



Research Week 2021

Reliability of Remote Physical Performance Data and the Role of Technology

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Keywords

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Abstract

Background

Researchers transitioned to remote delivery of clinical trials during the COVID-19 pandemic. While remote delivery has various advantages, trial success is now dependent on technology. Physical functioning assessments in our two randomized controlled exercise trials have transitioned to remote delivery via a video conferencing interface called Cisco Webex. We report on interim analyses of inter- and intra-rater reliability and detail technological factors that may affect the data's reliability.

Methods

Remote data collection included short physical performance battery (sPPB), chair stands, 4m usual walk, and timed-up-and go. Repeat remote assessments were conducted on the same participant 1-2 weeks apart, by the same assessor (intra-rater) or by another assessor (inter-rater). The mock remote visit had four assessors, one mock participant, and one observer. The mock participant completed physical assessments, and all assessors collected data simultaneously. A System/Application analyst provided information describing audio/video quality, application versions, connectivity, and overall call quality.

Results

Correlational R-values for intra-rater reliability are 0.91 (4mw), 0.93 (chair stands), 0.90 (PBB), and 0.96 (TUG). Correlational R-values for inter-rater reliability are 0.72 (4mw), 0.69 (chair stands), 0.65 (PBB), and 0.98 (TUG). During the mock visit, weak audio-connection indicators were

intermittently present for all call participants. The assessor who led the mock trial visit experienced weak video-connection during the beginning of call, but all other call participants experienced strong video-connection. Three participants were running outdated Webex applications. Five call participants were running Webex through a public IP (VPN), rather than a local IP.

Discussion

While preliminary analyses of intra-rater reliability testing were strong, inter-rater reliability was less favorable. To improve video conferencing and data reliability, connect directly to a router via an ethernet cord, run the Webex application through a local IP, keep CPU usage below 60%, wear headphones to block background noises, and use the most recent version of the videoconferencing software.