A National Cross-Sectional Survey to Assess the Education and Training Needs of Allied Health Professionals and Clinical Psychologists Delivering Rehabilitation for Children and Young People Affected by COVID-19 in the United Kingdom

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Abstract

Purpose: In the paediatric population there are two conditions associated with COVID-19 infection: Paediatric Multisystem Inflammatory Syndrome (PIMS-TS) and Paediatric Long-COVID. The emerging clinical picture of children and young people (CYP) affected by COVID-19 has highlighted the vital role Allied Health Professionals (AHP’s) and clinical psychologists have in supporting rehabilitation. Therefore, it is imperative that AHP’s and Psychologists working across all clinical sectors have the knowledge, experience and training to meet the rehabilitation needs of CYP who have been affected by COVID-19. The aim of this cross-sectional survey was to explore AHPs and psychologists’ views on CYP rehabilitation needs and education needs for AHP’s to support CYP rehabilitation to be delivered effectively. Methods: A 20 item online cross-sectional questionnaire was implemented providing a convenience sample of AHP’s and Psychologists who worked with a paediatric population in the United Kingdom. Results: 85 healthcare professionals responded, of which 52 (61%) had direct experience working with CYP affected by PIMS-TS or Long-COVID. We present a model of education and training that addresses gaps in the knowledge and skills of AHP’s and psychologists treating CYP affected by COVID-19 as part of a multidisciplinary rehabilitation approach outlining principles for a model of rehabilitation. Conclusions: AHP’s and psychologists’ management of PIMS-TS and Long-COVID had commonalities with other clinical presentations and therefore transferable knowledge and skills. Multidisciplinary network of professionals who work across this field should combine expertise and come together as a community to share good practice, knowledge and contribute to emerging evidence views. Healthcare professionals should be mindful that effects of COVID-19 may exacerbate existing health inequalities, further impacting school attendance and family relationships.

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Special Interests: Cardiology and Cardiac Intensive Care

Acknowledgements

We would like to thank all the health professionals who completed the survey making this cross-sectional survey possible, providing a platform for future research in this novel and complex area

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A National Cross-Sectional Survey to Assess the Education and Training Needs of Allied Health Professionals and Clinical Psychologists Delivering Rehabilitation for Children and Young People Affected by COVID-19 in the United Kingdom

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ABSTRACT

Purpose: In the paediatric population there are two conditions associated with COVID-19 infection: Paediatric Multisystem Inflammatory Syndrome (PIMS-TS) and Paediatric Long-COVID. The emerging clinical picture of children and young people (CYP) affected by COVID-19 has highlighted the vital role Allied Health Professionals (AHP’s) and clinical psychologists have in supporting rehabilitation. Therefore, it is imperative that AHP’s and Psychologists working across all clinical sectors have the knowledge, experience, and training to meet the rehabilitation needs of CYP who have been affected by COVID-19. The aim of this cross-sectional survey was to explore AHPs and psychologists’ views on CYP rehabilitation needs and education needs for AHP’s to support CYP rehabilitation to be delivered effectively. Methods: A 20 item online cross-sectional questionnaire was implemented providing a convenience sample of AHP’s and Psychologists who worked with a paediatric population in the United Kingdom. Results: 85 healthcare professionals responded, of which 52 (61%) had direct experience working with CYP affected by PIMS-TS or Long-COVID. We present a model of education and training that addresses gaps in the knowledge and skills of AHP’s and psychologists treating CYP affected by COVID-19 as part of a multidisciplinary rehabilitation approach outlining principles for a model of rehabilitation. Conclusions: AHP’s and psychologists’ management of PIMS-TS and Long-COVID had commonalities with other clinical presentations and therefore transferable knowledge and skills. Multidisciplinary network of professionals who work across this field should combine expertise and come together as a community to share good practice, knowledge and contribute to emerging evidence views. Healthcare professionals should be mindful that effects of COVID-19 may exacerbate existing health inequalities, further impacting school attendance and family relationships.

Keywords: COVID-19; children and young people; long COVID; paediatric multisystem inflammatory syndrome; PIMS-TS; allied health professionals; educational needs; rehabilitation
BACKGROUND
An outbreak of the coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) spread rapidly around the world.\(^1\) For most children and young people (CYP), COVID-19 infection causes mild respiratory illness with low rates of hospital admission and low risk of mortality.\(^2\) Although a higher proportion of CYP recover without sequelae compared to adults, there remains a minority of children who are affected and some for whom daily life is significantly impacted.\(^3\) There are two main conditions in the paediatric population associated with COVID-19 infection: Paediatric Multisystem Inflammatory Syndrome (PIMS-TS) and Long-COVID (also referred to as post-covid syndrome).

PIMS-TS is a novel inflammatory condition in CYP and was first identified in April 2020.\(^2\) PIMS-TS has been defined as a persistent fever, inflammation and evidence of single or multi-organ dysfunction in CYP, with exclusion of any other microbial of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a strain of coronavirus that causes COVID-19 and has an incidence of 0.5%.\(^1\) Affected CYP may require hospitalisation and paediatric intensive care.\(^4\) There is emerging research into the clinical features, cause, treatment, and management of CYP with a PIMS-TS diagnosis.\(^5\)\(^6\)

Long-COVID is a novel condition defined by signs and symptoms that develop during or after an infection consistent with COVID-19 and continues for more than 12 weeks and symptoms cannot be explained by an alternative diagnosis.\(^7\) It usually presents with clusters of symptoms, often overlapping, which can fluctuate and change over time and can affect any system in the body. However, Long-COVID may be considered before 12 weeks while the possibility of an alternative underlying disease is also being assessed.\(^8\) Whilst prevalence of the condition has increased it remains a novel syndrome and long-term prevalence remains unknown.\(^9\)

Reports from the United Kingdom’s Office for National Statistics\(^4\) showed varying results on the prevalence of Long-COVID condition in adults and children with confirmed SARS-CoV-2 infection. The presentation of children with Long-COVID include fatigue, headaches, anxiety, brain fog, and shortness of breath. Half of CYP presenting had a pre-existing medical and mental health condition, and it remains difficult to separate the effects from COVID-19 and the pandemic more broadly. A survey by Buonsenso et al (2021) found that 42% of paediatric patients experienced at least one persistent symptom more than 60 days from initial infection despite only 5% of the patients having been hospitalized. Additionally, the survey reported that 10% of infected children aged 2–12 years and 13% of those aged 12–16 years had long-lasting symptoms at least 5 weeks after infection.\(^10\)

While the understanding and the experience regarding the acute phase of COVID-19 infection has increased remarkably over the course of the pandemic, scientific and clinical research is still exploring the long-term effects of the illness.\(^11\) Research remains sparse and the evidence base limited due to the small sample size study designs, settings, populations, follow-up time, and symptom ascertainment methods and risk of bias in the current studies (retrospective design with risk of selection bias, largely self-reported outcomes so increased risk of recall bias).\(^12\) Additionally, a deeper understanding of Long-COVID is being presented by highly heterogeneous studies that used inconsistent terminology describing symptoms and limited details and stratification on pre-existing comorbidities.\(^13\) It is unknown whether the groups with a greater risk for acute severity and mortality from COVID-19 because of metabolic conditions, socioeconomic circumstances, or race/ethnicity are also at greater risk of long COVID.\(^14\) In a population based, longitudinal cohort study in adults, up to 18% of individuals who were not vaccinated before infection had Long-COVID condition up to two years after infection, with evidence of excess symptom risk compared with controls. Effective interventions are needed to reduce the burden of Long-COVID condition.\(^15\)

Allied health professionals (AHP’s) and clinical psychologists provide direct patient care for a range of diagnostic, technical, therapeutic services that are critical to other healthcare professionals. The input AHP’s and psychologists provide is considered vital to the delivery of effective clinical care throughout the entire patient pathway.\(^16\) Given the novel nature of this condition, and an emerging clinical picture of children affected by COVID in addition to the vital role AHP’s take in supporting these CYP, it is imperative that AHP’s and psychologists working across clinical sectors have the knowledge, experience, and training to meet the rehabilitation needs of this population. Therefore, the aim of this cross-sectional survey was to explore AHP’s and psychologists’ views regarding the rehabilitation needs of CYP, to understand their education and training needs to support CYP rehabilitation needs effectively and confidently, and their views regarding the key components and principles of a model of rehabilitation.

METHODS
Design and Setting
An online cross-sectional questionnaire design was implemented providing a convenience sample of AHPs and clinical psychologists who work with CYP in the United Kingdom. The survey was disseminated using email via the north and south Thames paediatric networks and national profession specific networks. These profession specific networks included Royal College Occupational Therapists, Chartered Society of Physiotherapy, Royal College of Speech and Language Therapists, British Dietetic Association, and Chartered psychologists. The email invited participants to complete the online survey using a
link or QR scan code. The survey link was open for six months. Participation required disclosure of professional group and the healthcare sector but no other identifying details were required. This survey for healthcare professionals was approved and registered as a national service evaluation by anonymous NHS Trust Review Boards (Reference Number: GOSH-2022:3234).

Participants
All participants were self-identified AHPs and clinical psychologists who worked across tertiary, secondary, and primary care settings and who worked directly and indirectly with CYP affected by COVID - either PIMS-TS or Long-COVID. Participation was voluntary and all participants were at least 18 years of age.

Survey Questionnaire:
The questions were developed by an expert panel consisting of AHPs and clinical psychologists who specialised in working with CYP affected by COVID-19 based across two tertiary hospitals. A pilot phase was undertaken with healthcare professionals (n=11) to ensure that the survey was clearly written and understandable. Respondents in the pilot were asked to record the time it took to complete the survey, which was 5 mins.

The 20-item survey was designed to elicit the views and opinions of AHP’s and clinical psychologists relative to

- **Healthcare role and clinical setting:** Respondents were asked their job role and to identify the care sector they practice in. Professional contact with CYP affected by COVID-19. Respondents were asked if they work with CYP affected by Covid and if so, which population they worked with (Long-COVID, PIMS-TS or both).

- **Rehabilitation needs:** Respondents were asked to identify the main rehabilitation needs of the CYP they worked with. They were asked to provide a view as to whether the rehabilitation needs of these CYP have changed during the pandemic. Respondents were then asked if they consider the rehabilitation needs to be similar to other paediatric groups. There was an option for respondents to provide details of groups they considered have similar rehabilitation needs.

- **Confidence:** The respondents were asked to rate their confidence in supporting the rehabilitation of CYP affected by COVID-19. This was scored from 0 to 10, with 10 being very confident and 0 as no confidence.

- **Knowledge, skills, and experience:** Respondents were asked to provide reasons for their confidence rating specifically asking respondents to identify training, education and experience which contributed to the rating and to identify gaps in their knowledge, skills and experience.

- **Learning needs:** Respondents were asked to detail any hopes and wishes in terms of learning and training needs, which would support working with CYP affected by COVID-19.

- **Views regarding clinical setting:** Respondents were asked to provide their view in terms of the clinical setting in which they considered the rehabilitation needs of CYP would be most appropriately met.

- **Views regarding key components and principles of rehabilitation model:** Respondents were asked to provide a view of the key components and principles which should underpin a model of rehabilitation for this population.

- **CYP feedback:** Respondents were asked to detail any feedback from CYP who they have worked with in relation to their rehabilitation needs and/or how these needs were met by AHP/Psychologists supporting them.

RESULTS
A total of 85 healthcare professionals completed the survey, with 52 (61%) of the respondents had direct experience working with CYP affected by COVID-19 (Long-COVID or PIMS-TS). The respondents who reported no direct experience working with CYP affected by COVID-19 was 33 (39%) and therefore excluded from the data set. A response rate could not be calculated for the survey due to the method of dissemination. Respondents from all AHP groups working with children affected by COVID-19 (as shown in Table 1). Most respondents were physiotherapists (n=26, 50%) followed by clinical psychologists (n=12, 23%).

Of the total respondents, 33% (n=28) worked in a tertiary setting. However, there was representation across all settings except for voluntary services (Table 2). Most respondents worked with CYP affected by Long-covid (n=32, 62%), followed by 23% (n=12) who worked with PIMS-TS and 8% (n=15) worked with both cohorts (Table 3).
Table 1. Overall numbers of responders and their professional group (n=52)

<table>
<thead>
<tr>
<th>Professional</th>
<th>Number (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Psychologist</td>
<td>14</td>
<td>27</td>
</tr>
<tr>
<td>Physiotherapist</td>
<td>26</td>
<td>50</td>
</tr>
<tr>
<td>Occupational Therapist</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Speech and Language Therapist</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Dietitian</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2. Overall respondents based on care sector, primary, secondary or tertiary

<table>
<thead>
<tr>
<th>Care Sector/setting</th>
<th>Number (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Secondary</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Tertiary</td>
<td>28</td>
<td>54</td>
</tr>
<tr>
<td>Community</td>
<td>12</td>
<td>23</td>
</tr>
<tr>
<td>Voluntary</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 3. Percentage of responders working with Long-COVID, Paediatric Multisystem Inflammatory Syndrome (PIMS-TS), or both

<table>
<thead>
<tr>
<th></th>
<th>Number (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-COVID</td>
<td>32</td>
<td>62</td>
</tr>
<tr>
<td>PIM-TS</td>
<td>12</td>
<td>23</td>
</tr>
<tr>
<td>Long-COVID and PIM-TS</td>
<td>8</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 4. Views of allied health professionals’ and psychologists’ regarding rehabilitation needs for children and young people with Paediatric Multisystem Inflammatory Syndrome (PIMS-TS) and Long-COVID

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Rehabilitation Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIMS-TS</td>
<td>Muscle weakness, Fatigue, Low and/or unbalanced activity levels, Anxiety and low mood,</td>
</tr>
<tr>
<td></td>
<td>Trauma symptoms, Feeding difficulties including abdominal pain, Voice control difficulties,</td>
</tr>
<tr>
<td></td>
<td>Cognitive difficulties: memory problems, planning and organisation, Dysphagia (swallow impairment),</td>
</tr>
<tr>
<td></td>
<td>Dysphonia (voice dysfunction)</td>
</tr>
<tr>
<td>Long-COVID</td>
<td>Mobility difficulties, Muscle loss and weakness, Fatigue, Low and/or unbalanced activity levels,</td>
</tr>
<tr>
<td></td>
<td>Pain, Breathing pattern disorder/ breathlessness, Fatigue and malaise, Anxiety and Low mood,</td>
</tr>
<tr>
<td></td>
<td>Strained family system, Difficulties adjusting to the health needs – individual and family</td>
</tr>
</tbody>
</table>

PIMS-TS: Confidence to Rehabilitate Based on Intervention Needs
The mean confidence rating of healthcare professionals treating CYP with PIMS-TS was 7 (2SD). Healthcare professionals who rated lower confidence was related to low number of referrals and therefore limited exposure to COVID-19. Confidence was connected to experience of working within an MDT treatment approach, and prior experience of working with PIMS-TS: Biopsychosocial model of care with CYP with similar needs, and experience of working with CYP with similar rehab needs. Of note, psychologists found it advantageous if they had previous experience with post-traumatic stress disorder, had experience of working in intensive care and acute care, knowledge of infectious diseases and experience of working in infectious disease.
specialist MDT. Speech and Language therapist’s reported confidence to treat PIMS-TS due to experience of managing dysphagia in children.

**Long-COVID: Confidence to Rehabilitate Based on Intervention Needs**

The mean confidence rating of healthcare professionals treating CYP with Long-COVID was 5 (2SD). The survey identified that physiotherapist and psychologist were the professionals predominantly utilised in the management of Long-COVID rehabilitation. Confidence was predominately connected to clinician’s prior experience and training working with children with similar rehabilitation needs. Experience in working with children with chronic fatigue, chronic pain and long-term conditions were cited as linked with greater confidence. Other factors connected to confidence rating were availability and accessibility of resources, information, and guidance regarding long covid, consultation and advice from others including the MDT and peers and learning from children and families with lived experience.

**Table 5: Gaps in current knowledge and training and proposed solutions**

<table>
<thead>
<tr>
<th>Gaps Identified in Healthcare Professionals’ Experience</th>
<th>Proposed Strategies and Solutions to Address Gaps</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PIMS-TS</strong></td>
<td><strong>Interprofessional collaboration:</strong> Liaison and consultation within professional group to share knowledge and experience. This was highlighted as important when professionals are treating low numbers of CYP with PIMS-TS.</td>
</tr>
<tr>
<td>Knowledge: Prognosis and rehabilitation need</td>
<td>MDT working: Importance of AHP’s and psychologists working closely with MDT to support a holistic understanding of the CYP presentation, to help inform the intervention and to offer and receive advice and support from each other.</td>
</tr>
<tr>
<td>Trauma knowledge and management</td>
<td>Knowledge, education, and training: Information regarding diagnosis of PIMS-TS, rehabilitation needs and trajectory of symptoms.</td>
</tr>
<tr>
<td>Fatigue knowledge and management</td>
<td>Access to specific training to support skill development for example, fatigue management; psychological impact of diagnosis; trauma focussed work; using a biopsychosocial model of care; impact of diagnosis on language and cognition; and skills in cultural competence to ensure rehabilitation support is accessible</td>
</tr>
<tr>
<td>Knowledge and experience supporting CYP with cognitive impairment following COVID infection.</td>
<td>Knowledge and guidance from cohorts with similar needs: Transfer of knowledge cystic fibrosis, cerebral palsy, and chronic fatigue syndrome, and persistent physical symptoms.</td>
</tr>
<tr>
<td>Experience: Limited experience/research regarding helpfulness of delivering virtual interventions</td>
<td>Experience: Working with paediatric cohort Working with family/systems</td>
</tr>
<tr>
<td>Assessing language impact of such impairment.</td>
<td>Specific Long-Covid Information: Knowledge and understanding regarding the pathophysiology of COVID and long-term management needs</td>
</tr>
<tr>
<td><strong>Long-COVID</strong></td>
<td><strong>Knowledge and guidance from cohorts with similar needs:</strong> Transfer of knowledge cystic fibrosis, cerebral palsy, and chronic fatigue syndrome, and persistent physical symptoms.</td>
</tr>
<tr>
<td>Knowledge: Information regarding pathophysiology of Long-COVID</td>
<td>Experience: Working with paediatric cohort Working with family/systems</td>
</tr>
<tr>
<td>Ensuring interventions that is culturally sensitive Information regarding breathing dysfunction Biopsychosocial model of care and how this is applied to post covid</td>
<td><strong>Specific Long-Covid Information:</strong> Knowledge and understanding regarding the pathophysiology of COVID and long-term management needs</td>
</tr>
<tr>
<td><strong>Limited guidance:</strong> Long term management Managing fatigue Working with wider family and family centred approach</td>
<td>Resources for child’s network of care: Limited resources for schools and parents/carers regarding how they can support children</td>
</tr>
</tbody>
</table>
Table 6. Key components for model of rehabilitation divided into Paediatric Multisystem Inflammatory Syndrome (PIMS-TS) and Long-COVID

<table>
<thead>
<tr>
<th>Model of Rehabilitation</th>
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</thead>
<tbody>
<tr>
<td><strong>PIMS-TS</strong></td>
</tr>
</tbody>
</table>
| **Timely Input:** Support from initial onset of disease. Physiotherapy input needed intensively initially (2-3 times a week).  
**Collaboration across sectors of care:** MDT model of care with joined up tertiary to community support. Including joined up working with CYP network of care. Rehabilitation integrated with family and education to ensure learning is supported and optimised.  
**Child-centred care:** Ensuring choice regarding virtual or face to face support; child centred goals/rehabilitation. Group intervention to be categorised by age  
**Access to knowledge training and resources:** linked with the wider MDT to understand diagnosis progression, advice and support from colleagues and access to training and education resources. This was deemed particularly importance if treating low numbers |
| **Long-COVID**           |
| **Collaboration across sectors of care:** Majority view of joint tertiary and community approach. Tertiary centres working alongside community colleagues to bolster knowledge and confidence. Hub and spoke model. Acknowledge and consider transfer from adult cohort  
**Need for this to be joined up with good communication between all clinical settings. Input locally to minimise disruption to school. For centres seeing larger numbers of CYP to liaise and support the smaller community centres in terms of guidance/advice.  
**MDT approach:** CYP and family centred approach with an emphasis on a biopsychosocial model of care which validates the body and mind impact of COVID.  
**Liaison with local services/partners:** Assigned keyworkers for liaison with school/education.  
**Training** to be culturally sensitive and delivered on-line and in webinar format. A platform for professionals to share good practice, resources and experience which are regularly updated |
| **Overarching Principles:**  
**Cross cutting themes for both PIMS-TS and Long-COVID**  
Engaging with CYP and family system intervention, emphasis on validation of their experiences.  
Communication style to determine what is most important for CYP - formulation driven model.  
Consideration of mental and physical health connection. Monitor and review appropriately depending on the clinical need or resources available.  
Care coordination of interventions across all settings to prevent fragmentation of care. Silo/ isolated interventions limiting effectiveness  
Resources: funding for staffing; funding to attend education/training events; community/ outreach resources so can visit home / school to plan returns to school |

Other Comments Relating to Community Rehabilitation

Most responses reported that community AHP’s and clinical psychologists would have appropriate skills to support CYP with Long-COVID. When discharged, a community team would be able to continue the work (but if there were delays to community teams picking this up this was highlighted as having a negative impact on rehabilitation needs). Community teams would need a thorough handover, with access to education resources to develop their knowledge particularly when these CYP will form a very small number. Concerns that the psychological needs of CYP would breach an already stretched caseload within community mental health services. Furthermore, concerns that waiting lists will be too long and therefore miss timely intervention windows to support rehabilitation. Long waiting lists and/or less intervention would have a negative impact on treatment trajectory.

DISCUSSION

This cross-sectional survey explored the training and education needs of AHPs and psychologists working with CYPs affected by COVID. It highlights that those working across primary, secondary, and tertiary services have developed clear ideas about both the rehabilitation needs and intervention requirements of this population. In addition, the survey highlights several similarities between long covid and PIMS-TS whilst also delineating the different rehabilitation needs for these two groups.
Confidence to deliver interventions despite a lack of long-standing evidence was helped by practice-based experience of working with CYPs presenting with similar issues. Transferrable core skills and prior training and experience for both AHPs and Psychologists proved vital in helping to navigate an emerging disease course. AHPs and Psychologists shared the importance of working with peers and MDT colleagues, utilising a multidisciplinary rehabilitation approach, accessing resources and guidance where it existed and utilising opportunities for clinicians to come together to discuss clinical work and cases.

Importantly, the survey highlighted gaps in knowledge, skills, and resources for AHPs and Psychologists working in this field and from this, it is possible to present a model of education and training that addresses these gaps. Training and resource development will be important to ensure high-quality and timely care for CYP living with the long-term effects of COVID.

One of the concerns emerging from this survey and in the development of training and or resource development is the risk of exacerbating existing health inequalities. It is imperative that this is considered when discussing the outcomes of the survey. Prolonged home isolation may lead to long-term negative consequences for both CYP and caregivers’ psychological well-being, especially in families with children with additional needs such as neurodevelopmental disorders.

In addition, the awareness of Long-COVID in CYP remains limited and the referral routes into services are inconsistent depending on geographical area. For example, worse achievement or absenteeism at school is sometimes erroneously attributed to other causes, leading to an under-referral of cases to dedicated long COVID clinics or multidisciplinary rehabilitation services.\(^\text{12}\) It is therefore not possible to tease apart the effects of health inequalities and the impact of intersectionality on the data set collected. It is likely that CYP being seen in other physical and mental health services may well be affected by the sequelae of COVID-19 and therefore the true extent of the impact of long covid on CYP is not clear and as such the range of presentations may differ from those observed in the current population accessing care. It is imperative for all healthcare professionals to be aware of the impact of COVID and how to refer to specialist services as needed or to treat if appropriate.

Evidence of long-term impact on school absenteeism, school performance, social activities, and parental job loss or days off work should be assessed; investigation of COVID-19-related burden on health care and society is also required. Core outcome sets are required for optimal decision-making for a harmonized set of assessments of essential outcomes in clinical research and clinical practice. Vulnerable groups of CYP must be recognised and heard and targeted actions must focus on improving their health outcomes during the pandemic and beyond. This pandemic offers a unique opportunity for us as a health system to reshape this narrative and reset our approaches to ensure our strategies for recovery address inequity as we build our way back to full-service offerings.\(^\text{17}\)

What remains clear, however, is the need for multidisciplinary service delivery to manage young people with Long-COVID and supports recommendations for service delivery outlined elsewhere. Stephenson et al (2022) highlight that there is a close relationship between mental and physical health in the context of recovery from COVID and that it is not possible to separate these different aspects of a child’s well-being.\(^\text{6}\) An integrated approach (multi-component and multi-professional intervention) to treating the physical and mental health of CYP – both with Long COVID and those who had PIMS TS is essential.

**Limitations**

There are a few limitations of the research and this survey. Accurately determining the risk of long-COVID is challenging due to existing studies in CYP having considerable limitations distinguishing Long-COVID associated symptoms. A significant limitation of this survey is its sample size. However, the range of healthcare professionals from different professions and clinical settings is a positive aspect. In addition, the use of self-report surveys is limited by respondent bias. Evidence base practice for CYP remains uncertain due to previous studies’ small sample size and risk of bias of studies (retrospective design with risk of selection bias, largely self-reported outcomes so increased risk of recall bias).\(^\text{12}\) The long-term effects of COVID-19, in both hospitalised and non-hospitalised individuals, including children and at-risk populations, should be a priority for future research using standardised and controlled study designs. Robust research is needed to characterise and define Long-COVID and identify risk factors and underlying aetiology, to inform prevention, rehabilitation, clinical and public health management to improve recovery and long-term COVID-19 outcomes.\(^\text{13}\) In addition, there is no consensus core outcome sets in either clinical or research settings. Without developing these there is a risk of overlooking domains important to patients and their caregivers and there will be missed opportunities for comparability and effective synthesis of results.

**CONCLUSIONS**

This survey highlights the education and training needs of AHP’s and clinical psychologists working with CYPs affected by COVID. It identifies the core skills and knowledge that professionals are utilising to meet the rehabilitation needs of this population and outlines the gaps in current education materials. In addition, there is a request for a multidisciplinary network of professionals who work across this field to come together as a community to share good practices, develop specific outcome...
measures, and share emerging evidence. Healthcare professionals should be mindful that effects of COVID-19 may exacerbate existing health inequalities, further impacting school attendance and family relationships.

Competing Interests
The authors declare that they have no competing interests be it personal, professional, and/or financial that might have influenced the presentation of the study described in this manuscript.

REFERENCES

4. Torjesen I. Covid-19: Omicron variant is linked to a steep rise in hospital admissions of very young children. BMJ. 2022;376:o11010.1136/bmj.o110