

A Transdisciplinary Model to Improve Screening and Early Intervention within Dietetics and Speech Pathology: A Case Study

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Abstract

Background: Transdisciplinary health research and clinical practice is supported by numerous Australian health workforce documents and the broader transdisciplinary research literature. This research assessed the impact of early screening and limited intervention for nutrition, swallowing, cognition, and communication deficits in medical admissions in a large metropolitan hospital.

Methods and Findings: Validated screening tools were selected and consensus for interventions were obtained by dietetic and speech pathology disciplines. Intensive training was undertaken to familiarize staff members with the screening documents and project scope. Ethics approval was obtained. Participants included 179 patients aged ≥ 65 years admitted to the emergency department or medical unit. The project significantly reduced referral time to both disciplines, and time to full assessment in dietetics but not speech pathology. Results found 43% of patients were malnourished or at risk of malnutrition, and 14 patients had oral intake ceased due to swallowing difficulties.

Conclusions: This study has demonstrated that transdisciplinary screening and intervention may work within dietetics and speech pathology, providing an innovative extension to practice. Further alternatives using this model include the use of allied health assistants or less-experienced clinicians, while opportunities exist for transdisciplinary practices within other healthcare disciplines.

Keywords: Transdisciplinary; Dietitian; Speech pathologist; Screening; Early intervention; Workforce

Introduction

Transdisciplinary research has been described as “the strongest form of cross-disciplinarity since it involves integrating two or more disciplines to produce novel, integrated hybrids of ideas, theories, and methods. Moreover, a distinguishing feature of transdisciplinary collaboration is the creation of a shared conceptual model or framework for analyzing the problem at hand, which transcends the individual disciplinary perspectives of each team member. Transdisciplinarity, thus, may provide a more comprehensive perspective for improving ... research and prevention efforts” [1, p. 1459]. Transdisciplinary research and clinical practice has been described in several domains of healthcare [2-5] with authors largely supporting the paradigm to extend linkages between and beyond healthcare.

Two key documents provide strategic direction for the health workforce in Australia, where many people will need healthcare over the coming years—the National Health Workforce Strategic Framework [6] and the National Health Workforce Innovation and Reform Strategic Framework for Action 2011–2015 [7]. Both documents include various strategies that support transdisciplinary approaches to clinical practice. For example, the former suggests that:

to make optimal use of workforce skills and ensure best health outcomes, it is recognised that a complementary realignment of existing workforce roles or the creation of new roles may be necessary. Any workplace redesign will address health needs, the provision of sustainable quality care and the required competencies to meet service needs. [6, p. 15]

In addition, the latter states that it is necessary to “reform health workforce roles to improve productivity and support more effective, efficient and accessible service delivery models that better address population needs” [7, p. 16]; specifically, it suggests the need to “increase the productivity and retention of the existing workforce and enable all current health disciplines to work to their full or extended scope of practice, including options to better utilise the assistant and support workforce” [7, p. 17].

A four-phase model for transdisciplinary research has been proposed by Hall et al. [8]. The development phase of this model uses relevant expertise from each group member to define the scientific problem, whereas in the conceptualization phase, team members develop research questions and the research design. Within the implementation phase, the research is conducted, with research findings applied within the translation phase.

This research explored the use of a transdisciplinary approach to screening in two of the smaller allied health disciplines—dietetics and speech pathology—including all four phases of the Hall et al. model [8]. Specifically, the research aimed to assess the impact of early screening and intervention for nutritional, cognitive, communication, and swallowing deficits in medical admissions to a large metropolitan Melbourne hospital. Funding for the project was received from the Victorian Department of Health to explore and implement innovative transdisciplinary practices within the allied health professions into the clinical setting.

Issues with screening implementation across the clinical domains of dietitians and speech pathologists, particularly for malnutrition and dysphagia identification, have been documented elsewhere [9-11]. Challenges to implementing nurse-led nutrition screening have included organizational culture, competing priorities, the value of clinical judgement, training and education, and discrepancy between attitudes and practice [9], although nurse-led screening, particularly for dysphagia, is widely implemented in the United States [11]. Practice at the study hospital prior to this project involved speech pathologists and dietitians working only on weekdays to provide specialist allied health assessment and treatment planning. No service existed for either discipline at the hospital on the weekends, with patients waiting until the clinicians’ next working day. The absence of a screening process delayed patient access to specialist speech pathology and dietetic care, potentially increasing patient length of stay.

We therefore aimed 1) to develop and implement a screening tool suitable for use both by dietitians and by speech pathologists that would allow them to accurately identify patients at risk of malnutrition (dietetics) as well as swallowing, communication, and cognitive difficulties (speech pathology); 2) to develop and

implement a training package for dietetics and speech pathology clinicians to administer the screening tool and limited clinical intervention usually within the scope of practice of the other profession; and 3) to screen patients admitted under the general medical stream for deficits relating to nutrition, cognition, communication, and/or swallowing. As a direct result of implementing the screening and early intervention initiative, the following changes to referral and intervention patterns were anticipated:

1. The length of time from admission to referral for speech pathology and/or dietetics will decrease.
2. The length of time from admission to intervention by speech pathology and/or dietetics staff will decrease.
3. The number of patients referred to speech pathology and/or dietetics for intervention will increase.

Methods

There were multiple phases to this project and hence the methods used were diverse. Phases included the development of the screening tool package, development and implementation of training materials to support the project implementation, collection of pre-audit data, and data collection of the main study. Ethics approval was obtained from the health network ethics committee, approval number LR46/1011.

Discipline representatives worked independently and collaboratively to choose screening methods that were well known and validated. Screening tools with high internal consistency and high test-retest reliability were sought where possible. The screening package used for the research had five components:

- MST – malnutrition screening tool [12]
- BNVR – cognitive assessment [13]
- RUDAS – cognitive assessment [14]
- ASSIST – acute screening of swallow in stroke/TIA [15]
- WAB-R – communication/language impairment [16]

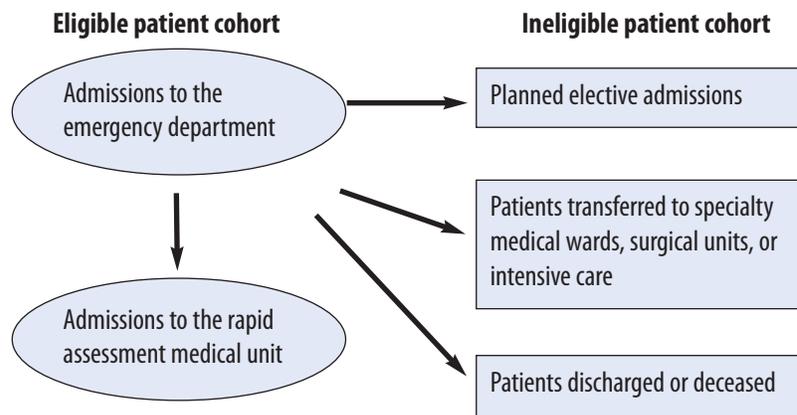
A flowchart for a first-line intervention was developed for use by study clinicians and is included as Appendix 1. Transdisciplinary consensus was obtained for these early interventions, including the dietitian ceasing the patient's oral intake of food or fluids if the patient had sub-optimal results on the speech pathology screens, and speech pathology commencing high-energy diets for patients identified with, or at risk of, malnutrition. This was an extension of traditional practice for both disciplines, enabling staff members conducting the screens to respond to the dietetics/speech pathology situation that arose from the screening process. It provided a timely response and decreased risk for patients involved in the study.

Senior clinical staff from both disciplines developed a training package to incorporate all aspects of the study protocol. Two clinicians (one dietitian and one speech pathologist) were appointed to conduct the transdisciplinary study. The training packages were delivered to both clinicians simultaneously over one day. The study was conducted on both weekend days over a six month period. In order to establish

interrater reliability with the suite of screening tools chosen, both staff members assessed three patients independently on one day.

Participants were triaged to the general medical stream who were over 65 years of age, deemed competent to give consent, and who were able to participate without the need for an interpreter. In addition to these inclusion criteria, patients were excluded if they were considered too acutely unwell to participate. All prospective participants were provided with an explanatory statement, and verbal consent obtained. Patients were screened during the early stages of their admission, either in the emergency department or in the rapid assessment medical unit. Patients triaged to the medical stream were those not requiring admission to specialty medical units (renal, oncology, etc.), surgical units, or intensive care. A broad range of diagnoses and co-morbidities may be included across this case mix. Due to the convenience sampling method chosen, we were unable to determine whether the study sample was representative of all patients admitted within this stream. Figure 1 details eligible and ineligible patients.

Figure 1
Flowchart of eligible and ineligible patients in the dietetics and speech pathology transdisciplinary research



All data were entered into a Microsoft Excel spreadsheet. Statistical analysis was performed to reject/accept the null hypotheses using PASW Statistics 18.0 [17]. Independent samples t-tests were applied, with Levene’s test for equality of variances calculated. Significance was determined where $p < .05$. The project has considered and reported within the guidelines of the SQUIRE framework for quality improvement studies in healthcare [18].

Results

A total of 179 patients were screened during the data collection period (69 emergency department and 110 general medical unit screens), with an average age of 80.6 ± 7.6 years across all participants. This study identified 54 patients for referral to speech pathology and 77 patients to dietetics for specialized assessment. Demographic information regarding participants is included in Table 1. All patients who were invited agreed to participate, with 161 participants (90%) completing all

aspects of data collection. In addition, 100% agreement between clinicians across all screening tools was established through independent assessments on three patients.

Table 1
**Demographic information of participants
in the transdisciplinary project**

Demographic information	Results
Total number of screens conducted	179; 82 (45.8%) were males
Screening location	69 emergency department 110 rapid assessment medical unit
Age	80.6 ± 7.6 years

A malnutrition prevalence of 24% was identified in the participants studied, with a further 19% of participants at risk of malnutrition. Fifteen patients (9%) failed both cognitive tests and were referred for additional speech pathology assessment and treatment. Furthermore, 14 patients failed the ASSIST screen [12] and were placed nil by mouth as a result. These results are highlighted in Table 2. Also, cognitive impairments were identified in 47 patients (of 169 participants who completed these tests, i.e., 27.8% of the study cohort), who also benefited from further cognition assessment.

Table 2
Screening results of the transdisciplinary research

Screening tool	Total number of participants completing this screen component	Results
MST – malnutrition screening tool	178	0-1 (not malnourished or at risk) – <i>N</i> = 101 patients (57%) 2 (at risk of malnutrition) – <i>N</i> = 34 patients (19%) ≥3 (malnourished) – <i>N</i> = 43 patients (24%)
BNVR – cognitive Assessment	168	8-10 pass – <i>N</i> = 153 patients <8 fail (further assessment for possible cognitive impairment needed) – <i>N</i> = 15 patients
RUDAS – cognitive assessment	169	>22 pass – <i>N</i> = 122 patients ≤22 fail (further assessment for possible cognitive impairment needed) – <i>N</i> = 47 patients
ASSIST – acute screening of swallow in stroke/TIA	174	1 = pass – <i>N</i> = 160 patients (92%) 9 = fail – <i>N</i> = 14 patients (8%)
WAB-R – communication/ language impairment	161	Screen examined aspects of a patient’s expressive and receptive language. Poor performance on any of the 8 subtests indicated further speech pathology assessment was needed.

Table 3

**Average time taken from admission to referral
in the transdisciplinary research**

Discipline	No. of participants pre-test ¹	Average time from admission to referral pre-test (hours) ± SD	No. of participants post-test ²	Average time from admission to referral post-test (hours) ± SD	Results ²
Speech pathology	38	46.7 ± 76.8	52	14.2 ± 7.0	$t = 2.601$ $p = 0.01$
Dietetics	26	84.0 ± 93.1	68	14.2 ± 7.0	$t = 3.815$ $p = 0.001$

1 = Data for the pre-test were collected during usual business hours, not over weekends.

2 = Results were calculated using independent *t*-tests and applying Levene's test for equality of variances.

Table 4

**Average time taken from admission to intervention
in the transdisciplinary research**

Discipline	No. of participants pre-test ¹	Average time from admission to intervention pre-test (hours) ± SD	No. of participants post-test ²	Average time from admission to intervention post-test (hours) ± SD	Results ³
Speech pathology	38	58.3 ± 84.4	39	72.6 ± 37.3	$t = -0.97$ $p = 0.33$
Dietetics	22	118.1 ± 98.2	31	74.2 ± 29.2	$t = 2.035$ $p = 0.05$

1 = Data for the pre-test were collected during usual business hours, not over weekends.

2 = Number of patients for speech pathology and dietetics from admission-referral to referral-treatment due to many patients discharged before clinicians could provide assessment, and some missing data.

3 = Results were calculated using independent *t*-tests and applying Levene's test for equality of variances.

Screening results of the transdisciplinary research Tables 3 and 4 include the statistical analyses for the time differences pre/post-test for both disciplines for the period from admission to referral and admission to full clinical assessment. The transdisciplinary research made a significant difference in reducing time from admission to referral for both disciplines. Additionally, the time from admission to intervention was significantly reduced for dietetics.

There was an increase in referrals to both departments as a result of this project, with 54 additional referrals to speech pathology and 77 additional referrals to dietetics over the six-month study period, of which some may have been referred via pre-existing referral pathways.

Discussion

The transdisciplinary research undertaken within dietetics and speech pathology has shown many benefits for working beyond the scope of practice of these two disciplines.

All project aims were fulfilled, with many patients receiving the screening and early intervention offered within the scope of the study. This research identified that 43% of patients screened were malnourished or at risk of malnutrition. Malnutrition is well known to have serious health outcomes, including increased risk of complications and infections, decreased response and/or tolerance to treatment, decreased quality of life and life expectancy, and increased use of medications, length of stay, and readmission rate. The importance of nutrition screening has been well defined by accreditation bodies in healthcare at national levels [19]. With nutrition screening usually conducted by allied health assistants or nursing staff in isolation from communication, cognition, and swallowing, this transdisciplinary research has provided an opportunity to extend the scope of practice for staff members of both disciplines.

With respect to the speech pathology outcomes, 14 patients had reduced clinical risk through early identification of swallowing difficulties leading to early intervention. These patients may have been at clinical risk had they continued to consume food and fluids. There was a significantly reduced time from admission to treatment within dietetics but not in speech pathology, limited by the staffing capacity within the department and other competing priorities.

Limitations of the research included the convenience sampling of participants, as opposed to a series of consecutive admissions, which was beyond the capacity of the project staffing. The screening tools chosen were nationally and internationally used; however, transferability of study findings are limited by the tools selected. Staffing was one of the challenges posed by the current study, with only two staff specifically recruited and trained in the research protocol. Ideally, the staffing pool would be expanded for further transdisciplinary research and clinical practice. Clinical diagnoses were not recorded, although these may have expanded our understanding of where screening was most needed. Additionally, a cost-effectiveness/economic analysis was not undertaken, and this would have strengthened the interpretation of study findings. One further limitation is the absence of a control group due to the pre-post study design. An alternate study design incorporating a control group may have strengthened study outcomes and enabled greater translation of study findings.

This research showed that transdisciplinary screening and limited early intervention by dietitians and speech pathologists was able to be implemented with differing results. The ability for both professions to conduct transdisciplinary screening and to offer first-line intervention provides opportunities for healthcare facilities where access to both dietetics and speech pathology staffing across weekends is not available. This project has provided an opportunity to extend the scope of practice of both disciplines. The project would be reproducible in its current form, with high interrater reliability recorded. However, more efficiencies and opportunities may be created through the training and rollout of a similar project by credentialed allied

health assistants or less-experienced clinicians. Further work would be required to explore these models before either could be endorsed for implementation.

Furthermore, the success of this research suggests that there may be many opportunities for transdisciplinary approaches to be used within allied health and other health disciplines, supporting the strategic direction proposed in workforce planning models. Further research will tell.

Acknowledgements

I acknowledge the contributions of staff at Box Hill Hospital, particularly Melissa Berryman, Vicky Cooper, Claire Trevorrow and Danielle Czapnik, and all patients who consented to participate in this study. I would also like to thank the Dietetics Department, Eastern Health, as well as the Department of Nutrition & Dietetics, Monash University, for their support to undertake this research.

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