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From policy towards pharmacy practice: a review of the intended use of ehealth in pharmacy in Scotland

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Abstract

Background

Policy-driven ehealth underpins the delivery of healthcare in which pharmacy practice plays an increasingly integral role. As health is a devolved matter within the UK, responsibility for policy development and service delivery lies with the parliament of each of the home nations.

Aim

The aim of this research was to describe the policy-driven intended use of ehealth as the landscape of pharmacy practice evolves in Scotland.

Methods

A content analysis of current policy and strategy documents was conducted. A framework approach was applied (transcribing, familiarising, coding, developing/applying analytical framework, mapping data to the framework, interpreting patterns across and within constructs) from which a conceptual

model of the intended use of technology in pharmacy was developed along with this explanatory narrative.

Results

Four key documents were identified for inclusion with a subsequent policy refresh incorporated. Key constructs were identified with associated sub-themes inducted from the data: Patient care: safety, partnership, integration, resources; Education and training: fit-for-future needs, multidisciplinary, delivery mode; Information governance: systems, staff; Implementation: accessibility, interoperability, support for role development.

Conclusions

The policy-driven strategy for ehealth in pharmacy practice in Scotland values the pharmacy team and promotes their role in multidisciplinary healthcare delivery. The clearly described intention is to facilitate and develop the patient-facing clinical role of the pharmacist and more integrated role of pharmacy in Scotland. This integrated role for pharmacy practice within the healthcare team, based on a secure, shared EHR, is a 2020 target for Scotland moving policy towards pharmacy practice.

Introduction

The World Health Organization (WHO) Global Observatory for eHealth tracks and benchmarks the ehealth policies of its member states. In urging the adoption of, 'appropriate eHealth services,' the stated mission of WHO is to offer 'strategic information and guidance on effective practices and standards in eHealth.'[1,2] Support through research is a major focus of the European Commission's 'eHealth Action Plan 2012-2020'[3] with current ehealth research funding streams aligned to promoting and developing the ehealth strategies of member states. In the United Kingdom (UK), Lord Darzi's influential 'High Quality Care for All – NHS Next Stage Review'[4], was welcomed beyond England's borders. In the report he promoted greater use of technology in providing care closer to the patient's home; for patient, practitioner and cost benefits. Lord Darzi noted that, 'wealth and technology have changed the nature of our society's outlook and expectations.' He added his support for the role of ehealth enabled pharmacy practice in observing that, 'improved technology is enabling patients that would once have been hospitalised to live fulfilling lives in the community, supported by their family doctor and multi-professional community teams'[4]

In 2006, digital competence was identified by the European Parliament as one of eight key skills for lifelong learning along with a recommendation for, 'better identification of occupational needs'[5]. The European Commission Information Society (ECIS) promotes and tracks citizen and member states digital engagement as indicators of the ways in which national governments and people do, and do not, use technology[6]. As part of the ECIS research programme, the sixth pillar out of seven in the Digital Agenda for Europe builds on that recommendation by focusing on digital literacy, skills and inclusion for lifelong learning[6].

As far back as 2011, a joint statement issued by the Royal Pharmaceutical Society (RPS) and Royal College of General Practitioners (RCGP) on cooperative working further emphasised the need for IT (information technology) and associated staff training to facilitate the role of pharmacy in primary care[7]. This was followed by publication of the RPS Information Technology Strategic Principles[8] developed and applicable across Great Britain, with parallel national work streams. More recently, the integration of Health and Social Care Act (2013) in Scotland increases the need for interprofessional communication and collaboration, again supported by ehealth and IT systems.[9]

While the NHS Scotland eHealth Applications Strategy[10] is geared to: rationalising: removing unnecessary duplication; extracting more value: exploiting existing assets; building flexibility: allowing for easier integration and sharing of information; choosing strategically: getting the best long-term value from investment, the Healthcare Quality Strategy for Scotland prioritises both workplace skills and job satisfaction in seeking to ensure that, 'everyone working in and with NHS Scotland is confident that they will be supported to do what they came in to the NHS to do, and that they are valued for doing that'[11].

Pharmacy practice in Scotland

As health is a devolved matter within the UK, responsibility for policy development and service delivery lies with the parliament of each of the home nations[12]. The Scottish Government eHealth policy features an epharmacy programme designed to, 'support the future delivery of the new community pharmacy contract and improve communications across the healthcare team'[13]. There are four core services which National Health Service (NHS) contracted community pharmacies in Scotland are required to provide: Public Health, Minor Ailment (MAS), Acute Medication (AMS) and Chronic Medication Services (CMS), with all except the first reliant on IT[14-16]. Further recent investment by the Scottish Government in support of robotic dispensing technologies re-emphasises recognition of the role of ehealth as a potential solution and also the current focus on pharmacy practice[17].

While e-prescribing is well-established in Scotland, the 'Prescription for Excellence' report found that, in secondary care, 'Hospital Electronic Prescribing and Medications Administration (HEPMA) and related electronic decision support has only been implemented in a very small number of acute hospitals, and in those cases not to its full potential'[18]. Non-standardised forms of paper prescription are still utilised in hospitals to indicate out-patients, day patients, discharge and ward specific instructions. Variation in processes for handling prescriptions has been shown to be a major cause of errors[20,21]. Conversely, research into electronic prescribing and robotic dispensing show reductions in errors, promotion of patient safety and better use of healthcare resources across the care interface[22,23].

Research context and aim

Ehealth has been evidenced to be a supportive mechanism for the delivery of multidisciplinary, collaborative health and social care[18-23]. A looming shortage of GPs in Scotland has in part prompted the recently (April 2017) announced investment of £16.2 million to extend the role of pharmacists in general medical practices[24]. Pharmacists already play an increasingly accepted non-medical prescribing role within community, primary and secondary care settings[25]. Yet little research has described the role of ehealth in this context[19]. This research aims to capture and describe the policy and strategy-driven intended role of ehealth in pharmacy practice in Scotland as a benchmark for future retrospective research into its effective implementation. Ethical review was not required for this document review.

Method

A conceptual model, or abstract representation of key elements and their inter-relationships, was developed to capture and describe the intended role of ehealth in pharmacy practice in Scotland by mapping relevant policy and strategy documents. The review team searched Scottish Government and professional pharmacy body (General Pharmaceutical Council (GPhC), RPS, Community Pharmacy Scotland (CPS)) databases to identify policy and strategy documents relevant to current and future role of ehealth in pharmacy practice in Scotland. Academic pharmacy colleagues, with

experience in government policy and pharmacy strategy development, were consulted to ensure currency and relevance and to reduce the possibility of omissions.

Summative content analysis[26] was conducted to identify and extract major constructs (categories/concepts) and sub-themes mapping illustrative extracts[27,28] from the source documents. This was done independently by two researchers meeting after: each reading and electronically searching the documents for content relevant to technology in pharmacy practice (keywords of pharmacy, ehealth, technology, digital, ICT, IT using 'Find' option in MS Word or Adobe pdf); each independently noting preliminary codes (constructs, sub-themes); joint negotiation to reach consensus on constructs and sub-themes to be added to an analytical framework; and, agreement on identification of illustrative quotes extracted from the text and added to the coding framework for further analysis. Although summative content analysis can be a 'blunt' frequency approach, when combined with familiarisation, it can serve the dual purposes of aiming to ensure[27,28] completeness of the search and the review: all iterations of the search terms would be returned; and accuracy of the extracted data: copy and paste being less prone to errors of omission, commission or transcription than re-typing. The coding framework, including data extracted as illustrative examples, was analysed for similarities and differences which were mapped and reported in this accompanying narrative.

Results

Four documents were identified, and confirmed as the most relevant (Table 1). Three of the documents were Scottish Government publications[13,17,29] with the fourth from the Royal Pharmaceutical Society[8]. There were no publications related to pharmacy technology found on the GPhC or Community Pharmacy Scotland databases.

[Position holder for Table 1]

The results of the summative content analysis are reported in Table 2.

[Position holder for new Table 2]

Also in 2011, the Royal Pharmaceutical Society published a set of IT Strategic Principles which underlined their commitment to ensuring that, 'the professional requirements of pharmacists are maintained, supported and developed through the adoption and use of appropriate IT systems'[8]. The remit of the Wilson and Barber report (2013) was to review, 'how pharmaceutical care can best contribute to the ambitions set out in 'The Healthcare Quality Strategy for Scotland' that is care which is person-centred, safe and effective'[29]. The recommendations look to build on the strengths of Scotland's current pharmacy IT infrastructure in which applications are developed to make better use

of workforce skills in providing safe, effective person-centred care. Similarly, 'Prescription for Excellence'[17] emphasised the potential benefits to be gained from technology-supported, integrated person-centred care aligned to 'A Route Map to the 2020 Vision for Health and Social care'[30].

Key constructs with identified sub-themes were extracted from the documents:

- Patient care: safety, partnership, integration, resources
- Education and training: fit for future needs, multidisciplinary, delivery mode
- Information governance: systems, staff
- Implementation: accessibility, interoperability, support for role development.

These were further developed into a conceptual model, with illustrative extracts from the policy and strategy documents, and accompanying explanatory narrative.

[Position holder for Figure 1]

The conceptual model demonstrated congruence of the intended role of ehealth in pharmacy practice in Scotland at both policy and strategic levels. For example, the construct of 'patient care' with the sub-theme of 'safety' was evident across all four documents. It was seen as an opportunity to improve the safety of people taking medicines for their effective use[13], also for pharmacy IT system developments to enhance medicines safety[8]. The growth of additional technologies to support the adherence of patients was a further opportunity for pharmaceutical care to optimise patient safety[29]. Electronic prescribing was viewed as a means of monitoring both appropriateness and safety of prescribing[29]. Furthermore, the sharing of information between primary and secondary care was indicated as a necessity for all NHS Boards[17]. The construct of 'patient care' had three further sub-themes inducted from the data. Firstly, the role for technology in supporting 'partnership' between pharmacy staff, patients and carers around a shared electronic record with improved NHS communications and increased use of mobile technologies to promote self-management of care. Secondly, 'integration' of health and social care across all sectors with an increased role for ehealth to support people in their own homes. Thirdly, adequate 'resources' to secure future development of the pharmacy profession to enhance the patient journey.

The second construct of, 'education and learning' with a sub-theme of, 'fit for future needs' was again evident across all four documents. For example, development of a strategy for improving the digital literacy skills of pharmacy staff[13]. It was suggested that pharmacy education should ensure a basic standard of digital or IT literacy[8]. Designing education and training to meet the future professional and service needs[29] would involve a review of all aspects of pharmacy workforce and associated education and training. This was viewed as necessary in developing an integrated approach which would ensure a workforce which could meet future service needs[17]. Further sub-themes of the 'education and learning' construct promoted 'multidisciplinary' training delivered via IT to reflect working practices. Also, appropriate information sharing at all levels, while developing and using the

skills of the whole pharmacy team. The 'delivery mode' sub-theme called for IT to be used and developed to support education and training.

A third construct of 'information governance' featured two sub-themes namely 'systems' and 'staff.' For example, implementation of an agreed Information Assurance Strategy[13] was seen as fundamental to the development of any pharmacy IT system or information process. It was self-evident that patient information should be stored in a safe and secure manner to ensure patient confidentiality[8]. The data also indicated that the pharmacist should be seen as a healthcare professional who, together with the rest of the pharmacy team, would be bound by the same code of confidentiality that applied elsewhere in the NHS[29]. This was seen as central to the future development of NHS pharmaceutical care given the importance of sharing of patient information between the pharmacist delivering NHS services and the other health and social care professionals within secure and confidential systems[17].

One of the most heavily exampled constructs across the documents was 'implementation' with sub-themes of 'accessibility,' 'inter-operability' and 'support for role development.' A consistent element across this construct, and all three sub-themes, was the need to facilitate sharing of information across the health and social care team and across sectors. This clearly included the primary-secondary care interface to improve the patient journey and making best use of workforce skills mix. For example, the availability and accessibility of an accurate and up-to-date electronic medication summary for the appropriate healthcare workers involved in the patient's journey through the healthcare system[13]. Also, pharmacists to have full access to the internet and web-based information systems in their daily practice[8] with further development of the Pharmacy Care Record (PCR). The PCR records the pharmaceutical care needs and dispensing of medicines to patients which documents indicated should be readily shared with other systems, and that other systems can feed information into it, as appropriate[29]. The release of pharmacist time to deliver the clinical role was seen as key, therefore, the automation of the dispensing process, largely managed by pharmacy technicians, would make better use of pharmacy team skills [17].

Discussion

Scotland is following the example set by the World Health Organization, tracked globally and across European Union and prominent in research literature to increasingly adopt ehealth[1-3,5,6,20-23]. Where larger European nations have struggled to integrate their ehealth technologies beyond regional level, Scotland, like other smaller nations, has benefitted from its' national wide area internet network, interoperability of GP and pharmacy systems and scalability[19]. Consistent throughout the policy and strategy documents was the ongoing drive to continue to develop compatible, secure technologies which support and extend the non-medical prescribing and clinical role of pharmacists in support of health and social care colleagues[18,19,25]. Scottish Government recently announced plans to invest £16.2 million bringing pharmacists and pharmacy technicians into every primary care team in general practices[24]. In addition, further Scottish Government investment based on the pivotal 'Prescription

for Excellence' strategy, will implement and evaluate key advances: centralised medication supply chain 'hub and spoke' robotic dispensing; movement towards a five year integrated Master of Pharmacy degree, including one year of placement; all Scottish pharmacists becoming clinical independent prescribers by 2023[17]. With the ageing and increasingly multi-morbid population growing across Europe, Scotland is not alone in seeking strategies to address issues of polypharmacy and adherence[33-36]. These are areas in which the pharmacist supported by ehealth can play a key role[19,22,23,25] within the multidisciplinary team. Looking ahead, this will be vital to meeting Scotland's healthcare needs with the impending GP crisis which is facing our healthcare service[37,38]. The policy-driven strategy for ehealth and IT supported pharmacy practice in Scotland values the whole pharmacy team and promotes their role in 'improving the safety of people taking medicines and their effective use'[13]. The RPS and Scottish Government intention is to facilitate and develop the patient-facing clinical role of the pharmacist. This integrated role for pharmacy practice within the health and social care team, based on a secure, shared EHR[38], is a 2020 target for Scotland moving policy towards pharmacy practice.

Key findings

Key findings inducted from data and evidenced across all constructs were the clear policy and strategic intention that:

1. Patient care: should be supported by technology in pharmacy which is adequately resourced to support the integration of health and social care delivery promoting the role of trained pharmacy staff working in partnership with patients for their safe, effective care
2. Education and training: should be designed for training the multidisciplinary health and social care team in the appropriate, effective use of technology, developing and using the skills of the whole pharmacy team to meet future professional and service needs
3. Information governance: should be fundamental to development of secure, shared patient information systems with pharmacy staff bound by the same rules of patient confidentiality as other health and social care professionals
4. Implementation: should improve accessibility to accurate, up-to-date patient information shared across secure, interoperable health and social care systems to facilitate greater integration, skill mix, choice and control using technology to deliver clinical care more effectively.

Patient care

The drive to 'improve the safety of people taking medicines'[8,13] is central to all pharmacy activity and is a recurring theme throughout the policy documents.

Education and Learning

The conceptual model placed emphasis on education and learning to create a workforce 'fit for future needs'[29]. The RPS (2011) contention that, 'pharmacy education should ensure a basic standard of IT literacy'[8] aligns with the British Computer Society call for every citizen to be, 'able to make use of technologies to participate in and contribute to modern social, cultural, political and economic life'[31] .

Information governance

The conceptual model placed staff and systems central to the promotion of information governance in the future development of pharmacy practice.

Implementation

Sub-themes from the conceptual model aspired to 'accessibility', 'interoperability' and 'support for role development' underpinned by technology in pharmacy. There were overwhelming calls within the policy and strategy documents for 'full access to the internet and shared web-based information systems'[8]. CMS provides the only form of electronic patient record access through PCR, which has yet to be linked to the PMR. There remains a distance for technology to travel to meet aspects of the '2020 Route Map'[30] and the aims espoused by policies for health and social care integration[9]. These can only be fulfilled by an appropriately trained, resourced and supported workforce[32].

Strengths and limitations

Consulting academic experts helped ensure all relevant documents were included in the review, which was updated to include the refreshed eHealth Strategy[13], but could potentially have introduced selection bias. Summative content analysis can be a blunt instrument seeking to quantify qualitative research (Table 2) as the frequency of terms does not necessarily indicate relative weighting or intended emphasis. The review was strengthened by software search functionality so all iterations of the search terms would be returned where hand searching may overlook some instances. Software also helped ensure the accuracy of the extracted data as copy and paste is less prone to errors of omission, commission or transcription than re-typing. The review was further strengthened by independent coding following an agreed plan by two researchers to reduce design bias (by applying agreed standard procedures in data handling), information bias (misclassification of data), social desirability bias (coders acquiescing on the basis of assigning assumed values to the other coder) and promote objectivity (systematic processing applied independently)[26-28]. However, all human activities are subject to weakness and, although timely when written, this review will be weakened as soon as the policy documents are superseded.

Conclusion

The policy documents reviewed placed emphasis on supporting the role development of the whole pharmacy team through ehealth technology, multidisciplinary education and training 'to meet future professional and service needs'[29]. This review demonstrates the cohesion of purpose across current policy and strategy for intended role of technology in pharmacy in Scotland, as policy moves towards pharmacy practice. Future research should track the cohesion between policy and its implementation into pharmacy practice with emphasis on the role of ehealth technologies.

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Table 1 Documents selected to inform the development of a conceptual model of the intended use of ehealth in pharmacy practice in Scotland

Year	Authors	Title
2011	Scottish Government	eHealth Strategy 2011-2017[13]
2011	Royal Pharmaceutical Society	Empowering pharmacists to improve Pharmaceutical Care and Medicines Safety through Information Technology: Information Technology Strategic Principles[8]
2013	Wilson H, Barber N	Review of NHS Pharmaceutical Care of Patients in the Community in Scotland[29]
2013	Scottish Government	Prescription for Excellence: A Vision and Action Plan for the right pharmaceutical care through integrated partnerships and innovation[17]

Table 2. Frequency of constructs in policy sources

Policy source Construct	RPS IM&T [8]	eHealth Strategy [13]	Prescription for Excellence [17]	Wilson & Barber [29]
Patient care	9	7	13	9
Education and training	24	6	21	24
Information governance	7	26	20	8
Implementation	38	15	24	11

Highlights

Key findings inducted from data and evidenced across all constructs were the clear policy and strategic intention that:

1. Patient care: should be supported by technology in pharmacy which is adequately resourced to support the integration of health and social care delivery promoting the role of trained pharmacy staff working in partnership with patients for their safe, effective care.
2. Education and learning: should be designed for training the multi-disciplinary health and social care team in the appropriate, effective use of technology, developing and using the skills of the whole pharmacy team to meet future professional and service needs.
3. Information governance: should be fundamental to development of secure, shared patient information systems with pharmacy staff bound by the same rules of patient confidentiality as other health and social care professionals.
4. Implementation: should improve accessibility to accurate, up-to-date patient information shared across secure, interoperable health and social care systems to facilitate greater integration, skills mix, choice and control using technology to deliver clinical care more effectively.