JOHOR AUTISM CONFERENCE 2024:

SCIENTIFIC CONFERENCE

“Building Bridges in Healthcare: Advancing Autism Understanding and Support for a Brighter Future Together.”

Saturday, Dec 7th 2024

2pm - 4pm

Berjaya Waterfront Johor Bahru

JAC24:
SCIENTIFIC
CONFERENCE

Program.

2:00 PM – 2:15 PM	**A Link Between Mitochondrial Dysregulation, Oxidative Stress And Idiopathic Autism Spectrum Disorder (ASD)** *Norwahidah Abdul Karim,* Hajar Ahmad Jamil, Hazirah Hassan Department of Biochemistry, Faculty of Medicine, University Kebangsaan Malaysia
2:15 PM – 2:30 PM	**A Study On Developmental Disabilities and MINDplus** *Jamuna Bai a/p Nageswera Rao*, Maksuma Mahsom, Shanthini, Mariah Adrina Noorazhar Department of Penawar Physiotherapy & Fitness Centre, Hospital Penawar
2:30 PM – 2:45 PM	**Robot-Mediated Adapted Emotional Training Module for Autism Spectrum Disorder Children** *Muhammad Hariz Hafizalshah*, Nur Adilla Munir, Aimi Shazwani Ghazali, Hazlina Md. Yusof, Shahrul Na'im Sidek
2:45 PM – 3:00 PM	**The Effectiveness of MINDplus on Non-Verbal Autism Spectrum Disorder (ASD)** Nurul Aini Yahya, *Tengku Nur Amalina Tengku Alias*, Mariah Adrina Noorazhar Penawar Special Learning Centre (PSLC), Hospital Penawar
3:00 PM – 3:15 PM	**Digital Handwriting Analysis for Autism Spectrum Detection** *Aziman Abdullah*, Nurul Af-Iedah Ali Faculty of Computing, Universiti Malaysia Pahang Al-Sultan Abdullah
3:15 PM – 3:30 PM	**Planning Balanced and Nutritious Diet for Paralympic (Autistic) athlete (100M Sprinter) using Linear and Integer Programming Approach** *Natasha Amira Mohd Zailani*, Suliadi Firdaus Sufahani Faculty Applied Science and Technology, Universiti Tun Hussein Onn Malaysia
3:30 PM – 3:45 PM	**Economic Burden is a Major Concern for Parents/Caregivers of Children with Autism Spectrum Disorder** *Amy Azira Hamis*, Roszita Ibrahim, Norfazilah Ahmad, Syahirah Hashim Department of Public Health Medicine, Faculty of Medicine, National University of Malaysia, Kuala Lumpur, Malaysia
3:45 PM – 4:00 PM	**Award Ceremony** **End of Scientific Conference**

Overview

The Johor Autism Conference 2024 (JAC24) revolves around the theme "Building Bridges in Healthcare: Advancing Autism Understanding and Support for a Brighter Future Together." This event emphasizes the importance of collaboration among healthcare and educational professionals to enhance the diagnosis, treatment, and overall care for individuals with autism.

By bringing together experts from diverse fields, JAC24 seeks to foster a deeper clinical and educational understanding, improve access to essential resources, and work towards achieving better health and educational outcomes for those affected by autism.

Key Focus Areas of JAC24:

Building Bridges:
Highlighting the critical need for interdisciplinary collaboration among healthcare providers such as paediatricians, neurologists, psychiatrists, therapists, and special needs educators to develop cohesive strategies for autism diagnosis, treatment, care, and educational support.

Advancing Autism Understanding and Support:
Promoting innovative medical research, advanced diagnostic techniques, evidence-based treatments, and specialized educational approaches to improve the lives and outcomes of individuals with autism.

Foreword

Director of Penawar Group
Dr. Mohd Adnan bin Sulaiman

Autism, dyslexia, and other learning disabilities represent unique neurological profiles that require a comprehensive and compassionate approach to unlocking their potential. Therapy begins at home, where a foundation of love, patience, and consistent support is built. Parents and caregivers play a pivotal role in shaping positive developmental outcomes, and their awareness and commitment are critical in creating an environment conducive to growth and progress.

From a medical perspective, evidence-based interventions, early diagnosis, and personalized therapeutic plans are key to addressing the diverse challenges faced by individuals with learning disabilities. Education, medication, rehabilitation, and assistive technology must work in harmony to ensure holistic care. This conference serves as an essential platform to share multidisciplinary research, explore innovations, and strengthen the collaboration between medical, educational, and social sectors.

An inclusive society depends on understanding and action. Raising awareness within communities is vital, empowering families to seek early interventions and fostering social acceptance. With the right support systems and opportunities, individuals with autism and learning disabilities can achieve a high quality of life, contributing meaningfully to society.

Let us continue to champion the importance of therapy, awareness, and commitment in building an inclusive and supportive society.

Warm regards,
Dr. Mohd Adnan bin Sulaiman
Director, Penawar Group

Foreword

Chairman, Organising Committee JAC24
Dr. Ruwinah Abdul Karim

It is with great pride and excitement that we welcome you to the Johor Autism Conference 2024 (JAC24). Aligned with the theme, "Building Bridges in Healthcare: Advancing Autism Understanding and Support for a Brighter Future Together," this year's Scientific Conference continues to be an integral and enriching part of the summit. This specialized section is dedicated to showcasing advancements in autism care and learning disabilities from a scientific and interdisciplinary perspective.

The Scientific Conference reflects the commitment to fostering collaboration among healthcare professionals, educators, and researchers. Covering a broad spectrum of topics, it emphasizes innovative approaches in autism diagnosis, treatment, and education. As such, this document serves as a comprehensive guide to help participants navigate the program effectively and maximise their experience at the conference.

I extend my heartfelt gratitude to Dr. Adnan Sulaiman for his invaluable support and contributions in making this Scientific Conference a reality. His guidance and expertise have been instrumental in shaping the vision and execution of this initiative.

I am confident that this year's Scientific Conference will offer participants invaluable insights and foster meaningful collaborations, advancing our collective mission to improve the lives of individuals with autism.

Let us work together to build bridges and pave the way for a brighter future for everyone touched by autism.

Warm regards,
Dr. Ruwinah Abdul Karim
Chairman, Organising Committee JAC24

Organising Committee

Chairman

Dr. Mohd Adnan Bin Sulaiman

Dr. Ruwinah Abdul Karim

Secretary

Sharnina Mahendra

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Nurul Fatin Syahirah Khairul Anuar

Nurul Aini Yahya

Reviewer and Poster Submission

Dr. Ruwinah Abdul Karim

Promotion

Mariah Adrina Noorazhar

Ella Wardani

A Link Between Mitochondrial Dysregulation, Oxidative Stress And Idiopathic Autism Spectrum Disorder (ASD)

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ABSTRACT

Introduction: Autism spectrum disorder (ASD) is a neurological disorder triggered by various factors through complexmechanisms (1). Research has been done to elucidate the potential etiologic mechanisms in ASD, but no single cause hasbeen confirmed (2). The involvement of oxidative stress is correlated with ASD and possibly affects mitochondrial function (3). This study aimed to elucidate the link between mitochondrial dysregulation and idiopathic ASD by focusing on mitochondrial bioenergetics, membrane potential, oxidative status and morphological changes.
Design/Methodology/Approach: Autism Lymphoblastoid Cell Line (ALCL) which was derived from autism children was used as the model and the findings were compared to its normal sibling pair (NALCL). Cells were cultured in RPMI-1640 medium at 37° C and 5% CO2. Mitochondrial bioenergetics parameters were performed using high resolution spectrophotometer (O2k), oxidative status were measured via enzyme-linked immunosorbent assay (ELISA), deoxyribonucleic acid (DNA) damage was determined via comet assay and mitochondrial morphological changes were detected under scanning electron microscope (SEM).

Results: Respiratory capacities of OXPHOS, electron transfer of the Complex I- and Complex II-linked pathways, Complex V activity and mitochondrial membrane potential of the ALCL were significantly higher ($p < 0.05$) compared to NALCL. Low SOD activity ($p < 0:05$) and high MDA level ($p < 0:05$) were observed in ALCL compared to NALCL.Higher grade (Grades 2 and 3) of DNA damage was highly observed ($p < 0:05$) in ALCL compared to NALCL, whereaslower grade (Grades 0 and 1) DNA damage was highly detected ($p < 0:05$) in NALCL compared to ALCL. Scanning electron micrograph of isolated mitochondria from ALCL showed distortion with presence of blebs, depression, ridgesand furrows throughout the longitudinal length of the mitochondria. However, normal morphology was visualized inNALCL such as oval shaped mitochondria with smooth outer mitochondrial membrane without any distortions. These results indicate the abnormalities in mitochondrial respiratory control and morphology, and changes in oxidative status linking mitochondrial function with autism.

Conclusions: Our findings showed that mitochondrial bioenergetics was significantly dysregulated with higher oxidativestress in autism lymphoblastoid cell line. Correlating mitochondrial dysfunction, oxidative stress and autism isimportant for a better understanding of ASD pathogenesis in order to produce effective interventions.
Keywords: Autism, mitochondria, respiration, membrane potential, oxidative stress

A Study On Developmental Disabilities and MINDplus

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ABSTRACT

Developmental disabilities, including conditions like cerebral palsy (CP), significantly impact cognitive, physical, and emotional development, necessitating a multidisciplinary approach to management. Traditional treatments often focus on symptom management rather than addressing the underlying biological mechanisms. Recent interest in natural compounds for their potential neuroprotective and cognitive benefits has led to the exploration of Nigella sativa, commonly known as black seed, for its anti-inflammatory, antioxidant, and neuroprotective properties. Thymoquinone, the active component of Nigella sativa, has shown promise in modulating oxidative stress, inflammation, and neurotransmission pathways, which are implicated in neurodevelopmental disorders.

This study aimed to investigate the potential of Nigella sativa as a therapeutic agent for cerebral palsy (CP), focusing on its impact on motor functions and overall quality of life. The study utilized a single-group design with four CP patients over three months, with daily supplementation of Nigella sativa. Motor function improvements were assessed using the Gross Motor Function Measure (GMFM), with pre-and post-intervention comparisons. Although no significant improvements in motor function were observed, the results suggest that Nigella sativa may serve as a complementary therapy. The study underscores the need for further research, including longer trials, larger sample sizes, and integrative approaches, to fully explore the therapeutic potential of Nigella sativa in developmental disabilities.

Keywords: *Nigella sativa, cerebral palsy, thymoquinone, Gross Motor Function Measure (GMFM), motor function, developmental disabilities, neuroprotective therapy.*

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Robot-Mediated Adapted Emotional Training Module for Autism Spectrum Disorder Children

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ABSTRACT

Introduction: Training modules are a staple element for the therapy of Autism Spectrum Disorder (ASD) children. These modules range from behavioural training to academic skills. Emotional training modules, an example of the prior, are a fundamental component in the majority of training modules, designed to accommodate the common emotional skill deficits found among ASD children. A rising trend in socio-robotics is the utilization of Socially Assistive Robots to aid therapists during therapy. The introduction of robots in therapies is due to a consistently positive effect on the overall engagement of the ASD child as reported in numerous studies [1][2]. Based on this, an emotional training module was developed with regard to applying the core functions of the socially assistive robot to mediate the therapy.

Design/Methodology/Approach: A streamlined emotional training module was drafted based on an established and commercial variant. The activities were broken down into six separate sub-modules which are Introduction, Imitation, Recognition, Portrayal and Identification and Conclusion. Each sub-module pertains to the different aspects of emotional expressions and emotional connotations. Modifications were then made based on current literature on the topic to assimilate standard procedures and materials to be conveyed through a robot. Interviews with three separate subject matter experts (SME) were then held, discussing current in-classroom procedures, activity specifics and potential inclusions to account for in the finalized version of the adapted module. Lastly, the pre-finalized module was submitted to SMEs for final reviews and the changes and suggestions were applied.

Results: An emotional training module for emotion Imitation, Recognition, Portrayal and Identification conductedbetween the Introduction and Conclusion sub-modules with a robot as the main mediator was developed. The module details the method, suggested order and scoring system employed. The Imitation and Recognition sub-modules particularlyfocuses on building associations between emotions and expressions. The Portrayal and Identification sub-modulesadvances the syllabus further to instead build association of emotions to specific scenarios. The Introduction and Conclusion sub-modules serves as the transitive activities to begin and end the sessions.

Conclusions: An SME-validated emotional training module was produced. The emotional training module is field-readyand can be applied and modified as necessary. A benefit to note is that the module only requires that the robots are capableof producing speech and visually depicting emotions at a minimum.

Keywords: *Emotional Training Module, Autistic Children, Robot-mediated, Socially Assistive Robot*

The Effectiveness of MINDplus on Non-Verbal Autism Spectrum Disorder (ASD)

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ABSTRACT

This study explores the effectiveness of MindPlus a specialized formulation derived from Habbatus Sauda, in improving expressive and receptive communication skills in non-verbal autistic individuals. Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that impacts social interaction, communication, and behavior. The intervention includes nutrients such as monk fruit, vitamin D, vitamin B, and zinc, which have been clinically proven to support brain function and communication abilities. The primary aim of the study is to assess the impact of MindPlus on the communication skills of non-verbal autistic students aged 4 to 8 years.

A quantitative research design with pre- and post-assessments was used to evaluate receptive and expressive communication skills changes. Sixteen students from multiple centers participated in the study, and data was collected using the PLS5 Basic Developmental Checklist. Results indicated a significant improvement in receptive communication skills, with an average gain of 0.47 points per student, compared to a modest improvement of 0.33 points in expressive skills. Notably, while most students showed improvement in receptive skills, expressive language remained a challenge for many, suggesting that more targeted interventions may be needed. The findings contribute to the development of more effective communication interventions for non-verbal autism, highlighting the potential of MindPlus in enhancing cognitive and communication abilities in this population.

Keywords: *Autism spectrum Disorder (ASD), Non-verbal Autism, Mindplus, Communication Skills*

Digital Handwriting Analysis for Autism Spectrum Detection

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ABSTRACT

Early detection of Autism Spectrum Disorder (ASD) is essential for improving long-term outcomes by enabling timely interventions. Traditional diagnostic methods can be complex, time-consuming, and subjective, which makes early and accurate diagnosis challenging. This study explores digital handwriting analysis as a non-invasive, efficient, and accessiblemethod for early ASD detection. Handwriting is a complex skill that reflects cognitive and motor abilities, and childrenwith ASD often show distinct handwriting differences, such as variations in letter formation, spacing, speed, and accuracy. This method analyzes spatial and temporal features of handwriting, such as letter size, stroke consistency, and writing speed, to identify patterns typical of ASD. Spatial irregularities involve inconsistent letter spacing, alignment, and size, while temporal irregularities include changes in writing speed and pauses between strokes. These features are commonlyfound in individuals with ASD and provide insights into motor and cognitive challenges. By using advanced analysis techniques, handwriting analysis can improve early detection, guide personalized interventions, and support ongoingmonitoring, ultimately enhancing outcomes for individuals with ASD.

Planning Balanced and Nutritious Diet for Paralympic (Autistic) athlete (100M Sprinter) using Linear and Integer Programming Approach

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ABSTRACT

Every athlete should maintain a balanced diet to ensure proper physical preparation before participating in anycompetition, as well as for recovery afterward. Dietary planning is essential for ensuring adequate nutrient intake andavoiding food allergens, which can help improve the condition of individuals with autistic (100M sprinter) athletes while also strengthening the immune system. Human dietary planning involves the use of strategies to select suitable food items that are healthy for the body and then integrate them into meals This paper seeks to use Linear programming and Integerprogramming to develop diet plans for autistic 100M sprinters aged 20-30 years. Linear and Integer Programming are the two scientific approaches that can be useful in reducing the costs and considering some additional constraints such as the necessary amounts of certain nutrients, as well as the allergenic products that must not be used. In the future, it could beimplemented across other sports within the industry to allow caterers feed athletes with sufficiently nourishing meals that are balanced.

Keywords: Autistic athletes, dietary planning, nutrient intake, linear programming, integer programming

Economic Burden is a Major Concern for Parents/Caregivers of Children with Autism Spectrum Disorder

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ABSTRACT

Introduction: The prevalence rates of Autism Spectrum Disorder (ASD) have increased significantly around the world over the past few decades, and an increasing number of parents/caregivers are being faced with the challenges of lifelong caring the children with ASD. This study aims to determine the economic burden on parents/caregivers with ASD child in Malaysia and the factors associated with the economic burden.

Design/Methodology/Approach: This study used the cross-sectional design to determine the economic burden on parents/caregivers with an autistic child in Malaysia and the factors associated with the economic burden. The study period spanned July 2023 and December 2023. A total of 297 respondents were selected. A retrospective costing analysis was conducted based on the cost data obtained from the questionnaire and cumulative median cost was calculated. A regression analysis was conducted using IBM SPSS version 27 to obtain factors associated with the economic burden.

Results: Most of the children were diagnosed with Level 2 moderate level of severity (62.6%) and aged 2-6 years (53.8%). The estimated annual median total economic burden on the parents/caregivers per child in 2022 was RM28,220.00, with developmental services cost being the greatest cost (RM13,800.00), followed by indirect cost (RM8400.00), direct non-healthcare cost (RM3600.00) and direct healthcare cost (RM2420.00). Children's age ($p<0.001$, 95% CI -2613.50, -722.86), mothers/female caregivers employment status ($p<0.001$, 95% CI 5827.94, 18633.89), presence of the co-occurring condition ($p=0.001$, 95% CI 4549.52, 18449.84) and the average annual household income ($p<0.001$, 95% CI: 2.86, 4.44) were identified as a significant determinant factor of the economic burden.

Conclusions: Our findings may aid local policymakers when planning the greater provision of support to the affected families in the future, especially for the parents/caregivers of children with autism who are facing socioeconomic challenges. Considering the cost estimate changes over time, the literature would benefit from longitudinal study designs examining the evolution of ASD costs and the impact of changes in national and local policies for services for ASD on cost estimates

Keywords: Autism spectrum disorder (ASD); parents/caregivers; children; economic burden; factor