A qualitative study on community pharmacists' decision-making process when making a diagnosis.

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Abstract

Rationale, aims and objectives Self-care policies are increasingly directing patients to seek advice from community pharmacists. This means pharmacists need to have sound diagnostic decision-making skills to enable them to recognise a variety of conditions. The aim of this study was to investigate the process by which pharmacists manage patient signs and symptoms and to explore their use of decision-making for diagnostic purposes.

Methods Data were collected through semi-structured, face-to-face interviews with community pharmacists working in England, between August 2013 and November 2013. Pharmacists were asked to share their experiences on how they performed patient consultations, and more specifically how they would approach a hypothetical headache scenario. As part of the interview their sources of knowledge and experience were also explored. Framework analysis was used to identify themes and subthemes.

Results Eight interviews were conducted with pharmacists who had a wide range of working practice, from one year through to forty years of experience. The pharmacists' main motivations during consultations were product selection and risk minimisation. Their questioning approach and decision-making relied heavily on mnemonic methods. This led to poor quality information gathering - although pharmacists acknowledged they needed to 'delve deeper' but were often unable to articulate how or why. Some pharmacists exhibited elements of clinical reasoning in their consultations but this seemed, mostly, to be unconscious and subsequently applied inappropriately. Overall, pharmacists exhibited poor decision-making ability and often decisions were based on personal belief and experiences rather than evidence.

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Conclusions Community pharmacists relied heavily on mnemonic methods to manage patients' signs and symptoms with diagnosis-based decision-making being seldom employed. These findings suggest practicing pharmacists should receive more diagnostic training.

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Introduction

As people live longer, generally through advances in medicine, the economic strain on healthcare systems has grown, requiring healthcare organisations to undergo major changes in the way they deliver patient care. Promotion of self-care, where patients can make decisions about their health without consulting their doctor, for issues ranging from adopting healthier habits to managing minor ailments, is increasingly being advocated (1-3). This has placed community pharmacists in a position to help patients manage their own health (4-6), but at the same time has brought with it a new set of challenges, such as providing appropriate advice to patients presenting with signs and symptoms and making diagnoses

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To support this self-care paradigm, many medicines have been made available to the public without the need for a prescription, exemplified in the UK where more than 130 medicines have become available over-the-counter since 1983 (7); similar deregulation processes have occurred in countries such as New Zealand, Australia, Germany and the USA (8). The majority of these medicines are for relief from acute illnesses, however recently medications for chronic conditions, such as statins and tamsulosin, have been made available, with the possibility of more in the future in countries like the UK and the USA (9, 10). For community pharmacists this means they need to be able to recognise the signs and symptoms associated with a wide range of conditions that these medications can treat.

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The skillset of the pharmacist therefore needs to include decision-making skills, which ensure patients receive safe and accurate guidance for presenting symptoms, although, traditionally these have not been taught in most UK universities, as symptom management was seen as less important compared

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to medicine supply . However, as the pharmacist role has developed in this area, pharmacy educators have begun to teach symptom recognition, but the approach has been largely through protocol-driven questioning, which has limited evidence as being effective in establishing diagnoses (11). Clinical reasoning is another approach used by clinicians such as GPs and nurses, when performing diagnoses and establishing treatment plans, however its use among pharmacists has not been established . Clinical reasoning is a dynamic rather than a static process, in which evidence-based knowledge serves to recognise and interpret clinical data and practical experience allows to integrate all available information into forming a diagnosis. Thus, with this approach, there is no set protocol being followed and questioning is adapted to each different case. Clinicians can rely on the information provided by the patient for their interpretations but they must also be able to make their own observations based on epidemiological facts (e.g. is the patient young or old), the recognition of patterns that can help differentiate between clinical cases (e.g tension-type headache patterns vs. migraine patterns), visual cues they can get by looking at the patient (e.g. location of redness for eye conditions) and any other sort of facts they can draw clinical information from.

The aim of this study was to investigate the process by which pharmacists manage patient signs and symptoms and to explore their use of decision-making for diagnostic purposes.

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Methods

To investigate how community pharmacists approach the consultation process when patients present with signs and symptoms, a qualitative approach was selected. Data were collected through face-to-face semi-structured interviews, in order to better understand the pharmacists thinking process when assessing patients. An interview guide was devised, based on previous published works (reference needed) that explored thought processes of pharmacists when trying to establish a diagnosis, to allow participants to share their experiences of consultations. The guide contained questions aimed to

facilitate participating pharmacists in case they steered out of context or the interview stalled, and it was not a definitive questionnaire. It included a question about pharmacists' approach to a hypothetical scenario of a patient presenting with headache symptoms. The headache scenario was chosen as headache is one of the most commonly presented pharmacy ailments. Participants were further able to talk about their decision-making process and the reasoning behind it as well as the sources from which they derive their knowledge and experience.

Participants were practicing community pharmacists across England with a period of registration of at least six months as a minimum of practice experience, and who did not hold, or were not working towards to, a prescribing qualification. Pharmacists were identified and recruited via word of mouth. Recruitment of participants was based on the principle of data saturation rather than a set number of interviews. The interviewer (PS) met the pharmacists at a place of their choice (for example, coffee shop, workplace) and the interviews lasted between 30 to 45 minutes. The interview guide was piloted on two pharmacists, following which, amendments to question wording were made. Pharmacists were not provided with any incentive for their participation. All interviews took place between August 2013 and November 2014 and were audio recorded. Transcribing, ad verbatim, was outsourced.

Interviews were initially analysed by PS and findings independently reviewed and further analysed by the other authors , using a clinical reasoning based framework analysis to identify themes and subthemes. This involved the initial familiarisation with the data, an initial thematic framework and then the data was imported to nVIVO© QSR for Mac version 11.3.2 for indexing and sorting. This was followed by a review of the data extracts, data summary and abstraction and interpretation through description and explanation. Ethical approval was granted by the University of Wolverhampton, Division of Psychology Ethics Committee.

Results

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Eight community pharmacists, three female and five male, were recruited and completed interviews. Their experience ranged from one to forty years in community practice (Table 1).

The results are presented in three main sections. First, a section related to the pharmacists' consultations with symptom-presenting patients, second a section related to their decision-making and third a section about their knowledge and experience. Supporting quotations are featured for each section and each quotation ends with a code for the pharmacists gender (F/M), length of registration in years (eg. 19) and nickname (eg. Ramona).

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Table 1

Consulting the patient

Participants' responses about the questions they ask tended to revolve around two distinct themes: their motivations behind the consultation and the questioning strategies they would employ during the consultation in order to elicit information from the patients.

Motivations

The pharmacists' consultations seemed to be primarily influenced through *product-based motivation:*

> *"…where I am looking at what it is they are treating, and trying to recommend the best product […] for that condition…" (M40 Seth)*

and *risk-aversion motivation:*

> *"Again I want to make sure that I am recommending them things that actually are going to be suitable for them […] I certainly don't want to recommend them things that are going to potentially make it worse […] I am wanting to make sure there is going to be nothing that if I recommend is going to interact, I want to make sure there were no medicines that will actually cause the problem…" (F6 Abby)*

whilst a *diagnosis-based motivation* was limited to a secondary role.

> *"Just trying to, distinguish between tension headache through to a migraine […], and depending on what the patient said and depending on things like how long they've had it before? Or have they had these types of headaches before? And things like that would depend on […] whether I […] would have to refer them or to sell them something." (F3 Kim)*

Pharmacists seemed to focus on product selection, minimising medication interactions and aspects of diagnosis were often conflated within the process of making a product selection.

Questioning strategies

A variety of methods were mentioned by the pharmacists when they asked questions during consultations. *Gathering of information*, most of it geared towards making a product selection, was most prominent,

> *"So who is the patient, how old are they, are they at risk of anything other than something that's serious, is there any symptoms that they have got that would warrant referral, so I would look at all of that and see what medication they are on as well, to see whether that headache could be a side effect of their medication." (F5 Ramona)*

however there were many occasions in which there was no apparent explanation offered as to why and how the information gathered was useful. A *desire to 'delve deeper'* characterised by mentions of asking 'probing' questions, asking what the pharmacists themselves called "tailored" questions, and use of open-ended questions was also prominent,

> *"Listening to the sentences, looking at what language, and how they feel, and finally, from the sort of sentence that they have given me, they are asked more probing questions about the condition and far more deeper into the sentence." (M9 Sascha)*

yet, it was often difficult for the pharmacists to meaningfully explain the reasoning of their 'deeper' questioning. Another part of the pharmacists' questioning strategy was *involving the patient*, asking for the patient's input and giving them the opportunity to disclose information with a clear preference for shared decision-making

> *"So, I think you have to give the patient a choice and, that they have, like I said, more of an ownership of the condition and why we've chosen the drugs." (F3 Kim).*

Decision-making

Responses from pharmacists were categorised in two themes. First, the pharmacists' approaches to decision-making, which included the mnemonic method of memorised protocol-questions, and a clinical-reasoning approach. Secondly, the pharmacists' decision-making outcomes with respect to diagnosing, product selection and referring the patient.

Decision-making approaches

The *use of mnemonics* was adopted by all pharmacists interviewed, with WWHAM (Who is the patient, What are the symptoms, How long have the symptoms been present, Action taken, Medication being taken), being the most prominent iteration of this method.

> *"It's those basic five questions that you should ask that allows you to get the information that you need basically to cover everything that should be covered when you are speaking to somebody about* [a] *health complaint" (F6 Abby)*

Often, the pharmacists used this as the backbone of their consultations, from diagnosis to product selection. There were instances where the pharmacists talked about limitations of this method such as

that it cannot apply on each individual case or the limited amount of information you can get by using it

> *"but I kind of think […] each scenario is different and you have to take each one with questions that you deemed suitable in that situation and it's not simple as going through [a] list, because that often makes you sound like you just blabbering lots of irrelevant questions that doesn't necessarily suit the scenario" (F3 Kim)*

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and of attempts to 'delve deeper', however, often these attempts were unspecified generalisations.

> *"I tend to just go through the general questions* […] *so how old they are, any contraindications, any other medical conditions or medication, and things like that, if it's a more complex query, obviously, I talk to them in more detail and then if I thought it was relevant to sell something…" (F3 Kim)*

Elements of a clinical reasoning approach were present, such as the identification of visual cues, the use of epidemiology, pattern recognition, the need for examination of the patient and assessment of symptoms, and taking into account the patients' medical history

> *"…whether he or she—it's normally a she, suffers with headaches on a regular basis, whether it's certain times of the day, such as early in the morning.." (M40 Seth)*

These instances of clinical reasoning were however not used in a conscious manner or with specific purpose and were often applied incorrectly and based on assumptions and not on evidence

> *"She obviously was quite young, say about 40, so obviously there is no worry with regards to, or suspecting any underlying conditions with that as well, there was no need for a referral really obviously because she had plenty of fluids and vitamin C and the paracetamol" (M1 Avery)*

Only one pharmacist demonstrated clear use of clinical reasoning

"Generally I like to examine the eye if I can, if the patient is comfortable with that. It's quite often easy to differentiate irritated, red, sore eyes, from a genuine infection and you also get an idea from just having a good look over the eye and the eyelashes and surrounding area whether there has been any sort of stickiness of the eye which can be quite a classic symptom of bacterial conjunctivitis as opposed to an allergic conjunctivitis." (M12 Pasquale)

Decision-making outcomes

The pharmacists' *diagnostic outcomes* were characterised by poor diagnostic ability, often attributing a condition to medication side effects, for example associating headaches with contraceptive use even though there was no causality

"…and if they are on medications or things like the oral contraceptive, a headache will be a risk factor, or any kind of problems or risks that might be as a result of the medication, it is a good idea to stop medication if they are having headaches" (M1 Avery)

Most of the pharmacists mentioned the need to challenge patient belief/self-diagnosis,

"I would imagine that despite what people think in most of the headaches like fictional headaches or the superficial vascular … that has nothing to do with what's going on inside the head. So I have to try and convince people that it's not a brain tumour or anything but I've had a few cases like that where people think they've got brain tumours and I have to try and ascertain whether they are imagining such a thing or not." (M19 Mohamed)

however, that said, in many cases patients were apparently taken at face value

"I didn't. I took his word for it, the fact that he had them before, he called it migraine, it was intense pain, feeling a bit nauseous as well, but I must confess I didn't tend to accept his word for it…" (M40 Seth)

Product selection appeared to be the pharmacists' main outcome priority, which often overshadowed the need to first establish a diagnosis. The outcomes discussed were mainly based on the symptoms described by the patients and their medical/medication history and aimed at symptom relief and management

> *"I've asked him to describe the symptoms and they mentioned that there's a bit of bloating now, if the patient mentions to me saying that he has heartburn also, then I'm more prone to recommend something like Wind-eze […] which has got the ingredients for indigestion and for heartburn" (M9 Sascha)*

Facilitation of patients' product choice and patient adherence also factored in the pharmacists decision-making.

> *"Again I give them the options if they say to me their eyes are itching, I will give them the opportunity, I will tell about the eyedrops but ultimately it comes back to their decision unless for example there is a direct medication interaction or they really want a non-drowsy antihistamine, then in that case I will steer them toward the ones that I think will be better for them." (F6 Abby)*

Substance abuse, such as an apprehension for selling codeine-containing products for fear of patient misuse, was mentioned often, rather than a potential diagnosis such as medication overuse headache.

> *"Anyone presenting with headache who I knew was regularly buying say Co-codamol or Nurofen Plus, any codeine containing product on a regular basis, by which I mean attempted purchases two or three or more times a week or every week on a regular basis, then that would be utmost in the mind." (M40 Seth)*

Many pharmacists referred to 'lists of personal preferences' to which they revert to when selecting a product which were based on personal criteria with no evidence-based criteria mentioned.

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"I will then start filtering through various products. Like a lot of pharmacists, I have my favourite which I tend to stick to. It may or may not be always the good idea but I tend to have particular products that I will always go back to time and again." (M19 Mohamed)

Product selection was often accompanied by *medication advice* which would be about the proper use of products or when they should not be used. *General advice,* which did not revolve around medication, was also offered. There were instances of evidence based as well as non-evidence based advice.

"I find the softeners aren't normally sufficient, so the docusate isn't normally sufficient […] and so opioid constipation and I find personally and from people that I spoke to, that Dulcolax is quite strong, so I normally recommend that people start Senna..." (F3 Kim)

"Don't use anything unless you absolutely have to. Don't use cough remedies, just let the cold work itself through. It's the body's natural response." (M19 Mohamed)

Pharmacists also spoke of *referral to a doctor.* Reasons stated that warranted a referral predominantly relied on severity and duration of the symptoms and past treatment failure

"…if they have had the same headache continuously for more than two days or something, that's not – nothing has worked on it, then that would warrant referral" (F5 Ramona)

The pharmacists also had a sense of professional duty to refer patients when they were unable to help them

"Basically, what it means is if they've already told me what they're actually using and I've got nothing else in my arsenal, I would be more likely to then refer them because I would feel then that I would be letting them down if I didn't. I would need to try and give them some guidance as to what to do next because if they come to me and they've tried […] I don't really have anything else up my sleeve apart from referral, that's the reason." (M19 Mohamed)

and, in some cases, simply the fact that they could not think of a care option was enough to warrant a referral.

> *"I would probably recommend some basic pain killers and then refer them if they really are that concerned, if the headache is so severe" (M19 Mohamed)*

On the other hand, there were a couple of instances where pharmacists discussed when a case would not warrant a referral, however the reasons they presented for considering not referring the patient did not seem to be entirely comprehensive

> *"Well she seemed quite young, there was no question whether she would be at further risk if she wasn't being treated by antibiotics...there was no need for her to be referred to a GP to be treated by antibiotics" (M1 Avery)*

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Knowledge and experience

Knowledge

While there were several instances of *good subject knowledge,* such as the following quotation of a pharmacist associating male gender with cluster headaches:

> *"if it's for severe male you might be thinking about cluster headaches" (F6 Abby)*

there were various occasions where the basis of the pharmacists knowledge was questionable, as indicated by the following on the topic of headaches:

> *"…but if they have to be diabetic or taking certain medications, diabetes medications maybe H2 blockers or any medication, which may cause I guess headaches as a side effect or even the natural condition may cause headaches" (M9 Sascha)*

"But I know that you can have an internal headache, but I'm just thinking that most headaches I believe are from either the muscles at the back of the neck leading up to the back of the head or the whole vasculature, superficial vascular muscle." (M19 Mohamed)

"I don't know. I mean, I think it's just something I've always believed. Partly I think due to the nature of most headaches is that they are self-limiting and they go away around. They are very … I think that's part of the reason is because they're not serious. I think perhaps I associate serious headaches with internal and superficial is just something that comes and goes." (M19 Mohamed)

Regarding the sources of their information on symptom presentation, most pharmacists mentioned that they rely on the knowledge they received during their education,

"So, just start of the WWHAM questions that you get at uni, you know, the sort of, the five questions that you should ask…" (F3 Kim)

their personal beliefs and opinions of their colleagues, patients and social circle, as well as being self-taught and relying on their own 'research'

"Maybe I'm wrong in this but I always believe myself that most headaches are self-limiting […] It may not always be true but that's what I believe." (M19 Mohamed)

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They also mentioned accessing professional resources such as the British National Formulary (BNF), which is, however, not related to symptom presentation,

"I guess it's still based on BNF and reference sources that I have used in the past really." (F6 Abby)

or surveys they have to complete as part of a medication licence, such as the one used for the sale of sumatriptan in the UK;

"…it's actually the questionnaire that I get them to fill out and I will go through with them" (F6 Abby)

Textbooks were also mentioned (no specific titles were mentioned), although internet sources, such as Google, were mentioned as a source to be avoided.

> *"…we do keep a couple of texts and keep a visual minor ailments book which has pictures that help you differentiate whether it's minor illness or something more severe […] I tend to stick to the textbooks rather than Google or anything, anything crazy like that which some people tend to go on to Google for everything." (M12 Pasquale)*

Experience

Pharmacists mentioned that, with respect to patient consultations they draw from their *personal experiences* and those of their friends and family,

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> *"I mean products that I use myself or products that I know ha[ve] been effective in patients that I have seen before..." (F5 Ramona)*

as well as the experience of their patients and other pharmacists.

> *"I think it's just, experience from my learning, but also personal experience, friend and family experience" (F3 Kim)*

They also mentioned that they draw from their *professional experience* as registered pharmacists, their training and CPD,

> *"Well from pre reg as well, from revising for the pre-reg exam, from learning from over the counter and symptoms in the pharmacy from that just from observing while I was pre reg as well and from previous experience, previous situations similar previous situations" (M1 Avery)*

and one of the pharmacists mentioned their instinct.

"In some instances, I have to be honest, it's down to my own instinct, my own feeling, experience."

(F6 Abby)

Interestingly, most of the experiences mentioned, centred around product use and not around experiences of dealing with symptom presentation.

Discussion

The results of this study show that diagnosis-based decision-making is seldom employed by community pharmacists. When diagnostic decision-making was noted, through elements of clinical reasoning, pharmacists exhibited poor mastery of appropriate knowledge and lacked skill in utilising this information in this way. They relied heavily on mnemonic questioning, which led them to ask questions without having any sound reason as to why; this has been observed in other studies (12-14).

Pharmacist consultations were generally shaped around product recommendation, and thus questioning strategies were focused on information gathering to make an appropriate and safe product choice for the patient. This approach, whilst ensuring safety of products taken, ignores the need to first establish a diagnosis. One could argue that patient safety is compromised if a diagnosis is not arrived at, as product selection/recommendation may be inappropriate and could mask symptoms, or allow symptoms to worsen. The way in which consultations occurred was irrespective of experience and suggests that educational instruction at undergraduate and postgraduate (eg CPD activities) level advocates mnemonic methods of information gathering. In the UK this is generally the WWHAM method, which places as much emphasis on product recommendation as diagnosis.

Mnemonic methods have been advocated as an easy and simple way of facilitating diagnosis and evidence-based decision-making (11, 15). In this study, mnemonic questioning was often used but it is not clear how the information they gathered was assimilated to form a diagnosis; pharmacists

consistently struggled to explain how questions asked were linked or inter-related, and showed little comprehension of the significance of answers received in shaping their thought process. This was highlighted by the tendency to ask superficial questions about the patients' symptoms and attempting to attribute them to medication being taken by the patient, which was something common between the pharmacists interviewed. There was, however a sense of this limitation, and pharmacists expressed a desire to 'delve deeper', but the explanations of what that involved often contained platitudes and generalisations, which raises important questions on pharmacists being properly equipped to deal with these types of patient. Methods that are based on clinical reasoning, which have been prominent in other medical professions for decision-making (16), seem a more suitable solution as they combine knowledge and experience with the information that is being received to further inform questioning. The pharmacists in this study showed some signs of clinical reasoning, however, all but one, were mostly using them loosely or improperly and probably subconsciously, without being aware of what they were doing.

Given the pharmacists in the study were very protocol-led in questioning, it is not surprising that they displayed poor diagnostic ability. They tended to associate conditions to the patients' medication history, or forfeiting a diagnosis altogether for direct product selection aimed at symptom management and relief, and often their sole focus appeared to be on products and medication. The attention paid to ensure patient safety, both when selecting products and when referring as safety netting, is a positive element of their consultations, however, referral reasons mentioned do highlight weaknesses as diagnosticians, as there were cases where referrals were not needed, or cases where referral could have been dismissed without proper consideration.

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The fact that experienced and inexperienced pharmacists alike displayed poor diagnostic ability and decision-making, shows that, even though the pharmacists say they rely on their experience, without the appropriate skillset experienced pharmacists still exhibited 'novice' levels of clinical decision making. The knowledge breadth and depth around symptom presentation and therefore diagnosis

was unremarkable and the fact that pharmacists relied frequently on non-evidence based information and personal beliefs was quite surprising. This further goes to explain potential poor performance, and reinforces the need for pharmacy educational institutions to reconsider the approach they take on decision-making (17).

The sample of this study was very small but it indicated that community pharmacists lack important skills and knowledge for making diagnoses. Instead, they rely on the product selection process when consulting symptom-presenting patients. This can lead to misdiagnosis and inappropriate recommendations, and putting a strain on the healthcare system instead of relieving it. Educational institutions need to address pharmacists' lack of knowledge and expertise on this field and more emphasis should be put on practicing pharmacists receiving appropriate training.

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Table 1 Pharmacist demographics and years of experience

Participants	Gender	Period of registration	Nickname
Participant 1	F	6 years	Abby
Participant 2	M	1 year	Avery
Participant 3	F	3 years	Kim
Participant 4	M	19 years	Mohamed
Participant 5	M	12 years	Pasquale
Participant 6	F	5 years	Ramona
Participant 7	M	40 years	Seth
Participant 8	M	9 years	Sascha