

COMMENTARY

Treatment intensity in everyday clinical management of speech sound disorders in Hong Kong

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Abstract

Much evidence supports the efficacy of different treatment approaches for speech sound disorders (SSD) in children. Minimal research in the field has been conducted using treatment intensity as a research variable. This study examined the current practice of speech-language pathologists (SLPs) in Hong Kong regarding the treatment intensity prescribed to children with SSD and potential factors that were associated with the intensity. Participants were 102 SLPs working in different settings in Hong Kong who completed an online questionnaire. SLPs who had a heavier caseload offered significantly less frequent and shorter treatment duration to clients with SSD. Public and private settings differed significantly in treatment duration. Treatment approaches and clinicians' consideration about a client's conditions did not affect treatment intensity. SLPs in Hong Kong do not plan treatment duration and frequency in an evidence-based direction because of their heavy workloads and the dearth of research evidence on treatment intensity to guide their clinical practice.

Keywords: *Treatment intensity, survey, speech sound disorders, clinical practice, questionnaire, caseload.*

Introduction

Effective treatment relies on a number of contributing factors such as intervention techniques, clinicians' experience, service delivery models, treatment intensity, motivation, and attitude of the clients. Among these factors, treatment intensity has received little attention. In the area of speech sound disorders (SSD), a considerable number of studies have supported the efficacy of SSD treatment in children (Law, Garret, & Nye, 2004). However, there were a small number of outcome studies using treatment intensity as a research variable. In a recent systematic review, Baker and McLeod (2011) reviewed available intervention studies for children with SSD from 1979–2009. Most of the studies reviewed either compared children's performance outcomes under different treatment approaches (e.g., maximal opposition vs minimal opposition contrast) or service delivery models (e.g., direct treatment vs parent training) within a pre-determined treatment duration or examined the time required to achieve specific treatment goals. As stressed in the lead paper of this scientific forum (Baker, 2012), information on treatment intensity assists clinicians, service providers, and users not only to identify effective and efficient intervention, but also to plan for appropriate service and resource allocation. This is

especially important for areas where there is a shortage of speech-language pathology services.

Hong Kong is a densely populated city of China with around 7 million people living in 1104 square kilometres of land (HKSAR Government, 2011). With better recognition of the importance of communication and swallowing needs over the last decade, the demand for speech-language pathology services have expanded dramatically in Hong Kong. There are around 570 locally-trained speech-language pathologists (SLPs) since the Speech and Hearing Sciences degree was first established at The University of Hong Kong in 1988. However, there is no statistical record on the current number of practicing SLPs who were trained locally or overseas. Yet it can be easily estimated that the number of SLPs serving the population is inadequate. As treatment intensity is affected by the caseload size (Brandel & Loeb, 2011), it is predicted that treatment intensity provided in Hong Kong would be sparse. Considering the high client-to-clinician ratio and the lack of treatment information on SSD in Hong Kong, this study aimed to investigate the intensity of treatment that SLPs employ and the factors that influence clinicians' decision on determining treatment intensity for children with SSD in Hong Kong.

Method

Participants

One hundred and two SLPs working in different settings in Hong Kong in the year of 2012 participated in this study.

Procedure

Construction of the questionnaire

A questionnaire was created using a free internet survey engine at www.my3q.com. The full questionnaire consisted of 36 questions requesting 64 responses from the respondents. Four main areas were included in the questionnaire: (i) demographic information (five questions), (ii) workload (eight questions), (iii) treatment intensity for clients with SSD (14 questions), and (iv) selection of treatment approach and target (five questions). The purpose of the study was explained in the questionnaire and all the responses were returned in anonymous form. Ethical clearance was granted by the Human Research Ethics Committee for Non-Clinical Faculties, The University of Hong Kong.

Administration of the survey

An invitation email including the link of the questionnaire was sent to all the 361 SLPs who were in the Hong Kong Association of Speech Therapists 2012 registry. There were 102 respondents, resulting in a 28.3% response rate. The survey was opened for 3 weeks from January 2012 to February 2012. One reminder email was sent 1 week before the closing date to minimize non-response error.

Results

Demographics of the respondents

About 90% of the respondents ($n = 92$) obtained their SLP qualification in Hong Kong, while others were trained in Australia (3.9%), the UK (2.9%), and Canada (2.0%). The clinical experience of the respondents covered a wide range, with 43.1% of them having less than 4 years of experience, 31.4% 4–10 years, 23.5% 11–20 years, and 2.0% more than 20 years. Most of the respondents (87.3%) worked full-time, while 12.7% worked on a part-time basis (i.e., work less than 100%). With reference to the main work settings, 31.4% served in pre-school centres, 28.4% in private sectors, 16.7% in school settings, 7.8% in hospitals, 4.9% in assessment centres, and 9.8% indicated other settings.

Respondents were requested to state the number of sessions (including both individual and group sessions) they conducted in a typical week. When stratified by full-time and part-time status, full-time

respondents reported that they conducted an average of 34.1 sessions per week ($SD = 19.1$). To report the percentage of clients with SSD on their caseload, 98% of the respondents indicated that they had clients aged from 2–16 years with SSD on their caseload, and 18.6% of the respondents reported that this client group composed of more than 40% of their total caseload. This suggested that SSD were one of the core caseloads among SLPs in Hong Kong.

Treatment intensity for children with SSD

Treatment intensity was defined as the typical treatment frequency (per month), typical duration of a session, and the usual number of sessions provided to a client with SSD by the respondents in the present study. The five respondents working in assessment centres were excluded, leaving 97 respondents who could provide information regarding their practice on treatment intensity, as summarized in Table. These 97 respondents were also grouped into whether they worked in a public setting (i.e., pre-school centres, schools, and public hospitals) or private setting to examine if there was any difference between government-financed and self-financed service. For the public setting, the most predominant treatment frequency and duration were twice per month and from 30–35 minutes, respectively, while the usual total number of sessions offered spread from one to more than 20 sessions quite evenly. In the private setting, clients were mostly seen 2-times or 4-times per month, the typical session duration ranged from 30 minutes to 1 hour, and the usual number of sessions was from five to 12 sessions.

Potential factors associated with treatment intensity

Four factors that may associate with treatment intensity for children with SSD were explored: (1) caseload, (2) work setting, (3) treatment approaches frequently used by SLPs, and (4) respondents' perceived factors. Correlation coefficients and chi-square tests with Yate's correction were conducted depending on the level of measurement of the variables. To carry out the chi-square tests, respondents were stratified according to the choices they selected.

Caseload

Caseload in the present study refers to the total number of different clients (seen individually or in groups) that an SLP served in a typical week. The mean caseload among the respondents were 41.9 ($SD = 26.2$). Treatment frequency was found to be negatively and mildly correlated with caseload size ($r = -.32; p = .01$). A similar pattern was observed for treatment duration and with a stronger association ($r = -.58; p < .01$). However, the total number of sessions given to clients

with SSD was not related to caseload ($r = -.05$; $p = .71$). This suggests that SLPs who had a heavier caseload reported less frequent and shorter treatment duration prescribed to clients with SSD.

Work setting

Respondents' caseload was related to their work setting. The mean caseload per week of respondents who worked in public hospitals, schools, pre-schools, and private sectors were 66.9 clients ($SD = 16.7$), 57 clients ($SD = 33.8$), 41.9 clients ($SD = 14.3$), and 36.9 clients ($SD = 23.0$), respectively. By grouping the respondents into public settings ($n = 66$) and private settings ($n = 31$), as in Table I, a chi-square test was conducted in relation to treatment intensity. Results revealed that respondents from these two settings differed significantly in the treatment duration (chi-square = 27.90, $df = 3$; $p < .01$). For treatment frequency and total number of sessions, the difference between the two groups did not reach statistical significance (frequency: chi-square = 8.71, $df = 4$; $p = .07$; total number of session: chi-square = 11.33, $df = 6$; $p = .08$). These results indicate that treatment duration offered to children with SSD was bound by the setting of the SLPs.

Treatment approaches

Respondents were requested to rate how often they made use of various treatment approaches for SSD with five choices, namely, always/very frequent, often, sometimes, occasionally and rare/never. More than half of the respondents (54.6%) reported very frequent use of the traditional articulation approach. Auditory discrimination and core vocabulary

approaches were also reported to be very frequently used by 11.2% and 12.1% of the respondents, respectively. For often-used approaches, they were auditory discrimination (58.4%), phonological awareness (57.1%), non-speech oromotor training (55.1%), auditory bombardment (53.1%), and minimal pair therapy (51.1%). Respondents were stratified into three groups according to their responses in rating the frequency of treatment approach they used. One group consisted of those respondents who rated the motor-based approaches (traditional articulation approach, non-speech oromotor training, core vocabulary and PROMPT) as very frequently used ($n = 50$). The second group consisted of those who rated any of the linguistic approaches (maximal opposition/contrast therapy, minimal pair/contrast therapy, cycle approach, non-linear, and Metaphon) as the predominant approach they used ($n = 9$), and the third group did not show any preference in the treatment approaches, that is, they gave similar ratings to the approaches ($n = 38$). Chi-square tests were conducted. Results show that respondents' practice in treatment approaches was not related to treatment frequency (chi-square = 11.43, $df = 8$; $p = .18$), duration (chi-square = 6.89; $df = 6$; $p = .33$), or total number of sessions provided (chi-square = 9.59, $df = 12$; $p = .65$).

Criteria perceived by the respondents

Respondents were requested to indicate three important criteria that they relied on to determine treatment intensity for clients with SSD. According to their choices, the respondents were stratified into three groups who considered (1) only child factors (16.2%); (2) child and family factors (27.8%), and

Table I. Typical treatment intensity provided by SLPs in Hong Kong for children with speech sound disorders.

	Setting		
	All ($n = 97$)	Public ($n = 66$)	Private ($n = 31$)
Frequency (per month)			
Once	17.5%	21.4%	12.9%
Twice	52.5%	55.4%	45.2%
Three times	8.2%	8.9%	6.5%
Four times	19.6%	10.7%	35.5%
Others	2.1%	3.6%	0
Duration			
< 30 minutes	9.3%	10.7%	6.5%
30–35 minutes	54.6%	71.4%	35.5%
36–45 minutes	14.4%	5.4%	29.0%
46 minutes to 1 hour	21.6%	12.5%	29.0%
Total number of session			
1–4 sessions	7.2%	10.7%	0
5–8 sessions	26.8%	16.1%	41.9%
9–12 sessions	20.6%	17.9%	19.4%
13–20 sessions	15.5%	16.1%	16.1%
More than 20 sessions	16.5%	19.6%	16.1%
Others (e.g., big variation)	13.4%	19.6%	6.5%

(3) child, family factors, and caseload size (55.9%). Results suggest that treatment intensity in terms of frequency (chi-square = 9.41; $df = 6$; $p = .15$), duration (chi-square = 2.08; $df = 6$; $p = .92$), and the total number of sessions (chi-square = 9.81; $df = 14$; $p = .78$) were independent of the respondents' perceived criteria.

Discussion

This study examined the treatment intensity prescribed by the SLPs in Hong Kong when managing clients with SSD and associated factors. Survey data showed that SLPs in Hong Kong were aware of various recent treatment approaches for children with SSD and would consider child- and family-related factors when determining treatment intensity for their clients. However, the results show that these clinical considerations were not related to the outcome of treatment intensity. Instead, administrative factors, including the caseload of a clinician and whether it was a public or private setting, affected treatment frequent and the duration of a session.

Large caseload in Hong Kong

SLPs always face a pressing caseload. With the heavy demand of speech therapy services in Hong Kong, SLPs encounter an even higher caseload than those reported in other countries. According to the figures reported by Dowden, Alarcon, Vollan, Cumley, Kuehn, and Amtmann (2006), SLPs serving in Washington state schools conducted "an average of 117 sessions per month" (p. 110). When compared to the data found in the present study, it appears that SLPs in Hong Kong, who conducted an average of 34.1 sessions per week, that is, ~ 136 sessions per month, have to provide relatively more clinical sessions. Given such heavy workload in the public service, a simple way to schedule sessions is to have a uniform timetable (frequency and duration) for all clients and only vary the number of sessions provided. As a result, within the public service, the severity of a child's SSD cannot impact the frequency and duration of sessions. On the other hand, self-financed private service can offer a longer session and a more frequent schedule as required by the extent of the problem and the request of the service users.

Limited research evidence

Even if SLPs know clinically that certain clients with SSD would need more intensive training, they do not have evidence-based support to plan for better service for their clients. As reviewed in the outset, current efficacy research in the area of SSD mainly focused on various treatment approaches and service delivery models (Baker & McLeod, 2011; Williams, McLeod, & McCauley, 2010) and seldom took into

account other treatment factors such as treatment intensity. Among the 132 research studies reviewed by Baker and McLeod (2011), there were a number of studies that varied treatment schedule within or between participants (e.g., Eiserman, Weber, & McCoun, 1990, 1992; Fey, Cleave, Ravida, Long, Dejmaj, & Easton, 1994; Page, Pertile, Torresi, & Hudson, 1994; Tyler & Lewis, 2005; Tyler, Lewis, & Welch, 2003; Tyler, Lewis, Haskill, & Tolbert, 2002, 2003; Tyler, Williams, & Lewis, 2006). However, the main focus of these studies was either on treatment approaches or service delivery models. The contribution of treatment intensity to treatment outcomes was not always adequately controlled for. In addition, there was a large variety of session duration (ranged from 15–270 minutes) and session frequency (ranged from 5-times per week to once per month) among these studies (Baker & McLeod, 2011). To date, the role of treatment intensity in treating children with SSD is not yet clear and the question of whether greater dose of treatment or longer direct clinical time are associated with increased rate of speech sound acquisition has yet to be explored. The limited available evidence leads to the difficulty in establishing guidelines on treatment intensity for SLPs when managing SSD. SLPs or administrators of the workplace would therefore determine the intensity based on practical factors such as caseload size.

Conclusion

The dominant factors of work setting and caseload, rather than a client's clinical need, determine treatment intensity on SSD. This has highlighted the needs of future outcome studies on how clients sharing similar profiles respond to different doses of treatment of a particular type of treatment. This piece of knowledge not only guides clinician's decision-making but also informs policy-makers on resource allocation.

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References

- Baker, E. (2012). Optimal intervention intensity. *International Journal of Speech-Language Pathology*, 14, 401–409.
- Baker, E., & McLeod, S. (2011). Evidence-based practice for children with speech sound disorders: Part 1 narrative review. *Language, Speech, and Hearing Services in Schools*, 42, 102–139.

- Brandel, J., & Loeb, D. F. (2011). Program intensity and service delivery models in the schools: SLP survey results. *Language, Speech, and Hearing Services in Schools, 42*, 461–490.
- Dowden, P., Alarcon, N., Volland, T., Cumley, G. D., Kuehn, C. M., & Amtmann, D. (2006). Survey of SLP caseloads in Washington State schools: Implications and strategies for action. *Language, Speech, and Hearing Services in School, 37*, 104–117.
- Eiserman, W. D., Weber, C., & McCoun, M. (1990). A cost-effectiveness analysis of two alternative program models for serving speech-disordered preschoolers. *Journal of Communication Disorders, 14*, 297–317.
- Eiserman, W. D., Weber, C., & McCoun, M. (1992). Two alternative program models for serving speech-disordered preschoolers: A second year follow-up. *Journal of Communication Disorders, 25*, 77–106.
- Fey, M. E., Cleave, P. L., Ravida, A. I., Long, S. H., DeJmal, A. E., & Easton, D. L. (1994). Effects of grammar facilitation on the phonological performance of children with speech and language impairments. *Journal of Speech and Hearing Research, 37*, 594–607.
- HKSAR Government. (2011). *Hong Kong – the facts*. Available online at: <http://www.gov.hk/en/about/abouthk/facts.htm>, accessed 12 March 2012.
- Law, J., Garret, Z., & Nye, C. (2004). The efficacy of treatment for children with developmental speech and language delay/disorder: A meta-analysis. *Journal of Speech, Language, and Hearing Research, 47*, 924–943.
- Page, F., Pertile, J., Torresi, K., & Hudson, C. (1994). Alternative service delivery options: The effectiveness of intensive group treatment with pre-school children. *Australian Journal of Human Communication Disorders, 23*, 61–72.
- Tyler, A. A., & Lewis, K. E. (2005). Relationships among consistency/variability and other phonological measures over time. *Topics in Language Disorders, 25*, 243–253.
- Tyler, A. A., Lewis, K. E., Haskill, A., & Tolbert, L. C. (2002). Efficacy and cross-domain effects of a morpho-syntax and a phonology intervention. *Language, Speech, and Hearing Services in Schools, 33*, 52–66.
- Tyler, A. A., Lewis, K. E., Haskill, A., & Tolbert, L. C. (2003). Outcomes of different speech and language goal attack strategies. *Journal of Speech, Language and Hearing Research, 46*, 1077–1904.
- Tyler, A. A., Lewis, K. E., & Welch, C. M. (2003). Predictors of phonological change following intervention. *American Journal of Speech-Language Pathology, 12*, 289–298.
- Tyler, A. A., Williams, M., & Lewis, K. (2006). Error consistency and the evaluation of treatment outcomes. *Clinical Linguistics & Phonetics, 20*, 411–422.
- Williams, L., McLeod, S., & McCauley, R. (Eds.) (2010). *Interventions for speech sound disorders in children*. Baltimore, MD: Paul H. Brookes Publishing.