

An Exploration of Whether an Intervention at the Primary School Level Is an Effective Way to Improve Asthma Management by Staff in Primary Schools in Haringey, London

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Abstract— Background: Asthma is the most common long-term health condition in children. It affects 1 in 11 primary school children in the UK and causes significant morbidity and mortality. The NHS spends over £137m on asthma-related hospital care each year and in 2016, 11 children in London died as a result of an asthma attack. Novel methods of improving asthma outcomes are being explored, and schools may be an under-utilised point of intervention in this field.

Aim: To determine whether implementing a set of standards and providing training in primary schools is an effective way to improve staff knowledge and confidence in managing asthma.

Methods: Interviews were carried out with newly designated ‘Asthma Leads’ in four primary schools in Haringey and asthma training was provided to all staff. Questionnaires were sent to staff before and after the intervention to evaluate knowledge of asthma management in schools.

Results: 107 questionnaires were completed in total. Asthma prevalence was found to be lower than expected, ranging from just 2.5-5.8% of children. Staff knowledge and confidence improved in the two schools which completed the program within the project timeframe.

Conclusion: Pre-intervention questionnaires identified a gap in staff knowledge of asthma management. An improvement in scores on post-intervention questionnaires suggests that this gap can be addressed by the intervention and that primary schools are a key setting in which asthma management can be improved. Following this project, we aim to extend the intervention into other primary schools in Haringey through joint working between schools and the local authority.

Index Terms—Asthma, Education, Local Authority, Primary schools

I. INTRODUCTION

Asthma represents a huge burden in the UK, costing the NHS approximately £1.1 billion each year^[1]. £137m of this spending is on hospital care, a large proportion of which could be avoided with proper management of asthma at a basic level^[2]. The National Review of Asthma Deaths (NRAD) found that the UK has some of the poorest outcomes for children with asthma in Europe, and that London in particular has disproportionately high rates of morbidity and mortality for children with asthma^[3].

The majority of asthma care takes place in a primary care

setting. However, a child in the UK is admitted to hospital with asthma every 20 minutes^[2]. A large proportion of these admissions could potentially be avoided with improved management of asthma, both in primary care and in the community. The NRAD found that 45% of the people who died from asthma in the study did not call for or receive help during their final asthma attack^[3].

Despite significant advances in asthma treatment, childhood asthma morbidity and mortality remain high^[4]. Improvements can be made in many aspects of asthma care, and increased understanding of asthma, its risks and how it can be managed effectively is vital – particularly in children and those who care for them.

A literature review carried out by Al Aoolo *et al.* in 2014^[5] investigated the evidence to support asthma management in primary schools. This review identified several themes which were common to successful asthma improvement programs in primary schools, including health promotion, teaching and economic principles.

The most successful programs reviewed by the study shared common themes. The most effective interventions combined a sustainable approach with long-term planning and efficient use of available resources. This ensured that the asthma programs were effective over a long period and minimised the overall investment required.

One example of a successful program is the ‘Asthma Friendly Schools Project (AFSP)’ in Islington, which demonstrates effective collaboration between healthcare and education. The authors of this project were guided by advice from the AFSP team, who successfully worked with schools in Islington to reduce school absence rates, indicating improved asthma control^[6].

Barriers to the implementation of school management schemes have been discussed in several studies. One hurdle is engaging schools initially, since schools are busy with administration and it is difficult to incorporate asthma teaching into the school curriculum. Another challenge to the implementation of asthma programs in London is the lack of funding for school nurses^[7]. For example, at the time of the project Haringey had less than 10 full-time school nurses providing care for over 70 schools. This makes it difficult for nurses to provide consistent care and to recognise worrying signs, such as a child needing to use their reliever inhaler excessively.

The Healthy London Partnership is a collaboration

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between the NHS, Public Health England, the London Mayor and several other organisations to promote public health in London. Part of their work towards improving asthma care involved putting together a 'London Schools' Guide for the Care of Children and Young People with Asthma' (LSG). This is a set of guidelines for schools outlining five 'gold standards' in terms of asthma care which schools should aim to achieve^[7]. The main hypothesis of this project is that the implementation of the five standards outlined by the 'Healthy London Partnership' in primary schools is an effective way to improve the confidence of staff in their ability to recognise and manage a child having an asthma attack.

Objectives:

- A. To conduct interviews with newly designated 'Asthma Leads' in each school and work collaboratively with the school to meet standards as outlined by the Healthy London Partnership in 2016^[8].
- B. To provide formal asthma training at each school
- C. To investigate staff understanding of asthma and their confidence in managing an asthma attack.
- D. To investigate staff knowledge of school policy and school resources related to asthma.
- E. To raise awareness of the Asthma Friendly School Project (AFSP) in Haringey and promote asthma management in schools, with advice and guidance from the Islington AFSP team^[6].

This project is considered an audit and service improvement project within the Public Health department at Haringey Council. This is classed by the UCL Research and Ethics Committee to be a Service Evaluation^[9], so no formal ethical approval was required or sought. However, every effort was made to respect the identity of respondents to the questionnaire. Participants were assured that confidentiality would be maintained to ensure that respondents felt able to answer as honestly as possible.

II. METHODOLOGY

The NRAD shows that London has disproportionately poor outcomes for children with asthma, with North London having particularly low rates of diagnosis and high rates of morbidity and mortality^[3]. Haringey is the sixth most deprived borough in London and has a population of 267,541, approximately 18.9% of which are aged 0-14^[10]. This study was based in four primary schools in the borough of Haringey. Each school takes students from age 4 to 11, with the number of pupils at each school ranging from approximately 200 to 620.

The authors worked with the 'Healthy Schools Officer' from Haringey Public Health to identify which schools would be most likely to engage and act as initial 'champions' for the project. Once the project is more established in the borough, the aim is to move to a more needs-led approach. There are 76 schools in the borough of Haringey, fifteen of which were

identified as 'engaged' with Public Health and contacted initially by email. Five schools then expressed an interest in the project, one of which subsequently decided that the Asthma Lead did not currently have sufficient time to devote to the project. The authors were able to engage with and conduct the study in four primary schools.

The primary aim of this project was to implement the five key 'Asthma Friendly' standards provided by the 'Healthy London Partnership'^[8].

This involved providing whole-school asthma training. Basic asthma resources were given to schools, including an asthma policy, register, 'emergency kits' and individual asthma plans.

With these simple standards, primary schools could help to reduce preventable asthma admissions and deaths through collaboration between schools, healthcare and the local authority. The asthma training was provided to over 85% of staff at each of the primary schools in the study and newly-assigned 'Asthma Leads' assisted with implementation of the other four standards.

This has several potential benefits for children^[7]:

- 1) *Improved attendance*
- 2) *Improved academic achievement*
- 3) *Improved participation in physical activities*
- 4) *Reduced asthma complications & deaths*

First, schools were contacted with an initial telephone call to highlight the importance of the project to the school, explaining what it involves and the benefits it could potentially bring to the school. Initial interviews involved discussion with the Asthma Lead to evaluate current asthma policy using the LSG^[7].

Throughout the interview, every effort was made to emphasise to the Asthma Leads that the 'Asthma Friendly School' project is not a test or an official audit, but rather a collaborative effort between healthcare providers, the local authority and the school to make schools as safe as possible for children with asthma. Following the interview, a set of recommendations was emailed to the Asthma Lead, outlining in detail the steps which needed to be taken for the school to be awarded the "Asthma Friendly School" status. This email also included other positive comments and advice from the visit.

Staff asthma training was carried out to ensure that schools were able to meet the standard which requires 'at least 85% of the school staff [to have] formal asthma training'.

The aim of the training was to review the basics of asthma management and to ensure that a teacher would be able to react appropriately in the event of a child having an asthma attack.

The structure of the presentation was as follows:

- 1) *Introduction and the background of the project*
- 2) *The basic pathophysiology of asthma, causes and triggers*
- 3) *How to recognise and react to a child having asthma*

attack

4) Types of medication – differences between ‘relievers’ and ‘preventers’

5) The importance of using a spacer

6) Key resources – using a child’s Asthma Plan and the ‘TIME’ poster

7) Benefits of good asthma management.

A pre- and post-intervention audit of each school used questionnaires to evaluate staff knowledge of asthma management. Questions 1-5 assess staff ability to manage an asthma attack while questions 8-12 test staff knowledge of school processes related to asthma.

The questionnaire responses represented by figures (3) and (4) are below:

1. I am confident I can recognise the signs of an asthma attack
2. I am confident of the procedure to follow if a child is having an asthma attack
3. I am confident I know which children in my school are asthmatic or where to find this information
4. I am confident I know the difference between a ‘preventer’ (brown) and ‘reliever’ (blue) inhaler
5. I know what a spacer is and how to use it
8. I know where the school asthma policy is kept
9. I know where the school Asthma Emergency Kits are kept
10. I know who the school Asthma Leads are
11. I have received formal Asthma Training
12. I know where to find a student’s Personal Asthma Action Plan

The results of the questionnaires were analysed using descriptive statistics. The results were displayed using stacked bar charts to illustrate the spread of the data. The Kruskal-Wallis test^[11] was used to investigate the ability of different roles within the school staff to react in the event of an asthma attack.

III. RESULTS

Throughout this project, information about schools’ asthma resources was gathered through interviews with the Asthma Leads at each school and via questionnaires given to members of staff before and after the intervention. Figures 1 and 2 show which of the five standards were met in each school before and after the intervention. None of the schools met every standard before the visit, and all schools showed significant improvement at follow-up. Schools A and D completed every standard and achieved the ‘Asthma Friendly School’ status.

Figure 1: Findings at initial interview

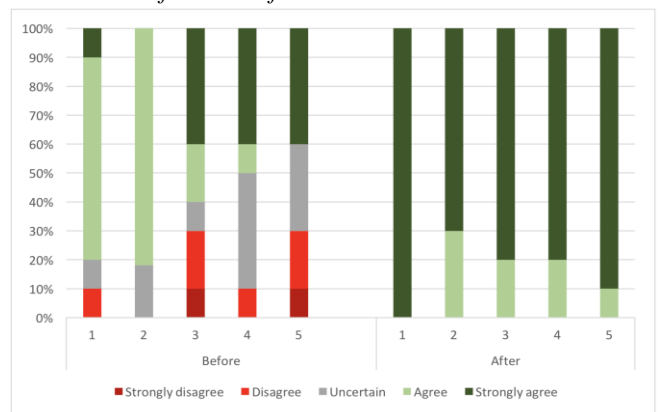
	School A	School B	School C	School D
Policy	X	X	X	✓
Register	✓	X	✓	✓
Emergency Kits	X	X	X	X
Asthma Plans	X	X	X	✓
Training	X	X	X	X

Figure 2: Findings at follow-up interview

	School A	School B	School C	School D
Policy	✓	✓	✓	✓
Register	✓	✓	✓	✓
Emergency Kits	✓	✓	✓	✓
Asthma Plans	✓	✓	✓	✓
Training	✓	X	X	✓

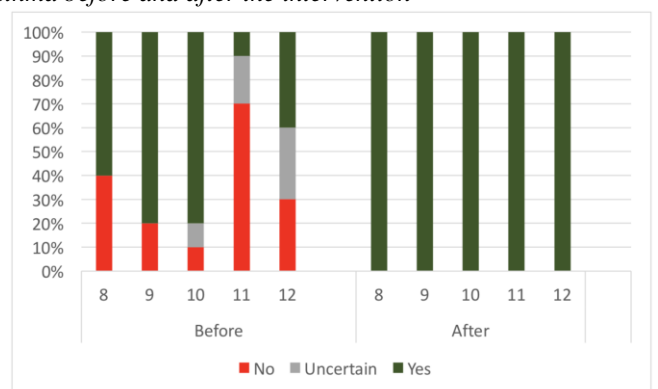
Pre-intervention, 36% of staff felt uncertain of the procedure to follow in an asthma attack. Post-intervention, 100% of staff agreed that they were confident in managing an asthma attack, as illustrated by figure 3.

Figure 3: Confidence of staff to react in the event of an asthma attack before and after the intervention



There is a lack of staff knowledge of asthma management in schools, as demonstrated by figure 4. The staff responsible for children when they are exercising and most susceptible to asthma were found to have some of the lowest scores - only 20% knew which children were asthmatic before the intervention.

Figure 4: Staff knowledge of school processes related to asthma before and after the intervention



Since the data is non-parametric and compares more than two staff roles, analysis was carried out using the Kruskal-Wallis test^[11]. It was carried out using SPSS, and demonstrated that for questions 1, 2, 4 and 5 there was not a statistically significant difference between the different staff roles. However, for question 3 (asking teachers whether they knew the difference between reliever and preventer medication) the p-value is 0.046, marginally within the range considered statistically significant.

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Without exception, every respondent is now familiar with the school's process in relation to asthma attacks and every respondent had received formal asthma training. The number of respondents familiar with the location of the asthma policy and those knowing where to find a student's personal asthma plan showed a marked increase. All respondents know where the emergency asthma kits are kept. The results demonstrate that staff now have a high level of confidence in the process to follow to effectively manage an asthma attack.

IV. DISCUSSION

There is a lack of staff knowledge in schools of how to recognise asthma symptoms and how to manage a child having an asthma attack. The staff responsible for supervising children when they are exercising and most susceptible to asthma were found to have some of the lowest scores, and only 20% knew which children were asthmatic before the intervention.

Several schools in Haringey lack basic asthma resources such as an asthma policy, register, 'emergency kits' and individual asthma plans. Interviews with a newly assigned 'Asthma Lead' role within the school are an effective way to implement these. The HLP London Schools' Guide is a useful and effective resource, both for researchers conducting interviews and the new 'Asthma Lead' in each school.

Prevalence of asthma in children in Haringey is unusually low, at approximately 2.5- 5.8% in the schools surveyed^[12]. This supports the most recent statistics showing that Haringey has disproportionately low asthma prevalence, and further research is needed to investigate possible reasons for this.

Whilst the findings of this study are positive and support extending the project across the borough of Haringey and potentially further, they must also be viewed in context. This study includes four of the most responsive and engaged schools in Haringey, and even with these schools a significant time commitment was required to arrange visits and training sessions.

It is also important to acknowledge that this study has focused on staff members. It is vital that future studies broaden the scope of this project and engage with both children and their parents^[13]. Training could be offered to children, perhaps through whole-school assemblies or as part of the curriculum. Asthma training for parents could also be encouraged, perhaps through coffee mornings which currently take place at some schools.

V. CONCLUSION

This project is a step towards the widespread changes needed across the borough of Haringey to ensure that asthma is managed safely in primary schools. The results from this study demonstrate that the 'Asthma Friendly Schools Project' initiative can improve understanding of asthma in the community, potentially improving asthma outcomes and children's quality of life across Haringey.

This highlights the effectiveness of asthma programs in primary schools, but also demonstrates the challenge of ensuring sustainability of a large-scale project in a borough with limited resources. Our low-cost and highly effective intervention filled a significant gap in staff knowledge of

asthma management. This suggests primary schools have a key role in helping to reduce asthma morbidity and mortality.

Following the success of this intervention, Haringey Council plans to expand the program to every school in Haringey. With persistent work across sectors, this has the potential to positively impact outcomes for children with asthma in the long term.

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