

Appraisal in Meta-journal Hour 23

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The Paper: [An evidence-based demand management strategy using a hub and spoke training model reduces waiting time for children's therapy services: An implementation trial](#) [1]

Why was this study conducted?

Timely access to services is crucial for young children with disabilities to capitalize on optimal periods for intervention during their growth and development. Short waiting times from referral to the first appointment are highly valued by families, yet there is a common issue of long waiting lists for services such as speech therapy, occupational therapy, and physiotherapy.

Long waiting times for healthcare services often result from an imbalance between high demand and limited resources. However, addressing contributing factors can improve timely access to care. Systematic reviews highlight over 60 examples of outpatient and community health services that have successfully reduced waiting lists and improved access by implementing strategic changes in service delivery. The Specific Timely Appointments for Triage (STAT)[2] model is one such approach that combines principles such as allocating new referrals directly to protected initial appointments, combining triage and initial assessment, and service redesign to eliminate non-value adding processes.

This study focuses on the STAT model's application in paediatric community health services, addressing specific challenges such as existing waiting lists, recruitment difficulties, mixed service models, and fluctuating demand. While previous STAT model trials have been successful in adult populations, the transferability of results to paediatric therapy settings is uncertain. The primary objective of this study is to assess whether training healthcare clinicians and managers on the STAT model in paediatric community health services can lead to reduced waiting times for children seeking allied health therapy, with secondary aims including evaluating impacts on employee satisfaction, other service delivery measures, and exploring employee perceptions of model implementation.



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Why was the objective of this study?

This study primarily aimed to determine whether training healthcare clinicians and managers on the STAT model in paediatric community health services would lead to reduced waiting times for children seeking allied health therapy. Secondly, this study aimed to evaluate whether implementing STAT was associated with changes in employee satisfaction and to determine whether there were impacts on other measures of service delivery and to explore employee perceptions of implementing the model.

How was it done?

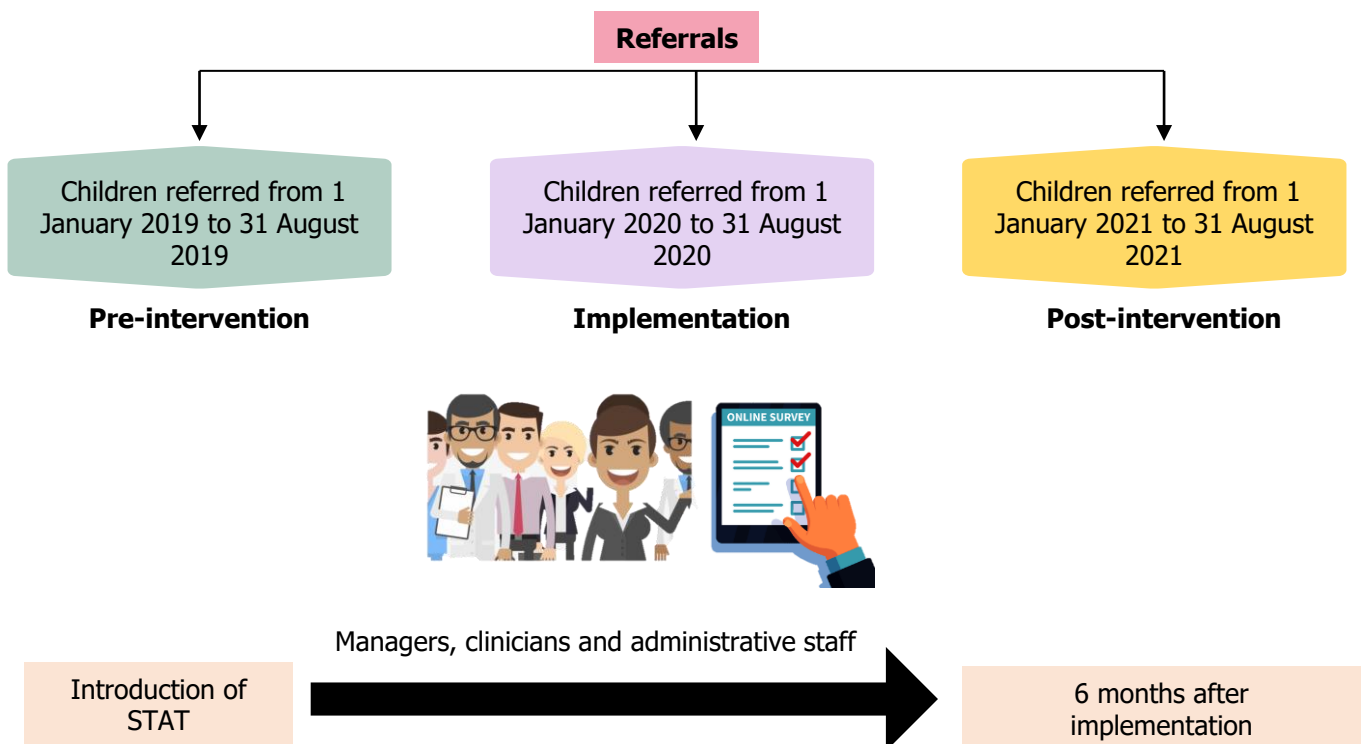
01 This study was a non-randomized intervention study

02 Service data was routinely collected for children referred to five community health centres before, during and after the implementation of the STAT model.

03 Employee surveys were completed during and after the implementation of the STAT model.

04 The study was reviewed and approved by the Eastern Health Human Research Ethics Committee and reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist.

Five participating allied health centres provided a common dataset containing routinely collected data from electronic health records for all children referred to relevant allied health disciplines from **1 January 2019 to 31 August 2021**.



- Any employee impacted by the change in service delivery was eligible to participate.
- The survey was completed anonymously, and consent was implied through the submission of the questionnaire.

How was it done?

Setting

- Allied health services centers related to physical or cognitive disabilities, disorders of speech or language, developmental delays, or concerns related to feeding or nutrition.

Intervention

- Using Specific-Timely-Appointments-Triage (STAT) model
- A principles-based model of access and triage that brings together several evidence-based strategies to improve patient flow into a step-by-step process that can be implemented methodically by health service providers.

Implementation

- The 'hub' led five 2-h synchronous online work-shops over a 6-month period in 2020.
- The five participating services each received a small grant of up to \$10 000 AUD provided by the regional health authority to support strategies to reduce the backlog of patients on the waiting list. To access this funding, each site was required to prepare a backlog reduction plan outlining how the funds would be used

Sample size determination

- It was anticipated that the participating services would each receive an average of 20 referrals per month. Data would therefore be available from a pooled sample of approximately 900 children in each time period, making the study well-powered to detect clinically significant changes in waiting time.

Clinicians scheduling a specified number of assessment appointments every week based on historical data, with the aim of having sufficient appointments to meet usual levels of demand.



New clients are immediately given the first available appointment at the time of referral for an initial assessment.



This first appointment serves a variety of purposes, including an initial assessment of the child's needs, triage for ongoing service delivery and the initiation of early advice, education, and referral to other services or treatment.



Where a child was identified as requiring the services of more than one health discipline, the first appointment would be booked with the professional appropriate for the most pressing need identified, with subsequent interdisciplinary referrals made as required.

How was it done?

Outcome Measures	Primary	Waiting time across the three time periods
	Secondary	<ul style="list-style-type: none"> Proportion of children discharged within 3 months after the first appointment (a marker of change in clinician decisions about ongoing care). Proportion of appointments not attended. Employee satisfaction was measured before and 6 months after implementation of the STAT model using the 20-item 'Satisfaction of Health Care Employees' (SHCE) questionnaire. Open-response questions about perceptions of the implementation of the model at their service. Employees were asked whether they would recommend the model to others (yes, no or unsure)
Analysis	<ul style="list-style-type: none"> Waiting time data were pooled across the centres and compared across the three time periods using a Kruskal–Wallis test. Chi-squared statistics were used for the comparison of nominal variables. Paired t-tests were conducted comparing changes in waiting time from time point 1 to time point 2, and from time point 1 to time point 3, to provide an estimate of the size of any effect while acknowledging a lack of power as a potential limitation. A total score for the SHCE survey was calculated by taking the average of items 1–18 and converting it to a score out of 100, with higher scores indicating greater satisfaction. Comments from the text response items in the follow-up survey were coded line by line and sorted into themes using an inductive approach by a single reviewer. 	

Results

Background data

A total of 2564 children participated in the study with mean age 3.2 years (2.0).

Waiting time

Waiting time across all centres **reduced by 33%** from a median of 57 for children referred to the service in the pre-intervention period, compared with 34 days for those referred during the implementation period and 38 days for those referred post-intervention.

All centres observed some reduction in waiting time from the pre-intervention to the post-intervention periods, but there was variation between sites in relation to the magnitude and trajectory of change.

Only **Centre 2 did not observe significant reduction** in waiting time at Centre 2 from 54.4 days pre-intervention to 46.0 days post-intervention ($p=0.43$).

Number of children on the waiting list

In July 2020, immediately prior to the beginning of the implementation period, there were **335** children waiting for a first appointment across the five participating services, an average of 67 (SD 25.1) per service.

In March 2021, immediately following the implementation period and backlog reduction strategy, this number had fallen to **112** (mean 22, SD 13.5, $p < 0.01$).

In July 2022, 2 years after the commencement of the study, **two of the services were continuing to operate with no waiting list**, and **three were observing some recurrence**. The total number of children waiting ($n=195$, mean 39 per centre, SD 35.8) remained **42% lower than the baseline** measure ($p=0.07$).

Discharge practices and missed appointments

The proportion of children discharged within 3 months of their first assessment **reduced** from 22% (158 of 752) to 14% (128 of 907) ($p < 0.01$) from pre- to post-intervention periods.

Results

Employee Satisfaction

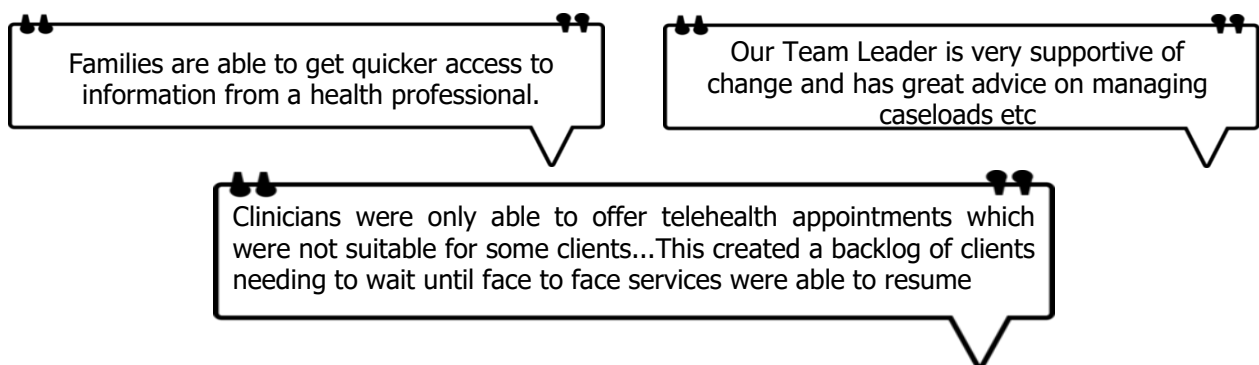
There were **no significant differences** between the characteristics of the pre- and post-intervention respondents.

When asked to rate the statement '**I would recommend this health facility to other workers as a good place to work**', there was **no significant difference between those who answered affirmatively** ('definitely yes' or 'probably yes') during the pre-intervention period (88%) compared with post-intervention (91%) ($\chi^2=0.21$, $df[1]$, $p=0.71$).

Similarly, there was no significant difference in the mean rating when respondents were asked to rate their workplace out of 10 as a place to work (7.8 pre-intervention compared with 7.1 post-intervention, $t=1.79$, $p=0.08$).

Of the 27 respondents to the post-intervention survey, 16 (59%) said that they would recommend the STAT model to others, 9 (33%) were unsure, and 2 (8%) would not recommend it

Open Response Survey



Discussion

This study focused on implementing the Specific Timely Appointments for Triage (STAT) model in paediatric community health settings to reduce waiting times for therapy services. Health professionals underwent group online workshops, and the results demonstrated a consistent reduction of approximately one-third in median waiting times, aligning with findings from previous trials. The STAT model implementation did not significantly impact failure to attend rates or employee satisfaction. Despite some implementation challenges noted by staff, the overall perception was positive for both clients and the healthcare providers.

The clinical significance of reducing waiting times for children seeking therapy services is underscored by the potential for improved outcomes in various developmental conditions. Early intervention positively influences outcomes in conditions such as autism, cerebral palsy, and speech and language disorders, impacting social engagement, academic learning, functional development, and overall well-being.

While previous STAT model trials have shown effectiveness, this study distinguishes itself by testing the impact of training healthcare employees using a practical, low-cost model that can be replicated at scale. The training approach serves as an "evidence hub," facilitating knowledge translation and providing peer support, resource-sharing, and group problem-solving. The study highlights the potential for this model's translation to other areas of evidence application and scalability to reach large, geographically dispersed audiences.

Challenges related to the COVID-19 pandemic, including lockdowns and redeployment of healthcare professionals, influenced the study's course. Despite these challenges, waiting times and waiting lists decreased, suggesting that in a more stable environment, even greater reductions could be achieved. Attention to change management strategies during implementation, such as identifying champions and maintaining communication, likely contributed to the stable employee satisfaction observed.

How much can we take out from this paper?

The non-randomised approach of the study especially in the context of the COVID-19 pandemic, introduce some limitations to the robustness of the findings. In a randomized controlled trial (RCT), participants are randomly assigned to either the intervention group or the control group, minimizing the risk of selection bias and ensuring that any observed differences are more likely to be attributed to the intervention rather than other external factors. In contrast, a non-randomized design allows participants to be allocated to the intervention or control group based on certain criteria, potentially introducing bias into the results.

Given that this study used a non-randomized design and historical controls, there is an increased risk of confounding variables influencing the outcomes. The COVID-19 pandemic, which occurred during the course of the study, created unique challenges and potential confounders. The pandemic led to two significant lockdown periods and disruptions in healthcare services, including community services, where professionals were temporarily redeployed to acute care.

These external factors could have influenced the study outcomes in ways unrelated to the implementation of the STAT model. For example, service closures, sick leave, and the shift to telehealth during the pandemic may have independently affected waiting times and waiting lists, making it challenging to attribute changes solely to the STAT model. The study acknowledges that waiting times and waiting lists decreased despite the challenges of the pandemic, suggesting the potential for even greater reductions in a more stable environment.

Besides that, the lack of demographic data and absence of a proper sample size calculation should be taken into consideration in designing a large-scale study. Although the study included a large number of subjects, a proper sample size calculation justifies sufficient statistical power to detect meaningful effects as well as to expand the ability to generalize its findings across diverse populations.

While the implementation of the STAT model showed positive outcomes, the study's design limitations emphasize the importance of cautious interpretation and the need for further research to strengthen the evidence-based effectiveness of the STAT model in reducing waiting times in pediatric therapy services.

References

- [1] Harding, K. E., Lewis, A. K., Dennett, A., Hughes, K., Clarke, M., & Taylor, N. F. (2023). An evidence-based demand management strategy using a hub and spoke training model reduces waiting time for children's therapy services: An implementation trial. *Child: care, health and development*, 10.1111/cch.13154. Advance online publication. <https://doi.org/10.1111/cch.13154>.
- [2] Harding, K. E., Lewis, A., Snowdon, D., & Taylor, F. (2018). Specific and timely appointments for triage (STAT) handbook. Eastern Health and LaTrobe University. <https://stat.trekeeducation.org/wp-content/uploads/sites/33/2020/12/STAT-Handbook-ed-2-Nov-2018.pdf>