Identifying children with disabilities: Approaches to functionality screenings in schools

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Review of screenings approaches

• Research question: What approaches are available to screen school-age children for functional disabilities or difficulties?

• Rationale:
  • Schools need to understand the barriers that children face to support them
  • But screening is not always widely available
  • What options exist to introduce screening in those contexts?

• Screening = assessing functioning, generating referrals
• Methods: document searches on PubMed, Google, and Google Scholar, key informant interviews, snowballing

Sources: IAPB, Light for the World, UNESCO
Scope of review

Review focused on screening approaches that....

- Could be used with school-age children
- Are open source or low cost
- Could be used by non-specialists
- Have been used in low and middle income countries
- Directly assess functioning rather than relying on parent reports or self-reports. There are a number of validated tools available that use those approaches, including:
  - Washington Group and UNICEF Module on Child Functioning and Disability
  - Washington Group Long and Short Sets
  - 34 Item Disability Screening Questionnaire (DSQ-34)
  - Rapid Assessment of Disability (RAD)
  - Ten Questions
Overview of findings

**Vision screenings**
- By teachers
- By children
- Utilizing technology

**Hearing screenings**
- Utilizing technology
- Voice tests

**Motor skills screenings**
- Developmental screenings

**Cognitive screenings**
- Developmental screenings
- Study using tablet-based games
- Learning assessments?
Teachers conduct vision screenings

- Evidence shows that trained teachers can accurately identify vision impairments in children; children who “fail” the screening are referred to specialists.

- Teachers have been trained as screeners in a variety of settings:
  - Brazil
  - Cambodia
  - China
  - India
  - Indonesia
  - Iran
  - Nigeria
  - Peru
  - Thailand
  - Vietnam

- Teachers, on the whole, perform as well as eye care workers (Reddy & Bassett, 2017) but not always, e.g., Iran (OstadiMoghaddam et al., 2012).

Source: Claire Eggers/AP Images for Sightsavers
Teachers conduct vision screenings

- Guidelines available, piloted in Cambodia, Ethiopia, Ghana, and Senegal:
  

- Not just for vision screenings. Teachers can also be trained to detect simple eye diseases and promote eye health.

- What ages? Primary school ages and up. Children do not need literacy skills but do need to be able to follow screening instructions. Guidelines include specific recommendations for different age groups.

- Screening is not just for students, teachers should be screened too!
Child-to-child vision screening

- Children trained to conduct visual acuity screenings with each other
- Approach used by Light for the World and in a case study in South Africa (Cook & Pasio, 2013)
- Creates “ownership” of eye health among students
- Less draw on teacher time in conducting screenings

Source: Light for the World
Technology for vision screenings

App-based screening tools: Peek Acuity from PeekVision

Tele-health support: optometrist follow-up
Hearing screenings

• Challenges with adopting traditional approaches to hearing screening in schools:
  • Hearing screenings typically conducted by trained health specialists, which are in short supply in some contexts: Just 1 audiologist per million people in a number of countries in Sub-Saharan Africa (UNESCO, 2017)
  • Use expensive equipment, such as an audiometer
  • Lower cost, non-specialist alternatives are available
Technology for hearing screenings

- App-based approaches validated in peer-reviewed literature (Bright & Pallawela, 2016):
  - shoeBox audiometry (self- or tester-administered, at least ages 3+)
  - EarTrumpet (self-administered, ages?)
  - uHear (self-administered, ages?)
  - hearScreen (tester-administered, at least preschool ages+)
  - Used in at least 21 countries, including South Africa, The Philippines, Tanzania, Malawi, Botswana, and Ethiopia
  - Has GPS-technology to help locate local health facilities if a child or adult “fails” the screening
- Costs: hearScreen reduces costs of screening by 50-70% (UNESCO, 2017)

Source: hearScreen
Technology for hearing screenings

- Battery for the Evaluation of Listening and Language Skills (BELLS) Platform approaches:
  - Multi-Frequency Animal Sound Test (mFAST, ages 3+)
  - Adaptive Auditory Speech Test (AAST, ages 4+)
    - Developed in several languages, including Arabic, KiSwahili, some Ghanaian languages; more languages under development
    - New language versions can be created in consultation with developer ($)

- Costs
  - Sound card or BELLSbox (100-200 Euros)
  - Special headphones (≈100 Euros)
  - Notebook, tablet, or computer
  - May involve remote consultation with developer

Image of AAST from Royal Dutch Kentalis
WHO guidance for “voice tests”

  - Defines thresholds for different levels of impairment. For example, normal hearing = able to hear whispers
  - Suggests screening tests for ages 0-3, ages 3-7, and ages 7+. For example, suggests naming objects for the child to point to for ages 3-7
  - BUT intended for health care workers, not teachers or other (non-health care) school staff
- Tradeoffs between costs and qualifications of screeners, between costs and accuracy
- Adaptations for schools?
Testing motor skills in younger children

- Developmental assessments
  - Malawi Developmental Assessment Tool (MDAT), Malawi, ages 0-6
  - Kilifi Developmental Checklist (KDC), Kenya, ages 1-9
  - Rapid Neurodevelopmental Assessment (RNA), Bangladesh, ages 2-5
  - Denver II, US, ages 0-6
- Gross motor skills
- Fine motor skills
- Typically require moderate training
- \( \approx 15-30 \) minutes per assessment

Examples of MDAT test items for gross motor skills (Gladstone et al., 2010)
Screening for cognitive functioning

- Rapid Neurodevelopmental Assessment (RNA), Bangladesh, ages 2-5. Examples:
  - Matching colors
  - Looking at an object (e.g., response to “Oh! Look! There is a ball.”)
  - Pretend play (e.g., response to “Can you make me a cup of tea?”)
- Pitchford & Outhwaite (2016): Tablet-based games with early primary school students in Malawi to assess:
  - Short-term memory
  - Visual attention
  - Working memory
  - Spatial intelligence
  - Math skills
Conclusions

• Limited screening options available but options are growing
  • Most widely available for sensory impairments: vision and hearing
  • Found fewer options for assessing motor and cognitive functioning
• Technology and game-based tests options are increasingly available and could help to reduce costs, improve accuracy, and reduce time for screenings
• Avenues for future research and work:
  • Low cost options for screening from high income contexts
  • Options for screening for other challenges, like language and behavioral skills
  • Best practices to limit dangers of labeling and mislabeling children, especially in screenings by non-specialists
  • FHI 360 developing a screening tool that will be shared through the Disability Task Team
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