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## **ABSTRACT**

Background: There is increased involvement of Speech and Language Therapists (SLTs) in critical care and long-term units supporting patients with ventilatory needs and complex dysphagia. SLTs have a range of specialist knowledge in the function of the pharynx and larynx to enable them to support therapeutic interventions and contribute to the management of those patients. In Israel, there are currently no designated courses or training programmes for SLTs to establish advanced clinical skills in tracheostomy and ventilator management. There are currently standards of care for SLT working in designated wards for ventilated patients, however not in acute wards, critical care and internal medicine wards where ventilated patients can be hospitalized.

Aims: To identify the skills and expertise of the Israeli SLT workforce working with tracheostomy patients. Specifically, to identify their level of training, access to training, client population, work settings, and level of work confidence.

Methods: The study involved electronic distribution of a 55-item online survey to SLTs in Israel. The questions included demographic information, training, confidence, and clinical support.

Results: Responses were received from 47 SLTs. The majority (40.4%) spent between 1-9% of their clinical time with ventilated patients. Almost 80% work with seniors (65yrs+) and almost 70% work with adults (18-65yrs) half the time or more. In inpatient rehabilitation, 46.8% reported that they manage patients with tracheostomy half the time or more. In outpatient rehabilitation settings, 21.3% reported that they manage patients with tracheostomy half the time or more. Prior to managing complex airway patients independently, 55.3% received less than five hours formal tracheostomy training whilst 68.1% received less than five hours training on ventilated patients.

Multidisciplinary teams (MDT) existed for tracheostomy patients (85.1%) and ventilated patients (70.2%) and high levels of confidence were reported for managing patients with tracheostomies (mode of 4 in a scale of 0-5, where 5 means fully confident) and ventilated patients (mode of 3 in a scale of 0-5). A significant relationship was found between level of confidence and presence of a multidisciplinary team.

Conclusions: Limited training access was found for SLTs working with this complex population. A competency framework needs to be established with access to training and supervision. MDT existence contributes to confidence. Most respondents worked in rehabilitation settings, and very few worked in acute care, critical care and internal medicine wards. It seems reasonable that in order to change this, minimal standards of care should be established on these wards.

## **What this paper adds**

*What is already known on the subject:*

- Speech and Language Therapists (SLTs) have an important role in critical care and long-term units supporting patients with complex dysphagia and undergo formal training and supervision in UK and Australia.

*What this paper adds to existing knowledge*

- In Israel, most SLTs work with tracheostomy and ventilated adult patients in rehabilitation settings, whilst few work in acute, critical care and internal medicine wards. There are limited opportunities for formal training and supervision, although MDT support enhances clinical confidence.

*What are the potential or actual clinical implications of this work?*

- SLTs in Israel would benefit from establishing a competency framework for tracheostomy and ventilator patient management to support training, standards of care and increase clinical involvement in acute settings. This will enhance clinical outcomes for their large population of complex airway patients.

## **INTRODUCTION**

In recent years there has been a growing literature base to identify the knowledge and skills of Speech and Language Therapists (SLTs) working with patients who have tracheostomy in the UK (Ward et al., 2012, McGowan et al., 2014) and Australia (Freeman-Sanderson et al., 2011, Cardinal et al., 2020). This has been in response to the increased involvement of SLTs in critical care and long-term units supporting those with ventilatory needs and complex dysphagia, to evidence the value in improved clinical outcomes.

SLTs have a range of specialist knowledge in the function of the pharynx and larynx to enable them to support therapeutic interventions and contribute to the management of patients with tracheostomy and ventilation, exploring options for the rehabilitation of speech and swallowing (McRae et al., 2019, McGrath and Wallace, 2014). Professional bodies in a number of countries have established guidance and competency documents to ensure safe and consistent practices (Royal College of Speech and Language Therapists, 2019, Speech Pathology Australia, 2013, American Speech-Language-Hearing Association). The role of SLTs as part of the multi-disciplinary team has highlighted the synergy that they can bring to clinical decision-making for tracheostomy and ventilator weaning that support laryngeal functions for voice and swallowing (Bonvento et al., 2017, Garrubba et al., 2009).

In the UK, dysphagia and tracheostomy competencies are developed post-registration and are set by the professional body (Royal College of Speech and Language Therapists, 2014). These require supervision by another clinical specialist SLT before practice, in addition to annual continuous professional development requirements. SLTs have access to Clinical Excellence Networks for a range of specialist areas including tracheostomy as well as training courses, seminars and

conferences. There is a career structure that enables the development of expertise alongside seniority.

In Israel, all pre-registration SLT training is undertaken at undergraduate level with clinical placements in paediatric and adult settings. Training for specialist skills, such as managing tracheostomy and ventilator is accessed post-registration level through workplace supervision, although this is dependent on access to SLTs with these skills. In Israel, there are currently no designated courses or national competency training programmes for SLTs to establish advanced clinical skills in tracheostomy and ventilator management and no recognised expertise in the career structure.

Israel is a religious country and has a pro-life approach to long term care, which means that there is a growing presence of long-term ventilated patients (Izhakian and Buchs, 2015). Patients requiring ventilation are cared for in a variety of settings, such as critical care, internal medicine wards, long term care settings and active rehabilitation. According to the Israeli Ministry of Health reports from 2019, there are 772 beds for hospitalized patients with prolonged ventilation and an estimated 200 patients cared for in the community (Ministry of Health (Israel), 2020). In Israel, SLTs are employed directly by government bodies, social care, private organizations or medical insurance organisations, based on predetermined level of needs. The standard of care according to Ministry of Health is 8 hours of SLT per week in 12-24 beds of a ventilated ward (Israeli Ministry of Health, 2017), however not all ventilated patients are necessarily placed in ventilated wards.

There are 6098 registered SLTs in Israel (Ministry of Health (Israel), 2020), some of them are retired or non-active. Most of them work with children in the community and educational systems. The percentage of SLTs working with adults is

not published anywhere. According to the Ministry of Health, in 2019 there were 772 beds of patients requiring prolonged ventilation, with 8 hours per week of SLT services for 24 beds. There should be no more than 220 SLTs working with adults according to unpublished data from the Israeli Association of SLTs, and less than that work with ventilated patients.

The standards of care in Israel also define the scope of practice of SLTs in different healthcare units, namely swallowing, speech, language and hearing assessments and identifying and facilitating communication needs without specifying the scope of practice of SLTs that are involved in the rehabilitation of the ventilated or tracheostomized patients. This might leave SLTs with degrees of freedom in their intervention with ventilated and tracheostomized patients whilst the scope of practice will be dependent on their professional skills, confidence and the approach of the interdisciplinary teams. Moreover, in Israel there are no standards of care for SLT with ventilated patients in acute and critical care and the allocation of SLT in those units is done based on the priorities that are set by the directors of the healthcare units.

This study aimed to survey the current Israeli SLT workforce working with tracheostomy patients, to identify their level of training, access to further training, client population and work settings, and level of work confidence.

## **METHODS**

### ***Online survey***

The study involved electronic distribution of a 55-item online survey to SLTs in Israel. The survey was mainly based on those developed by Ward et al. (2012, 2008) as a questionnaire of tracheostomy management practices in the United Kingdom and Australia. The questionnaire was translated from English into Hebrew by two of the authors (OS and AG), both experienced SLTs, Hebrew native speakers, with some

cultural adaptations made to the survey.

Twenty-nine of the questions centered around demographic information: employment status, years and academic educational background, years of practice, hours of clinical work per week with various clinical populations including tracheostomized/ventilated patients and clinical settings and more. Twenty-six of the questions centered around training, confidence, and clinical support in the management of patients with ventilators and tracheostomies. The respondents were required to give consent before accessing the online survey and all the data was collected anonymously. Most of the survey questions were presented in a multi-choice or dichotomous format so that the responses could be quantified and compared. Five of the questions were open-ended questions. Ethical approval was obtained from the ethical committee of Ono Academic College (Ref: 201920ono) The survey was distributed online via Google forms from May 2019 to August 2019.

### ***Respondents***

A link to the survey was posted on professional groups to social media and directed to SLTs who were currently or in the last year working with tracheostomised and/or ventilated patients.

### ***Data analysis***

Descriptive statistics were used to summarize the data. Chi-square test of independence and Spearman's rank-order correlation were used to test for associations.

## **RESULTS**

### ***Survey respondents: Demographic information***

Forty-nine SLTs consented to respond to the survey however only 47 SLTs completed the survey and submitted their responses. Forty-two of the respondents graduated in



Israel (23 in Israeli colleges and 19 in Israeli universities), while five graduated outsidess of Israel. All respondents had a BA degree qualification in Speech and Language Therapy, 21 had an additional MA qualification, none had a PhD qualification. The average number of years since graduation was 9 years (SD: 8.4; range: 1-35).

***Survey respondents: clinical experience and work settings***

Of all respondents, 74.5% had  $\leq 10$  years of experience (see Table 1). In reporting time spent on direct therapy, 40.4% of respondents provided 20-29 hours of direct therapy per week (see Table 1). Table 2 demonstrates that less clinical time was spent with ventilated patients than with patients with tracheostomy. For example, 57.4% (n = 27) of respondents spent 0-9% of their clinical time with ventilated patients, however 31.9% (n=15) of respondents spent 0-9% of clinical time with patients with tracheostomy.

Insert Table 1 here

Insert Table 2 here

Examination of Table 3 reveals that 78.8% (n= 37) of the respondents worked with seniors (above 65 years)  $\geq$ half of the time, and 68.1% (n= 32) of the respondents work with adults (18-65 years)  $\geq$ half of the time. Only 21.3% (n= 10) work with children (0-11 years)  $\geq$ half of the time.

Insert Table 3 here

In all work settings, the majority of respondents reported that they never manage patients with tracheostomies. The only exception to that is inpatient rehabilitation, where 46.8% (n = 22) reported that they manage patients with tracheostomy  $\geq$ half of the time. In outpatient rehabilitation centres and in different acute care wards,

approximately 20% of the respondents reported that they manage patients with tracheostomy  $\geq$ half of the time (Table 4).

Insert Table 4 here

### ***Training***

Most respondents received very little formal training (for example, university lectures, workshops and seminars for SLTs) and clinical supervision (for example, direct clinical supervision by senior or experienced SLT, peer support) prior to managing patients with tracheostomy independently. Less than 20% (n = 17) received  $\geq$ 11 hours of formal training and 55.3% (n = 26) received 0-5 hours. In terms of clinical supervision, less than 20% (n = 9) received  $\geq$ 11 hours, and 66% (n = 31) received 0-5 hours.

Less training and supervision was received prior to managing ventilated patients. Eleven hours or more of formal training were received by 21.2% (n = 10) and 68.1% (n = 32) received 0-5 hours. Only 10.6% (n= 5) received  $\geq$ 11 hours of clinical supervision and 78.8% (n = 37) received 0-5 hours. Thus, greater percentage of SLTs received little formal training and less clinical supervision in this highly complex clinical area.

Insert Table 5 here

Formal training programs were only available to 8.5% of SLTs working with tracheostomy patients and to 6.4% of SLTs working with ventilated patients. Non-existence of formal training programs were reported by 74.5% of respondents in both fields. Development of training programs was reported by 14.9% of respondents in both fields.

Only 8.5% of the respondents felt up to date with evidence-based practice relating to tracheostomy management, and 6.4% felt up to date with evidence-based

practice relating to ventilated patients' management. Only 10.6% felt up to date with advances in tracheostomy technology (Figure 1).

*Insert Figure 1 here*

In response to the question 'what training can help your clinical work with tracheostomy or ventilated patients', the respondents mentioned conferences, workshops and evidence-based knowledge starting from basic information to clinical hands-on supervision. Most of them mentioned the need for case discussion, clinical supervision from experts, and practical knowledge regarding equipment, cannulas, ventilation machines and rehabilitation.

### ***Multi-disciplinary team (MDT)***

MDT existence for treating patients with tracheostomy and patients who are ventilated was indicated by 85.1% and 70.2% of the respondent, respectively (Figure 2). Having a defined role with the MDT in managing dysphagia in patients with tracheostomy was reported by 57.4%, and by 61.7% managing dysphagia in ventilated patients. Over 65% of respondents felt that they had support or partial support from an expert in their team (Figure 3).

*Insert Figure 2 here*

*Insert Figure 3 here*

An optimal and partly optimal MDT approach for managing patients with tracheostomy was reported by 83% of the respondents. Similarly, 65.9% of respondents reported the same for ventilated patients.

### ***Confidence***

On a scale of 1-5, where 1 means no confidence and 5 means full confidence, the mode level of confidence in managing patients with tracheostomies was 4, and 3 for managing ventilated patients (Figure 4).

Insert Figure 4 here

A chi-square test of independence was performed to examine the relation between confidence in management of patients with tracheostomy and amount of clinical supervision received prior to working independently with patients with tracheostomy. The relation between these variables was not significant  $\chi^2 (16, n = 47) = 15.99, p = .453$

In addition, the relation between confidence in management of ventilated patients and amount of clinical supervision received prior to working independently with ventilated patients was also not significant  $\chi^2 (16, n = 46) = 15.46, p = .491$

A significant relationship was found between confidence in management of ventilated patients and having an MDT approach for managing these patients  $\chi^2 (12, n = 46) = 28.56, p = .005$ .

Similarly, a significant relationship was found between confidence in management of patients with tracheostomy and having an MDT approach for managing these patients  $\chi^2 (8, n = 47) = 25.04, p = .002$ . In both cases, SLTs who worked in an optimal MDT were more confident.

Spearman's rank-order correlation was used to test for a correlation between years of experience as a SLT and confidence. No correlation was found for management of patients with tracheostomy  $r (47) = .263, p = .074$ , and for management of ventilated patients  $r (46) = .07, p = .60$ .

## **DISCUSSION**

Speech and Language Therapy is an established profession in Israel. Internationally, there has been increasing involvement of SLTs with tracheostomy and ventilated patients, however in Israel the role has not evolved in acute and critical care. This has been demonstrated by the very restricted time that SLTs work in these settings, the

lack of formal training and clinical supervision. The limited development of skills restricts SLT scope of practice when addressing the specific clinical needs of patients with tracheostomy and ventilated patients, such as secretion management, weaning and decannulation practices and use of one-way valves. This leads to stagnation of the SLT service provision negatively affecting patient care and clinical outcomes.

### *Clinical settings*

Although it was not possible to identify and select respondents for the survey, it is felt that this is a good representation of the SLTs working with tracheostomy and ventilated patients. There should be no more than 220 SLTs working with adults according to unpublished data from the Israeli Association of SLTs, and less than that work with ventilated patients and patients with tracheostomy.

In Israel, the level of SLT clinical involvement is usually pre-determined by government bodies, so it is unsurprising that most of the respondents worked with the adult and senior populations in inpatient rehabilitation settings.

Almost 47% reported that they manage patients with tracheostomies half of the time or more. This result is similar to the UK result with 36% in the inpatient rehabilitation setting working all or most of the time with patients with tracheostomies. However, in the acute wards, less than 20% of the respondents in the current study managed patients with tracheostomy half of the time or more. This number is much lower than the UK results, with 78% spending most of their time on the acute wards.

In the outpatient settings, 21.3% of the Israeli respondents reported that they manage patients with tracheostomy half of the time or more, which is higher than the UK results with 11% spending more than half the time in this setting. This comparison can shed light on the differences in the job allocation for SLTs. In the

rehabilitation setting, the Ministry of Health sets a standard that determines greater SLT contact time as reflected by the results.

There is a recognised link between presence of a tracheostomy and disruption to subglottic pressures (Gross et al., 2003), breath-swallow synchrony (Terzi et al., 2010) as well as motor and sensory functions of the larynx (Ding and Logemann, 2005), especially following endotracheal intubation. This does not always result in dysphagia (Leder and Ross, 2010) and a recent systematic review of post-extubation laryngeal symptoms reported only 49% prevalence of dysphagia compared to 76% reported dysphonia (Brodsky et al., 2018). The aetiology of the primary condition is thought to be the causal factor for dysphagia and influences the selection of interventions required (Skoretz et al., 2020b, Skoretz et al., 2020a). The added presence of dysphagia increases the risk of pneumonia and death (Siempos et al., 2015), whilst increasing length of hospital stay and treatment costs (Attrill et al., 2018). In the UK system, having an SLT on acute wards has become a standard of care (Faculty of Intensive Care Medicine and Intensive Care Society, 2019) to anticipate complications and specialist SLTs are trained for these roles.

In trying to understand the reasons behind the absence of SLTs on acute wards in Israel, the lack of awareness of the potential contribution of SLTs with this patient group, may be an explanation as this population is viewed as vulnerable, with little potential to engage in speech therapy. However, a number of studies have shown that early SLT interventions in the acute setting, especially as part of a team can improve outcomes for communication and swallowing (Freeman-Sanderson et al., 2016), and reduce costs through shorter length of stay, reduced complications and return of functions (Cetto et al., 2011, McGrath et al., 2020).

The time spent with ventilated patients was less than 10% overall and is likely to reflect the limited contact of SLTs in such an environment. This in turn reduces the awareness of the potential role SLTs can play in the rehabilitation of ventilated patients who may benefit from therapy for communication and swallowing (Dikeman and Kazandjian, 2002).

### ***Training***

Opportunities for training and supervision are limited in Israel, however support appears to come from working as an MDT, as seen in the results around levels of confidence. SLTs in Israel receive very little training prior to working independently. Most of them (55%) had zero to five hours training prior to working with patients with tracheostomies. However, when it comes to ventilated patients, almost 70% received zero to five hours training, and almost 80% received zero to five hours of clinical supervision prior to working with ventilated patients independently.

These percentages are much higher than the UK results, where only 47% of SLTs reported receiving zero to five hours of training and clinical supervision. This difference might be related to the lack of formal training programs in Israel for new SLTs. Only 6.4% of respondents reported access to formal training programs for SLTs working with ventilated patients, whilst in the UK 43% reported having a formal tracheostomy competency training program.

Allowing access to comprehensive training and direct clinical supervision might enable SLTs to advocate for the importance of their involvement in this vulnerable population. Simulation training has been found to be successful in skills development (Miles et al., 2020) and does not rely on work-based training alone. This is particularly relevant for reducing unnecessary exposure, for example during the COVID pandemic. In addition, the lack of structured specialism programs in

tracheostomy management in Israel might limit the advancement of clinical skills and knowledge. It is not known who is currently involved in developing training programs. Since in some countries SLT have an established role in these areas it is important to collaborate with internationally-based SLTs with expertise in management of tracheostomized patients and ventilated patients to develop formal training programs and clinical guidelines in Israel.

### ***Confidence***

Despite low levels of training, supervision and current knowledge, SLTs reported relatively high levels of confidence in the clinical management of tracheostomy and ventilated patients. A significant correlation was found with the presence of an MDT and it could be that SLTs feel well supported in the familiar rehabilitation environments alongside other team members, which demonstrates the added value of collaborative working.

In Israel MDTs are common and most SLTs reported having a defined role in dysphagia management within the team. An optimal or partly optimal MDT approach was reported by most respondents. However, an optimal team approach was not defined in the survey thus, it is not clear how respondents interpreted the meaning of “optimal” MDT approach. In any case, this was found to explain the high confidence the respondents expressed in managing patients with tracheostomies and ventilated patients, whereas the relationship between amount of clinical supervision was not related to clinical confidence. The value of multi-disciplinary teams for tracheostomy management has been frequently reported to improve patient outcomes (Mitchell et al., 2013, Cameron et al., 2009).

### ***Strengths and limitations***



The current study explored the Israeli SLT workforce working with tracheostomy patients and ventilated patients for the first time. The level of training, access to training, client population and work settings were described in detail to gather information regarding settings and populations that might be underserved. This provided comprehensive baseline information against which it will be possible to make future comparisons about workforce and skills.

A key limitation was recruitment to the survey and the challenge of making contact with all SLTs working in every type of setting to ensure widespread representation. As a result, most of our respondents were SLTs working with adults in rehabilitation settings as these were part of an existing/accessible network. We do not know if this is a representative sample as it is possible that SLTs working in other settings and with younger populations were not aware of the survey or chose not to respond if this was not their main caseload.

## **CONCLUSIONS**

In many countries, SLTs have established a valuable role working with tracheostomy and ventilated patients in acute settings and have demonstrated great impact with early interventions. In Israel, we identified a lack of formal training and supervision for SLTs working with this complex population which may limit the potential impact. For this to be achieved in Israel, a competency framework needs to be established with access to training and supervision. Future pilot studies will allow for evaluation of outcomes of SLT interventions and support the case for change.

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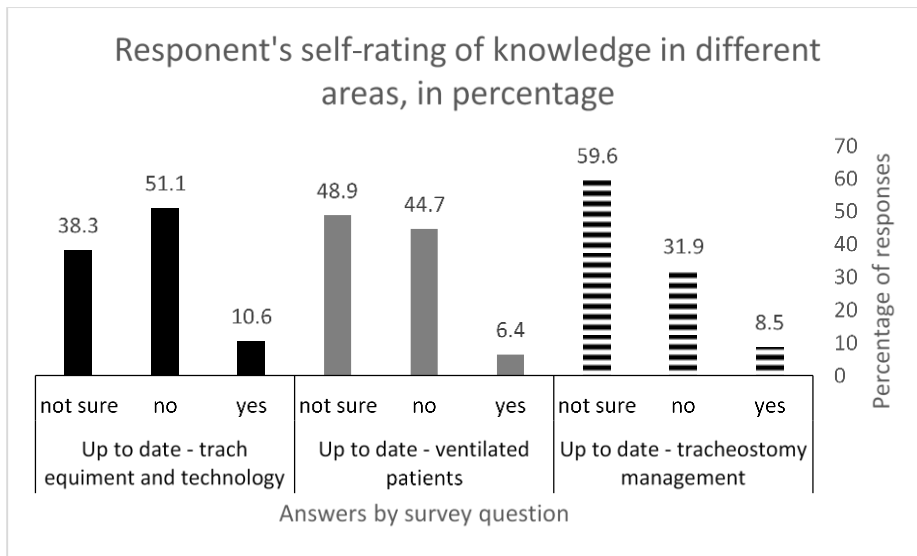
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*Figure 1.* Respondents' self-rating of up-to-date knowledge in tracheostomy equipment and technology, ventilated patients' evidence-based practice (n = 47) and tracheostomy management evidence-based practice (n = 47).