Engaging patients in their nutrition care using technology: The NUTRI-TEC study

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Background: Hospital malnutrition

- Affects 20–50% of hospitalized patients\(^1,2\)
- Serious consequences for:
  - Patients: ↑mortality, complications (infection, pressure injury, falls)\(^3-5\)
  - Hospitals: ↑LOS, readmissions, hospital costs\(^6,7\)
- Inadequate dietary intake = major modifiable risk factor
  - Majority of patients fail to meet nutrition needs in hospital\(^8,9\)
  - Interventions to improve dietary intake are needed
- Patient participation can improve dietary intakes in hospital\(^10,11\)
Background: Patient participation in care

• Core concepts\textsuperscript{12}
  1. Meaningful knowledge/information exchange between patient & clinician
  2. Mutual engagement in health care activities & decisions
  3. Surrendering of some power/control by clinicians
  4. Trusting and respectful relationship between patient & clinician

• Australian Commission on Safety and Quality in Health Care national standard\textsuperscript{13}; endorsed by WHO\textsuperscript{14}, Joint Commission\textsuperscript{15}
• Improves patient outcomes, satisfaction, safety\textsuperscript{16,17}
• Improves nutritional intake among hospital patients\textsuperscript{10,11}
Overall aim

Develop, implement and evaluate a patient-centred intervention to engage patients in their nutrition care, for improving their dietary intakes in hospital.
PhD research: paper-based intervention

Patient education

Self-monitoring (and feedback)

Goal-setting

Pilot study findings:
✓ Feasible
✓ Likely to be effective
✓ Acceptable
The next phase

Using technology
To engage patients in their nutrition care
Adapting intervention to new technology
KNOWLEDGE TO ACTION (K2A) FRAMEWORK

Adapting intervention to technology

- Literature review$^{18}$
- Usability testing (patients)$^{19}$
- Interviews$^{19,20}$ (patients and staff)
- Intervention design$^{21}$
- Pilot intervention$^{22,23}$
Realist review
14 studies included
5 features of successful interventions engaging hospital patients in their care

Patient usability testing & interviews
n=32 patients included
Feedback on user interface / usability

Staff interviews
n=32 patients included
Considerations for use in practice

Intervention design
Co-design, theories, frameworks
NUTRI-TEC interface
Feasibility study

NUTRI-TEC intervention tested with real hospital patients

4 wards:
• Orthopaedic
• Renal
• Respiratory
• Vascular/medical

Patients:
✓ Able to consent
✓ At nutritional risk
✓ Expected LOS ≥4 days from recruitment

Gold Coast University Hospital

Intervention:

Initial session (day 1):
Education on meeting requirements
Training on how to use program

Daily review sessions:
Review dietary intake / goals
Select strategies to ↑ intake
Feasibility study continued

n=49

55% male; median age 71 (65–78) years, LOS 10 (7–14) days; mean BMI 27.7±7.6, 37% malnourished (SGA)

Feasibility

✓ Intervention delivery (100%)
✗ Recruitment (31%), retention (69%)

High patient satisfaction & engagement ✓

Trend for improved dietary intakes ✓
Feasibility study continued

Research assistants (RAs) collected dietary intake via direct observation.

Patient-recorded intakes (via Delegate) correlated strongly with RA-collected intakes.
### Feasibility study

**Patient interviews**

## High acceptability of NUTRI-TEC

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-themes</th>
<th>Example quotes</th>
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</thead>
<tbody>
<tr>
<td>Using NUTRI-TEC</td>
<td>High satisfaction and value</td>
<td>“I really enjoyed it, it’s very beneficial… very educational.” P4</td>
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<td>“I liked using the program. I would like to use it at home every day, because it means I would know I was getting the nutrition…” P7</td>
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<td>Good usability</td>
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<td>“I don't think you can get much simpler than that, really.” P5</td>
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<td>Human interaction</td>
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<td>“[The dietitians] explain everything, and I value their input, and I’ve been able to respond to that.” P6</td>
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Original article

Hospital patients’ perceptions of using a technology-based intervention to participate in their nutrition care: A qualitative descriptive study

## Feasibility study

### Patient interviews

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<tr>
<td>The spectrum of participation in nutrition care</td>
<td>Learning and awareness</td>
<td>“Self-education was a plus… you learn what the value of your meals are… what protein and energy are all about and looking at your food… it should be taught.” P5</td>
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<td>Evaluating and monitoring</td>
<td>“Well it was interesting yes, I was surprised to find out I was only eating 60% of what I should be.” P2</td>
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<td>“The chart would have shown with the levels… if they weren’t going up as high…then I would be like, well something here is not right. I need the right stuff to give me energy. So yeah, that was helpful.” P1</td>
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<td>Changing behaviour</td>
<td>“It makes you want to stay on track.” P7</td>
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<td>“If there’s some reason why your energy or your protein is sort of haphazard, well it gives you the opportunity to work it out between you both [patient and dietitian], and what we are going to do to improve it.” P11</td>
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Next steps

- Evaluate NUTRI-TEC in a RCT to determine clinical effectiveness for improving:
  - Energy and protein intakes
  - Malnutrition-related adverse events
  - Patient-centred outcomes (QoL, functional outcomes); and
  - Cost-effectiveness vs. standard care
- Pilot study of technology-assisted, patient-led malnutrition risk screening (eMST)
Expected outcomes and considerations

Expected outcomes / benefits

• ↑ Energy & protein intakes
• ↑ Patient outcomes
• ↓ Malnutrition & related events
• ↓ Hospital costs
• ↑ Staff time savings
• Streamlined nutrition care

Practice considerations

• Not for all patients
• Target patients most likely to benefit for best outcome
• Engage family members where possible
• Potential for tracking other nutrients & BYOD
• Transitions back home ??
THANK YOU
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References


References


