Identifying the Factors Influencing Patients' Telehealth Visit Satisfaction: Survey Validation Through a Structural Equation Modeling

April 14th, 2022 12p ET

From the Abigail Wexner Research Institute
Nationwide Children’s Hospital

Mounika Guntu, PharmD, MHI
Data scientist

Deborah Lin, PhD
Project Scientist

Emre Sezgin, PhD
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Yungui Huang, PhD
Director

Moderator: Jen Goldsack
CEO
DiMe
But first, housekeeping

• Please note today’s session is being recorded
• To ask a question for discussion during Q&A, please:
  • Either ‘raise your hand’ in the participant window and moderator will unmute you to ask your question live, or
  • Type your question into the chat box
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Virtual Journal club

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Information Technology Research & Innovation
The Abigail Wexner Research Institute
Nationwide Children's Hospital
Agenda

1. Introduction
2. Aims of the study
3. Study setting
4. Methods
5. Results
6. Principal findings and takeaways
7. QnA
NCH Telehealth Rollout (first 6 weeks since mid March)

+55
Number of Clinics Live

49,262
Telehealth Encounters Completed

55% by video*

45% by telephone*

*Approximate values

Telehealth Visit Volume by Service Line

- Behavioral Health 47%
- Other 23%
- Neurology 3%
- Gastroenterology 3%
- OT 3%
- PT 3%
- Primary Care 5%
- Speech 13%
2020 Telehealth Visits by Month

2020 Telehealth Visits by Area

2020 Percent of Telehealth Visits
Timeline for Survey Development

1. Form Working Group
2. Literature & conceptual model review
3. Assess the current status of surveys
4. Assess survey distribution methods
5. Define technical implementation steps
6. Preliminary validation of the content and revision
7. Presentation to leadership
8. Approved survey for implementation
9. Regular communication to stakeholders and clinical teams

Note: Survey Design Activities
Related Implementation Activities
Patient Satisfaction Survey Design

Existing Ambulatory Patient Survey

Assurance
- I understand the plan of care
- Given home care instructions
- Staff was polite and kind

Empathy
- Easy to schedule appointment
- Included in the health care decision
- Care is important to the staff

Reliability
- Provider able to diagnose and treat
- Care comparison w/ in-person visit

Responsiveness
- Informed of long wait if I had any
- Needs met promptly

Other Information:
- Barriers
- Language
- Device
- Comments

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Technology Acceptance Model
- Check-in process
- Quality of the video
- Access of care
Survey Implementation

1. Telehealth Encounter
2. Survey Sent through MyChart
3. Survey Complete on REDCap
4. Satisfaction Dashboard
5. Research + QI

Data Warehouse

Instruments:
- MyChart
- REDCap
- Zoom
- Epic
### Survey Response Rate

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>~ 6 months</td>
<td>7 July, 2020 to 4 Jan, 2021</td>
</tr>
<tr>
<td>163,477</td>
<td>Total telehealth visits</td>
</tr>
<tr>
<td>36,360</td>
<td>Total unique patients</td>
</tr>
<tr>
<td>72,311</td>
<td>Number of survey links sent out</td>
</tr>
<tr>
<td>6,189</td>
<td>Number of survey opened</td>
</tr>
<tr>
<td>5,013</td>
<td>Number of completed survey</td>
</tr>
<tr>
<td>3977</td>
<td>Unique patients completed survey</td>
</tr>
<tr>
<td>8.6%</td>
<td>Survey response rate</td>
</tr>
</tbody>
</table>
Survey participant demographics

- Mean age: 10.28 years
- 95.9% English
- 1.8% Spanish
- 2.3% Others
- 8.4% Patient
- 85.4% Parent
- 6.2% Other Guardian

Race:
- White, 75%
- Black or African American, 12%
- Asian, 3%
- Unknown, 2%
- Multiple race, 7%
- Others, 1%

Gender:
- 52.7% Male
- 47.3% Female

Location:
- 97.1% Ohio
Patient experience of telehealth

- The staff was polite and kind: 96%
- Care is important to the staff: 76%
- Given home care instructions: 96%
- Included in the health care decisions: 76%
- Needs were met promptly: 96%
- Overall telehealth experience was positive: 96%
- Understand the plan of care: 76%
- Satisfied with the quality of the video connection: 96%
- It was easy to schedule my appointment: 76%
- I was happy with the check-in process: 96%
- Provider able to diagnose and treat condition: 96%
- Telehealth improves my access to healthcare services: 76%
- Informed of long wait time: 96%
- If given the option, I would use video visits in future: 76%

*N = 3,977 patients*
To extract relevant dimensions as factors we used exploratory factor analysis (EFA).

A high KMO index (0.94) and a significant Bartlett’s statistic (Bartlett's K-squared = 3279, p-value = <0.05) - suitability for factor analysis.

Scree plot and parallel analysis indicated that our items correspond to 3 unobserved factors (constructs).

Minimal Residuals (MINRES) with Direct Oblimin rotation approach was used for factor extraction.

Items with factor loadings greater than 0.30 and Cronbach’s alpha > 0.6 were considered acceptable.

Removed one item (“Informed of long wait time”) as the factor loading was below cutoff.
## Exploratory Factor Analysis - Results

<table>
<thead>
<tr>
<th>Factors</th>
<th>Loading</th>
<th>Cronbach alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1 - Perceived quality of service</strong></td>
<td></td>
<td>0.93</td>
</tr>
<tr>
<td>Q4: My or my child's needs were met promptly.</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td>Q5: The provider was able to diagnose problems and treat my or my child's condition</td>
<td>0.71</td>
<td></td>
</tr>
<tr>
<td>Q6: I understand the plan of care which includes why tests and procedures are needed.</td>
<td>0.90</td>
<td></td>
</tr>
<tr>
<td>Q7: I feel that I was included in the health care decisions.</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>Q8: I was given home care instructions and able to ask questions.</td>
<td>0.84</td>
<td></td>
</tr>
<tr>
<td>Q9: I know my care and/or my child’s care is important to the staff.</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>Q10: The staff was polite and kind.</td>
<td>0.64</td>
<td></td>
</tr>
<tr>
<td>Q15: Overall my needs were met. I would recommend others to Nationwide Children’s Hospital</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>Factors</td>
<td>Loading</td>
<td>Cronbach alpha</td>
</tr>
<tr>
<td>----------------------------</td>
<td>---------</td>
<td>----------------</td>
</tr>
<tr>
<td><strong>Factor 2 - Telehealth satisfaction</strong></td>
<td></td>
<td>0.83</td>
</tr>
<tr>
<td>Q11: I was satisfied with the quality of the video connection during the visit.</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>Q12: Telehealth improves my access to healthcare services.</td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td>Q13: My overall experience with NCH telehealth was good.</td>
<td>0.56</td>
<td></td>
</tr>
<tr>
<td>Q14: If given the option, I would use video visits for future appointments.</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 3 - Admission process</strong></td>
<td></td>
<td>0.67</td>
</tr>
<tr>
<td>Q1: It was easy to schedule my appointment.</td>
<td>0.58</td>
<td></td>
</tr>
<tr>
<td>Q2: I was happy with the check-in process for my appointment.</td>
<td>0.76</td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Factors

- **Admission Process**: The subjective experience of the admission process that precedes receiving healthcare.

- **Perceived Quality of Service**: Patient/family's assessment of the overall excellence of the service.

- **Telehealth Satisfaction**: Positive attitudes towards the use and value of telehealth.
Hypothesis Development

- HP1: Admission Process positively influences Perceived Quality of Service.
- HP2: Admission Process positively influences Telehealth Satisfaction.
- HP3: Perceived Quality of Service positively influences Telehealth Satisfaction.
 Confirmatory Factor Analysis

- To confirm dimensionality of the EFA results and provide evidence of construct validity by facilitating assessment of item loadings and overall model fit.
- Items that have standardized loadings at or above .30 in the CFA are suggested to be retained.
- The results of the CFA indicated that the model fit well.
Partial Least Squares – Path Modeling (PLS-PM) method to understand the interplay between our defined factors and to test our hypotheses.

**Measurement model:** To describe the relationship between the factors/constructs and their block of items.

**Structural model:** To identify relationships between the constructs and focused on estimating the path coefficients.

We implemented the Path model with a 500-bootstrap sampling and obtained path coefficients and t-statistics values to evaluate the relationships between variables.
Partial Least Squares Path Model
## Hypothesis tests

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Relation</th>
<th>Direct Effect</th>
<th>Indirect Effect</th>
<th>Total Effect</th>
<th>T value</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP1</td>
<td>Admission process — Perceived quality of service</td>
<td>0.67</td>
<td>0.00</td>
<td>0.67</td>
<td>36.1</td>
<td>Supported</td>
</tr>
<tr>
<td>HP2</td>
<td>Admission process — Telehealth Satisfaction</td>
<td>0.16</td>
<td>0.45</td>
<td>0.61</td>
<td>7.46</td>
<td>Supported</td>
</tr>
<tr>
<td>HP3</td>
<td>Perceived quality of service — Telehealth Satisfaction</td>
<td>0.67</td>
<td>0.00</td>
<td>0.67</td>
<td>31.8</td>
<td>Supported</td>
</tr>
</tbody>
</table>
• Admission process, as the first step of telehealth visit, influences the remainder of the experience of the telehealth visit, including the quality and eventual satisfaction of telehealth visits.

• This finding indicates the importance of user interface and human-computer interaction, as it may influence healthcare delivery and satisfaction.

• Therefore, patient-provider engagement should be assessed with patient system engagement to better understand telehealth satisfaction.

• Clear guidance for virtual visits and an intuitive interface can help to streamline this process.
Limitations

• Some questions kept from previous internal surveys were double-barreled, which introduced ambiguity.
• The trade-off for a generalizable survey is that the questions may not be tailored for certain clinical service lines.
• We used a single telehealth platform which makes it easier. Organizations using multiple platforms may need additional software specific considerations.
• Not on diverse population and specialties.
• The retention of most of the items from the in-person patient satisfaction survey for historical comparison, and the need to keep the questionnaire short, also limited our ability to use items in validated instruments.
Acknowledgement

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  • Megan Gregory
• NCH IS
  • Sirina Lu
• Data Resource Center
  • Zachary Gray

For further questions and comments, please contact: Mounika.Guntu@nationwidechildrens.org
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