

## Teaching Research in Paediatrics: A “Hands On” Experience for Medical Students

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### Abstract

**Aim:** To teach medical students about the methods, ethics and practicalities of conducting social science research, using a “hands on” approach.

**Methods:** For a Student Selected Component (elective) offered by the Hull York Medical School, five students, under supervision, conducted a pilot study of a research project about family-centred care in three children’s hospitals in the UK. They used a set of questionnaires for parents of hospitalised children, and staff, developed in Australia.

**Results:** The students all scored highly on assessment and demonstrated that they had learned much about research methods and the ethics surrounding data collection with families in a hospital setting. The results confirmed the reliability of the tool for use in the UK.

**Conclusions:** The students learned about social science research, its methods, ethical issues and practical problems surrounding data collection.

**Keywords:** education, social medicine

### Introduction

Research is notoriously difficult to teach to students, and medical students are no exception. Several methods have been tried, from didactic lectures to participation in research itself. Student

participation in primary care research increased publication rates in a US medical school (Kelly & Rourke 2002), while a summer assistantship in family medicine increased students’ knowledge of research methodology (Griswold 1991). Participation in a nine-week training programme of community based health research combined learning experiences about research and disadvantaged communities (Dehaven & Chen 2005). A learning experience about research, ethics, practicalities of social science research, and paediatric models of care was used with students at the Hull York Medical School (HYMS) in the United Kingdom (UK). The

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project piloted a tool used to measure parents' and hospital staff's attitudes to family-centred care (FCC).

Family-centred care is: "a way of caring for children and their families within health services which ensures that care is planned around the whole family, not just the individual child/person, and in which all the family members are recognized as care recipients" (Shields, Pratt & Hunter 2006, p 1318). Until the 1960s, many health professionals believed that parents should be excluded during a child's hospitalisation (Shields & Nixon 1998) due to firmly held beliefs that the presence of parents was detrimental to children's emotional health. Family-centred care is now widely used in paediatrics, though notoriously difficult to implement, with some parents feeling that they are being imposed upon to undertake nurses' work (Darbyshire 1994), though effective negotiation between staff and parents ensures its effective implementation (Coynes 1996). Within the UK's National Health Service, paediatricians and others are encouraged to support FCC and its implementation in clinical practice.

The aim of the study, of which this pilot is a part is, to examine parents' and hospital staff's attitudes to FCC in the UK. However, the aim of this paper is to describe this method of teaching research to medical students, and the project is explained in detail.

### Materials and methods

Three parts of this exercise, and their aims, are described – 1. the students' educational experience; 2. the main

project of which this study was a pilot, and 3. the pilot study itself.

### *Students' educational experience*

A Student Selected Component (SSC) is an elective offered in the HYMS curriculum (HYMS 2008). Planning for this SSC began in June 2006, and executive and administrative permission and ethical approval were gained prior to it being offered (REC 06/Q1104/26). In February 2007, five students (SA, PC, SK, SR, LW) took up the SSC under supervision of LS. The students were in their second and third years of the HYMS problem based learning course. All but one had entered medical school straight from school (one, SK had a degree in molecular biology), and apart from SK, none had been involved in research before.

The aims of the SSC were to: 1. provide a learning experience for students about FCC; 2. provide "hands-on" experience for students about conducting a research project in paediatrics. The project, a pilot study of a tool to measure attitudes to FCC in children's wards in the area served by HYMS, using a validated instrument (Shields & Tanner

**Table 1:** SSC time frame

Week	Activity
1	Introduction to project Literature search and critical review Preparation for data collection
2	Data collection and entry into spreadsheet
3	Data analysis Preparation of findings Presentation

2004) was completed. Printing of the questionnaires, information and consent forms, and SPSS spreadsheets for data entry and analysis were in place before the students began. The team completed a literature review, visited the hospitals and distributed information sheets, consent forms and questionnaires to parents of hospitalised children and health service staff. They collected the completed questionnaires, entered the data in spreadsheets, analysed them using SPSS, wrote a report and presented the findings at a seminar open to staff and students. The supervisor and two other academics assessed this.

During the SSC (Table 1), the students organised themselves as a team, liaised with the hospitals involved (usually with nurses in charge of the wards), and planned their time and working methods. Consequently, they learned about teamwork, time management and multidisciplinary. They learned correct ethical procedures for inviting subjects to participate in research, such as distributing information sheets and then allowing subjects time to decide on involvement or not; how to ask people to complete consent forms, and how to ensure they completed questionnaires. They found out how difficult this can be when, for example, the researcher returns only to find that the parents have left the ward or the staff member has gone off duty; or find that families are discharged before completing the questionnaire.

### *The main study*

This project is part of a large, on-going study, the aim of which is to investigate FCC in health services – its use, applicability, ethics and the attitudes of both those who provide it (staff of

all disciplines) and those who receive it (families, parents, carers, children and patients). These component studies have been undertaken in various countries, including the UK (Shields, Hunter & Hall 2004), Australia (Mitchell & Courtney 2004; Shields, Young & McCann 2008), Sweden (Shields, Hallström & O'Callaghan 2003), Iceland (Kristjánsdóttir 1995), Indonesia and Thailand (Shields & Nixon 2004). The project has several branches, such as a Cochrane systematic review (Shields et al 2007), a survey of the needs of parents (Shields, Hallström & O'Callaghan 2003; Shields, Hunter & Hall 2004), FCC in developing countries (Shields & Nixon 2004), and in adults (Mitchell & Courtney 2004). The aims of this current project are to: 1. examine attitudes of staff (nurses, doctors and allied health staff) about FCC; 2. examine attitudes of parents of hospitalised children about FCC; 3. compare responses from parents and staff.

### *The pilot study*

The questionnaires were developed in Australia (Shields & Tanner 2004) and we describe the pilot study in the UK, testing reliability of the questions and scales, ease of use, relevance, and practicalities of use in UK health services. In the two questionnaires, one for parents of hospitalised children and one for staff (slightly modified from the parents'), the scales yielded Cronbach's alpha 0.72 – 0.79 respectively. Another short scale was added to address staff's perceptions of FCC. This was taken from another questionnaire used in the UK before (Cronbach's alpha 0.8) (Shields 1999). To ensure

**Table 2:** Sample sizes and response rates

Hospital	Parents		Staff	
	distributed	returned (%)	distributed	returned (%)
1	10	10 (100)	10	10 (100)
2	30	10 (30)	30	10 (30)
3	20	14 (70)	10	10 (100)

content validity, a “panel of experts” comprising two paediatric nurses, one paediatrician and two parents examined the questionnaires. Because the questionnaire was initially developed in Australia, the students helped adapt the demographic questions before the study began.

### *Sample size*

As a pilot study, practicalities such as availability of subjects within areas and time constraints determined the convenience sample of 10 parents and 10 staff at each hospital (Table 2). Three hospitals were involved – all general hospitals with children’s wards. Return rates were influenced by the ability of the students to wait for the questionnaires to be completed (this was part of the learning experience). At one hospital, double the number of questionnaires were distributed to achieve the required number, at another, the students collected 20 completed questionnaires with no difficulty and then left.

## **Results**

### *Statistical analysis*

Data were entered as the questionnaires were collected. Cronbach’s alpha showed that the questionnaires were reliable,

with 0.79 for the staff questionnaire, and 0.72 for the parents questionnaire. The findings are not presented here. With only 10 questionnaires collected at each site, the results are meaningless and the analysis was to determine reliability only and in doing so, provide the students with an educational exercise about such statistics.

### *Meeting the aims of the SSC*

Analysis of the responses was done by the students, but not presented here because the small sample size renders them meaningless. This led to a discussion of power calculations and their necessity, and about generalisability of research findings and of the influence of demographic characteristics. Response rates were discussed, and students explained how, in one hospital, where staff were cognizant of the research, they had no difficulty collecting the required number of completed questionnaires. At another site, they found that they had to distribute double the number to attain the required sample, and in another, collected several incomplete questionnaires. They described times when they had returned to collect the questionnaires to find that the family had been discharged, or the parents or staff members were missing from the

ward, but had completed some of the questions.

On the final day of the SSC, the students presented their research to students and staff of the university and health services. They gave an overview of existing literature, outlined the methods and described results. They provided insight into both the practical problems and ethical issues they encountered. In short, they learned that such research as this, using questionnaires and with subjects who are “captive” (Shields & Pearn 2007) at the time of data collection, who are subject to the vagaries of timetables and events surrounding a child’s admission to hospital, and work loads, can be difficult.

- Ward location
- Equipment required
- Finding person in authority
- Lack of awareness of the project on wards
- Security
- Pre-coding questionnaires
- Student’s lack of identity in wards
- Waiting around for questionnaires
- Boredom

**Figure 1:** Practical problems encountered by students

Practical problems are shown in Figure 1. Despite an intensive effort by LS to ensure the wards were fully informed, all permissions in place, and agreement that the students could collect data, problems occurred. For the students who had not visited the hospital before, finding the ward took some

time. When they arrived, the person in charge (with whom they had liaised prior to their arrival) may have been absent or engaged. The level of security necessitated the students asking for entry, having to press a buzzer and ask permission to enter if they left for a short break. Once on the wards, they found that many staff had no idea of why they were there, and found it hard to communicate their role as medical students who were doing a research project, rather than their traditional role.

The students realised the difficulty and oft times fickleness of data collection in social science research, as the response rates varied greatly between hospitals. In discussion around this, the students described the problems with communication they had with ward staff, who, in some cases, had not been informed the students were coming, and who had trouble reconciling this new role for medical students. In the wards where data collection had been successful, the students described the support they had from the nursing staff, who facilitated their experience and interaction with parents.

The students found that while they thought they had taken enough equipment (copies of questionnaires, pencils etc.) at times they had not, nor had they planned as effectively as they thought in that pre-coding the questionnaires would have facilitated their dissemination more efficiently. Boredom was part of the experience, as once they had distributed the questionnaires, they had to find something to do while they waited for them to be completed. All demonstrated

they learned time management and planning skills.

- Duty of care vs research
- Compromise confidentiality with named consent form
- Coercion
- Inducements
- Parental concern for sick child vs participation in research
- Selection bias in non-randomised sample

**Figure 2:** Ethical issues encountered

Figure 2 shows the ethical issues encountered. The students considered whether the duty of care owed to families was compromised by asking them to participate in research. Another compromise questioned was the ability to give assurances of confidentiality when parents were asked to sign consent forms (despite a system for anonymising the questionnaires). The students recognised the potential for some coercion to enter negotiation with subjects, and that they had to ensure they constructed their communication to avoid this. They queried the ethics of asking people to participate for altruistic motives (no material inducements were offered). Of note was the dilemma of when and how to approach parents whose concern is for the well being and comfort of their sick child, rather than being bothered with research from which they derive no direct benefit. Selection bias was raised, as only those who could read and write English were included, and informally, the students felt they tended not to approach parents deemed to be from lower socio-economic groups.

## Discussion

The students earned full marks for assessment, as they had displayed not only a solid grasp of the complexities of FCC, but also a high level of knowledge about research processes, data entry, simple statistical analysis, writing and presentation, ethics, time management and team working. Similarly to others (Kelly & Rourke 2002; Griswold et al 1991; Dehaven & Chen 2005), the students' indicated that they met the learning objectives in a novel way that enabled them to explore and discover aspects of medicine and research they had not encountered before.

In a teaching assessment, the students all gave this exercise the highest score possible and their presentations for which they were marked showed that they had learned much about research. An in-depth qualitative study would have provided substantial information about how they felt about undertaking such an activity, but was outside the scope of the project.

Family-centred care is a by-word in paediatric practice, one which the students will encounter often. They now have knowledge of its basic principles and of the evidence (or lack of) (Shields et al 2007) which underpins it. Consequently, they have learned to critically analyse evidence about FCC, and its implementation.

Research like this, which uses social science methods such as questionnaires, can be far more complex than is recognised by more esoteric sciences. The students experienced these complexities and can now engage with researchers from other disciplines, who use research approaches different to

those of pure medicine. The practicalities of this type of data collection posed particular problems which provided a rich learning experience, and they gained understanding of the vagaries of ethical dilemmas encountered in research projects.

### **Limitations**

At this stage, and for the purposes of this SSC, it was not practical to collect enough questionnaires to allow for factor analysis, which would validate the questionnaires more thoroughly than Cronbach's alpha. This will be undertaken as part of the main study (some of the students have expressed an interest in being involved).

An inability to randomise subjects and the use of a convenience sample was noted, and led to discussion about why this was not possible, nor appropriate for this study. Even when the full study is undertaken, it may not be possible to collect more than a convenience sample. Analysis of the data from the questionnaires was undertaken as an exercise for the students, but is not presented here.

While every effort was made to ensure the project was set up before the students began, missed communication, workloads of managers and staff in the hospitals, and time lapses between initial contact and visits to the wards meant that the students had more problems recruiting staff than was anticipated.

### **Conclusion**

Five students, under supervision, conducted a pilot study of a research project about family-centred care in three children's hospitals in the UK.

They used a set of questionnaires developed in Australia for parents of hospitalised children and staff. The results confirmed the reliability of the tool for use in the UK, but importantly, the students learned about social science research, its methods, ethical issues and practical problems surrounding data collection.

This project worked well with the class of five students. Such a project could be implemented with large classes, but would require extra resources to provide tutors to supervise small groups, and a number of sites (and prior ethical approval) would be needed.

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