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Final year MPharm students approach to questioning when responding to symptoms

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Abstract

The advisory role of the community pharmacist in helping patients manage self-limiting conditions is well established. Recent trends promoting patient self-care coupled with greater availability of non-prescription medicines has focused renewed attention on this role. Graduate pharmacists must therefore possess good consultation skills to elicit information from patients. A retrospective descriptive analysis of questions asked by final year students studying at Portsmouth University was undertaken. Data was drawn from six simulated patient scenarios that were part of a series of observed structured clinical examinations (OSCEs) students sat in the final semester.

Results show that questioning patients centred on the use of the mnemonic known as WWHAM, although supplementary questions were always asked to gain further information. Questions not directly related to the presenting complaint were least asked. Despite possible shortcomings in their approach to questioning the correct diagnosis was achieved in the majority of cases and appropriate recommendations made.

Keywords: *Undergraduate, questioning technique, diagnosis, response to symptoms*

Introduction

A core role of the community pharmacist is advising patients who wish to exercise self-care. How many patients ask for advice from community pharmacies is a matter of conjecture, (Bissell, Ward and Noyce, 1997; Bower and Eaton, 1998) but what is certain is they seek advice on a wide range of ailments on a daily basis (Smith, 1993; Seston, Nicolson, Hassell, Cantrill and Noyce, 2001).

This advisory role looks set to increase based on recent government health care policies coupled with a greater emphasis on cost containment by health care organisations (Soller, 1998; Harrington and Shepherd, 2002). In the UK, probably of greatest impact is the continued deregulation of medicines. Over 50 prescription, only medicines have been deregulated to Pharmacy only status (restricted by UK law to sale in a pharmacy, under the supervision of a pharmacist) since the first, loperamide, was deregulated in 1983 and include products from new therapeutic classes (e.g. anti-emetics and proton pump inhibitors) allowing more conditions to be managed by community pharmacists without the need for medical referral.

It is therefore important that graduate pharmacists possess the pre-requisite skills to competently perform this expanding role. As several studies have examined and criticised the performance of qualified community pharmacists in giving advice on non-prescription medicines (Anderson and Alexander, 1993; Consumer's Association, 1994; 1999; Krska and Kennedy, 1996).

The aim of this study was to determine if questioning techniques used by final year MPharm undergraduates studying at Portsmouth University, UK, were adequate to allow them to draw correct diagnoses, and hence course of action from simulated patient scenarios.

Background to the study

Educational material relating to differential diagnosis is currently taught and assessed in semester two of the third year and semester one of the fourth (final) year.

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As part of the final year curriculum, students have a further final assessment in semester two via observed structured clinical examinations (OSCEs). Students sit three OSCEs, the first two sessions being formative and the final session being summative. The OSCE consists of 8 timed workstations, one of which is differential diagnosis. At this station the student is presented with a "patient",(a member of staff), who asks for advice on a symptom or illness they are currently experiencing. The student has 5 min to diagnose the problem and make appropriate recommendations to the patient. After which the member of staff scores their performance and also marks down the order in which the student asked the questions. After each formative session students receive the mark sheets to allow reflection and thus identify areas of strengths or weakness prior to the summative assessment.

Method

For each formative OSCE session, the year group for practical and logistical reasons, was split into three equal sized classes (approximately 40 students per group). To minimise cheating each group received a different differential diagnosis scenario, and so a total six scenarios were developed for the two formative sessions:

Scenario one: A 23 year-old female, 26 weeks pregnant complaining of a burning pain in her chest (heartburn);
Scenario two: A 36 year-old female asks for something to help with sickness and diarrhoea (food poisoning);
Scenario three: A 28 year-old woman wants something for stomach ache (irritable bowel syndrome);
Scenario four: A 21 year-old male wants a cream for a rash he has on his foot (athlete's foot);
Scenario five: A 19 year-old male presents with red eye (viral conjunctivitis); and
Scenario six: A 37 year-old male, wants something for constipation (lack of dietary fibre).

Scenarios one to three were used in the first OSCE session and scenarios four to six in the second. Scenarios were constructed by the course team and designed to reflect accurately typical situations encountered by community pharmacists during their day-to-day activities. Standardised replies were constructed to ensure responses given by staff were consistent when questioned by the student (Appendix 1 highlights scenario 1).

After completion of each formative OSCE session, mark sheets were photocopied and then returned to the students. Data was analysed descriptively using Excel, paying particular attention to the order in which the questions were asked. Questions were further categorised in to one of three types:

(1) clarification/probing;
(2) related to history taking; and
(3) belonging to the mnemonic WWHAM (WWHAM stands for: *w*ho is the patient; *w*hat are the symptoms (both known in this instance); *h*ow long have the symptoms been present; *a*nything tried already and, other *m*edication).

Results

In total, 119 students were eligible to sit the formative OSCE sessions. Due to illness/non-attendance 115 students sat the first session and 114 the second. Table I highlights the number of questions asked by students. The range of questions asked varied from just two questions, asked by only one student in scenario one, to 11 questions asked by three students (one in scenario three and two students in scenario five). The modal value for each scenario showed little variation, with seven being the commonest modal value. Although students asked differing number of questions in each scenario it appeared to have little bearing on the final outcome. It was thought that as more questions were asked, the likelihood of the student arriving at the correct diagnosis would increase. This was not observed and no relationship appeared to exist between questions asked and outcome.

When questions were categorised into clarification, history related or WWHAM questions, (Table II) it was apparent that history-related questions were the least asked. Only in scenario six (constipation)

Table I. Question breakdown for each scenario.

Scenario	Number of questions										Total	Range	Modal value
	2	3	4	5	6	7	8	9	10	11			
1 Heartburn ($n = 37$)	1	2	11	15	6	1	0	1	0	0	179	2–9	5
2 Food poisoning ($n = 40$)	0	3	3	8	10	7	4	3	2	0	249	3–10	6
3 IBS ($n = 38$)	0	0	2	1	8	10	9	4	3	1	280	4–11	7
4 Athletes foot ($n = 39$)	0	0	4	6	7	10	10	1	1	0	217	4–10	7 or 8
5 Viral conjunctivitis ($n = 38$)	0	0	3	4	6	13	5	4	1	2	267	4–11	7
6 Constipation ($n = 37$)	0	1	0	2	3	14	10	5	2	0	274	3–10	7

Table II. Types of questions asked for each scenario.

Scenario	Questions directly from WWHAM	Clarification questions	Questions related to history taking
1 Heartburn ($n = 37$)	93	69	17
2 Food poisoning ($n = 40$)	99	85	65
3 IBS ($n = 38$)	91	136	53
4 Athletes foot ($n = 39$)	82	101	34
5 Viral conjunctivitis ($n = 38$)	86	159	22
6 Constipation ($n = 37$)	88	97	89

the number of questions were comparable to the two other question types. In contrast most students did ask WWHAM questions. Given that the student already knew who the patient was and what the presenting symptoms were (2 of the 5 WWHAM questions) it is clear that most students in all six scenarios asked the remaining three questions (H, A and M questions). For example, in scenario one (heartburn) the 37 students asked 93 WWHAM questions; the maximum number of WWHAM questions that could have been asked was 111. Clarification questions were most frequently asked in four of the six scenarios, especially in scenarios three (irritable bowel syndrome) and five (viral conjunctivitis). Interestingly, these two scenarios produced the worst student performance (Table IV).

The order in which students asked the questions was also recorded (Table III). To aid clarity, Table III only highlights the first five questions that were most frequently asked. For example, in scenario one (heartburn) the question asked first by most students was "how long have the symptoms been present?" Thirty out of the thirty-five students who asked this question did so as their opening question. Indeed, this question was the first most frequently asked in all six scenarios and is a WWHAM question. Clarification questions were the second most frequently asked for all scenarios. The third and fourth most commonly asked questions were either WWHAM or clarification questions. Only in scenario six (constipation) did lifestyle questions feature in the first five questions asked by students, being fourth and fifth most frequently asked.

The end point of any consultation is to know whether or not to treat or refer and student performance is shown in Table IV. All students in scenario one ($n = 37$) correctly diagnosed heartburn, with 31 (84%) going on to recommend a course of action. Lifestyle advice, with or without drug, treatment was the commonest recommendation and offered by 21 students. This included avoiding eating large meals, to stop smoking and drinking and to cut down on spicy foods. Five students, although diagnosing heartburn, would not recommend treatment or advice and referred to the GP. Student performance in scenario four was also good with only two students incorrectly diagnosing athlete's foot as either an allergic rash or bacterial infection. Of the 36 that were correct, 25 offered an antifungal alone and the remaining 11 offered an antifungal plus hygiene advice.

Thirty-five students (88%) in scenario two correctly diagnosed food poisoning. Loperamide was the preferred course of action with 26 students recommending it either alone or in combination with increased fluid intake. Seven students stated fluids alone would be advisable. Questionable treatment options included kaolin and morphine ($n = 1$) and a bulk forming laxative ($n = 1$). For constipation, 33 students (89%) arrived at the right diagnosis and 30 of these offered an appropriate laxative. In addition to medication, 16 students also advised on increased fibre and fluid intake. The remaining three students referred to the GP to rule out depression.

Poorer performances were observed in scenario three (irritable bowel syndrome) and scenario five (viral conjunctivitis). Six students thought that the patients red eye was another form of conjunctivitis (bacterial or allergic) and three thought it to be subconjunctival haemorrhage and one uveitis. Advice offered by 22 students who correctly stated it was viral conjunctivitis went on to recommend an antibacterial eye drop/ointment. Students faired most poorly in the irritable bowel syndrome scenario with 18 students misdiagnosing the problem. Misdiagnosis ranged from appendicitis ($n = 2$) to ectopic pregnancy ($n = 1$). Fifteen of the twenty-two students who diagnosed IBS referred to the GP as this was a first time presentation of the symptoms. The remaining seven students went on to recommend an antispasmodic.

Discussion

In the context of arriving at the correct diagnosis, student performance was generally good. Only one scenario, irritable bowel syndrome, saw almost as many misdiagnoses as correct ones. However, the way in which students arrived at the diagnosis was interesting. Students appeared to base their questioning technique around the use of the mnemonic WWHAM. Most students asked the "H", "A" and "M" questions from the mnemonic in all six scenarios. (The two "W" questions were already known) and furthermore, except scenario six (constipation) tended to ask them early in

Table III. Order and frequency in which questions were asked for each scenario (first 5 questions only).

Scenario	First	Second	Third	Fourth	Fifth
1 Heartburn ($n = 37$)	How long had symptoms? ($n = 30/35$)	When do you get the symptoms? ($n = 13/27$)	Tried any medication? ($n = 8/28$)	On any other medication? ($n = 8/26$)	Any other symptoms present? ($n = 7/25$)
2 Food poisoning ($n = 40$)	How long had symptoms? ($n = 31/37$)	Eaten anything different? ($n = 9/26$)	On any other medication? ($n = 11/34$)	Tried any medication? ($n = 6/25$)	On any other medication? ($n = 10/34$)
3 IBS ($n = 38$)	How long had symptoms? ($n = 23/30$)	Where is the pain? ($n = 9/25$)	On any other medication? ($n = 6/25$)	Where is the pain? ($n = 6/25$)	Any other symptoms? ($n = 8/27$)
4 Athletes foot ($n = 39$)	How long had symptoms? ($n = 21/30$)	What does the rash look like? ($n = 11/26$)	Exactly where is the rash? ($n = 9/24$)	On any other medication? ($n = 4/26$)	Tried any medication? ($n = 7/27$)
5 Viral conjunctivitis ($n = 38$)	How long had symptoms? ($n = 29/36$)	Any pain in the eye? ($n = 11/26$)	Any discharge? ($n = 11/35$)	Any discharge? ($n = 13/35$)	On any other medication? ($n = 8/23$)
6 Constipation ($n = 37$)	How long had symptoms? ($n = 28/34$)	What is your normal bowel movements? ($n = 10/25$)	Any other symptoms? ($n = 10/24$)	Lifestyle/ dietary changes ($n = 6/28$)	Lifestyle/ dietary changes ($n = 8/28$)

Light grey: WWHAM questions. Clear: clarification questions. Dark grey: History-related questions.

the patient consultation. This suggests that students were extensively relying on WWHAM to gain initial information from the patient. This approach to the questioning technique is not too surprising since it is heavily promoted in UK pharmacy literature.

More surprising though was the reliance on WWHAM by Portsmouth undergraduate's as they had been introduced to clinical decision making as an alternative approach to differential diagnosis. This involves recognition of cues and analysis of data. Very early in the consultation, based on the presenting complaint and who the patient is, (using prevalence data on the likelihood of that person having a particular condition/s), the practitioner will arrive at a small number of hypotheses. The practitioner then sets about testing these hypotheses by asking the patient a series of questions. The answer to each question should allow the practitioner to narrow down the possible diagnosis by either eliminating particular conditions or confirming their suspicions from the replies given by the patient. Once the question series is over, a differential diagnosis of the patient's condition should be possible. Differential diagnosis was poorly adopted by students, (if at all), and may be because it requires an understanding of the conditions, coupled with knowledge on epidemiological data, which then has to be applied to each clinical situation. Epidemiological data requires integration of multiple pieces of information and can be difficult, especially compared to memorising a short mnemonic like WWHAM. Alternatively, all Portsmouth students have had work experience in pharmacy (over 90% had community experience in the last 12 months prior to the OSCE sessions) and the WWHAM approach to questioning is adopted by many of the multiple national pharmacy chains which may have then been taken up by students as an easier alternative.

WWHAM does have limitations that reduce its usefulness. It fails to take in to account previous history of similar symptoms and does not address lifestyle or social histories. This may mean information gained is of little value without supplementary questioning. This appeared to be the case in the six scenarios enacted in this study. Follow-up questions centred on clarification of the presenting complaint, and was expected. For each scenario students were given only a brief description of the presenting complaint. This should, and did, trigger students to find out further information to ascertain the exact nature of the problem. In all scenarios students generally asked pertinent and relevant questions that had a bearing on them arriving at the correct diagnosis, (except perhaps in the viral conjunctivitis and irritable bowel syndrome scenarios). In these two cases student performance was poorer despite extensive supplementary questioning. This may suggest a lack of knowledge or understanding in these areas.

Table IV. Diagnosis and action.

Scenario	Action taken by those who correctly diagnosed patient	Diagnoses given by those who were incorrect
Heartburn ($n = 37$)	$n = 37$ (100%) 11 lifestyle advice 10 lifestyle advice and alginate 5 referred to GP for medicine 4 said to drink milk 3 alginate only 1 each for H_2 antagonist, antacid, milk of magnesia and no course of action offered	Not applicable
Food poisoning ($n = 40$)	$n = 35$ (88%) 12 loperamide only 11 loperamide and increase fluids 5 oral rehydration therapy (ORT) only 3 ORT and loperamide 2 increase fluids only 1 each for kaolin and morphine, Motilium, Pepto-Bismol and bulk forming laxative NB 37 responses, as two students who referred also recommended a product in the interim period before seeing a GP	5 unsure so referred for second opinion
IBS ($n = 38$)	$n = 22$ (55%) 15 referred to GP 7 treated; 6 with mebeverine and 1 with hyoscine	3 possible IBS 3 Don't know 2 possible appendicitis 2 infection 1 each for ulcer, endometriosis, trapped wind, ectopic pregnancy, muscle spasm and indigestion
Athlete's Foot ($n = 39$)	$n = 36$ (92%) 16 imidazole alone 9 imidazole and hygiene advice 8 allylamine (terbinafine) alone 2 allylamine and hygiene advice 1 mycota	1 allergic rash 1 bacterial infection 1 unsure
Viral conjunctivitis ($n = 38$)	$n = 27$ (71%) 22 anti-infective 5 no treatment (self-limiting)	4 allergic conjunctivitis 3 subconjunctival haemorrhage 2 bacterial conjunctivitis 1 uveitis 1 unsure
Constipation ($n = 37$)	$n = 33$ (89%) 16 laxative plus fluid/fibre 14 laxative alone 3 GP referrals to rule out depression	1 IBS 1 unsure 1 haemorrhoids 1 refer due to blood present

Students failed to ask question about the patient in general, that is those questions not directly related to the presenting complaint. Students tended to concentrate, except scenario six (constipation), solely on the patient's symptoms and did not find out about history-related questions. Similar findings were noted by Morrow, Hargie, Donnelly and Woodman (1993), when categorising question type asked by pharmacists in a study based in Northern Ireland. They too found that questions related to social matters were least asked. Only near the end of consultations in this study did students start to ask these types of question. Although not known, it is hypothesised that students asked these questions late in the consultation as they had run out of things to ask about the presenting complaint and were endeavouring to glean as much information from the patient as they could. Whether or not this information shaped their thinking is unknown but worthy of further investigation.

It could also be argued that people will always ask proportionally less history-related questions compared with clarification questions, and in the students defence, four of the scenarios (sickness, diarrhoea, athlete's foot and red eye), were acute conditions and the taking of histories be it medical, previous instances of similar symptoms or a social/lifestyle history would have little bearing on the outcome. This argument

would have greater validity if students had exhibited a clinical decision making approach to diagnosis. However most, if not all, students did not as they appeared to use WWHAM for information retrieval.

The courses of action students took once they had arrived at a diagnosis were generally appropriate and in line with good practice and medication chosen were evidence-based. The only scenario in which their action could be called into question was for red eye. Most offered an anti-infective to treat viral infection. Anti-infectives available in the UK are either propamidine isethionate or dibromopropamidine isethionate and used for bacterial conjunctivitis and have no place in therapy for viral conjunctivitis. It is unknown why students recommended such products, although a standard pharmacy textbook does advocate their use to prevent secondary infection (Blenkinsopp and Paxton, 2002).

Limitations

The data presented only shows how students performed on two occasions in two simulated scenarios. It is possible that the same student on a different day responding to a different scenario may perform better or worse. Also, the mock consultation is not a true reflection of practice and the performance of students may be hindered by talking to academic staff.

Conclusion

Students appeared to rely heavily on using a WWHAM approach to questioning but their overall performance, both in diagnosis and recommendations was good. If this can be translated to a clinical setting, then many students once qualified, will be able to competently perform this role.

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Appendix 1

Workstation 2: Differential diagnosis
Practical 1: Group A and B
Student name. . . . . .

Scenario: You are a 23 year-old female, 26 weeks pregnant. You wish to speak with the pharmacist. Your present complaint is a burning sensation in the chest.

Patient details

Question order	Questions expected to ask	Response
	How long had the symptoms?	Started about 2 weeks ago
	When do you get the symptoms?	Mainly occurs at night and after a large meal. Large meal often late in the evening as my husband and I work late
	Do you get any other symptoms?	Leaves a sour taste in my mouth
	Does anything make it better or worse?	Also occurs if I have to bend forward or down for anything
	Tried anything?	Rennies but they don't really ease the discomfort
	Lifestyle; eating/drinking habits	Smokes 10 cigarettes a day. Drink 1 or 2 glasses of wine most nights, helps me to relax after a stressful day at work—I am a trainee accountant
	Any meds. from GP?	Taking iron tablets prescribed by the doctor
	Any other medical conditions?	No

ADDITIONAL QUESTIONS ASKED

Differential diagnosis: Heartburn. Offer advice on eating habits and suggest Gaviscon. If symptoms unresponsive to treatment could refer to GP .

Scoring criteria

	Ability of student			
Questions	Yes	Most	Few	None/No
Were all the relevant questions about the presenting complaint asked?				
Were social, medical and drug histories considered?				
What did the student think was wrong with patient?				
Was the correct course of action suggested?				
Total Score				
Q1	Yes (3)	Most questions (2)	Only a few asked (1)	None (0)
Q2	Yes, all (2)	Partly (1)		None (0)
Q3	Correct diagnosis (2)			Incorrect (0)
Q4	Correct course of action, no prompting (3), little prompting (2), much prompting (1), Wrong course of action (0)			

Author Queries

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Q1 The dark and light grey colouration in the appendix table has not been given. Please differentiate by some other means, as we are unable to do the colouration.