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Uptake, referral and attendance: results from an inner city school based vision screening programme

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Abstract

Aim: **To review the children's school vision screening service in order to investigate the uptake, referral pattern and follow-up attendance.**
Methods: **The children were screened in school. The vision screening results of the children screened in the academic year 2011–2012 were reviewed for both uptake of screening and subsequent attendance for the follow-up assessment. Attendance outcomes from children referred to an optometrist of their choice and also those children referred to the Hospital Eye Service (HES) were reviewed.**
Results: **Of the 5786 children eligible for vision screening in school 5409 were screened (96.7%). A total of 866 (16%) of children were referred for further investigation; 534 (9.87%) were referred to an optometrist of their choice and 332 (6%) were referred to the Hospital Eye Service (HES). 479 (55.3%) attended the first appointment sent. 114 (34.4%) failed to attend (FTA) the HES and 257 (48.13%) failed to attend their local optometrist. Recall appointments for the HES yielded a 10.54% increase in coverage and recall appointments sent to attend local optometrists yielded a 14.23% increase in coverage.**
Conclusions: **Vision screening in school provides the opportunity for universal coverage. However, the failure to attend for follow-up both in the community and in the Hospital Eye Service (HES) suggests that a high proportion of children fail to benefit from appropriate treatment. Further research is required to provide an insight into the reasons for failing to attend that subsequently limit access.**

Key words: Attendance, Uptake, Vision screening, Visual acuity

Introduction

Screening has been defined as 'the systematic application of a test or inquiry, to identify individuals at sufficient risk of a specific disorder to warrant further investigation or direct preventive action, among persons who have not sought medical attention on account of symptoms of that disorder'.[1] Screening programmes can be an effective method of reducing morbidity and mortality from disease by detecting it before symptoms occur, and over 300 screening programmes currently exist in the UK.[2] Screening uptake refers to the proportion of persons eligible to be screened within a population who have been both invited for screening and have also received the screening procedure during a specified period.[3] The uptake of screening programmes is not however consistent,[4] and the use of screening services varies among different population groups and in different localities.[5]

The current recommendations for vision screening is for children aged four to five years to be screened on school entry by an orthoptist or orthoptic trained personnel.[6,7] The recommendation that children are screened in school is based on evidence demonstrating poor attendance at pre-school vision screening programmes.[8–10] Screening at school was undertaken both to ensure up-take – a captive population – and to reduce demand on parents. This study reports the uptake and the attendance rate for follow-up treatment of an orthoptic school based vision screening programme of four to five year old children in inner city Bradford.

Methods

A retrospective analysis of the children screened in school during the academic year 2011–2012 in Bradford was undertaken. The screening assessment consisted of visual acuity (VA) using Keeler crowded logMAR, cover test, ocular movements and auto refraction using SureSight Vision Screener (Welch–Allyn. Inc. Skaneateles, NY). Children absent from school on the day screening takes place are either assessed on a return visit or a letter is sent to the parents/carers advising that the child has missed the assessment and to arrange a routine optometric examination.

Stata version 10.2 was used for statistical analysis. A Kruskal–Wallis test was performed to explore if attendance varies with the type of condition found at screening.

Referral pathway

Children found to have a VA of better than or equal to 0.2 logMAR and no strabismus passed the screening and were not further assessed. Children with a VA of poorer than 0.2 logMAR and better than 0.7 logMAR were given a letter to attend a local optometrist of their choice for a cycloplegic refraction, the results of which we requested the optometrist to return. After 6 months

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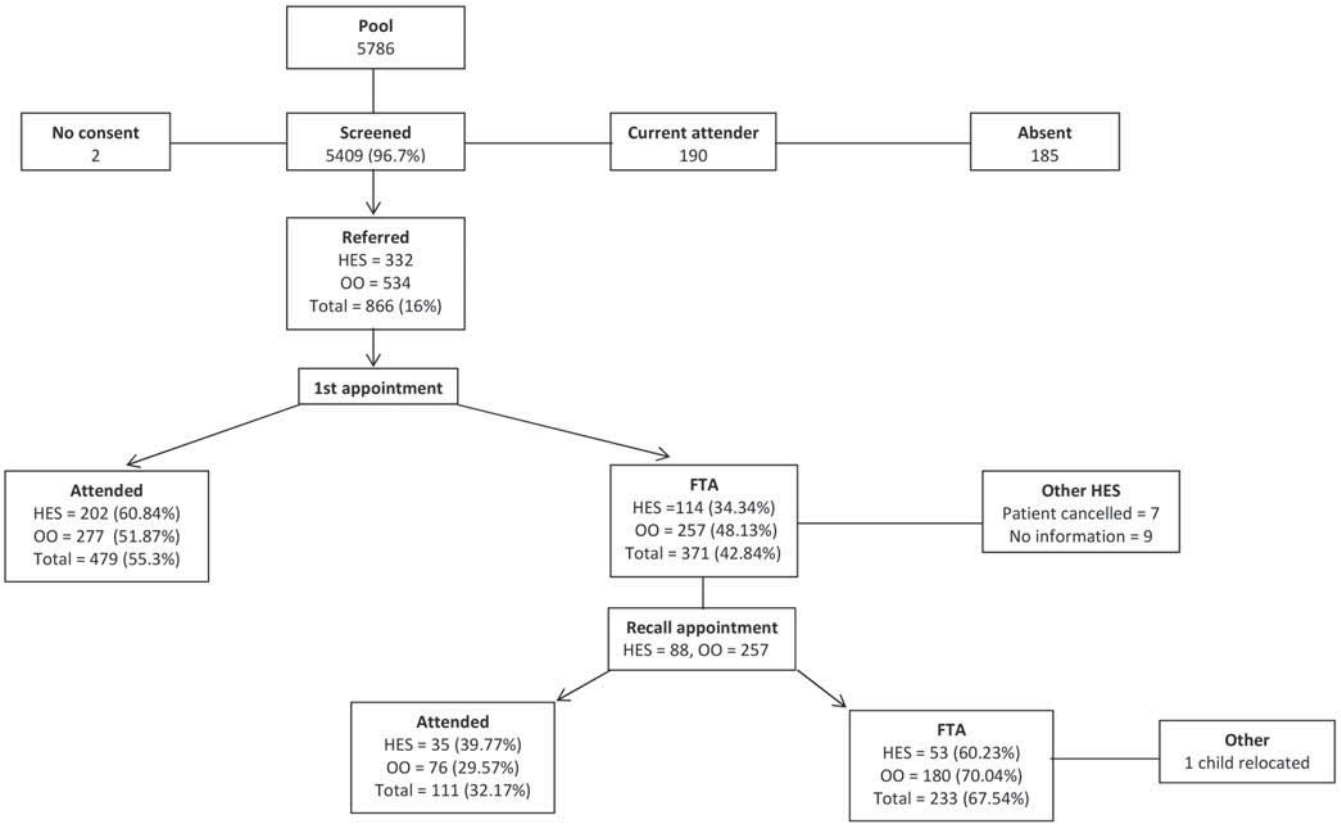

Fig. 1. Flow chart of referrals from the school vision screening programme. HES = hospital eye service, OO = local optometrist, FTA = failed to attend.

Table 1. Coverage of vision screening referrals to Hospital Eye Service 2011–2012

Appointment	Referred	Attended	Absenteeism (%)	Coverage (%)
Screened		5409		
First appointment	332	202	39.16%	60.84%
Recall	88	35		10.54%
Total	332	237	28.61%	71.39%

Table 2. Coverage of vision screening referrals to local optometrists 2011–2012

Appointment	Referred	Attended	Absenteeism (%)	Coverage (%)
Screened		5409		
First appointment	534	277	48.13%	51.87%
Recall	257	76		14.23%
Total	534	353	33.90%	66.10%

reminder letters were sent to the parents if the refraction result was not returned by the optometrist. Children found to have a strabismus, pathology or VA poorer than or equal to 0.7 logMAR were referred directly to their local hospital eye service (HES), Bradford Teaching Hospitals Foundation Trust.

Results

Of the 5786 children, 190 already attended either the HES or their own optometrist for treatment. There were therefore 5596 children eligible for vision screening in school, 185 children were absent from school and the parents of 2 children declined consent for vision screening, therefore in the academic year 2011–2012 5409 (96.7%) children were screened in school by the orthoptist. A total of 866 (16%) children were referred for further investigation; 534 were referred to an optometrist of their choice and 332 were referred to the HES (Fig. 1).

Of the 866 children referred from vision screening 479 (55.3%) attended the first appointment sent. 371 (42.84%) failed to attend and of these 345 were sent a recall appointment. 111 (32.17%) attended the recall appointment. The details of the referral pathway for both the HES and the local optometrists are individually detailed in Fig. 1 and Tables 1 and 2. The recall appointments sent to attend the HES yielded a 10.54% (60.84% to 71.39%) increase in coverage (Table 1) and the recall appointments sent to attend the local optometrists yielded a 14.23% (51.87% to 66.10%) increase in coverage (Table 2).

Of the 332 children referred to the HES, 115 had reduced VA in either one or both eyes without strabismus, 170 had either a manifest or latent strabismus, 18 had an ocular motility disorder (e.g. Brown's or Duane's syndrome) and 22 children did not complete the vision screening test in school and required a more detailed eye examination. Details of the condition type found on vision screening and attendance rate are

Table 3. Characteristics of children referred into the Hospital Eye Service (HES) from the four to five year old school vision screening programme

Group	Condition	Number (%)	Attendance[a]
1	Reduced visual acuity	115 (34.6)	86
2	Strabismus (inter/man)	170 (51.2)	119
3	Did not complete	22 (6.6)	15
4	Ocular motility disorder	18 (5.4)	11
5	Other[b]	7 (2.1)	6
	Total	332 (100)	237

[a]Attendance includes both first and recall appointments.
[b]'Other' refers to conditions such as nystagmus and ptosis.

Table 4. Uptake rates for published vision screening programmes

Study	Description of study	No. (%) screened
Jarvis *et al*. 1990[8]	Health Visitor (HV) pre-school screening	743 (59)
Jarvis *et al*. 1990[8]	HV, GP, CMO pre-school screening	812 (84)
Milne 1994[9]	Primary orthoptic pre-school screening	1858 (61)
Williamson *et al*. 1995[10]	Primary orthoptic pre-school screening	8142 (57)
Mulley 2000[14]	Primary orthoptic pre-school screening	917 (67)
Bruce and Outhwaite, present study	Primary orthoptic school screening	5409 (97)

presented in Table 3. On analysis of the failure to attend rate between the five referred groups no significant difference was found ($p = 0.55$) (Table 3).

There were 77 (1.4%) children referred to the HES classified as visually impaired using the WHO definition of visual impairment caused by uncorrected or inadequately corrected refractive errors with the presenting VA in the better eye poorer than 0.4 logMAR (6/18 Snellens).[11]

Discussion

High rates of uptake need to be attained if screening programmes are to have a significant impact in reducing mortality and/or morbidity from the target condition. Rates of uptake and coverage vary widely according to the type of screening: e.g. new-born screening for neonatal metabolic disorders is 95–100%[12] while other programmes such as colorectal and cervical cancer screening have more variable uptake rates.[13] One of the most important factors affecting the effectiveness and efficacy of a screening programme is the participation of the target group. In this study this includes the children as participants and parents/carers who must act on the results of the screening assessment. Data obtained from the Bradford vision screening programme demonstrates an almost universal uptake in the school based vision screening programme with nearly 97% of the available population being screened. This is an improvement on previously published results of pre-school vision screening in this same locality, reporting 67% uptake.[14] It is also higher than other areas where pre-school vision screening attendance has been reported (Table 4). The provision of vision screening in the school setting, which in Bradford is an opt-out programme, clearly provides the opportunity to maximise uptake.

The success of the coverage of the Bradford visual screening programme, identifying visual status in four to five year old children in mainstream schools is, however, diminished by the low level of attendance for follow-up assessment, both in the community at locally based optometrists, with 48.13% not attending, and similarly at the hospital eye service (HES) with 34.34% failing to attend appointments. A high proportion of children are therefore being denied access to health services and subsequently appropriate treatment. The reasons for this level of non-attendance are not known.

The World Health Organisation (WHO) has revised their definition of visual impairment (VI). The original definition defines the level of vision as 'best-corrected' i.e. VA obtained with the required refractive correction.[15,16] However, in order to recognise a significant underestimation of the prevalence of VI caused by uncorrected refractive error the definition was revised to 'a presenting vision as defined by the VA in the better eye using currently available refractive correction, if any'.[11] The prevalence of visual impairment (1.4%) found in this study is similar to that found in a study of six to seven year old children in Northern Ireland.[17] The implication of low levels of attendance combined with a 1.4% prevalence of VI in the community is that a significant number of children will be visually impaired despite having a potentially treatable condition.

Attendance rates in Bradford were low in both the community and the hospital setting. Children referred from the vision screening to the local optometrist are given a letter requesting the parent/carer to attend a local optometrist of their choice. Bradford has one of the highest number of optometry practices per square mile in the UK; accessibility of an optometry practice is therefore unlikely to be an obstacle to attendance.

In a study of adults exploring access to community optometry services, cost was shown to be a factor deterring adults from accessing these services.[18] The referral letter used in the Bradford school vision screening programme clearly states that eye tests are free for children; it is therefore unlikely that cost is the factor limiting attendance.

The failure to attend (FTA) rate to the local optometrist is based on the absence of refractive information returned to us by the optometrist. It is possible that the optometrists have carried out refraction but not forwarded the result. The school screening scheme has been running for over 10 years and the local optometrists are supportive of this service and a number of other local shared care schemes. Where a result is not forwarded within 6 months we send a reminder letter to the parent; this generated an additional 14.23% coverage (Table 2). As we do not have information of which optometrist a child has been taken to it is not possible to conclusively determine if patients are being managed by their own optometrist without our knowledge and this may have influenced the higher FTA rate to local optometrists.

The attendance rate for referrals to the HES is also poor but is similar to previous studies reporting attendance in the elderly population accessing ophthalmic services.[19] The introduction of direct booking

systems to hospital services should provide patients with improved choice, this has been shown to improve attendance for audiological services.[20]

Of the children referred to the HES, 170 (51%) had either a constant manifest or an intermittent deviation. The deviation may have been more apparent to the parents/carers than the presence of a refractive error however, and no significant difference was found in attendance between the children with strabismus or those with reduced vision.

Little is known as to the reasons that limit access to and prevent participation in health care, particularly in the field of ophthalmology. The Avon Longitudinal Study of Parents and Children (ALSPAC) found socio-economic factors influenced access to children's eye care services.[21,22] The ALSPAC population mainly comprised of white British participants and therefore the effect of ethnicity and cultural diversity were not able to be rigorously explored and cannot be transferred to the Bradford population. Bradford is the fifth largest metropolitan area in the UK and home to the eighth most deprived health community. Around 50% of the 6,000 babies born in the city each year are of South Asian origin.

A study examining participation in health promotion activities in Manchester found population movement contributing to non-participation.[23] The King's Fund[24] reported a higher level of dissatisfaction with NHS services amongst ethnic minority groups, but factors such as health and socio-economic deprivation did not fully account for the differences in access to care. A review of adherence to treatment[25] highlights patients' health beliefs as being important in influencing their decisions regarding compliance. Different ethnic groups may have distinct perceptions of disease, causality and prevention that may not reflect those defining the provision of healthcare.[26]

Studies on the uptake rate of screening programmes have shown participants' knowledge and perceptions of the symptoms and risks of the disease, as well as the nature of the screening process and the consequences of the test results, affect uptake in screening programmes.[27] Apathy, lack of a perceived need or concern and the ease of the procedure are factors reported by participants to act as barriers towards screening.[28,29] In contrast, research has also shown that personal or family experiences of the target disease or screening programme may motivate people to attend for screening.[30]

Consequently, a wide range of factors influence the decision to attend for screening and follow-up treatment, including: socio-demographic characteristics, knowledge of the disease or the screening programme; attitudes and beliefs; social influences of friends and relatives; and any previous history of disease. The model and organisation of the service, and the knowledge, attitudes and practice of the provider may also influence the uptake of screening programmes.[31,32]

Screening in school does minimise inconvenience to the child and family, but the family are required to actively participate if referral is required. This may explain why uptake at school vision screening is high in comparison to pre-school screening programmes with subsequent poor follow-up attendance for treatment.

Conclusion

Further evidence is required to provide an insight into the reasons limiting access to and non-participation in eye health care. Knowledge of why people do not access ophthalmic services would allow strategies to be put in place to redesign services, e.g. providing services in an easily accessible location such as school, or provide target information for certain groups. This evidence would influence service provision both in the community and in the HES and a revised service model/models could be recommended with the aim of reducing inequalities to access and improving participation in health care.

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