This proposed sample size is consistent with the panel size in other Delphi studies<sup>13 14</sup> and qualitative studies.<sup>15</sup> Given the narrowly defined objective and the multi-stage Delphi process that allowed for revision and refinement, we were confident that the data would be adequately captured. With 12 participating experts in Round 1, 11 participating experts in Round 2, and 18 participating experts in Round 3, we met our recruitment goal. More details about the paediatric pain providers can be found in [table 1](#).

### Round 1: online survey

One week before the REFER panels were scheduled, paediatric pain providers received an online survey with 16 open-ended questions (see online supplemental material S1) that guided them to reflect conceptually on pain psychology (eg, 'How do you conceptualise pain psychology?', 'How do you conceptualise graded exposure treatment?'), patient suitability for pain psychology (eg, 'Which patients do you consider suitable for pain psychology?') and graded exposure treatment (eg, 'Which patients do you consider suitable for GET Living as a specialised pain psychology treatment?'), and the referral process (eg, 'What is the best timing for referral?' 'What are barriers for referral?'). Paediatric pain providers were also asked to paraphrase how they typically present pain psychology to families (eg, 'Briefly paraphrase how you would present pain psychology to families'). Their responses were synthesised into initial summary statements describing a concrete action plan including provider's responses characterising patient suitability and describing an ideal referral process to pain psychology. Based on this synthesis, essential elements of a referral conversation were identified (eg, showing interest and expressing empathy for the unique pain experience). The initial statements and the referral conversation elements served as a starting point for the later expert panels. Twelve paediatric pain providers participated in Round 1 (n=5 MD, n=5 PSY, n=1 PT, and n=1 OT).

**Table 1** Paediatric pain provider expert characteristics

	n	%
Profession	18	100
Medicine	9	50
Psychology	5	28
Nursing	1	6
Physical therapy	2	11
Occupational therapy	1	6
License		
Licensed professional	18	100
Area(s) of training*		
Paediatrics	8	47
Anaesthesiology	8	47
Integrative medicine	4	22
Paediatric pain psychology	2	11
Pain medicine	1	6
Physical medicine and rehabilitation	1	6
Orthopaedics	1	6
Sports medicine	1	6
Palliative care	1	6
Number of years treating paediatric patients with pain		
0–5 years	5	28
6–10 years	5	28
11–15 years	3	17
>15 years	5	28
Number of paediatric patients with pain treated per year		
0–50	3	17
50–100	6	33
100–150	2	11
150–200	2	11
200–250	1	6
>250	4	22
Hours per week treating paediatric patients with pain		
0–10	1	6
11–20	3	17
21–30	6	33
31–40	4	22
>40	4	22

\*Paediatric pain providers could choose several areas of expertise.

### Round 2: expert panel

Paediatric pain providers were invited to join a subsequent REFER panel moderated by the first author (LS) who did not have any relation to the clinic or the staff prior to the panel. Researchers on the study team who had dual clinical and research roles within the PPMC were not involved in the REFER panels (LES, LEH). The panel discussion lasted approximately 1 hour. The REFER panels were held separately for paediatric pain



providers with different professional backgrounds to elicit nuances of perspectives within each discipline. This approach also enabled us to explore possible divergences in the opinions of the disciplines. Due to fewer participants in these roles, the allied health professionals (PT, NP, OT) were combined into one group. In the beginning, the initial statements based on the first online survey were presented via printouts so that panellists could take notes or highlight important statements. The panellists were then guided to elaborate and discuss each statement. In the first part of the panel discussion, panellists were instructed to formulate specific statements that characterise patient suitability for pain psychology. In the second part of the panel discussion, panellists were instructed to formulate an action plan to improve referrals to pain psychology. To further refine the discussion, patient vignettes were presented that varied in their degree of diagnostic uncertainty,<sup>16</sup> medical mistrust,<sup>17</sup> pain-related fear avoidance,<sup>18</sup> and complexity of mental health condition,<sup>19</sup> theorising that these factors could potentially influence the referral decision made by each provider. The vignettes were thus intended to help panellists reflect more concretely on critical cases throughout their discussion. To produce the vignettes in the current study, a vignette used in previous research<sup>10</sup> was adapted to the current context and manipulated to create four vignettes that differed to emphasise the four predetermined factors. The adaptation was done according to existing guidelines (see online supplemental material S2).<sup>20</sup> During the expert panels, developed statements were written down by one investigator (NJ) who read the statements aloud to the panellists to confirm that they were consistent with the stated opinion. In this process, no absolute consensus was sought. Another investigator (RM) summarised the discussion that unfolded during the generation of statements to cross-check the accuracy of the statements. Lastly, panellists were asked for their feedback on the referral conversation elements. For example, the experts could add further elements to the referral conversation or refine the sample formulations. Eleven paediatric pain providers participated in Round 2 (MD panel: n=4; PSY panel: n=5; PT, OT, NP panel: n=2 with OT and PT represented).

### Round 3: consensus rating

In a concluding online survey approximately 1 month later, paediatric pain providers were asked to indicate their level of agreement to statements that were developed in the different panels on a 5-point Likert scale (1, *strongly disagree* to 5, *strongly agree*). They could suggest minor adjustments to the statements (eg, regarding wording) as long as they did not change their meaning. In regard to the developed referral conversation elements, paediatric pain providers were asked to rate the importance of each element of the referral conversation on a five-point Likert scale (1, *not at all important* to 5, *very important*). This allowed us to extract the elements that were considered most important. In accordance

with previous research,<sup>21</sup> consensus criteria formulated a priori expressed by a combination of median and percentage scores. Median scores of  $\geq 4$  with a small IQR of  $\leq 1$  as an indicator of statistical dispersion combined with 75% responses of  $\geq 4$  were considered an indicator for consensus.<sup>22 23</sup> Data were analysed separately for MD and PSY. Data from the PT, NP and OT were combined into a third group. This allowed for investigation of the consensus within each discipline and also explored possible discrepancies between groups of providers. Statements that did not meet the two consensus criteria in all groups were dismissed. Eighteen paediatric pain providers participated in Round 3 (n=9 MD, n=5 PSY, n=2 PT, n=1 OT, n=1 NP).

## RESULTS

### Description of the Delphi process (rounds 1–2)

Based on the responses to the first online survey (Round 1), we extracted 41 statements to characterise patients who were perceived as suitable to benefit from pain psychology in general (eg, 'Patient who suffers from distress') or graded exposure treatment more specifically (eg, 'Patient who suffers from fear of pain'). An additional 25 statements were extracted to describe an ideal referral process (eg, 'Patients should be referred to pain psychology at the time of the chronic pain diagnosis'). To reflect the entire range of opinions expressed, different gradations were formulated (eg, 'Patients are suitable with mild vs moderate vs severe functional impairments'). Other statements contradicted one another (eg, 'A patients should be referred to pain psychology parallel to other medical approaches' vs 'A patient should be referred to pain psychology when other medical approaches were unsuccessful'). Thereby, some statements were deliberately presented in a pointed manner, to stimulate discussion in the expert panels.

A total of 58 statements were developed in the subsequent expert panels (Round 2). Fifteen statements characterised patient suitability for pain psychology in general, and nine statements described patient suitability to graded exposure treatment more specifically. Twenty-two statements formulated an ideal referral process to pain psychology. Twelve potential elements of a referral conversation were identified, and example phrases were formulated.

### Results of the consensus rating (round 3)

Approximately one-third of the statements (20/58; 35%) reached consensus in all groups (see [table 2](#)) with most statements achieving consensus in only one (17/58; 29%) or two (13/58; 22%) groups. Eight statements (8/58; 14%) did not find consensus in any groups. The MD group agreed on most statements (41/58; 71%), followed by the PT, NP and OT group (34/58; 59%). The PSY group agreed with the fewest statements (28/58; 48%). Despite challenges in reaching consensus on statements about patient suitability (3/24; 13%), there

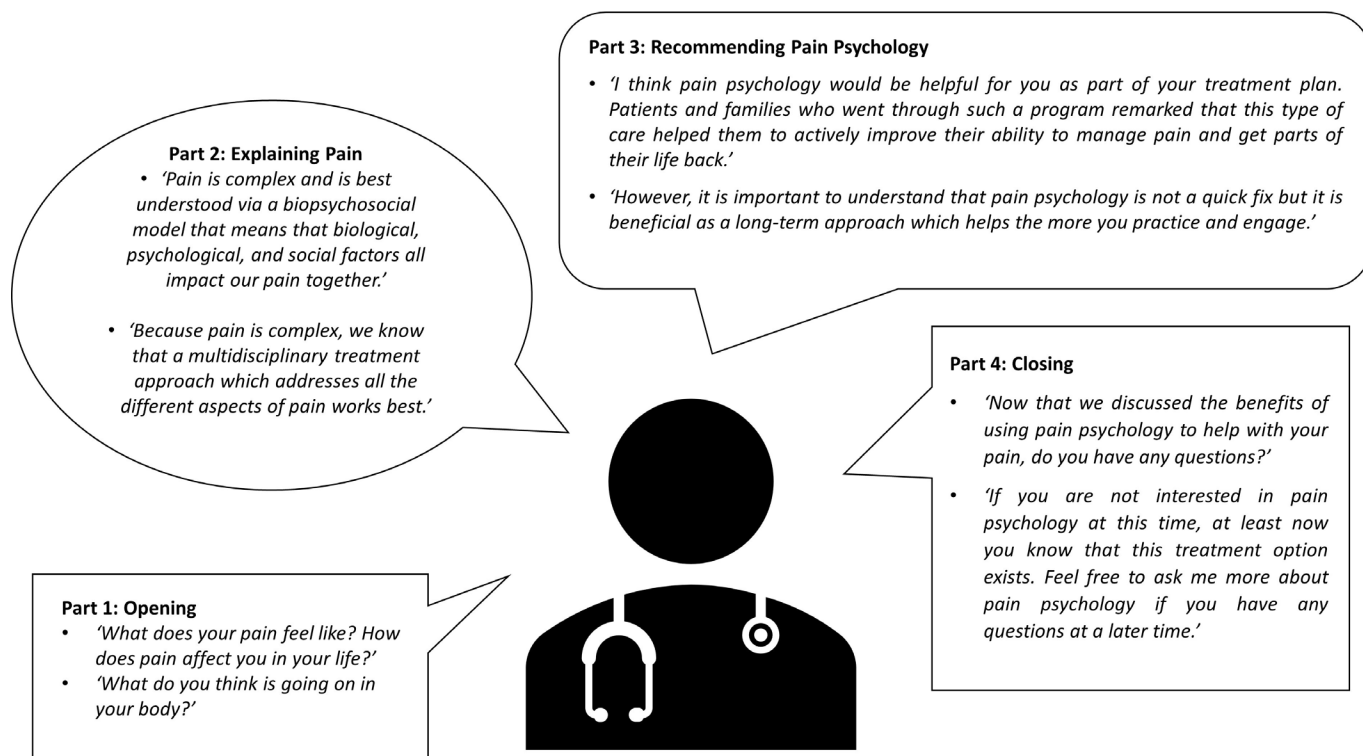
**Table 2** Statements that reached consensus in all groups

	Physicians			Psychologists			Physical therapist, nurse practitioner and occupational therapist		
	Endorsement (%)	Median	IQR	Endorsement (%)	Median	IQR	Endorsement (%)	Median	IQR
<b>Task 1 a: suitability to pain psychology in general</b>									
Motivation									
Patients/families who are open to participate in pain psychology.	89%	4.0	1.0	100%	5.0	1.0	100%	4.5	1.0
Patient/families who are ready to take an active role in their recovery.	100%	5.0	1.0	100%	4.0	0.5	100%	4.0	0.8
Although clear expectations and low resistance are desirable, patients with unclear expectations and some resistance could still benefit from pain psychology.	89%	4.0	1.0	80%	4.0	1.0	75%	4.0	0.8
<b>Task 2 a: ideal referral process</b>									
Referral situation									
The referral should be explained verbally.	89%	4.0	1.0	100%	4.0	1.0	75%	4.0	0.8
When making the referral, referring providers should respond to the patient's individual situation, for example, by taking the time to listen to the patient empathetically and encouraging them to take the next step.	100%	5.0	1.0	100%	5.0	0.0	75%	4.0	0.8
The referral should support a biopsychosocial understanding of pain.	100%	5.0	1.0	80%	5.0	2.0	100%	4.0	0.0
Additional materials (eg, information materials, brochures or patient testimonials) should be provided.	89%	4.0	1.0	100%	4.0	1.0	75%	4.0	0.8
An overview about different treatment options and providers should be provided.	89%	4.0	1.0	100%	4.0	0.5	75%	4.0	0.8
Referral strategy									
Patients are ideally referred according to a stepped care approach, in which the type and intensity of pain psychology treatment are matched to the patient's individual needs with the possibility to step up or down to different levels as they move along their recovery journey.	89%	5.0	1.0	100%	5.0	0.5	100%	4.0	0.8
Family members (eg, parents, caregivers, siblings) should be involved during treatment.	100%	5.0	1.0	100%	5.0	1.0	100%	4.5	1.0
Overcoming barriers									
Free links to web resources should be provided for pain education.	100%	5.0	1.0	100%	5.0	0.5	100%	4.5	1.0

Continued

**Table 2** Continued

	Physicians			Psychologists			Physical therapist, nurse practitioner and occupational therapist		
	Endorsement (%)	Median	IQR	Endorsement (%)	Median	IQR	Endorsement (%)	Median	IQR
To overcome distance barriers, telehealth options could be considered.	100%	5.0	0.5	100%	5.0	0.0	100%	5.0	0.8
To address the shortage of treatment providers, the involvement and training of other disciplines to provide Level 1 pain psychology should be considered.	100%	5.0	1.0	80%	5.0	2.0	100%	5.0	0.8
<b>Task 2b: essential elements of a referral conversation</b>									
Part 1: opening									
Be interested and express empathy towards the unique pain experience	100%	5.0	1.0	100%	5.0	0.5	100%	5.0	0.8
Assess the patient's individual explanatory model for their symptoms	100%	4.0	1.0	100%	4.0	1.0	100%	4.5	1.0
Part 2: explaining pain									
Describe pain from a biopsychosocial perspective	100%	5.0	0.5	100%	5.0	0.5	100%	4.5	1.0
Recommend the multidisciplinary treatment approach	100%	5.0	0.5	100%	5.0	1.0	100%	4.5	1.0
Part 3: recommending pain psychology									
Set realistic expectations	100%	5.0	0.5	100%	5.0	0.5	100%	5.0	0.8
Part 4: closing									
Leave room for questions	100%	5.0	0.5	100%	5.0	0.5	100%	5.0	0.8
Leave the door open	100%	4.0	1.0	100%	4.0	1.0	100%	4.50	1.0
Note: Experts rated each statement on a five-point Likert scale. Endorsement: selection of response options 4 - agree or 5 - strongly agree. IQR as an indicator of statistical dispersion. Two criteria for consensus were formulated: Consensus criteria 1: $\geq 75\%$ endorsement. Consensus criteria 2: median $\geq 4$ and IQR $\leq 1$ . Consensus was assumed when statements passed both consensus criteria. Statements are are assessed both consensus criteria in all expert groups (see S3 for more details).									



**Figure 1** Sample referral conversation elements developed during the Delphi process. Experts agreed that the referring providers need to respond to the patient's individual situation (eg, depending on how the patient answers the opening questions); thus, this is an example of how a referral conversation might proceed, not a script.

did appear to be more agreement on the statements that formulated an ideal referral process (17/34; 50%). None of the statements describing patient suitability for graded exposure treatment were agreed upon in all groups. The entire list of statements together with indicators for both consensus criteria by each group can be found in online supplemental material S3. Some examples of how the essential elements of a referral conversation (see Aim 2a with results presented in table 2) might be implemented are shown in figure 1. These sentences were extracted from the responses to the initial online survey and refined in the subsequent Delphi rounds. Because the experts agreed that the referring provider should respond to the patient's individual situation, this is an example of how a referral conversation might proceed, not a script.

## DISCUSSION

The present study aimed to better understand how multidisciplinary paediatric pain providers describe an ideal referral process to pain psychology. In a three-round Delphi process, paediatric pain providers were guided to characterise patients they consider suitable for pain psychology in general (Aim 1a) and graded exposure treatment more specifically (Aim 1b), develop an ideal referral process (Aim 2a) and identify essential elements of a referral conversation (Aim 2b). Ultimately, paediatric pain providers developed an actionable plan (see table 2) together with the essential elements and concrete sample formulations of a referral conversation

(see figure 1) with the hope of decreasing the referral gap to pain psychology. The current Delphi study also enabled the generation of hypotheses about factors that may contribute to the referral gap, including diverging perceptions about which patients are considered suitable for pain psychology across disciplines.

## Closing the referral gap to pain psychology

Drawing from the expertise of a multidisciplinary team of paediatric pain providers, the main contribution of this paper is to describe a practical referral action plan to pain psychology treatments. Paediatric pain providers agreed that the referral should be made verbally, as well as provided via written materials (eg, information materials, brochures or patient testimonials). They also agreed that the referring provider should understand the referral as an opportunity to explain a biopsychosocial conceptualisation of pain. When describing specific phrases that could be used in a typical referral conversation, paediatric pain providers' responses were largely congruent with previously developed formulations for credible explanations for chronic non-traumatic knee pain<sup>24</sup> and the role of emotions in physical symptoms.<sup>25</sup> For example, experts have previously emphasised the importance of addressing the patient's individual needs, approaching them with empathy and acknowledging their pain experience.<sup>24 25</sup> In addition, other experts have similarly encouraged the use of open-ended questions to learn more about how the patient understands their



symptoms and to allow the referring provider to meet the patient where they stand.<sup>25</sup>

During the expert panels, there were repeated discussions about resource problems, including provider shortages as well as distance and financial barriers. To overcome these barriers, providers in the REFER panel described referral to a treatment plan using a stepped care approach,<sup>26</sup> challenging traditional treatment models where the delivery of pain psychology can instead take many forms with different components and delivery modes. The stepped care approach consists of different levels or steps of an intervention ranging, eg, from self-help resources (level 1) to a single session or group interventions (level 2) and one-one-one sessions in an outpatient or inpatient setting. Tailored to symptom severity and patient needs, individuals can transition between levels as they progress in their recovery, with priority given to less resource-intensive interventions.<sup>19</sup> The utility and implementation of a stepped care approach has also built momentum among pain researchers.<sup>19 27</sup> For example, there are concrete suggestions on how different pain rehabilitation interventions could be tailored to patients' individual needs based on a risk assessment tool.<sup>19</sup> There has been continued effort to develop and evaluate more condensed formats to deliver pain psychology, eg, in the form of 1 day workshops<sup>28</sup> or single session interventions.<sup>29</sup> The COVID-19 pandemic has also led to a proliferation of asynchronous and virtual options, for which there exists empirical evidence, particularly at lower levels of stepped care with minimal health professional involvement.<sup>27</sup>

Altogether, paediatric pain providers have developed creative solutions to scale up pain psychology treatments and encourage referring providers to recommend pain psychology as a fundamental element in a pain management plan despite potential resource limitations. This plan may be implemented by upstream referring providers such as paediatricians, rheumatologists, orthopaedists, beyond just pain specialists. It should be noted, however, that this plan is based on clinician expert opinion only. The extent to which this plan can actually contribute to reducing the referral gap needs to be empirically verified by future research. Future research could also investigate the extent to which the plan can be adapted to adult populations, where the dissemination of pain psychology is similarly difficult.<sup>30</sup>

### Exploring reasons for the referral gap

Throughout the Delphi process, possible reasons for the referral gap to pain psychology treatments became evident. It seemed comparatively more difficult for paediatric pain providers to decide on specific characteristics that indicate suitability for pain psychology treatments. This is largely consistent with the contradictory findings on treatment moderators for pain psychology treatments in adults.<sup>31</sup> Empirical studies of treatment moderators in paediatric populations are scarce,<sup>32</sup> and few studies that exist, for example, in the context of an intensive pain

rehabilitation programme with psychological elements, have had difficulty identifying consistent predictors of treatment response.<sup>33</sup> Although it has not yet been possible to empirically determine which patients benefit most from pain psychology treatments, it is important to emphasise that, on average, patients can expect small to moderate improvements in their symptoms.<sup>1</sup>

Paediatric pain providers agreed that engagement in pain psychology requires openness on the part of the patient and family and readiness to take an active role in their recovery. This recommendation is consistent with a recently published pain management standard, which recommends a multimodal treatment approach including psychosocial elements.<sup>34</sup> To choose the most appropriate psychosocial strategies and maximise the potential benefits, shared decision-making is essential, taking into account the needs, abilities and preferences of patients and their families.<sup>34 35</sup> Similarly, previous research found readiness for change to be the most robust and modifiable baseline predictor of the response to an intensive pain rehabilitation programme.<sup>33</sup> It should be noted critically, however, that while standardised tools exist to measure readiness for change such as the Pain Stages of Change Questionnaire,<sup>36</sup> these measures are typically not included in general risk assessments that usually include physical and psychosocial risk factors.<sup>37</sup> There is, therefore, a risk that the evaluation of motivation depends heavily on the perspective of the referring provider. At the same time, paediatric pain providers weakened both points regarding openness and readiness by agreeing that patients with unclear expectations and some resistance could still benefit from pain psychology. Indeed, structured interventions have been developed that aim to promote patient readiness and engagement prior to participation in an intensive pain rehabilitation programme with the idea to maximise the success of such programmes.<sup>38</sup> Many patients and families are also unaware of how pain psychology could help them with their symptoms and an important task of the referring provider is to collaboratively build this understanding.<sup>9</sup>

Although other psychological or physical indicators of suitability for referral to pain psychology reached consensus within disciplines, none of these indicators was endorsed by all disciplines. It appears that while paediatric pain providers agreed on *how* patients should ideally be referred to pain psychology, they disagreed on *who* should be referred, possibly reflecting different models around case conceptualisation and treatment planning. As in previous research,<sup>39</sup> concerns and uncertainty were particularly evident with exposure-based pain psychology reflected by the fact that none of the developed statements formulating criteria for patient suitability for graded exposure treatment reached consensus in all expert groups. The disagreement and uncertainty might exacerbate the referral gap. For example, referrals may depend more on the provider's beliefs and perceptions than the patient presentation or symptoms, making referral decision-making more susceptible to bias. Contradictory



messages or uncertainty on the part of treatment provider(s) could also lead to patient mistrust, inequitable pain care and possibly impact treatment engagement.

### Limitations

During this Delphi process, we consulted highly experienced and well-trained pain specialists at a reputable US pain clinic. The opinions expressed, therefore, represent the perceptions of a single multidisciplinary team, and it is unclear to what extent they generalise to treatment providers working in other settings and healthcare systems. To draw more general and robust conclusions about an ideal referral process to pain psychology, it is essential that the study be replicated in other contexts and with other clinicians. For example, although resource deficits in the delivery of pain psychology were repeatedly discussed in the REFER panels, resource deficits are undoubtedly more profound in other communities and countries. In addition, the composition of various disciplines among the REFER experts was unbalanced and could be different in other settings. In many other settings, treatment providers may also not have specialised training in pain management or may rarely collaborate with colleagues from other disciplines, which could lead to even greater discrepancies and uncertainties in their perceptions. In particular, replication with upstream providers will be informative to better understand divergent opinions. For example, previous research identified that paediatricians often feel isolated in their decision-making without the support that is characteristic of a multidisciplinary team.<sup>40</sup> Future research should, therefore, be built on existing work<sup>9 10</sup> and continue to examine the attitudes and practices of upstream referring providers, such as paediatricians, rheumatologists, and orthopaedists who often have even less contact with pain psychology. While this study focused on the provider lens on the referral process, it is imperative that future research seeks to understand additional perspectives, such as the patient and caregiver lens. For example, their input would be extremely valuable in further understanding how referral conversations are perceived at the recipient end.

### CONCLUSIONS

Paediatric pain providers developed a concrete action plan to improve referrals to pain psychology (see [table 2](#)) together with the essential elements and concrete sample phrases of a referral conversation (see [figure 1](#)). Dissemination of this plan to referring providers may help close the referral gap for pain psychology treatments. Future research should continue to understand the reasons for the referral gap, including possible influences of differing perceptions of which patients are considered suitable for pain psychology across disciplines.

**Acknowledgements** We would like to thank Rashmi Bhandari, Laurel Brabson, Rachel Christensen, Andrew Dinh, Genevieve D'Souza, Julie Good, Ana Goya Arce,

Albert H. Kwon, Sabrina Majmundar, Jennifer A. Rabbitts, Jenny Wagner and all the other paediatric pain providers that participated as experts in the REFER panels.

**Contributors** All authors (LS, LEH, CWH, AJN, NJ, RSLM, JAG, LES) were involved in the study planning and conceptualisation. The data were collected by LS, NJ and RSLM. LS was responsible for the data analysis and drafting of the manuscript. JAG and LES supervised the study process. All authors (LS, LEH, CWH, AJN, NJ, RSLM, JAG, LES) reviewed and edited the manuscript. LS is responsible for the overall content as guarantor. As a non-native speaker, LS has used deepL to improve her English.

**Funding** This work was supported by a program to initiate an international collaboration of the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG) awarded to LS and by K24AR078945 awarded to LES.

**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were not involved in the design, conduct, reporting or dissemination plans of this research.

**Patient consent for publication** Not applicable.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** All data relevant to the study are included in the article or uploaded as supplementary information.

**Supplemental material** This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

### ORCID iDs

Lea Schemer <http://orcid.org/0000-0001-7830-4889>  
 Lauren E Harrison <http://orcid.org/0000-0002-2113-6471>  
 Courtney W Hess <http://orcid.org/0000-0001-5207-7411>  
 Alexandra J Neville <http://orcid.org/0000-0002-1947-2994>  
 Ryan S L Ma <http://orcid.org/0009-0004-5897-2790>  
 Laura E Simons <http://orcid.org/0000-0002-3395-9483>

### REFERENCES

- 1 Fisher E, Law E, Dudeney J, *et al*. Psychological therapies for the management of chronic and recurrent pain in children and adolescents. *Cochrane Database Syst Rev* 2018;9:CD003968.
- 2 Eccleston C, Fisher E, Howard RF, *et al*. Delivering transformative action in paediatric pain: a Lancet Child & Adolescent Health Commission. *Lancet Child Adolesc Health* 2021;5:47–87.
- 3 Fisher E, Eccleston C. Psychological aspects of pain prevention. *Pain Rep* 2021;6:e926.
- 4 Feldman DE, Nahin RL. National Estimates of Chronic Musculoskeletal Pain and Its Treatment in Children, Adolescents, and Young Adults in the United States: Data From the 2007–2015 National Ambulatory Medical Care Survey. *J Pediatr* 2021;233:212–9.
- 5 Salamon KS, Carlson M, Hildenbrand AK. Who Gets Referred? A Pilot Study of Risk Stratification and Treatment Referral in Pediatric Headache Using the Pediatric Pain Screening Tool. *J Pediatr Psychol* 2022;47:403–11.
- 6 Cucchiari G, Schwartz J, Hutchason A, *et al*. Chronic Pain in Children: A Look at the Referral Process to a Pediatric Pain Clinic. *Int J Pediatr* 2017;2017:8769402.
- 7 Simons LE, Harrison LE, Boothroyd DB, *et al*. A randomized controlled trial of graded exposure treatment (GET living) for adolescents with chronic pain. *Pain* 2024;165:177–91.
- 8 Simons LE, Vlaeyen JWS, Declercq L, *et al*. Avoid or engage? Outcomes of graded exposure in youth with chronic pain using

- a sequential replicated single-case randomized design. *Pain* 2020;161:520–31.
- 9 Darnall BD, Scheman J, Davin S, *et al.* Pain Psychology: A Global Needs Assessment and National Call to Action. *Pain Med* 2016;17:250–63.
  - 10 Locher C, Wörner A, Carlander M, *et al.* Chronic pain concepts of pediatricians: a qualitative survey. *Pain Rep* 2023;8:e1060.
  - 11 Hess CW, Rosen MA, Simons LE. Looking inward to improve pediatric chronic pain outcomes: a call for team science research. *Pain* 2023;164:690–7.
  - 12 Niederberger M, Spranger J. Delphi Technique in Health Sciences: A Map. *Front Public Health* 2020;8:1–10.
  - 13 Taylor E. We Agree, Don't We? The Delphi Method for Health Environments Research. *HERD* 2020;13:11–23.
  - 14 Leake HB, Heathcote LC, Simons LE, *et al.* Talking to Teens about Pain: A Modified Delphi Study of Adolescent Pain Science Education. *Can J Pain* 2019;3:200–8.
  - 15 Hennink M, Kaiser BN. Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Soc Sci Med* 2022;292:114523.
  - 16 Pincus T, Noel M, Jordan A, *et al.* Perceived diagnostic uncertainty in pediatric chronic pain. *Pain* 2018;159:1198–201.
  - 17 Williamson LD, Bigman CA. A systematic review of medical mistrust measures. *Pat Educ Couns* 2018;101:1786–94.
  - 18 Simons LE, Kaczynski KJ. The Fear Avoidance model of chronic pain: examination for pediatric application. *J Pain* 2012;13:827–35.
  - 19 Harrison LE, Pate JW, Richardson PA, *et al.* Best-Evidence for the Rehabilitation of Chronic Pain Part 1: Pediatric Pain. *J Clin Med* 2019;8:1–19.
  - 20 Evans SC, Roberts MC, Keeley JW, *et al.* Vignette methodologies for studying clinicians' decision-making: Validity, utility, and application in ICD-11 field studies. *Int J Clin Health Psychol* 2015;15:160–70.
  - 21 Boulkedid R, Abdoul H, Loustau M, *et al.* Using and reporting the Delphi method for selecting healthcare quality indicators: a systematic review. *PLoS One* 2011;6:e20476.
  - 22 Courtenay M, Deslandes R, Harries-Huntley G, *et al.* Classic e-Delphi survey to provide national consensus and establish priorities with regards to the factors that promote the implementation and continued development of non-medical prescribing within health services in Wales. *BMJ Open* 2018;8:e024161.
  - 23 Keeney S, Hasson F, McKenna H. Consulting the oracle: ten lessons from using the Delphi technique in nursing research. *J Adv Nurs* 2006;53:205–12.
  - 24 Djurtoft C, Bruun MK, Riel H, *et al.* How do we explain painful chronic non-traumatic knee conditions to children and adolescents? a multiple-method study to develop credible explanations. *medRxiv* [Preprint] 2022.
  - 25 Boerner KE, Dhariwal AK, Chapman A, *et al.* When feelings hurt: Learning how to talk with families about the role of emotions in physical symptoms. *Paediatr Child Health* 2023;28:3–7.
  - 26 Bower P, Gilbody S. Stepped care in psychological therapies: access, effectiveness and efficiency. Narrative literature review. *Br J Psychiatry* 2005;186:11–7.
  - 27 Birnie KA, Pavlova M, Neville A, *et al.* Rapid Evidence and Gap Map of virtual care solutions across a stepped care continuum for youth with chronic pain and their families in response to the COVID-19 pandemic. *Pain* 2021;162:2658–68.
  - 28 Coakley R, Wihak T, Kossowsky J, *et al.* The Comfort Ability Pain Management Workshop: A Preliminary, Nonrandomized Investigation of a Brief, Cognitive, Biobehavioral, and Parent Training Intervention for Pediatric Chronic Pain. *J Pediatr Psychol* 2018;43:252–65.
  - 29 Darnall BD, Roy A, Chen AL, *et al.* Comparison of a Single-Session Pain Management Skills Intervention With a Single-Session Health Education Intervention and 8 Sessions of Cognitive Behavioral Therapy in Adults With Chronic Low Back Pain: A Randomized Clinical Trial. *JAMA Netw Open* 2021;4:e2113401.
  - 30 Darnall BD. Psychological Treatment for Chronic Pain: Improving Access and Integration. *Psychol Sci Public Interest* 2021;22:45–51.
  - 31 Murillo C, Vo T-T, Vansteelandt S, *et al.* How do psychologically based interventions for chronic musculoskeletal pain work? A systematic review and meta-analysis of specific moderators and mediators of treatment. *Clin Psychol Rev* 2022;94:102160.
  - 32 Murray CB, de la Vega R, Loren DM, *et al.* Moderators of Internet-Delivered Cognitive-Behavioral Therapy for Adolescents With Chronic Pain: Who Benefits From Treatment at Long-Term Follow-Up? *J Pain* 2020;21:603–15.
  - 33 Simons LE, Sieberg CB, Conroy C, *et al.* Children With Chronic Pain: Response Trajectories After Intensive Pain Rehabilitation Treatment. *J Pain* 2018;19:207–18.
  - 34 Working group of the Health Standards Organization. Pediatric pain management, CAN/HSO13200:2023(E). Natl Stand Canada; 2023. Available: [www.healthstandards.org](http://www.healthstandards.org)
  - 35 MacKenzie NE, Tutelman PR, Chambers CT, *et al.* Can sharing improve caring? A call to prioritize shared decision making in pediatric pain management. *Clin Pract Pediatr Psychol* 2023;11:253–61.
  - 36 Guite JW, Logan DE, Simons LE, *et al.* Readiness to change in pediatric chronic pain: initial validation of adolescent and parent versions of the Pain Stages of Change Questionnaire. *Pain* 2011;152:2301–11.
  - 37 Simons LE, Smith A, Ibagón C, *et al.* Pediatric Pain Screening Tool: rapid identification of risk in youth with pain complaints. *Pain* 2015;156:1511–8.
  - 38 Smith AM, Logan DE. Promoting readiness and engagement in pain rehabilitation for youth and families: Developing a pediatric telehealth motivational interviewing protocol. *Paediatr Neonatal Pain* 2022;4:125–35.
  - 39 Pittig A, Kotter R, Hoyer J. The Struggle of Behavioral Therapists With Exposure: Self-Reported Practicability, Negative Beliefs, and Therapist Distress About Exposure-Based Interventions. *Behav Ther* 2019;50:353–66.
  - 40 Neville A, Noel M, Clinch J, *et al.* "Drawing a line in the sand": Physician diagnostic uncertainty in paediatric chronic pain. *Eur J Pain* 2021;25:430–41.