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ARTIFICIAL INTELLIGENCE–ASSISTED EARLY AUTISM SCREENING: INTEGRATING M-CHAT-R/F WITH DIGITAL BEHAVIORAL MARKERS

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Background

Autism-specific screening can reduce delays in recognition, but accuracy and access vary across settings. M-CHAT-R/F is a validated two-stage parent-report tool for ages 16–30 months; it estimates likelihood and does not establish diagnosis. AI can combine questionnaire responses with video, gaze, speech, or movement features, potentially improving triage while introducing risks of bias, privacy loss, and dataset shift [1–5].

Aim

To evaluate a clinically responsible model in which AI augments M-CHAT-R/F-based early screening without replacing standardized follow-up or expert diagnostic assessment.

Materials and methods

A focused literature synthesis was performed using PubMed/MEDLINE and authoritative guidance through 4 September 2026. Priority was given to M-CHAT-R/F validation and meta-analysis, prospective digital-biomarker studies, systematic reviews of AI, and clinical guidelines. Evidence was compared by intended use, reference standard, external validation, calibration, subgroup performance, and workflow relevance. No new patient data were analyzed.

Results

The 2023 meta-analysis of 50 M-CHAT(-R/F) studies reported pooled sensitivity of 0.83 and specificity of 0.94, with substantial between-study heterogeneity [2]. The structured follow-up interview is essential for reducing false positives, and persistent clinical concern warrants evaluation even after a negative screen [1–3]. AI studies using home video and eye tracking demonstrate that brief behavioral samples can discriminate referred autistic and non-autistic children [4–7]. Nevertheless, retrospective sampling, small external test sets, demographic imbalance, uncertain calibration, and limited prospective impact evaluation constrain generalization [8,9].

Component	Role	Minimum requirement
M-CHAT-R/F	Standardized first-stage risk screen	Validated translation; correct follow-up; referral tracking
AI adjunct	Combine behavioral signals and prioritize assessment	Locked external validation; calibration; subgroup audit
Clinician assessment	Establish diagnosis and developmental profile	Comprehensive history, observation, differential diagnosis
Monitoring	Detect missed cases and model drift	Outcome linkage, override review, periodic recalibration

Conclusion

The strongest near-term use of AI is clinician-supervised triage after standardized screening, not autonomous diagnosis. A positive M-CHAT-R/F or ongoing developmental concern should trigger

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timely evaluation; an AI score must not be used to deny referral. Prospective multisite validation in culturally and linguistically representative populations, privacy-preserving data governance, transparent thresholds, and evidence of reduced waiting time without increased missed cases are prerequisites for adoption.

Keywords: autism; artificial intelligence; M-CHAT-R/F; early screening; digital biomarkers; clinical validation

Declarations

Ethics approval: Not applicable (literature synthesis). Funding: None. Competing interests: None declared.

References

1. Hyman SL, Levy SE, Myers SM. Identification, evaluation, and management of children with autism spectrum disorder. Pediatrics. 2020;145:e20193447. doi:10.1542/peds.2019-3447.

2. Zwaigenbaum L, Bauman ML, Fein D, et al. Early screening of autism spectrum disorder: recommendations for practice and research. Pediatrics. 2015;136(Suppl 1):S41–S59. doi:10.1542/peds.2014-3667D.

3. Robins DL, Casagrande K, Barton M, et al. Validation of the Modified Checklist for Autism in Toddlers, Revised with Follow-up (M-CHAT-R/F). Pediatrics. 2014;133:37–45. doi:10.1542/peds.2013-1813.

4. Wieckowski AT, Williams LN, Rando J, Lyall K, Robins DL. Sensitivity and specificity of the Modified Checklist for Autism in Toddlers (original and revised): a systematic review and meta-analysis. JAMA Pediatr. 2023;177:373–383. doi:10.1001/jamapediatrics.2022.5975.

5. Schjølberg S, Shic F, Volkmar FR, et al. What are we optimizing for in autism screening? Examination of algorithmic changes in the M-CHAT. Autism Res. 2022;15:296–304. doi:10.1002/aur.2643.

6. Tariq Q, Daniels J, Schwartz JN, et al. Mobile detection of autism through machine learning on home video: a development and prospective validation study. PLoS Med. 2018;15:e1002705. doi:10.1371/journal.pmed.1002705.

7. Abbas H, Garberson F, Glover E, Wall DP. Machine learning approach for early detection of autism by combining questionnaire and home video screening. J Am Med Inform Assoc. 2018;25:1000–1007. doi:10.1093/jamia/ocy039.

8. Jones W, Klaiman C, Richardson S, et al. Eye-tracking-based measurement of social visual engagement compared with expert clinical diagnosis of autism. JAMA. 2023;330:854–865. doi:10.1001/jama.2023.13295.

9. Keehn B, Kinnear M, Shic F, et al. Eye-tracking biomarkers and autism diagnosis in primary care. JAMA Netw Open. 2024;7:e2411190. doi:10.1001/jamanetworkopen.2024.11190.

10. Moon SJ, Hwang J, Kana R, Torous J, Kim JW. Accuracy of machine learning algorithms for the diagnosis of autism spectrum disorder: systematic review and meta-analysis of brain magnetic resonance imaging studies. Psychiatry Investig. 2019;16:129–140. doi:10.30773/pi.2018.11.12.1.

11. Solek P, Kaszyński J, Słowik A, et al. The role of artificial intelligence for early diagnostic tools of autism spectrum disorder: a systematic review. J Clin Med. 2025;14:1792. doi:10.3390/jcm14061792.

12. National Institute for Health and Care Excellence. Autism spectrum disorder in under 19s: recognition, referral and diagnosis (CG128). London: NICE; updated 2017.

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