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UCLouvain
Institut de recherche santé et société

RESO

SÉLECTION DE RESSOURCES

Dépistage des troubles de l'audition chez l'enfant en milieu scolaire :

Approches et recommandations internationales

Avec le soutien de

Wallonie familles santé handicap AVIQ

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ONE OFFICE DE LA NAISSANCE ET DE L'ENFANCE

SELECTION DE RESSOURCES DU SERVICE UNIVERSITAIRE DE PROMOTION DE LA SANTÉ UCLOUVAIN/IRSS-RESO

Dépistage des troubles de l'audition chez l'enfant en milieu scolaire : approches et recommandations internationales

Contexte de la demande :

À la demande de l'Office de la Naissance et de l'Enfance (ONE), le RESO a réalisé une sélection de ressources consacrée au dépistage auditif en milieu scolaire. Celle-ci est subdivisée en deux parties : la première partie aborde les programmes actuels de dépistage des troubles de l'audition chez l'enfant et propose des recommandations internationales, la seconde partie parle de l'efficacité et des coûts de ce dépistage. Les ressources proposées sont triées des plus récentes aux plus anciennes.

Cette sélection est le résultat d'un travail collaboratif au sein de l'équipe du RESO.

Critères de recherche :

- Langue : français et anglais
- Période recherchée : 2015-2023
- Mots-clés (français et anglais) : "bilan de santé" ; "dépistage auditif" ; "efficacité"; "coûts" ; "visite médicale scolaire" ; "hearing health education" ; "cost-effectiveness" ; "hearing screening" ; "school health service" ; "screening children/student"
- Bases de données : Doctes, Pubmed, Google Scholar, Science Direct, Taylor & Francis Online, Frontiers
- Site : OMS
- Nombre de ressources retenues : 13

Coordination de la sélection de ressources : Laura Mertens & Dominique Doumont

Mise en page : Laura Mertens

Pour citer ce document :

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Child health screening program in French nursery schools: Results and related socioeconomic factors

Article (France)

En ligne : Lien vers la ressource

Milcent, K., Gassama, M., Dufourg, M.-N., Thierry, X., Charles, M.-A., & Bois, C. (2023). Child health screening program in French nursery schools: Results and related socioeconomic factors. *Frontiers in Pediatrics*, *11*: 1167539, 1-10p. https://doi.org/10.3389/fped.2023.1167539

« Objectives: The study aims to describe the output of routine health screening performed in French nursery schools by the maternal and child health services among children aged 3–4 years and to quantify the level of early socioeconomic health disparities.

Methods: In 30 participating départements, data on screening for vision and hearing impairments, overweight and thinness, dental health, language, psychomotor development, and immunizations were collected for children born on specific dates in 2011 and enrolled in nursery school in 2014–2016. Information was collected on the children, their socioeconomic characteristics and on the school attended. Odds of abnormal screening results were compared for each socioeconomic factor by logistic regressions adjusted for age, sex, prematurity and bilingualism.

Results: Among the 9,939 children screened, prevalence of disorders was 12.3% for vision, 10.9% for hearing, 10.4% for overweight, 7.3% for untreated caries, 14.2% for language and 6.6% for psychomotricity. Newly detected visual disorders were more frequent in disadvantaged areas. Children with unemployed parents were three time more likely to have untreated caries and twice as likely to present language or psychomotor impairments; 52% were referred to a health professional following screening compared to 39% of children with employed parents. Except for children in disadvantaged areas, vaccine coverage was lower among disadvantaged groups.

Conclusion: The prevalences of impairments, which are higher among disadvantaged children, highlight the potential preventive impact of systematic screening under the comprehensive maternal and child healthcare program. These results are important to quantify early socioeconomic inequalities in a Western country known for its generous social welfare system. A more holistic approach to child health is needed with a coherent system involving families and aligning primary care, local child health professionals, general practitioners, and specialists. Further results are needed to evaluate its impact on later child development and health. »

A Smartphone Application and Education Program for Hearing Health Promotion in High School Teenagers

Article (Etats-Unis)

En ligne : Lien vers la ressource

Chang, J. L., Huwyler, C., Yoshida, N., Henderson Sabes, J., & Cheung, S. W. (2023). A Smartphone Application and Education Program for Hearing Health Promotion in High School Teenagers. *The Laryngoscope*, *133*(8), 2007-2013p. https://doi.org/10.1002/lary.30411

« Objectives: To assess knowledge retention after video-based hearing health education and measure headphone listening behavior change using a novel smartphone application.

Methods: In this prospective longitudinal study, students participated in video-based hearing health education and hearing screening sessions. Hearing health knowledge was assessed in students and parents after 6 weeks. A novel smartphone application was created to measure daily noise exposure based on volume settings with headphone use and to display the National Institute for Occupational Safety and Health (NIOSH) noise doses with alerts for cumulative daily doses nearing the maximum.

Results: Seventy-six teenage students and parents participated. Eighty three percent of participants identified as a racial or ethnic minority and 66% were of low-income socioeconomic status. Hearing health knowledge was retained in students 6 weeks after education and parents' knowledge improved from baseline. The smartphone app was installed on 12 student phones, and 25% of days monitored exhibited noise doses that exceeded the NIOSH maximum. App use for at least 10 days by nine students showed a significant reduction in average daily noise dose and time spent at the highest volume settings during the second-half of app use.

Conclusions: Video-based hearing health education with knowledge question reinforcement was associated with knowledge retention in students and improved parental attitudes and knowledge about hearing conservation. A smartphone app with a real-time display of headphone cumulative noise exposure dose identified at-risk students. The integration of hearing health education, hearing screening, and digital health tools has promised to promote positive behavior changes for long-term hearing conservation. »

Tele-audiology diagnostic testing services for children with disabilities in a school setting: A pilot study

Article (Etats-Unis)

En ligne : Lien vers la ressource

Ramkumar, V., & Krumm, M. (2023). Tele-audiology diagnostic testing services for children with disabilities in a school setting: A pilot study. *International Journal of Pediatric Otorhinolaryngology, 165*, 1-8p. https://doi.org/10.1016/j.ijporl.2022.111426

« Objective: Children with disabilities (CWDs) having comorbidities face challenges in accessing and completing diagnostic hearing evaluations. This study was conducted to determine whether a tele-audiology diagnostic test battery can be administered to school-aged CWDs having comorbidities in a school-setting.

Design: A proof-of-concept pilot study using a cross-sectional design.

Study sample: Ten typically developing children between 3 years 9 months and 10 years 9 months of age; mean age of 8 years 3 months (pilot-norm group) and seven CWDs having comorbidities between 3 years and 8 years and 1 month of age; mean age of 5 years and 2 months (CWD group) participated in the study. A diagnostic test protocol delivered via tele-audiology was first administered to the pilot-norm group to ensure its efficiency and suitability for use in the CWD group. Following modifications, the diagnostic test protocol was delivered for CWDs.

Results: We identified key aspects, including the role of the facilitator in conducting a diagnostic test battery using tele-audiology on CWDs, the usefulness of having co-facilitators to support child-friendly testing, as well as technology-related requirements. With respect to tele-audiology diagnostic testing, it was possible to quickly assess peripheral hearing using synchronous tele video-otoscopy, tympanometry, and DPOAEs. We identified limitations in conducting behavioral audiometry and completing tone-burst ABRs in CWDs.

Conclusion: Evidence was obtained from this exploratory pilot study that a tele-audiology diagnostic test battery can be administered in a school setting to school-aged CWDs having comorbidities. Tele-audiology can be considered to provide hearing healthcare services to school-aged CWDs who may otherwise not receive these services. »

Combined hearing and vision screening programs: A scoping review

Article (International)

En ligne : Lien vers la ressource

Oosthuizen, I., Frisby, C., Chadha, S., Manchaiah, V., & Swanepoel, D. W. (2023). Combined hearing and vision screening programs: A scoping review. *Frontiers in Public Health*, 11: 1119851. 1-13p. doi: 10.3389/fpubh.2023.1119851

« Background and aim: The World Health Organization (WHO) estimates that 1.5 billion and 2.2 billion people have hearing and vision impairment, respectively. The burden of these non-communicable diseases is highest in low- and middle-income countries due to a lack of services and health professionals. The WHO has recommended universal health coverage and integrated service delivery to improve ear and eye care services. This scoping review describes the evidence for combined hearing and vision screening programs.

Method: A keyword search of three electronic databases, namely Scopus, MEDLINE (PubMed), and Web of Science, was conducted, resulting in 219 results. After removing duplicates and screening based on eligibility criteria, data were extracted from 19 included studies. The Joanna Briggs Institute Reviewer Manual and the Preferred Reporting Items for Systematic Reviews and Meta-analyzes (PRISMA) Extension for Scoping Reviews were followed. A narrative synthesis was conducted.

Results: Most studies (63.2%) were from high-income countries, with 31.6% from middle-income and 5.2% from low-income countries. The majority of studies (78.9%) involved children and the four studies reporting on adults all included adults above 50 years of age. Vision screening was most commonly performed with the "Tumbling E" and "Snellen Chart," while hearing was typically screened using pure tone audiometry. Studies reported referral rates as the most common outcome with sensitivity and specificity rates not reported in any included articles. Reported benefits of combined vision and hearing screenings included earlier detection of vision and hearing difficulties to support functioning and quality of life as well as resource sharing for reduced costs. Challenges to combined screening included ineffective follow-up systems, management of test equipment, and monitoring of screening personnel.

Conclusions: There is limited research evidence for combined hearing and vision screening programs. Although potential benefits are demonstrated, especially for mHealth-supported programs in communities, more feasibility and implementation research are required, particularly in low- and middle-income countries and across all age groups. Developing universal, standardized reporting guidelines for combined sensory screening programs is recommended to enhance the standardization and effectiveness of combined sensory screening programs. »

Hearing Screening among First-Grade Children in Rural Areas and Small Towns in Małopolskie Voivodeship, Poland

Article (Pologne)

En ligne : Lien vers la ressource

Swierniak, W., Skarzynski, P. H., Gos, E., Czajka, N., Matusiak, M., Hartwich, P., & Skarzynska, M. B. (2021). Hearing Screening among First-Grade Children in Rural Areas and Small Towns in Małopolskie Voivodeship, Poland. *Audiology Research*, *11*(2). 275-283p. https://doi.org/10.3390/audiolres11020025

« Undiagnosed hearing deficits hamper a child's ability to learn. Hearing screening in school aged children helps detect educationally significant hearing loss and prevents negative impacts on academic achievement. The main purpose of this study was to improve early detection and assess the incidence of hearing disorders in first-graders from rural areas and small towns in the Małopolskie Voivodeship of Poland. There were 5029 children aged 6–7 years. Hearing thresholds were measured over the frequency range 0.5–8 kHz. A result was considered positive (abnormal) if the hearing threshold was worse than 20 dB HL at one or more frequencies. The prevalence of hearing loss was estimated in terms of four-frequency hearing loss, high-frequency hearing loss, and low-frequency hearing loss. Parents filled in a brief audiological questionnaire. The analysis was performed using IBM SPSS Statistics, version 24. Of all the children, 20.5% returned a positive result and were referred for further audiological diagnoses. The estimated prevalence of hearing loss was 11.6%, made up of 6.5% with FFHL, 7.6% with HFHL, and 8.2% with LFHL. This study showed that large numbers of children in the district had hearing problems. Adoption of hearing screening in primary schools is recommended as a routine procedure within preventive pediatric health care. »

Organizational Aspects and Outcomes of a Hearing Screening Program Among First-Grade Children in the Mazovian Region of Poland


Organizational Aspects and Outcomes of a Hearing Screening Program Among First-Grade Children in the Mazovian Region of Poland

Article (Pologne)

En ligne : Lien vers la ressource

Skarżyński, P. H., Świerniak, W., Gos, E., Gocel, M., & Skarżyński, H. (2021). *Organizational Aspects and Outcomes of a Hearing Screening Program Among First-Grade Children in the Mazovian Region of Poland.* Language, Speech, and Hearing Services in Schools, 52(3), 856-867p. https://doi.org/10.1044/2021_LSHSS-20-00083

« Purpose: The purpose of this study is to describe and assess a hearing screening program of first-grade children in Poland. The program aimed to detect hearing disorders and increase awareness among parents of hearing problems.

Method: A hearing screening program was conducted in all elementary schools of the biggest region in Poland. A total of 34,618 first-graders were screened. The hearing screening protocol included video otoscopy and pure-tone audiometry. The program also included an information campaign directed to the local community and educational meetings between parents and medical staff.

Results: The estimated prevalence of hearing loss was 11%. Unilateral hearing loss was more common than bilateral hearing loss. Mild hearing loss was more frequent than moderate (or worse) hearing loss. In otoscopy, the most common positive result was otitis media with effusion. Parents and medical staff took part in 1,608 educational meetings, broadening the parents' knowledge of how to care for hearing.

Conclusions: A hearing screening program not only provides data on the prevalence of childhood hearing problems but is also an avenue for providing the local community with valuable knowledge about how to care for hearing. This study demonstrated the importance for systematic monitoring of children's hearing status and of increasing awareness among parents and teachers of the significance of hearing loss. The hearing screening of children starting school should become a standard part of school health care programs. »

Dépistage auditif : considérations sur la mise en œuvre

Rapport (Intenational)

En ligne : Lien vers la ressource

World Health Organization. (2021). *Hearing screening : Considerations for implementation.* OMS. 64p. https://doi.org/10.37774/9789275225561

« Le présent manuel est l'aboutissement d'un processus de consultation mené par l'Organisation mondiale de la Santé. Il s'adresse à toutes les personnes qui prévoient d'instaurer un programme de dépistage auditif à l'échelon national ou infranational : coordinateurs de soins de l'oreille et de l'audition ou points focaux au sein des ministères de la Santé, planificateurs en santé publique, organisations non gouvernementales ou entités de la société civile qui prodiguent des soins de l'oreille et de l'audition. Cet ouvrage contient des informations pratiques visant à faciliter le dépistage des pertes auditives et des maladies connexes de l'oreille ainsi que l'intervention précoce chez les nouveau-nés et les nourrissons, les enfants d'âge préscolaire et scolaire ainsi que les personnes âgées. Ce manuel contient aussi des conseils sur des facteurs importants à prendre en compte lors de l'élaboration d'un programme de dépistage auditif : sujets devant faire l'objet du dépistage, objectif du programme, fréquence du dépistage, outils à employer, etc. »

How the World's Children Hear: A Narrative Review of School Hearing Screening Programs Globally

Article (International)

En ligne : Lien vers la ressource

Yong, M., Panth, N., McMahon, C. M., Thorne, P. R., & Emmett, S. D. (2020). How the World's Children Hear: A Narrative Review of School Hearing Screening Programs Globally. *OTO Open*, *4*(2), 1-8p. https://doi.org/10.1177/2473974X20923580

« Objective: School hearing screening may mitigate the effects of childhood hearing loss through early identification and intervention. This study provides an overview of existing school hearing screening programs around the world, identifies gaps in the literature, and develops priorities for future research.

Data Sources: A structured search of the PubMed, Embase, and Cochrane Library databases.

Review Methods: A total of 65 articles were included according to predefined inclusion criteria. Parameters of interest included age groups screened, audiometric protocols, referral criteria, use of adjunct screening tests, rescreening procedures, hearing loss prevalence, screening test sensitivity and specificity, and loss to follow-up.

Conclusions: School hearing screening is mandated in few regions worldwide, and there is little accountability regarding whether testing is performed. Screening protocols differ in terms of screening tests included and thresholds used. The most common protocols included a mix of pure tone screening (0.5, 1, 2, and 4 kHz), otoscopy, and tympanometry. Estimates of region-specific disease prevalence were methodologically inaccurate, and rescreening was poorly addressed. Loss to follow-up was also a ubiquitous concern. »

Preschool hearing screening in Sweden. An evaluation of current practices and a presentation of new national guidelines

Article (Suède)

En ligne : Lien vers la ressource

Stenfeldt, K. (2018). *Preschool hearing screening in Sweden. An evaluation of current practices and a presentation of new national guidelines. International Journal of Pediatric Otorhinolaryngology*, 110, 70-75p. https://doi.org/10.1016/j.ijporl.2018.04.013

« Objectives: As the various regional authorities responsible for health care in Sweden operate independently, no knowledge was available on pre-school hearing screening available to children living in different parts of the country. The aim of this study was to carry out a survey to ascertain how preschool hearing screening was performed in the various regions of Sweden. An objective of the present paper was also to present the uniform national guidelines for pre-school hearing screening that were launched by health authorities and were based on this study. A follow-up investigation was performed to ascertain whether the new guidelines were well accepted and followed throughout the country.

Methods: A questionnaire was sent to 25 physicians responsible for child health care centers in all 21 regions throughout the whole country. The questionnaire included detailed questions on hearing screening in preschool children. New national guidelines were introduced in cooperation with health authorities and providers of preventive child health care. After two and four years, questionnaires were sent to the same recipients to determine whether changes in practice in pre-school hearing screening had been implemented, and to obtain information about experiences with the new guidelines.

Results: Sixteen of 21 regions practiced universal hearing screening of 4-yearolds. Many different protocols were used. Professionals at child health care centers expressed a need for national guidelines for pre-school hearing screening. At the two and four-year follow-ups, one more region had introduced universal hearing screening of 4-year-olds, while two regions were planning to introduce it in 2019. The new national guidelines were well accepted and used throughout the country.

Conclusion: There was a great variability in how pre-school hearing screening was performed in Sweden. Efforts are being made to provide uniform pre-school hearing screening. Cooperation between professionals in hearing health and health authorities is needed in order to broaden the use of universal pre-school hearing screening and to implement the new national guidelines. »

Cost-effectiveness of School Hearing Screening Programs: A Scoping Review

Article (International)

En ligne : Lien vers la ressource

Yong, M., Liang, J., Ballreich, J., Lea, J., Westerberg, B. D., & Emmett, S. D. (2020). Cost-effectiveness of School Hearing Screening Programs: A Scoping Review. *Otolaryngology--Head and Neck Surgery: Official Journal of American Academy of Otolaryngology-Head and Neck Surgery*, *162*(6), 826-838p. https://doi.org/10.1177/0194599820913507

« Objective: School hearing screening is a public health intervention that can improve care for children who experience hearing loss that is not detected on or develops after newborn screening. However, implementation of school hearing screening is sporadic and supported by mixed evidence to its economic benefit. This scoping review provides a summary of all published cost-effectiveness studies regarding school hearing screening programs globally. At the time of this review, there were no previously published reviews of a similar nature.

Data Sources: A structured search was applied to 4 databases: PubMed (Medline), Embase, CINAHL, and Cochrane Library.

Review Methods: The database search was carried out by 2 independent researchers, and results were reported in accordance with the PRISMA-ScR checklist and the JBI methodology for scoping reviews. Studies that included a cost analysis of screening programs for school-aged children in the school environment were eligible for inclusion. Studies that involved evaluations of only neonatal or preschool programs were excluded.

Results: Four of the 5 studies that conducted a cost-effectiveness analysis reported that school hearing screening was cost-effective through the calculation of incremental cost-effectiveness ratios (ICERs) via either quality- or disability-adjusted life years. One study reported that a new school hearing screening program dominated the existing program; 2 studies reported ICERs ranging from 1079 to 4304 international dollars; and 1 study reported an ICER of £2445. One study reported that school-entry hearing screening was not cost-effective versus no screening.

Conclusion: The majority of studies concluded that school hearing screening was cost-effective. However, significant differences in methodology and region-specific estimates of model inputs limit the generalizability of these findings. »

Economic Evaluations of Childhood Hearing Loss Screening Programmes : A Systematic Review and Critique

Article (Australie)

En ligne : Lien vers la ressource

Sharma, R., Gu, Y., Ching, T. Y. C., Marnane, V., & Parkinson, B. (2019). Economic Evaluations of Childhood Hearing Loss Screening Programmes: A Systematic Review and Critique. *Applied Health Economics and Health Policy*, *17*(3), 331-357p. https://doi.org/10.1007/s40258-018-00456-1

« Background: Permanent childhood hearing loss is one of the most common birth conditions associated with speech and language delay. A hearing screening can result in early detection and intervention for hearing loss.

Objectives: To update and expand previous systematic reviews of economic evaluations of childhood hearing screening strategies, and explore the methodological differences. Data Sources—MEDLINE, Embase, the Cochrane database, National Health Services Economic Evaluation Database (NHS EED), the Health Technology Assessment (HTA) database, and Canadian Agency for Drugs and Technologies in Health's (CADTH) Grey matters. Study Eligibility Criteria, Participants and Interventions—Economic evaluations reporting costs and outcomes for both the intervention and comparator arms related to childhood hearing screening strategies.

Results: Thirty evaluations (from 29 articles) were included for review. Several methodological issues were identified, including: few evaluations reported outcomes in terms of quality-adjusted life years (QALYs); none estimated utilities directly from surveying children; none included disutilities and costs associated with adverse events; few included costs and outcomes that differed by severity; few included long-term estimates; none considered acquired hearing loss; some did not present incremental results; and few conducted comprehensive univariate or probabilistic sensitivity analysis. Evaluations published post-2011 were more likely to report QALYs and disability-adjusted life years (DALYs) as outcome measures, include long-term treatment and productivity costs, and present incremental results. »

Global costs of unaddressed hearing loss and cost-effectiveness of interventions

Rapport (International)

En ligne : Lien vers la ressource

World Health Organization. (2017). *Global costs of unaddressed hearing loss and cost-effectiveness of interventions: a WHO report, 2017.* World Health Organization. 52p.

« Millions of people across the world continue to live with the adverse impacts of unaddressed hearing loss and lack access to required ear and hearing care services. While the impact of hearing loss on individuals and families is well established, there have been relatively few attempts to assess at its economic costs, especially in low- and middle-income countries and at the global level. This report provides an analysis of the global costs of hearing loss. It sets out different components of cost and, where feasible, attaches monetary values to such elements as direct market-price costs typically incurred by health-care systems for hearing loss, as well as costs that fall beyond the health system, e.g. for special educational support for hearingimpaired children. The report also highlights other aspects of cost, including the adverse impacts of hearing loss on the potential for individuals to contribute to the economy through participation in paid work. Finally, the analysis considers some of the broader societal impacts of hearing loss and the way in which they can be incorporated into estimates of global cost. The report also reviews evidence on the cost–effectiveness of interventions to address hearing loss and presents the main findings. »

A programme of studies including assessment of diagnostic accuracy of school hearing screening tests and a cost-effectiveness model of school entry hearing screening programmes

Rapport (Royaume-Uni)

En ligne : Lien vers la ressource

Fortnum, H., Ukoumunne, O. C., Hyde, C., Taylor, R. S., Ozolins, M., Errington, S., Zhelev, Z., Pritchard, C., Benton, C., Moody, J., Cocking, L., Watson, J., Roberts, S., Fortnum, H., Ukoumunne, O. C., Hyde, C., Taylor, R. S., Ozolins, M., Errington, S., ... Roberts, S. (2016). *A programme of studies including assessment of diagnostic accuracy of school hearing screening tests and a cost-effectiveness model of school entry hearing screening programmes* (Vol. 20). NIHR Journals Library. 177p.

« Background: Identification of permanent hearing impairment at the earliest possible age is crucial to maximise the development of speech and language. Universal newborn hearing screening identifies the majority of the 1 in 1000 children born with a hearing impairment, but later onset can occur at any time and there is no optimum time for further screening. A universal but non-standardised school entry screening (SES) programme is in place in many parts of the UK but its value is questioned.

Objectives: To evaluate the diagnostic accuracy of hearing screening tests and the cost-effectiveness of the SES programme in the UK.

Design: Systematic review, case–control diagnostic accuracy study, comparison of routinely collected data for services with and without a SES programme, parental questionnaires, observation of practical implementation and cost-effectiveness modelling.

Setting: Second- and third-tier audiology services; community.

Participants: Children aged 4–6 years and their parents.

Main outcome measures: Diagnostic accuracy of two hearing screening devices, referral rate and source, yield, age at referral and cost per quality-adjusted life-year. »

RESO - SERVICE UNIVERSITAIRE DE PROMOTION DE LA SANTE

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