Validation and Discrimination Analysis of a Novel Patient Satisfaction Questionnaire for Preoperative Fasting in Cataract Surgery

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Introduction

• Pre-operative fasting is routinely performed to prevent anaesthesia-related pulmonary aspiration.
• The process of fasting before surgery may cause patient discomfort.
• Fasting guidelines:
  • Nil per os (NPO) after midnight: traditionally used in cataract surgery, or
  • 6 hours of fasting for light meals, 2 hours for clear liquids: latest guidelines by the American Society of Anesthesiologists (1).
• A randomized controlled trial has been proposed comparing patient experiences and safety outcomes of these two guidelines (NCT03828500).
• For this trial, a questionnaire to measure fasting-related burden is needed.

Purpose: We report on the development and psychometric validation of the first questionnaire to measure patient fasting-related burden in cataract surgery. We also assess this questionnaire’s ability to discriminate between participants with a short versus long duration of fasting and early versus late day surgery.

Methods

Design: Prospective observational study.
Subjects: Consecutive sampling of cataract patients on the surgery day at the Kensington Eye Institute in Toronto, Canada was conducted from February to December 2019.
Methods: A questionnaire evaluating demographics and fasting-related burden was administered.

1) Questionnaire development: An iterative process of questionnaire development was conducted with expert investigators and patients. Once concluded, validation and psychometric evaluation was performed with Rasch analysis.

13-Item Questionnaire Structure

- Five iterations of questionnaire development were completed with 186 cataract patients and 10 study investigators.
- Rasch analysis of the 13-item questionnaire demonstrated acceptable psychometric properties except issues with redundancy of items on the person-item map, mistargeting and multidimensionality.
- Thus, 13 separate re-analyses were conducted with removal of certain items.
- One 6-item subset (Figure 1) demonstrated excellent psychometric properties:
  - Ordered category thresholds
  - Acceptable item calibration, fit
  - Acceptable targeting
  - Unidimensionality
  - No redundancy of items
  - Adequate precision (ability to distinguish between low and high burden from fasting)
  - No differential item functioning

2) Discriminative ability was assessed by comparing questionnaire responses in patients belonging to various groups:

<table>
<thead>
<tr>
<th>Surgery in Morning (8:00am-12:00pm)</th>
<th>Surgery in Afternoon (12:00pm-3:30pm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting for Short Duration (&lt;8 hours)</td>
<td>Fasting for Long Duration (&gt;8 hours)</td>
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</table>

3) Diagnostic ability of the 6-item questionnaire relative to the original 13-item questionnaire was assessed with a receiver operator curve (ROC) analysis. Mean logit score on the 13-item questionnaire was chosen as a cutoff to define patients’ burden status (at mean or above = ‘not having burden’; below mean = ‘having burden’).

Results

A 6-item questionnaire with items on hunger, thirst, hoarseness, weakness, anxiety, and nausea is a psychometrically robust measure of fasting-related burden. It has excellent discriminative ability between early versus late surgery patients.

• The time fasting while awake may be a more relevant predictor of fasting-related burden relative to the total duration of fasting.
• The 13-item questionnaire does not provide additional unique information relative to the 6-item variant.
• Future studies should aim to assess the questionnaire’s performance and validate our findings in other populations.

Conclusions

References