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## The Functioning of AQ-10 for Initial Screening of ASD Symptoms among Residents in the State of Qatar

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**Objective:** Prevalence of ASD in the State of Qatar is very uncertain. Therefore, in this pilot study we intended to create understanding of the ASD characteristics reported by residents in the State of Qatar while making a comparison between males with females. This study also aimed to assess the functionality of the Autism Quotient questionnaire (AQ-10) as initial screening tool in identifying possible residents with suspected ASD, improving the referral rate to a specialist for further assessment. **Methods:** The short AQ-10 was distributed among students and staff of Qatar University and members of the Qatari community. **Results:** The total sample includes 214 respondents (126 females, mean age: 28). Preliminary results of this pilot study show 5.3% of the respondents scored above the AQ-10 cut-off point, showing self-reported signs of ASD and indicating they require an official diagnostic assessment. **Conclusion:** This referral rate is important to obtain a clearer picture of the current prevalence of ASD in the State of Qatar because clarification of ASD prevalence will help diagnosed residents to get ASD-specific support if needed which could improve their quality of life.

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## Autism Screening in Oman, Knowledge, Attitudes and Practices of Healthcare Professionals

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**Objectives:** The national screening programme for autism and other developmental disorders for all 18-month-old children was launched in September 2016. Healthcare professionals are at the first level of care serving such patients in terms of detection and referral to specialised care. This is the first study to assess the trained healthcare professionals' knowledge, attitudes and to address autism screening practices in Oman. **Methods:** In this quantitative study, the link of an online survey (powered by Questback) was sent to the mobile phones of 571 healthcare providers. **Results:** A total of 174 responses (response rate: 30%) were obtained from staff nurses (64.4%, n = 112), general practitioners (19.5%, n = 34), paediatricians (10.3%, n = 18), family physicians (2.9%, n = 5), psychiatrists (1.1%, n = 2) and others (1.7%, n = 3) from all 11 governorates of Oman. Most of the respondents were female (84%, n = 143), young (mean age: 36 ± 6.6 years), working in primary healthcare (91%) and had more than 10 years' experience (59%). There was a significant knowledge variation among different groups of professionals; paediatricians and GPs showed high levels of knowledge. A second important finding suggested no significant relation between professionals' knowledge levels and their training, practical experience, and the care level they work on. Overall good attitudes were noted towards early detection and intervention. An interesting finding was that professionals express satisfaction with their perceived knowledge and self-confidence in autism screening. **Conclusion:** These findings represent a further step towards future studies and improvement of the screening programme.

## Use of Floor Time in Engaging Autism: A systematic review

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**Objective:** Floor time is a relationship-based therapy where the parent gets down on the floor with the child to play and interact with the child at their level. This article described the effects of floor time on children with autism and explored the factors influencing the impact of floor time among autistic children and their parents based on a systematic review from identified journals in PubMed, EMBASE, social science citation index and reviews. **Methods:** Out of 18,000 studies, 11 studies met the inclusion criteria and were considered for this review. The criteria considered were: the children do not suffer from co-morbid developmental disorders, studies exploring the impact of floor time therapy in autistic children, studies published in English and available for free download from 2014–2019. The search terms used were floor time and autism, DIR/floor time and autism, relationship therapy and autism factors influencing floor time in autism. **Results:** The results showed significant improvement in emotional functioning, communication and daily living skills and mothers perceived an improvement in the parent-child interactions. Parents who were married, had lower income, severity of the diagnosis and better knowledge of floor time had a better and higher quality parent engagement, which was significantly correlated with better improvement in child development. **Conclusion:** Every child with autism is different and every family has its unique make, hence it is important for parents to have the necessary information on various forms of therapies to make informed choices on the type of services their child could receive.

## Feeding Abnormalities in Malaysian Children with ASD: *Pilot translation to Malay language, internal reliability, and findings utilising the Brief Autism Mealtime Behaviour Inventory (BAMBI) questionnaire*

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**Objectives:** In this study we assessed feeding abnormalities in children with autism spectrum disorder (ASD) with the Brief Autism Mealtime Behaviour Inventory (BAMBI) questionnaire. **Methods:** For the pilot phase, the BAMBI questionnaire was translated to Malay and back-translated to English and administered to parents of 151 children and adolescents aged 2–18 years at the Child Development Centre (CDC) at the Universiti Kebangsaan Malaysia Medical Center (UKMMC), diagnosed with ASD based on DSM criteria. Both questionnaires were tested on 20 bilingual parents and internal reliability was determined. Data analysis was carried out using Statistical Package for Social Sciences (SPSS) Version 23.0. **Results:** A total of 138 of 151 (91.4%) ASD children in the CDC were problematic feeders based on the BAMBI scoring. Of the total sample, 51 (33.7%) children had a limited variety of food, 16 (10.5%) had food refusal and 23 (15.2%) had feeding patterns that showed features of autism. **Conclusion:** In this study, we ascertained using BAMBI that the majority of ASD children in CDC had feeding abnormalities, with up to a third eating a limited variety of food. Assessing feeding difficulty may allow improvement in nutrition and care of ASD children.

## The Promising Benefit of Omega-3 for Children with Autism: *Diwan clinic experience*

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**Objectives:** Omega-3 fatty acid is known to have a positive effect on cognitive function and brain development. Autism is a type of neurodevelopmental disorder that affects a person's communication and functionality including different brain function. Literature shows a link between improvement in autism symptoms and supplementation of omega-3 fatty acid. This study aimed to determine the effect of omega-3 fatty acids on autism symptoms in children attending Diwan Polyclinic, Muscat, Oman. **Methods:** This was an observational descriptive study (January to October 2019). All children with autism (N = 11, aged 3–9 years, 9 boys and 2 girls), both newly diagnosed and old cases, attend the Paediatrics clinic at Diwan Polyclinic were offered omega-3 on appropriate daily recommended dose. These children were diagnosed with autism at a specialised tertiary governmental hospitals in Muscat but continued their follow-up at Diwan Polyclinic. Parents of the included children were advised to continue the rehabilitation sessions and the special educational support in addition to taking omega-3. Children were followed-up every 8 weeks. **Results:** Eight children started to take omega-3 supplementation, while two refused. All 8 children improved in their hyperactivity, disobedience and concentration. Seven (88%) improved in their eye contact, communication, language development, learning ability in both language and simple calculation and in their memory. The younger to start the intervention with omega-3 the better the outcome. **Conclusion:** Omega-3 has great potential in helping children with autism. Omega-3 supplementation should be used in conjunction with behavioural therapy and rehabilitation and not as a substitute for rehabilitation.

## Understanding the Needs of Students with Autism in Higher Education Settings

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**Objectives:** Understanding the specific challenges that students with autism face and the services that are appropriate for them remains a challenge for many higher education (HE) institutions. This paper reviews the literature regarding the current practices in including students with autism and how their needs are currently met in HE settings. **Methods:** Research papers and books were searched in electronic databases, such as ERIC, and in search engines, such as Google Scholar. Sources were also found using the library websites of the University of Exeter and King Saud University. The primary keywords used in the searches were 'disability services and HE', 'inclusion and autism' and 'autism and HE'. The reviewed materials included publications from journals, such as Focus on Autism and Other Developmental Disabilities. **Results:** The literature indicates that the adjustment needed for students with autism should reflect their very particular set of needs. **Conclusion:** The role of disability services is also concerned with the broader culture of the university and, in particular, with inclusive practices and how these might be shaped to help integrate students with autism. More research is needed to understand the needs of students with autism and how these needs can be better addressed by disability service providers in HE settings.

## Gene Expression Study of Mitochondrial Complex I in Autism Spectrum Disorder

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**Objectives:** Autism spectrum disorder (ASD) is known as a neurodevelopmental disorder with difficulty in social relationships, verbal and non-verbal communication and repetitive and ritualistic behaviours. Although genetics is known as the primary cause of autism, it is still not clear which genes and molecular mechanisms are effective in the pathogenesis of this disease. Mitochondrial complexes' role in the aetiology of psychiatric disorders, such as schizophrenia, have been reported. The present study aimed to assess the role of mitochondrial complex I and cell bioenergetic pathways in the aetiology and characteristics of ASD. **Methods:** mRNA levels of all genomic and mitochondrial genes which encode mitochondrial complex I subunits (44 genes) were assessed in blood in 1,594 ASD patients and 1,284 non-psychiatric subjects using Real-time PCR. Three domains of executive functions (working memory, response inhibition and vigilance) were examined using the Cambridge neuropsychological test automated battery (CANTABexpedio) in all subjects. **Results:** Significant expression changes of 7 genes (including *NDUFS1*, *NDUFV1*, *NDUFB11* and *NDUFA1*) in ASD patients were detected in mitochondrial complex I. Most of these genes were novel candidate genes for ASD. Several correlations between mRNA levels and severity of symptoms, deficits in attention, working memory, response inhibition and brain activities were found. Correlations were found between attention and memory deficiencies and complex I abnormalities. **Conclusion:** The aetiology of ASD involves the deregulations of both core and supernumerary subunits of the mitochondrial complex I. Abnormal structure, assembly or functions of complex I could result from either up- or down-regulation of mRNA levels of both core and supernumerary subunits. This abnormal complex I may lead

to electron transport chain problems in the prefrontal cortex and neurodegeneration. The identified correlations could lead to better understanding the role of the neuronal bioenergetics system in executive function performances.

## Fragile X Syndrome among a Cohort of Children with Developmental Delay

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**Objectives:** Fragile X syndrome is a genetic condition that causes a range of developmental problems including learning disabilities and cognitive impairment. Affected individuals usually have delayed development of speech and language by age 2. Most males with fragile X syndrome have mild to moderate intellectual disability, while about one-third of affected females are intellectually disabled. Usually, males are more severely affected by this disorder than females. Fragile X syndrome occurs in approximately 1 in 4,000 males and 1 in 8,000 females. Fragile X syndrome is inherited in an X-linked dominant pattern. **Methods:** Fragile X was one of the tests that was given the priority to be established at the molecular lab due to its important clinical utility in Genetic and Development Medicine (GDM) clinic. Currently the test is centralised and offered to all tertiary hospitals in the country. **Results:** Two hundred children affected by developmental delay underwent the following test: allele-specific methylation PCR (mPCR) of the CGG trinucleotide repeat within the 5'-untranslated region of the fragile X mental retardation-1 (FMR1) gene using the Applied X mPCR kit (Asuragen). PCR products are sized by capillary electrophoresis. More than 99% of individuals with Fragile X Syndrome harbour a CGG repeat expansion accompanied by hyper-methylation of the FMR1 promoter region and consequent absence of FMRP protein expression. **Conclusion:** In the cohort, as per clinical standards to investigate affected children with fragile X, 200 affected with developmental delay were included. 2 out of 200 were positive for the pathogenic mutation, which is in keeping with international figures.

## Dance Movement Therapy: An intervention for children with autism spectrum disorder; Integrative review

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**Objectives:** Autism spectrum disorder (ASD) is a developmental disorder that exhibits substantial variations in social, communication and behavioural symptoms. Although numerous therapies are being implemented as intervention for autism, no particular approach has yet been verified in relieving the vital indicators of ASD. Creative measure and dance is a useful and practical choice for children with ASD. Therefore, the purpose of this paper was to present outcomes of an integrative literature review related to dance movement therapy (DMT) and ASD in children. **Methods:** The review on DMT for autistic children was conducted by searching electronic records of PubMed, Google Scholar, Medline and CINAHL for articles with complete text. The primary search recognised 157 papers published between 2014 and 2019. **Results:** A total of 14 studies were included in this review after applying the exclusion criteria. The main outcomes revealed that DMT does benefit the child by allowing them to work on their behaviour, communication and motor skills in a non-invasive environment. The DMT showed significant progress to several behavioural effects including stereotypic behaviours, social-emotional functioning, cognition and attention. **Conclusion:** There is a high likelihood for further investigations in this area as it is practical and non-invasive and it provides a sociable experience for children diagnosed with ASD. While DMT cannot completely treat all symptoms of ASD, neither can any single treatment, its benefits do make it a worthwhile complementary to an existing therapy.

## The Role of Mentalisation in Autism Spectrum Disorder: Explicit and implicit pathways

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**Objectives:** The proposed presentation reviews the state-of-the-art literature on autism spectrum disorder (ASD). Children who function on this spectrum possess deficits in social communication and interaction that have traditionally been explained in terms of Theory of Mind's (ToM) difficulties. However, performances on the ToM tests have, at times, been inconsistent with these findings where some children with ASD successfully pass these tests, although these results often do not translate into real life situations. This suggests a complexity that does not seem to be fully captured by the literature on the role of the ToM in ASD. **Methods:** Building on this, and in line with ASD's difficulties around understanding others' internal worlds, recent studies have explored the claim that mentalising might be a useful tool to conceptualise ASD presentations and to explain the inconsistencies mentioned above. In fact, mentalising encapsulates the emotional, relational and affective regulation elements that the ToM test neglects. **Results:** In keeping with the mentalising dimensions, two pathways to mentalising difficulties in ASD have been suggested, an implicit and an explicit one. The implicit system is supposed to be a relatively effortless and fast yet inflexible. The explicit one is believed to be highly flexible, effortful and highly reliant on language and executive functions. It has been suggested that classical false-belief tests rely on the explicit dimension of mentalising whereas in real-life situations, children often rely on implicit mentalising to process social information in the environment. This is a capacity that even children with high-functioning ASD difficulties struggle to compensate for. **Conclusion:** In its early conceptualisation, the role of implicit and explicit mentalising in ASD ought to be further explored in order to develop adaptive preventative interventions at a systemic level.

## Interaction with Roadway Environment and Infrastructure while Driving: Experiences of adults with autism

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**Objectives:** This study aimed to (1) determine how drivers with an autism spectrum disorder (ASD) experience the use of roadway environment/infrastructure and (2) identify strategies used to cope with environment/infrastructure elements. **Methods:** Participants were recruited through convenience and criterion sampling in order to obtain rich case informants. Semi-structured interviews identified experiences of ASD drivers while interacting with the roadway environment/infrastructure. These were analysed based on a phenomenological hermeneutical approach with participants' perceptions and experiences being central. **Results:** Data saturation was

reached when twelve drivers with ASD were interviewed ( $\chi = 34.8$ , 66.7% female). They reported both positive (e.g. calm, feeling safe) and negative (e.g. stress, anger) feelings towards roadway environment/infrastructure. Light, sound, chaos, complex situations, etc. are factors that complicate the (1) driving task, (2) observation process and (3) effective application of traffic rules. Interviewees reported that driving experience and automation are important to deal with these situations. Avoidance, adjustment (e.g. early departure) and use of alternative transport means were mentioned as coping mechanisms. **Conclusion:** Roadway environment/infrastructure can have a negative impact on both driving behaviour itself and the subjective experience of the activity by ASD drivers. Apparently, driving can be an exhausting and stressful daily life activity. Future research could focus on novice ASD drivers still lacking driving experience to determine how they appraise and cope with roadway infrastructure/environment.

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## A Model for Applying Multiple Intelligences Theory with Autistic Children

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**Objectives:** Autistic children require attention and comprehensive care that is commensurate with the nature of their disability, especially with the development of human thought and scientific and technological progress. Therefore, social workers seek to provide the required assistance through using theoretical guidelines that enable them to deal with autism spectrum, including the theory of multiple intelligences. Hence, this study aimed to build an applied model for the theory of multiple intelligences with autistic children. **Methods:** This is a descriptive and analytical study using the social survey method utilising the interview guide with experts and specialists. The study was applied at the Rehabilitation Services Center (Diagnostic Unit), Autism Department, and Center of Evaluation and professional Rehabilitation for the disabilities, in Muscat, Ministry of Social Development during the period of 8<sup>th</sup> October 2019 to 1<sup>st</sup> December 2019. **Results:** The results showed the most important roles of the social worker and the steps of the applied model of the theory of multiple intelligences with autistic children. **Conclusion:** The study indicated the multiplicity of concepts, considerations and basic assumptions of the theory of multiple intelligences with autistic children.