NUHS National University Health System

National University Hospital

National University Polyclinics

MEDIA RELEASE

14 March 2024

LARGE-SCALE STUDY SHOWS PROMISE IN EARLY AUTISM DETECTION AMONG YOUNG CHILDREN IN SINGAPORE

NUH and NUP study on M-CHAT-R/F autism screening tool involving 5,336 multi-ethnic children shows promising results that may enable early detection and intervention

SINGAPORE — A pilot study on a screening tool has demonstrated effectiveness in early autism detection in the primary care setting, which may facilitate systematic screening and pave the way for earlier interventions that can lead to better developmental outcomes in young children with the condition.

The large-scale study, published in leading international journal *Autism*[1] in October 2023, showed promise for the early detection of autism spectrum disorder (ASD) among toddlers who attended their routine developmental checks at the National University Polyclinics (NUP). Positive feedback from staff who administered the screening highlighted the tool's efficacy and feasibility.

Led by the Child Development Unit under the National University Hospital's (NUH) Khoo Teck Puat – National University Children's Medical Institute (KTP-NUCMI) in collaboration with NUP, the large-scale study involved 5,336 children aged between 17 to 20 months.

Systematic screening for autism has potential for earlier intervention

ASD is a life-long neuro-developmental condition that can affect learning, development as well as social communication skills of children. Signs of autism are usually seen in early childhood and can be detected as young as between one to two years of age in many children[2].

A prior study that examined autism trends in Singapore[3] from 2016 to 2018 led by Dr Aishworiya Ramkumar, Consultant, Child Development Unit, KTP-NUCMI, NUH, showed that the mean age of autism diagnosis was 35.5 months of age, and age of receiving intervention was 42 months.

---

[1] Zheng, R. M., Chan, S. P., Law, E. C., Chong, S. C., & Aishworiya, R. (2023). Validity and feasibility of using the Modified Checklist for Autism in Toddlers, Revised with Follow-Up (M-CHAT-R/F) in primary care clinics in Singapore. Autism, 0(0). https://doi.org/10.1177/13623613231205748

[2] 2023 Clinical Practice Guidelines on Autism Spectrum Disorder in Children and Adolescents. https://www.ams.edu.sg/latest-news/2023-guidelines-on-autism-spectrum-disorder-in-children-and-adolescents

[3] Aishworiya, R., Goh, T. J., Sung, M., & Tay, S. K. H. (2021) Correlates of adaptive skills in children with autism spectrum disorder. Autism, 25(6), 1592–1600. https://doi.org/10.1177/1362361321997287

In this latest study conducted between August 2020 and November 2022, children who screened positive were seen for a comprehensive evaluation by a mean age of 21.9 months and began autism-specific therapy at a mean age of 22.1 months.

Dr Ramkumar who is the senior author of the study said: "Early treatment and intervention can make a big difference to children with ASD as it can lead to better improvements in their skills and development, including improved language and cognitive skills, which in turn can lead to better quality of life, and independent-living skills in future. There are many effective treatment options for ASD in children."

Screening tool shows good performance and feasibility consistent with international studies

Primarily, the study assessed the performance of the **Modified Checklist for Autism in Toddlers, Revised with Follow-Up (M-CHAT-R/F)** questionnaire and its practical implementation in seven polyclinics[4] under NUP.

Parents and caregivers were asked to complete the questionnaire as part of the routine 18-month-old childhood developmental screening visits. Screening and follow-up interviews were administered by trained nursing staff or research personnel.

Results of this initial pilot study suggested that the M-CHAT-R/F is able to identify children who are at a higher likelihood for autism spectrum and need further assessment, accurately. Approximately two per cent of children were screened positive, and among those who had further evaluation at the Child Development Unit, the majority (85.7%) were confirmed to have autism[5].

Children identified with autism received appropriate follow-up support and intervention to address their communication and behavioural difficulties.

A large majority of nurses who administered the study were in favour of the practicality of the M-CHAT-R/F screening tool, with 98 per cent agreeing that it is a good and suitable tool to be used in Singapore primary care clinics. Advantages of the M-CHAT-R/F include the short time taken to complete it (approximately five to 10 minutes) by families and caregivers with minimal guidance and support.

Plans for further studies to support autism screening in Singapore

Dr Ramkumar shared: "This study is important for Singapore, being the first to explore systematic screening of well-children for presence of autism, using a quick, easy to use questionnaire. While this is a promising first step, further studies are essential to better understand the use of the M-CHAT-R/F, including the most appropriate age to screen and caregivers' acceptability to such screening."

---

[4] The seven polyclinics under NUP are Bukit Batok Polyclinic, Bukit Panjang Polyclinic, Choa Chu Kang Polyclinic, Clementi Polyclinic, Jurong Polyclinic, Pioneer Polyclinic and Queenstown Polyclinic.

[5] A limitation of the study was that about 44 per cent of children who were screened positive did not attend the follow-up diagnostic evaluation, which could be attributed to the cultural stigma associated with autism. Hence, the team is unable to confirm if they have a positive diagnosis.

Dr Ruth Zheng Mingli, co-lead researcher of the study and Senior Consultant, Family Physician, NUP, said: "The results of this study underscore the importance of early screening for ASD in young children in a primary care setting, bringing it upstream into the community and improving the outreach to families. The M-CHAT-R/F has proven to be a promising tool that enhances the capacity of healthcare professionals to identify children who may benefit from early interventions."

Dr Ramkumar cautioned that while the M-CHAT-R/F is valuable for screening, a positive screen does not equate to an autism diagnosis, and definitive assessment is necessary. It is recommended to be administered by trained healthcare professionals, ensuring appropriate counselling for parents and caregivers after completion.

The M-CHAT-R/F questionnaire is currently offered as part of the routine 18-month childhood developmental screening in all the seven polyclinics under NUP.

Said Ms Ong Li Ping, Nurse Manager at Pioneer Polyclinic and one of the nursing leads for the pilot study at NUP: “The M-CHAT-R/F has become an integral component of the routine well-child check with nurses for children at 18 months old since August 2022. This proactive approach to early intervention and screening holds promise of not only significantly enhancing the immediate wellbeing of the child but also positively impacting their future functional outcomes and overall quality of life.

The research team intends to embark on further studies to better understand the long-term outcomes and benefits following the screening.

Chinese Glossary

National University Health System (NUHS)	国立大学医学组织 (国大医学组织)
National University Hospital (NUH)	国立大学医院 (国大医院)
National University Polyclinics (NUP)	国立大学综合诊疗所 (国大综合诊所)
Modified Checklist for Autism in Toddlers, Revised with Follow-Up (M-CHAT-R/F)	改良版婴幼儿孤独症筛查量表（附后续问题的修改版）
Dr Aishworiya Ramkumar, Consultant, Division of Developmental and Behavioural Paediatrics, Department of Paediatrics, Khoo Teck Puat – National University Children's Medical Institute, National University Hospital	Aishworiya Ramkumar 顾问医生 儿童发展中心 小儿发育与行为科 邱德拔-国立大学儿童医疗中心 国大医院
Dr Ruth Zheng Mingli, Senior Consultant, Family Physician, National University Polyclinics Programme Director, Family Medicine Programme, National University Health System	郑明丽医生 高级家庭顾问医生 国立大学综合诊疗所 主任, 家庭科计划 国立大学医学组织
Ms Ong Li Ping Nurse Manager Pioneer Polyclinic	王丽萍 护理经理 先驱综合诊疗所

For media enquiries, please contact:

HOI Wan Theng
Senior Manager
Group Communications
National University Health System
Email: wan_theng_hoi@nuhs.edu.sg

Sharon AW
Assistant Director
Communications
National University Polyclinics
Email: sharon_aw@nuhs.edu.sg

About the National University Health System (NUHS)

The National University Health System (NUHS) aims to transform how illness is prevented and managed by discovering causes of disease, development of more effective treatments through collaborative multidisciplinary research and clinical trials, and creation of better technologies and care delivery systems in partnership with others who share the same values and vision.

Institutions in the NUHS Group include the National University Hospital, Ng Teng Fong General Hospital, Jurong Community Hospital and Alexandra Hospital; three National

Specialty Centres - National University Cancer Institute, Singapore (NCIS), National University Heart Centre, Singapore (NUHCS) and National University Centre for Oral Health, Singapore (NUCOHS); the National University Polyclinics (NUP); Jurong Medical Centre; and three NUS health sciences schools – NUS Yong Loo Lin School of Medicine (including the Alice Lee Centre for Nursing Studies), NUS Faculty of Dentistry and NUS Saw Swee Hock School of Public Health.

With member institutions under a common governance structure, NUHS creates synergies for the advancement of health by integrating patient care, health science education and biomedical research.

As a Regional Health System, NUHS works closely with health and social care partners across Singapore to develop and implement programmes that contribute to a healthy and engaged population in the Western part of Singapore.

For more information, please visit www.nuhs.edu.sg.

About the National University Hospital (NUH)

The National University Hospital (NUH) is Singapore's leading university hospital. While the hospital at Kent Ridge first received its patients on 24 June 1985, our legacy started from 1905, the date of the founding of what is today the NUS Yong Loo Lin School of Medicine. NUH is the principal teaching hospital of the medical school.

Our unique identity as a university hospital is a key attraction for healthcare professionals who aspire to do more than practise tertiary medical care. We offer an environment where research and teaching are an integral part of medicine, and continue to shape medicine and transform care for the community we care for.

We are an academic medical centre with over 1,200-beds, serving more than one million patients a year with over 50 medical, surgical and dental specialities. NUH is the only public and not-for-profit hospital in Singapore to provide trusted care for adults, women and children under one roof, including the only paediatric kidney and liver transplant programme in the country.

The NUH is a key member of the National University Health System (NUHS), one of three public healthcare clusters in Singapore.

About the National University Polyclinics (NUP)

The National University Polyclinics (NUP) is a member of the National University Health System (NUHS), a leading academic health system and one of three public healthcare clusters in Singapore.

NUP provides primary care treatment for acute illnesses, management of chronic diseases, women and children health services, and dental care at its network of

polyclinics at Bukit Batok, Bukit Panjang, Choa Chu Kang, Clementi, Jurong, Pioneer, and Queenstown (with Taman Jurong, Tengah and Yew Tee to come).

As part of an integrated academic health system, NUP collaborates with the hospitals and national specialty centres within NUHS as well as partners in the community, such as general practitioners, grassroots, and social care agencies, to provide patient-centred care for the population.

For more information, please visit www.nup.com.sg