Investigating the organisational factors associated with variation in clinical productivity in community pharmacies: a mixed-methods study

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Declared competing interests of authors: none

Published October 2017
DOI: 10.3310/hsdr05270

Scientific summary

Clinical productivity in community pharmacies

Health Services and Delivery Research 2017; Vol. 5: No. 27
DOI: 10.3310/hsdr05270

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Background

Community pharmacies play a key role in health-care systems. Not only do they dispense prescriptions, but they are becoming increasingly involved in helping patients to use their medicines more effectively [e.g. through medicines use reviews (MURs)] and in providing services such as minor ailment schemes and smoking cessation services. Organisational characteristics, such as pharmacy ownership, staffing and skill mix, vary across community pharmacy organisations and create diverse practice settings. NHS pharmaceutical service provision in England also varies across community pharmacy organisations and may depend on organisational configuration.

Aims and objectives

The aim was to inform the commissioning of NHS general pharmaceutical services in England by exploring variation in clinical productivity (levels of service delivery and service quality) in community pharmacy organisations and identifying the organisational factors associated with this variation.

The objectives were to (i) explore variation in levels of service delivery across a representative sample of community pharmacies in England; (ii) investigate the relationships between organisational characteristics and levels of service delivery; (iii) investigate the inter-relationships between organisational characteristics, levels of service delivery and service quality; (iv) examine the mechanisms by which organisational factors influence both levels of service delivery and service quality; and (v) develop a toolkit to inform commissioning processes to improve clinical productivity in community pharmacy.

Methods

The study was conducted in two stages over 30 months within nine socioeconomically diverse geographical areas.

Stage 1

All community pharmacies in the nine study areas were approached to participate with the exception of those owned by four national chains. Data were obtained through three major sources, linked by pharmacy premises postcode and Organisational Data Service code, a unique organisational identifier allocated by the NHS, also known as the 'F' code: (1) community pharmacy returns [monthly dispensing volumes and volume of MURs and new medicines service (NMS) interventions conducted]; (2) socioeconomic and health-need data from secondary data sets (2011 census, 2010 Indices of Multiple Deprivation, 2011/12 Quality and Outcomes Framework disease prevalence data); and (3) a survey of community pharmacies (to capture ownership type, organisational culture, staffing and skill mix, working patterns, management structure, safety climate and pharmacy–general practice integration). Organisational culture was measured using the Pharmacy Service Orientation (PSO) tool, validated for use in community pharmacies. This short tool is scored on the basis of three semantic differential scales of 1 to 10 whereby respondents are asked to rate their pharmacy's orientation (patient vs. medicine), focus (quality vs. quantity) and pharmacists' work (professional vs. technical). Initially, we summarised the variation in our primary (dispensing volume, volume of advanced services) and secondary (safety climate) outcome measures graphically and using appropriate summary statistics. Using Stata® (version 13; StataCorp LP, College Station, TX, USA) statistical software, we then fitted a series of fixed-effects linear or logistic regression models to these outcomes – linked to the survey data set – to determine whether they were associated with pharmacy-level organisational variables and/or area-specific

demographic, socioeconomic and health-needs variables. In addition, we fitted a series of parallel regression models to determine whether these outcomes were associated with ownership type and/or area-specific demographic, socioeconomic and health-needs variables across pharmacies nationally.

Stage 2

Forty-one community pharmacies, across ownership type (supermarket, multiple, chain, independent) and NHS area, were randomly selected from stage 1 respondents to participate in stage 2. After like-for-like random substitution of those declining, 39 pharmacies agreed to participate. An eight-sided questionnaire was distributed by pharmacy staff in each of these pharmacies to two samples of approximately 30 consecutive patients each following receipt of (1) dispensing and (2) MUR services. The questionnaire collected background data (sociodemographic, existing conditions) in addition to three self-reported measures of (1) satisfaction with pharmacy visit, (2) satisfaction with information about medicines [measured on the Satisfaction with Information about Medicines Scale (SIMS)] and (3) adherence to medicines [measured on the Medication Adherence Report Scale (MARS)]. All outcome measures were of proven reliability and validity, and two (SIMS and MARS) had been widely used in research studies in a number of settings (including pharmacy) across a range of conditions and in several countries. Initially, we summarised the variation in each of these quality outcome measures graphically and using appropriate summary statistics. A mean item score was determined for overall satisfaction with pharmacy visit and used as the dependent variable in a multilevel linear regression model to determine which patient- (stage 2) and pharmacy-level (stage 1) independent variables were associated with satisfaction with pharmacy visit. SIMS items were dichotomised to represent satisfaction and dissatisfaction (with medication information): individual binary ratings were then summed to give an overall assessment of satisfaction (ranging from 0 to 17). A categorised version of this score was used as the outcome in a multilevel ordered logistic regression model. MARS item ratings were also summed to produce an overall medication adherence score that was then dichotomised to represent adherers and non-adherers, and used as an outcome in a multilevel logistic regression model. All regression models were fitted using Stata.

In addition, semistructured interviews were conducted with 40 pharmacy and commissioning representatives selected purposively to include at least one service commissioner and up to eight pharmacy interviewees from each geographical area across all types of pharmacy. Topic guides, developed from the aims of the research and the research literature, explored variation in the quantity and quality of service provision in community pharmacies, opportunities and barriers to clinical productivity in this setting and the mechanisms by which different organisational characteristics may help or hinder clinical productivity. Interviews were audio-recorded with permission, fully transcribed and thematically analysed using a framework approach and NVivo 10 (QSR International, Warrington, UK) qualitative analysis software.

Finally, with Primary Care Commissioning, we have developed a toolkit to help service commissioners improve their contracting processes with community pharmacies to promote clinical productivity. To inform the development of the toolkit, we organised a half-day workshop to which we invited community pharmacy commissioning leads and other community pharmacy stakeholders.

Results

Respondents

Of the 817 pharmacy questionnaires distributed in stage 1, 285 were returned completed (260 by post and 25 online). A further nine were returned undelivered. Eight questionnaires that had been completed by distance-selling pharmacies were removed from the sample. The total valid response rate was therefore 34.6% (277/800).

A total of 2124 patient questionnaires were distributed by the 39 stage 2 pharmacies (1160 to patients who had prescriptions dispensed and 964 to patients who had received a MUR). Of these, 1008 questionnaires were returned: 546 from the dispensing sample and 462 from the MUR sample, giving an overall response rate of 47.5% (47.1% for the dispensing sample and 47.9% for the MUR sample). Of these, 37 questionnaires were excluded from the analysis.

Forty semistructured interviews were conducted in stage 2 of the study (30 with pharmacists and 10 with service commissioners). Of the 30 pharmacists, five were superintendent pharmacists [one from a small chain and four from large chains of multiple pharmacies (referred to as 'multiples' from here on)]. A further six had a dual superintendent/patient-facing pharmacist role. The remaining 19 pharmacist interviewees each had a patient-facing role: nine in large multiples/supermarkets, six in small/medium-sized multiples and four in independent pharmacies. Of the 10 service commissioners, five were from NHS England area teams and five were from clinical commissioning groups. Interviews were conducted either face to face ($n = 21$) or by telephone, ($n = 19$) and lasted between 33 minutes and 1 hour 37 minutes.

Quantitative findings: quantity

Stage 1 pharmacy survey data

Higher annual dispensing volumes were significantly associated with greater local deprivation, pharmacies being open for > 3 years, staffing and skill mix (the employment of more than one pharmacist, a pharmacy technician and/or accuracy checker), longer working hours of the main pharmacist and an organisational culture more closely aligned to the medicine, quantity and technical work than to the patient, quality and professional work (lower PSO score). Higher annual volumes of MURs were related to ownership type (highest in large multiples/supermarkets), higher dispensing volumes, longer pharmacy opening hours and a lower local prevalence of asthma. Higher annual volumes of NMS interventions were significantly associated with ownership type (highest in large multiples/supermarkets), the availability of more than one pharmacist, the strength of the pharmacy–general practice relationship, and the location of the pharmacy (highest in large towns, lowest in city centres).

National data

Higher annual dispensing volumes were significantly associated with ownership type (lowest in supermarkets), higher local levels of deprivation, higher proportions of adults aged > 75 years and children aged 0–4 years, and higher local prevalence of a number of long-term conditions. Higher annual volumes of MURs were associated with ownership type (highest in large multiples/supermarkets), higher dispensing volumes and lower local levels of young children, deprivation and asthma. Higher annual volumes of NMS interventions were significantly associated with ownership type (highest in large multiples/supermarkets), higher dispensing volume, and lower levels of deprivation, mental illness and asthma.

Quantitative findings: quality

Stage 1 pharmacy survey data

Safety climate was significantly associated with pharmacy ownership type (large multiples/supermarkets had more favourable organisational learning scores, but less favourable working conditions scores on the Pharmacy Safety Climate Questionnaire), organisational culture [a more favourable safety climate was found in pharmacies more closely aligned to the patient, quality and professional work than to the medicine, quantity and technical work (higher PSO scores)], the employment of an accuracy checker (associated with less favourable safety climate), longer working hours of the main pharmacist (less favourable working conditions) and the strength of the relationship with the local general practitioner (GP) (better relationships were associated with a more favourable safety climate).

Stage 2 patient survey data

Greater satisfaction with the pharmacy visit was significantly associated with a greater number of reasons for choosing to visit a pharmacy, familiarity and continuity of the advice-giver, the employment of a pharmacy technician and conducting > 12 MURs per year. A greater SIMS score was significantly associated with increasing patient age, continuity of the advice-giver, weaker patient belief that medicines are overused and conducting > 12 MURs per year. A better self-reported MARS score was significantly associated with increasing patient age, weaker patient belief that medicines are overused and less regular use of locums.

Qualitative findings

Organisational factors influencing variation in clinical productivity

Variation in clinical productivity was reported between and within pharmacies. Interviewees reported being able to deliver a high volume and range of good-quality services when *staffing levels* and *skill mix* were optimal. This was further supported by the presence of a *trusted team*, enabling effective delegation. Although *volume of work* and competing demands were often mentioned as barriers to clinical productivity, second pharmacists and/or accuracy-checking technicians were perceived as important facilitators, enabling pharmacists to spend more time with patients and deliver additional services. The *role, values and priorities of pharmacy management* were considered influential, with some organisations showing a target-focused culture aimed at maximising service quantity. Conversely, cultures that focused on skill mix, team development and extended staffing models were considered to enable delivery of both service quantity and quality. Prescription collection and off-site dispensing services were perceived as examples of effective *ways to manage workload*, particularly where technology and positive *relationships with the general practice* supported this. Some interviewees highlighted how the gatekeeping function served by general practice staff could either help or hinder clinical productivity.

Extraorganisational factors influencing clinical productivity

Many interviewees identified several *patient and population factors* influencing clinical productivity. For example, older populations less likely to visit the pharmacy reduced opportunities to provide MURs; areas of higher deprivation offered opportunities to provide certain services while reducing the uptake of others; patients from more affluent areas were perceived as less likely to seek advice from pharmacists. Many believed that public misconceptions of the services available and of pharmacists' roles could challenge clinical productivity, leading to some pharmacists prioritising a speedy dispensing service over the quality of advice-giving or the delivery of other services. *Supply chain problems* were commonly perceived as a barrier to high-quality dispensing, but could sometimes be alleviated through fostering good relationships with other local pharmacies or general practices. *Commissioning and contractual factors* were also frequently cited as barriers to clinical productivity, chiefly in relation to the fractured commissioning landscape and insufficient levels of remuneration. Finally, *legal and regulatory constraints*, particularly around the criminalisation of dispensing errors and supervision arrangements were thought to stifle clinical productivity.

Monitoring clinical productivity

Arrangements for monitoring clinical productivity that already existed in community pharmacies primarily *focused on the quantity of service provision* but also looked at quality in terms of obtaining informal customer feedback, patient survey returns, monitoring and analysing errors and near misses, and monitoring complaints. Arrangements for monitoring clinical productivity by NHS commissioners almost exclusively focused on the quantity of service provision. When quality was monitored, this was usually through self-assessment by the pharmacy or following reported incidents or complaints from patients. A number of *benefits and drawbacks to monitoring* clinical productivity in community pharmacy were suggested by stakeholders, including the ability to benchmark activity, helping to improve quality and safety, providing an indicator of underlying problems and the bureaucracy involved. The *barriers to monitoring* clinical productivity identified by stakeholders included the inherent difficulty in measuring quality, poor recording by pharmacies, findings not being monitored by pharmacies or commissioners, a lack of resources and manpower, the fragmentation of commissioning and responsibilities for monitoring. However some *opportunities* were highlighted through pockets of good practice. Most stakeholders agreed that there should be more monitoring of clinical productivity in the future, but highlighted the *need for more quality markers to be developed* and the additional regulatory burden that would entail.

Conclusions

Implications for health care

The findings from this study have a number of important implications both for community pharmacies and for service commissioners. They highlight differences in the ways in which different types of community

pharmacy organisations operate, with potential implications for the volume, quality and safety of services. They emphasise the central role of staffing and skill mix to clinical productivity and support developments in this area. They also suggest that recent changes to pharmacy commissioning structures create barriers to the delivery of a diverse range of high-quality services. Finally, the study highlights the importance of good working relationships between pharmacies and GP surgeries to help manage demand in primary care and provide integrated services around the needs of the patient.

Recommendations for research

This study has highlighted existing barriers to health services research and improvement from private sector providers not sharing data for monitoring and research purposes nor engaging with research and evaluation endeavours.

Further research is needed to:

1. support the development of quantitative tools to measure community pharmacy service quality
2. describe and evaluate different models of skill mix in community pharmacies
3. explore the ways in which services are commissioned locally from community pharmacies and the extent to which local needs are met.

Funding

Funding for this study was provided by the Health Services and Delivery Research programme of the National Institute for Health Research.

Health Services and Delivery Research

ISSN 2050-4349 (Print)

ISSN 2050-4357 (Online)

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This report

The research reported in this issue of the journal was funded by the HS&DR programme or one of its preceding programmes as project number 11/1025/05. The contractual start date was in April 2013. The final report began editorial review in May 2016 and was accepted for publication in November 2016. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HS&DR editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report document. However, they do not accept liability for damages or losses arising from material published in this report.

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