Overview

Objective

- After this session, attendees will have an understanding of usability issues involved in assessing and providing services to individuals with autism spectrum disorders and other cognitive disabilities

Outline

I. ASERT
II. CSEP
Autism Service, Education, Research, and Training (ASERT)

- A collaborative network of providers of comprehensive, high-quality, state-of-the-art diagnostic assessments, research, education, and training programs
- The RERC TR has supported ASERT in delivering services using VISYTER and the TR portal, specifically delivering an adult autism assessment, the Autism Diagnostic Observation Schedule (ADOS) Module 4, remotely.

Autism Spectrum Disorders

- ASDs are usually diagnosed in early childhood
  - Behavioral observation
  - Developmental history
Autism Diagnostic Observation Schedule

- The ADOS is part of the gold standard in ASD diagnosis
- ADOS training opportunities are relatively limited and potentially difficult to access

- Proposed Solution: Remote ADOS Module 4 administration system

ADOS Module 4

- Adolescents/adults
- Verbally fluent
- 10-15 activities with focus on behaviors important in the diagnosis of ASD
- Cutoff scores for both a narrow diagnosis of Autism and a broader diagnosis of PDD
Versatile and Integrated System for Telerehabilitation (VISYTER)
Figure 5

Screenshot of the Autism Diagnostic Observation Schedule module 4 remote administration system, clinician view.

ADOS Algorithms for DSM-IV/ICD-10 Autism Diagnosis

Participant ID: [Redacted]
Gender: Male
Date of Birth: October 06, 2009
Chronological Age: 3
Date of Evaluation: November 04, 2009
Examiner Name: [Redacted]

Communication

Unrestricted/Learning Use of Words or Phrases (A-F)
Conversation (B-F)
Description, Novelty, Instrumental, or Informational Gestures (A-L)
Dagmatic or Emotional Gestures (A-L)

Nonverbal Social Interaction

Arousal (Eyes Open) (A-L)
Facial Expression Directed at Others (A-L)
Inappropriate Expressions on Others’ Faces (A-L)
Interpersonal Responsiveness (A-L)
Quality of Social Interests (A-L)
Quality of Social Response (A-L)
Amount of Reciprocal Social Communication (A-L)

Social Interaction Total

[Screen showing ADOS data collection interface]
Aim 1: Develop remote ADOS Module 4 Administration System
Aim 2: Assess fidelity to standard administration

FORMATIVE REMOTE USABILITY STUDY

Participants

- Clinically trained ADOS administrators
- At least one year experience administering the ADOS Module 4
Methods

• Cognitive Walkthrough Usability Inspection
  – Introduction to the system
  – Mock ADOS Administration
  – IBM Post-Study System Usability Questionnaire

Results

• Development and Clinician Usability
  – All possible usability problems and suggestions were analyzed to create a list of modifications, sorted by the severity of the problem
  – PSSUQ results

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Usefulness</td>
<td>1.29</td>
<td>4.00</td>
<td>2.23</td>
<td>1.11</td>
</tr>
<tr>
<td>Information Quality</td>
<td>1.20</td>
<td>3.60</td>
<td>2.00</td>
<td>1.07</td>
</tr>
<tr>
<td>Interface Quality</td>
<td>1.00</td>
<td>2.67</td>
<td>1.60</td>
<td>0.64</td>
</tr>
<tr>
<td>Overall</td>
<td>1.22</td>
<td>3.56</td>
<td>1.98</td>
<td>0.98</td>
</tr>
</tbody>
</table>
Results

• Fidelity to Standard
  – Of the 14 ADOS activities administered, only 6 were noted by at least one subject to force breaking standard, face-to-face administration
  – Mean ranking was 2.4, indicating that generally breaks in standardization were minimal

RELIABILITY AND PARTICIPANT USABILITY
Research Hypotheses

Standard (face-to-face or in-person) ADOS administration and remote administration scores will have a high degree of agreement.

Research Design

- IRB approval obtained
- On-site technician
- 7-item Post-ADOS User Satisfaction Questionnaire
- After administering ADOS, examiner coded participants’ behavior on 31 items
Results – Participant Usability

- Post-ADOS Assessment User Satisfaction Questionnaire
- 14 participants who had the remote ADOS administered second were asked which administration they preferred, face-to-face or remote?
  - 2 slightly preferred remote
  - 7 had no preference
  - 5 slightly or greatly preferred face-to-face

Post-ADOS Assessment User Satisfaction Questionnaire Results

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Felt comfortable using computer</td>
<td>2.48</td>
<td>2.00</td>
<td>1</td>
</tr>
<tr>
<td>2. Quality of video was acceptable</td>
<td>1.96</td>
<td>1.00</td>
<td>1</td>
</tr>
<tr>
<td>3. Quality of audio was acceptable</td>
<td>2.00</td>
<td>1.00</td>
<td>1</td>
</tr>
<tr>
<td>4. True picture of how I typically behave</td>
<td>2.70</td>
<td>2.00</td>
<td>1</td>
</tr>
<tr>
<td>5. There were things I was unable to do/say</td>
<td>4.39</td>
<td>5.00</td>
<td>5</td>
</tr>
<tr>
<td>6. Willing to do assessments over the computer in the future</td>
<td>2.26</td>
<td>1.00</td>
<td>1</td>
</tr>
</tbody>
</table>
Conclusions

• Teleassessment has potential to reduce service delivery costs associated with travel and time
• Teleassessment can also increase the accuracy and timeliness of ASD diagnosis
• The results of this study demonstrate that an autism assessment designed to be delivered face-to-face can be reliably administered remotely using an integrated web-based system

Cognitive Skills Enhancement Program

• Pre-vocational training program for individuals with cognitive disabilities
• VISYTER and a TR portal are used in CSEP to support a variety of clinical activities to increase efficiency and to improve clinical practices
Portal Users

CSEP/ CART Staff

University of Pittsburgh
Program Director
CSEP Program Coordinator
CART Program Coordinator
3 Pre-Doctoral Fellows
3 Assistive Technology Specialists

Hiram G. Andrews Center
Full-time Rehabilitation Counselor
Other Counselors
Group Counselor
Mental Health Counselors
OVR Counselors

CSEP Portal
Launched February, 2009
- Calendar
- Document files
  - Sessions and activities
  - Participant information
  - Referral Screening
- Clinical documentation
- HIPAA compliant

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Usability Study

EVALUATION OF A TELEREHABILITATION SYSTEM FOR COMMUNITY-BASED REHABILITATION

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Pennsylvania Office of Vocational Rehabilitation

**ABSTRACT**

The use of web-based portals, while increasing in popularity in the fields of medicine and research, are rarely reported on in community-based rehabilitation programs. A program within the Pennsylvania Office of Vocational Rehabilitation’s Hiram O. Andrews Center, the Cognitive Skills Enhancement Program (CSEP), sought to enhance organization of program and participant information and communication between part- and full-time employees, supervisors, and consultants. A telerehabilitation system was developed consisting of (1) a web-based portal to support a variety of clinical activities, and (2) a virtual conferencing application for an interactive experience. The study was a descriptive evaluation and comparison of the usability of the telerehabilitation system incorporating both the portal and VISYTER. Telerehabilitation system users include CSEP staff members from three geographical locations and employed by two institutions. The IBM After-Scenario Usability Questionnaire (ASUQ) and Post-Study System Usability Questionnaire (PSSUQ), the Telehealth Usability Questionnaire (T-UQ), and two demographic surveys were administered to gather both objective and subjective information. Results showed generally high levels of usability. Users commented that the telerehabilitation system improved communication, increased access to information, improved speed of completing tasks, and had an appealing interface. Areas where users would like to see improvements, including ease of accessing/setting documents and searching for information, are discussed.

Keywords: Web-based, on-line, internet-based, portal, rehabilitation, video-conferencing, telehealth, telerehabilitation, usability
Measures

- IBM After-Scenario Questionnaire (ASQ)
- IBM Post-Study System Usability Questionnaire (PSSUQ)
- Telehealth Usability Questionnaire (TUQ)
- Two demographic surveys

Results

- High levels of usability
- Users commented that the telerehabilitation system:
  - Improved communication
  - Increased access to information
  - Improved speed of completing tasks
  - Had an appealing interface
- Areas for improvement:
  - Ease of accessing/editing documents
  - Searching for information
Conclusions

• The results of the TR system evaluation were largely positive indicating that the system is highly usable
• Implementation of the TR system has improved staff communication and made accessing documents and information faster and easier.
• Users found the interface pleasant
• Accessibility