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Abstract Book

Innovations and Technological Developments in Rehabilitation
康復的創新與科技發展

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Table of Content

Virtual Platform Presentation

27 November 2021
Saturday 4:00-5:15 p.m.

Presenter	Abstract No.	Title of Presentation
Session 1a Application of Technology to Rehabilitation: Treatment Intervention		
Chan, G.	21002	A Systematic Review of Physical Capacity and Treatment Complications and Mortality Outcomes in Elderly Cancer Patients: Physical Capacity Recommendations for Elderly Patients Undergoing Treatment
Wei, X.	21003	Portable 6-DOF Immersive Virtual Reality as a New Tool to Promote Upper Extremity Recovery in Stroke Patients
Cao, Y.	21015	Cognitive Empathy and Affective Theory of Mind in Schizophrenia
Kan, R.L.D.	21035	Effects of Non-Invasive Brain Stimulation on Multiple Sclerosis: A Systematic Review and Meta-Analysis
Toh, F.M.	21044	Effectiveness of Home-Based Upper Limb Rehabilitation in Stroke Survivors: A Systematic Review and Meta-Analysis
Pang, J.C.Y.	21045	The Technology of Different Designs of Pillows on Reducing Neck Pain, Disability and Spinal Alignment: A Systematic Review and Meta-Analysis
Session 1b Application of Technology to Rehabilitation: Evaluation		
So, Y.N.L.	21040	Using Performance Analysis of Driving Ability (P-Drive) as a Standardized Assessment Tool to Assist Occupational Therapist Driver Assessors for Determining Fitness to Drive on a Simulator
Ho, L.Y.W.	21046	Test-retest Reliability for Cardio-Ankle Vascular Index (CAVI) among People with Stroke
Ho, L.Y.W.	21047	Reliability of Quantitative Ultrasound for Bone Density Measurement in People with Stroke
Kongsawasdi, S.	21057	Utilization of Embedded Smartphone Application for Testing Balance: the Study of Concurrent Validity
Wang, H.	21121	A Pilot Study on a Smart Gait and Balance Assessment System using Sensor Technology
Kantha, P.	21127	Differences in Balance Performance between Patients with Cervical Myelopathy and Radiculopathy

Presenter	Abstract No.	Title of Presentation
Session 1c Clinical Trials: Healthy Aging and Musculoskeletal Rehabilitation		
Au, I.P.H.	21064	Restoring Physical Performance in Residential Care Home Residents with Possible Sarcopenia by Outreach Physiotherapy Service: A Longitudinal Intervention Study
Sit, M.H.	21085	Combined intervention of Computerized Cognitive Training Preceded by Physical Exercise for Improving Frailty Status and Cognitive Function in Older Adults
Smith, G.D.	21105	The Effect of Chair-Based Dance Movement Therapy in the Rehabilitation Older People with Depression Symptoms in Long-Term Residential Care: An Exploratory Phase Study
Feng, B.B.	21113	Validation of the Chinese Central Sensitization Inventory among Chronic Pain: Factor Analysis, Internal Consistency, Test-Retest Reliability, and Criterion Validity
Wong, A.Y.L.	21124	What are the Perspectives of Patients regarding Prehabilitation and Lumbar Spinal Stenosis Surgery?
Pinto, S.M.	21128	Factors Affecting Pain and Disability in People with Chronic Low Back Pain

28 November 2021
Sunday 10:15-11:30 a.m.

Presenter	Abstract No.	Title of Presentation
Session 2a Application of Technology to Rehabilitation: Tele-rehabilitation		
Chen, M.T.J.	21023	A Comparison of Virtual Reality Training with Non-Computer Assisted Conventional Cognitive Training to Improve the Cognitive Function of Stroke Patients: A Systematic Review and Meta-Analysis
Li, S.K.	21039	A New Era of Physiotherapy Tele-Rehabilitation in Geriatric Day Hospital
Li, C.L.K.	21048	Exploring the Relationship between National eHealth Development and Hofstede's Cultural Dimensions using the WHO Global eHealth Surveys
Gomez, I.N.B.	21061	Infusing Standard Precautions for Infection Control in Occupational Therapy Telehealth with Children: A Qualitative Descriptive Study
Cheung, P.P.L.	21103	Is it a Substitute or a Family-Centered Practice? Experience Sharing on Telehealth in Occupational Therapy Service for Preschoolers with Special Educational Needs (SEN)

Presenter	Abstract No.	Title of Presentation
Session 2b Clinical Trials: Neurological Rehabilitation		
Jiang, Y.	21053	Influence of Environment on Cortical Activation during Stepping in the Elderly
Feng, B.B.	21072	Profiles of Neuropathic Pain Component and Associated Risk Factors in Patients with and without Peripheral Nerve Injuries
Chan, S.C.C.	21073	Effects of Contact Heat Stimulation Intensity on Reliability of Subjective Pain Rating
Wong-Yu, I.S.K.	21076	Effects of Combined Balance and Brisk Walking on Alleviating Non-Motor Symptoms in Parkinson Disease
Chan, S.P.J.	21095	Effect of 365-day Physiotherapy Restorative Rehabilitation on Functional Mobility, Activity and Hospital Length of Stay for Patient with Stroke and Satisfaction of Stakeholders - A Promise of Better Outcome
Winser, S.J.	21102	Dual-Task Training Versus Single-Task Training for Balance in Individuals with Cerebellar Ataxia: A Randomized Controlled Trial
Session 2c Pre-clinical and Clinical Trials		
Bello, U.M.	21014	Influence of Task Complexity and Mirror Image Clarity on Motor Facilitation in Post-Stroke Mirror Therapy
Ali, M.U.	21018	Efficacy of Non-Surgical, Invasive, and Non-Invasive Conservative Therapies for the Treatment of Urge Incontinence due to Neurogenic Bladder: A Systematic Review and Meta-Analysis
Hu, Z.	21060	Effect of Transcutaneous Electrical Acupoint Stimulation on VD Rats and its Mechanism was Studied based on PINK1/ Parkin Regulation
Ng, T.K.Y.	21119	A Systematic Review and Meta-Analysis Regarding the Impacts of COVID-19 Pandemic on Physical Activity Involvements and Exercise Habits of People with and without Chronic Diseases
Liang, G.S.	21120	The Effect of Physical Exercises on Reaction Time in Older People: A Systematic Review and Meta-analysis
Wong, A.Y.L.	21123	Factors Associated with Dance-Related Lumbar Injury in Dancers – A Population-Based Study

28 November 2021
Sunday 2:45-4:00 p.m.

Presenter	Abstract No.	Title of Presentation
Session 3a Application of Technology to Rehabilitation: Evaluation and Treatment		
Man, C.W.Z.	21050	Effectiveness of Peer Support to Stroke Survivors and Carers with Web-Based Intervention and Tele-Coaching: A Volunteer-Based Service
Soon. B.	21051	Preliminary Study on Feasibility of the Omni-Directional Platform and Virtual Reality for Rehabilitation
Lam, T.L.H.	21075	The Effect of Stimulating Neural Substrates of Dual-networks on the Task-set Preparation: A TMS and EEG Study
Lu, H.	21078	A Novel MRI-Based Geometric Mode for Personalized Transcranial Magnetic Stimulation in Age-Related Neurodegenerative Diseases
Zhang, J.J.Q.	21083	Priming Intermittent Theta Burst Stimulation Boosts Motor Learning in Patients with Stroke
Session 3b Clinical Trials: Physical and Cognitive Rehabilitation		
Chong, D.Y.K.	21031	An ICF-based Stroke Rehabilitation Program enhances Community Reintegration for Clients with Subacute Stroke
Lau, H.Y.	21034	The Efficacy of Hypnotherapy for People with Depression: A Pilot Study
Kwok, A.	21049	Localization of Chinese Activate Your Life Program in Hong Kong and its Preliminary Effectiveness among People with Chronic Conditions and Their Families
Powell, C.L.Y.M.	21069	How to Improve the Accessibility of Evidence-Based Psychological Service: A Pilot Study of Low-Intensity Cognitive Behavioral Therapy in a Community Setting in Hong Kong
Kan, M.M.P.	21110	The Effectiveness of a Cognitive Intervention on Reducing Playing Tension among Organists: A Randomized Controlled Trial
Wong, A.Y.L.	21130	Modifiable Risk Factors for Incident Mild Cognitive Impairment in Community-Dwelling Older Adults – A Systematic Review

Presenter	Abstract No.	Title of Presentation
Session 3c Learning and Teaching Innovation		
Neville, N.P.	21059	Older Drivers Navigating New Technology - Development of an Evidence-Informed Education Program Teaching Older Drivers to Use Advanced Vehicle Technologies
Ng, B.F.L.	21089	Web-based West-meets-East Lifestyle Modification Program for Risks Reduction Associated with Hypertension, Hyperglycaemia and Hyperlipidaemia
Yung, T.W.K.	21104	The Unique Relationship between Autonomic Nervous System Activities and Brain Activation among School Aged Children with Sluggish Cognitive Tempo (SCT) Symptoms
Wang, X.	21116	Effectiveness of Mindful Core Muscle Training Program on Attention and Balance of School-Aged Children: A Pilot Study
Smith, G.D.	21118	Maximising Cardiac Rehabilitation through Effective Virtual Simulation Teaching of Smoke Cessation Interventions: The INSTrUCT European Project

Abstract No. 21002

A Systematic Review of Physical Capacity and Treatment Complications and Mortality Outcomes in Elderly Cancer Patients: Physical Capacity Recommendations for Elderly Patients Undergoing Treatment

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Aim:
Systematically review the physical capacities in relation to post-cancer treatment complications and mortality in elderly cancer patients to identify appropriate physical and functional range prior to cancer treatment.

Methods:
A systematic search in MEDLINE, CINAHL SPORTDiscus, Cochrane library, Library Information Science & Technology Abstracts, and Google Scholar for published papers on frail elderly cancer patients' physical capacity and adverse clinical outcomes after cancer treatment.

Result:
Thirteen published papers were recruited for meta-analysis and showed, significant effects were found between patients classified as "unfit" physical function versus others by Instrumental Activity of Daily Living (IADL), Activity of Daily Living (ADL) and Time Up and Go (TUG)) with overall survival (OS) risk, post-operation complication (PC), and chemotherapy toxicity (CT).

adverse clinical outcomes (OS, PC and CT) after or during cancer treatment. At IADL cut off (<=7 to <4), 1 year OS hazard ratio (HR) = 2.21, (95% CI: 1.62- 3.02); P<0.00001. TUG cut off range (>12 to >20 seconds), 1-2 year OS HR = 2.64, (95% CI: 1.42- 4.93); P<0.002. TUG cut off range (>12 to >20 seconds), 30days PC odd ratio (OR) = 3.29, (95% CI: 1.66- 6.54); P<0.0007. IADL cut off (<=7 to <=13), CT OR = 4.08, (95% CI: 2.20- 7.57); P= 0.00001.

Conclusion:
There are significant risks of being categorized "unfit" in terms of physical function prior to cancer treatment (ADL, IADL and TUG) in relation to higher risks of OS, PC and CT in elderly cancer patients.

Keywords:
Cancer, Elderly, Physical Capacity

Abstract No. 21003

Portable 6-DOF Immersive Virtual Reality as a New Tool to Promote Upper Extremity Recovery in Stroke Patients

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Virtual reality (VR) is a valuable tool for upper extremity training in stroke patient. Majority of previous studies demonstrated the effectiveness of desktop-based VR. Portable 6-DOF immersive VR headset was commercially available in these two years, currently little research mentioned the use of this new technology.

Objective:
To preliminary investigate the effectiveness of upper extremity training based on portable 6-DOF immersive VR in subacute stroke patients, and explore its use in home-based rehabilitation.

Methods:
Twenty subacute stroke patents met the criteria were allocated to either VR group for receiving portal 6-DOF immersive VR training or control group for receiving conventional training. The VR headset used in this study was commercially available and in reasonable prize, the VR software was constructed by this study team based on the concept of neurodevelopmental treatment and motor learning. Assessments used before and after 3-week of intervention included Functional Test for Hemiplegic Upper Extremity-Hong Kong version, Fugl-Meyer Assessment, Box and Block Test, and Modified Barthel Index.

Results:
The patients in both groups showed comparable baseline and demonstrated significant improvement after 3-week of training in all assessments ($p<0.05$). Insignificant difference was found between groups ($p>0.05$). However, the patients in VR group rated significant higher rehabilitation experience and less manpower input was reported by the therapists ($p<0.05$).

Conclusion:
Upper extremity training delivered by portable 6-DOF immersive VR might have similar effectiveness as conventional training in stroke patients. Further study should increase the sample size for enhancing the power of evidence and trial to employ in home-based scenario.

Keywords:
VR, Stroke, Upper extremity

Abstract No. 21015

Cognitive Empathy and Affective Theory of Mind in Schizophrenia

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Objectives:
Previous literature suggested that social cognition is impaired in schizophrenia; however, the relationships between empathy, theory of mind (ToM), and social functioning remains unclear. This study explored the interplay between cognitive empathy and affective ToM in predicting social functioning in people with early and chronic schizophrenia.

Methods:
Clinical participants with either early (n = 26) or chronic (n = 32) schizophrenia completed measures of ToM (the VR-based Virtual Assessment of Mentalising Ability) and empathy (Empathy Quotient), as a part of a broader neuropsychological and social functioning test battery.

Results:
ToM contributed to the prediction of both community functioning and functional capacity beyond that was already explained by cognitive empathy, clinical symptoms and neurocognition. We also found that cognitive empathy mediated the relationship between affective ToM and social functioning.

Conclusions:
Findings support the functional significance of cognitive empathy and ToM in schizophrenia. There was also emerging evidence to suggest that cognitive empathy is a pre-requisite of accurate metalising ability.

Keywords:
Social cognition, Schizophrenia, Mental

Abstract No. 21035

Effects of Non-Invasive Brain Stimulation on Multiple Sclerosis: A Systematic Review and Meta-Analysis

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Objective:
The objective of this meta-analysis was to summarize evidence on the therapeutic effects of non-invasive brain stimulation (NIBS) including transcranial direct current stimulation (tDCS) and repetitive transcranial magnetic stimulation (rTMS) and its variants on core symptoms of multiple sclerosis (MS).

Methods:
We systematically searched articles published until 31 May 2021 comparing the effects of active tDCS and rTMS with sham intervention in MS patients in four databases. We used a random-effects model for this meta-analysis. We used meta-regression and subgroup meta-analysis to examine the effects of stimulation dose and different stimulation protocols, respectively.

Results:
26 randomized controlled trials (RCTs) were included in the review, consisting of 19 tDCS and 7 rTMS studies. tDCS led to a significant immediate reduction of fatigue with a large effect size (Hedges'g=-0.870, 95%CI [-1.225 - -0.458], NNT=2). Particularly, subgroup analysis showed that tDCS targeting left DLPFC and bilateral S1 led to fatigue reductions compared to sham stimulation. Besides, tDCS and rTMS alleviated pain (Hedges' g=-0.684, 95%CI [-1.337 - -0.032]), rTMS reduced muscle spasticity (Hedges'g=-1.126, 95%CI [-1.543 - -0.710])) and tDCS improved cognitive function (Hedges'g=-0.447, 95%CI [-0.858 - -0.036]). However, NIBS showed no effects on MS-associated motor and mood symptoms.

Conclusion:
tDCS has a favorable effect on alleviating fatigue in MS. NIBS alleviates MS-associated pain, rTMS reduces spasticity and tDCS improves cognitive function. More high-quality studies are needed to substantiate the therapeutic effects of NIBS in MS.

Keywords:
NIBS, MS, Fatigue, Meta-analysis

Abstract No. 21044

Effectiveness of Home-based Upper Limb Rehabilitation in Stroke Survivors: A Systematic Review and Meta-analysis

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Background:
Home-based training is an alternative option to provide intensive rehabilitation without costly supervised therapy. Several studies supported the effectiveness of home-based rehabilitation to improve upper limb function in stroke survivors.

Objectives:
To determine the effects of home-based upper limb rehabilitation for hemiparetic upper limb recovery in stroke survivors.

Methods:
The databases of Cochrane Library, MEDLINE, CINAHL and Web of Science were systematically searched from January 2000 to September 2020. Only randomised, controlled, and cross-over trials that evaluated the effects of home-based upper limb interventions were selected. The Pedro scale was used to assess the methodological quality of the studies. A meta-analysis on the upper limb function outcomes was performed by calculating the mean difference/standardised mean difference using a fixed/random effect model.

Results:
An initial search yielded 1049 articles. Twenty-six articles were included in the review. The pooled evidence of the meta-analysis showed that home-based upper limb intervention was more effective to improve upper limb function (SMD: 0.28, 95% CI (0.12, 0.44), I2= 0%, p <0.001) than conventional therapy. When comparing two types of home-based interventions, subgroup analysis revealed that home-based technology treatment- electrical stimulation, provided more significant improvement in upper limb function than treatment without the use of technology (SMD: 0.64, 95%CI (0.21, 1.07), I2= 0%, p=0.003).

Conclusion:
The beneficial effects of home-based upper limb interventions were superior to conventional therapy in improving function and perceived use of the hemiparetic upper limb in daily activities. Among the home-based interventions, home-based electrical stimulation seemed to provide the most optimal benefits.

Keywords:
Home-based intervention, Upper limb

Abstract No. 21045

The Technology of Different Designs of Pillows on Reducing Neck Pain, Disability and Spinal Alignment: A Systematic Review and Meta-Analysis

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Background:
Neck pain has high prevalent condition that affects adversely both quality of life, sleep quality and productivity at work. The aim of this systematic review and meta-analysis was to identify randomized controlled trials assessing the effectiveness of different designs of pillows in neck pain.

Objective:
To conduct a systematic review that assessed all available clinical trials to study the technology of different designs of pillows on reducing neck pain, disability and spinal alignment.

Methods:
Systematic review and meta-analysis of randomized control studies were collected by searching a series of keywords in six databases. Two independent reviewers were used to review the articles and assign a PEDro score. Thirty-five pillow articles that met the criteria to be included in this study.

Results:
Nine high-quality studies, 555 participants were included. The average PEDro score was 6.56/10. The meta-analysis demonstrated significant standardized mean difference values in favor of pillow intervention to reduce waking pain (-0.263, $P<0.001$), neck disability (-0.506, $P=0.02$) and satisfaction rate (1.144, $P<0.001$). The findings of this systematic review suggest that rubber and spring pillows may have better performance than feather pillows. In side-lying positions, the cervical segments were stable showed in 3-D motion analysis; while there is no study investigate the change of cervical segments in supine lying. Although 150 of cervical angle in supine lying has been recommended, there is no more literature support for this recommendation.

Conclusion:
Spring and rubber pillows are effective on waking pain, disability and pillow satisfaction in chronic neck pain patients because the alignment of the cervical spine can be maintained with appropriate pillow supports. Alignment of the cervical spine may be impacted more significantly by the shape and height of the pillow than materials.

Keywords:
Pillow design, Neck pain, Disability, Alignment

Abstract No. 21040

Using Performance Analysis of Driving Ability (P-Drive) as a Standardized Assessment Tool to Assist Occupational Therapist Driver Assessors for Determining Fitness to Drive on a Simulator

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Objective:
Driving is a complex instrumental activity of daily living. People who have changes in their health condition may affect driving performance thus it is crucial for us to accurately assess their functional ability in returning to drive. On-road assessment remains a gold standard in determining the fitness to drive whereas growing evidences also demonstrated the usefulness of a driving simulation assessment. P-Drive was recommended as the gold standard to be used during on-road assessments. With the increasing demand of driver assessment service in Hong Kong, there is a need for a valid standardized assessment tool to consolidate driver assessors in the decision process of fitness to drive.

Methods:
Five participants with a history of CVA in recent 12 months were selected for analysis, OT driver assessor used the P-Drive to rate the driving performance. P-Drive consists of 25 driving items for rating, the raw cut-off score of P-Drive at 85 out of 100.

Results:
The 5 participants' scores ranged from 75 to 96. Participants with a score below the cut-off of 85 demonstrated lower scores in sections of “orientate”, “attending and acting” and “maneuvers”, which reflected particular weakness in defensive driving behaviours. They were recommended either not to drive or suspended driving until further training arranged.

Conclusion:
The score from P-Drive could assist OT driver assessor in reasoning the fitness to drive of a client and as an indication of rehabilitation needs. Future studies on the validation the P-Drive cut off score for Hong Kong locals is recommended for better service development.

Keywords:
Return to drive, P-Drive

Abstract No. 21046

Test-retest Reliability for Cardio-Ankle Vascular Index (CAVI) among People with Stroke

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Objective:
This study aimed to establish the test-retest reliability for cardio-ankle vascular index (CAVI) in people with stroke.

Background:
The CAVI is a novel indicator of arterial stiffness from the aorta to ankle arteries. It could be used as a measurement for managing and monitoring atherosclerotic risk factors in stroke rehabilitation and clinical research. However, its test-retest reliability has not been established in stroke populations.

Methods:
Participants with stroke (n=45) were recruited from patient self-help groups in Hong Kong. Their CAVI was measured with the VaSera device (Fukuda Denshi, Japan). The measurements were done twice at 90-minute interval on day 1 (T1, T2) and once after 7 days (T3). Test-retest reliability was determined using the intra-class correlation coefficients and Bland-Altman plots. The CAVI levels of affected and unaffected sides of the people with stroke were also compared.

Results:
The intra-class correlation coefficients ranged 0.710-0.856 at the affected and unaffected sides over 90-minute and 7-day intervals. The Bland-Altman plots for 90-minute and 7-day test-retest reliability showed that only 1-2 measurements fell outside the limits of agreement. The mean CAVI values at the affected side were significantly and consistently higher than those of the unaffected side (T1: affected 8.402, unaffected 8.200; T2: affected 8.358, unaffected 8.220; T3: affected 8.384, unaffected 8.211).

Conclusion:
The CAVI has good test-retest reliability in people with stroke. The affected side showed higher CAVI values than the unaffected side. This novel technique has potentials to become an objective measurement of therapeutic outcome in stroke rehabilitation.

Keywords:
Arterial stiffness, Test-retest reliability

Abstract No. 21047

Reliability of Quantitative Ultrasound for Bone Density Measurement in People with Stroke

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Objective:
This study aimed to establish the test-retest reliability of quantitative ultrasound in measuring bone mineral density of people with stroke.

Background:
Motor impairment after stroke may lead to reduced activity, resulting in bone loss and increasing risk of fracture. Radiofrequency Echographic Multi Spectrometry combining B-mode ultrasound and radiofrequency signals offers an innovative approach to estimate bone mineral density. However, its reliability for clinical use and stroke research remains unclear.

Methods:
Thirty-six participants with stroke were recruited from several self-help groups in Hong Kong. Bone mineral density of the femoral neck was measured with an echographic device (Echolight S.r.l., Italy). Interrater reliability between two well-trained assessors and test-retest reliability over 7 days were determined using the intra-class correlation coefficients and Bland-Altman plots. Bone mineral densities of the affected and unaffected sides were also compared.

Results:
Interrater reliability was 0.978 at both the affected and unaffected sides. Test-retest reliability over 7 days of both sides was excellent (intra-class correlation coefficients=0.960-0.966). The Bland-Altman plots for interrater and test-retest reliability showed that only 1-2 measurements fell outside the limits of agreement. Bone mineral density of the affected side was significantly lower than that of unaffected side (affected 0.615±0.084, unaffected 0.621±0.082, p=0.016) in this sample.

Conclusion:
Quantitative ultrasound has good reliability in people with stroke. It overcomes the limitations of Dual-energy X-ray absorptiometry and has great potentials to be adopted in monitoring the changes of bone density in stroke rehabilitation. Larger sample size is required to determine the difference between the bilateral sides.

Keywords:
Bone density, Test-retest reliability

Abstract No. 21057

Utilization of Embedded Smartphone Application for Testing Balance: the Study of Concurrent Validity

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Objectives:
Postural control is an essential component to maintain equilibrium and control individual mobility. Currently, quantitative measures of balance include the force plate analysis systems of the center of pressure displacement. Despite, they have been accepted as the gold standard and have demonstrated high sensitivity, they still have several limitations. Analyses must be conducted in laboratory settings and are costly. Smartphone technology with embedded sensors may provide a promising evaluation of balance control when force plates are unavailable. The objective of this study was to explore the concurrent validity of the parameters calculated from the smartphone application compared to the force plate-based measure of postural sway.

Methods:
Fifty-three healthy volunteers, aged 20-72 years were evaluated for the ability to control balance during quiet standing. Six static balance tests were conducted in the following order: standing, tandem stance and single-leg standing. Each test was conducted by starting with eyes opened for 30 seconds then with eyes closed for 30 seconds.

Results: All the sway measurements from smartphones were significantly correlated with the force plate parameter. Data across the six balance tasks showed a strong positive correlation; the Spearman's rho correlation coefficients were 0.841-0.866 ($p<0.001$).

Conclusion:
Smartphone parameters demonstrated a high concurrent validity against the gold standard measurement and provided the opportunity for further development in clinical settings. Further studies are needed to determine the reliability and sensitivity to other populations.

Keywords:
Balance, Force Plate, Smartphone

Abstract No. 21121

A Pilot Study on a Smart Gait and Balance Assessment System using Sensor Technology

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Background:
Continuous monitoring of gait and balance could be an effective approach to reduce and prevent falls through early warnings and appropriate interventions. However, the continuous monitoring of gait and balance requires extensive healthcare and clinical resources.

Objective:
Our study objectives were: to develop a prototype surrogate system for gait & balance assessment using sensor technology and big data analytics; and to evaluate the system from the perspective of user acceptance.

Methods:
Forty-seven older adults (mean age=77.8, SD=6.1) participated in our study. A prototype surrogate system was designed by integrating inertial sensors to collect participants' sensor signals when performing a 3-meter timed-up and go test, a five-times-sit-to-stand test, and a Romberg test. Registered physiotherapists were recruited to evaluate participants' gait and balance. State-of-the-art data mining techniques were utilized to develop prediction models. User acceptance of the system was evaluated using a 5-point Likert-type scale, with anchors ranging from 1 (strongly disagree) to 7 (strongly agree).

Results:
The participants perceived that using the system is a good idea (mean=5.5, SD=0.8), useful to improve gait and balance (mean=5.4, SD=0.9), and dependable (mean=5.1, SD=0.9); and they intended to use the prototype for their gait and balance management (mean=5.3, SD=1.1). Some promising algorithms, e.g., automatically segmenting sensor signal data into different actions, have been developed and discussed.

Conclusions:
The proposed system is expected to fulfill the function of gait and balance monitoring in older adults by detecting any significant deteriorations and issuing warnings intended to promote interventions and thus prevent falls.

Keywords:
Gait, Balance, Assessment, Sensor

Abstract No. 21127

Differences in Balance Performance between Patients with Cervical Myelopathy and Radiculopathy

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Objective:
This study was to compare the balance performance of patients with Cervical myelopathy (CM) and cervical radiculopathy (CR) to healthy controls.

Background:
CM is a spinal cord disorder caused by a narrowing of the spinal canal at the cervical level, whereas CR is caused by compression of the cervical nerve roots. Compression can result in motor and sensory neurological dysfunction. Neurological dysfunction can result in disability, which is usually assessed in a subjective manner. Balance performance is a well-known objective measurement that represents disability.

Methods:
Patients with CR (aged = 59.8±8.5 years old; n = 32), CM (aged = 62.2±9.1 years old; n = 32), and healthy controls (aged = 61.5±9.1 years old; n = 32) were recruited. The balance performance (i.e., total excursion and sway area) was evaluated during quiet standing.

Results:
The total excursion and sway area in patients with CM were significantly higher than in healthy controls ($p < 0.01$) and in patients with CR ($p < 0.01$). However, there was no significant difference between patients with CR and healthy controls in total excursion ($p = 0.99$) nor sway area ($p = 0.71$).

Conclusion:
Postural instability is more common in patients with CM than in patients with CR or healthy controls. Our findings show that balance performance can objectively identify the disability for patients with CM. The findings may be useful in clinical decision-making for surgeon regarding who needs a surgery.

Keywords:
Balance, Clinical Decision-making

Abstract No. 21064

Restoring Physical Performance in Residential Care Home Residents with Possible Sarcopenia by Outreach Physiotherapy Service: A Longitudinal Intervention Study

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Objective:
To investigate the effect of an outreach physiotherapy service using a progressive resistance training protocol on improving physical performance in residential care home residents with possible sarcopenia.

Methods:
Residents of residential care home were screened by SARC-CalF questionnaire (score ≥ 11) and handgrip strength (M: < 28 kg; F < 18 kg) for possible sarcopenia. Residents with possible sarcopenia were assessed by Short Physical Performance Battery (SPPB), including balance, gait speed and chair stand test, and included in an outreach physiotherapy service twice weekly for 10 weeks. The service included a minimum of 30 minutes progressive resistance training at each session. Handgrip strength, gait speed, chair stand test, balance sub-score and total score of SPPB were compared after the 10-week physiotherapy service.

Results:
Twenty-four residents were screened with possible sarcopenia (Age: 85.3 ± 10.7 years, 17 Female). After 10 weeks of outreach physiotherapy service, there were significant improvements in chair stand test ($p = 0.042$; Cohen's $d = 1.099$), balance sub-score ($p = 0.023$; Cohen's $d = 0.451$) and total score of SPPB ($p = 0.001$; Cohen's $d = 0.499$) in residents with possible sarcopenia. However, there were no significant differences in handgrip strength ($p = 0.249$; Cohen's $d = 0.081$) and gait speed ($p = 0.490$; Cohen's $d = 0.154$).

Conclusion:
Using SARC-CalF questionnaire and handgrip strength to identify residential care home residents with possible sarcopenia and providing them with outreach physiotherapy service incorporated with progressive resistance training are effective to improve their balance and physical performance.

Keywords:
Aged-care, Elderly, Exercise, Muscle

Abstract No. 21085

Combined intervention of Computerized Cognitive Training Preceded by Physical Exercise for Improving Frailty Status and Cognitive Function in Older Adults

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Objective:
This study examined the effectiveness of a combined intervention of Brainastic computerized cognitive training (CCT) preceded by physical exercise (PE) for improving frailty status and cognitive function in older adults with pre-frail status.

Background:
Physical frailty and cognitive decline is common among older adults in Hong Kong. The frailty is associated with many adverse outcomes and hence affect the quality of life. Prevention of physical frailty and cognitive decline is important to an ageing society.

Methods:
286 older adults aged 50 years or above without history of cognitive impairment joined a 12-week CCT service (2 sessions per week, 2 hours per session). Repeated measures were used to measure participants' frailty level, physical functioning (by single leg test, and Inbody Body Composition Analysis) and quality of life (by SF-6D) at the 1st week, 6th week and 12th week.

Results:
Eighty percentage of participants showed improvements in frailty score from pre-frail to frail. Participant improved their postural and balance control which the time of single leg test, increased from 65 seconds to 112 seconds on average ($p<0.001$). They also improved their quality of life and score of SF6D increased from 0.76 to 0.78 ($p<0.01$). Participants also slightly increased their skeletal muscle mass ($p = 0.01$) and slightly reduce their body fat percentage ($p<0.01$).

Conclusion:
A combined intervention of CCT preceded by PE improves frailty status and cognitive function in community-dwelling older adults, by reducing frailty score, improving balance and quality of life.

Keywords:
Frailty-prevention, Older Adults

Abstract No. 21105

The Effect of Chair-Based Dance Movement Therapy in the Rehabilitation Older People with Depression Symptoms in Long-Term Residential Care: An Exploratory Phase Study

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Objectives:
Globally, depression is one of the leading causes of disability in older people, with higher prevalence rates in those in long-term residential care. In this study, we investigated the effect of chair-based dance movement therapy (C-B DMT) for depressive symptoms in older people in long-term residential care.

Background:
Although common, depressive symptoms are not a normal part of the ageing process. In general, non-pharmacological interventions have been shown to have good effect in the management of depressive symptoms. C-B DMT, a non-pharmacological intervention, may help rehabilitate older people with depressive symptoms in long-term residential care.

Methods:
Based on the Medical Research Council's framework for the evaluation of complex interventions, this was an exploratory phase quasi-experimental study. Older residents received weekly nurse-led C-B DMT sessions for a period of12 weeks in early 2020. The Geriatric Depression Scale Short Form (GDS-SF) as a primary outcome for assessment of depressive symptoms.

Results:
Data analysis revealed that mean GDS-SF score prior to the initial session of C-B DMT was 10.08, falling to 8.08 upon completion of the intervention.

Conclusion:
We believe that CB-DMT may have the potential role in the rehabilitation of depressive symptoms in older people in long term residential care. Despite a relatively small sample size in this study, mainly due to COVID-19 restrictions, the findings of this exploratory phase study highlight the need for a larger-scale randomized controlled trial. In summary, CB-DMT provides a safe and potentially effective intervention for older people with depressive symptoms, enabling them to enjoy life.

Keywords:
Nursing, Elderly, Depression, Rehabilitation

Abstract No. 21113

Validation of the Chinese Central Sensitization Inventory among Chronic Pain: Factor Analysis, Internal Consistency, Test-Retest Reliability, and Criterion Validity

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Background:
Central sensitization (CS) is commonly seen in individuals with persistent pain. The Central Sensitization Inventory (CSI) originated in English was invented to provide a standardized assessment of CS. However, the validation of a Chinese CSI is lacking.

Objective:
This study aimed to translate the CSI into Chinese with cultural adaptation and to examine its validity and reliability.

Methods:
The Chinese CSI (CSI-C) through forward translation, backward translation, panel review, and piloting. A factor analysis was performed on CSI-C among patients with chronic pain (n=220). Internal consistency of CSI-C was measured, and test-retest reliability of CSI-C was evaluated for a subset of chronic pain patients (n=64) with an interval of 3 weeks. Criterion validity was examined through the correlations between CSI-C and pain intensity, EQ-5D, and the Hospital Anxiety and Depression Scale (HADS).

Results:
The exploratory factor analysis resulted in a 6-factor model, including domains on physical symptoms, emotional distress, hypersensitivity syndrome, sleep and cognitive problem, as well as bowel disorders and trauma experience. High internal consistency of CSI-C was discovered in the study (Cronbach's alpha=0.896) and an excellent test-retest reliability was found (ICC=0.932). CSI-C score was significantly correlated with HADS (r=0.569), EQ-5D (r=-0.350), and pain intensity (r=0.202). Over 30% (78/220) of the participants presented CS symptoms with scoring above the cut-off value of 40.

Conclusion:
CSI-C was demonstrated to be a valid and useful instrument in measuring CS symptoms in Chinese patients with chronic pain. The manifestation of CS in the chronic pain population should be considered for optimal pain management in clinical practice.

Keywords:
CSI, Chronic Pain, Chinese

Abstract No. 21124

What are the Perspectives of Patients regarding Prehabilitation and Lumbar Spinal Stenosis Surgery?

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Objective:
To learn patients' perspectives regarding prehabilitation, lumbar spinal stenosis (LSS) surgery preparation, and postoperative recovery.

Background:
While LSS is the most common degenerative condition causing spine surgery in older adults, little is known regarding patients' concerns about LSS surgery and recovery.

Methods:
Twenty-five participants (9 females; average age: 67.7±6.7 years; postoperative time: 6.5±1.3 months) at 6 months after LSS surgery were recruited from a 2-arm (prehabilitation versus usual preoperative care) randomized controlled trial. Ten participants in the prehabilitation group and 15 participants in the usual care group were interviewed by semi-structured interviews. A facilitator asked open-ended questions regarding participants' experiences prehabilitation, preoperative preparation, and postoperative recovery. Transcripts were coded and themes were derived from thematic analysis.

Results:
Four themes were identified: (1) sources of information about LSS surgery; (2) factors affecting the surgical decision making; (3) attitudes toward prehabilitation; and (4) postoperative recovery. All participants wanted to have more preoperative education to facilitate their surgical decision making. Participants had mixed opinions regarding prehabilitation because LSS-related symptoms prevented them from joining prehabilitation. Many participants expected some or even complete postoperative relief of LSS-related symptoms. Unfortunately, only some participants experienced the expected postoperative improvements. Some participants experienced temporary symptomatic relief, whereas other experienced new postoperative symptoms. Most participants found that postoperative exercises taught by physiotherapists were useful although their compliance decreased over time.

Conclusion:
Our study underscores the necessity of proper preoperative LSS education. Future research should determine whether telerehabilitation can facilitate prehabilitation or postoperative rehabilitation in these patients.

Keywords:
Prehabilitation, Stenosis, Qualitative Study

Abstract No. 21128

Factors Affecting Pain and Disability in People with Chronic Low Back Pain

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Objective:
Chronic low back pain (CLBP) is difficult to treat because it is affected by multiple factors. A better understanding of factors affecting the pain intensity/disability of these patients may help clinicians identify potential targets or confounders for early intervention/modification. Hence, this study aimed to evaluate which lumbar multifidus (LM) parameters, psychological or behavioral factors were related to the pain intensity and disability of people with CLBP.

Methods:
Seventy-eight volunteers with CLBP provided their sociodemographic information, and completed the Numeric Pain Rating Scale, Rolland-Morris Disability Questionnaire, Hospital Anxiety, and Depression Scale, Pain Catastrophizing Scale, Fear Avoidance Belief Questionnaire (FABQ), and Insomnia Severity Index Scale. Further, Brightness-mode ultrasonography was used to measure the bilateral thickness of LM at the L4-S1 levels, at rest and during contraction. The percentage thickness change of LM at L4-S1 levels during submaximal contraction was calculated. Stiffness of bilateral LM at L4-S1 at rest and during contraction was measured by shear wave elastography. Separate multiple regression models were performed to identify factors predicting pain intensity and disability in people with CLBP.

Results:
Sleep disturbances and FABQ scores significantly predicted pain intensity (accounting for 21% of variance). FABQ scores, sleep disturbances, percentage thickness change of LM during contraction at L4-5 level, and LM stiffness at L5-S1 during contraction significantly predicted disability levels (accounting for 44% of variance) in people with CLBP.

Conclusion:
The presence of fear-avoidance beliefs and sleep disturbance affected both pain and disability. However, abnormal LM properties are more related to disability in people with CLBP.

Keywords:
Back Pain, Psychological Factors

Abstract No. 21023

A Comparison of Virtual Reality Training with Non-Computer Assisted Conventional Cognitive Training to Improve the Cognitive Function of Stroke Patients: A Systematic Review and Meta-Analysis

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Objective:
To compare the effect of virtual reality (VR) training with non-computer assisted conventional cognitive training (NCACCT) to improve cognitive function of stroke patients.

Background:
Cognitive impairment is common in stroke survivors. Conventionally, NCACCT is effective to improve one's cognitive function but high demand in resources. VR training maybe an alternative to improve cognitive function of stroke patients.

Method:
PRISMA guidelines were followed and six databases were searched (CINAHL, Cochrane Library, Medline, PsycINFO, PubMed and Scopus). Included studies were (1) RCTs published in peer-reviewed journals in English, (2) studies targeting adult stroke patients, (3) VR training for experimental group, (4) NCACCT as comparator, and (5) cognitive function as outcome. Studies cannot retrieve full-text were excluded. Quality of studies was appraised with Cochrane Collaboration's risk of bias assessment tool.

Results:
Five RCTs involving 132 stroke patients were included. They had good methodological quality. Although no statistical difference observed in global cognitive function (n=5, SMD=0.86, 95%C.I.: -0.09, 1.81, p=0.08), VR training using lower dosage (≤ 12 training sessions) was more effective than NCACCT to improve global cognitive function of stroke patients (n=3, SMD=1.63, 95%C.I.: 1.08, 2.19, $p<0.001$). Statistically insignificant results were found for improving the executive function, attention and memory of participants ($p>0.05$).

Conclusion:
Some evidence supports low dosage VR training is more effective than NCACCT in improving cognitive function of stroke patients. Future studies can explore the effect of low dosage VR training as an adjunct treatment and integrate it into stroke rehabilitation for better treatment outcomes.

Keywords:
Virtual reality, Stroke rehabilitation

Abstract No. 21039

A New Era of Physiotherapy Tele-Rehabilitation in Geriatric Day Hospital

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Objective:
To promote physical rehabilitation by means of physiotherapy tele-rehabilitation in Geriatric Day Hospital.

Background:
Facing to the challenge of COVID-19 pandemic in 2020, a comprehensive home-based multi-disciplinary tele-rehabilitation program was implemented in Geriatric Day Hospital (GDH) at Shatin Hospital in order to tackle the face-to-face patient service suspension during the second and third waves.

Methods:
Therapists made use of phone conversations, video-conferencing, video-recording, and mobile apps to conduct the tele assessments, intervention and monitoring. Through tele-rehabilitation, therapists provided education and advice on management of physical symptoms, functional mobility, caring skills and fall prevention. Individualized exercise program was also prescribed and continuously monitored using electronic pamphlets and videos, HA Go prescription or demonstration by therapist or patient using video-recording or interactive video-conferencing with carers' support.

Results:
All subsequent patients in GDH (144 in the second wave and 137 in the third wave) were recruited into the tele-rehabilitation program, with each lasting for about 4 months. By comparing pre- and post-program outcomes, patients showed significant improvement in all functional outcomes including Modified Functional Ambulation Classification, Berg Balance Scale, Modified Rivermead Mobility Index and 6 Minute Walk test ($P<0.01$). Furthermore, an excellent patient satisfaction rate (100% satisfaction) was also reported.

Conclusion:
Physiotherapy tele-rehabilitation program provided a feasible mode of service delivery disregarding the physical boundaries. Patients also showed significant improvement in their functional outcomes after receiving tele-rehabilitation. At present, physiotherapy tele-rehabilitation has been integrated into our face-to-face rehabilitation services in terms of home exercise prescription and monitoring, home assessment and carer education.

Keywords:
Physiotherapy, Tele-rehabilitation, Geriatric, COVID-19

Abstract No. 21048

Exploring the Relationship between National eHealth Development and Hofstede's Cultural Dimensions using the WHO Global eHealth Surveys

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Objective:
Promote eHealth development by examining supportive non-economic factors.

Background:
Technological advances enable cost-savings and quality improvements through adoption of eHealth, telehealth, and other initiatives. While more developed countries with greater resources at its disposal have developed better eHealth infrastructure, other high-income economies have not done so.

Methods:
The national policy status on eHealth and other related programs are obtained from the WHO Global eHealth Surveys of 2009 and 2015. The dependent variables consist of selected questions with either binary (yes/no) or checkbox responses. Explanatory variables include: healthcare expenditures per capita, hospital beds per 10000 persons, ICT Development Index, and values from Hofstede's (1989) Cultural Dimensions for the year 2015. OLS and logistic regression were used to correlate cultural factors with the decision to commit to an eHealth policy and means to do so.

Results:
The "Uncertainty Avoidance" dimension is negative correlated with the probability of establishing a national eHealth policy (WHO 2015, Q3). Hospital beds per capita are positively correlated with the probability of adopting a Health Information Systems policy (WHO 2015, Q6), suggesting that HIS systems are developed in response to the need to organise and maintain larger healthcare systems. Using fixed-effects regression to account for unobserved factors, we find that the ICT development index is positively related to the diversity of funding sources for eHealth development (WHO 2009 q1.17-q1.20, WHO 2015 q7-q10).

Conclusion:
Hesitation to commit to eHealth initiatives may be better explained by a location’s cultural aversion to novelty and uncertainty, rather than resource constraints

Keywords:
eHealth Policy, Cross-country Comparison

Abstract No. 21061

Infusing Standard Precautions for Infection Control in Occupational Therapy Telehealth with Children: A Qualitative Descriptive Study

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Objectives:
The COVID-19 pandemic has raised public health restrictions causing the cessation of in-person occupational therapy (OT) sessions and highlighted the need to teach infection control strategies. Innovative strategies must be developed in order to ensure continuity of OT services for children in a timely, effective, and safe manner. The aim of this study was to describe innovative practices employed by Filipino pediatric occupational therapists in integrating standard precautions for infection control in telehealth services.

Methods:
This study took place within the first year of the COVID-19 pandemic and used a qualitative descriptive study design. Data were collected using an online survey with open-ended questions among twelve Filipino occupational therapists between November-December 2020. Thematic analysis using conventional methods was employed to code data, identify concepts, and synthesize into overall themes.

Results:
The participants acknowledged the need to innovate in response to current contexts. Innovation was conceptualized to include the adaptation and adoption of strategies, especially when infusing concepts of standard precautions to prevent infection and transmission during telehealth sessions. This study highlights the importance of family collaboration, activity analysis, evidence utilization, and infusing standard precautions in children's daily occupations.

Conclusion:
Telehealth has provided an alternative avenue to continue OT services even in the time of the COVID-19 pandemic. Infusing standard precautions for infection control into telehealth services is an innovative strategy to prevent infection and transmission among children with disabilities and their families. Occupational therapists should consider these "new approaches" in the "new normal" and beyond.

Keywords:
Children, Telehealth, Occupational Therapy

Abstract No. 21103

Is it a Substitute or a Family-Centered Practice? Experience Sharing on Telehealth in Occupational Therapy Service for Preschoolers with Special Educational Needs (SEN)

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Background:
Healthcare professionals worldwide shifted from an in-person to a telehealth service mode during the COVID-19 pandemic. Throughout the on and off intervention suspension and resumption period, Occupational Therapists in Heep Hong Society, which serves children and teenagers with SEN and their family, responded to the crisis quickly by providing telehealth as a substitute for in-person intervention. From 3/2021, all in-person intervention has been resumed but telehealth in form of group or individual sessions have been maintained as value-added services with objectives on building capacity among caregivers, engaging in occupation and carrying over of skills within children's living contexts and environment.

Objective:
To share experiences on the use of telehealth from just as a substitute to a family-centered practice andto discuss the implication on future Occupational Therapy Service in the "new normal".

Methods:
Multiple case studies using multiple methods of data collection were conducted to achieve in-depth examination of the telehealth service.

Results:
Different telehealth strategies with OT conceptual models and health behaviour frameworks that were being used to address intervention goals will be provided. Application of digital tools for e-learning and apps to enhance OT treatment process will also be shared. Outcomes of children's performance and feedback from parents joining telehealth will be shown.

Discussion/Conclusion:
Although the effectiveness of telehealth still needs to be further examined, values of telehealth, consideration of best fit and its feasibility in serving as a complementary method of training delivery for children and families beyond the COVID-19 pandemic will be discussed.

Keywords:
Telehealth, Preschoolers, New Normal

Abstract No. 21053

Influence of Environment on Cortical Activation during Stepping in the Elderly

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Background:
Detrimental effect of Fear of falling (FOF) on balance in elderly is widely reported. However, the neural mechanism underlying remains unclear. To clarify this, we designed balance tasks on high stool, inducing FoF5, to compare the cortical activation with tasks overground in elderly.

Objectives:
(1) to investigate the difference in cortical activation during ground stepping and stool stepping conditions in the elderly.
(2) to explore the influence of environment on the cortical activation in response to the change of stepping difficulty.

Method:
Eleven community-dwelling elderly were enrolled in this study. They performed 4 tasks each 3 times at random: (1) normal stepping overground (2) fast stepping overground (3) normal stepping on a stool (4) fast stepping on a stool. Cortical activity was measured by functional near infrared spectroscopy (fNIRS) using an International 10-20 EEG cap. The cortical regions of interest consisted of Prefrontal Cortex (PFC), Pre-Motor and Supplementary Motor Cortex (PMC, SMA), Primary Motor Cortex(M1), Somatosensory Cortex(S1), Somatosensory Association Cortex(SAC). Paired-T test and two-way ANOVA (speed, environment) were adopted for analysis targeting at the first and second objectives respectively.

Results:
Cortical activation only during fast stepping showed near-to- significant more at PFC and SAC regions when on stool than overground ($P<0.1$). The ANOVA showed significant influence of environment on the cortical activation at PFC ($P<0.05$), but without interaction between environment and speed.

Conclusion:
Challenging environment induced more cortical activation, remarkably only during fast stepping but not normal stepping. These responses could be related to FoF, more sensitive at PFC and SAC regions.

Keywords:
Elderly fNIRS Stepping Environment

Abstract No. 21072

Profiles of Neuropathic Pain Component and Associated Risk Factors in Patients with and without Peripheral Nerve Injuries

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Objective:
Neuropathic pain (NP) is a pressing health concern worldwide. NP symptoms are not only found in neural impairments such as carpal tunnel syndrome (CTS), but also in non-neurological diseases like osteoarthritis (OA). Characteristics of NP resulting from different sources remain unclear. Therefore, this study aimed to investigate the distinct profiles of NP in CTS and hand OA cohorts, and explore associated predictors.

Methods:
Symptomatic patients diagnosed as CTS or hand OA were enrolled. The NP was screened by the PainDETECT instrument. Pain intensity and pain sensitization were assessed. Patients' emotional states, hand function, and quality of life were also measured. Prevalence of NP was calculated, and multivariate regression was used to investigate potential predictors.

Results:
Totally 125 patients were recruited (50 CTS; 75 hand OA; aged 64.3+8.08 years). Of CTS patients, 88% had equivocal or positive NP, and 70% were of possible or positive NP in hand OA cohort. Higher pain intensity and body mass index (BMI) were associated with elevated odds to develop NP in CTS patients (Odds ratio (OR) 1.67, 95% confidence interval (CI) 1.09-2.57; OR 1.35, 95% CI 1.05-1.75). For hand OA patients, associations were found between NP and self-perceived health status (OR 0.94, 95% CI 0.88-0.99).

Conclusion:
NP seemed prevalent in CTS and hand OA patients. Pain intensity and BMI were associated with NP in CTS patients. Self-perceived health status was inversely associated with NP in OA patients. Future studies are warranted to explore the mechanisms of different NP manifestations for an efficacious pain management.

Keywords:
Neuropathic-pain, CTS, Osteoarthritis

Abstract No. 21073

Effects of Contact Heat Stimulation Intensity on Reliability of Subjective Pain Rating

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Objectives:
Studies revealed contact-heat stimulations mediate one's pain perception due to temporal summation (TS). How heat intensity would affect the stability of pain rating of individuals with different heat tolerance is not well examined. The present study aimed (1) to investigate the influence of the preceding contact-heat stimuli with different intensity on the reliability of subjective pain rating; and (2) to examine the differences in reliability of subjective pain rating of participants with high and low heat tolerance.

Methods:
Participants were divided into high (n=18) and low (n=12) pain-tolerance groups based on the cut-off temperature of 47°C equivalent to numerical rating scale (NRS) of 7. In each trial, each participant was given a pair of 2-second contact-heat stimuli (an inter-stimulus interval of 2.5 seconds) at left thenar eminence and reported an NRS rating. Four blocks of intensity combinations were given: Low-Low, High-High, Low-High, and High-Low conditions, with 72 trials in each block.

Results:
Findings revealed high heat tolerance group results lower intraclass correlation coefficients (ICCs) when contact-heat stimuli were preceded by another with higher intensity (0.551–0.747) compared to those preceded by lower intensity (0.724–0.818). In contrast, the ICCs of low heat tolerance group were found to be uniformly higher regardless of heat intensity ranged from 0.595 to 0.806.

Conclusions:
Different consistency of heat-induced pain rating b suggests different stimulation protocols, in terms of stimulation duration and intervals may be needed for individuals with different heat tolerance.

Keywords:
Pain, Contact Heat, Reliability

Abstract No. 21076

Effects of Combined Balance and Brisk Walking on Alleviating Non-Motor Symptoms in Parkinson Disease

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Objectives:
To investigate the effects of a 6-month combined balance and brisk walking programme on alleviating non-motor symptoms in people with Parkinson's disease (PD).

Background:
Six-month combined balance and brisk walking (B&B) exercise could improve motor performance in people with mild to moderate PD. It is interesting to examine the effects of this programme on non-motor symptoms in the PD population.

Methods:
Participants with mild to moderate PD were randomized into B&B or control (CON) flexibility and strength group training. Six supervised sessions were provided by physiotherapists once weekly, followed by 4 supervised sections monthly. Movement Disorder Society Unified Parkinson Rating Scale non-motor (MDS-UPDRS I) and Non-motor Rating (MDS-NMS) scores, and Pittsburg Sleep Quality Index (PSQI) were assessed before (Pre), 6-week (Post6wk) and 6-month (Post6m) after training.

Results:
35 PD participants (BB=17; CON=18) completed the program with 96% attendance rate. There were no adverse effects or falls during training or home exercise. Significant group*time interactions were found in MDS-UPDRS I and MDS-NMS scores using 2-way repeated ANOVA in B& B group. At Post6wk, there was a significant decrease from baseline of the MDS-UPDRS I scores (-2.1 points) and of MDS-NMS scores (-10.1 points) in the B& B group ($p<0.05$). At Post6m, there was a marginal decrease of MDS-UPDRS I scores (-2.3 points) from baseline in the same group.

Conclusion:
Combined balance and brisk walking programme alleviates non-motor symptoms up to 6-week after training in people with PD. A larger sample size is needed to determine its longer term effects.

Keywords:
Parkinson's Disease, Non-motor Symptoms

Abstract No. 21095

Effect of 365-day Physiotherapy Restorative Rehabilitation on Functional Mobility, Activity & Hospital Length of Stay for Patient with Stroke and Satisfaction of Stakeholders - A Promise of Better Outcome

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Objective:
To investigate the effect of 365-day-per-year-coverage-restorative-Physiotherapy (365-day-PT) on functional mobility and activities, stakeholders' satisfaction and length of stay (LOS) for stroke.

Background:
365-day-PT for stroke was launched on 1 October 2019 in Kowloon Hospital (KH).

Methodology:
Patients with stroke receiving weekday-rehabilitation conventional service (control) and 365-day-PT from 1-10-2019 to 31-3-2021 in KH were recruited. Subjects was included if they had principal-diagnosis of stroke (ICD9 430-436).

The scores of Modified-Functional-Ambulation-Classification (MFAC), Modified-Barthel-Index (MBI), Modified-Rivermead-Mobility-Index (MRMI) and LOS were recorded by Physiotherapist on admission and at discharge. The recent experiences 365-day-PT at-discharge were reported by using a simple five-point-scale satisfaction-survey.

Result:
Data of 811 discharged patients with stroke in aged 70.57±4.52 years were analyzed. 46.7% (N=379) was female. Results of Wilcoxon-Signed-Ranks test revealed MFAC improved at discharges with median progression of 2 (N=811). The results of Mann-Whitney U test revealed significant-difference of the change score of MFAC among two groups (N=811, $p<0.05$) including a median progression of 2-categories from III-V for 365-day-PT (N=461) and 1-category from II-III for control (N=350). LOS of 365-day-PT was 33.12±23.25 and control was 35.75±36.24 ($p\geq0.05$).

In sub-group of 365-day-PT analysis, MBI improved at discharge ($p<0.05$); MRMI also improved at discharge ($p<0.05$). Majority (74.90%) of discharge-destination were home. High satisfaction rate about 365-day-PT was reported by Physiotherapist (94.5%) from satisfied to very-satisfied (S-VS); reported by patient (88.1%, N=461) of S-VS.

Conclusion:
Provision of 365-day-PT for stroke resulted in earlier greater achievement of functional outcomes within a relatively short LOS with high satisfaction of stakeholders.

Keywords:
Stroke, 365-day-per-year-coverage-restorative-Physiotherapy

Abstract No. 21102

Dual-Task Training Versus Single-Task Training for Balance in Individuals with Cerebellar Ataxia: A Randomized Controlled Trial

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Combining cognitive training with physical training to improve balance is a new approach for reducing the risk of falls in patient populations who are at risk for falls. Dual-task refers to the simultaneous performance of two tasks; that is, activities that combine cognitive demand and physical task. Dual-tasks are complex due to the great demand for motor and cognitive resources. People with brain pathology including cerebellar ataxia (CA) have difficulty in performing dual-tasks. Deficiency in dual-task performance relative to single-task performance referred to as dual-task cost is high in CA. Due to the high demands on cognitive resources, people with CA have higher falls rates during activities that involve dual tasking.

We hypothesize that (1) dual-task training will improve balance and reduce falls; (2) reduction in dual-task cost of balance and cognitive performance will mediate a reduction in the number of falls in CA and (3) dual-task training will be a cost-effective treatment option for improving balance and reduce falls.

To test these hypotheses, an assessor and statistician blinded two-arm parallel group, RCT comparing dual-task (CIBT) to single-task (conventional balance, coordination and cognitive) training is being conducted with 44 participants with CA. Eligible participants are randomized to study groups and allocation concealed.

Outcome measures include dual-task timed up and go test, scale for the assessment and rating of ataxia, Berg Balance scale, Sensory Organization test and the Euro-qol 5 dimension 5 level test. The findings of this ongoing trial will be presented.

Keywords:
Cerebellar Ataxia, Balance, Dual-task

Abstract No. 21014

Influence of Task Complexity and Mirror Image Clarity on Motor Facilitation in Post-Stroke Mirror Therapy

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Introduction:
Mirror therapy has been found effective for promoting upper limb function regain among post-stroke patients. Images and movement patterns of fingers projected on mirror are important attributes of mirror therapy.

Objective:
To examine the roles of movement complexity and image clarity of fingers on influencing motor facilitation among post-stroke patients and healthy participants.

Method:
Fifteen post-stroke patients and 18 right-handed healthy participants performed simple or complex finger tapping while viewing mirror images of these movements of various levels of clarity. The physical setup was identical to a typical mirror therapy. Functional near infrared spectroscopy (fNIRS) was used to capture brain activities elicited in the bilateral primary motor cortices (M1) in a block experimental design.

Results:
Irrespective of the study group, “complex finger-tapping task with blurred mirror image” resulted in lower intensity ($p<0.01$) and authenticity ($p<0.01$) of kinesthetic mirror illusion, and higher perceived effort in generating the illusion ($p<0.01$), than those in “simple finger-tapping with clear mirror image”. Greater changes in the oxygenated hemoglobin concentration were recorded at the ipsilesional and ipsilateral M1 in “complex finger-tapping task with blurred mirror image” than those in “simple finger-tapping task with clear mirror image” ($p=0.03$). Post-stroke patients showed greater changes than their healthy counterparts ($F=5.08$; $p=0.03$; partial eta squared=0.14).

Conclusions:
Modulation of ipsilesional motor activity among post-stroke patients by manipulating the complexity and images of the finger movements highlight the role of top-down attention and working memory in processing the mirror images.

Keywords:
Mirror therapy, Motor complexity

Abstract No. 21018

Efficacy of Non-Surgical, Invasive, and Non-Invasive Conservative Therapies for the Treatment of Urge Incontinence due to Neurogenic Bladder: A Systematic Review and Meta-Analysis

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Background:
The effectiveness of conservative therapies for the management of neurogenic bladder (NGB) remain inconclusive.

Objective:
To determine the efficacy of conservative therapies for the management of urge urinary incontinence (UUI) and quality of life (QoL) in individuals with NGB.

Methods:
Multiple databases were utilized. Randomized controlled trials comparing conservative therapies such as intravaginal electrical stimulation (IVES), transcutaneous electrical nerve stimulation (TENS), transcutaneous tibial nerve stimulation (TTNS), pelvic floor muscle training (PFMT) and behavioral therapy (BT) to controls were included. Trials' quality were evaluated.

Results:
Fourteen trials met the inclusion criteria. Meta-analysis of four and three trials revealed a significant effect of IVES (WMD= -0.414; 95% CI, -0.786 to -0.042; p=0.029) and TENS (WMD= -0.927; 95% CI, -4.219 to -1.635; p=0.000), on UUI symptoms respectively. Meta-analysis of two trials found a significant effect of TTNS on QoL of individuals with NGB (WMD= -9.117; 95% CI, -14.746 to -3.487; p=0.002). The pooled analyses of three trials of PFMT (WMD= -0.751; 95% CI, -2.426 to 0.924; p=0.380) and two trials of BT interventions (WMD= -0.597; 95% CI, -1.278 to 0.085; p=0.085) found no statistically significant effect.

Conclusion:
Our meta-analysis found IVES and TENS as beneficial for improving the symptoms of UUI among people with multiple sclerosis and stroke, respectively. This review found that TTNS can improve the QoL of people with NGB due to Parkinson's disease. Future studies to evaluate the inclusive effect of PFMT and BT and interventions that have received less attention such as repetitive transcranial magnetic stimulation are warranted.

Keywords:
Conservative therapies, Neurogenic bladder

Abstract No. 21060

Effect of Transcutaneous Electrical Acupoint Stimulation on VD Rats and its Mechanism was Studied based on PINK1/ Parkin Regulation

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Objective:
Mitophagy plays an important role in the pathogenesis of vascular dementia (VD). In this study, we investigated whether transcutaneous electrical acupoint stimulation (TEAS) could improve cognitive function in VD rats by regulating PINK1/ Parkin-mediated mitophagy.

Methods:
VD rat model was prepared by modified 2-vessel occlusion (2-VO) and randomly divided into four groups: Sham group (Sham), Model group (Model), TEAS group (TEAS), and TEAS+3-MA group (T+3-MA). In the T+3-MA group, PINK1/Parkin pathway inhibitor (3-MA) was injected into the lateral ventricle. The cognitive function and recovery of each group were observed by neurobehavioral analysis. The expression levels of mitochondrial markers (TOMM20) and autophagosome (LC3) were observed by immunofluorescence. The expression levels of PINK1, Parkin and other key proteins were detected by Western blot.

Results:
TEAS can effectively improve the learning and memory ability of VD rats. Immunofluorescence results showed that TEAS could up-regulate LC3. Western blot results showed that TEAS could reverse 2-VO-induced down-regulation of PINK1, Parkin, LC3-II/I and up-regulation of p62. In addition, the T+3-MA inhibitor group had a worse effect.

Conclusions:
This study suggests that TEAS can reduce the accumulation of damaged mitochondria through PINK1/ Parkin-mediated mitophagy, improve mitochondrial dysfunction, protect neurons from injury, and thus alleviating the cognitive dysfunction of VD rats.

Keywords:
Mitophagy, PINK1/Parkin, TEAS, VD

Abstract No. 21119

A Systematic Review and Meta-Analysis Regarding the Impacts of COVID-19 Pandemic on Physical Activity Involvements and Exercise Habits of People with and without Chronic Diseases

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Objectives:
To investigate the impacts of the new coronavirus (COVID-19) outbreak on physical activity (PA) involvements and exercise habits in people with and without chronic diseases.

Background:
COVID-19 pandemic posed a menacing threat to the global health. Governments implemented lockdowns to suppress the outbreak, which might inevitably alter some people's PA levels and exercise habits.

Methodology:
Seven databases were searched from November 2019 to May 2021 to identify relevant articles. Two independent reviewers screened abstracts and full-text articles, assessed methodological quality of the included studies based on study designs. Meta-analyses were conducted to determine the pooled standardized mean differences (SMD) in various post-outbreak PA-related outcomes in people with and without chronic diseases. Levels of evidence for each PA outcome was determined by GRADE.

Results:
Of 1,226 identified citations, 82 full texts were screened. Thirty-six articles with 800,256 participants were included. Very limited to moderate evidence suggested decreases in PA-related outcomes and increases in sedentary behaviors in people with and without chronic diseases. Specifically, pooled estimates of metabolic equivalent-minute per week (SMD=-0.16, $p=0.02$), duration of PA (SMD=-0.07, $p<0.01$), step counts (SMD=-2.79, $p<0.01$), and sedentary time (SMD=0.09, $p=0.04$) showed significant decreases (indicating small to large effects) in the general population. Very limited evidence showed similar patterns in people with chronic diseases.

Conclusions:
Throughout the COVID-19 pandemic, people with and without chronic diseases demonstrated significant reduction in PA levels and increases in sedentary behaviors. Health authorities should implement proper strategies to minimize or revert the lockdown-related deleterious impacts of PA in the future.

Keywords:
COVID-19, Physical Activity, Exercise

Abstract No. 21120

The Effect of Physical Exercises on Reaction Time in Older People: A Systematic Review and Meta-analysis

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Objective:
To evaluate the effect of physical exercise on simple (SRT) and choice reaction time (CRT) and to identify an optimal training protocol.

Background:
Reaction time is an important falls predictor in the older population. However, the effect of different types of physical exercises on reaction time remains uncertain.

Methods:
Five electronic databases (CINAHL, EMBASE, PubMed, Web of Science, SPORTDiscus) were searched to identify randomized controlled trials which (1) included older people ≥55 years old, (2) could delineate the effect of physical exercises, and (3) assessed SRT/CRT (last search in March 2021). Meta-analyses and sensitivity analyses were conducted to combine the results.

Results:
Among 1,132 articles screened, thirty-four trials (n=3361) fulfilled the selection criteria. Meta-analyses revealed that physical exercise could improve SRT (SMD=-0.41, 95%CI=-0.56 to -0.27) and CRT (SMD=-0.39, 95%CI=-0.66 to -0.11). Sensitivity analyses showed that strengthening (SMD=-0.68, 95%CI=-1.15 to -0.21), balance (SMD=-0.82, 95%CI=-1.11 to -0.52), stepping (SMD=-0.62, 95%CI=-1.08 to -0.16) and dual-task exercise (SMD=-0.48, 95%CI =0.90 to -0.06) significantly improves SRT, but only stepping exercise improves CRT (SMD=-0.76, 95%CI=-1.08 to -0.44). Training with a session duration of 30 to 60 minutes, for 1 to 2 hours per week, and a program duration of 6 to 12 weeks yielded larger effect sizes for both SRT and CRT.

Conclusion:
Stepping exercise can improve both SRT and CRT. Strengthening, balance and dual-task exercise can ameliorate SRT. To facilitate the improvement, training could be designed to last for 30-60 minutes per session, 1 to 2 hours per week, for 6 to 12 weeks.

Keywords:
Exercise, Reaction Time, Elderly, Review

Abstract No. 21123

Factors Associated with Dance-Related Lumbar Injury in Dancers – A Population-Based Study

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Objective:
To investigate the 12-month prevalence of dance-related lumbar injury and associated risk factors among dancers.

Background:
While lumbar injury is prevalent among dancers, no large-scale, population-based studies have investigated factors associated with dance-related lumbar injury among dancers in Hong Kong.

Methods:
Identical web- and paper-based questionnaires were sent to professional and recreational dancers through local dance associations and dance schools. The questionnaires collected data regarding demographics, dance experiences, and lumbar dance injury within the last 12 months. Factors associated with dance-related lumbar injury in the last 12 months was analyzed by a multivariate regression model.

Results:
A total of 1,416 respondents (mean age: 19.5+/- 10.2 years) replied. 87.4% and 30.0% of respondents were females and professional dancers, respectively. The 12-month prevalence of lumbar injury in dance instructors and dancers was 23.5% and 10.3%, respectively. The regression model showed that dancer instructors (odds ratio (OR)=2.49; 95% CI: 1.59 to 3.74), prior history lumbar injury (OR=2.32, 95% CI: 1.48 to 3.64), and the presence of scoliosis (OR=1.92; 95% CI: 1.78 to 3.87) were independently related to dance-related lumbar injury in the last 12 months.

Conclusion:
This is the first large-scale, population-based study to investigate the 12-month prevalence of lumbar injury and associated risk factors for dancers practicing different genres. Dance instructors, prior history of lumbar injury, and spinal deformity are significantly related to lumbar dance injury in dancers. Future research should determine whether education/rehabilitation can lower the risk of new/recurrent lumbar dance injury in these high-risk dancers.

Keywords:
Dance Injury, Dancers, Prevalence

Abstract No. 21050

Effectiveness of Peer Support to Stroke Survivors and Carers with Web-Based Intervention and Tele-Coaching: A Volunteer-Based Service

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Objective:
To shorten duration of stroke patients in receiving rehabilitation services and support and prevent burnout of caregivers with one-stop peer support service.

Background:
A pilot study was conducted among 47 stroke survivors' caregivers on service access barriers and result stated patients was delayed in rehabilitation and burdened caregivers with huge stress due to the lack of accessible information and fragmented service gap between hospitals and communities. Therefore, the peer support service with web-based resources platform was developed to aid stroke patient and families to achieve the objectives mentioned.

Methods:
Former stroked patients and caregivers received trainings to become tele-coaching supporters provided with ongoing supervision and standardised assessment documentation. They completed initial assessment with newly stroked patients or caregivers on phone and triage them to receive brief or intensive support. The web-based resource platform was sent to all contacted families for stroke rehabilitation knowledge and peer supporters provided tele-coaching on rehabilitation experience, brief counseling, and caring plan advice.

Results:
By the end of September 2020, 132 families received services. All clients completed both pre and post assessments. After receiving peer tele-coaching and web-based information, families reported to find suitable service within 16 days (median) compared to an average of 2-9 months from pilot study. Results were significant among caregivers in gaining accurate knowledge, stress reduction and self-efficacy.

Conclusion:
Peer support in the form of tele-coaching with web-based information was demonstrated to be a cost-effective and convenient way to enhance the provision of services for stroke patients and their families.

Keywords:
Stroke Caregivers, Peer Support, Tele-coaching, Online

Abstract No. 21051

Preliminary Study on Feasibility of the Omni-Directional Platform and Virtual Reality for Rehabilitation

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Introduction and aim:
Although the use of Virtual Reality (VR) has been well investigated in clinical studies, research on the use of the Omni-directional Platform (ODP) together VR is much less investigated in rehabilitation. Acceptance of this technology in rehabilitation and the potential cybersickness of walking on the spot using the ODP and VR is currently unclear. This preliminary study aims to investigate the feasibility of the ODP with VR in rehabilitation using a mixed method study design.

Methods:
The Kat-walk mini ODP and the HTC VIVE Pro headset were used in this study. Immersive VR content was created using 360-degrees videos. A total of 35 participants consisting of physiotherapists (n=8) and healthy adults (n=27) were recruited in the study. The participants completed the study by going through 8 different walking scenes. Symptoms of cybersickness were evaluated using the simulation symptoms questionnaire (SSQ) and qualitative feedbacks from the participants were taken at the end of the study on their perceived safety and acceptance of the system for rehabilitation purposes.

Results:
The overall results showed that majority of the participants perceived the system as being safe (score 78.9/100) and would accept this technology if offered as a form therapy treatment (score 64.5/100). A total of 71% of the participants experience mild to moderate symptoms of cybersickness based on the findings of SSQ.

Conclusion:
This preliminary study showed that ODP and VR has good potential for use in rehabilitation. Further VR software development is needed to reduce effects of cybersickness.

Keywords:
Virtual Reality, Rehabilitation, Technology

Abstract No. 21075

The Effect of Stimulating Neural Substrates of Dual-networks on the Task-set Preparation: A TMS and EEG Study

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Objective:
Under dual-task conditions, set-maintenance network would become active to prepare task-sets. How the set-maintenance and rapid-adaptive dual-networks cooperate to process information is yet to be investigated. By using transcranial magnetic stimulation (TMS) method, this study investigated neural signal flows as signified by theta-band coherence between cortical regions in the dual networks under dual-task condition.

Methods:
Eight cognitively intact participants (mean age = 26 years) volunteered to participate in two cognitive tasks: (1) a dual task of flanker and 2-back tasks (high demand on task-set) and (2) a single task of flanker task only (low demand on task-set). Before each session of the tasks, offline intermittent theta-burst TMS (iTBS) was applied in randomized order to three regions within the set-maintenance network (anterior insula (aI), medial superior frontal cortex (msFC), anterior prefrontal cortex (aPFC)), two regions within the rapid-adaptive network (dorsolateral prefrontal cortex (dlPFC) and dorsal prefrontal cortex (dFC) and control (vertex). Electroencephalogram signals were recorded across the tasks.

Results:
Isolated effective coherence analysis on theta-band oscillation revealed significant results at only aI ($p = .03$) after iTBS, suggesting stronger theta-band oscillation sending from dlPFC to aI, and from aI to msFC. No significant results found in other regions that do not subserve task-set preparation function.

Conclusion:
The increased signal flows from anterior insula in set-maintenance network suggest that its distinctive role to facilitate task-set preparation to handle the demands under dual-task conditions. The preliminary findings provide an insight into more emphasis on training set-maintenance network along with information processing.

Keywords:
Top-down Networks, Dual-task, TMS

Abstract No. 21078

A Novel MRI-Based Geometric Mode for Personalized Transcranial Magnetic Stimulation in Age-Related Neurodegenerative Diseases

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Background:
Transcranial brain stimulation in rehabilitation is a fast-growing field featured with computational and biophysical modeling. Cortical features and scalp-to-cortex distance (SCD) are key variables for determining the strength and distribution of the electric field, yet longitudinal studies able to capture these dynamic changes are missing. We sought to investigate the ageing effect on the morphometry and SCD of left primary motor cortex (M1) and dorsolateral prefrontal cortex (DLPFC) in normal ageing adults and mild cognitive impairment (MCI) converters.

Methods:
Baseline, 1-year and 3-year follow-up structural magnetic resonance imaging scans from normal ageing adults (n=32) and MCI converters (n=22) were drawn from the Open Access Series of Imaging Studies. We quantified the changes of the cortical features and SCDs of left M1 and DLPFC, including cortical thickness and folding. Head model was developed to simulate the impact of SCD on the electric field induced by transcranial current stimulation.

Results:
Pronounced ageing effect was found on the SCD of left DLPFC in MCI converters. The SCD change of left DLPFC from baseline to 3-year follow up demonstrated better performance to discriminate MCI converters from normal ageing adults than the other morphometric measures. The strength of electric field was consequently decreased with SCD in MCI converters.

Conclusion:
Ageing has a prominent, but differential effect on the region-specific SCD and cortical features in adults with cognitive impairments. Our findings suggest that SCD, cortical thickness and folding could be used as valuable markers when conducting transcranial brain stimulation in individuals with brain atrophy.

Keywords:
Geometry, Folding, Ageing, Neuromodulation

Abstract No. 21083

Priming Intermittent Theta Burst Stimulation Boosts Motor Learning in Patients with Stroke

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Objective:
Intermittent theta burst stimulation (iTBS) creates a state with increased excitability that permits learning modalities to induce neuroplasticity and behavior learning. Preceding iTBS with continuous theta burst stimulation (cTBS) may boost the facilitatory effect of iTBS via metaplasticity. The study aimed to investigate the effects of priming iTBS (cTBS followed by iTBS) on poststroke upper limb motor recovery.

Methods:
Chronic stroke patients were randomly allocated to 10-session priming iTBS, nonpriming iTBS, or sham stimulation, to the ipsilesional motor cortex, immediately before a customary robot-assisted training (RAT). Primary outcomes included Fugl-Meyer Assessment-Upper Extremity scores (FMA-UE) and Action Research Arm Test (ARAT). Secondary outcomes were mean movement velocity during each RAT session, and sensorimotor beta oscillations in electroencephalography.

Results:
Forty-two patients were included. The analysis of FMA-UE revealed a significant time-by-group interaction (P=0.011). Priming and nonpriming iTBS were both superior to sham stimulation in post hoc comparisons. Among higher functioning patients, priming iTBS yielded a significantly greater improvement in FMA-UE than nonpriming iTBS (P=0.025) and sham stimulation (P=0.029). No significant interaction was found in ARAT and mean movement velocity. Priming iTBS enhanced the mirror visual feedback-induced high beta sensorimotor desynchronization over the ipsilesional hemisphere.

Conclusion:
Priming and non-priming iTBS are both superior to sham stimulation in enhancing training gains from RAT, and potentially more benefits from priming TBS could be observed in patients with higher functioning. Priming iTBS facilitates poststroke motor learning, presumably by enhancing the permissiveness of the ipsilesional sensorimotor area to therapeutically sensory modalities, such as mirror visual feedback.

Keywords:
Metaplasticity, Stroke, Neuromodulation

Abstract No. 21031

An ICF-based Stroke Rehabilitation Program enhances Community Reintegration for Clients with Subacute Stroke

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Background:
Community reintegration is the ultimate goal in stroke rehabilitation. However, traditional stroke rehabilitation focuses on improving clients' impairment and activity limitations in the International Classification of Functioning, Disability and Health (ICF) framework. This project introduces a revamped subacute stroke rehabilitation service that focuses on goal setting and community engagement of clients. Preliminary program effectiveness is discussed.

Methods:
Subacute stroke clients referred to a day rehabilitation center and met the inclusion criteria were admitted into the ICF-based stroke rehabilitation program. Multidisciplinary outcome measures of various ICF domains were conducted at three time points: baseline, discharge and 3-month follow-up. Interventions with community engagement were individualized according to the collaborative goals set in the Goal Attainment Scale (GAS).

Results:
By the end of April 2021, 35 participants completed both baseline and discharge assessment, while 15 also completed the follow-up assessment. At discharge, there was a significant ($p<0.05$) medium to large reduction of frailty level (CFS: 5.03→4.31; MFAC: 4.79→5.61) and significant medium to large improvements of mobility (EMS: 10.47→14.76; BBS: 25.05→37.08; miniBEST: 13.76→15.68), ADL (8.52→11.88, except bladder and bowl functions), community living self-efficacy (30.81→37.69) and quality of life (41.08→45.90). The mean GAS T-score increased from 27.0 at baseline to 64.6 at discharge ($p<0.01$). In the cognitive domain, only memory function was moderately improved (27.05 →34.30). At follow-up, most improvements remained.

Conclusion:
Preliminary results indicated the effectiveness of this ICF-based stroke rehabilitation program on various levels of ICF domains. Goal-directed community re-integration intervention helped clients to accomplish continuous improvement.

Keywords:
ICF, Stroke Rehabilitation, Community

Abstract No. 21034

The Efficacy of Hypnotherapy for People with Depression: A Pilot Study

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Background:
Hypnotherapy has been widely applied in health care, and there is growing evidence showing its effectiveness in relaxation, symptom relief, and stress reduction. However, it was not commonly applied in the local context and efficacy studies were scarce. Neodissociation model proposed that people have multiple cognitive systems in which thought and information processing can function simultaneously. Hypnosis enables various cognitive subsystems that works autonomously and dissociates from one another. In treating depression, hypnotherapy enhances an individual's awareness of positive affect and facilitates divergent thinking.

Objective:
The objective of the study is to evaluate the efficacy of hypnotherapy for people with depression.

Methodology:
This study recruits participants with depression from the community, and participants would be randomly assigned to either experimental or control condition. Participants of experimental group attend 4 hypnotherapy sessions weekly. Each session lasts for 45 minutes. Standard hypnotherapy protocol of pre-talk, hypnotic induction, hypnotic suggestion, and debriefing will be carried out. Participant's depressive symptoms, rumination tendency and stress level will be assessed at baseline, and upon completion of intervention program by outcome measures of depression, well-being, rumination, and heart rate variability. The outcomes will be tested by repeated measures of ANOVA.

Conclusion:
This study hypothesized that hypnotherapy is effective in facilitating depressive clients to relax and reduce stress. If this hypothesis is supported, the results of this study could provide evidence that hypnotherapy could be a non-pharmacological treatment option for clients with depression in Hong Kong.

Keywords:
Hypnotherapy, Depression, Symptom-relief, Stress-reduction

Abstract No. 21049

Localization of Chinese Activate Your Life Program in Hong Kong and its Preliminary Effectiveness among People with Chronic Conditions and Their Families

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Background:
Activate your Life Program – Chinese version (C-AYL) is a psycho-education program developed in the United Kingdom by Professor Neil Frude based on Acceptance and Commitment Therapy (ACT). It promotes self-help method and encourages people to distinguish their thoughts and facts. The Hong Kong Society for Rehabilitation has translated and localized the content of C-AYL program for people with chronic conditions and their family members. The preliminary effectiveness of this program is investigated.

Methods:
The C-AYL program is 4-session psycho-education conducted by trained facilitators. Content of the program was first translated by the professional translator, then reviewed and amended by the project team members. The face validity of content was tested in a group of persons with chronic conditions. Targeted participants were recruited from community rehabilitation service units. Repeated pre- and post-assessment using questionnaire survey will be used to explore the preliminary effectiveness of the program.

Results:
By the end of June 2021, 35 participants were included for the program evaluation. All 35 participants completed both pre and post assessment. After the C-AYL program, there was a significant change in PHQ-9 (p-value =.000), GAD-7 (p-value = .016), AAQ-II (p-value = .019), MSES-R (p-value = .66), RSE (p-value = .003) and PWI-A (p-value = .000). At the follow-up assessment, most improvements remained and some outcomes showed significant continuous improvement.

Conclusion:
The preliminary results indicated that the C-AYL Program was an effective approach to enhance participants psychological distress and increase their positive thinking.

Keywords:
ACT, AYL, Psychosocial Care

Abstract No. 21069

How to Improve the Accessibility of Evidence-Based Psychological Service: A Pilot Study of Low-Intensity Cognitive Behavioral Therapy in a Community Setting in Hong Kong

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Background:
Despite the high prevalence and the detrimental impacts of common mental disorders (CMD), accessibility to evidence-based psychological treatment is low. Low-intensity cognitive behavioural therapy (LICBT) was developed to increase accessibility. However, there is little evidence on the effectiveness of LICBT.

Objective:
This study aimed to investigate the effectiveness of LICBT in treating CMD at a community centre in Hong Kong.

Method:
A prospective repeated measures design was adopted in the current study. From 2017 to 2020, 1220 participants were recruited and received LICBT in a guided self-help format. Depressive and anxiety severities were measured at pre- and post-treatment using Patient Health Questionnaire-9 and Generalized Anxiety Disorder-7.

Results:
Significant pre-post improvements and large effect sizes were found for both depression and anxiety scores (d = 0.87-0.89). When considering individuals who scored above clinical threshold at pre-treatment, the treatment effect sizes for depression and anxiety further increased (d = 0.95-1.02). The recovery rate was 51%, while the reliable improvement rate was 65%. Pre-treatment depression, pre-treatment anxiety, number of sessions, and waiting time were significant predictors of treatment outcome.

Conclusions:
The results indicated LICBT is effective in treating CMD in Hong Kong. Results are comparable to the findings from UK and Australia, as well as the meta-analytic effect size of traditional CBT. Although the current study did not have controlled groups, previous studies showed effect sizes for waitlist controls were small (d = 0.20-0.22), suggesting the improvements from LICBT is unlikely to occur naturally. Further studies using randomized controlled trials are needed.

Keywords:
CBT, Low-intensity, Psychotherapy, CMD

Abstract No. 21110

The Effectiveness of a Cognitive Intervention on Reducing Playing Tension among Organists: A Randomized Controlled Trial

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Background:
Unlike the piano, dynamics (sound volume) on organ are controlled by stops/expression pedals. However, organists may still vary their force (strong/weak) when expressing dynamics, which may increase the risk of injuries. Cognitive intervention targeting the top-down conscious process may increase organists' awareness of potential maladaptive habits (if any) and mitigate their playing tension.

Objectives:
To evaluate (1) if organists play dynamics with different force; (2) the effectiveness of a cognitive intervention.

Methods:
This single-blinded randomized controlled trial randomized 40 organists who learned the piano before organ into intervention/control groups. At baseline, participants played two dynamics [pp-pianissimo (very soft) and ff-fortissimo (very loud)] on the organ and piano in random orders. After the participants listened to a 5-minute audio instruction emphasizing minimal organ playing force (intervention) or took a 5-minute break (control), they replayed both dynamics on two instruments. Surface electromyography (sEMG) was used to measure 4 bilateral forearm muscle activities during organ/piano playing. Participants rated their playing force on an 11-point scale (0=minimal; 10=maximal).

Results:
Baseline sEMG signals of all 8 muscles and self-ratings were significantly higher during organ (piano) ff-trials than pp-trials. The intervention group displayed significantly lower post-treatment sEMG signals of all muscles and self-rated force during organ ff-trial than controls. There were no significant differences between groups for sEMG (except 1 muscle) or subjective ratings in the pp-trial.

Conclusion:
The results suggest that organists use "strong/weak" force to play dynamics. Cognitive intervention is effective to reduce organists' muscle tension in playing loud (but not soft) music.

Keywords:
Organist, Electromyography, Cognitive Intervention

Abstract No. 21130

Modifiable Risk Factors for Incident Mild Cognitive Impairment in Community-Dwelling Older Adults – A Systematic Review

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Objectives:
To summarise evidence regarding risk factors for mild cognitive impairment (MCI) in community-dwelling seniors.

Background:
Since seniors with MCI are at risk of developing dementia, numerous studies have investigated the modifiable risk factors for developing MCI so as to develop proper preventive strategies to prevent MCI development. However, no systematic review has summarised evidence regarding modifiable risk factors for incident MCI.

Methods:
We systematically searched CINAHL, Medline, Embase, SportDiscus, and PsycINFO from January 1, 2001 to April 27 2021 to identify relevant prospective studies. Four pairs of reviewers independently screened abstracts and full texts, extracted data, and assessed methodological quality of the included studies using QUIPS. Level of evidence was assessed by GRADE for cohort studies.

Results:
From 11,085 identified publications, 264 full texts were screened. Eighty-four articles involving 167,383 community-dwelling seniors were included. Seventy significant risk factors were reported. Strong evidence supported that one demographic factor (low education level) two psychological factors (depression and anxiety), two cardiovascular factors (type 2 diabetes mellitus and hypertension) and olfactory dysfunction increased the risk of incident MCI. Moderate evidence suggested that three lifestyle factors (high body mass index, physical inactivity, reduced social activities) in late-life, one biochemical exposure (hyperhomocysteine), history of head injury, stress, stroke, and hearing impairment were risk factors for incident MCI. Very limited evidence suggested that antihypertensive drugs significantly reduced the risk of MCI development.

Conclusion:
Proper diets, medications, psychotherapy, and lifestyle modification (increased physical and social activities) may lower the risk of MCI development in community-dwelling seniors.

Keywords:
Cognitive Decline, Risk Factors

Abstract No. 21059

Older Drivers Navigating New Technology - Development of an Evidence-Informed Education Program Teaching Older Drivers to Use Advanced Vehicle Technologies

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Objective:
To develop and pilot an evidence-informed, expert-reviewed, advanced vehicle technologies (AVT) education program for drivers aged 70 years and over.

Researchers are optimistic about the potential for AVT to assist older drivers. Despite an increased range of technologies in vehicles, education in their use is lagging. For older drivers to benefit fully from AVT use education programs are needed.

Methods:
Using best available evidence, an AVT education program for older drivers was developed. Learning approach was guided by geragogy, cognitive-load and transformative learning theories. Classroom and naturalistic on-road education components were included. Fifteen experts rated program content on relevance, representativeness, clarity and importance. Validity scores were calculated, and feedback analysed using content analysis. The program was piloted with eight older drivers to evaluate confidence, perceived competence, feasibility and acceptability using pre and post-program questionnaires.

Results:
International and local experts from academia, education, occupational therapy and older drivers formed the expert review panel. Content validity scores for individual domains ranged between 0.73-0.93 with overall content validity of 0.86. Older drivers (mean age: 75 years) participated in the pilot program. A statistically significant, pre-post program, increase in participant's confidence and perceived competence levels in AVT use was achieved. The program was suitable, feasible and acceptable to participants.

Conclusion:
An evidence-informed, expert-reviewed education program, grounded in learning theory, with high content validity was developed and piloted. Occupational therapists involved in prescription of assistive technology are ideally placed to understand the risks, benefits and therapeutic application of vehicle technology.

Keywords:
Older Drivers, Vehicle Technology

Abstract No. 21089

Web-based West-meets-East Lifestyle Modification Program for Risks Reduction Associated with Hypertension, Hyperglycaemia and Hyperlipidaemia

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Objectives:
The study intended to evaluate the effect of the 4-session web-based West-meets-East lifestyle modification program [www.healthclock.net] using biological, physiological, behavioural, psychosocial and lifestyle changes as outcome measures for risks reduction activities for those with pre-clinical metabolic syndrome. The study also explored the relationship among the lifestyle modification activities and significant correlates.

Methods:
The study adopted 2-arm single-blinded randomized controlled trial design. Invitation of adults living in the community with pre-metabolic syndrome was performed. A total of 51 participants were recruited and randomly assigned to the control group (n = 26) and the treatment group (n = 25) to attend a 4-week programme and subsequent 8 weeks follow-up using telecommunication. Intervention efficacy was evaluated using repeated measures ANCOVA analyses, correlation analysis and hermeneutics-based qualitative analysis.

Results:
Significant reduction in HbA1c (0.2%), total cholesterol (0.32 mmol/L), percentage of body fat (.72%) and improvement in Overall QOL (.84 vs. -0.08) were found. A sub-group analysis of the baseline and follow-up comparison of the treatment group also showed a significant decrease in Triglyceride (.69 mmol/L) and BMI (.35). During follow-up, significant more participants in the treatment group adopted the healthy habits of having breakfast regularly, wearing gown in the morning, sleeping before 12am, performing moderate exercises, adopting regular tea drinking habit and practicing health qigong. Twelve activities were found to be desirable.

Conclusion:
A lifestyle modification program with emphasis on circadian pattern seems to be effective risks reduction strategies in coping for those with pre-clinical metabolic syndrome.

Keywords:
West-meets-East Lifestyle Modification

Abstract No. 21104

The Unique Relationship between Autonomic Nervous System Activities and Brain Activation among School Aged Children with Sluggish Cognitive Tempo (SCT) Symptoms

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Background:
Although increasing evidence has suggested that Sluggish Cognitive Tempo (SCT) was independent of other childhood psychopathologies (e.g. ADHD), the neurophysiological nature of this condition remains poorly understood.

Objective:
The aim of the present study is to examine the relationship between ANS activities measured by Heart Rate Variability and the brain activation measured by the Functional Near-infrared Spectroscopy (fNIRS) in children with high SCT symptoms.

Methods:
A total of 36 children aged from 6-12 were recruited for the present study. They were assigned into two groups: High SCT group (with more SCT symptoms; n = 15) and Low SCT group (with less SCT symptoms; n = 21). All subjects received testing on HRV measurement in two conditions (resting and auditory stimulation conditions) and verbal fluency task with fNIRS measurement.

Results:
Subjects who have higher value of the SD1 of the Poincare Plot in the resting condition than in the warning signal condition was found to have lesser correct responses of the VFT in the High SCT group when the ADHD symptoms were statistically controlled. Moreover, subjects who have higher value of the SD2 of the Poincare Plot in the resting condition than in the warning signal condition was found to have higher oxy-haemoglobin in the Pre-frontal cortex during the VFT task.

Conclusion:
These results supported the hypothesis that hyper-arousal during stimulation condition in children with high SCT would be related to their deficient task performance and hyper-activation in the prefrontal cortex during the VFT task.

Keywords:
Sluggish Cognitive Tempo

Abstract No. 21116

Effectiveness of Mindful Core Muscle Training Program on Attention and Balance of School-Aged Children: A Pilot Study

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Background：
The academic environment, cognitive and physical demand for school-aged children is becoming more and more challenging. There are associations among children's balance, sustained attention and academic performance. Poor sustained attention is more likely to affect young school-aged children. Children who are complained of inattention by parents and have not been diagnosed as Development Disabilities (DD) need a training which can be conducted by parents at home.

Objective：
Core Muscle training (CM) can improve balance, and Mindfulness Practice (MP) can improve sustained attention. Mindful Core Muscle training (MCM) is a new training which is combined CM training and MP. The program aimed to examine the training effect of MCM training.

Methods:
We recruited 20 participants who were aged 6 to 8 and complained of inattention by parents. All participants were assigned to either one of the CM, MP, and MCM group randomly. They were assessed by attention and balance test before and after 3 weeks of training, two sessions per week.

Results:
Result showed there was no significant difference (>0.05) among three groups in improving attention and balance after training. However, some potential trends showed MCM training improved both balance and sustained attention. MCM training was not better than CM training for improving balance. MCM training tended to improve sustained attention better than MP.

Conclusion:
The study findings warrant further investigation that MCM training may be a potential training to provide a richer research report for improving the sustained attention and balance of children with DD simultaneously.

Keywords:
Mindful Core Muscle Training

Abstract No. 21118

Maximising Cardiac Rehabilitation through Effective Virtual Simulation Teaching of Smoke Cessation Interventions: The INSTrUCT European Project

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Objectives:
To develop innovative educational programs for teaching healthcare students, offering creative and robust solutions in the rehabilitation of cardiac patients through smoke cessation interventions, with an international perspective.

Background:
Continued smoking after a cardiac event greatly increases mortality risk. Smoking cessation in cardiac rehabilitation are known to be effective in reducing morbidity and mortality. Despite this, health care professionals have been found to be inadequately educated in this field. New technologies, like virtual simulation, provide innovative and promising ways to address this issue through the delivery of health education programmes, beyond physical healthcare.

Method:
The INSTrUCT Project is an evidence-based program, which focuses on teaching smoking cessation interventions in cardiac rehabilitation for healthcare students. It is an international European consortium, which develops and evaluates educational materials in public health and tobacco control, providing nursing/healthcare virtual simulation in relation to smoking cessation. INSTrUCT has overseen the development of an Open Educational Resource (INSTRUCT - OER), incorporating virtual simulation, it provides a way to improve healthcare students' competences, ultimately translated into tailored and efficient smoking cessation interventions in cardiac rehabilitation.

Results:
In the 2020-2021 academic year, one thousand students from four countries (Belgium, United Kingdom, Spain and Portugal) tested this innovative educational resource, mainly in the degree of nursing and medicine. Preliminary findings reveal that the satisfaction levels of the students has been very high, positively valuing the videos and the virtual simulation that have allowed them to carry out virtual clinical practice, despite the COVID-19 context.

Conclusion:
We strongly argue that INSTRUCT -OER could inspire further collaboration between international institutions, beyond the European context. Advances in technology and e-collaboration, can provide ways for working directly with international and multifaceted teams, enhancing the possibilities of identifying innovative options to deliver robust health educational programs. Working with this international vision, helps us to adapt to different scenarios across several countries, opening a window to establish new collaborative opportunities across Asia.

Keywords:
Cardiovascular, Smoking, Education, e-collaboration

Poster Presentation

Presenter	Abstract No.	Title of Presentation
Application of Technology to Rehabilitation: Treatment intervention		
Chiu, A.T.S.	21005	Clinical Use of Surface Electromyography (SEMG) as a Biofeedback Indicator for the Dysphagia Management of Elderies
Cheung, K.Y.	21009	Active Community Engagement (ACE) Program For Persons with Mental Illness and their Carers
Wong, A.Y.L.	21011	The Use of Mobile Health Technology in the Management of Osteoarthritis: A Scoping Review with Scientometric Analysis
Tang, L.M.	21013	Pilot Study on the Feasibility and Utilisation Of Cognitive App (HA Go) as a Home Program Extended from Hospitalisation for Stroke Survivors with Cognitive Impairment
Chow, P. Y.	21026	Augmented Feedback Treadmill (AFT) Improves Gait Speed, Step Length and Decreases Fear of Fall in Parkinson's Disease
Li, S.M.	21027	Innovated Technological Anti-gravity Treadmill Resembling Moonwalk for Young Stroke Survivors
Leung, W.K.C.	21029	Computer-Assisted Approach to Personalized Design of Exercise Programs for Older Adults in Care Facilities: Perspectives from Care Professionals
Zhang, B.B.B.	21036	Boosting Memory Performance with Brain Stimulation?
Fan, S.H.U.	21037	A Self-management Program using Telecare Service for Pulmonary Rehabilitation: A Case Series
Cheng, K.C.	21038	Use of Tele-carer Training to Facilitate Patient Discharge
Wong, S.M.	21043	Accelerate Ambulation Training by using Knee-Ankle-Foot Orthosis (KAFO) for Highly Dependent Stroke Patients with Lower Limb Paralysis
Man, C.W.Z.	21054	The Impact of using Online Method for Speech Rehabilitation and Motivation - A Case Study of Music Therapy via Zoom for Stroke Patients
Lin, J.	21055	Cerebral Hemodynamic Responses during Amplitude Requirement Task and Speed Requirement Task in Patients with Parkinson's Disease
Gomez, I.N.B.	21062	Occupational Therapy Dysphagia Management in Selected Philippine Hospitals during the Time of the COVID-19 Pandemic: A Qualitative Descriptive Study
Cheng, E.K.N.	21065	Systematic Review on the Effectiveness of Mindfulness-based Zentangle Art: A New Stress Reduction Tool of Occupational Therapy

Presenter	Abstract No.	Title of Presentation
Pan, H.	21071	Synergistic Effects of Mirror Therapy Combined with Electrical Stimulation for Motor Function Recovery of Upper Limb among People with Stroke: A Meta-Analysis
Tsui, L.N.	21079	Innovative Physiotherapy Tele-Care in TWEH Cardiac Rehabilitation under COVID19 Epidemic
Thawisuk, C.	21080	Current Knowledge on the Use of Robotic Rehabilitation for Older Adults' Upper Limb within the Scope of Physical and Occupational Therapy: A Scoping Review
Tharu, N.S.	21081	Trans-Spinal Electrical Stimulation for Improving Trunk and Sitting Function in Tetraplegics with Cervical Cord Injury
Bai, Z.	21084	Intermittent Theta Burst Stimulation to the Primary Motor Cortex Reduces Cortical Inhibition: A TMS-EEG Study
Ma, Z.	21086	From Adversity to Resilience: A Case Study of Psychological Intervention for COVID-19 Survivors
Cheung, A.K.K.	21090	Pulsed Electromagnetic Fields (PEMF) Augments the Sensitivity of Pseudomonas Aeruginosa to Antibiotics
Wong, S.Y.	21094	Creating a New Assistive Device for Stroke Patients with Diabetes Mellitus using 3D Printing
Lau, B.W.M.	21096	Development of a Novel, Environmental Friendly Material as an Alternative to Traditional Polycaprolactone for Splintage
Wu, H.L.	21097	The Application of the Design Thinking Methodology in Developing Innovative and Human-Centric Solution for the Delivery of Physiotherapy to Paediatric Congenital Cases under the COVID-19 Pandemic
Lai, S.Y.Y.	21098	Local Clinical Experience of Over-ground Assist-as-needed Robotic Exoskeleton Training: A Case Study to Examine Functional Gains for Stroke and Spinal Cord Injury Survivors in Community Settings
Kannan, P.	21101	The Pelvisense, an Innovative Biofeedback Device for Pelvic Floor Muscle Training for Women with Urinary Incontinence
Chan, M.M.S.	21111	Development of Pelvic Supporter for Use During Longtime of Sitting at the Specific Chair
Yu, K.	21112	Pilot EEG and EOG-Based Prediction Model for Drowsiness
Smith, G.D.	21114	Building the Case for Improved Health Literacy in Gastrointestinal Rehabilitation
Poon, W.S.	21115	"care-COPD": A Nursing and Physiotherapy Initiative to Develop a Mobile App for COPD Self-Management
Yu, K.	21117	Effects of Repetitive Transcranial Magnetic Stimulation (rTMS) on the Brain using Activation Likelihood Estimation
Kwok, H.M.	21122	Effects of Cerebellar Transcranial Direct Current Stimulation on Facial and Hand Movements in Individuals at Risk of Psychosis: A Pilot Study

Presenter	Abstract No.	Title of Presentation
Yeung, M.K.	21132	Alerting, Orienting, and Executive Attention are Modulated by Negative Emotional Stimuli in Healthy Young Adults: An fNIRS Study
Ma, H.	21133	Effectiveness of TES and rTMS for the Treatment of Insomnia: Meta-analysis and Meta-regression of Randomized Sham-controlled Trials
Wu, E.S.L.	21136	Altered Respiratory Muscle Performance during Submaximal Exercise in Individuals with Chronic Neck Pain
Man, D.W.K.	21138	Virtual Reality-Based System for Training Attention, Memory and Executive Functions in Persons with Schizophrenia
Application of Technology to Rehabilitation: Evaluation		
Wong, H.L.	21042	Stroke Registry with Reference MRMI Gain to Monitor Stroke Outcomes: A Big Data Concept
Chaiwong, P.	21056	Development of Occupational Therapy Cognitive Outcome Measure for the Elderly with Dementia
Mak, M.	21068	Concurrent Validity of the Latest Wearable Gait and Balance Measurement System
Lai, C.Y.Y.	21106	Psychometric Properties of the Sensory Processing and Self-Regulation Checklist- English Version
Gomez, I.N.B.	21107	Linguistic Equivalency, Cross-Cultural Validity, and Psychometric Properties of the Sensory Processing and Self-Regulation Checklist- Tagalog Version
Cheung, T.Y.	21126	Within- and between-day Intra- and Inter-Rater Reliability of using Myotonometer and Shear Wave Elastography to Assess Paraspinal Muscle Stiffness
Chak, N.T.	21135	Evaluation of Thoracic Spinal Stiffness and Kinematics during Lifting Tasks in Healthcare Professionals with and without Chronic Thoracic Spine Pain
Learning and Teaching Innovation		
Ng, T.Y.	21022	7-Level Functional Recovery Program for Patients with Vertebral Compression Fracture (VCF)
Lee, S.H.J.	21033	Preliminary Evaluation of Online Self-management Education under COVID-19 Pandemics: Experience from the Patient Empowerment Programme
Low, L.P.L.	21058	Process of Developing Multi-Media Video-Based Caregiving Resources (MMVCR) for Family Carers with Dementia Relatives at Home
Fung, W.F.J.	21067	Advancing Team Work to Trans-Professional Collaboration in Rehabilitation Homecare Service: The Local Strategies for Good Practice in Hong Kong

Presenter	Abstract No.	Title of Presentation
Leung, F.S.Y.	21087	The Impact of Psychiatric Day Service using Clubhouse Model (An International Award Winning Model)
Pre-clinical Trials		
Chiu, A.T.S.	21006	Association of Visual Impairment with Cognition in Older Adults
Lee, H.W.	21010	Effectiveness of Doll Therapy by DementiAbility Methods on Agitation for Dementia in Residential Home in Hong Kong
Kwan, I.Y.F.	21012	Map out your Personalized Exercise Plan at Fingertip
Chan, W.L.S.	21016	Factors Associated with Near-Falls and Falls in Community-Dwelling Older Adults: A Preliminary Report on an Ongoing Cross-Sectional Study
Liu, T.W.	21017	Translation of Chinese version of Brief 2-way Social Support Scale into Chinese for use in people with stroke
Pong, C.K.W.	21019	A “Fear-Less” Occupational Therapy Programme for patients with White-Coat Hypertension or Hypertension with White-Coat Effect in NTWC Primary Care Setting
Kwong, M.K.	21020	Comparison between the Hong Kong Version of the Montreal Cognitive Assessment (HK-MoCA) and the Hong Kong Brief Cognitive Test (HKBC) in Detecting Post-stroke Cognitive Impairment in Stroke Patients
Ng, M.H.F.	21099	A Mouse Model of Chemotherapy-Induced Heightened Anxiety – Association with Hippocampal Microglial Activation and Resilience by Enriched Housing
Clinical Trials: Neurological Rehabilitation		
Lo, K.Y.K.	21004	The Expectations of Interprofessional Perspective on Social Worker to Function as Case Manager in a Local Rehabilitation Homecare Team for People with Severe Disabilities
Kwong, M.K.	21021	Application of Kinesio taping (KT) method on patient with post-stroke shoulder pain
Yeung, T.Y.K.	21024	Assessing Feasibility and Effectiveness of Conducting Mindfulness-Based Interventions in Stroke Rehabilitation in Hospital Setting in Hong Kong: A Pilot Study
Sit, K.L.M.	21025	The Effectiveness of the Hemiplegic Upper Extremity Management Program for Patients with Stroke
Feng, H.	21052	Cerebral Hemodynamic Responses to Step and Turning Tasks in patients with Parkinson's Disease
Wong, K.M.	21070	Resolving Hemiplegic Shoulder Subluxation and Post-stroke Hypertonicity Based on Neuro-Integrative Functional Rehabilitation and Habilitation (Neuro-IFRAH®) Approach – A Case Series Study

Presenter	Abstract No.	Title of Presentation
Kong, J.K.Y.	21082	Interventions for Improving Self-awareness of Cognitive Deficits in Community-Dwelling Acquired Brain Injury Survivors
Poon, K.C.K.	21088	Efficacy of a Community-Based Nordic Walking Program on Improving Balance and Gait Performance, and Aerobic Capacity in Parkinson Disease - A Pilot Study
Simpson, M.W.	21093	Modulating Cortical Haemodynamic Activity in Parkinson's Disease with Transcranial Direct Current Stimulation: A Pilot fNIRS Study.
Lam, C.P.Y.	21100	Unveiling the Black Box of Nonsynchronous Balance Confidence and Capability for Stratified Target Intervention Against Fall in Patients with Neurological Conditions
Clinical Trials: Musculoskeletal Rehabilitation		
Wang, X.	21030	The Full Cycle Cardiac Rehabilitation Management for Elderly Patient with Coronary Heart Disease in China: A Pilot Randomized Controlled Trial
Bello, U.M.	21092	Conservative Interventions for Musculoskeletal Stiffness: A Systematic Review and Meta-Analysis
Chan, W.Y.	21108	Associations between Paraspinal Muscle Characteristics and Spinal Curvature in Conservatively Treated Patients with Adolescent Idiopathic Scoliosis: A Systematic Review
Pinto, S.M.	21129	Morphometric and Mechanical Characteristics of Lumbar Multifidus Muscle in Individuals with and without Chronic Low Back Pain
Wang, Y.	21131	Prevalence and Impact Factors of Self-Reported Knee Discomfort among Office Workers in China: A Cross-Sectional Study
Ng, S.H.	21137	The Effects of Thoracic Manipulation on Spinal Kinematics during Functional Tasks and Thoracic Stiffness in Patients with Chronic Neck Pain
Clinical Trials: Mental Health and Cognitive Rehabilitation		
Chaiwong, P.	21028	Occupational Therapy Practice for Cognition in the Elderly with Neurocognitive Disorders in Thailand
Chan, W.L.S.	21032	Reliability and Validity of Four Step Tests in Older Adults with Mild to Moderate Dementia: A Preliminary Report
Chien, C.W.	21066	Effects of the Change in Activity Participation during Coronavirus Disease Pandemic on Children's Mental Health
Lam, Y.T.J.	21109	Expression of consummatory, rather than anticipatory pleasure in schizophrenia is related with working memory performance
Lin, J.	21134	Effects of Acupressure Treatment on Depression: A Systematic Review and Meta-analysis

Abstract No. 21005

Clinical Use of Surface Electromyography (SEMG) as a Biofeedback Indicator for the Dysphagia Management of Elderies

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Objectives:
To investigate the muscle activity with the use of surface Electromyography (sEMG) during swallowing of food and drinks under the eight categories in the International Dysphagia Diet Standardisation Initiative (IDDSI) in healthy elderly and elderly with dysphagia.

Method:
2 subjects (1 healthy subject and 1 subject with dysphagia) were recruited in this study from residential care homes for persons with disabilities. The subjects were required to swallow test foods and drinks with different textures or thicknesses, which were prepared according to the IDDSI category 0 to 7. While the subjects were swallowing, the sEMG will be used to monitor the muscle activities. After all the sEMG diagrams are drawn, the (1) average, (2) duration, (3) peak, (4) integrated sEMG of the two subjects during swallowing were analyzed and compared with regard to the IDDSI categories. The results were analyzed by SPSS version 25.

Results:
Significant differences ($P<0.05$) were shown when comparing the average, peak, duration and integrated sEMG between IDDSI category 0 to 7 within subject (i.e. both healthy subject and subject with dysphagia). When comparing the result between subjects, significant differences ($P<0.05$) were shown in average (IDDSI category 0 to 7), peak (IDDSI category 0 to 6), duration (IDDSI category 3 to 6) and integrated sEMG (IDDSI category 3 to 5 and 7).

Conclusion:
To conclude, the present study showed significant differences in suprahyoid muscle activity within and between elderly with and without dysphagia.

Keywords:
Muscle activity, Dysphagia

Abstract No. 21009

Active Community Engagement (ACE) Program For Persons with Mental Illness and their Carers

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Introduction:
Current mental health system reflects an inadequate patients' exposure to the community support, which led to poor coping, high rate of relapse and re-hospitalization (Wei, 2005). Active Community Engagement (ACE) Program is a collaborative project between hospital and community setting in holding experiential booths using a mobile van once a quarter. Through early involvement of community partner in in-patient setting, it aims at expediting patients' access to social support and smoother transition to their living environment. This paper aims at exploring the influences of ACE program in promoting community integration of psychiatric patients.

Methods:
In this study, qualitative research method was adopted. Semi-structural interviews were used to evaluate the overall experience from participants.

Results:
A total of 50 participants, consisting of patients, care givers and the general public had attended the event. Feedback is summarized as follow:

1. Increased exposure to community resources
2. Encouraged daytime engagement
3. Carer giver empowerment and stress management
4. Enhanced awareness towards mental wellbeing

In view of the influence by COVID-19, the format of ACE program has been modified to the use of PowerPoint and videos. Collaboration was further expanded to various organizations.

Conclusion:
This program acts as a preliminary measure to advocate the importance of community bridging for patients with mental illness. It implies that early involvement of community partner in hospital setting could be a routine practice in promoting patients' community integration. Continuous expansion of services was recommended in order to evaluate the effectiveness of the program.

Keywords:
Community reintegration

Abstract No. 21011

The Use of Mobile Health Technology in the Management of Osteoarthritis: A Scoping Review with Scientometric Analysis

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Objectives:
This scoping review summarized research on the use of mobile health (mHealth) technology to promote self-management of osteoarthritis (OA) in adults and identified key research priorities for this topic.

Background:
Hip and knee OA are ranked as the eleventh most common cause of disability among adults worldwide. Growing evidence suggests that the use of mHealth technology in OA management is effective and helps users overcome barriers associated with direct primary care. However, a relevant state-of-the-art review is lacking.

Methods:
This review employed the Arksey and O'Malley framework, augmented with a scientometric analysis using the VOS viewer. Six electronic databases were searched from inception to 28th February 2021. The PRISMA extension for scoping reviews was used to report the findings.

Results:
Twenty-seven relevant studies published between 2013 and 2021 were included. The scientometric analysis revealed multiple co-occurring keywords reflecting conceptual properties of this research domain. There were strong intellectual connections among certain authors, research articles, and journals. However, few researchers and journals were the major contributors in this field. Ten web-based and nine mobile application-based programs were identified. The studies showed that mHealth technology was feasible and effective in reducing pain, improving physical function, and promoting quality of life among individuals with OA.

Conclusion:
mHealth for OA management is in its infancy, there is an urgent need to investigate the benefits and cost-effectiveness of this approach. More collaborative efforts across institutions are warranted to bolster relevant research. mHealth programs should also be made available to public, to promote accessible healthcare.

Keywords:
mHealth, Osteoarthritis, Telerehabilitation, Digitalcare

Abstract No. 21013

Pilot Study on the Feasibility and Utilisation of Cognitive App (HA Go) as a Home Program Extended from Hospitalisation for Stroke Survivors with Cognitive Impairment

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Introduction:
Cognitive impairments are commonly found in stroke survivors, which affects patient's functional outcomes and independence in activities of daily living.

Objectives:
This study aimed at exploring the feasibility of the n-back training via Cognitive App (HA Go) as a home program after hospital discharge.

Method:
Twenty stroke survivors from Tai Po Hospital were randomized into the intervention and control group. Ten patients completed the n-back training on Cognitive App, and 10 patients completed the conventional home program. Each intervention lasted for 4 consecutive weeks, 7 days a week, 2 sessions per day with 10 minutes each. HK-MoCA-5min were performed at baseline and re-administrated at week-4 immediately after training.

Results:
The results demonstrated improvement in all cognitive domains of HK-MoCA-5min in both groups. For the intervention group, registration ($p=0.026$), delayed recall ($p=0.005$) and the HK-MoCA-5min total ($p=0.005$) were proved statistically significant. Upon completion of Cognitive App, significant improvement was also found in their reaction time ($p=0.022$) and adjusted reaction time ($p=0.005$). For the control group, there was a significant improvement in verbal fluency ($p=0.023$), delayed recall ($p=0.017$) and the HK-MoCA-5min total ($p=0.008$). However, the differences of HK-MoCA-5min total between both groups were not significant.

Conclusion:
Cognitive App has the potential to improve cognitive functions in stroke patients in the community. It is a feasible option for continual of cognitive training at home. Further study is needed to investigate the effect of tele-cognitive rehabilitation for larger and different population groups.

Keywords:
Cognitive App, N-back training, Stroke, Cognitive impairment

Abstract No. 21026

Augmented Feedback Treadmill (AFT) Improves Gait Speed, Step Length and Decreases Fear of Fall in Parkinson's Disease

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Objective
To compare effects of Augmented Feedback Treadmill and ordinary treadmill training in improving mobility in Parkinson 's patients.

Background
Gait deviations and mobility deficits often hinder functional independence and result in fall incidents in patients with Parkinson 's disease (PD). Treadmill training could improve gait and mobility in PD patients but lacking of augmented sensory, visual and auditory feedback may impede rehabilitation performance.

Methods
PD patients were recruited from Physiotherapy Outpatient Department and randomly assigned into Augmented Feedback Treadmill (AFT) and ordinary treadmill training (TT) group. 8 sessions of 20-minute AFT or TT training were provided. AFT training was implemented on the Noraxon instrumental treadmill with interface and projector allowing real-time visual cues and gaming; patients were instructed to step onto the targeted footprints projected and walk over obstacles in the visual game. 10-meter walk test, step length and Fall Efficacy Scale (FES) were measured at baseline and 8th session.

Results
Total 17 PD patients (7 AFT vs 10 TT) completed the training. Both groups improved in all outcomes but the AFT group improved more. On average, gait speed improved more than 30% and step length about 15% while FES was decreased by 9% after 8 weeks of AFT training. No adverse effect was reported.

Conclusion
Augmented Feedback Treadmill training delivers safe and benefits for improving gait speed, step length and fear of fall in Parkinson's disease. More patients with Parkinson's disease should be engaged in this advance treadmill training. Future study with larger sample size and longer follow-up period is needed.

Keywords
Parkinson disease, Augmented-feedback treadmill

Abstract No. 21027

Innovated Technological Anti-gravity Treadmill Resembling Moonwalk for Young Stroke Survivors

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Objective:
To evaluate the safety and effectiveness of Anti-gravity treadmill in young stroke survivors.

Background:
Treadmill training is commonly used to improve walking speed, endurance and ambulatory independence in stroke survivors. Discomfort of the harness system, fear of falling and inability to understand verbal feedback during training may alter normal gait kinematics and hinder training effects. Resembling moonwalk, Anti-gravity treadmill effectively unloads the lower body without the negative drawbacks mentioned and provides immediate visual feedback on lower extremities while walking.

Methods:
Young stroke patients who suffered from first stroke less than 6 months were recruited from the Neurology Rehabilitation Program (NRP) in Tseung Kwan O Hospital between December 2019 and April 2021. 20-24 sessions of 15-20 minutes gait training on Alter G Anti-gravity treadmill were provided. Approximately 20-30% of body weight were supported. Patient's safety, 6-Minute Walk Test (6MWT) distance, Five Times Sit to Stand (FTSTS) and Functional Ambulation Category (FAC) were measured at baseline and end of rehabilitation.

Results:
Eleven patients (4 male) with a mean age of 52.09years (SD=11.55) and a mean weight of 69.56 kg (SD=10.47) received Anti-gravity treadmill training. No adverse events were reported. There were significant improvement in 6MWT distance (287.18±70.36 vs 400.55±69.60; p=0.003), FTSTS (13.06±4.14 vs 9.56±1.77; p=0.005) and FAC (1-4 vs 4-5; p=0.005).

Conclusion:
Anti-gravity treadmill training is safe and effective for young stroke patients to improve their walking ability. Improvement in aerobic capacity, lower limb strength and ambulatory independence were observed while comfort and positive feedback were reported.

Keywords,
Anti-gravity treadmill, Stroke, Physiotherapy

Abstract No. 21029

Computer-Assisted Approach to Personalized Design of Exercise Programs for Older Adults in Care Facilities: Perspectives from Care Professionals

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Background
Habitual physical activity (PA) has tremendous benefits for older adults. However, older residents in care facilities usually spend >90% of their awake time on sedentary behavior and their participation in PA programs is generally low (6-31%). Therefore, a personalized exercise that considers individual preference and accommodates specific needs is imperatively needed.

Objective
To examine facilitators and barriers to adoption of mobile health (mHealth) apps for personalized design of exercise programs in care facility settings

Methods
This study adopted a qualitative methodological design using an individual in-depth interview approach. Four geriatric care professionals (e.g. physicians, nurses, and social workers) and 19 recreational therapists having >10 years of geriatric working experience were interviewed. Common themes were identified using the thematic analysis and clustered according to the socio-ecological model.

Results
Technophobia at user/care staff level was a common barrier to drive them away from using mHealth apps. At product level, simple design (e.g. large font size, large button, one-page, no extended link, no typing required, etc.) was most important to facilitate the mHealth apps adoption. While running PA programs, recreational therapists commonly reported system-related challenges, including insufficient manpower to porter residents, spacious places required, and funding constraints for equipment. Intriguingly, most agreed that program delivery can be improved by tailoring the program to residents' interest/goals, cognitive status, and motivation.

Conclusion
When designing and implementing a user-friendly app for PA promotion in care facilities, a multi-level assessment by understanding users' preference, residents' functional capacity, followed by setting-related factors, should be considered.

Keywords:
Exercise, Geriatric, Care homes

Abstract No. 21036

Boosting Memory Performance with Brain Stimulation?

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Background:
Animal research indicates that excitatory brain stimulation opens a time window for enhanced neuroplasticity that permits remodeling of neural representations. Intermittent theta-burst stimulation (iTBS) may thus facilitate new association learning after iTBS by reducing proactive interference from previously learned associations.

Objective:
We aimed to investigate the effects of iTBS on left dorsolateral prefrontal cortex (DLPFC) or left lateral parietal cortex (lPC) on influencing associative memory.

Methods:
75 healthy participants underwent either iTBS of the DLPFC (n=30) or the lPC (n=30) compared to sham stimulation (vertex), or no stimulation (n=15) in a randomized controlled cross-over design. Participants underwent an associative memory test (face-word associations) consisting of an encoding period before and after stimulation. Face-cued word recall was evaluated before and after stimulation for the initially encoded associations, as well as after stimulation for the newly encoded associations.

Results:
Performance significantly increased for newly compared to previously encoded associations in all groups. Contrary to our expectation, performance increases were not significantly more substantial for either of the two active stimulations than sham stimulation. Instead, lPC stimulation significantly decreased performance for newly encoded associations compared to sham stimulation. In addition, DLPFC stimulation reduced recall of previously encoded associations immediately after stimulation.

Conclusions:
Stimulation-induced loosening of neural associations and permissiveness for change, as observed in animals, does not translate to the realm of human association learning. Instead, lPC stimulation impedes recall of newly acquired association memory, indicating increased proactive interference. This study was recently accepted for publication in Brain Stimulation (doi: 10.1016/j.brs.2021.05.017).

Keywords:
Associative memory, Neuroplasticity, iTBS

Abstract No. 21037

A Self-management Program using Telecare Service for Pulmonary Rehabilitation: A Case Series

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Background:
GDH service of TPH was suspended due to COVID-19 pandemic in July of 2020. Therefore, we provided a self-management program for patients with chronic pulmonary conditions using an innovative telecare services.

Objectives:
To describe functional and psychological outcomes in patients with chronic lung diseases after experiencing a 3-week self-management program delivered via telecare services.

Method:
Four individuals (aged 56-73) with chronic lung disease, including asthma (n=2), chronic obstructive pulmonary disease (n=1), interstitial lung disease (n=1), were included. The participants received 45-minute treatment sessions twice per week. The treatment was delivered via HA GO app, WhatsApp, phone calls and video calls. It focused on education of energy conservation techniques and coordinated breathing techniques in self-care, domestic care, outdoor and leisure activities, education and practice of stress management skills and Health Qigong (Baduanjin). The outcome measures included the Manchester Respiratory Activities of Daily Living Questionnaire, San Diego Shortness of Breath Questionnaire, Depression Anxiety Stress Scales which examined their functional status, self-perceived dyspnea in ADLs, emotional distress respectively at baseline and post-treatment. A satisfaction survey was also conducted to collect feedback from the participants.

Results:
All four participants were satisfied with the treatment and demonstrated improvements in functional status, dyspnea and emotional well-beings.

Conclusion:
This study suggests the feasibility of using telecare services in delivering self-management program for pulmonary rehabilitation and provides preliminary evidence of potential benefits following the treatment. Larger sample size and further studies are recommended to examine the effectiveness of self-management program for pulmonary rehabilitation via telecare services.

Keywords:
Self-management, Telecare, Pulmonary rehabilitation

Abstract No. 21038

Use of Tele-carer Training to Facilitate Patient Discharge

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Background:
Carer training is one of the core physiotherapy services to ensure that carer acquires proper skills to take care of patient at home with confidence. In-person carer training might not be possible to carry out due to different access barriers, such as transportation issues or during disease outbreak where hospital visits are not allowed. Current solution is to provide training content to the carer through telephone consultation. However, the content delivered to the carer is usually limited. Tele-physiotherapy employing information and telecommunication technologies had been tested to be effective in facilitating patients' rehabilitation at home. These technologies can provide training to carer with visual information on real patient, which improves care-giver training service under special circumstances.

Objective:
1) To test the feasibility of tele-carer training in improving the access of carers before patient discharge
2) To develop carer's understanding of patient's needs, and confidence in executing transfer and mobility skills with patients at home

Methods:
Criteria of target patients in need of tele-carer training is established. Specific areas for tele-carer training in gym and ward is allocated. Evaluation is done in two areas: 1) patient feedback from online questionnaire forms and 2) feasibility of this project through analyzing duration of training, tele-communication software readiness and venue availability for tele-carer training.

Results:
Scoring in the questionnaire shows that carers generally find tele-carer training useful, and this mode of delivery increases their confidence in taking care of patients at home. The average duration of tele-carer training is 17.2 minutes, which is similar to the amount of time spent on conventional carer training. Therapists have adequate equipment and technical knowledge to use a range of tele-communication software to conduct training. If a carer is not competent to use tele-communication software at home by self, hospital-based tele-carer training can also be arranged in a designated room in the department and technical support can therefore be provided by staff.

Conclusions:
The result of this project shows that tele-carer training is feasible to be conducted to improve the access of carers before patient discharge. It can also develop carer's understanding of patient's needs, and confidence in executing transfer and mobility skills with patients at home.

Keywords:
Tele-health, Carer training, Education

Abstract No. 21043

Accelerate Ambulation Training by using Knee-Ankle-Foot Orthosis (KAFO) for Highly Dependent Stroke Patients with Lower Limb Paralysis

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Introduction:
Manual assisted standing and walking training for dense stroke patients with lower limb paralysis are labor-intensive. Use of external support such as orthosis seems to be the easiest way to assist stroke patients in walking, especially in the early stage of stroke. However, conventional gaiter, ankle-foot orthosis (AFO) or air splint can only be able to support knee or ankle joint separately.

Objective:
The objective is to investigate the effectiveness of KAFO (Knee-Ankle-Foot Orthosis) training on dense stroke patients with lower limb paralysis.

Methodology:
Recruit dense stroke patients from Tai Po hospital and provide KAFO training as early as possible with custom-moulded insole and calf padding prepared by P&O colleague. Analyze functional outcome, feedback of patients and physiotherapists after ten sessions.

Results:
There were total 10 patients recruited. Seven of them improved in functional mobility; two patients improved from MFAC CAT I to CAT II; two patients improved from CAT II to CAT III and three patients improved from CAT II to CAT IV. Total nine questionnaires collected, all patients agreed that KAFO is useful especially in the early stage of stroke rehab and they were very satisfied with the custom-moulded insole and calf padding, by which the affected foot and calf can be protected and supported comprehensively.
All case physiotherapists agreed that KAFO is user-friendly and less labor-intensive especially in the training of severe stroke patient with lower limb paralysis in early stage.
One-year review found that 33 stroke patients received KAFO training, the main changes of MRMI and MFAC were 10.73 and 1.24 respectively and there was no any adverse side effect detected.

Conclusion:
All positive outcomes proved that KAFO can improve walking ability and tolerance in highly dependent stroke patients. All patients and physiotherapists were very satisfied with the KAFO in training and KAFO was adopted as one of the training modalities for stroke rehab in Tai Po Hospital especially for stroke patients with lower limb paralysis in early stage.

Keywords:
KAFO, Stroke Rehab

Abstract No. 21054

The Impact of using Online Method for Speech Rehabilitation and Motivation - A Case Study of Music Therapy via Zoom for Stroke Patients

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Objective:
To enhance the speech abilities and motivation of patients with speech difficulties with an onset of stroke within 2 years through music therapy.

Background:
The outbreak of COVID-19, all rehabilitation services delivered face-to-face came to a halt. Existing lack of service coupled with hampered rehabilitation for stroke patients with speech impairment. Music Therapy (MT) and Neurologic Music Therapy (NMT) have been shown to have a significant positive impact on patients' motivations and speech rehabilitation in many Western and recently Asian countries. However, the effectiveness of adopting MT using online methods has yet to be closely examined.

Methods:
Music therapists with NMT qualification delivered a weekly 45 minutes per session for 12 consecutive weeks via Zoom in two groups of 4. The music therapist did individual monitoring and group exercises simultaneously using NMT techniques targeted at breathing, oral-motor muscles (Oral-Motor Respiratory Exercise), and speech production (Musical Speech Stimulation and Melodic Intonation Therapy). Specific music-based rehabilitation exercises were distributed to each participant each week.

Results:
The self-reported and observed increase in motivation were seen across all participants. Pre and post-intervention tests done by the music therapist indicated some improvements in vocal production, word-finding, sounds, breathe length and control. Both caregivers and participants have reported improved mood in participants using speech in their everyday life.

Conclusion:
This pilot project exemplifies the potential of delivering speech rehabilitation services to stroke survivors through the online method. The small group size was reported by participants to have been effective in providing enough individual support.

Keywords:
Speech, Music therapy, Online, Stroke

Abstract No. 21055

Cerebral Hemodynamic Responses during Amplitude Requirement Task and Speed Requirement Task in Patients with Parkinson's Disease

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Background:
Gait impairments are common in patients with Parkinson disease (PD). Ambulatory training is the important components of physical therapy to improve functional activities and quality of life. However, the neural mechanism of different forms of ambulatory tasks in patients with PD is unclear.

Objective:
The aim of this study was to investigate the neural mechanisms in forms of cerebral hemodynamic responses during different ambulatory tasks with requirement of amplitude or speed in patients with PD.

Methods:
17 patients with PD (mean age 65.18±6.17 years, H&Y 2.71±0.59) performed 3 ambulatory tasks: (a) normal stride, (b) long stride, and (c) fast stride, with a mobile functional near-infrared spectroscopy (fNIRS) device. The cortical activation of Prefrontal Cortex (PFC), Premotor cortex and Supplementary Motor Cortex (PMC&SMA), Primary Motor Cortex (M1), Primary Somatosensory Cortex(S1) and Somatosensory Association Cortex (SAC) were measured. The location setting of optodes was refer to the international EEG 10–20 system.

Results:
Patients with PD had higher activation in PFC and PMC&SMA during long stride compared with fast stride ($P<0.030$). Hemodynamic responses of PFC were obviously increased in long stride compared with normal stride ($P<0.030$); There was no obvious activation difference between normal stride and fast stride in all the examined cortices ($P>0.05$);

Conclusion:
These findings indicate that long stride is more difficult to PD, compare with both normal stride and fast stride, with additional activation to the cognition cortex and motion planning cortex.

Keywords:
Parkinson's Disease, Ambulation, Difficulty Level, Cerebral Hemodynamics, fNIRS

Abstract No. 21062

Occupational Therapy Dysphagia Management in Selected Philippine Hospitals during the Time of the COVID-19 Pandemic: A Qualitative Descriptive Study

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Objectives:
Due to the nature of dysphagia management, the continuation of its delivery by occupational therapists during the COVID-19 pandemic is challenging. The high risk of infection and transmission associated with dysphagia management calls for innovative, safe, and effective strategies. The purpose of this study is to describe the current practices in dysphagia management by occupational therapists in selected Philippine hospitals.

Methods:
Three occupational therapy unit managers of private tertiary hospitals were recruited to answer an online survey consisting of open-ended supplemented by follow-up individual interviews accomplished through phone or social networking messaging systems between November-December 2020. Conventional data analysis was accomplished to inductively code the data and identify major concepts and themes.

Results:
Analysis of the data reveals that current practices include integrated infection control strategies, development of telehealth services, indirect service delivery, use of acrylic barriers during in-person sessions, and development or curating of exercise videos. These practices are further interpreted and classified as either sustaining or disruptive innovations in light of the current contexts.

Conclusion:
Dysphagia management continued to be an essential service among OTs. The effect of the global COVID-19 pandemic has shaped how occupational therapy services in Philippine hospitals were delivered safely and effectively. The innovative strategies described in this report offer options to consider towards the development of best practices in dysphagia management in the time of the COVID-19 pandemic or even beyond.

Keywords:
Occupational Therapy, Dysphagia, COVID-19

Abstract No. 21065

Systematic Review on the Effectiveness of Mindfulness-based Zentangle Art: A New Stress Reduction Tool of Occupational Therapy

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Objective:
To review the therapeutic value of Mindfulness-based Zentangle Art for stress reduction.

Background:
Occupational Therapy assists clients to handle stress through the use of therapeutic activities. Several meta-analyses showed that mindfulness are effective in stress reduction, and Zentangle is an emerging form of mindful activity. Zentangle, "Zen" means meditation and "tangle" means pattern, is an easy-to-learn art activity that may overcome some challenges in mindfulness practice such as mind wandering.

Methods:
Through a systematic search of nine academic databases, 103 articles involve using Zentangle as an intervention either conducted in person or internet live modes. Book chapters, blog or wire feed, and those were not related to wellness or mental health context nor the effectiveness of Zentangle approach were excluded. Eight articles were finally selected and critically reviewed.

Results:
These eight papers consisted of two qualitative studies, three mixed-method studies and three quantitative studies. Half of these were published articles while others were student theses. There are few formal evaluations or clinical trials. The preliminary evidence supported the therapeutic effect of improving self-esteem and self-confidence, reducing anxiety and stress, uplifting mood and increasing sense of social support. Zentangle was regarded as a mindfulness-based activity with the key therapeutic elements, such as gratitude, focus on every single stroke, acceptance and no mistakes. The duration of sessions to reach therapeutic effect varied across studies, which ranged from one-off two-hour class to eight-weekly classes.

Conclusion:
Further research is warranted to understand its impacts and benefits for different populations.

Keywords:
Zentangle, Stress Reduction

Abstract No. 21071

Synergistic Effects of Mirror Therapy Combined with Electrical Stimulation for Motor Function Recovery of Upper Limb among People with Stroke: A Meta-Analysis

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Background:
Findings of recent clinical trials demonstrated that combined use of mirror therapy (MT) and electrical stimulation (ES) could induce greater improvement in the motor recovery than the use either mirror therapy or electrical stimulation in people with stroke.

Objective:
The objective of this review is to synthesize the effects of combined use of MT and ES in improving motor recovery of paretic upper limb in people with stroke based on the International Classification of Functioning (ICF)framework.

Methods:
A literature search was conducted using 10 electronic databases: MEDLINE, Embase, Cochrane Library, Web of Science, Scopus, Physiotherapy Evidence Database (PEDro), China Biology Medicine (CBM), China National Knowledge Infrastructure (CNKI), Wan Fang, VIP. Effect sizes were analyzed by calculating standardized mean differences (SMDs) and 95% confidence intervals (CIs) applying random effects models.

Results:
The pooled analysis showed significant effects of MT combined with ES on the Body Structure and Function domain, with outcomes of Fugl-Meyer Assessment – upper extremity scores (ES=0.64, P<0.0001) and Maximum electromyographic (EMG) value of upper limb muscle (ES=2.17, P<0.0001), respectively. However, there was no significant effects of MT combined with ES on the Activity domain, with upper limb function administered with Action Research Arm Test (ARAT) (ES=0.32, P=0.08) and manual dexterity assessed by Box and Block Test (BBT) (ES=0.26, P=0.06), respectively.

Conclusions:
The combined use of mirror therapy and electrical stimulation is an effective therapeutic intervention in improving the upper limb motor functions in individuals with stroke.

Keywords:
Mirror Therapy, Electrical Stimulation

Abstract No. 21079

Innovative Physiotherapy Tele-Care in TWEH Cardiac Rehabilitation under COVID19 Epidemic

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Background & Objective:
Physiotherapy Tele-Care utilizing telecommunication technology was introduced to enhance patients' access to cardiac rehabilitation (CR) during COVID 19 pandemic in Hospital Authority setting. Current study aimed to explore the feasibility, efficacy and acceptability of the new service model.

Methods:
This was a two-arm (experimental-control) study in which patients with stable cardiac conditions were recruited in either Tele-care and usual group. Both groups received 8-session CR program with Tele-care group having supplementary home exercise program using mobile application (HA Go Rehab module), exercise diary and education class via Zoom. Exercise intensity, precautions and patient's feedback were evaluated periodically.

6-minute Walk Test (6MWT), exercise volume (duration x frequency) and Cardiac Exercise Self-Efficacy Instrument Chinese Version (CESEI-C) were measured in both groups at baseline and upon discharge for comparison. Patients' exercise adherence and satisfaction to service were also collected in Tele-care group.

Results:
33 patients under Tele-Care (n=18) and usual care (n=15) with comparable baseline demographic data completed the study. Both groups showed increase in 6MWT ($p<0.01$) with no significant between-group difference. A significant higher ($p=0.001$) in change of exercise volume and increased in CESEI-C ($p<0.05$) was found in Tele-care group compared to that of the usual group. Tele-Care group was able to maintain exercise adherence at one-month follow-up and all the participants were satisfied with the Tele-Care service.

Conclusion:
The hybrid model of physiotherapy Tele-Care in CR was well accepted by patients and shown to be effective in promoting patients' exercise capacity, improving exercise self-efficacy and maintaining exercise adherence.

Keywords:
Physiotherapy Tele-Care Rehabilitation

Abstract No. 21080

Current Knowledge on the Use of Robotic Rehabilitation for Older Adults' Upper Limb within the Scope of Physical and Occupational Therapy: A Scoping Review

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Background:
Rapid population aging and the prevalence of older adults with neurological diseases is leading to the growing interest in robotic-assisted rehabilitation to reduce motor impairment and enhance functional recovery of this population. The outcomes on the upper limb rehabilitation have reported on the positive effect of functional activities. Physiotherapists and occupational therapists play a key role in rehabilitation.

Objective:
To review the current study on upper limb robotic rehabilitation for older adults within the physical therapy and occupational therapy field.

Methods:
Using the Arksey O'Malley framework, a scoping review was conducted. Total 371 articles from 2016 to 2021 was retrieved from three databases (PubMed, Scopus, Science Direct).

Results:
Twenty-three original articles were included. Most were mainly older adults with stroke in the subacute phase. There was only one study about ALS condition. Various models of robotics were studied; however, some studies combined robotics with other approaches such as conventional rehabilitation, task-oriented training, or transcranial magnetic stimulation. The robotic approaches showed equal or superior outcomes compared to conventional rehabilitation.

Conclusion:
This scoping review demonstrated a positive effect of using robotic rehabilitation for the upper limb of older adults with neurological disorders. Robotics rehabilitation could be useful as a part of the alternative program and incorporated with conventional physical or occupational therapy.

Keywords:
Elderly, Stroke, Upper limb

Abstract No. 21081

Trans-Spinal Electrical Stimulation for Improving Trunk and Sitting Function in Tetraplegics with Cervical Cord Injury

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Objective:
The aim of this study was to examine the efficacy of trans-spinal electrical stimulation (tsES) for improving trunk control and sitting stability with task specific rehabilitation (tsR) in peoples with chronic tetraplegia.

Study design:
Longitudinal cohort study.

Setting:
The Hong Kong Polytechnic University, Hong Kong

Participants:
3 individuals with complete (AIS-A) cervical (C5-C8) SCI were enrolled in this 6-month clinical study.

Methods:
After a baseline test, combined intervention of tsES and tsR were given for 12 weeks followed by only tsR for another 12 weeks. The stimulating sites were T11 and L1, and the stimulation frequency was from 20-30 Hz with 0.1-1 ms pulse width modulated at 9.4 kHz biphasic stimulation.

Main Outcome Measures:
(1) Modified Functional Reach Test was recorded to observe the reaching distance and to evaluate the risk of fall from wheelchair, (2) Trunk Control Test was performed to assess the static and dynamic equilibrium, and (3) Function In Sitting Test was used to measure the functional sitting balance.

Results:
After the combined intervention, participants were able to perform supine to prone movements, independent sitting for longer time in upright erect posture with help of upper extremity and could maintain static and dynamic, trunk and sitting balance with no external assistance for 2-3 minutes with eyes closed. Also, each participant was able to perform anterior, posterior and lateral scooting with support of upper limbs.

Conclusion:
It is not conclusive yet until we do the tsR and would update the results in next 12 weeks.

Keywords:
Trans-spinal Electrical Stimulation, Tetraplegia

Abstract No. 21084

Intermittent Theta Burst Stimulation to the Primary Motor Cortex Reduces Cortical Inhibition: A TMS-EEG Study

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Introduction:
The aim of this study was to reveal the effects of intermittent theta burst stimulation (iTBS) in modulating cortical networks using transcranial magnetic stimulation and electroencephalography (TMS-EEG) recording.

Methods:
Eighteen young adults participated in our study and received iTBS to the primary motor cortex (M1), supplementary motor area, and the primary visual cortex in three separated sessions. A finger typing task and ipsilateral single-pulse TMS-EEG recording were administrated before and after iTBS in each session. The effects of iTBS in motor performance and TMS-evoked potentials were investigated.

Results:
The results showed that iTBS to the M1, but not supplementary motor area or the primary visual cortex, reduced the N100 amplitude in bilateral hemispheres significantly ($p = 0.019$), with a more prominent effect in the contralateral hemisphere than in the stimulated hemisphere. Moreover, only M1 stimulation decreased global mean field power (corrected $ps < 0.05$), interhemispheric signal propagation ($t = 2.53$, $p = 0.030$) and TMS-induced early α-band synchronization ($p = 0.020$).

Conclusion:
Our study confirmed the local and remote aftereffects of iTBS in reducing cortical inhibition. Further exploration of TMS-induced oscillations after iTBS for changed cortical excitability in patients with various neurological and psychiatric conditions is warranted.

Keywords:
TMS, Cortical Inhibition

Abstract No. 21086

From Adversity to Resilience: A Case Study of Psychological Intervention for COVID-19 Survivors

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The COVID-19 pandemic has brought a profound impact on the psychological wellbeing of the COVID-19 survivors. A recent focus group study revealed that the survivors commonly perceived stress and loneliness because of anxiety about return to their normal social life. To better deal with their psychological needs, we developed a psychological intervention by utilizing a face-to-face psychosocial group and internet technology approach to improve their psychological wellbeing.

Methods:
The pilot service collaborated with Pamela Youde Nethersole Eastern Hospital. Thirteen COVID-19 survivors recruited from the hospital participated in the service. The intervention included one session of induction psychosocial program and four sessions of the psycho-education group. The approach focused on resilience-building skills to support them deal with unexpected changes in lifestyle, negative thoughts, and emotions. Besides the face-to-face group-based intervention, a relaxation video has been provided to participants through WhatsApp for their self-practice. Self-reported, pre- and post-assessment were used to explore the preliminary effectiveness of the intervention.

Results:
After the intervention, there was a significant increase in personal wellbeing (p-value = 0.049). Generally, participants have reported psychological distress was gradually improved. They had a positive attitude towards their life and it helped increase confidence before resume their social life. The preliminary results indicated that the interventions were effective to improve participant's psychological distress and strengthen their positive thinking.

Keywords:
COVID-19 Survivor, Resilience Building

Abstract No. 21090

Pulsed Electromagnetic Fields (PEMF) Augments the Sensitivity of Pseudomonas Aeruginosa to Antibiotics

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Diabetic ulcers, the leading cause of non-traumatic lower limb amputations, are mainly resulted from uncontrolled bacterial infections in unhealed diabetic wounds that gradually progress to chronic ulcers. Pseudomonas aeruginosa (PA) is an opportunistic bacteria commonly found in diabetic ulcers. In addition to possessing virulence factors that enhance chances of infection, PA is notorious for its low sensitivity towards antibiotics due to low membrane permeability.

Clinically, there is currently no effective treatment except frequent debridement and the use of increasing doses of antibiotics, further imposing risks of antibiotic resistance. Pulsed electromagnetic field (PEMF) has previous been shown to affect bacterial (E. coli, S. aureus) growth. In this study, we have treated the PA with PEMF of different frequencies for 8 hours, followed by a further 16 hours without PEMF treatment. Bacterial growth was assessed using colony-forming units. Scanning electron microscope (SEM) was used to examine the morphological changes.

To further explore the effects of PEMF on PA, proteomic analyses were performed. Our pilot data has shown that i) PEMF (in a frequency-dependent manner) significantly enhanced PA sensitivity to antibiotics (gentamicin); ii) SEM demonstrated structural deformation of PA under same antibiotic concentration in the presence of PEMF; iii) proteomics analyses demonstrated that PEMF significantly downregulated various enzymes that contribute to PA virulence.

We have shown that PEMF and antibiotics synergistically inhibit bacterial growth. It is suggested that PEMF may non-specifically increase PA membrane permeability. Further investigation may enhance the development of novel therapeutic approaches to diabetic ulcers.

Keywords:
PEMF, Pseudomonas Aeruginosa, Diabetes

Abstract No. 21094

Creating a New Assistive Device for Stroke Patients with Diabetes Mellitus using 3D Printing

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Introduction:
Many patients, suffering from diabetes mellitus (DM), need to self-administer insulin injections daily. However, many of them also suffer from stroke with limited upper limb and hand function. It is difficult for them to perform the insulin injection, especially the assembly of the injection devices and the adjustment of the injection dose.

Objectives:
This study aims at using an innovative way to create assistive devices for insulin injection by stroke patients with limited upper limb and hand function.

Method:
A patient who had DM and stroke with limited upper limb and hand function was seen in Tai Po Hospital. The assisted device was designed using computer-aided design software based on the insulin injection pen model Novopen-5. It was printed by a fused deposition modeling 3D printer. After printing the assistive devices, the patient was educated to use the assistive device to perform the insulin injection.

Results:
The patient was unable to perform the insulin injection without assistance before using the assistive aids. With the use of the newly-designed assistive device, the patient took about 10 minutes to learn how to use the assistive device and became independent in insulin injection with one handed technique using Novopen-5. The assistive device could also be mounted on different tables to facilitate the patient to perform the insulin injection at various locations.

Conclusion:
3D printing has potential to be utilized to fabricate different assistive devices which are tailor-made and are suitable for patients with various individual needs.

Keywords:
Diabetes, Stroke, 3D Printing

Abstract No. 21096

Development of a Novel, Environmental Friendly Material as an Alternative to Traditional Polycaprolactone for Splintage

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Objective:
To develop a new malleable, environmental friendly thermoplastic materials, Biodegradable Clay, for splinting. Polycaprolactone (PCL) is a thermoplastic splinting material commonly used for positioning body parts of patients with orthopaedic or neurological conditions. The material has some desirable characteristics, such as relatively low melting temperature, good toughness and resistance to chemicals. However, PCL has some shortcomings, such as conformity issues, limited recyclability, and relatively higher cost.

Methods:
To address issues of the conventional thermoplastic materials, we have developed a new, recyclable material for splintage, called Biodegradable Clay (BDC, patented), which is synthesized based on PCL and addition of boron and other plasticizers. Material testing was carried out to evaluate various physical properties of BDC (1) after the first fabrication and (2) after the material is recycled by a newly designed recycling machine.

Results:
The results of materials testing revealed that the elasticity and tensile strength of BDC has adequate rigidity to provide support for splinting body parts. With the use of the new recycling machine, used materials can be recycled onsite and re-shape into a usable sheet of material. The recyclability of the BCD may minimize the total amount of materials used for splinting for end users.

Conclusion:
The new thermoplastic material, BCD, provides a novel and environmental friendly alternative to PCL for splintage, and may impose potential to change the mode of splinting in clinical settings.

Keywords:
Splinting, New Material, Polycaprolactone

Abstract No. 21097

The Application of the Design Thinking Methodology in Developing Innovative and Human-Centric Solution for the Delivery of Physiotherapy to Paediatric Congenital Cases under the COVID-19 Pandemic

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Objective:
Timely physiotherapy intervention for congenital anomalies is essential. However, the delivery of service to infection vulnerable infants was challenged by COVID-19, resulting in imminent need for identifying new solution. Design Thinking is an action-oriented and human-centered methodology that develops innovative and effectual solutions. It consists of seven iterative processes, including Empathize, Define, Ideate, Prototype, Test, Evaluate and Implement. The objective is to investigate the application of the Design Thinking methodology in developing solutions for the delivery of physiotherapy to paediatric congenital cases under COVID-19.

Methods:
The seven iterative processes in Design Thinking methodology were adopted. For evaluating the new practice, the rate of adherence, rate of satisfaction, feedbacks and report of incident were considered.

Results:
For empathizing and defining, open discussions and semi-structured interviews were taken with staff. Opinions from parents were considered. Majority of staff perceived that additional protection practices should be taken considering the vulnerability of infants and the benefits of early intervention. Ideation was then collaboratively generated and transformed to a prototype – a specially designed case that tailored to the maneuvers commonly performed. This prototype was tested, evaluated and modified before implementation. From April 2021, all indicated infants were managed with the practice. There were positive feedbacks from staff and parents and satisfaction rate was high. No incident was reported.

Conclusion:
Preliminary benefits of utilizing the Design Thinking methodology in rehabilitation setting were shown. New promising practice in managing paediatric congenital cases was evaluated.

Keywords:
Design Thinking, COVID-19, Paediatric

Abstract No. 21098

Local Clinical Experience of Over-ground Assist-as-needed Robotic Exoskeleton Training: A Case Study to Examine Functional Gains for Stroke and Spinal Cord Injury Survivors in Community Settings

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Objective:
To examine robotic-assisted walking proficiency and functional gains for stroke and spinal cord injury (SCI) survivors after robotic exoskeleton training

Background:
Restoring walking and improving gait pattern are of high priority for survivors of stroke and SCI. Powered exoskeleton provides a promising means to retrain walking for these two patient groups.

Methods:
A wearable lower limb robotic exoskeleton (Ekso Bionics, CA) was used to examine its users' walking proficiency during robotic-assisted walking, their functional gains without the exoskeletal assist, and the changes in parameter settings for individual users over the training course. Participants with chronic (> 1 year) stroke or motor complete (C7 or below) or incomplete SCI were trained to walk in the Ekso. Parameter settings were documented and measures on walking progression were taken before and after the training.

Results:
With training, participants with severe SCI and preserved arm strength could walk over-ground with walking aids at reasonable speed and distance while those with stroke showed improvement in gait performance. The training was accompanied by functional improvements in some participants. Minor adverse events encountered by the trainers were reported.

Conclusion:
This case study revealed improved lower limb coordination resulting in smooth stepping motion during exoskeletal-assisted walking in all participants. However, training dosage required for optimal walking proficiency and the carry-over effects remain unclear. For SCI users, studies of its effects on autonomic functions like cardiovascular and thermoregulation are warranted. Tips on overcoming challenges encountered by the trainers were discussed.

Keywords:
Exoskeleton, Gait, Stroke, SCI

Abstract No. 21101

The Pelvisense, an Innovative Biofeedback Device for Pelvic Floor Muscle Training for Women with Urinary Incontinence

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Objective:
To examine the feasibility of using the PelviSense for pelvic floor muscle training (PFMT) in women with stress urinary incontinence (SUI).

Methods:
First, we developed a non-invasive biofeedback device (PelviSense) for the re-education of pelvic floor muscles (PFMs). The PelviSense consists of a high-precision wearable EMG sensor that displays electrical activity in the PFMs on a user's mobile device. We then evaluated the feasibility of using the PelviSense in a quasi-experimental design, using ten women having SUI. Participants performed PFMT with and without the PelviSense for 4 weeks each. Feasibility measures included compliance to PFMT with and without the PelviSense, safety, and acceptability.

Results:
Ten participants had 12 sessions prescribed without the PelviSense and 12 sessions with the PelviSense over the study period. The mean percentage of home-based PelviSense-assisted PFMT sessions completed was 94%. The mean percentage of home-based unassisted PFMT sessions completed was 63%. Participants in the feasibility study, after using the PelviSense device, expressed the following concerns: (i) disposable AAA batteries run out or become flat quickly and must be replaced often; (ii) inability to monitor their progress on the mobile application; and (iii) incompatibility with iPhones because the device is only compatible with Android phones.

Conclusion:
Results revealed that the PelviSense is safe and can significantly improve compliance to PFMT compared to unassisted PFMT. Based on the feedback received from study participants, we plan to further upgrade the design of the device and its associated mobile application.

Keywords:
Biofeedback, Pelvic Floor, Incontinence

Abstract No. 21111

Development of Pelvic Supporter for Use During Longtime of Sitting at the Specific Chair

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Background:
The study proposed warp knit fabric to replace conventional woven pelvic supporter for people required long time sitting at the specific chair. The purpose of pelvic supporter is aimed to protect the user prevent sliding or falling from specific chair at the elderly home. Upon elderly cannot self-care and get lose temper, some may have distraction or depression. Study the well-being and happiness (positive psychology) of elderly after use the newly developed pelvic supporter is needed.

Method and Results:
Initial study included interview with the users, listened their experience stories on use the pelvic supporter. Subsequently the experience of knowing needs and modify the pelvic supporter with rehabilitation organizations, occupational therapists, material experts and fashion designers will be shared.

Through the feedbacked of wear trial, users and caretakers mentioned that air permeability, colour, fabric design, fabric thickness and aesthetic of the pelvic supporter prototype were very impressed and comfort in used. The nice outlook was glorious and urge for outgoing.

Conclusion:
Hence with the developed pelvic supporter prototype, a further research on the impact of the user emotion well-being on use favour colour pelvic supporter at the specific chair. To evaluation emotion enhancement of the user, an intensive interview with art therapy activity will be conducted. They can share the wear experience and tell their own story at stressful free environment.

Keywords:
Pelvic Supporter, Mental Health, Warp Knit, Well-being

Abstract No. 21112

Pilot EEG and EOG-Based Prediction Model for Drowsiness

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Objective:
To test the feasibility of constructing a psychophysiological-based prediction model for drowsiness state.

Background:
Drowsiness is a mental state that influences one's attention and decision-making (1,2). For some daily operations such as driving, drowsiness has been identified as a major cause of accidents (3). In this pilot study, an EEG and EOG-based computational model is used to predict drowsiness state of the participants.

Methods:
Twelve participants were recruited, who completed a 90-minute driving task in a dark and quiet room. The EEG and EOG signals were acquired throughout the task. The participants were asked to assign a rating on evaluating the level of sleepiness verbally using the Karolinska Sleepiness Scale (KSS) every 5 minutes during the experiment. A computational model based on Support Vector Machine (SVM) was used, with the KSS scores as a classifier and the spectral band powers (derived from EEG), percentage of eyelid closure and eye blink durations (from EOG) as the features.

Results:
The final prediction model had 135 features achieving an 82.1% accurate rate for the drowsiness classification. The selected EEG features were the midline-oriented delta rhythms (1-4 Hz), and the frontocentral oriented theta (4-8 Hz) and alpha (8-13 Hz) rhythms.

Conclusion:
The pilot EEG and EOG-based computational model showed a considerable high accuracy of predicting drowsiness state. This model sheds lights on the salient parameters defining a drowsiness state. Findings form the basis for other prediction studies involving large sample sizes and in real-life situation.

Keywords:
EEG, EOG, Drowsiness, Model

Abstract No. 21114

Building the Case for Improved Health Literacy in Gastrointestinal Rehabilitation

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Objectives:
To explore the issues associated with health literacy in chronic gastrointestinal disease, highlighting the impact of low health literacy in gastrointestinal rehabilitation.

Background:
Living with a chronic gastrointestinal disorder, such as inflammatory bowel disease, can be a very challenging, requiring a range of skills to deal with some of the issues and uncertainties associated with living with a chronic illness, including health literacy. Currently, the full impact of low health literacy in gastrointestinal rehabilitation is unknown.

Method:
A narrative literature review was conducted to provide a comprehensive, critical, and objective overview of health literacy in clinical gastroenterology.

Results:
Health literacy interventions have been shown to have the potential to improve health outcomes in a range of conditions. Within health care systems, improving health literacy may enhance clinical practice and patient education. Health literacy can be best improved through structured, theory and evidence -informed educational programmes, or similarly designed on-line learning resources. In particular, eHealth interventions would appear to have good potential to improve health literacy skills for those in rehabilitation. In addition, development of eHealth interventions may also help reduce socio-economic inequalities in healthcare.

Conclusion:
Health literacy is a critical, but often overlooked, skillset that can enhance the patient experience. It is believed that greater attention to health literacy in gastroenterology, in particular eHealth interventions, may have a positive impact on gastrointestinal rehabilitation. In support of building the case for enhancing health literacy in gastroenterology, healthcare professionals should strive to improve health literacy in their patients.

Keywords:
Gastrointestinal, Rehabilitation, Literacy, eHealth

Abstract No. 21115

"care-COPD": A Nursing and Physiotherapy Initiative to Develop a Mobile App for COPD Self-Management

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Objective:
The study aims to conduct a formative evaluation a Chronic Obstructive Pulmonary Disease (COPD) Mobile App on its usability, effectiveness and adherence from COPD patients and health care professionals (HCPs).

Background:
COPD is a chronic progressive respiratory disorder. The provision for timely and appropriate care coordination of COPD management is often a big challenge to health care providers. Innovative mobile health applications have the potential to integrate COPD care to sustain self-management of patients over time. This study is the first phase of a larger interdisciplinary collaborative initiative between nursing and physiotherapy.

Methods:
A purposive sample of 10 COPD patients and 20 HCPs will be included to evaluate the acceptability of the "care- COPD" App. Focus group interviews will be conducted to both COPD patients and HCPs after the trial ends. Data will be analysed thematically to identify themes and patterns.

Results:
After testing the "care-COPD" for 4 weeks, focus groups are done to explore technical difficulties, perceived effectiveness of the App, and attitude towards the use of mobile application to aid COPD self-management. The views from COPD patients and HCPs are compared and contrasted.

Conclusion:
This study can provide important insights on the application of digital interventions in COPD self-management to further improve the availability and accessibility of pulmonary rehabilitation initiatives for patients.

Keywords:
COPD, Self-management, Mobile application, Interdisciplinary

Abstract No. 21117

Effects of Repetitive Transcranial Magnetic Stimulation (rTMS) on the Brain using Activation Likelihood Estimation

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Objective:
Two are better than one: toward dual-site stimulation for neurorehabilitation

Background:
Transcranial Magnetic Stimulation (TMS) facilitates functional neuroplasticity. Recent study showed that dual-site TMS further enhance reorganisation of functional network. The aim of this study is to consolidate existing empirical finding of single-site TMS on motor cortex with function MRI data. To our knowledge, this is the first TMS neuroimaging meta-analysis.

Methods:
PubMed and Web of Science were systematically searched for publications. Concurrent studies of TMS and fMRI, in which the site of TMS simulation was at the motor cortex and the fMRI paradigm was a motor-related task, were selected. Only studies which made used of traditional rTMS protocol (but not iTBS or cTBS) were included. Studies that did not report peak coordinates of pre-and-post effect of TMS were rejected.

Results:
7 studies were included in the meta-analysis with a total of 134 subjects (78 males and 56 females; mean age = 38. Activation of the right putamen, left frontal lobe (BA 6), left temporal lobe (BA 13), and left paracentral Gyrus was observed. Deactivation was observed in the left occipital lobe, bilateral medial frontal gyrus, right caudate, right putamen, and left precuneus.

Conclusion:
Our results show that different brain activation and deactivation patterns occurred during TMS stimulation of the motor cortex. Future works should be done to investigate if and how dual-site stimulation enhance neural reorganisation and functional improvement.

Keywords:
TMS, Brain, Stimulation

Abstract No. 21122

Effects of Cerebellar Transcranial Direct Current Stimulation on Facial and Hand Movements in Individuals at Risk of Psychosis: A Pilot Study

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Objective:
To examine effects of cerebellar transcranial direct current stimulation (tDCS) on improving facial and hand movements in individuals at risk of psychosis.

Background:
Movement abnormalities, associated with dysfunctional cerebellum in at-risk individuals, are risk factors for psychotic onset. The tDCS is promising for modulating cerebellar activities. This pilot study investigates the effects of cerebellar tDCS on facial and hand movements in at-risk individuals and estimates the required sample size in future studies.

Methods:
A randomized controlled trial was conducted. Fifteen at-risk individuals were identified using Prodromal Questionnaire (16 items) and Community Assessment of Psychic Experiences (CAPE; 15 items), and were randomized to receive 2-mA 8-session real (n=7) or sham (n=8) cerebellar tDCS. Facial and hand movement abnormalities were assessed using VICON motion analysis when participants executed movement tasks. Normalized number of movement units (nNMU) meant severity of dyskinesia. Analysis of covariance tested effects of cerebellar tDCS on nNMU at posttest.

Results:
For the current sample size, no significant differences between two groups were found in facial and hand nNMU at posttest. The effect size f for hand and facial nNMU was 0.55 and 0.48 respectively, indicating the sample size of 29 and 37 were required respectively with alpha level (two-tailed) at 5% and the power at 80%.

Conclusions:
This pilot study showed cerebellar tDCS was promising for improving movements in at-risk individuals. In future studies, a larger sample size is warranted to validate effects of cerebellar tDCS. Developing effective preventive interventions will contribute to early prevention of psychotic onset.

Keywords:
tDCS, Psychosis, At-risk, Dyskinesia

Abstract No. 21132

Alerting, Orienting, and Executive Attention are Modulated by Negative Emotional Stimuli in Healthy Young Adults: An fNIRS Study

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Objective:
To use functional near-infrared spectroscopy (fNIRS) to understand the neural mechanisms underlying the effects of negative emotional stimuli on alerting, orienting, and executive attention in healthy young adults.

Background:
Attention is fundamental to multiple cognitive domains. Substantial evidence suggests three attentional processes that engage distinct frontal brain networks, including alerting, orienting, and executive attention. Threatening stimuli influence attention, but whether negative emotional stimuli affect all three processes of attention and their associated neural processing remains elusive.

Methods:
Forty-five nonpsychiatric young adults undertook the emotional variant of the Attention Network Test (ANT) during frontal fNIRS recording. On each trial, participants performed the arrow flanker task. The arrow stimuli were sometimes preceded by a warning stimulus, which might or might not inform the location of the upcoming target stimulus. The warning stimulus was either a neutral or an angry human face.

Results:
The participants responded faster in the presence than the absence of a warning signal (alerting), when the target stimulus was preceded by an informative than an uninformative cue (orienting), and when the target stimulus was surrounded by congruent than incongruent flanker stimuli (executive attention). Compared with neutral warning signals, negative warning signals induced weaker alerting and executive attention effects but a stronger orienting effect. Some of these effects were paralleled by differences in frontal lobe activation between task conditions.

Conclusion:
Negative emotional stimuli modulate alerting, orienting, and executive attention. These findings have implications for depressive and anxiety disorders, which show attentional bias to negative and threatening stimuli.

Keywords:
Attention, Frontal Lobe, fNIRS

Abstract No. 21133

Effectiveness of TES and rTMS for the Treatment of Insomnia: Meta-analysis and Meta-regression of Randomized Sham-controlled Trials

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Objectives:
To examine the effectiveness of randomized sham-controlled trials of transcranial electric stimulation (TES) and repetitive transcranial magnetic stimulation (rTMS) in improving insomnia and potential moderators associated with the effect of the treatment.

Background:
TES and rTMS have experienced significant development in treating insomnia. Methods: Nine electronic databases were searched from the inception of these databases to 25 June 2021. Meta-analyses were conducted to examine the effect of TES and rTMS in treating insomnia. Univariate meta-regression was performed to explore potential treatment moderators that may influence the pooled results.

Results:
A total of 16 TES studies and 27 rTMS studies were included in this review. The pooled results indicated that there was no significant difference between TES group and sham group in improving object measures of sleep. rTMS was superior to its sham group in improving sleep efficiency (SE), total sleep time (TST), sleep onset latency (SOL), WASO (wake up after sleep onset), and number of awakenings (NA) (all $p< 0.05$). Both TES and rTMS were superior to their sham counterparts in improving sleep quality measured by Pittsburgh Sleep Quality Index (PSQI). Gender, total treatment sessions, number of pulses per session, and length of treatment per session were associated with rTMS efficacy. No significant relationship was observed between TES efficacy and the stimulation parameters.

Conclusions:
It seems that TES and rTMS have a chance to play a decisive role in the therapy of insomnia. Possible dose-dependent and gender difference effects of rTMS are suggested.

Keywords:
TES, rTMS, Insomnia, Review

Abstract No. 21136

Altered Respiratory Muscle Performance during Submaximal Exercise in Individuals with Chronic Neck Pain

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Background:
The biomechanic and neuro-musculoskeletal inter-relationship between cervical and thoracic spine would partly explain the manifestation of respiratory deficiency in some patients with chronic neck problem. However, knowledge of the impact of physical exertion on respiratory muscle recruitment in individuals with chronic neck pain remains limited. This study compared the muscle recruitment pattern and fatigability during submaximal exercise condition between healthy and chronic neck pain (CNP) participants.

Method:
Twenty-nine participants (15 CNP group and 14 healthy controls) underwent a 12-minute submaximal exercise test while the respiratory muscle strength and recruitment pattern were assessed respectively by maximal inspiratory and expiratory pressure and electromyography of six targeted muscle pairs (anterior scalene (AS), sternocleidomastoid (SCM), upper trapezius (UT), diaphragm (DF), external intercostals (EI), and rectus abdominus (RA)).

Results:
The MIP and MEP values which denote the respiratory muscle strength were comparable between two groups ($p>0.05$). Effort of all inspiratory accessory muscles (AS, SCM and UT) increased during the exercise test in CNP group. AS showed significantly higher degree of recruitment between baseline, termination and recovery phases of submaximal exercise test in CNP group ($p\leq0.05$). Their left AS and SCM also displayed a significant greater fatigability during the submaximal exercise test as expressed in the EMG median frequency value ($p\leq0.05$).

Conclusion:
Altered recruitment pattern and greater fatigability of selective muscles involved in respiration of neck pain participants upon the submaximal physical exertion suggest the importance of monitoring and possible rehabilitation for this respiratory dysfunction associated with chronic cervical spine condition.

Keywords:
Chronic Neck Pain, Respiratory Muscle Strength, Recruitment Pattern, Submaximal Exercise

Abstract No. 21138

Virtual Reality-Based System for Training Attention, Memory and Executive Functions in Persons with Schizophrenia

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Background:
Schizophrenia is a serious psychiatric disorder that has demonstrated cognitive problems which are negatively affecting functional outcomes. The present project developed VR training programme, via a virtual convenience shop as a training scenario, as effective strategies for cognitive rehabilitation.

Objective:
Through a virtual reality-based (VR) programme,

a. Better post-training in cognitive function in VRG reflected by outcome measures.
b. Better improvement in VR when compared with control group engaging online computer games (OGCG)reflected by similar outcome measures

Methods:
This study was a single-blinded, randomized controlled trial in evaluating VR programme for enhancing cognitive outcomes in 142 individuals with schizophrenia who were randomly assigned to either an VR group or an online cognitive game group (OGCG). Outcome measures of the study included the MATRICS Consensus Cognitive Battery (MCCB), Wisconsin Card Sort Test (WCST), Brief Psychiatric Rating Scale (BPRS), and Self-efficacy Scale and they were conducted during pre-, post-test period.

Results:
Compared to participants in the OGCG group, those in the VR group exhibited significant improvement in attention, working memory, executive and social cognition. IVR training might target cognitive problems in schizophrenia. Social functions in schizophrenia was strongly associated with social cognition as well as neurocognitive function.

Conclusion:
The subjects in this study had been benefited from improvement in social function apart from they were having psychiatric rehabilitation. VR has a high potential to improve cognition and self-efficacy as compared with online games, which also had potential effect in improving brain processing. It has little contribution to changes of negative symptoms associated with schizophrenia. Other means may be explored to tackle this area of problems.

Keywords:
Virtual reality, schizophrenia, cognitive rehabilitation, social cognition

Abstract No. 21042

Stroke Registry with Reference MRMI Gain to Monitor Stroke Outcomes: A Big Data Concept

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Background:
Accelerated Stroke Ambulation Program (ASAP) was developed in Physiotherapy Department, Tai Po Hospital (TPH). With big data concept, a clinical prediction model of Modified Rivermead Mobility Index (MRMI) gain was built. To monitor stroke outcomes and process compliance, Stroke Registry, a longitudinal stroke database, was also developed. Taken the reference MRMI gain as indicator, Stroke Registry can monitor progress of stroke patients proactively.

Objectives:
1. To monitor stroke outcomes and process compliance.
2. To predict clinical outcome.
3. To give therapists a clear goal and timely clinical decision support.

Methods:
1. Clinical prediction model of MRMI gain was developed with TPH stroke data from 2011 to 2018 (n=4136). The correlation of reference MRMI gain and actual MRMI gain was investigated by Pearson correlation coefficient in SPSS.
2. Stroke Registry was developed with Excel to use as a database which indicated the reference MRMI gain and process compliance of ASAP. MRMI score of stroke patients was updated by therapists weekly for proactive monitoring and support.
3. One-year functional outcomes of stroke patients before and after the use of Stroke Registry (Oct 2018 to Sep 2019 Vs Oct 2019 to Sep 2020) were compared in SPSS.

Results:
The Pearson correlation was 0.386 which showed a moderate correlation of the reference MRMI gain and the actual MRMI gain. One-year functional outcomes before and after the use of Stroke Registry were able to keep similar (mean MRMI difference: pre 5.26, post 5.08; mean Modified Functional Ambulation Classification (MFAC) difference: pre 0.73, post 0.67; mean Berg Balance Scale (BBS) difference: pre 6.62, post 6.39) with the length of training decreased by 1.39 days (mean: pre 23.17 days, post 21.78 days). Meanwhile, the staff experience of Senior Physiotherapist and Physiotherapist I reduced 9.8 years (mean: pre 22.8 years, post 13.0 years) and that of Physiotherapist II reduced 0.7 year (mean: pre 2.2 years, post 1.5 years). Functional outcomes were kept similar though staff experience much decreased.

Conclusion:
Stroke Registry with clinical prediction model of MRMI gain helps predict and monitor stroke outcomes and facilitates timely support to therapists.

Keywords:
Stroke, Outcomes, MRMI

Abstract No. 21056

Development of Occupational Therapy Cognitive Outcome Measure for the Elderly with Dementia

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Objective:
To develop occupational therapy cognitive outcome measure for the elderly with dementia in Thailand and examine content validity, internal consistency, and intra-rating reliability.

Background:
Evaluating the effectiveness of intervention is important in the occupational therapy process. A reliable and valid outcome measure is required to assess such effectiveness. However, in Thailand, an outcome measure for cognitive function in older people with dementia is lacking. Therefore, a cognitive outcome measure that is suitable for a Thai context is deemed necessary.

Methods:
A developmental research design was used in this study. The outcome measure was developed based on DSM-5 and occupational therapy cognitive models. Then, content validity was judged by the Index of item Objective Congruency (IOC). After the pilot was used with 5 older people, the outcome measure was revised and examined for internal consistency in 49 older people with dementia. In addition, 10 older people with dementia were assessed by the same assessor to examine its intra-rating reliability. The data were analyzed using the Cronbach's alpha coefficient and Intraclass Correlation Coefficient (ICC).

Results:
The IOC of the measure was between 0.67-1.00, the Cronbach's alpha coefficient was 0.90 and the ICC was 0.99.

Conclusion:
The developed outcome measure showed content validity, high internal consistency, and excellent intra-rating reliability. However, other psychometric properties should be further examined.

Keywords:
Outcome Measure, Cognition, Dementia

Abstract No. 21068

Concurrent Validity of the Latest Wearable Gait and Balance Measurement System

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Objective:
To establish the concurrent validity of the wearable gait and balance measurement system in measuring sit-to-stand and timed-up-and-go tasks in people with Parkinson`s disease (PD).

Background:
Duration of performing physical mobilities such as five-time-sit-to-stand (5T-STS) and time-up-and-go (TUG) was reported to be related with the severity of PD. Besides using a stopwatch, a newly upgraded wearable measurement system could be used to record the duration of these clinical tests as well as to assess movement pattern. However, the concurrent validity of the wearable system has not been established.

Method:
Thirty-eight people with Parkinson`s disease (age: 63.7 ± 6.9 years; H&Y: 2.43 ± 0.28) without freezing of gait or dyskinesia were recruited. The subjects conducted 5T-STS twice and 3-meter TUG test three times. The duration of the two tests were recorded by the stopwatch and exported from Mobility Lab (APDM, Inc. Portland, OR, USA) software. The average duration of the test trials was used in the data analysis. Agreement was assessed by intra-class correlation coefficients (ICC 2,k) and Pearson correlation.

Results:
The ICC and Person correlation were 0.977 and 0.955 for the 5T-STS; 0.972 and 0.946 for the TUG. The p values of the above-mentioned outcomes were below 0.001.

Conclusion:
The agreement between the stopwatch and the Mobility Lab system was excellent. The Mobility Lab, a wearable assessment system, is valid to measure the duration of the 5T-STS and TUG test.

Keywords:
Parkinson, Validation, Giat, TUG

Abstract No. 21106

Psychometric Properties of the Sensory Processing and Self-Regulation Checklist- English Version

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Objectives:
Sensory processing difficulties usually present with other self-regulation symptoms, making it challenging to determine the root cause of behavioral problems. The Sensory Processing and Evaluation Checklist is an innovative questionnaire that is able to simultaneously evaluate the sensory processing and self-regulation abilities among children. This study examines the psychometric properties of the SPSRC (English version) in measuring the sensory processing and self-regulation abilities of children.

Methods:
Testing of the SPSRC-English was conducted in a sample of Filipino children (164 without disability and 30 with a disability) ages 4-12 to evaluate its reliability and validity properties. Bilingual parents of the recruited children answered the questionnaire.

Results:
The SPSRC-English was shown to have high internal consistency ($\propto$= 0.99) test-retest reliability (ICC= 0.92); and good discriminant validity (r= 0.70; p= 0.002). Scores on Parts 1 and 2 of the SPSRC-English were strongly correlated (r= 0.70; p= 0.002). The ICC for the subscale and factor scales of Part 1 (0.53-0.83) and Part 2 (0.35-0.88) were significant ($p<0.001$). SPSRC-English can discriminate age groups ($p<0.001$) and between children with and without disabilities ($p<0.001$).

Conclusion:
The current study provides evidence on the reliability and validity of SPSRC-English in measuring the sensory processing and self-regulation abilities in children with and without a disability. The SPSRC-English may provide salient information supporting the understanding of sensory processing difficulties among children.

Keywords:
Sensory, Self-regulation, Children, Psychometrics

Abstract No. 21107

Linguistic Equivalency, Cross-Cultural Validity, and Psychometric Properties of the Sensory Processing and Self-Regulation Checklist- Tagalog Version

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Objectives:
Sensory Processing and Self-Regulation Checklist (SPSRC) is a tool measuring sensory processing and self-regulation abilities of children. The original Chinese and English versions have shown their reliability and validity properties. Translating the tool into another language necessitates investigating whether the same psychometric properties are retained. This study reports on the cross-cultural validation, and psychometric testing of the SPSRC- Tagalog version.

Methods:
The SPSRC was translated into Tagalog, a widely spoken language in the Philippines. Its linguistic equivalency, cultural relevance, face content validity by an expert panel. The resulting SPSRC-Tagalog was then tested for its psychometric property among a sample of Filipino children (45 without disability and 45 with a disability) ages 4-12, based on the reports of their bilingual parents and caregivers.

Results:
This study found that SPSRC-Tagalog had high internal consistency ($\propto$= 0.98) and test-retest reliability (ICC= 0.99). Consistency of scores on the English and Tagalog versions was high (ICC-0.99). Scores on Parts 1 and 2 of the SPSRC-Tagalog were strongly correlated (r= 0.78; $p<0.001$). The ICC for the subscale and factor scales of Part 1 (0.61-0.72) and Part 2 (0.80-0.91) were significant ($p<0.001$). SPSRC-Tagalog can discriminate between children with and without disabilities ($p<0.001$).

Conclusion:
The psychometric properties of SPSRC-Tagalog corroborate with its other language versions in its reliability and validity to measure the sensory processing and self-regulation abilities in Filipino children with and without a disability. The information obtained from the SPSRC-Tagalog may be useful in informing our understanding of sensory processing difficulties among children.

Keywords:
Sensory, Tagalog, Psychometrics, Children

Abstract No. 21126

Within- and between-day Intra- and Inter-Rater Reliability of using Myotonometer and Shear Wave Elastography to Assess Paraspinal Muscle Stiffness

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Objectives:
To determine the within- and between-day intra- and inter-rater reliability of novel examiners in using myotonometer and shear wave elastography (SWE) to measure paraspinal muscle stiffness.

Background:
Myotonometer and SWE are common clinical devices for evaluating muscle stiffness. However, the within- and between-day intra- and inter-rater reliability of novel examiners in using these devices to measure paraspinal muscle stiffness remained unknown. The results can inform clinical practice.

Methodology:
The left paraspinal muscle stiffness of 26 prone lying volunteers (average age:20±0.8 years) was measured 2 times by 2 newly trained examiners using myotonometer and SWE each. The volunteers then performed back extension in prone until subjective fatigue. Both examiners immediately repeated the muscle stiffness measurements. The volunteers returned 5 days later to undergo the same procedure. The within- and between-day intra- and inter-rater reliability of both devices in measuring paraspinal muscle stiffness were evaluated by intra-class correlation coefficients.

Results:
The within-day intra-rater reliability estimates for myotonometer and SWE ranged from 0.960 to 0.984 and 0.503 to 0.638, respectively. Between-day intra-rater reliability for myotonometer and SWE ranged from 0.831 to 0.950 and 0.383 to 0.494, respectively. The within-day inter-rater reliability for myotonometer and SWE were 0.936 and 0.680, respectively. The respective between-day inter-rater reliability for myotonometer and SWE were 0.865 and 0.408.

Conclusions:
Compared to SWE, both examiners demonstrated better intra- and inter-rater reliability for using myotonometer to measure paraspinal muscle stiffness. To improve reliability, novel users should receive more SWE training/practice.

Keywords:
Myotonometer, Shear Wave Elastography

Abstract No. 21135

Evaluation of Thoracic Spinal Stiffness and Kinematics during Lifting Tasks in Healthcare Professionals with and without Chronic Thoracic Spine Pain

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Objective:
This study examined the thoracic segmental stiffness and kinematics among healthcare professionals with and without chronic thoracic spine pain using the mechanical indentation and 4D tomography method. The intra-day test-retest reliability of two measurements were also determined.

Background:
Healthcare professionals involving in lifting are at high risk of developing thoracic spine pain. A scarcity of studies explored the effects of thoracic spine pain on spinal stiffness and lifting kinematics.

Methods:
This was a cross-sectional observational study of 28 asymptomatic and 18 symptomatic participants. Thoracic kyphotic and flexion-extension angles in upper, middle and lower region during 11 lifting tasks (+/- 10-kg load) were captured by the 4D tomography (DIERS, Germany). Regional thoracic global and terminal stiffness were measured by the mechanical indenter (VerteTrack, Canada).

Results:
Good-to-excellent intra-day test-retest reliability of the measurement were obtained [Intraclass correlation coefficient (3,3): 0.656-0.968]. No significant between-group differences found in all regional stiffness measurements ($p>0.05$). Both groups showed lower thoracic extension in loaded front-lift with or without left trunk-rotation ($p<0.017$). Same compensatory extension strategy was detected only in asymptomatic group during loaded left side-lift ($p<0.017$). Significant task-group interaction effects of lower thoracic flexion-extension angle were observed in front-lift with right ($p=0.041$) and left ($p=0.020$) trunk-rotation, and for the kyphotic angle in front-lift with left trunk-rotation ($p=0.006$).

Conclusion:
Findings support the use of two systems to quantify the biomechanical properties of the thoracic spine. Healthcare professionals with chronic thoracic pain displayed similar thoracic stiffness but altered postural adaptation strategies during loaded-lifting tasks compared to asymptomatic controls.

Keywords:
Chronic Thoracic Spine Pain, Segmental Stiffness, Tomography, Lifting

Abstract No. 21022

7-Level Functional Recovery Program for Patients with Vertebral Compression Fracture (VCF)

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Background
Vertebral compression fracture (VCF) causes acute low back pain which hinders patients' ADL functional performance. Prolonged inactivity may cause deconditioning and further worsen the pain level. Therefore, adequate pain control and early functional ADL training are essential for promoting the recovery at ward.

Objective
7-Level Functional Recovery Program aimed at minimizing the low back pain, maximizing patients' ADL functional performance and self-efficacy in performing ADL at ward.

Methodology
An expert panel was formed to establish 7-level ADL functional level according to the ADL communication cards with key advisory messages on ADL functional status and QR code for back care education which was designed and posted at bedside. To examine effectiveness of this new program, pre & post Visual Analogue Scale (VAS) in low back pain, Modified Barthel Index (MBI) and a five-point self-rating scale for patient were collected. The self-rating scale for patients included 1) Patient understanding of their ADL functional level, 2) Self-efficacy in ADL functional performance, 3) Understanding in OT roles.

Results
Seventeen subjects were recruited. Results were analyzed by Wilcoxon Signed Ranks Test. There were significant improvements including VAS in low back pain, MBI ($p \leq 0.001$), patient understanding in their ADL functional level ($p \leq 0.001$), self-efficacy in ADL functional performance ($p \leq 0.001$) and understanding in OT roles ($p \leq 0.001$).

Conclusion
Implementation of this program showed positive effects and enhance VCF patients 'early functional ADL performance. Future studies to include large patient number and evaluation on program efficiency are recommended.

Keywords
VCF, Occupational Therapy, MBI, LBP

Abstract No. 21033

Preliminary Evaluation of Online Self-management Education under COVID-19 Pandemics: Experience from the Patient Empowerment Programme

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Background:
Patient Empowerment Programme (PEP) is a primary care initiative aiming to improve chronic patients' knowledge on the diseases and enhance their self-management skills, self-efficacy, and lifestyle modification. Due to the COVID-19 pandemics, the implementation of face-to-face PEP encountered huge difficulty. The Hong Kong Society for Rehabilitation (HKSR) has attempted to revise the implementation into online mode using video conferencing tools and instant messaging tools. The aims of this study was to investigate the preliminary effectiveness of online version of PEP.

Methods:
Patients with diabetes and/or hypertension who were referred by General Out-patient Clinics of Hospital Authority (HA) and agreed to join HKSR based PEP were recruited to fill in questionnaires before starting the programme and at the last session of the programme.

Results:
By the end of 2020, 113 PEP participants were recruited in the study. 56.6% of them were diabetic patients and 43.4% were hypertensive patients. The participants enhanced their self-management behaviour after the PEP program (e.g. drug compliance: 42.5%, blood pressure monitoring: 54.9%, regular exercise: 59.3%, healthy diet: 75.2%, weight management: 85.8%). They also enhanced various domains of health-related quality of life (16.8% to 61.9%) and self-rated health (56.6%). They also achieved a moderate- to high-level of self-efficacy (mean = 6.82).

Conclusion:
The preliminary results confirmed that online version of PEP was effective to enhance participants' self-management behaviours, self-efficacy and quality of life under the COVID-19 pandemics. It is recommended that future studies could explore the difference between face-to-face and online mode of the self-management programmes.

Keywords:
On-line Self-Management Education

Abstract No. 21058

Process of Developing Multi-Media Video-Based Caregiving Resources (MMVCR) for Family Carers with Dementia Relatives at Home

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Objective:
To delineate the process of developing multi-media video-based caregiving resources (MMVCR) and determine their appropriateness, acceptability, relevancy and satisfaction among family carers with dementia relatives at home.

Background:
Dementia caregiving is a highly demanding and a very lonely task faced by family carers. The provision of timely information on dementia care rests on the ability of family carers to access appropriate and relevant information to meet their immediate concerns.

Methods:
The MMVCR were developed with older people, family carers and healthcare professionals. Seventeen family carers from a district elderly centre were approached.

Results:
The process of developing and validating the MMVCR were captured. The MMCVR contained specific caregiving themes that were identified by family carers to be important aspects of daily caregiving at home. There was great value in working in partnership with older people and carers in developing resources that targeted at their specific needs. Together with healthcare professionals, views from all parties were solicited to validate the quality of these resources which were considered to be appropriate, acceptable, relevant and satisfying.

Conclusion:
This small innovative study, which gave rise to DVDs and USBs, demonstrated the need to closely involve older people and family carers when developing resources that are of use to them. Bearing in mind that time is at a premium for family carers, key take home messages should be deliberately short, concise, and jargon-free. Content should be packaged using creative and innovative multimedia resources, and reused for teaching and supporting carers in future activities.

Keywords:
Family Carers, Dementia, Multi-media

Abstract No. 21067

Advancing Team Work to Trans-Professional Collaboration in Rehabilitation Homecare Service: The Local Strategies for Good Practice in Hong Kong

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Objective:
To show why and how social workers could play an essential role to facilitate a more holistic approach of interprofessional practice to rehabilitation service.

Background:
This paper reports on the conceptual findings and practice insights which are part of a qualitative case study for exploring the nature and common issues of interprofessional collaborative practice in the home care service settings in Hong Kong, with a focus on social worker's roles.

Methods:
Conceptual research was conducted by (i) observing and analysing already present information and literature on the topic of interprofessional collaborative practice, and interprofessional education, (ii) developing local strategies for good practice through the interpretation of professionals' experiences on existing teamwork or collaborative practice in parallel with the caregivers' view. Selected key informants included the social worker, nurse, physiotherapist, occupational therapist of a rehabilitation homecare service team and the caregivers of service users.

Results:
Our findings have been integrated into a list of interprofessional education learning outcomes and good practice strategies for social workers' training. The 3 training categories for further discussion and examination are as follows: Team goal setting & expected flexibility, Inter-disciplinary communication, and trans-professional collaboration including the integration of service users and caregivers.

Conclusion:
This paper is an overdue engagement of conceptual research in combining previous studies and associated work for developing education of interprofessional collaborative practice for social work students and professionals. It points out the pedagogical vision and direction of building good inter-professional practice in Hong Kong's rehabilitation service.

Keywords:
Trans-professional Collaboration, Rehabilitation Homecare

Abstract No. 21087

The Impact of Psychiatric Day Service using Clubhouse Model (An International Award Winning Model)

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Background:
Established in 1998, Phoenix Clubhouse (PC) is a community adult psychiatric rehabilitation services under the auspice of the Department of Psychiatry, Queen Mary Hospital. It was formally an Occupational Therapy Psychiatric Day Unit, which was converted to the "Clubhouse Model for Psychiatric Rehabilitation" to enhance the treatment effect especially on psychosocial rehabilitation.

Objective:
To review impact of the Clubhouse model in terms of resources, service coverage, functions and employment outcomes.

Methods:
Retrospective review on
1. the resource implication of the service,
2. employment outcome,
3. other add on service functions.

Results and Conclusion:
PC is included in World Health Organization's New Guidance and Technical Packages on Community Mental Health Services: Promoting Person-Centred and Rights-based Approaches in 2021. PC has attained high level of achievement in 7 accreditations from the certifying organization. Compared to traditional Psychiatric Day Hospital service, there was no implication in requiring additional resources.

PC provided tremendous employment programs which significantly helped members to find and maintain jobs in the community. As at May 2021, PC has a total of 597 members, in which 277 members have participated in our employment programs. Among them, 109 members have secured jobs in the open market. The average wages of our employment programs were at market rate.

Moreover, PC has value-added functions like education support, non-work-hour social programs and advocacy work to reduce stigma on people with mental illnesses. It also attracts passionate peers, carers, volunteers and employers to expand its resources and extend its influence in the community.

Keywords:
Clubhouse Model, Mental Illness

Abstract No. 21006

Association of Visual Impairment with Cognition in Older Adults

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Background:
With the rapid growth of the aged population in Hong Kong, the cognitive performance of elderlies became one of the main concerns in caring. Visual impairment is associated with an increased risk of developing Alzheimer's disease (Tran, et al., 2020; Uhlmann, et al., 1991).

Objective of study:
The objective of this study was to develop the cognitive profile for elderly with visual impairment who lived in residential homes.

Methodology:
The study was conducted in a residential home under the Hong Kong Society for the blind. HKMoCA – VI was adopted (HK-MoCA) and (MoCA – B). It was validated by Hong Kong Society for the Blind and the University of Hong Kong University at 2016.

Result:
There were 65 elderlies with visual impairment who completed the survey. Their age ranged from 62 to 102 with a mean (standard deviation; S.D.) at 81.3 (10.2). The studies build up a local normative data set with percentile and age range given. The cut off score of the HK-MoCA were at the 2nd, 7th and 16th percentile, they were given the light about community aged blind to show the corresponding score in the HKMoCA– VI.

Conclusion:
This study provided information on the cognitive performance of the elderly with visual impairment who lived in the residential home.

Keywords:
Visual impairment, Cognition, MoCA

Abstract No. 21010

Effectiveness of Doll Therapy by DementiAbility Methods on Agitation for Dementia in Residential Home in Hong Kong

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Objective:
This study investigated the effectiveness of the Doll Therapy by DementiAbility Methods on Agitation for moderate to severe dementia in residential home in Hong Kong.

Background:
Agitation was common in the elderly with moderate to severe dementia. Previous studies suggested that doll therapy and Montessori based activity emphasizing on preparing the environment could alleviate agitation manifested by dementia. While rare local study has examined the effectiveness of doll therapy by Montessori way for dementia.

Methods:
This study employed a single-case ABA reverse design. Eleventh participants with dementia and Global Deterioration Scale 5 or above were recruited in a residential home by convenient sampling to receive doll therapy groups by DementiAbility Methods by Occupational Therapists in a nursery room for 3 weeks, 3 sessions per weeks. Agitated behavior was measured by Chinese version of Cohen-Mansfield Agitation Inventory (CCMAI). Assessments were conducted at baseline, just after completion of groups and 3 weeks after groups.

Results:
All data were analyzed by Wilcoxon signed-rank tests. CCMAI total scores decreased significantly after just finishing groups ($z = -2.395$, $p = 0.017$). While scores increased significantly after withdrawal of groups for 3 weeks ($z = -2.047$, $p < 0.05$), indicating agitated behavior deteriorated without treatment. No lasting effect was observed when comparing the difference in CCMAI total scores between baseline and 3 weeks after groups ($z = -1.512$, $p = 0.130$).

Conclusion:
The findings indicate that doll therapy by DementiAbility Methods may have positive effects on agitation manifested by demented clients in local residential home.

Keywords:
Doll Therapy, DementiAbility, Dementia

Abstract No. 21012

Map out your Personalized Exercise Plan at Fingertip

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Objective:
To evaluate the effectiveness of innovated exercise map to knee osteoarthritis patients in community-based program.

Background:
Elderly usually struggle to access space and exercise facilities. Physiotherapy Department of David Trench Rehabilitation Centre, Queen Mary Hospital designed an exercise map displaying public resources to facilitate community rehabilitation.

Methods:
Exercise facilities in Hong Kong Central-Western District and Southern District were identified. Details of address, transportation and equipment could be achieved through scanning the designated QR code in exercise map. The map was introduced to patients who have completed a 6-session integrated self-management and coping strategies with exercise regimen. Confidence of training was evaluated by Chinese Self-efficacy for Exercise (SEE-C). Physical capability was assessed by Numerous Pain Rating Scale (NPRS), Knee Injury and Osteoarthritis Outcome Score Physical Function Short forms (KOOS-PS) and 30-second sit-to-stand test. Telephone follow-up was arranged 1-month and 1-year after completion of program.

Results:
Total of 8 sports centres, 5 swimming pools and 35 parks with aerobic, resistance and flexibility training were located. 115 patients joined the program, in which 106 participants completed from July 2019 to March 2020. SEE-C, NPRS, KOOS-PS and 30-second sit-to-stand test all showed significant improvement ($p<0.05$). Fifty-eight and 66 participants were contacted successfully 1-month and 1-year post-program respectively. Ninety percent reported good exercise compliance outside clinical setting and further melioration in a month. Ninety-seven percent maintained exercise habit and satisfactory knee condition over one year.

Conclusion:
A user friendly exercise map demonstrated enhancement in exercise compliance and functional level to knee osteoarthritis patients in a 6-week community-based program.

Keywords:
Knee, Exercise, Map, Community

Abstract No. 21016

Factors Associated with Near-Falls and Falls in Community-Dwelling Older Adults: A Preliminary Report on an Ongoing Cross-Sectional Study

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Objectives:
To investigate the factors contributing to near-falls in the past month and falls in the past 12 months in community-dwelling older adults.

Background:
Near-falls have been viewed as a "precursor" of falls in older adults. However, little is known about the risk factors for near-falls in community-dwelling older adults. Determining the risk factors for near-falls would help to identify older individuals who are at a higher risk of falls.

Methods:
Community-dwelling older adults who are (1) 65 years or older; (2) able to walk independently indoor and outdoor were recruited. Demographics, history of near-falls and falls, fear of falling, balance confidence, activity avoidance, physical performance, reactive balance, cognitive function, depressive and anxiety symptoms, and functional activities of the participants were assessed.

Results:
Until May 2021, 59 participants were recruited. Nineteen participants (32%) had at least 1 near-fall in the past month, and 25 participants (44%) had at least 1 fall in the past 12 months. Fear of falling (OR = 0.91, p = 0.047) and lower limb strength (OR = 1.07, p = 0.044) were associated with near-falls, while reactive balance (OR = 1.75, p = 0.032) and anxiety symptoms (OR = 1.12, p = 0.035) were associated with falls.

Conclusion:
The preliminary results show that fear of falling and lower limb strength may be associated with near-falls, and the factors contributing to near-falls and falls in community-dwelling older adults may be different. Further study using a larger sample is therefore indicated to examine the risk factors for near-falls.

Keywords:
Near-falls, Falls, Elderly, Cross-sectional

Abstract No. 21017

Translation of Chinese version of Brief 2-way Social Support Scale into Chinese for use in people with stroke

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Background:
Social support is important in stroke rehabilitation. Higher level of social support correlates with better functional capacity, social participation and activities of daily living, and lower level of depression of people with stroke. The Brief 2-way Social Support Scale (Brief 2-way SSS) consists of 12-items assessing the self-perceived giving and receiving emotional and instrumental social support. Although the Brief 2-way SSS was found psychometrically sound among general population, it has not been translated and culturally adapted to Chinese version. This study aimed at translating and adapting English version of Brief 2-way SSS to Chinese, and preliminarily investigating the psychometric properties of the Chinese version of Brief 2-way SSS in people with stroke.

Methods:
Standardized forward and backward procedures were used to translate and culturally adapted the English version of the Brief 2-way SSS to Chinese. An expert panel with 4 experienced healthcare workers examined the content validity of Chinese version of Brief 2-way SSS (Brief 2-way SSS-C). Thirty-four community-dwelling people with stroke (n=34) were recruited through telephone-interview to investigate the internal consistency and establish test-retest reliability after a 1-week interval.

Results:
The Brief 2-way SSS-C was found to have excellent internal consistency (Cronbach's α=0.95) and good overall test-retest reliability (intra-class correlation coefficients = 0.86), respectively.

Conclusion:
The Brief 2-way SSS-C is a comprehensible and reliable scale measuring self-perceived social support in Chinese people with stroke. Future study can further investigate the validity to support the use of it for social support among people with stroke.

Keywords:
Stroke, Stroke rehabilitation, Social support

Abstract No. 21019

A "Fear-Less" Occupational Therapy Programme for patients with White-Coat Hypertension or Hypertension with White-Coat Effect in NTWC Primary Care Setting

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Objective:
White-coat hypertension (WCHT) or hypertension (HT) with white-coat effect (WCE) is commonly encountered in primary care setting. Occupational Therapist with expertise in lifestyle redesign intervention pioneered the "Fear-Less" Programme, aiming to empower patients to cope with WCHT or WCE.

Methods:
352 patients with confirmed or suspected WCHT or WCE were recruited from GOPCs in NTWC. The programme included two therapeutic group sessions on stress management in clinic, mind-body relaxation practice and lifestyle modification, supplemented with home programme, individual consultation at two-month and follow up at six-month.

Results:
288 cases completed two group sessions. Mean clinic systolic blood pressure (SBP) and diastolic blood pressure (DBP) was significantly lowered by 5.4%*** and 2.4%*** respectively while clinic heart rate (HR) decreased 6.3%**.

For 196 cases at two-month follow up, mean clinic SBP and DBP significantly decreased 6.4%*** and 3.9%***. Generalized Anxiety Disorder(GAD)-7 Scale total score decreased from 5.1 to 3.9***. Subjective anxiety level in clinic decreased 18.6%***, both self-efficacy to HT self-management and sleep quality improved 11.7%*** and 8.8%***.

105 cases showed sustained effect at six-month review. While clinic SBP and DBP kept significant decrease of 5.7%*** and 5.3%**, GAD-7 Scale total score was 3.0*** with subjective anxiety level in clinic dropped 16.7%***, self-efficacy to HT and sleep quality kept 11.5%** and 10.3%* improvement. ***$p<0.001$, **$p<0.01$, *$p<0.05$

Conclusion:
The results provide evidence for Occupational Therapy interventions to improve clinic BP, subjective anxiety level in clinic and HT self-management among patients with WCHT or WCE.

Keywords:
Whitecoat, Hypertension, Chronic Disease

Abstract No. 21020

Comparison between the Hong Kong Version of the Montreal Cognitive Assessment (HK-MoCA) and the Hong Kong Brief Cognitive Test (HKBC) in Detecting Post-stroke Cognitive Impairment in Stroke Patients

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Background:
The Hong Kong version of the Montreal Cognitive Assessment (HK-MoCA) is one of the most commonly used cognitive screening tests for stroke patients in Hong Kong. However, the performance in HK-MoCA has a strong correlation with the educational level of patients and is suggested to cause anxiety during the test. Chiu and her colleagues, who developed the Hong Kong Brief Cognitive Test (HKBC), suggested that HKBC has a shorter administration time and has less influence from educational level.

Objective:
In this study, the feasibility of utilizing HKBC in Hong Kong hospital setting for post-stroke cognitive impairment screening was investigated.

Method:
Seventy-seven participants, aged above 65 without communication difficulties or documented cognitive impairments, were recruited. Both HKBC and HK-MoCA were administered to each participant within the same day by occupational therapists or trained healthcare workers. The order of the tests performed were assigned in random order.

Results:
The mean scores of HKBC showed strong positive correlation with the mean score of HK-MoCA ($p < 0.05$). The administration time of HKBC was shorter than that of HK-MoCA ($p < 0.05$). HKBC and HK-MoCA showed similar ability in identifying post-stroke cognitive impairment, yet, HKBC was less affected by educational level.

Conclusion:
With the consideration that most elderly people in Hong Kong had received relatively little education, utilization of HKBC in Hong Kong hospital settings for post-stroke cognitive impairment screening could be feasible and practical.

Keywords:
Stroke, Cognitive impairment, Assessment

Abstract No. 21099

A Mouse Model of Chemotherapy-Induced Heightened Anxiety – Association with Hippocampal Microglial Activation and Resilience by Enriched Housing

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Rationale and Objectives:
The cognitive impairments associated with chemotherapy in cancer patients–known as chemobrain, has been extensively studied. By contrast, the potential side effects of chemotherapy on emotion have received scant attention. Here, we hypothesize that chemotherapy may also contribute directly to anxiety. A mouse model was employed to isolate the contribution of chemotherapy. We evaluated its potential neural substrate and tested if environmental manipulation in the form of enriched housing would offer resilience. The study helped clarify the scope of mental side-effects of chemotherapy and identify potential environmental modification to facilitate cancer rehabilitation.

Methods:
40 juvenile male C57BL/6J mice were allocated to standard or enriched housing conditions. They were further subdivided into two treatment conditions at adult age: receiving consecutive courses of a common anti-cancer drug (5-fluorouracil) or vehicle control. Afterwards, anxiety was assessed using the elevated plus maze. To examine the contribution of neuroinflammation, brains were harvested to quantify microglial cells in the hippocampus following immunostaining against allograft inflammatory factor 1.

Results:
We showed that 5-FU alone could heighten anxiety, but mice housed in a psychosocially and physically stimulating enriched environment were protected against it. Parallel elevation and normalization in the expression of brain immune cells further suggested a link to dysregulated ventral hippocampal function.

Conclusions:
First, the negative effect of chemotherapy may extend to emotional processing. Second, enriched housing provided protection against the anxiogenic effect of 5-FU observed here. Third, these effects may be mediated by the elevation and normalization of immune activation in the hippocampus.

Keywords:
Chemotherapy, Anxiety, Environmental Enrichment

Abstract No. 21004

The Expectations of Interprofessional Perspective on Social Worker to Function as Case Manager in a Local Rehabilitation Homecare Team for People with Severe Disabilities

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Objective:
This study aimed to explore the significant expectations of interprofessional collaboration for social workers to perform as case manager within a local rehabilitation homecare team.

Background:
The researcher attempted to apply the paradigm of constructionism in exploring the interprofessional collaborative practice in the service to understand their collaboration among professions i.e. Social worker, Occupation Therapist, Physiotherapist and Nurse.

Methods:
The qualitative approach is adopted, and 14 participants are voluntary for participating into the study. Four types of stakeholders from the team which are social workers, paramedical staff, auxiliary and non-professional members, and caregivers are purposeful invited to have individual in-depth interview respectively.

Results:
Some of the essential components such as communication, respect, professional attitude and staff stability are highly concerned by the participants for enhancing and smoothing the practices. Furthermore, the roles and functions of social worker are act as dual roles i.e. case manager and service coordinator in coordinating the individual service plan with other professional members and caretakers so as to deliver tailor-made and quality of home-based rehabilitation services for the service users in the service.

Conclusion:
The study found that the western framework of interprofessional collaborative practice and concept of case management could not be fully transplanted into community-based rehabilitation homecare services in Hong Kong. Some areas in local experience such as organizational structure, professional training are adjustable in practice to fit the local context so as to strengthen the roles and functions of social workers as case manager from the interprofessional collective practice.

Keywords:
Case manager, Homecare

Abstract No. 21021

Application of Kinesio taping (KT) method on patient with post-stroke shoulder pain

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Introduction:
The impaired upper limb function and the hemiplegic shoulder pain (HSP) of the stroke patients greatly limit their activities of daily living (ADL) performance. Kinesio taping (KT) method is a potential alternative therapy to enhance treatment outcomes of conventional upper limb training. It provides systematic assessment and application which continuously alters functions of different target tissues, such as, fascia, muscles and joints.

Objectives:
A single-case study is presented to explore the effect of KT method in maximizing the outcome of hemiplegic upper limb functional training in stroke patients.

Methodology:
A 69 year-old man was admitted with hemorrhagic stroke, resulting in a right hemiplegia. Two weeks after onset, he had limited right shoulder passive range of motion (PROM), HSP and impaired right upper limb function. At the beginning of each OT training session, various taping methods of were applied according to the Kinesio assessment results. The patient then performed ADL and upper limb functional training for at least an hour. The tapes were removed afterwards.

Result:
Seven days of KT method adjunct to conventional OT training were completed. Improving trends in HSP and shoulder PROM were observed throughout the 7-day training period. There were also clinically significant improvements in ADL performance and hemiplegic upper limb function.

Conclusion:
KT method can be an adjunct modality that can be applied along with conventional OT training to maximize treatment outcomes. Further studies of a larger scale would be needed.

Keywords:
Kinesio tape, Stroke, Pain

Abstract No. 21024

Assessing Feasibility and Effectiveness of Conducting Mindfulness-Based Interventions in Stroke Rehabilitation in Hospital Setting in Hong Kong: A Pilot Study

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Objective:
A number of studies positively support the implementation of Mindfulness-based intervention (MBI) in symptoms of anxiety and depression in different neurological diseases. However, less is known about MBI's efficacy for physical and functional impact in stroke patients. Therefore, the current study is aimed to assess the feasibility and effectiveness of delivering MBIs in stroke rehabilitation in Hong Kong.

Methods:
Participants were recruited from patients in day hospital setting in Tung Wah Hospital. Six 1.5-2-hour MBI sessions were carried out, which lasted for six weeks, by a mindfulness certified instructor. Initial assessments on physical, psychological and functional parameters were done before MBIs commenced. Same set of assessment were repeated after completion of six sessions.

Results:
A total of 7 subjects, which were divided into two therapeutic groups, were recruited into the study with mean age of 68.29 and mean post-stroke period of 7.14 months. There was a significant improvement in Fugl-Meyer Assessment of upper extremity ($Z=-2.04$, $p=0.04$) and Berg balance Scale ($Z=-2.03$, $p=0.042$). Significant improvement was seen in WHO-5 well-being index ($Z=-2.21$, $p=0.03$). For functional parameter, there is also a significant improvement as seen in the performance in Modified Barthel Index ($Z=-2.02$, $p=0.043$).

Conclusion:
The current study positively supported the use of MBI in post-stroke patients especially for physical, psychological and functional parameters. However, follow-up studies are further suggested to investigate the carry-over effect of MBI. Controlled trials are also suggested to investigate the effect of the MBI compared to patients who receive conventional therapy program.

Keywords:
Mindfulness, Stroke, Baduanjin, Occupational Therapy

Abstract No. 21025

The Effectiveness of the Hemiplegic Upper Extremity Management Program for Patients with Stroke

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Objective:
To ensure proper management of hemiplegic upper extremities of patients with stroke

Background:
Protective measures including proper positioning of hemiplegic upper extremities and use of shoulder slings can reduce shoulder subluxation in flaccid upper extremities of stroke patients. However, the compliance in these protective measures were not satisfactory as Occupational Therapy (OT) or ward staff showed inadequate knowledge and fair competence in application of these protective measures.

Methods:
The improvement program consisted of 3 phases. Phase 1 – Evaluation on baseline knowledge and competence level of OT and ward staff; Phase 2 – Provision of educational talks and hands-on practice for staff and introduction of signage cards on wards for proper management of hemiplegic upper extremities; Phase 3 – Re-evaluation of staff knowledge and competence in hemiplegic upper extremity management.

Results:
OT and ward staff who received training showed significant improvement in knowledge ($p<0.05$) and competence level ($p<0.00$) on the application of protective measures of hemiplegic upper extremities. The signage cards also served as reminders for ward staff on flaccid upper extremity positioning and wearing of shoulder slings on wards. The compliance in the application of protective measures for hemiplegic upper extremities of stroke patients was enhanced.

Conclusion:
The hemiplegic upper extremity management program was effective in improving the compliance in protective measures of OT and ward staff. Staff training on a regular basis was encouraged so that the quality of rehabilitation services for stroke patients could be maintained.

Keywords:
Stroke, Hemiplegia, Upper extremity

Abstract No. 21052

Cerebral Hemodynamic Responses to Step and Turning Tasks in patients with Parkinson's Disease

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Background:
Turning is the freezing of gait-induced and a fall-prone movement for patients with Parkinson's Disease (PD). The neural mechanism underlying turning has not been clear in patients with PD.

Objective:
This study aimed to evaluate the neural mechanism underlying turning, and fast turning comparing to normal stepping.

Methods:
We used functional near-infrared spectroscopy (fNIRS) to explore cerebral hemodynamic responses to different movement tasks in 17 PD patients during “ON” medication. The cortical regions of interest consisted of the prefrontal cortex (PFC), Supplementary Motor Cortex (SMA), Primary Motor Cortex (M1), Somatosensory Cortex(S1) and Somatosensory Association Cortex (SAC). The change of hemodynamic responses among tasks was analyzed with paired contrast followed.

Results:
The ANOVA analysis showed significant activation of oxygenated hemoglobin among tasks ($p<0.05$). Fast turning showed more regions of interest with higher activation of oxygenated hemoglobin than normal stepping, which included SAC, S1. However, no difference in cortical activation was found between normal turning and stepping tasks.

Conclusion:
Fast turning but not normal turning, requires more cortical activation than normal stepping. The finding could be used to explain its freezing of gait-induced or fall-prone features.

Keywords:
Parkinson‘s Disease, Hemodynamic, Stepping, Turning

Abstract No. 21070

Resolving Hemiplegic Shoulder Subluxation and Post-stroke Hypertonicity Based on Neuro-Integrative Functional Rehabilitation and Habilitation (Neuro-IFRAH®) Approach – A Case Series Study

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Background and Objective:
Despite recent advancement in rehabilitation technology and modalities, hemiplegic shoulder subluxation (HSS) and post-stroke hypertonicity (PSH) are common impairments among stroke survivors and strongly associated with disabilities and poor quality of life. Neuro-IFRAH Organization® uses video documentation for years to demonstrate self-evident effective therapy (https://www.neuro-ifrah.org). The study objective is to investigate how these impairments are being resolved by the Neuro-IFRAH® approach.

Methods:
Case series study is adopted to review the longitudinal visible changes in a) HSS - the general appearance of the shoulder and the gap distance between the inferior aspect of the acromion and the superior aspect of the humeral head; and b) PSH - the general appearance, position and posture of the extremities and body at rest and in functional activities, both were recorded by serial digital videos and photographs with clients' consents. A sample of 8 stroke clients with these impairments were recruited by a private occupational therapist adopting Neuro-IFRAH® approach.

Results:
Over 250 hours of unconverted digital videos were reviewed. Qualitative findings revealed visible and significant reduction in HSS and PSH in all subjects with Neuro-IFRAH® treatment. In addition, improvements in active, passive, quality of movements and functions were demonstrated. Self-explained videos and photos were used as feedback to reinforce and motivate clients to incorporate the learnt movements or skills in daily activities and to make it functional.

Conclusion:
Neuro-IFRAH® approach is effective in resolving HSS and PSH and enhancing functions of stroke survivors demonstrated by case series study.

Keywords:
Neuro-IFRAH®, Post-stroke, Hypertonicity, Subluxation

Abstract No. 21082

Interventions for Improving Self-awareness of Cognitive Deficits in Community-Dwelling Acquired Brain Injury Survivors

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Background:
Self-awareness plays an important role in a brain injured patient's motivation for rehabilitation, participation in daily activities and functional outcomes. Cognitive deficit is a common aftermath of acquired brain injury (ABI) and is adversely affecting rehabilitation outcomes. Motor recovery after ABI, however, has received much attention while most ABI survivors are unaware of their concurrent cognitive deficits. The European Brain Injury Questionnaire (EBIQ) is a validated and reliable questionnaire to determine the subjective well-being of people with ABI (Sopena et al., 2007). The EBIQ involves self- and carer-ratings of their subjective experience of cognitive, emotional and social difficulties encountered by the ABI survivors.

Methods:
A Chinese version of EBIQ was used to identify the self-perceived difficulties in everyday function among community-dwelling ABI survivors and to investigate the discrepancies between the survivors' and their close relatives' response in regards to such difficulties. The ratings were done at the responders' own home at their own pace with standby assistance from the interviewers. The questionnaire was administered either online or using a tablet-enabled form at venues without internet access.

Results:
Participants were recruited from a Community Rehabilitation Day Centre and a Home Care Service Centre. The EBIQ results allowed ABI survivors, and their carers, to get aware of their underlying cognitive problems that are affecting their day-to-day functions. The findings enabled healthcare professionals to reach consensus with the ABI survivors and their carers, to set up and comply with an individualized cognitive rehabilitation programme that focuses on the identified function(s) at stake.

Keywords:
Self-awareness, Brain Injuries

Abstract No. 21088

Efficacy of a Community-Based Nordic Walking Program on Improving Balance and Gait Performance, and Aerobic Capacity in Parkinson Disease - A Pilot Study

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Objectives:
To examine whether the community-based Nordic Walking (NW) program would be effective in improving balance and gait performance, and aerobic capacity in people with Parkinson's disease (PD) at 6-week post-training.

Background:
NW is a moderate-intensity aerobic walking exercise using poles with specially designed wrist straps and rubber boots. It improves walking speed and stride length in people with PD 6-month post training. However, its effects on balance and aerobic capacity remains unknown.

Methods:
Eligible participants with mild to moderate disease PD were recruited for the 6-month NW intervention. The initial 90-minute weekly program in small groups (3 to 5) were delivered by a Certified NW instructor for 6 weeks. Mini Balance Evaluation Systems Test (Mini-BEST) scores, fast gait speed (FGS) and 6-minute walk distance (6MWD) were assessed as outcomes before and after intervention.

Results:
Eight PD participants (age 63.1±3.2) completed the first 6-week program with an attendance rate of 98%. There were no adverse effects or falls reported during the training period. Immediately post 6-week training, there was a significant increase in the Mini-BEST scores (by +1.9 points, $p<0.05$) and marginal increase of 6MWD (by +29.5m) ($p<0.1$) as compared with baseline. There was a 6.8 cm/s increase in FGS after treatment but the improvement did not reach a significant difference.

Conclusion:
The community-based Nordic Walking program improves dynamic balance in people with PD after 6-week training. Further investigation is necessary to investigate its effectiveness in balance, gait performance and aerobic capacity for PD in a longer term.

Keywords:
Parkinson's Disease, Nordic Walking

Abstract No. 21093

Modulating Cortical Haemodynamic Activity in Parkinson's Disease with Transcranial Direct Current Stimulation: A Pilot fNIRS Study

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Objective:
To evaluate the effect of transcranial direct current stimulation (tDCS) on functional haemodynamic activity of the primary motor cortex (M1) in Parkinson's disease (PD).

Background:
Reduced thalamocortical facilitation of the motor cortex in PD leads to characteristic motor deficits such as bradykinesia. Recent research has highlighted improved motor function following tDCS, but a lack of neurophysiological evidence limits the progress of tDCS as an adjunctive therapy. Here, we evaluate the efficacy of tDCS to modulate M1 hemodynamic activity using functional near-infrared spectroscopy (fNIRS).

Methods:
In this randomised crossover experiment, fourteen PD and twelve healthy control participants attended three laboratory sessions and performed a regulated (3 Hz) finger tapping task with their right index finger before and after receiving tDCS. On each visit, participants received either anodal, cathodal, or sham tDCS applied over M1. Haemodynamic activity of M1 was quantified using fNIRS.

Results:
Significant task related activity was observed in M1 and the inferior parietal lobe in PD and healthy ($p < 0.05$). PD additionally recruited the dorsal premotor cortex. Task related haemodynamic activity was unchanged following any tDCS intervention ($p > 0.05$). During tDCS, while at rest, anodal and cathodal tDCS significantly increased the oxygenated haemoglobin concentration of M1 compared to sham ($t_{62} = 4.09$ and $t_{62} = 4.25$, respectively).

Conclusion:
Task related haemodynamic activity of M1 is not modulated by tDCS in PD or healthy. During tDCS, both anodal and cathodal stimulation cause a significant increase of M1 oxygenation, the clinical significance of which remains to be clarified.

Keywords:
Parkinson's Disease, tDCS, M1

Abstract No. 21100

Unveiling the Black Box of Nonsynchronous Balance Confidence and Capability for Stratified Target Intervention Against Fall in Patients with Neurological Conditions

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Objective:
Balance deficit is prevalent in patients with neurological disorders and associated with diminished balance confidence and increased risk of falls. Literatures revealed discrepancies may occur between perceived and actual balance ability, which further increase the likelihood of falls. The objective of this study is to explore potential balance tests to identify such discrepancies in chronic neurological patients.

Methods:
Chronic neurological patients were recruited from the out-patient physiotherapy unit of Kowloon Hospital. Perceived balance ability of participants was evaluated by the Cantonese version of Activities-specific Balance Confidence (ABC-C) scale, while actual balance ability was assessed by Berg Balance Scale (BBS), Time Up and Go Test (TUG) and Sensory Organization Test (SOT). Participants with mean ABC-C score of ≤70.0% and ≥ 90.0% were classified into low and high balance confidence groups respectively.

Results:
From the 70 eligible participants, 26 and 20 participants were classified into low and high balance confidence groups respectively, with mean ABC-C score of 56.51±11.55% and 94.78±4.39%. Age and duration since onset of disease were comparable between the groups. No between-group differences were found for TUG($p=0.514$), somatosensory ratio of the SOT($p=0.839$) and visual ratio of the SOT($p=0.381$). Compared to the low balance confidence group, high balance confidence group had higher BBS score($p=0.010$) and vestibular ratio of the SOT($p=0.016$). Stepwise multiple linear regression was performed. The variables in order of significance were BBS and vestibular ratio of the SOT.

Conclusion:
Identification of the discrepancy with quantifiable balance measures may guide clinicians in formulating therapeutics in addressing balance and fall prevention rehabilitation in future.

Keywords:
Balance Confidence, Fall, Neurological

Abstract No. 21030

The Full Cycle Cardiac Rehabilitation Management for Elderly Patient with Coronary Heart Disease in China: A Pilot Randomized Controlled Trial

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Background:
It is urgent to establish the heart disease rehabilitation management system in China for the increasing population of elderly coronary heart disease (CHD) patients. The main objective of this study is to explore and establish the full cycle cardiac rehabilitation management model (FCCRMM) for elderly Chinese with CHD. Comparing the impact on cardio-pulmonary function and longer-term(=1 year) effect of elderly Chinese with CHD of three different FCCRMM and usual cardiac rehabilitation.

Method:
The study will randomize 96 patients(Age over 60) who have meet the inclusion criteria to four groups[the outpatient rehabilitation group (ORG), the home-based rehabilitation group (HRG) and the combined rehabilitation group (CRG) and control group (CG)]on a 1:1:1:1 basis. Assessment will be performed at baseline, 4 weeks and 12 weeks of intervention, 3 months and 1 year of follow-up. The primary outcome is the VO2peak. The compliance and acceptability of different FCCRMM will be assessed.

Results:
36 participants(36/96=37.5%) took part in this trial and 32 participants finished 3-month intervention program. ORG, HRG and CRG were significantly improved compared with CG at 4 weeks and 12 weeks after intervention ($P<0.05$). ORG compared with HRG were improved significantly($P<0.05$). ORG and CRG showed higher compliance and acceptability.

Conclusion:
FCCRMM for elderly with CHD was significantly effective for improving the cardio-pulmonary function compared usual cardiac rehabilitation. ORG and CRG had the higher acceptability and compliance. It suggest that the establishment of FCCRMM is indispensable for the management of elderly with CHD in China

Trial registration:
ChiCTR2000040509

Keywords:
Cardiac, Rehabilitation, PeakVO2, Management

Abstract No. 21092

Conservative Interventions for Musculoskeletal Stiffness: A Systematic Review and Meta-Analysis

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Background:
A growing number of studies have investigated the effects of different intervention strategies for reducing musculoskeletal (MSK) stiffness by using ultrasound elastography to evaluate in-vivo changes to tissue mechanical properties.

Purpose:
The objective of this review was to identify and evaluate the available evidence regarding the use of conservative, non-invasive intervention strategies for eliciting changes in MSK stiffness assessed with ultrasound elastography.

Methods:
A systematic search of Web of Science, Cochrane Library, MEDLINE, CINAHL and EMBASE databases was performed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. Bias was assessed using the Cochrane Risk of Bias tool for true experimental studies or the Risk Of Bias In Non-randomised Studies of Interventions tool for quasi-experimental studies. Meta-analyses were conducted using Comprehensive Meta-Analysis software. Prior to subgroup analyses, meta-regressions were performed to determine the influence of independent factors on effect size estimates.

Results:
In the final review, a total of 57 studies were included with 2 studies excluded from the quantitative synthesis (n=55). Bias was low or unclear for most studies with true experimental designs (n=18), and bias judgements for quasi-experimental studies (n=39) were largely moderate. Sensitivity analyses found similar reductions in MSK stiffness for static stretching (Hedges's g=0.513, 95% CI=0.185-0.842) compared to combined stretching interventions (g=0.406, 95% CI=-0.243-1.725). Analyses for other intervention types and patient groups were underpowered.

Conclusion:
Moderate evidence supports the use of static stretching interventions of high cumulative dose (≥15 minutes) targeting lower limb muscles for reductions in stiffness among healthy populations.

Keywords:
Musculoskeletal Stiffness, Therapeutic Interventions

Abstract No. 21108

Associations between Paraspinal Muscle Characteristics and Spinal Curvature in Conservatively Treated Patients with Adolescent Idiopathic Scoliosis: A Systematic Review

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Background:
Adolescent idiopathic scoliosis (AIS) is a common tridimensional spinal deformity among adolescents that may compromise their physical and psychological well-being. While prior studies identified some unique paraspinal muscles characteristics in these patients, no systematic review has summarized the relationships between various characteristics of paraspinal muscles and spinal curvature.

Objectives:
To summarize the evidence regarding the relationships between various paraspinal muscle characteristics and spinal curvature.

Methods:
Five scientific databases (i.e., CINAHL, Academic Search Premier, MEDLINE, Scopus, and PubMed) were searched from the inception to 30 October,2020 to identify relevant articles. Two independent reviewers screened abstracts and full-text articles, assessed the methodological quality of the included papers using study design related risk of bias tools, and extracted relevant data.

Results:
Of 1,473 identified publications, 96 full-text were screened. Fifteen studies were included. One prospective, four cross-sectional, and ten case-control studies were rated as low to moderate quality. Limited evidence suggested that greater asymmetry of cross-sectional area or fatty infiltration in paraspinal muscles were related to greater Cobb angles in patients with AIS. Very limited evidence suggested that the presence of muscle-related genes [Ladybird Homeobox1 (LBX1), Paired box gene 3 (PAX3), and Piezo Type Mechanosensitive Ion Channel Component 2 (PIEZO2)] increased the Cobb angles. Likewise, very limited evidence substantiated that greater numerical proportion of type I fibers on convexity was related to greater curvature.

Conclusion:
While our results indicated significant relationships between paraspinal muscle characteristics and spinal curvature in AIS cases, future studies should clarify their causal relationships.

Keywords:
Scoliosis, Paraspinal Muscle, Adolescent

Abstract No. 21129

Morphometric and Mechanical Characteristics of Lumbar Multifidus Muscle in Individuals with and without Chronic Low Back Pain

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Objective:
Muscle atrophy and/or increased fatty infiltration of lumbar multifidus muscle (LM) among individuals with chronic low back pain (CLBP) are presumed to indicate suboptimal function/biomechanical properties of LM. Since this hypothesis has not been substantiated, this study aimed to determine if LM parameters are altered in people with CLBP compared with healthy individuals.

Methods:
People with (n=78) and without CLBP (n=73) underwent lumbar magnetic resonance imaging (MRI) and ultrasonography to examine LM morphometry. Total cross-sectional areas (CSAs) and lean muscle CSAs of LM from L4-S1 levels were manually measured to estimate LM volume using a customized MATLAB program. Brightness-mode ultrasonography was used to measure thickness of LM at L4-S1 levels, at rest and during contraction. The percentage thickness change of LM at L4-S1 levels during contraction was calculated. Shear wave elastography was used to measure stiffness of LM at L4-S1 at rest and during contraction. Mann-Whitney U tests were performed to compare morphometric and biomechanical properties of LM between two groups.

Results:
Total/lean muscle CSAs of LM at L4-5 ($p=0.01$), L5-S1 ($p<0.01$), LM volume across L4-S1 levels ($p=0.02$) and resting thickness at L4-5 ($p=0.05$) were significantly greater in CLBP participants than healthy individuals. The percentage thickness change at L4-5 ($p<0.01$) and L5-S1 ($p<0.01$) was significantly smaller in CLBP participants than healthy individuals. No significant between-group differences were noted in contracted thickness and resting/contracted stiffness of LM at L4-S1.

Conclusion:
CLBP participants demonstrated significantly greater CSAs, volume, resting thickness and smaller percentage thickness change of LM than healthy individuals.

Keywords:
Lumbar Multifidus, Back Pain

Abstract No. 21131

Prevalence and Impact Factors of Self-Reported Knee Discomfort among Office Workers in China: A Cross-Sectional Study

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Objectives:
This study aimed to investigate the prevalence of self-reported knee discomfort among office workers in a metropolitan city in China and to identify associated impact factors.

Methods:
This was a cross-sectional designed study, and conducted at a medical center in a metropolitan city, China. There were 1930 participants, aged from 22-62 years included. A self-made questionnaire was used to collect their demographic information, daily dietary and sleeping behavior, work-related physical and psychosocial factors, knee symptoms and the treatment history.

Results:
Among the 1930 office workers, 1163 participants reported without knee symptoms, and 767 participants reported knee symptoms. In this population, the prevalence of knee discomfort was 39.7%. Comparing variables between participants with knee symptoms and without symptoms, weight, body mass index (BMI), waist circumference (WC), fast blood glucose, sleeping hours, office work years were significant difference ($P < 0.05$). Among the 767 knee-discomfort participants, 257 reported that didn't receive any treatment, 156 received massage therapy, 128 received external medication therapy, 94 received thermotherapy, 85 received rehabilitation therapy, and 51 received oral medication therapy.

Conclusions:
The prevalence of self-reported knee discomfort among office workers is high. Higher weight, BMI, WC, fast blood glucose, office working years and less sleeping duration may affect the knee self-reported symptoms. The symptomatic participants prefer to receive massage therapy.

Keywords:
Prevalence, Knee Discomfort

Abstract No. 21137

The Effects of Thoracic Manipulation on Spinal Kinematics during Functional Tasks

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Background:
There is no previous study examining the immediate effect of manipulation on thoracic stiffness and functional kinematics in chronic neck pain (CNP) or test-retest reliability of a rolling-indentation spinal stiffness measurement (RISSM) device for thoracic spine.

Objective:
To investigate the effect of thoracic manipulation on spinal kinematics during functional tasks and segmental stiffness in CNP population and establish the test-retest reliability of thoracic spine stiffness measurement.

Methods:
Thirty-four CNP and seventeen asymptomatic participants were recruited. Test-retest reliability of RISSM on thoracic spine was investigated in both CNP and asymptomatic participants. Moreover, pain intensity, segmental thoracic spine stiffness and kinematics were assessed by Numeric Pain Rating Scale, VerteTrack and DIERS Formetric 4D tomography respectively, before and after thoracic manipulation in experimental (n=17) and control groups (n=17) of CNP participants.

Results:
No significant difference in baseline characteristics was observed. Excellent reliability was revealed for segmental thoracic spine stiffness measurement in CNP ($ICC_{3,1}$=0.945-0.983) and asymptomatic ($ICC_{3,1}$=0.795-0.961) groups. Significant between-groups difference (p<0.001) was observed for the neck pain intensity, but not the spinal stiffness (p>0.05) or functional kinematics of the thoracic spine (p>0.05) in CNP participants after intervention. The experimental group (p<0.001) but not the control group (p>0.05) showed significant reduction in neck pain intensity after thoracic manipulation (effect size: 1.22-1.81).

Conclusion:
Excellent test-retest reliability for thoracic spine using RISSM device (VerteTrack) was found in CNP and asymptomatic participants. Thoracic manipulation could only reduce the neck pain intensity without any associated modulation of thoracic stiffness and functional kinematics in CNP participants.

Keywords:
Chronic Neck Pain, Thoracic Manipulation, Spinal Stiffness, Spinal Kinematics

Abstract No. 21028

Occupational Therapy Practice for Cognition in the Elderly with Neurocognitive Disorders in Thailand

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Objective:
To explore current practice of occupational therapy for cognitive assessment and interventions in the elderly with Neurocognitive disorders (NCDs) in Thailand.

Background:
Occupational therapist has a significant role to maintain health and well-being of the elderly via encouraging and supporting them to participate in their purposeful activities. Understanding the current practice can enhance OT practices for the elderly.

Methods:
A cross-sectional survey was used in this study. The questionnaires were distributed to 191 occupational therapists throughout Thailand. Data was analysed by descriptive analysis.

Results:
One hundred and fifty-two participants (79.87%) responded to the survey. Most of them worked full-time (94.08%) at public hospitals (74.34%). Both standardized and non-standardized tests were commonly used to assess cognitive abilities. The typical cognitive standardized tests were screening tests and the Thai Cognitive-Perceptual Test. The most commonly reported cognitive problem was basic cognition (77.63% to 98.08%). Therefore, the main cognitive intervention of the occupational therapists was focused on basic cognition (80.92% to 94.74%). The typical interventions were caregiver education (83.89%), physical activity (73.15%), and perceptual retaining (68.46%).

Conclusion:
From these findings, one of the suggestions is that the comprehensive or outcome assessment for evaluating cognitive abilities in the elderly with NCDs in Thailand is needed.

Keywords:
Elderly, Neurocognitive Disorders, Occupational Therapy Practice, Cognition

Abstract No. 21032

Reliability and Validity of Four Step Tests in Older Adults with Mild to Moderate Dementia: A Preliminary Report

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Objectives:
To examine the test-retest and inter-rater reliability, and construct validity of 4 step tests in older adults with mild to moderate dementia (OwD).

Background:
Several step tests have been developed to evaluate the stepping performance of healthy older adults. The psychometric properties of these step tests, however, have not been investigated in OwD.

Methods:
Individuals who are (1) 65 years or older; (2) able to walk independently; and (3) diagnosed with dementia were recruited. Participants completed the Four Square Step Test (FSST), Choice Stepping Reaction Time Test (CSRTT), Maximum Step Length Test (MSLT) and Alternate Step Test (AST) on 3 testing occasions conducted by 2 assessors independently within 2 weeks. The 2-minute walk test (2MWT), 10-meter walk test (10mWT), 30-second sit-to-stand test (30sSTS) and Berg Balance Scale (BBS) were used to evaluate physical performance.

Results:
Fifteen participants have been recruited until June 2021. Good to excellent test-retest [intraclass correlation coefficient (ICC) = 0.71 – 0.94] and inter-rater reliability (ICC = 0.76 – 0.95) were found in the FSST, CSRTT and MSLT. The AST showed moderate test-retest (ICC = 0.64) and low inter-rater reliability (ICC = 0.41). The MSLT was strongly correlated with the 2MWT, 30sSTS and BBS (Pearson's $r > 0.60$), and the AST was moderately correlated with the 2MWT ($0.30 \leq r \leq 0.60$).

Conclusion:
The preliminary results show that the FSST, CSRTT and MSLT have good to excellent reliability in OwD. The MSLT also shows excellent construct validity with other physical performance measures in this population.

Keywords:
Psychometrics, Dementia, Assessment, Stepping

Abstract No. 21066

Effects of the Change in Activity Participation during Coronavirus Disease Pandemic on Children's Mental Health

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Objectives:
Prolonged change in activity participation owing to the coronavirus disease containment measures may exacerbate the risk of mental health problems in children. This study aimed to examine the relationship between the change in children's activity participation and their mental health.

Methods:
A cohort of 114 children (60 boys; mean age 11.4 years) who participated in one previous study was followed before and during the coronavirus disease pandemic. The parents completed questionnaires assessing their child's activity participation and mental health.

Results:
The parents reported a significant increase in their children's externalizing problems and a decrease in prosocial behaviors during the coronavirus disease pandemic. Increased externalizing problems were further found to be significantly associated with less frequency and involvement in school activities and less involvement in community activities. Also, significant associations were found between decreased prosocial behaviors and reduced participation involvement in all types of activities.

Conclusions:
The findings confirmed that pandemic-related restrictions on children's participation were unfavorably related to their mental health. Strategies and services that promote children's involvement in daily activities are needed to decrease the risk of mental health problems during the coronavirus disease pandemic.

Keywords:
Participation, Mental Health, COVID-19

Abstract No. 21109

Expression of consummatory, rather than anticipatory pleasure in schizophrenia is related with working memory performance

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Background and objectives:
Application of the Anticipatory and Consummatory Pleasure (ACP) task (Heerey & Gold 2007) to schizophrenia patients has led to the suggestion that avolition – a core negative schizophrenia symptom – stems from the failure to translate experience into action to seek pleasure and avoid aversive experiences in the future. The potential contribution to cognitive deficits, however, has not been well characterized. Here, we derived four novel indices from the ACP task and correlated them with working memory, cognitive flexibility, and sustained attention in schizophrenia patients.

Methods:
123 community-living adults with schizophrenia were recruited. The emotional response (pleasure and arousal) to visual stimuli and their ability to drive anticipatory and consummatory action in the ACP task were correlated with response accuracy in a visual working memory test, preservative errors in Wisconsin Card Sort Test (WCST), and commission errors in the Sustained Attention Response Test (SART).

Results:
Working memory performance was found to correlate with emotion-driven consummatory action and self-reported pleasure gradings in the ACP task. Stronger consummatory action and steeper pleasure gradient were associated with memory accuracy. By contrast, WCST or SART performance did not correlate significantly with any ACP measures.

Conclusion:
To our surprise, we failed to observe any significant association with emotion-driven anticipatory action in spite of its emphasis in literature comparing schizophrenia patients directly with healthy controls. Our findings highlight that sensitivity to emotional stimulation as well as its direct consummatory reaction also warrant further investigation, especially for their potential linkage with specific cognitive symptoms.

Keywords:
Anhedonia, Working Memory, Psychosis

Abstract No. 21134

Effects of Acupressure Treatment on Depression: A Systematic Review and Meta-Analysis

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Objectives:
This systematic review and meta-analysis examined the effectiveness and adverse effects of acupressure for individuals with depression.

Background:
Depression is recognized as a major public health problem with a substantial impact on individuals and society. Complementary therapies such as acupressure may be considered a safe and cost-effective treatment for people with depression. An increasing body of research has been undertaken to assess the effectiveness of acupressure in various populations with depression, but the evidence thus far is inconclusive.

Methods:
A systematic literature search was performed on PubMed, PsycINFO, Scopus, Embase, MEDLINE, and China National Knowledge (CNKI). Randomized clinical trials (RCTs) or single-group trials in which acupressure was compared with control methods or baseline in people with depression were included. Data were synthesized using a random-effects or a fixed-effects model to analyze the impacts of acupressure treatment on depression and anxiety in people with depression. The primary outcome measures were set for depression symptoms. Subgroups were created, and meta-regression analyses were performed to explore which factors are relevant to the greater or lesser effects of treating symptoms.

Results:
A total of 14 RCTs (1439 participants) were identified. Analysis of the between-group showed that acupressure was effective in reducing depression (SMD=-0.58, 95% CI: -0.85 to -0.32, $p < 0.0001$) and anxiety (SMD=-0.67, 95%CI: -0.99 to -0.36, $p < 0.0001$) in participants with mild-to-moderate primary and secondary depression. Subgroup analyses suggested that acupressure significantly reduced depressive symptoms compared with different controlled conditions and in participants with different ages, clinical conditions, and duration of intervention. Adverse events, including hypotension, dizziness, palpitation, and headache, were reported in one study.

Conclusion:
The evidence of acupressure for mild-to-moderate depressive symptoms was significant. Importantly, the findings should be interpreted with caution due to study limitations. Future research with a well-designed mixed method is required to consolidate the conclusion and provide an in-depth understanding of potential mechanisms underlying the effects.

Keywords:
Acupressure, Depression, Systematic Review, Meta-analysis

Index of Abstract Numbers

Abstract No.	Presenting Author	Title of Abstract
21002	Chan, G.	A Systematic Review of Physical Capacity and Treatment Complications and Mortality Outcomes in Elderly Cancer Patients: Physical Capacity Recommendations for Elderly Patients Undergoing Treatment
21003	Wei, X.	Portable 6-DOF Immersive Virtual Reality as a New Tool to Promote Upper Extremity Recovery in Stroke Patients
21004	Lo, K.Y.K.	The Expectations of Interprofessional Perspective on Social Worker to Function as Case Manager in a Local Rehabilitation Homecare Team for People with Severe Disabilities
21005	Chiu, A.T.S.	Clinical Use of Surface Electromyography (SEMG) as a Biofeedback Indicator for the Dysphagia Management of Elderies
21006	Chiu, A.T.S.	Association of Visual Impairment with Cognition in Older Adults
21009	Cheung, K.Y.	Active Community Engagement (ACE) Program For Persons with Mental Illness and their Carers
21010	Lee, H.W.	Effectiveness of Doll Therapy by DementiAbility Methods on Agitation for Dementia in Residential Home in Hong Kong
21011	Wong, A.Y.L.	The Use of Mobile Health Technology in the Management of Osteoarthritis: a scoping review with Scientometric Analysis
21012	Kwan, I.Y.F.	Map out your Personalized Exercise Plan at Fingertip
21013	Tang, L.M.	Pilot Study on the Feasibility and Utilisation Of Cognitive App (HA Go) as a Home Program Extended from Hospitalisation for Stroke Survivors with Cognitive Impairment
21014	Bello, U.M.	Influence of Task Complexity and Mirror Image Clarity on Motor Facilitation in Post-Stroke Mirror Therapy
21015	Cao, Y.	Cognitive Empathy and Affective Theory of Mind in Schizophrenia
21016	Chan, W.L.S.	Factors Associated with Near-Falls and Falls in Community-Dwelling Older Adults: A Preliminary Report on an Ongoing Cross-Sectional Study
21017	Liu, T.W.	Translation of Chinese version of Brief 2-way Social Support Scale into Chinese for use in people with stroke

Abstract No.	Presenting Author	Title of Abstract
21018	Ali, M.U.	Efficacy of Non-Surgical, Invasive, and Non-Invasive Conservative Therapies for the Treatment of Urge Incontinence due to Neurogenic Bladder: A Systematic Review and Meta-Analysis
21019	Pong, C.K.W.	A "Fear-Less" Occupational Therapy Programme for patients with White-Coat Hypertension or Hypertension with White-Coat Effect in NTWC Primary Care Setting
21020	Kwong, M.K.	Comparison between the Hong Kong Version of the Montreal Cognitive Assessment (HK-MoCA) and the Hong Kong Brief Cognitive Test (HKBC) in Detecting Post-stroke Cognitive Impairment in Stroke Patients
21021	Kwong, M.K.	Application of Kinesio taping (KT) method on patient with post-stroke shoulder pain
21022	Ng, T.Y.	7-Level Functional Recovery Program for Patients with Vertebral Compression Fracture (VCF)
21023	Chen, M.T.J.	A Comparison of Virtual Reality Training with Non-Computer Assisted Conventional Cognitive Training to Improve the Cognitive Function of Stroke Patients: A Systematic Review and Meta-Analysis
21024	Yeung, T.Y.K.	Assessing Feasibility and Effectiveness of Conducting Mindfulness-Based Interventions in Stroke Rehabilitation in Hospital Setting in Hong Kong: A Pilot Study
21025	Sit, K.L.M.	The Effectiveness of the Hemiplegic Upper Extremity Management Program for Patients with Stroke
21026	Chow, P. Y.	Augmented Feedback Treadmill (AFT) Improves Gait Speed, Step Length and Decreases Fear of Fall in Parkinson's Disease
21027	Li, S.M.	Innovated Technological Anti-gravity Treadmill Resembling Moonwalk for Young Stroke Survivors
21028	Chaiwong, P.	Occupational Therapy Practice for Cognition in the Elderly with Neurocognitive Disorders in Thailand
21029	Leung, W.K.C.	Computer-Assisted Approach to Personalized Design of Exercise Programs for Older Adults in Care Facilities: Perspectives from Care Professionals
21030	Wang, X.	The Full Cycle Cardiac Rehabilitation Management for Elderly Patient with Coronary Heart Disease in China: A Pilot Randomized Controlled Trial
21031	Chong, D.Y.K.	An ICF-based Stroke Rehabilitation Program enhances Community Reintegration for Clients with Subacute Stroke

Abstract No.	Presenting Author	Title of Abstract
21032	Chan, W.L.S.	Reliability and Validity of Four Step Tests in Older Adults with Mild to Moderate Dementia: A Preliminary Report
21033	Lee, S.H.J.	Preliminary Evaluation of Online Self-management Education under COVID-19 Pandemics: Experience from the Patient Empowerment Programme
21034	Lau, H.Y.	The Efficacy of Hypnotherapy for People with Depression: A Pilot Study
21035	Kan, R.L.D.	Effects of Non-Invasive Brain Stimulation on Multiple Sclerosis: A Systematic Review and Meta-Analysis
21036	Zhang, B.B.B.	Boosting Memory Performance with Brain Stimulation?
21037	Fan, S.H.U.	A Self-management Program using Telecare Service for Pulmonary Rehabilitation: A Case Series
21038	Cheng, K.C.	Use of Tele-carer Training to Facilitate Patient Discharge
21039	Li, S.K.	A New Era of Physiotherapy Tele-Rehabilitation in Geriatric Day Hospital
21040	So, Y.N.L.	Using Performance Analysis of Driving Ability (P-Drive) as a Standardized Assessment Tool to Assist Occupational Therapist Driver Assessors for Determining Fitness to Drive on a Simulator
21042	Wong, H.L.	Stroke Registry with Reference MRMI Gain to Monitor Stroke Outcomes: A Big Data Concept
21043	Wong, S.M.	Accelerate Ambulation Training by using Knee-Ankle-Foot Orthosis (KAFO) for Highly Dependent Stroke Patients with Lower Limb Paralysis
21044	Toh, F.M.	Effectiveness of Home-Based Upper Limb Rehabilitation in Stroke Survivors: A Systematic Review and Meta-Analysis
21045	Pang, J.C.Y.	The Technology of Different Designs of Pillows on Reducing Neck Pain, Disability and Spinal Alignment: A Systematic Review and Meta-Analysis
21046	Ho, L.Y.W.	Test-retest Reliability for Cardio-Ankle Vascular Index (CAVI) among People with Stroke
21047	Ho, L.Y.W.	Reliability of Quantitative Ultrasound for Bone Density Measurement in People with Stroke

Abstract No.	Presenting Author	Title of Abstract
21048	Li, C.L.K.	Exploring the Relationship between National eHealth Development and Hofstede's Cultural Dimensions using the WHO Global eHealth Surveys
21049	Kwok, A.	Localization of Chinese Activate Your Life Program in Hong Kong and its Preliminary Effectiveness among People with Chronic Conditions and Their Families
21050	Man, C.W.Z.	Effectiveness of Peer Support to Stroke Survivors and Carers with Web-Based Intervention and Tele-Coaching: A Volunteer-Based Service
21051	Soon. B.	Preliminary Study on Feasibility of the Omni-Directional Platform and Virtual Reality for Rehabilitation
21052	Feng, H.	Cerebral Hemodynamic Responses to Step and Turning Tasks in patients with Parkinson's Disease
21053	Jiang, Y.	Influence of Environment on Cortical Activation during Stepping in the Elderly
21054	Man, C.W.Z.	The Impact of using Online Method for Speech Rehabilitation and Motivation - A Case Study of Music Therapy via Zoom for Stroke Patients
21055	Lin, J.	Cerebral Hemodynamic Responses during Amplitude Requirement Task and Speed Requirement Task in Patients with Parkinson’s Disease
21056	Chaiwong, P.	Development of Occupational Therapy Cognitive Outcome Measure for the Elderly with Dementia
21057	Kongsawasdi, S.	Utilization of Embedded Smartphone Application for Testing Balance: the Study of Concurrent Validity
21058	Low, L.P.L.	Process of Developing Multi-Media Video-Based Caregiving Resources (MMVCR) for Family Carers with Dementia Relatives at Home
21059	Neville, N.P.	Older Drivers Navigating New Technology - Development of an Evidence-Informed Education Program Teaching Older Drivers to Use Advanced Vehicle Technologies
21060	Hu, Z.	Effect of Transcutaneous Electrical Acupoint Stimulation on VD Rats and its Mechanism was Studied based on PINK1/ Parkin Regulation
21061	Gomez, I.N.B.	Infusing Standard Precautions for Infection Control in Occupational Therapy Telehealth with Children: A Qualitative Descriptive Study
21062	Gomez, I.N.B.	Occupational Therapy Dysphagia Management in Selected Philippine Hospitals during the Time of the COVID-19 Pandemic: A Qualitative Descriptive Study

Abstract No.	Presenting Author	Title of Abstract
21064	Au, I.P.H.	Restoring Physical Performance in Residential Care Home Residents with Possible Sarcopenia by Outreach Physiotherapy Service: A Longitudinal Intervention Study
21065	Cheng, E.K.N.	Systematic Review on the Effectiveness of Mindfulness-based Zentangle Art: A New Stress Reduction Tool of Occupational Therapy
21066	Chien, C.W.	Effects of the Change in Activity Participation during Coronavirus Disease Pandemic on Children's Mental Health
21067	Fung. W.F.J.	Advancing Team Work to Trans-Professional Collaboration in Rehabilitation Homecare Service: The Local Strategies for Good Practice in Hong Kong
21068	Mak, M.	Concurrent Validity of the Latest Wearable Gait and Balance Measurement System
21069	Powell, C.L.Y.M.	How to Improve the Accessibility of Evidence-Based Psychological Service: A Pilot Study of Low-Intensity Cognitive Behavioral Therapy in a Community Setting in Hong Kong
21070	Wong, K.M.	Resolving Hemiplegic Shoulder Subluxation and Post-stroke Hypertonicity Based on Neuro-Integrative Functional Rehabilitation and Habilitation (Neuro-IFRAH®) Approach – A Case Series Study
21071	Pan, H.	Synergistic Effects of Mirror Therapy Combined with Electrical Stimulation for Motor Function Recovery of Upper Limb among People with Stroke: A Meta-Analysis
21072	Feng, B.B.	Profiles of Neuropathic Pain Component and Associated Risk Factors in Patients with and without Peripheral Nerve Injuries
21073	Chan, S.C.C.	Effects of Contact Heat Stimulation Intensity on Reliability of Subjective Pain Rating
21075	Lam, T.L.H.	The Effect of Stimulating Neural Substrates of Dual-networks on the Task-set Preparation: A TMS and EEG Study
21076	Wong-Yu, I.S.K.	Effects of Combined Balance and Brisk Walking on Alleviating Non-Motor Symptoms in Parkinson Disease
21078	Lu, H.	A Novel MRI-Based Geometric Mode for Personalized Transcranial Magnetic Stimulation in Age-Related Neurodegenerative Diseases
21079	Tsui, L.N.	Innovative Physiotherapy Tele-Care in TWEH Cardiac Rehabilitation under COVID19 Epidemic
21080	Thawisuk, C.	Current Knowledge on the Use of Robotic Rehabilitation for Older Adults' Upper Limb within the Scope of Physical and Occupational Therapy: A Scoping Review

Abstract No.	Presenting Author	Title of Abstract
21081	Tharu, N.S.	Trans-Spinal Electrical Stimulation for Improving Trunk and Sitting Function in Tetraplegics with Cervical Cord Injury
21082	Kong, J.K.Y.	Interventions for Improving Self-awareness of Cognitive Deficits in Community-Dwelling Acquired Brain Injury Survivors
21083	Zhang, J.J.Q.	Priming Intermittent Theta Burst Stimulation Boosts Motor Learning in Patients with Stroke
21084	Bai, Z.	Intermittent Theta Burst Stimulation to the Primary Motor Cortex Reduces Cortical Inhibition: A TMS-EEG Study
21085	Sit, M.H.	Combined intervention of Computerized Cognitive Training Preceded by Physical Exercise for Improving Frailty Status and Cognitive Function in Older Adults
21086	Ma, Z.	From Adversity to Resilience: A Case Study of Psychological Intervention for COVID-19 Survivors
21087	Leung, F.S.Y.	The Impact of Psychiatric Day Service using Clubhouse Model (An International Award Winning Model)
21088	Poon, K.C.K.	Efficacy of a Community-Based Nordic Walking Program on Improving Balance and Gait Performance, and Aerobic Capacity in Parkinson Disease - A Pilot Study
21089	Ng, B.F.L.	Web-based West-meets-East Lifestyle Modification Program for Risks Reduction Associated with Hypertension, Hyperglycaemia and Hyperlipidaemia
21090	Cheung, A.K.K.	Pulsed Electromagnetic Fields (PEMF) Augments the Sensitivity of Pseudomonas Aeruginosa to Antibiotics
21092	Bello, U.M.	Conservative Interventions for Musculoskeletal Stiffness: A Systematic Review and Meta-Analysis
21093	Simpson, M.W.	Modulating Cortical Haemodynamic Activity in Parkinson's Disease with Transcranial Direct Current Stimulation: A Pilot fNIRS Study.
21094	Wong, S.Y.	Creating a New Assistive Device for Stroke Patients with Diabetes Mellitus using 3D Printing
21095	Chan, S.P.J.	Effect of 365-day Physiotherapy Restorative Rehabilitation on Functional Mobility, Activity and Hospital Length of Stay for Patient with Stroke and Satisfaction of Stakeholders - A Promise of Better Outcome
21096	Lau, B.W.M.	Development of a Novel, Environmental Friendly Material as an Alternative to Traditional Polycaprolactone for Splintage

Abstract No.	Presenting Author	Title of Abstract
21097	Wu, H.L.	The Application of the Design Thinking Methodology in Developing Innovative and Human-Centric Solution for the Delivery of Physiotherapy to Paediatric Congenital Cases under the COVID-19 Pandemic
21098	Lai, S.Y.Y.	Local Clinical Experience of Over-ground Assist-as-needed Robotic Exoskeleton Training: A Case Study to Examine Functional Gains for Stroke and Spinal Cord Injury Survivors in Community Settings
21099	Ng, M.H.F.	A Mouse Model of Chemotherapy-Induced Heightened Anxiety – Association with Hippocampal Microglial Activation and Resilience by Enriched Housing
21100	Lam, C.P.Y.	Unveiling the Black Box of Nonsynchronous Balance Confidence and Capability for Stratified Target Intervention Against Fall in Patients with Neurological Conditions
21101	Kannan, P.	The Pelvisense, an Innovative Biofeedback Device for Pelvic Floor Muscle Training for Women with Urinary Incontinence
21102	Winser, S.J.	Dual-Task Training Versus Single-Task Training for Balance in Individuals with Cerebellar Ataxia: A Randomized Controlled Trial
21103	Cheung, P.P.L.	Is it a Substitute or a Family-Centered Practice? Experience Sharing on Telehealth in Occupational Therapy Service for Preschoolers with Special Educational Needs (SEN)
21104	Yung, T.W.K.	The Unique Relationship between Autonomic Nervous System Activities and Brain Activation among School Aged Children with Sluggish Cognitive Tempo (SCT) Symptoms
21105	Smith, G.D.	The Effect of Chair-Based Dance Movement Therapy in the Rehabilitation Older People with Depression Symptoms in Long-Term Residential Care: An Exploratory Phase Study
21106	Lai, C.Y.Y.	Psychometric Properties of the Sensory Processing and Self-Regulation Checklist- English Version
21107	Gomez, I.N.B.	Linguistic Equivalency, Cross-Cultural Validity, and Psychometric Properties of the Sensory Processing and Self-Regulation Checklist-Tagalog Version
21108	Chan, W.Y.	Associations between Paraspinal Muscle Characteristics and Spinal Curvature in Conservatively Treated Patients with Adolescent Idiopathic Scoliosis: A Systematic Review
21109	Lam, Y.T.J.	Expression of consummatory, rather than anticipatory pleasure in schizophrenia is related with working memory performance
21110	Kan, M.M.P.	The Effectiveness of a Cognitive Intervention on Reducing Playing Tension among Organists: A Randomized Controlled Trial

Abstract No.	Presenting Author	Title of Abstract
21111	Chan, M.M.S.	Development of Pelvic Supporter for Use During Longtime of Sitting at the Specific Chair
21112	Yu, K.	Pilot EEG and EOG-Based Prediction Model for Drowsiness
21113	Feng, B.B.	Validation of the Chinese Central Sensitization Inventory among Chronic Pain: Factor Analysis, Internal Consistency, Test-Retest Reliability, and Criterion Validity
21114	Smith, G.D.	Building the Case for Improved Health Literacy in Gastrointestinal Rehabilitation
21115	Poon, W.S.	“care-COPD”: A Nursing and Physiotherapy Initiative to Develop a Mobile App for COPD Self-Management
21116	Li, Y.	Effectiveness of Mindful Core Muscle Training Program on Attention and Balance of School-Aged Children: A Pilot Study
21117	Yu, K.	Effects of Repetitive Transcranial Magnetic Stimulation (rTMS) on the Brain using Activation Likelihood Estimation
21118	Smith, G.D.	Maximising Cardiac Rehabilitation through Effective Virtual Simulation Teaching of Smoke Cessation Interventions: The INSTrUCT European Project
21119	Ng, T.K.Y.	A Systematic Review and Meta-Analysis Regarding the Impacts of COVID-19 Pandemic on Physical Activity Involvements and Exercise Habits of People with and without Chronic Diseases
21120	Liang, G.S.	The Effect of Physical Exercises on Reaction Time in Older People: A Systematic Review and Meta-analysis
21121	Wang, H.	A Pilot Study on a Smart Gait and Balance Assessment System using Sensor Technology
21122	Kwok, H.M.	Effects of Cerebellar Transcranial Direct Current Stimulation on Facial and Hand Movements in Individuals at Risk of Psychosis: A Pilot Study
21123	Wong, A.Y.L.	Factors Associated with Dance-Related Lumbar Injury in Dancers – A Population-Based Study
21124	Wong, A.Y.L.	What are the Perspectives of Patients regarding Prehabilitation and Lumbar Spinal Stenosis Surgery?
21126	Cheung, T.Y.	Within- and between-day Intra- and Inter-Rater Reliability of using Myotonometer and Shear Wave Elastography to Assess Paraspinal Muscle Stiffness

Abstract No.	Presenting Author	Title of Abstract
21127	Kantha, P.	Differences in Balance Performance between Patients with Cervical Myelopathy and Radiculopathy
21128	Pinto, S.M.	Factors Affecting Pain and Disability in People with Chronic Low Back Pain
21129	Pinto, S.M.	Morphometric and Mechanical Characteristics of Lumbar Multifidus Muscle in Individuals with and without Chronic Low Back Pain
21130	Wong, A.Y.L.	Modifiable Risk Factors for Incident Mild Cognitive Impairment in Community-Dwelling Older Adults – A Systematic Review
21131	Wang, Y.	Prevalence and Impact Factors of Self-Reported Knee Discomfort among Office Workers in China: A Cross-Sectional Study
21132	Yeung, M.K.	Alerting, Orienting, and Executive Attention are Modulated by Negative Emotional Stimuli in Healthy Young Adults: An fNIRS Study
21133	Ma, H.	Effectiveness of TES and rTMS for the Treatment of Insomnia: Meta-analysis and Meta-regression of Randomized Sham-controlled Trials
21134	Lin, J.	Effects of Acupressure Treatment on Depression: A Systematic Review and Meta-analysis
21135	Chak, N.T.	Evaluation of Thoracic Spinal Stiffness and Kinematics during Lifting Tasks in Healthcare Professionals with and without Chronic Thoracic Spine Pain
21136	Wu, E.S.L.	Altered Respiratory Muscle Performance during Submaximal Exercise in Individuals with Chronic Neck Pain
21137	Ng, S.H.	The Effects of Thoracic Manipulation on Spinal Kinematics during Functional Tasks and Thoracic Stiffness in Patients with Chronic Neck Pain
21138	Man, D.W.K.	Virtual Reality-Based System for Training Attention, Memory and Executive Functions in Persons with Schizophrenia

Index of Authors

Cheung, P.P.L.	21103	Fung, O.H.Y.	21124
Cheung, T.Y.	21126	Fung, T.K.H.	21096
Cheung, Y.W.	21026, 21027	Fung, W.F.J.	21067
Chia, P.F.	21044	Gomez, I.N.B.	21061, 21062, 21106, 21107
Chiang, K.H.	21039	Ha, C.	21086
Chien, C.W.	21066	He, C.Y.Y.	21130
Chiu, A.Y.Y.	21124	He, J.	21133, 21134
Chiu, A.T.S.	21005, 21006	Hiller, C.	21123
Chiu, B.F.	21009	Ho, A.	21054
Choi, F.S.	21086	Ho, C.K.F.	21017
Choi, H.M.C.	21090	Ho, C.M.	21009
Choi, W.M.	21026, 21027	Ho, F.C.C.	21017
Chong, D.Y.K.	21031	Ho, I.K.	21105
Chow, H.W.J.	21040	Ho, J.K.J.	21126
Chow, K.T.K.	21095	Ho, L.Y.W.	21046, 21047
Chow, P.Y.	21026, 21027	Hsu, W.	21127
Chow, S.L.E.	21095	Hu, K.	21060
Choy, C.M.	21115	Hu, Z.	21060
Chu, T.	21069	Huang, X.	21116
Chu, V.W.	21132	Huang, X.P.	21120
Chui, E.M.C.	21087	Hui, K.	21049, 21086
Chung, C.K.M.	21017	Hui, Y.L.K.	21050
Chung, C.S.H.	21096	Hung, D.C.K.	21098
Chung, E.F.	21048	Inoue, K.	21080
Chung, K.	21054	Ip, W.Y.	21113
Chung, M.T.K.	21136	Ip, W.Y.	21072
Chung, P.H.	21042	Jiang, X.	21131
Chung, R.C.K.	21134	Jiang, Y.	21052, 21053, 21055
Coxon, K.	21059	Jin, L.	21052, 21053
Descarreaux, M.	21124	Kan, C.W.	21111
Dibben, N.	21110	Kan, M.M.P.	21110, 21130
Dong, A.	21030	Kan, R.L.D.	21035, 21036
Duaso, M.	21118	Kannan, P.	21018, 21101
Esguerra, J.T.	21106	Kantha, P.	21127
Fan, S.H.U.	21037	Karppinen, J.	21128, 21129
Fan, X.	21121	Kaunnil, A.	21080
Feliu, A.	21118	Kim, M.	21080
Feng, B.B.	21072, 21113, 21131	Kong, I.S.Y.	21137
Feng, H.	21052, 21053, 21055	Kong, J.K.Y.	21082
Fong, K.N.K.	21018, 21036, 21083, 21084	Kongsawasdi, S.	21057
Fu, A.C.L.	21045	Kranz, G.	21035, 21117
Fung, B.	21101	Kranz, G.S.	21018, 21035, 21036
Fung, E.Y.S.	21019	Kwan, C.	21124

Kwan, I.Y.F.	21012	Leung, F.S.Y.	21087
Kwan, J.	21054	Leung, H.Y.	21079
Kwok, A.	21049	Leung, K.C.	21079
Kwok, C.K.C.	21119	Leung, K.K.L.	21100
Kwok, H.M.	21122	Leung, P.M.H.	21090
Kwok, T.K.	21024	Leung, P.P.Y.	21137
Kwong, M.K.	21020, 21021	Leung, P.W.L.	21069
Lai, C.K.Y.	21046, 21047	Leung, T.C.	21097
Lai, C.Y.Y.	21065, 21104, 21106, 21107, 21116	Leung, W.K.C.	21029
Lai, D.	21127	Li, C.L.K.	21048
Lai, E.	21049	Li, L.C.	21120
Lai, F.H.Y.	21035	Li, L.L.	21011
Lai, S.Y.Y.	21098	Li, S.K.	21039
Lai, V.	21114	Li, S.M.	21026, 21027
Lai, W.N.	21085	Li, X.	21105
Lam, A.K.H.	21124	Li, Y.	21116
Lam, C.P.Y.	21100	Liang, G.S.	21120
Lam, C.S.H.	21019	Liang, J.	21019
Lam, C.W.	21017	Liang, R.B.	21082
Lam, F.M.H.	21120, 21130	Lin, J.	21052, 21053, 21055, 21133, 21134
Lam, H.H.S.	21096	Ling, S.	21030
Lam, H.M.	21135	Liu, K.	21059
Lam, H.M.K.	21095	Liu, T.W.	21017, 21071
Lam, L.C.W.	21078	Lo, D.H.T.	21133
Lam, P.L.	21012	Lo, K.Y.K.	21004, 21067
Lam, S.L.	21039	Lo, T.M.	21043
Lam, S.M.	21122	Lou, S.	21048
Lam, T.L.H.	21075	Low, L.P.L.	21058
Lam, Y.T.J.	21109	Low, P.L.	21115
Lau, A.C.H.	21137	Lu, H.	21078
Lau, B.W.M.	21034, 21096, 21099	Lu, W.W.	21072
Lau, F.O.	21042, 21043	Lui, L.Y.	21073
Lau, H.Y.	21034	Luk, K.D.K.	21124
Lau, J.	21051	Ma, H.	21133, 21134
Lau, K.K.L.	21123	Ma, L.H.Z.	21050
Lau, K.M.	21079	Ma, S.Y.	21073
Lau, S.Y.	21022	Ma, Z.	21086
Lee, H.W.	21010	Mak, M.	21068
Lee, K.F.S.	21095	Mak, M.K.Y.	21076, 21088, 21093
Lee, K.Y.J.	21095	Man, C.W.Z.	21050, 21054
Lee, N.	21051	Man, D.W.K.	21138
Lee, S.H.J.	21033	Martínez, C.	21118
Leung, D.Y.P.	21023	Miller, T.	21092

Mok, K.H.Y.	21130	Santos, M.E.	21106
Morato-Espino, P.G.G.	21107	Schoeb, V.	21123
Moreno-Arroyo, M.	21118	Shen, X.	21052, 21053, 21055
Munkhetvit, P.	21028, 21056	Shu, K.T.	21035
Nabsanittum, C.	21057	Shum, D.H.K.	21015, 21138
Neumann, D.L.	21015	Simpson, M.W.	21093
Neville, N.P.	21059	Sin, S.W.	21043
Ng, B.F.L.	21089	Singh, G.	21108
Ng, C.K.M.	21090	Sit, K.L.M.	21025
Ng, M.H.F.	21099	Sit, L.M.K.	21023
Ng, M.W.	21126	Sit, M.H.	21085
Ng, S.H.	21137	Siu, A.M.H.	21034, 21065
Ng, S.S.M.	21017, 21046, 21047, 21071	Siu, H.Y.	21073
Ng, S.W.S.	21040	Siu, M.Y.	21115
Ng, T.K.Y.	21119	Smith, G.D.	21105, 21114, 21118
Ng, T.Y.	21022	So, S.Y.	21079
Ng, Y.M.	21031, 21085	So, Y.N.L.	21040
Ngan, G.Y.K.	21119	Soon, B.	21051
Ngan, L.H.M.	21096	Suarez, C.G.	21062
Ou, H.	21011	Sulaiman, S.K.	21011
Ouyang, W.	21060	Sun, V.K.T.	21099
Pak, Y.C.M.	21058	Sungkarat, S.	21028, 21056
Pan, H.	21071	Surgenor, B.	21123
Pang, C.Y.	21115	Szeto, G.P.Y.	21124
Pang, J.C.Y.	21045	Tai, W.C.S.	21099
Pang, M.Y.C.	21102, 21092, 21128, 21129	Tam, A.	21049
Pardavilio-Belio, I.	21118	Tam, C.T.	21017
Penetrante, P.J.H.	21106	Tam, L.W.L.	21136
Pinto, S.M.	21128, 21129	Tam, W.Y.A.	21033
Pong, C.K.W.	21019	Tan, J	21003
Poon, K.C.K.	21088	Tan, N.	21051
Poon, S.	21114	Tang, L.M.	21013
Poon, W.S.	21115	Thammachat, K.	21057
Porlucas, K.	21106	Tharu, N.S.	21081
Powell, C.L.Y.M.	21069	Thawisuk, C.	21080
Qin, P.	21003	Ting, K.H.	21112
Ramos, J.M.R.D.	21061	Toh, F.M.	21044
Rattakorn, P.	21028, 21056	Tong, L.Y.	21073
Ren, L.J.	21068, 21076	Tricas-Sauras, S.	21118
Roca, J.	21118	Tsai, S.J.	21108
Romero, A.	21118	Tsang, C.S.L.	21092
Samartzis, D.	21123, 21128, 21129	Tsang, M.H.	21135

Tsang, S.M.H.	21045, 21136, 21137	Wong, S.Y.	21013, 21094
Tsang, H.W.H.	21011, 21033, 21089, 21134	Wong, T.F.	21108
Tsang, V.N.F.	21098	Wong, W.M.	21043
Tse, L.C.	21009	Wong, Y.L.	21108
Tse, P.H.	21043	Wong-Yu, I.S.K.	21076, 21088
Tse, Y.W.	21037	Woo, C.W.	21097
Tsoi, T.C.W.	21073	Woo, T.F.	21036
Tsoi, V.H.Y.	21090	Wu, E.S.L.	21136
Tsui, L.N.	21079	Wu, H.	21026, 21027
Umali, C.B.	21106	Wu, H.L.	21097
Valimaki, M.	21109	Xu, G.X.J.	21035
Vilaplana, J.	21118	Yang Y.J.	21029
Wan, R.	21131	Yau, S.F.C.	21024
Wang, H.	21121	Yau, T.Y.	21079
Wang, R.	21060	Ye, E.	21049
Wang, S.M.	21122	Yee, B.K.	21099, 21109
Wang, X.	21030, 21116	Yeung, G.T.Y.	21069
Wang, Y.	21072, 21113, 21131	Yeung, M.K.	21132
Wantanajittikul, K.	21057	Yeung, M.K.C.	21130
Wei, X.	21003	Yeung, M.Y.	21115
Wei, Y.	21003	Yeung, S.C.S.	21136
Wen, Y.	21060	Yeung, T.Y.K.	21024
Winser, S.J.	21014, 21092, 21102	Ying, M.T.C.	21092
Wong, A.C.T.	21130	Yip, C.C.K.	21005, 21006, 21138
Wong, A.Y.L.	21011, 21110, 21123, 21124, 21126, 21128, 21129, 21130, 21135, 21137	Yip, C.Y.T.	21067
Wong, C.	21117	Yu, A.C.H.	21064
Wong, C.Y.	21108	Yu, K.	21112, 21117
Wong, C.Y. J.	21050	Yung, P.S.H.	21123
Wong, F.Y.T.	21095	Yung, T.W.K.	21104
Wong, G.K.C.	21088	Zhai, H.	21055
Wong, H.K.H.	21119	Zhang, B.B.B.	21036
Wong, H.L.	21042	Zhang, J.	21049
Wong, I.	21068	Zhang, J.J.Q.	21083, 21084
Wong, J.T.M.	21100	Zhang, L.	21078
Wong, J.Y.K.	21096	Zhao Y.	21121
Wong, K.K.L.	21069	Zheng, Y.P.	21081, 21128, 21129
Wong, K.W.	21070	Zheng, Z.	21090
Wong, L.F.F.	21033	Zhong, J.J.P.	21130
Wong, L.N.	21081	Zhou, J.	21060
Wong, M.M.W.	21064	Zhou, P.	21003
Wong, S.M.	21043	Zhou, Z.X.	21130

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