## Supplementary material A: Study characteristics of included studies (n = 30)

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| Study | Author(s) | Year of publication | Study Design | Level of evidence | Target population | Population age range | Total sample size | Location | Test platform used | Individual who completed the tool/s | Risk of bias | Study outcomes |
| Developmental delays in children with neurofibromatosis type 1 | E Soucy, F Gao, D Guttman and C Dunn | 2011 | Cross-sectional study | 4 | Children with neurofibromatosis type 1 | 7 months – 8 years | 66 | United States | PEDS:DM; Paper-based | Parents and children | 7 | The PEDS:DM demonstrates the high presence of developmental delays in children with neurofibromatosis type 1 and the need for aggressive and early screening. |
| Comparing the results of developmental screening of 4 to 60-month-old children in Tehran using parents evaluation of developmental status and ages and stages questionnaires | S Shasshahani, R Vameghi, F Sajedi and A Biglarian | 2017 | Cross-sectional study | 4 | Children living in Tehran city | 4 – 60 months | 648 | Iran | PEDS; Paper-based | Parent/caregiver | 8 | The PEDS and ASQ have acceptable agreement, thus it seems that PEDS can be used for children’s developmental screening especially in child care visits. |
| Early identification of children with developmental delay and behavioural problems according to parents concerns in the Republic of Serbia | S Ilić, S Nikolić, D. Ilić-Stošović and Š  Golubović | 2019 | Cross-sectional study | 3 | Preschool children in Serbia | 3 – 7 years | 289 | Serbia | PEDS; paper-based | Parents | 7 | According to the criteria of PEDS test, this research identified 56.4% of children whose development needed to be monitored, 27.7% of children who needed to be referred for detailed diagnostic procedures, and 1.7% who needed to be included in treatment or special education support. |
| The outcome of a developmental screening tool (PEDS) in English and Northern Sotho: A comparative study | L Fyvie, J Anderson, C Kruger, M le Roux and J  van der Linde | 2016 | Cross-sectional study | 4 | Caregivers who were literate in both English and Northern Sotho | 2 – 5 years | 95 | South Africa | PEDS and PEDS-NS; Paper-based | Parents/caregivers | 8 | This proved that the PEDS-NS is an accurate translation of the PEDS. High referral rates were reported, which may be due to participants being from underserved communities. Positive and negative correspondence of the PEDS-NS was high. |
| Validity and reliability determination of Parents Evaluation of Developmental Status (PEDS) in 4-60 months old children in Tehran | R Vameghi,F Sajedi, S Shahshahani and A Biglarian | 2015 | Cross-sectional study | 2 | Persian children attending healthcare clinics | 4 – 60 months | 648 | Iran | PEDS; Paper-based | Parents | 8 | This research showed that the PEDS has a good content validity and reliability and can be used for developmental screening of children in Tehran city. Because the test is brief, using it can lead to saving time and resources.  All of the questions in PEDS had desirable content validity. |
| Parent Evaluation of Developmental Status (PEDS) in screening: The Thai experience | I Chunsuwan, T Hansakunachai and S Pornsamrit | 2016 | Cross-sectional study | 4 | Children attending 9, 18 and 30 month health checkups | 9 – 30 months | 266 | Thailand | PEDS tools; Paper-based | Parents and pediatricians | 8 | Implementation of PEDS in well-child visits could enhance early detection of developmental problems, but many Thai parents were unable to mention their concerns about delayed abilities in the correct PEDS question. |
| Assessment of a neuro-developmental screening tool in children in Bhutan | B Wong, S Grundy, L Tshering, K Tshering and F Mateen | 2019 | Cross-sectional study | 2 | Community-dwelling Bhutanese children without diagnosed neurocognitive conditions | 3 – 7 years | 96 | Bhutan | PEDS:DM; Paper-based | Pediatrician | 7 | The PEDS:DM requires further modifications and validation studies before it can be reliably implemented to assess developmental delay in children in Bhutan. |
| Screening for Autism spectrum disorders using the PEDS and M-CHAT | V Eapen, R Črnčec, S Woolfenden and R Blackmore | 2014 | Cross-sectional study | 4 | Parents of children aged 16 – 60 months attending childcare centers | 16 – 60 months | 97 | Australia | PEDS; Paper-based | Parents | 8 | These data provide some support for tiered screening with the PEDS and M-CHAT in identifying children requiring specialized ASD assessment.  Five percent of children required specialized ASD assessment based on their M-CHAT scores. |
| Screening strategies for autism spectrum disorders in pediatric primary care | J Pinto-Martin, L Young, D Mandell,  L Poghosyan, E Giarelli and S Levy | 2008 | Cross-sectional study | 4 | Children identified at risk for ASD at their well child visits | 18 – 30 months | 152 | United States | PEDS; Paper-based | Parents | 8 | The PEDS missed the majority of children who screened positive for ASD on the M-CHAT, suggesting that these two tools tap into very different domains of developmental concerns. |
| Developmental outcomes at age four following maternal antiepileptic drug use | N Richards, D Reith, M Stitely and A Smith | 2019 | Prospective cohort study | 4 | Children with prenatal exposure to AEDs | 4 years | 606 | New Zealand | PEDS; Paper-based | Parents | 2 | Prenatal exposure to sodium valproate and lamotrigine is associated with an increased risk of concerns about emotional and behavioral development being reported by parents in a neurodevelopmental screening program. |
| Comparative Accuracy of Developmental Screening Questionnaires | RC Sheldrick, S Marakovitz, D Garfinkel, A Carter and E. Perrin | 2020 | Cross-sectional study | 4 | Families of children aged 9 – 42 months | 9 – 42 months | 1495 | United States | PEDS; paper-based | Parents | 8 | This study found that 3 frequently used screening questionnaires offer adequate specificity but modest sensitivity for detecting developmental delays among children aged 9 months to 5 years. |
| Developmental Screening With Spanish-Speaking Families in a Primary Care Setting | N Huntington, K Horan, A Epee-Bounya and A Schonwald | 2016 | Cross-sectional study | 4 | Families attending an urban community health center where 75% of families are Spanish speaking | 18 – 48 months | 607 | United States | PEDS; paper-based | Parents | 7 | The systematic inclusion of developmental screening as part of culturally competent primary care may aid in reducing current disparities in the identification of developmental concerns. The adjusted odds of a concern being identified was 1.5 times greater in the post-PEDS period for Developmental concerns and 2.1 times greater for Behavioral concerns. There was no association with family language indicating that the PEDS performs equally well for English- and Spanish-speaking families. |
| Prioritized Surveillance of Young At-risk South African Children: An Evaluation of the PEDS Tools Referral and Response Characteristics | BK Maleka,  J Van Der Linde,  DW Swanepoel and  FP Glascoe | 2019 | Retrospective cohort study | 4 | Children at risk for developmental delays in a primary health care setting | 5 – 36 months | 406 | South Africa | PEDS tools; paper-based | Parents/caregivers | 3 | The PEDS tools must be evaluated for applicability in low-and-middle-income countries. Referral criteria must be sensitive to the demands on under-resourced health care systems. Referral criteria of the PEDS:DM in isolation as well as of the PEDS tools combined prioritizing moderately to severely affected children were modelled from the data. |
| Developmental Screening-Evaluation of an m-Health Version of the Parents Evaluation Developmental Status Tools | BK Maleka, J Van Der Linde,  FP Glascoe, and DW Swanepoel | 2016 | Cross-sectional study | 4 | CHWs in a primary health care setting | 6 – 36 months | 207 | South Africa | PEDS tools; app-based | CHW and SLP | 7 | Outcomes of the smartphone application, operated by a CHW, corresponded closely to the gold standard PEDS tools operated by a health professional. |
| Early detection of developmental delays in vulnerable children by community care workers using an mHealth tool | M van der Merwe, R Mosca, DW Swanepoel, FP  Glascoe and J van der Linde | 2019 | Mixed method | 4 | CCWs in a primary health care setting | 1 – 38 months | 138 | South Africa | PEDS tools; app-based | CCW | 8 | CCWs and mHealth-assisted developmental screening can facilitate better access to early detection and developmental surveillance for vulnerable populations. CCWs perceived mHealth screening as valuable in terms of utility, outcomes and contribution to developmental knowledge for community members and CCWs. |
| Interpreting parents’ concerns about their children’s development with the Parents Evaluation of Developmental Status: Culture matters | J Kiing, P Low,  Y Chan and M Neihart, | 2012 | Cross-sectional study | 4 | Parents, teachers and child care workers of preschool children in Singapore | 1 month – 6 years 11 months | 1806 | Singapore | PEDS; paper-based | Parents and teachers/child care workers | 8 | Parents’ interpretation of the concept of “concern” varies across language and culture. Findings highlight the importance of evaluating a screening tool’s use in local contexts before its widespread implementation to yield clinically meaningful results. The reporting of significant parental concern was considerably higher than US norms and Australian pilot figures when Western cutoff scores were applied. When cutoff scores were adjusted, similar patterns of reporting of high, medium, and low risk for disability could be captured. |
| Comparison of a broad-based screen versus disorder-specific screen in detecting young children with an autism spectrum disorder | L Wiggins, V Piazza and D Robins | 2012 | Cross-sectional study | 4 | Children evaluated for autism during 18- and 24- month well-child visits | 18 – 24 months | 52 | United States | PEDS; paper-based | Parents | 7 | Findings support universal autism spectrum disorder–specific screening in addition to general developmental screening and offer considerations to encourage early identification of toddlers with autism spectrum disorder. |
| Socioeconomic disadvantage and developmental delay among US children aged 18 months to 5 years | A Simon, PN Pastor, R Avila and S Blumberg | 2013 | Cross-sectional study | 4 | All children aged 18 months to 5 years in the 2007 National Survey of Children’s Health were  categorised into three groups based on the likelihood of  developmental delay | 18 – 60 months | 91 642 | United States | PEDS; online survey | Parents | 8 | It was found that children who were older, male, of low birth weight, non-Hispanic black or Hispanic in a non-English-speaking household, poor or receiving more than 10 h/week of care at someone else’s home were at most risk of a probable developmental delay. |
| Comparison of the ASQ and PEDS in screening for developmental delay in children presenting for primary care | M Limbos and D Joyce | 2011 | Cross-sectional study | 4 | Children who presented to their primary care provider for  routine care | 12 – 60 months | 334 | Canada | PEDS; paper-based | Parents | 8 | The findings support the guidelines of the American Academy of Pediatrics, demonstrating that both the ASQ and, to a lesser extent, the PEDS have reasonable test characteristics for developmental screening in primary care settings. |
| Prevalence of developmental and behavioral disorders in a pediatric hospital | M Petersen, D Kube, T Whitaker, JC Graff and  F Palmer | 2008 | Cross-sectional study | 4 | Primary caregivers of children admitted to a general pediatric service | 16 months – 17 years | 325 | United States | PEDS; paper-based | Parents/caregivers | 9 | This higher prevalence of developmental and behavioral disorders in hospitalized children emphasizes the need to screen for developmental disabilities at every opportunity. Strategies to implement systematic screening of hospitalized children should be examined. |
| Parents' concerns about their children's development at school entry | G Restall and B Borton | 2009 | Mixed method | 4 | Parents and guardians of children who entered kindergarten in one school division | 36 – 60 months | 290 | Canada | PEDS; paper-based | Parents | 7 | Eliciting parent perspectives can assist to build trust and to contribute meaningfully to the identification of children at risk for poor developmental outcomes. Providers need strategies to overcome potential barriers to early identification and referral. |
| Detecting developmental delays in infants from a low-income South African community: Comparing the BSID-III and PEDS tools | S Abdoola, DW Swanepoel, J Van Der Linde and FP Glascoe | 2019 | Cross-sectional study | 4 | Caregivers attending the baby wellness clinic in a primary healthcare setting | 3 – 18 months | 174 | South Africa | PEDS tools; app-based | SLP | 7 | A combination of tools for screening and assessment in infants in a South African PHC context may be necessary. The high-risk nature and age group may have contributed to poor agreement across tools. |
| Early developmental screening for children in foster care | K Hodges, M Landin, M Nugent and P Simpson | 2016 | Cross-sectional study | 4 | Children entering foster care | 0 – 6 years | 167 | United States | PEDS; paper-based | Parents | 7 | These results support use of a developmental screen for children in foster care and suggest that screening be performed as early as possible to expedite necessary evaluations and referrals. Use of a developmental screening tool at foster care entry increased detection of potential DD, and the results remained consistent with screening 1 month later. |
| Parental perception of developmental vulnerability after inter-country adoption: A 10-year follow-up study: Longitudinal study after inter-country adoption | G Diamond, Y Seneckya, HR Reichman, D Inbar and G Chodick | 2015 | Prospective cohort study | 4 | Parents of adopted children | 1 – 12 years | 191 | Israel | PEDS; paper-based | Parents | 6 | Parents perceive international adoption as being associated with a substantial risk for developmental problems. Even meticulous pre-adoption screening cannot preclude developmental problems that may appear in later childhood. |
| Longitudinal analysis of developmental delays in children with neurofibromatosis type 1. | L Wessel, F Gao,  D Gutmann and C Dunn | 2012 | Prospective cohort study | 4 | Children with neurofibromatosis type 1 | 0 – 8 years | 124 | United States | PEDS:DM; paper-based | Clinician | 6 | Early developmental screening and intervention for this at-risk pediatric population is advocateda, especially in the area of gross motor function.  School-age children exhibited significantly more areas of delay than infants or preschool-age children. Delays in math, reading, gross motor, fine motor, and self-help development were observed more frequently in older than younger children. Finally, analysis of 43 subjects for whom longitudinal assessments were available revealed that children often migrated between delayed and non-delayed groups in all areas except gross motor development. |
| Evaluation of a Zulu translation of the Parents’ Evaluation of Developmental Status | M van der Merwe, M Cilliers, C Mare, J van der Linde and M le Roux | 2017 | Cross-sectional study | 4 | Caregivers of children fluent in English and Zulu | 18 – 71 months | 99 | South Africa | PEDS; paper-based | Caregivers | 8 | The Zulu PEDS displayed high positive and negative correspondences, representative of an accurate translation of the English PEDS. It is recommended that the study be repeated in a community where the majority are Zulu home language speakers |
| Routine developmental screening implemented in urban primary care settings: more evidence of feasibility and effectiveness | A Schonwald, N Huntington, E Chan, W Risko and C Bridgemohan | 2009 | Prospective cohort study | 4 | Patients attending well-child care visits | 6 months – 8 years | 616 | United States | PEDS; paper-based | Parents | 6 | Implementation of validated screening by using the PEDS was feasible in large, urban settings. Effectiveness was demonstrated via chart review documenting an increased rate of identification of developmental and behavioral concerns. |
| PEDS and ASQ developmental screening tests may not identify the same children | L Sices, T Stancin, L Kirchner and H Bauchner | 2009 | Cross-sectional study | 4 | Pediatricians and parents with children attending well-child care visits | 9 – 31 months | 60 | United States | PEDS; paper-based | Parents | 6 | There was substantial discordance between PEDS and ASQ developmental screens. Clinicians need to be aware that in implementing revised AAP guidelines, the choice of screening instrument may affect which children are likely to be identified for additional evaluation. |
| Parents’ Evaluation of Developmental Status in the Australian day-care setting: Developmental concerns of parents and carers | D Coghlan, JSH Kiing, M Wake | 2003 | Cross-sectional study | 4 | Children from day-care centres and kindergartens | 18 – 36 months | 26 | Australia | PEDS; paper-based | Parents | 7 | The PEDS is acceptable to parents of Australian preschool children, with a prevalence of significant concerns that is similar to those in the USA. Further research is needed to assess what factors differentially influence whether a concern is felt in a particular domain for a particular child. |
| Does Parents’ Evaluation of Developmental Status at school entry predict language, achievement and quality of life 2 years later? | M Wake | 2005 | Prospective cohort study | 4 | Children with significant parental developmental concerns | 5.3 – 7.5. years | 173 | Australia | PEDS; paper-based | Parents | 9 | Although individual developmental concerns at school entry variably predict later academic and language scores, sensitivity and specificity values would not support use of the PEDS as a stand-alone screen to detect later problems. |