

# The content and methodology of research papers published in three United Kingdom primary care journals

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## SUMMARY

**Background.** With the expansion of academic departments, the National Research and Development initiative, and the Culyer report, United Kingdom (UK) general practice research is undergoing a period of investment and change.

**Aim.** To examine the content and methodological quality of UK-published general practice research, and in particular to focus on the quantity and proportion of studies that were of high methodological quality, namely randomized controlled trials (RCTs).

**Method.** We manually searched three UK-published journals over a five-year period: the British Journal of General Practice (BJGP), Family Practice, and the British Medical Journal (BMJ), which has a section devoted to general practice research. Studies were classified according to the International Classification of Health Problems of Primary Health Care (ICHPPC-2).

**Results.** Nearly half of published studies in UK primary care journals were concerned with either organization and administration issues in primary care or social problems (509 studies, 48%). Just over half were either qualitative studies or surveys of opinion or attitudes (528 studies, 50%). The overall number of RCTs was low (67 studies, 6%), and the proportion published has not changed over time ( $\chi^2$  for trend = 3.79,  $df = 1$ ,  $P = 0.051$ ). In contrast to surgical journals, nearly one-fifth of studies in general practice followed a longitudinal design (186 studies, 18%).

**Conclusions.** The content and design of published general practice research in the UK is varied and broad. The most robust methodological design should be the aim of all prospective researchers in general practice.

**Keywords:** research methodology; United Kingdom; periodicals; primary care.

## Introduction

ACADEMIC research is now a well-established part of the discipline of general practice, albeit one that is pursued by a minority of general practitioners (GPs).<sup>1,2</sup> Historically, the emphasis and content of research in United Kingdom (UK) general practice has changed over time.<sup>1</sup> Pioneers such as Edward Jenner and William Pickles were concerned with infectious dis-

ease epidemiology.<sup>1</sup> More recently, the influence of psychology, psychiatry, and sociology has led to the pursuit of qualitative research into the process and agenda of the consultation.<sup>3</sup> In parallel with these pursuits, contemporary GPs have followed the legacy of James MacKenzie, returning to practice populations as the unit of enquiry for descriptive and analytical epidemiology.<sup>4</sup>

There are new challenges for the general practice research community.<sup>2,5,6</sup> Academic general practice is enjoying a period of expansion.<sup>7</sup> In the UK, the NHS Research and Development programme and the Culyer report have increased funding opportunities and enabled the establishment of a research infrastructure in the form of research networks in many regions. However, credibility and responsibility accompanies these opportunities. For research to be worthwhile, it must be valid, relevant, and timely for GPs, leading some commentators to redefine the content and role of research in general practice.<sup>1,6,8,9</sup> General practice is not alone in examining the content, methodology, and relevance of its research. The editor of *The Lancet* recently challenged the surgical research community about the poor methodological approach of many published studies in nine general surgery journals; 46% of these studies were case series, while only 7% were randomized, controlled trials (RCTs).<sup>10</sup>

We decided to evaluate the content and methodological approach of recently published UK general practice research over a five-year period. In view of the increasing importance of the Cochrane Collaboration,<sup>11-13</sup> we sought to examine the proportion of RCTs published during this time, particularly to determine if publication of this type of study had increased. Finally, we explored whether academic GPs or academic departments of general practice differ in the content or methodology used in their published reports when compared with non-general practice researchers.

## Method

We hand-searched three UK-published journals; two of these are specifically primary care journals — *the British Journal of General Practice (BJGP)* and *Family Practice* — and the other, the *British Medical Journal (BMJ)*, has a section devoted to primary care research. The search covered a five-year period from 1 July 1991 to 30 June 1996.

From each published report, we extracted the following data: journal; date of publication; title of paper; summary of contents from the abstract; area of investigation classified according to the International Classification of Health Problems of Primary Care (ICHPPC-2);<sup>14</sup> the methodological design (qualitative, survey, cohort/longitudinal study, randomized controlled trial, other quantitative design); the job of the first author; and, finally, the institutional affiliation of the first author. If a study required conceptual rather than numerical analysis, then for the purposes of this paper it was defined as being qualitative.<sup>15</sup>

Data extraction was performed by one of us (TT); checking and validation was then performed by the second author (TF). Study classification according to ICHPPC-2 was then carried out, independent of data extraction (MS). Details of studies were recorded onto a statistical database (SPSS for Windows).

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Descriptive statistics are presented; all comparisons are by means of the chi-square test or an unpaired test for difference in proportions. We used the chi-test for trend to examine whether the rate of publication of RCTs changed over time.

## Results

Over the five-year period, 1042 studies (original reports and review articles) were published in the three journals. The classification according to ICHPP-2 and the methodological design are summarized in Table 1. By far the commonest subject dealt with was studies relating to administrative and organizational duties in primary care (442 studies, 42.4%); the two other areas dealt with most frequently were mental health (95 studies, 9.1%) and preventive medicine (82 studies, 7.9%). Overall, 315 (30.2%) studies were qualitative reports; the remainder (727 studies, 69.8%) contained quantitative data in their results section (Table 1).

The methodological approach to studies did not appear to change over time (Table 2). In particular, the proportion of published RCTs did not increase over time ( $\chi^2$  for trend = 3.79,  $df = 4$ ,  $P = 0.051$ ). When the three journals were examined separately, the proportion of RCTs was significantly higher in the *BMJ* (42 studies, 13.4%) than in the other two journals, the *BJGP* having 16 studies (3.9%) and *Family Practice* nine studies (2.9%). Comparing the *BMJ* with the other two journals [42 studies (13.4%) versus 25 studies (3.4%)] resulted in a difference of 10% [95% confidence interval (CI) = 5.9–13.9%]. None of the three journals demonstrated an increase in the proportion of RCTs published over time. *Family Practice* published a higher proportion of qualitative studies than the other two journals: 119 studies (37.9%) compared with 119 (28.7%) in the *BJGP* and 77 (24.5%) in the *BMJ*. This order was repeated when surveys were analysed, with 72 studies (22.9%) reported in *Family Practice*, 86 (20.8%) in the *BJGP*, and 55 (17.5%) in the *BMJ*.

General practitioners were first authors in just over half of the papers (552 studies, 53%; Table 3). They were no more likely to

perform an RCT than other authors [32 studies (5.8%) versus 35 studies (7.12%); difference 1.35% (95% CI = 1.65–4.35%)]. The likelihood of a report being published by a GP who did not hold an academic position did not change over time ( $\chi^2$  for trend = 1.56,  $P = 0.21$ ). GPs who had an academic title were responsible for 374 (35.9%) of studies, but they were no more likely to perform an RCT than other authors [26 studies (7.0%) versus 41 studies (6.1%); difference 9% (95% CI = -2.34% to 3.97%)]. However, academic GPs did publish significantly more qualitative papers than all other authors [132 studies (35.3%) versus 185 studies (27.7%); difference 7.6% (95% CI = 1.69–13.5%)]. Finally, the proportion of published papers whose first author was an academic GP fell significantly during the five-year period ( $\chi^2$  for trend = 3.87,  $P = 0.049$ ).

Academic departments of general practice were responsible for 485 (46.5%) of the published studies. Departments of general practice were more likely than other departments to publish qualitative-based research [168 studies (34.6%) versus 149 studies (26.8%); difference 7.9% (95% CI = 1.23–13.5%)]. Finally, academic departments of public health medicine or epidemiology were no more likely to publish RCTs than other departments, being responsible for 96 published reports, of which seven (7.3%) were RCTs compared with 60 (6.3%) published in other departments [difference 1% (95% CI -4.5 to 6.4%)]. They were, however, more likely to publish quantitative research [75 studies (78.1%) versus 653 studies (69%); difference 9.1% (95% CI = 0.3–17.9%)].

## Discussion

This study has shown that nearly half of published studies in UK primary care journals are concerned with either the administration or the organization of primary care or social problems in general practice (Table 1). This confirms that the spectrum of general practice research is indeed broad.<sup>1,8</sup> In terms of applied clinical research, one-third was covered by studies into mental

**Table 1.** Subject area covered<sup>a</sup> and methodology used in studies, number (%).

Subject area	Qualitative n (%)	Cohort n (%)	RCT n (%)	Survey n (%)	Other n (%)	Total n (%)
Infective	5 (23)	3 (14)	1 (4)	3 (14)	10 (45)	22 (2)
Neoplasm	4 (40)	2 (20)	0 (0)	1 (10)	3 (30)	10 (1)
Endocrine	2 (12)	3 (18)	2 (12)	1 (6)	9 (53)	17 (2)
Blood	1 (33)	2 (67)	0 (0)	0 (0)	0 (0)	3 (0)
Mental	24 (25)	22 (23)	6 (6)	15 (16)	28 (30)	95 (9)
Nervous system	6 (19)	6 (19)	2 (6)	1 (3)	17 (53)	32 (3)
Circulatory	11 (20)	13 (23)	6 (11)	10 (18)	16 (29)	56 (5)
Respiratory	9 (14)	15 (23)	12 (18)	12 (18)	18 (27)	66 (6)
Digestive system	4 (14)	9 (32)	1 (4)	8 (29)	6 (21)	28 (3)
Genitourinary	10 (21)	11 (23)	3 (6)	13 (27)	11 (23)	48 (5)
Pregnancy	1 (12.5)	3 (37.5)	0 (0)	2 (25)	2 (25)	8 (1)
Skin	1 (9)	2 (18)	2 (18)	2 (18)	4 (36)	11 (1)
Musculoskeletal	2 (13)	7 (47)	1 (7)	1 (7)	4 (26)	15 (1)
Perinatal	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)	1 (0)
Sign/symptoms	4 (44)	1 (11)	0 (0)	2 (22)	2 (22)	9 (1)
Injuries/adverse effects	1 (17)	1 (17)	1 (17)	1 (17)	2 (33)	6 (1)
Preventive medicine	24 (29)	13 (16)	10 (12)	17 (21)	18 (22)	82 (8)
Family planning	1 (33)	0 (0)	0 (0)	1 (33)	1 (33)	3 (0)
Administrative	182 (41)	62 (14)	6 (1)	104 (23)	88 (20)	442 (42)
Maternal/child health	8 (38)	3 (14)	3 (14)	4 (19)	3 (14)	21 (2)
Problems external to patient (organization)	10 (24)	7 (17)	10 (24)	7 (17)	8 (19)	42 (4)
Social/marital problems	5 (20)	1 (4)	1 (4)	8 (32)	10 (40)	25 (2)
Total	315 (30)	186 (18)	67 (6)	213 (20)	261 (25)	1042 (100)

<sup>a</sup>Subject area coded in accordance with the International Classification of the Health Problems of Primary Care.<sup>14</sup> Rounding errors were present when estimating percentages.

**Table 2.** Methodology used in published studies over a five-year period,<sup>a</sup> number (%).

Study design	1991 n (%)	1992 n (%)	1993 n (%)	1994 n (%)	1995 n (%)	1996 n (%)	Total n (%)
Qualitative studies	29 (34)	56 (27)	59 (29)	70 (33)	44 (24)	57 (39)	315 (30)
Cohort studies	10 (12)	41 (20)	53 (26)	31 (15)	32 (17)	19 (13)	186 (18)
RCTs	7 (8)	8 (4)	10 (5)	11 (5)	17 (9)	14 (10)	67 (6)
Surveys	20 (24)	46 (22)	34 (17)	51 (24)	44 (24)	18 (12)	213 (20)
Other quantitative	19 (22)	57 (27)	49 (24)	49 (23)	48 (26)	39 (27)	261 (25)
Total	85 (100)	208 (100)	205 (100)	212 (100)	185 (100)	147 (100)	1042 (100)

<sup>a</sup>Rounding errors are present when estimating percentages.

**Table 3.** Methodology according to researcher (first author in paper): number (%).\*

	Qualitative n (%)	Cohort n (%)	RCT n (%)	Other quantitative n (%)	Total n (%)
Academic GP	132 (42)	75 (40)	26 (39)	85 (33)	374 (36)
GP	53 (17)	34 (18)	6 (9)	54 (21)	178 (17)
Researcher	49 (16)	25 (13)	11 (16)	49 (19)	185 (18)
Nurse	1 (0)	1 (1)	1 (2)	0 (0)	5 (1)
Clinician	47 (15)	41 (22)	17 (25)	51 (20)	204 (20)
Others	33 (11)	10 (5)	6 (9)	22 (8)	96 (9)
Total	315 (30)	186 (18)	67 (6)	213 (20)	1042 (100)

\*Rounding errors are present when estimating percentages.

health or preventive, circulatory, respiratory, or genitourinary medicine (Table 1). Most probably, this reflects the common nature of these problems in general practice. Half of published research is of a qualitative nature or concerned with surveying attitudes and opinion (Table 2). In contrast to surgical research,<sup>10</sup> case studies or case series reports are very rare. Nearly one-fifth of reported research adopts a longitudinal or cohort design, following groups of patients prospectively over a period of time.

Randomized controlled trials (RCTs) were the chosen design in 6% of the published studies, a proportion similar to that found in surgical research.<sup>10</sup> Reasons why so few studies follow this methodological design can be postulated. First, RCTs may have been published elsewhere in specialist journals that relate to the condition of interest or in international primary care journals.<sup>13</sup> In a paper describing the development of a register of RCTs published between 1987 and 1991, only 23% of RCTs had been published in primary care journals.<sup>13</sup> Secondly, the small number of published RCTs may reflect a difficulty in recruitment. Researchers who have experienced such difficulty give several reasons: poor motivation of GPs; a lack of belief in either the active or the alternative interventions; and a willingness to participate in an RCT in theory but an inability to recruit sufficient patients in practice.<sup>16-19</sup> Thirdly, some negative studies may have been performed but may not have been published.<sup>20</sup> Whatever the reason for the low proportion of RCTs, this finding is of some concern, particularly as the proportion of published RCTs does not appear to be increasing over time. It appears that the research community has not, as yet, wholeheartedly taken up the challenge of performing RCTs in general practice.<sup>21</sup>

Despite the importance of evidence-based medicine, a minority of studies (RCTs and cohort studies made up 24% of published research in this period) were of this design.<sup>22</sup> As van Weel has stated,<sup>5</sup> 'only on the basis of sound clinical data of prognosis and intervention will it be possible to teach, train and safeguard the quality of care.' If research is to be of relevance and clinically meaningful to GPs, greater investment in more rigorous study design will need to occur. Others, concerned with the disparity

between clinical practice and medical research, have commented on the dearth of research on the predictive value of symptoms and signs for common clinical conditions in general practice.<sup>23</sup> In this period, only a few studies studied the predictive value of symptoms and signs for common conditions, for example acute sinusitis.<sup>24,25</sup> Clearly, there is much more scope for research in this area.<sup>23</sup>

There are limitations to the design of this study; it was not possible to assess whether the methodology chosen was appropriate to the research question that had been asked. The methodology used in a study should be chosen on the basis of being the most appropriate tool to aid investigation into a specific question.<sup>15,26</sup> Therefore, if the aim of a study is to explore meaning and understanding, then a qualitative methodology is unarguably the most appropriate approach.<sup>15</sup> Our concern at the lack of published RCTs should not be misinterpreted as a call against qualitative research. Several studies reported and analysed both numerical and conceptual data; these were defined as qualitative reports for the purposes of classification. Our definition of qualitative research may differ than that used by Murphy and Mattson,<sup>27</sup> who reported that 16% of studies published in *Family Practice* during 1989 and 1990 followed a qualitative design.

The proportion of published papers by GPs remained stable during this period (Table 3). This finding is encouraging when seen in the context of previous research, which demonstrated a decline in the quantity of papers in which the author was a GP in the *BJGP*.<sup>28</sup> It is interesting to note that academic GPs and academic departments were more likely to perform qualitative research and that the proportion of published research by academics fell during this period, although the absolute number of papers increased. This fact is surprising in the context of the expansion of academic departments.<sup>7</sup>

If more robust study designs are to be used in the future, strategies must be adopted that anticipate and combat the potential barriers to research. A research infrastructure is developing, which, it is hoped, will yield groups of practices that are partners rather than participants in research. Remuneration to practices is

required for participation in research, but many have argued that payment *per se* does conflict with a professional role for researchers and GPs in unravelling uncertainty.<sup>16,17,28</sup> Fees should compensate for costs and be a reasonable payment for time invested. Any award beyond such remuneration should be discouraged.<sup>29</sup> In conjunction with participation comes acknowledgement of uncertainty. Beliefs in current or experimental practices have been shown to influence the likelihood of randomizing patients,<sup>30</sup> which, in turn, can subvert the validity of an RCT.<sup>30</sup> Clearly, for research to be effective, GPs need to be engaged on the issue of uncertainty.<sup>18</sup> Also, to be more effective and more relevant, researchers in general practice need to elicit the views of patients.<sup>32</sup> Some organizations, for example the Cochrane Collaboration, are actively trying to encourage lay participation in the design, conduct, and dissemination of research.<sup>32</sup> Finally, an RCT should not be performed just for the sake of carrying out a trial. It should not be forgotten that it may not be appropriate, possible, or desirable to perform an RCT, and other study designs may be used to better purpose.<sup>34</sup>

In conclusion, this paper has demonstrated that the content and design of published general practice research in the UK is varied and broad. As journals, academic institutions, and funding bodies develop strategies for research and dissemination,<sup>1,35,36</sup> future research should be viewed in the context of the recently published literature. If research in general practice is to be taken more seriously and influence clinical care,<sup>37</sup> the methodological quality of general practice research may need to improve.

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