conclusions:

wearing afoS affects trunk movements. the association between trunk RoM and netEC indicates that afo-induced abnormal trunk movements can negatively affect netEC. therefore, our results indicate that clinicians should consider trunk movements in their decision making when optimizing afo prescription in children with CP, specifically when aiming to reduce the walking energy cost.

key words: cerebral palsy, orthotic devices, biomechanical phenomena

disclosures:

First (presenting) author is currently working at OIM Orthopedic in the Netherlands. This work is related to her PhD thesis which was performed at the VU University medical center.

late-breaking research poster 355165

the additive risk of criminal arrest to physical, mental, and social functioning post-traumatic brain injury

Ellen Hada (New York University Langone Health - Rusk Rehabilitation), Coralynn Long, Angela Man, Tamara Bushnik

research objectives:

To investigate and discuss the correlates between TBI and incarceration, as well as the additional difficulties associated with repeat offenses as it relates to mental health (i.e., psychiatric hospitalization, suicide attempts), physical health, and social interaction and functioning (i.e., employment, social support).

Design:

New York City site of the Traumatic Brain Injury Model Systems (TBIMS) center medical record abstraction and patient self-report data on TBIMS Form I and Form II, and an expanded incarceration/homelessness questionnaire.

Setting:

One urban New York City TBIMS center, including TBI participants from an acute inpatient rehabilitation public and and private hospital.

Participants:

239 acute TBI inpatients who received acute/rehabilitation care at a TBIMS center. Male (79%), White (36%), or Hispanic (33%). Mean age of 49.0 years (SD = 19.9). Sample includes 45 individuals with a history of incarceration (felony, misdemeanor, overnight stay, arrest).

Interventions:

Not applicable.

Main Outcome Measures:

TBIMS Form I & II interviews and an expanded incarceration/homelessness questionnaire.

Results:

Chi-squares and t-tests will demonstrate that participants who have reported committing both a criminal arrest (overnight stay, misdemeanors) and a felonious offense experience higher incidences of homelessness, substance use, psychiatric hospitalizations, suicide attempts, less social support, and decreased job stability.

Conclusions:

Current TBI research has recognized TBI as a “chronic disease” noting the cognitive and psychological sequela occurring up to 10, 20, and even 30 years post-injury. Given the compounding risk with recidivism, coupled with risks of chronic TBI, it is imperative that further research seek to more exhaustively capture all criminal offense class incidences. Furthermore, future research should address the interplay between chronic TBI and incarceration, aiming to resolve the added adverse effects it has upon this vulnerable population.

Key Words: Criminal Offense, Traumatic Brain Injury, Chronic TBI

disclosures:

None disclosed.

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Automatic Multimodal Speech Scoring for Using a New Speech Rehabilitation Technology

Mehrdad Heydarzadeh (The University of Texas at Dallas), Jun Lu, Klaus Okkelberg, Maysam Ghovaloo

Research Objectives:

Preliminary revaluation of a signal processing algorithm for automatically scoring quality of articulation using the new multimodal speech capture system (MSCS), which can record and visualize the patient’s tongue trajectory, lip gestures, and voice in real time.

Design:

A signal processing algorithm for calculating the frequency features and dimension reduction is developed for comparing the trajectories of utterance for different subjects. Dynamic time warping is applied for matching different utterances and scoring the speech.

Setting:

The study was done at GT Bionic lab at Georgia Institute of Technology.

Participants:

Six healthy subjects, 3 males and 3 females, 20-32 years old, participated in this study. Half of them were native American English speakers and others were not but fluent in English.

Interventions:

A small magnetic tracer (5mm diameter and 1mm thick) was attached near the tip of the tongue using oral adhesive.

Main Outcome Measures:

Participants were asked to read 6 different groups of words. In each group, just one word was changed to create a gradient difference compared to a reference group. The automatic scoring algorithm was used to process the raw data from MSCS and indicate the difference between word groups.

Results:

For tongue movement trajectories, in the subject-dependent case, the correlation coefficients (CCs) averaged across subjects for each phrase group were: Correlation coefficients Min Mean Magnetic sensor 0.91 0.94 Time-frequency spectrum 0.95 0.96 Voice (audio) 0.98 0.98 Video (lip reading) 0.95 0.96.

Conclusions:

1) Adopted methods produced acceptable matching scores for audio and video signals. 2) Matching scores of 3-D tongue movement trajectories and time-frequency spectrums.

Key Words: Speech Rehabilitation, Signal Processing, Speech Scoring, Multi-modal Signal Processing

Disclosures:

None disclosed.