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Prevention of communication disorders – screening pre-school and school-age children for problems with hearing, vision and speech: European Consensus Statement

Authors' Contribution:

- A** Study Design
- B** Data Collection
- C** Statistical Analysis
- D** Data Interpretation
- E** Manuscript Preparation
- F** Literature Search
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Summary

Background:

Communication is an integral part of human behaviour. Communication disorders are associated mainly with impairment in hearing, vision, and/or speech, which influences the ability to receive, comprehend, produce, and express verbal, nonverbal, and graphic information. When unrecognized and unmanaged, these very often “invisible” conditions can have a significant detrimental effect on a child’s development, affecting educational, social, and psychological progress.

Material/Methods:

A panel of experts discussed the screening of pre-school and school-age children for problems with hearing, vision, and speech during the 10th Congress of the European Federation of Audiology Societies (EFAS), held in Warsaw, Poland, on 22 June, 2011.

Results:

The European Consensus Statement on Hearing, Vision, and Speech Screening in Pre-School and School-Age Children was the result of the scientific discussions. It was endorsed by experts in audiology, otolaryngology, phoniatry, ophthalmology, and speech language pathology from throughout Europe*. Key elements of the consensus, as described herein, are: 1) defining the role of screening programmes in the identification and treatment of communication disorders; 2) identifying the target population; 3) promoting general awareness about the consequences of communication disorders; 4) recognizing the need for a quality control system in screening programmes; 5) encouraging cooperation among European countries to provide a high level of public health services for the prevention, identification, and treatment of communication disorders.

Conclusions:

The European Consensus Statement on Hearing, Vision, and Speech Screening in Pre-School and School-Age Children will encourage the appropriate authorities of the various countries involved to initiate screening for communication disorders in pre-school and school-age children.

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BACKGROUND

Communication is a complex human skill that combines physical and mental elements. Language and communication are crucial to all children and young people [1]. Modern society requires a high level of communication skills; speech, language, vision, and literacy are the foundation skills that are needed to meet these demands [2]. Dysfunction in one or more of these areas, for example, caused by various medical conditions, may lead to communication disorders. Communication disorders can involve impairment in hearing, vision and/or speech, which influences the ability to receive, comprehend, produce, and express verbal, nonverbal, and graphic information.

When untreated, communication disorders in childhood can result in further negative consequences, such as developmental delay in communication abilities and the normal acquisition of language. In turn, this can lead to limited educational achievement, reduced employment opportunities, and problems with social adaptation. Hence, early identification and intervention are essential [1] so that effective treatments can be undertaken before significant limitations develop. Effective and directed early detection, diagnosis, and treatment, as well as promotion, prevention, and education, can create better opportunities for children with communication disorders. Children who face difficulties in acquiring the ability to communicate require appropriate support to allow them to interact socially, to participate fully in education, and to lead safe, healthy lives [1]. High levels of communicative competence are essential for progress at school and work.

HEARING DISORDERS

The prevalence of hearing loss increases with age and may involve conductive hearing loss, acquired and delayed onset sensorineural hearing loss and/or auditory processing disorders that cannot be identified by neonatal hearing screening (NHS) [3,4]. Children with conductive hearing impairment can have either congenital or acquired middle ear pathology. Some forms of middle ear pathology, such as subtle middle ear abnormality with no apparent hearing loss and otitis media with effusion, are usually insidious and difficult for parents or care givers to detect. Sensorineural loss can result from inner ear defects or auditory nerve damage. Known causes of acquired sensorineural hearing loss include viral and bacterial infections, ototoxicity, and head trauma. Noise-related hearing impairment can also pose a serious health problem to children [5]. Auditory processing disorders seen in children can result from neuromorphological disorders, maturational delay of the central auditory nervous system, and neurological disorders [6].

It is estimated that 9–10 per 1000 children will have identifiable permanent hearing loss in one or both ears by school age [7]. Moreover, there is evidence that children with unrecognized and unmanaged unilateral hearing loss or minimal bilateral hearing loss have significant speech-language delays, negative educational consequences, and behavioural problems [8–12]. Thus far, screening programmes for hearing at schools have been offered mostly as local initiatives in the USA [13,14], Australia [15], China [16], and some European countries [17–19].

VISION DISORDERS

According to the World Health Organization, approximately 153 million people worldwide are visually impaired as a result of uncorrected refractive errors. This population includes children [20,21]. There is no doubt that problems with visual ability have considerable impact on a child's learning potential, and that severe uncorrected refractive errors affect general development, resulting in lower educational achievement and impairing learning ability [22]. Normal visual acuity is of particular importance, especially at the beginning of school education. Given the number of visual activities that are performed at close range at school and at home, the assessment of near and distance vision is critical. Refractive errors – hyperopia and myopia – are age-dependent. Hyperopia is typical of infants, and decreases gradually towards emmetropia [23]. Early development of emmetropia is a risk factor for the occurrence of myopia. Significant uncorrected refractive errors in childhood can result in amblyopia, developmental delays, and problems with spatial orientation [24]. Significant hyperopia in toddlers and schoolchildren may lead to educational difficulties and problems with mobility [22,25,26]. In cases of severe hyperopia, the constant accommodation effort that is required to overcome uncorrected hyperopia in near vision activities can result in strabismus at any age [27], together with headache and eye discomfort [28].

Information is not available in the literature on the screening programmes for vision that are offered in schools in Europe. Data from the USA indicate the need for interventions to correct decreased visual acuity in students in the first grade [29].

SPEECH/LANGUAGE DISORDERS

Speech and language development should be consistent with a child's overall development and is related to success at school [30,31]. Speech and language difficulties and abnormalities cover a wide range of childhood conditions. Speech disorders refer to difficulties in the expression of speech sounds or problems with voice quality. Language disorders are impaired ability to understand and/or to use words in context, both verbally and nonverbally. Speech and language problems can result from global developmental conditions, or they can occur in a normal developmental course and have no obvious cause [32]. Although speech and language disorders are differentiated, they are highly comorbid [33], and children with speech disorders often have complex health and developmental needs [34]. The prevalence of childhood speech disorders varies, depending on the methodology used to measure it [35]. Shriberg et al. [36] reported that approximately 15% of children with persistent speech disorders also have a language disorder, and approximately 5% of children with specific language impairment experience difficulties with speech. Early identification and intervention in children with speech/language disorders assist with educational planning and are often associated with better long-term outcomes [37,38]. However, it is not clear how consistently clinicians screen for speech and language disorders in primary care practice [39], and there is no uniformly accepted screening technique [40].

PAEDIATRIC HEALTH PROGRAMMES

Paediatric health programmes are intended to provide equal opportunities for children to develop [41]. The major purpose

of a paediatric health programme is to provide primary care for sick children, as well as preventive care, by maintaining, improving, and promoting the health of the child [42,43]. One of the fundamental health services in paediatric care is the appraisal of health by routine evaluation at specified intervals, at specific stages of growth and development, such as before beginning school [44]. Screening for problems with hearing, vision and speech/language functions, and associated conditions, throughout infancy, childhood, and adolescence, should be recommended as a part of preventive paediatric health care [45]. The objective of screening programmes for hearing, vision, and speech impairment is to identify communication disorders, which in many cases are not obvious or apparent, but may hinder a child's ability to communicate and which can be treated more effectively when detected at an early stage. This is particularly crucial for children, whose good health is fundamental for their proper development and influences their quality of life and social and economic situation in the future. In a child, a breakdown in communication may cause the development of abnormal social growth and behaviour, interfere with education and human potential, and lead to the development of adjustment problems in children and their families. Hence, the impaired child's requirements for adequate health care, whether physical, developmental, emotional or social, should be identified as promptly as possible. Such needs should be brought to the attention of the parents and other care givers [46].

Key point 1: Screening programmes have great potential to enable effective identification and treatment of hearing, vision, and speech/language disorders in at-risk children and to remediate detrimental effects for both the individual and society.

Communication disorders in children should be identified by screening as early as possible. Entry into school is the last opportunity to detect the problem in order to avoid or reduce its negative impact on language and the cognitive development of children. This is endorsed by the fact that hearing, vision, and speech disorders are significant reasons for delay in learning and for difficulties in the acquisition of language skills, which are crucial for children if they are to communicate effectively. Given that a child develops particular skills and abilities gradually through their entire childhood in physiological steps and in a defined order, this process should be controlled and checked periodically. Hence, hearing, vision, and speech/language should be screened at critical stages of development [47]. Furthermore, a health-promoting elementary school environment was recognized as one of four targets for preventive environment, as an outcome of the European Community Health Indicators (ECHI) Project supported by the European Commission [48].

Key point 2: The primary target population for pre-school and school-age screening of hearing, vision, and speech is all children aged 4–7 years. In addition, students in higher grades can also be screened.

SCREENING PROGRAMMES FOR COMMUNICATION DISORDERS

As with any mass-screening programme, there are many challenges that can affect the success of a programme of screening for communication disorders. These challenges may be related to the physical characteristics of the screening facility, the methodological factors used (procedures, tools,

methods), the agency that requests the services (staff cooperation, state regulations), and administrative constraints (availability of personnel, budgetary factors). Success will be strongly influenced by the logistics and quality of the testing system, as well as the competence of the personnel who perform the screening procedures. Another critical issue is the follow-up system for those who are positive on screening. It is very important to organize the programme in a way that does not result in large numbers of repeat screens and referrals, owing to the costs involved in conducting large-scale screening projects. An appropriate tracking system must be implemented to secure an adequate follow-up rate.

Key point 3: There is a need to increase awareness among policy makers, health care professionals, and the general public of the consequences of communication disorders, as well as the crucial role of early detection and intervention in cases of impairment of hearing, vision, and speech in children.

Key point 4: A system of quality control is an essential component of a pre-school and school screening programme. It is necessary that all personnel who are involved in screening have adequate training and instruction in order to acquire and maintain the appropriate skills.

PUBLIC HEALTH SERVICES IN EUROPE

Health is central to people's lives and needs to be supported by effective policies and actions at the European Community and global levels [49]. Public health services have a vital role to play in meeting the health challenges that Europe faces. The governance of public health in Europe is complex and multifaceted. The organization and delivery of public health services involves many distinct institutions and professions within the health sector. There are also differences in general health within and between EU Member States, which are related to various factors, including differences in education, socioeconomic situation, living and working conditions, health-related behaviour, and health care. Furthermore, there have been significant changes in health care systems during recent years, in part as a result of the rapid development of new technologies such as information and communication technologies (ITC) and the E-health strategy [49]. This dynamic situation requires the continued interest and commitment of EU Member States, as well as the maintenance of an expert facility linked to the Commission that can coordinate and guide the process. For these reasons, the European Commission's Health Monitoring Programme [50] was established to:

1. Measure health status, its determinants, and the trends therein throughout the Community;
2. Facilitate the planning, monitoring, and evaluation of Community Programmes and actions;
3. Provide Member States with appropriate health information to make comparisons and support their national health policies.

According to a set of specific guidelines formulated by the Child Health Indicators of Life and Development (CHILD) project and the (ECHI) project [48,51], which were developed under the Health Monitoring Programme, cooperation among European countries is essential in order to apply new methods of assessment of child health in screening programmes for pre-school and school-age children and to ensure the appropriate adjustment of public health services.

Key point 5: To provide a high level of public health services, there should be cooperation among European countries by means of the exchange of knowledge and good practice, continuous improvement of methods and procedures, introduction of e-Health tools, and creation of national and European databases.

CONCLUSIONS

In the context of the above statements, the representatives of the European societies of audiologists and phoniatricians, ENT (ear-nose-throat) physicians, ophthalmologists, psychologists, and speech therapists endorsed the European Consensus Statement and presented the following opinions. The European Consensus Statement on Hearing, Vision and Speech Screening in Pre-School and School-Age Children determined that:

1. Screening programmes have great potential to enable effective identification and treatment of hearing, vision and speech/language disorders in at-risk children and to remediate detrimental effects for both the individual and society.
2. The primary target population for pre-school and school-age screening of hearing, vision, and speech is all children of age 4–7 years. In addition, students in higher grades can also be screened.
3. There is a need to increase awareness among policy makers, health care professionals, and the general public of the consequences of communication disorders, as well as the crucial role of early detection and intervention in cases of impairment of hearing, vision and speech in children.
4. A system of quality control is an essential component of a pre-school and school screening programme. It is necessary that all personnel who are involved in screening have adequate training and instruction in order to acquire and maintain the appropriate skills.
5. To provide a high level of public health services, there should be cooperation among European countries by means of the exchange of knowledge and good practice, continuous improvement of methods and procedures, introduction of e-Health tools, and creation of national and European databases.

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