

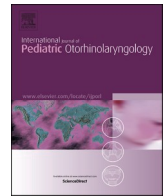
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Children with a tracheostomy: Global speech-language therapists' practice

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ABSTRACT

Purpose: Speech-language Therapists (SLTs) are specialists in communication, feeding and swallowing as core members of the paediatric tracheostomy multidisciplinary team (MDT). Inconsistent tracheostomy care leads to staff and family frustration and delayed intervention. Little is known about international SLT tracheostomy practices.

Methods: This global survey explored training, clinical practices, perceived knowledge, skills and roles, and barriers for SLTs working with paediatric tracheostomy. Survey questions consisted of Likert scale and open-ended questions. 92 SLTs completed the survey representing 6 continents and 19 countries.

Results: Overall SLTs were confident in their knowledge of communication, and feeding but less confident in weaning, tracheostomy care skills (such as suctioning and cuff deflation) and specialist tracheostomy tube use (such as tracheostomy tubes with a subglottic suction port). Formal competency training was infrequent but most had access to supervision. Understanding of the SLT role by the MDT was perceived as good. Many felt managing one-way speaking valves was part of their role. The majority reported staffing, lack of guidelines and access to resources (one-way speaking valves and flexible endoscopic evaluation of swallowing) as barriers.

Conclusions: This expert opinion paper summarises the current evidence-base and international paediatric tracheostomy practice. SLTs were experienced and confident in tracheostomy. The SLT role varies internationally with a lack of formal written policy to guide practice and a variability in access to education.

1. Introduction

The role of speech-language therapists/pathologists (SLTs) in tracheostomy care encompasses the assessment and management of feeding, swallowing, and communication both from a development and impairment perspective. SLTs contribute to the multidisciplinary team (MDT) approach, with their essential involvement well recognised within international guidelines [1,2] and the otorhinolaryngology (ORL) literature [3]. Tracheostomy competency frameworks have been developed by some institutions to outline the specialised knowledge required for working with children with tracheostomies [2,4].

Paediatric tracheostomies (infants and children) are increasingly

performed for a variety of reasons including long-term ventilation, craniofacial and laryngeal anomalies, or upper airway obstruction [5]. These infants and children often present with multiple co-occurring conditions, including prematurity, genetic and neurological abnormalities. Compromised respiratory status may be an underlying cause or a contributing factor in the need for the tracheostomy and/or any co-existing feeding difficulties [6]. Early compromise of the upper airway, combined with these underlying conditions, can lead to significant developmental feeding delays, particularly in the establishment of sucking feeds [7]. There is a limited evidence base in paediatrics as to the impact of a tracheostomy on swallowing biomechanics and aspiration risk. The paediatric literature reflects the wider adult literature

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suggesting that the underlying or coexisting condition is the primary cause of a swallow problem. Yet, it is acknowledged that tracheostomy tubes may also be a contributing factor [2]. These impairments frequently necessitate prolonged support with gastric feeds and disrupt the development of mature feeding patterns [8]. As the infant anatomy and swallowing physiology changes over time, the impact of a tracheostomy placement at different developmental ages and stages of feeding development can be variable.

Moreover, the tracheostomy and underlying aetiologies may contribute to delayed and/or disordered communication development, compounded by the absence of trans laryngeal and upper airway airflow, and therefore vocalisation [9]. The SLT's core knowledge of early speech and language development and the potential effect of a tracheostomy placed early in the life of infants, is essential to mitigate the loss of voice to developing speech and language. In addition, the SLT's understanding of potential one-way speaking valve use and other augmentative alternative communication (AAC) devices is vital [10].

Whilst SLTs are acknowledged as integral members of the hospital-based MDT, the composition and expertise of community teams varies widely, potentially leading to differing levels of care. Importantly, families of children with tracheostomies bear a significant burden of responsibility in the hospital, educational settings and especially at home. Lee et al. (2024) reported that many parents feel overwhelmed by the care required for their child, with 50 % expressing regret about opting for the tracheostomy in hindsight [11]. Parents particularly highlighted the lack of adequate resources to support them in home care and education settings.

Liao and colleagues (2021) discussed that in general infants and children with a tracheostomy, disproportionately account for increased hospital length of stay, costs, complications and readmissions, with community disadvantaged families having an increased cost compared with advantaged families [12]. Overall, families with a child with a tracheostomy are reported to have a decreased quality of life compared with those with children who do not have a tracheostomy. With long hospital stays and complex underlying co-occurring conditions [6,13], a well organised MDT with up to date knowledge and skills is essential, with parents as integral members of this team. There is a need for more research to support evidence-based, consistent MDT intervention and guidance to provide best outcomes.

1.1. Aim of this paper

The aim of this paper was to capture a comprehensive overview of current international SLT clinical practice when working with children with tracheostomies. By documenting what is currently happening across the globe, we hope to facilitate an international collaborative action plan to support SLTs to strive towards best care for children with tracheostomies worldwide. The paper summarises the current literature supporting SLTs working with children with tracheostomies and reports the results of a recent global survey exploring SLT training, clinical practices, perceived knowledge, skills and roles, as well as successes and barriers to change. The paper concludes with a list of suggested recommendations for the future.

2. Methods

The international survey data presented in this paper was approved by Auckland Health Research Ethics Committee (AH25285). The CROSS Checklist was used to guide study design and reporting [14].

2.1. Survey design

The survey was designed by two researchers with extensive tracheostomy experience. Contributions and pilot testing was provided by another six SLTs from a national tracheostomy SLT leadership group in New Zealand. Feedback was taken onboard prior to survey launch and

amendments made accordingly. The survey explored tracheostomy experience, training, clinical practices, perceived knowledge, skills, roles and responsibilities. The survey was created and distributed in Qualtrics XM. Questions included likert scale responses as well as open ended questions designed to capture opinions on improvements, barriers and ideas to promote positive change. SLTs were asked "Finally, give an example of something that has happened at your workplace that helped improve patient care", "What are the top barriers to best practice in your workplace?" and "If you could make one change in tracheostomy practices in your workplace, what would it be?" In order to gain a broad global response, the survey was developed in English and then translated into French, German, Spanish, Russian, Brazilian Portuguese, and Japanese. Surveys were translated using Qualtrics translation services and then edited by 1–2 native speakers who were SLTs with experience in tracheostomy.

2.2. Survey distribution

A staggered and sustained recruitment drive was conducted between August–December 2023. Contact was made with key Associations with known SLT membership, including all SLT Mutual Recognition Agreement signatory associations, and all 60 affiliated speech-language therapy societies of IALP, as well as APSSLH, HKSLTA, SASLHA and four recognised dysphagia societies; ESSD, DRS, JSDR, SLAD. The survey was also promoted via special interest groups, tracheostomy networks, authors' professional connections and social media channels, with a purposeful effort made to reach as many countries as possible. Inclusion criteria for completion was i) practising SLT and, ii) experience in managing patients with a tracheostomy.

2.3. Data analysis

Data was extracted into excel for analysis. Data was cleaned for errors and missing data and SLTs practising in adult tracheostomy management were separated for analysis and reported elsewhere (Miles et al., in review). In total, 1638 survey responses were logged in Qualtrics; 89 were removed as incomplete, 1261 respondents worked only with an adult tracheostomy caseload, 197 respondents reported working with a mixed adult and paediatric caseload but it was not possible to extract paediatric practices from these survey responses so they were all excluded. A total of 92 respondents were extracted for paediatric tracheostomy analysis. Demographic data and Likert data were tallied and tabulated. Qualitative open-ended responses were used alongside quantitative data to illustrate respondent perspectives.

3. Results

A total of 92 SLTs working solely in paediatrics completed the survey across 19 countries, in a range of settings including intensive care units, inpatient wards, rehabilitation wards, outpatient clinics and community settings (Table 1).

3.1. Training and competency development

Only 37 % of survey respondents reported completing tracheostomy competencies in their workplace despite 63 % having more than 5 years of experience working with children with tracheostomies. However, the majority (83 %) had access to skilled colleagues and to a skilled SLT (64 %) for supervision/support.

Respondents were more confident in communication and feeding knowledge and skills compared with tracheostomy weaning and tracheostomy tube practices such as cuff deflation/inflation, inner cannula changes and subglottic suction line use for secretions or vocalisation (Table 2). Respondents described "learning from critical incidents and complex cases" (UK) and "regular MDT training sessions" (Ireland) as facilitators of improvements in care. Respondents also reported

Table 1
Respondent demographics and experience in tracheostomy care n = 92.

Variable	Data	
Continent	Africa	4 (4 %) South Africa 3, Zambia 1
	Asia	30 (33 %) Japan 28, Malaysia 1, Singapore 1
	Australasia	25 (27 %) NZ 19, Australia 6
	Europe	23 (25 %) Austria 1, Deutschland 1, Greece 1, Ireland 3, Latvia 1, Sweden 1, UK 15
	North America	4 (4 %) Canada 2, US 2
	Central/South America	6 (7 %) Chile 3, Argentina 2, Columbia 1
	How many years of experience in speech-language therapy/pathology practice do you have?	under 2yrs 4 % 2–5yrs 8 % 5–10yrs 16 % 10yrs+ 72 %
	How many years of experience in working with patients with a tracheostomy do you have?	under 2yrs 22 % 2–5yrs 15 % 5–10yrs 27 % 10yrs+ 36 %

competency-based barriers to best practice including “limited training in VFSS (videofluoroscopic swallow study)” (Japan), “no training in FEES (flexible endoscopic evaluation of swallowing)” (UK) as well as lack of “access to supervision and training” (New Zealand) and “not enough patients” (Latvia).

3.2. Role recognition within the MDT

The vast majority of survey respondents felt their role was well understood by their MDT with only 3 % reporting ‘often’ being asked to perform a task outside of their role. The majority of respondents were in agreement regarding the SLT role in their workplace with regards to assessing swallowing (91 %), communication (97 %) and AAC (92 %). Most SLTs did *not* have a role in oral (69 %) or tracheal (76 %) suctioning, cuff inflation/deflation (76 %), cuff pressure monitoring (70 %), tracheostomy tube type recommendations (71 %) or use of a suction-aid above cuff port for secretion removal (76 %) (Table 3). Respondents were less aligned in their role in placing/removing a one-way speaking valve with 51 % saying ‘yes’, 46 % saying ‘no’ and 3 % saying ‘I don’t know’. Respondents described facilitators of MDT working including: “paediatric tracheostomy ward rounds are done weekly with all involved stakeholders - these are used for family training, routine tracheostomy changes and planning” (South Africa), “development of outpatient MDT dedicated to tracheostomy care” (Canada) and “monthly allied health and nursing MDT” (Australia).

3.3. Access to resources

Survey respondents did not have consistent access to written guidelines, policies and protocols with only 24 % having access to a one-way speaking valve protocol. Consistency and access to evidence-based resources was desired. “Standardised procedures for speaking valves and management - or at least guideline agreement” (UK), “a formal pathway for transfer from hospital to community” (UK), and “updated clinical guidelines and policies with the most up-to-date, best evidence” (Australia) were all sought after. Only 25 % had consistent access to one-way speaking valves and 41 % had access to AAC as needed. Twenty-two percent had no access to FEES and 17 % had no access to VFSS. However, time and staffing was the most frequent resource barrier: “more time on the wards - we have had a big increase in tracheostomies in the region” (UK), “caseload/workload pressures on the universal healthcare system, leading to less time and staff to provide best practice care” (UK),

Table 2
Perceived knowledge and skills.

Variable	Data	
Knowledge	I have access to supervision from a SLT colleague who is Tracheostomy Competent	No 63 % Yes 64 % No 36 %
	I have access to supervision from a medical or allied health colleague who is Tracheostomy Competent	Yes 83 % No 17 %
	I am confident that I have the knowledge to support tracheostomy weaning	not confident 31 % somewhat confident 41 % very confident 28 %
	I am confident that I have the knowledge to support communication	not confident 16 % somewhat confident 30 % very confident 55 %
	I am confident that I have the knowledge to support swallowing/feeding	not confident 16 % somewhat confident 30 % very confident 54 %
	I am confident that I have the skills to advise the multidisciplinary team in tracheostomy weaning.	not confident 19 % somewhat confident 39 % very confident 42 %
	I am confident that I have the skills to manage communication in patients with a tracheostomy	not confident 19 % somewhat confident 40 % very confident 42 %
	I am confident that I have the skills to manage swallowing in patients with a tracheostomy	not confident 14 % somewhat confident 31 % very confident 55 %
	I am confident that I have the skills to support one way/speaking valve use	not confident 17 % somewhat confident 28 % very confident 56 %
	I am confident that I have the skills to deflate a cuff	not confident 28 % somewhat confident 26 % very confident 46 %
Skills	I am confident that I have the skills to change an inner cannula	not confident 53 % somewhat confident 20 % very confident 27 %
	I am confident that I have the skills to suction above the cuff using a tracheostomy with a subglottic suction line	not confident 68 % somewhat confident 12 % very confident 20 %

“staffing” (Greece), “time and FTE” (Australia) and “lack of availability to human capital” (Zambia).

4. Discussion

Survey respondents were experienced and confident SLTs. Yet, the SLT role varied internationally with a general lack of formal written policy to guide clinical practice and a variability in access to education and resources.

4.1. Training and supervision

Our survey confirms that paediatric tracheostomy training is not

Table 3

Role recognition: In your facility, the following activities are roles that belong to a SLT.

Role	Data
Assess swallowing	Yes 91 %
	Not sure 2 %
	No 7 %
Assess communication	Yes 97 %
	Not sure 2 %
	No 1 %
Provide oral suctioning	Yes 16 %
	Not sure 14 %
	No 69 %
Providing tracheal suctioning	Yes 13 %
	Not sure 11 %
	No 76 %
Remove secretions from above the cuff of a suction-aid tracheostomy	Yes 9 %
	Not sure 15 %
	No 76 %
Provide recommendations for AAC	Yes 92 %
	Not sure 3 %
	No 5 %
Check cuff pressures	Yes 18 %
	Not sure 12 %
	No 70 %
Inflate and deflate a cuff	Yes 23 %
	Not sure 12 %
	No 70 %
Provide recommendations regarding a tracheostomy tube type	Yes 15 %
	Not sure 14 %
	No 71 %
Place and remove a speaking valve	Yes 51 %
	Not sure 3 %
	No 46 %

universally agreed. Training ranged from ‘on the job’ experience to national accreditation using competency-based frameworks. A range of competency frameworks and guiding documents are available from UK, North America, Australasia, Central/South America and Germany [1,2,15–21]. Volsko and colleagues (2021) highlighted that some of the challenges around training may relate to the lack of evidence-base supporting our understanding of feeding development in children with a tracheostomy [19]. It is likely that the heterogeneity of children presenting with a tracheostomy as well as low incidence with high complexity impacts on competence and confidence, particularly in countries that lack formal recognition of the SLT role [22–25]. How competencies are attained and maintained, when SLTs see a low incidence of these highly complex children in education and home settings, is challenging [26–29], and this may further explain the survey responses.

It is important to highlight that children with a tracheostomy are not just smaller versions of their adult equivalents, thereby requiring smaller technology. Core skills need to focus on the impact of timing of tracheostomy insertion on skill acquisition [13]. This suggests a holistic approach to supporting a child and their family, rather than a focus on the management of the technology, is required [30–33]. As an example, a tracheostomy placed in children is typically a planned surgical procedure, compared to a percutaneous placement, that attempts to primarily address either upper airway obstruction or long-term ventilation needs [6,10]. A child with a tracheostomy may require a prolonged hospital stay, not least to enable the family to learn to manage the artificial airway at home [31–33]. Focus is therefore on the SLTs clinical

skills that support children with a tracheostomy and their families to navigate and thrive in health, social and education settings, and increasingly into adulthood with an on-going tracheostomy need [30].

4.2. Advanced skill development

All SLTs working in tracheostomy must gain additional skills after graduation. SLTs need to have a core minimum skillset to support communication and feeding development as well as appropriate knowledge of the impact of the tracheostomy on communication and feeding. An advanced understanding of laryngeal structure and function as well as the impact of, for example, airway reconstruction on communication and feeding, is a priority for paediatric SLTs knowledge and skills. Below, we offer a pragmatic set of core minimum knowledge and skills for generalist SLTs as well as those more advanced:

Core minimum knowledge and skills:

- Communication (including AAC) and feeding - developmental context
- Awareness of types of tracheostomy tubes and their impact on communication and feeding
- Understanding why an infant, child or young person may need a tracheostomy.
- Who/where to go for specialist tracheostomy support.
- Understanding the limits of own knowledge and when to refer a child to a specialist centre or to access external advice and guidance
- Educating the MDT and families on the role of SLT.

Advanced tracheostomy knowledge and skills:

- Advanced knowledge of laryngeal pathology and medical/surgical airway interventions
- One-way valve assessment and management
- Contributing to MDT weaning plan and tracheostomy tube choice
- Working with a child requiring ventilation
- Above cuff vocalisation (ACV)
- Tracheal suctioning

Extended roles may be limited for paediatric SLTs due to the way families are empowered to support their child following tracheostomy placement. This often leads to a hands-off approach to the tracheostomy itself potentially with a limited need for SLTs to be educated in wider scope of tracheostomy management or have extended roles, as is often observed in adult SLT colleagues’ roles. It is important that SLTs are able to judge their own competency and confidence levels and understand their professions’ and their individual scope and limits of practice. When working with children with medical complexity, making professional risk assessments of one’s own knowledge and skills is critical. Some ideas for questions for reflection to ensure that one works to one’s own limits and not beyond our own level of expertise or scope of practice include: What is my role with this child?, What are the child’s priorities?, Do I have the core minimum knowledge and skills?, What do I feel safe to do?, What do I not feel safe to do?, Am I being pressured to do something out of my scope?, Am I being pressured to do something out of my own skill-set and level of competency?, Who can advise and support me?

4.3. Tracheostomy weaning

While skills in weaning are critical for SLTs working with adults with a tracheostomy, these skills may be less relevant for SLTs working with children. This was highlighted by the survey responses to questions around role definition. The indication for tracheostomy and the potential need for long-term tracheostomy placement means weaning ventilation or the tracheostomy is not an early outcome for most children. For some children, particularly in later childhood, the focus of the SLT role

may shift to supporting decannulation. Examples of decannulation protocols include the summary of protocols offered by Fuller et al. (2021) [6], the Great Ormond Street Hospital inpatient five day protocol [34], the Starship inpatient SLT led protocol [35], or the proposal for a structured approach to decannulation as presented by the German-speaking society of paediatric pulmonology [36]. It is recognised that these approaches do not necessarily highlight the role of the paediatric SLT or indeed, reflect consensus global practice, for example, in some regions capping of the tracheostomy in the daytime may span across weeks and sometime before decannulation takes place [5]. Fuller et al., 2021 describe the prerequisites for decannulation, for example, a pre-decannulation airway examination to minimise the risk of decannulation failure [6]. Fuller and colleagues acknowledge that whilst international consensus is lacking, ventilator and tracheostomy weaning in the paediatric population requires a multidisciplinary team approach [6]. The skills of clinicians working with adults with a tracheostomy sometimes reflect a more defined set of circumstances, for example, in an intensive care unit with a focus on liberation from ventilation and decannulation before discharge from the critical care or ward hospital setting. The needs of children with a tracheostomy require different skill sets and involve working across a range of settings from paediatric intensive care to home and educational settings with care often delivered by clinicians, particularly in community, without specialist skills or identified roles in tracheostomy [2]. The lack of on-going community support appears to be globally acknowledged in the reported lived experiences of families and children living with a tracheostomy [23,33].

4.4. One-way speaking valve placement

Only 56 % of respondents felt confident in using a one-way speaking valve. Yet, the benefits of one-way speaking valve placement on communication, swallow and tracheostomy wean are increasingly recognised across the lifespan. Almost 50 % of the paediatric population have an obstructed upper airway or a large tube in relation to trachea size and placement of a one-way speaking valve is not always appropriate. One-way speaking valves may not be tolerated by the child and can cause aversive or behavioural reactions and risk volutrauma to the lungs [36–38]. Furthermore, one-way speaking valve placement is not always essential to achieving vocalisation and decannulation. Clinical assessment of laryngeal function in children by SLTs contributes to the work up for both vocalisation and decannulation. It is important to highlight that the paediatric airway is subject to rapid and continuous change. Such changes are important to understand and manage as they have clinical impact and consequences for continued successful one-way speaking valve placement. Pathways and clinical protocols are lacking in the literature [6] but are necessary to support the MDT to troubleshoot airway changes (such as granuloma or worsening mucosal subglottic stenosis) as these may lead to difficult and inappropriate placement of one-way speaking valves. In the UK, it is general best practice for one way speaking valve assessments to be carried out by SLTs in secondary and tertiary care settings, with access to medical and surgical records and MDT support.

The paediatric SLT's broad clinical skills are essential in supporting assessment of readiness and timeliness in such cases. Yet, there remains lack of clarity around the roles of SLT in one-way speaking valve assessments, with only half of our survey respondents reporting a key role in one-way speaking valve management. A number of Children's Hospitals (e.g. Gaylord) have clearly defined roles for one-way speaking valve placement, recognising the collaboration required, particularly with respiratory physiotherapy and SLT [39]. Where care pathways and protocols do not exist and particularly where the SLT role may be limited or absent, it is likely other colleagues assume this role. Further research validating protocols may help to inform the understanding of roles and skills required to assess the safety of one-way speaking valve assessment. For example, the use of trans-tracheal pressure (TTP) manometry or determining minimal time with valve in situ to commence wearing.

Furthermore, where one-way speaking valve assessment is unsuccessful or inappropriate, SLTs need to advise on ACC methods, based on local availability and appropriateness, for example, sign-aided language, ventilator assisted leak, or finger occlusion.

4.5. Access to resources

Internationally, guidelines regarding paediatric tracheostomy care are often medically focussed leading to limited input from SLT in guideline development [20]. Where consensus statements do exist, these are generally not paediatric-specific, or display a reduced awareness of the SLT role from medical professions. Access to specific equipment (e.g. one-way speaking valves and FEES) alongside access to adequately trained staff appears limited in many countries. Protocols that include MDT involvement have been shown to lead to earlier initial trials and increased usage of one-way speaking valves [40], and better standardisation leading to more to widespread use [41].

There is little recognition within the literature of SLT input with paediatric tracheostomy in resource-poor settings, compared with the research regarding adults and emergency tracheostomy tube management, such as tube blockages and infection [5–42]. Sander and colleagues (2019) modified emergency procedures used at Boston Children's Hospital to make them more appropriate for use in a lower-resourced centre in Rwanda and reported many items of standard care needed to be removed or adapted, such as any procedures involving a mechanical suction machine, because of their unavailability [27]. A number of articles from South Africa reference community-based programmes designed to manage children with tracheostomy at home in a low-resourced setting, and argue that comprehensive in-hospital training of caregivers, even with lower levels of formal education, income, and housing quality, can result in safe and successful home management [9,43–46]. However, none of these papers discuss skills, training, or resource (human or equipment) availability specific to SLT. Equipment such as heat-moisture exchanger and suction (either manual or mechanical) were viewed as crucial to standard tracheostomy care [27]; while one-way speaking valves were not mentioned. The 'First Clinical Consensus and National Recommendations on Tracheostomized Children' from Brazil mentions use of phonatory valves only with the endorsement of the attending physician [20]. While publications from Brazil summarise the development process of a multidisciplinary protocol for tracheostomy care, these do not include SLT in their development, and reference SLT only in passing as part of the post-operative assessment for swallowing and phonation [47,48].

Instrumental assessment to visualise swallowing biomechanics is gold-standard for children with or without tracheostomy, however, clinicians reported often working with this population without immediate access to these services (e.g. VFSS or FEES). The use of the Modified Evans blue dye test has well-documented limitations in reliability for identifying aspiration [49,50] but could be an adjunct to assessment in some areas with limited resources. Functional assessment using these principles (e.g., feeding colourful foods such as chocolate) and monitoring of changes to baseline including tracheostomy secretions and respiratory health may also be useful to supplement clinical findings in the absence of timely access to instrumental assessment.

4.6. Specialist tracheostomies in paediatrics

Cuffed tracheostomy tubes are more commonly used in adult populations where the tracheal space is not filled by the tracheostomy tube itself and the cuff provides an additional seal in the form of an inflatable/deflatable balloon around the tracheostomy tube. Where cuffed tubes are used in paediatric populations, they are used most typically in paediatric populations to support positive pressure ventilation and minimise the risk of chronic aspiration, for example, in a child with bulbar dysfunction. Challenges for SLTs and the MDT working with cuffed tubes includes the variation in types of cuffed tubes and their

management, for example an air-cuff versus foam-filled cuff versus water-filled cuff. Children with foam filled cuff tubes are at greater risk in the community if the MDT are unsure of their self-expanding properties [51]. Additionally, in some countries, there is an emergence of commonly used 'adult' tracheostomy tubes (i.e., double lumen tubes) being increasingly used in older paediatrics. This highlights challenges for families and clinicians alike that may have had education and experience in single lumen tubes only [30]. There are some advantages to exploring difference tube types. For example, the use of cuffed double lumen tubes in the older paediatric population may provide wider opportunities for appropriately experienced clinicians to offer laryngeal rehabilitation and sensitisation, e.g., use of Above Cuff Vocalisation (ACV) and management of gross aspiration of secretions e.g., use of a subglottic port, that otherwise would not be accessible for children with single lumen tracheostomy tubes [52]. Learning from our adult SLT colleagues, the adult evidence and literature may further inform clinical practice in paediatrics.

4.7. Limitations of the survey

The wider survey included in this paper had limitations, including the focus on both adult and paediatric tracheostomy management and therefore, while capturing tracheostomy practice across the lifespan, did not specifically target paediatric issues. Responses were greater from SLTs working with adults and countries are not evenly represented in the paediatric data with New Zealand and the UK over represented. Translations into more languages may have helped uptake. Despite this, the data provides useful insights alongside the subsequent discussion of the current evidence-base, which can be used to guide international initiatives supporting more standardised SLT tracheostomy education and practice.

4.8. Recommendations for the future

This paper highlights the need for more support for the SLT workforce working with children with tracheostomies. International collaboration may support those in less developed tracheostomy services and may include:

- International initiatives to advocate and fund **evidence-based, relevant education** for SLTs working in this area. The focus needs to be on **accessibility to all** with initiatives that can be accessed freely online and be readily available without specialist resources.
- **Strong outreach or mentorship programmes** to support paediatric SLTs in community services and educational settings who have less exposure to children with tracheostomies, who feel less competent and where outreach support is needed.
- Highlighting to professional associations and affiliated societies the need for **culturally appropriate and safe core competencies and SLT and MDT role delineation** in countries or places of employment where these do not currently exist. We need to understand that differences in scope of practice exist internationally and may not matter but SLTs need to be supported to work within the scope of their workplace and be acknowledged for the unique knowledge and skills they offer children with tracheostomies.
- Building international and local **SLT and interprofessional tracheostomy networks/communities of practice** and/or highlighting the unique needs of paediatrics in established international networks. This would facilitate sharing of staffing business cases, best clinical practice, written protocols/guidelines, knowledge and solutions to barriers.
- Highlighting the **resource differences worldwide and their potential to negatively impact health equity**, including access to specialist services/expertise and equipment.

- A call for **further research** by SLTs on the impact of tracheostomy on eating, drinking, swallowing and communication in the paediatric populations and across the lifespan.
- Hearing, promoting and acting on the **lived experiences of children** with a tracheostomy placed in childhood and needing this into adulthood in all initiatives.

5. Conclusions

For SLTs working with children with tracheostomies it is not solely about managing the tracheostomy, because the SLT is first and foremost a communication therapist and a feeding therapist (developmental and impairment-based). The SLT's education and competency development is therefore perhaps less about core tracheostomy skills (cuff deflation and weaning) and more about holistic practice in children with complex needs as they grow older. SLTs need specialist medical knowledge to manage the acuity of this population with extended knowledge in typical and abnormal anatomy and paediatric medical and surgical interventions. SLTs work in diverse settings - educational as well as health; yet, SLTs still need to serve children when they return to their communities including those with complex needs and a long term tracheostomy. When working with a child with a tracheostomy is not common practice, the SLT needs access to MDTs who know 'enough' to understand the clinical management opportunities and who can support the SLT to learn. For those SLTs working in small centres with less frequency of complex children with tracheostomies, support from specialist centres and access to education as needed is important. This paper summarises the survey findings, current practice and evidence-base and offers recommendations of the next steps for SLTs as we continue to strive for best care for the children and families that we work with.

CRedit authorship contribution statement

Anna Miles: Writing – review & editing, Writing – original draft, Supervision, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Sarah Wallace:** Writing – review & editing, Project administration, Methodology, Investigation, Data curation, Conceptualization. **Louise Bax:** Writing – review & editing, Writing – original draft, Resources. **Melissa Keesing:** Writing – review & editing, Writing – original draft, Resources, Investigation. **Louise Edwards:** Writing – review & editing, Writing – original draft, Resources, Investigation. **Vicky Thorpe:** Writing – review & editing, Writing – original draft, Investigation.

Declaration of competing interest

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