A method of teaching clinical problem-solving skills to primary health care student nurses

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Abstract

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The article provides a description of a method of teaching a clinical problem-solving process to primary health care nurses/clinical nurse practitioners (PHC nurses). The process was developed in the Soweto PHC Nurse Training Unit over the past 30 years as a result of the changing availability and role of nurse and doctor teaching staff. Students doing the diploma for nurse clinicians (Diploma in Clinical Nursing Science, Health Assessment, Treatment and Care) are guided in the use of mind maps, assisted by constant clinical practice and group discussions to develop their clinical problem-solving process. This method has assisted in clinical training

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Introduction

On 16 June 1976, Soweto erupted in protest against the apartheid government. Later that day, all government doctors were withdrawn from the clinics. They only returned to the clinics several years later. The medical superintendent of the then Baragwanath Hospital, Dr PJ Beukes, had for several years been motivating his head office to start training nurses to assist with the diagnosis and management of patients in the Soweto clinics. He took the opportunity provided by the withdrawal of doctors to approach Professor Wagstaff from the Baragwanath Paediatric Department to start training nurses in clinical skills so that they could manage patients at the clinics. Prof Wagstaff initially started training nurses in paediatrics. She found that it took on average three months for the students to become clinically competent. Clinic doctors with good experience in managing adult clinic patients were seconded to start training other professional nurses in adult clinical care. This was found to take longer – on average six months.

After four years the South African Nursing Council (SANC) agreed to accept the course as a one-year postgraduate diploma. The diploma was named the Diploma in Clinical Nursing Science, Health Assessment, Treatment and Care. The paediatric and adult training in Soweto was combined into this one-year diploma. The training has proved to be effective.[1–4]

Development of a process of clinical problem solving

A clinical problem-solving process is defined by Fraser[5] as one in which a practitioner:

- Elicits relevant and specific information from patients to help distinguish between working diagnoses
- Generates appropriate working diagnoses
- Seeks relevant and discriminating physical signs to help confirm or refute working diagnoses
- Correctly interprets and applies information obtained from all sources about a patient
- Applies knowledge of basic, behavioural and clinical sciences to the identification, management and solution of patients' problems
- Recognises limits of competence and responds appropriately

It has been an ongoing concern in the Soweto training unit as to how much theory students need before they can start clinical practice. Initially, traditional lecturing methods were used to introduce theory, with emphasis placed on patient-based clinical teaching. During a course to develop clinical skills for midwives, it was found that these students, who had no previous experience of doing patient consultations, demonstrated an unexpected level of competence when allowed to perform clinical consultations on patients. It was realised that, as a result of their nursing education and experience of working with patients, nurses developed quite an advanced process of clinical problem solving. This observation made us realise that the main aim of training should be to promote this innate clinical problem-solving process.

Practising PHC nurses who had demonstrated good clinical problem-solving skills and attitudes over several years in the working situation were asked to become nurse tutors. They became aware of the importance of promoting the clinical problem-solving process. It seemed to be related to the degree to which students developed confidence in their ability to use their own intrinsic problem-solving processes. Tutors began to develop ways to promote this process. From the beginning of the course, the tutors encouraged the students to present patients

seen the previous day to the whole student group. They encouraged the students to challenge each other's findings and to provide reasons for their history, assessments, examination or final diagnosis. It was found that, in the safety of an environment of their own colleagues and nurse tutors, and with positive dynamics in the student groups, the students grew in the confidence that they had the ability to solve these clinical problems themselves.

The tutors were aware of the delicateness of the initial process of gaining confidence. A relaxed and accepting relationship was needed on the part of the teachers so that the students would feel safe in exploring new areas, acknowledging difficulties and being allowed to make mistakes. The success of the course and the support for the weaker students were fundamentally dependent on the ability of the group to work together. The tutors would actively remove a doctor from the teaching situation if they saw that his/her teaching was causing the students to regress back to a rote learning mode as a result of the doctor's more threatening presence. This method of training seems to suit students from less developed educational backgrounds. Students with further post-basic education often had more difficulty learning the clinical problem-solving process. It is thought that this is because they have more trust in an artificial, learnt problem-solving method than in their own intrinsic problem-solving ability.

The courses started with the adult module first and others with the paediatric module first. When comparing the results of the two methods over several years and many courses, it was found that starting with the paediatric module promoted the clinical problem-solving process better. An explanation may be that paediatric diseases tend to have clearer disease patterns and are easier for decision making. Adult clinical decision making is complex and needs a more formal method of decision making. History taking and physical examination are based on the hypothetico-deductive method (encouraging the student to form hypotheses based on the presenting symptoms and then testing them progressively on history and examination), similar to the Leicester method.[5] This is supported by Baye's theorem that clinicians change their diagnosis using the likelihood of a disease based on the initial evidence of the disease, balanced against the strength of new information about another disease.[6,7] The Leicester method has been found to result in quicker and more natural development of the clinical problem-solving process.[5]

Use of a learning structure

About 25 years ago, a visiting lecturer, whose first name was Bonny, illustrated the use of mind maps for learning. These were adapted for clinical teaching by the author, and nicknamed "Bonny diagrams". The students found the one-page mind map showing all important local causes of a symptom combined with summary clinical features useful for clinical problem solving. Causes are classified according to systems of the body. Common causes for each of the systems in Soweto are given, as are the critical symptoms and signs for each disease. References to the (Soweto) Primary Clinical Care Manual,[8] which is the students' main reference, are given to enable them to look up more details of the clinical features and management of some of the diseases. An example of a Bonny diagram for "Cough in an Adult" is given in Figure 1 below.

This clinical problem-solving method has been tried out with nurses doing the diploma on a part-time basis, with teaching based at clinics. The students alternate one week in the working situation and one week in the classroom for 18 months. This allows them to apply any new knowledge immediately in a working situation. When they return for the teaching week, their clinical experiences of the previous week are used for reflection and discussion. During the teaching week in the training section, students, under the supervision of nurse tutors, spend half of each day seeing patients. In the afternoon the students work as a group, using the clinical problem-solving process to integrate and develop their biopsychosocial theory and clinical knowledge.

Once the students have become confident with the clinical problem-solving process, they begin to use reference books and to develop their own theory knowledge. One group of students initially demanded copies of the doctors' lectures; later in the course, when they had become more confident in their ability to learn theory themselves, they preferred to use group self-study methods.

An important support for learning is the method used for assessing clinical skills and knowledge. The qualified PHC nurses say that the method of assessment has helped prepare them for the working situation.

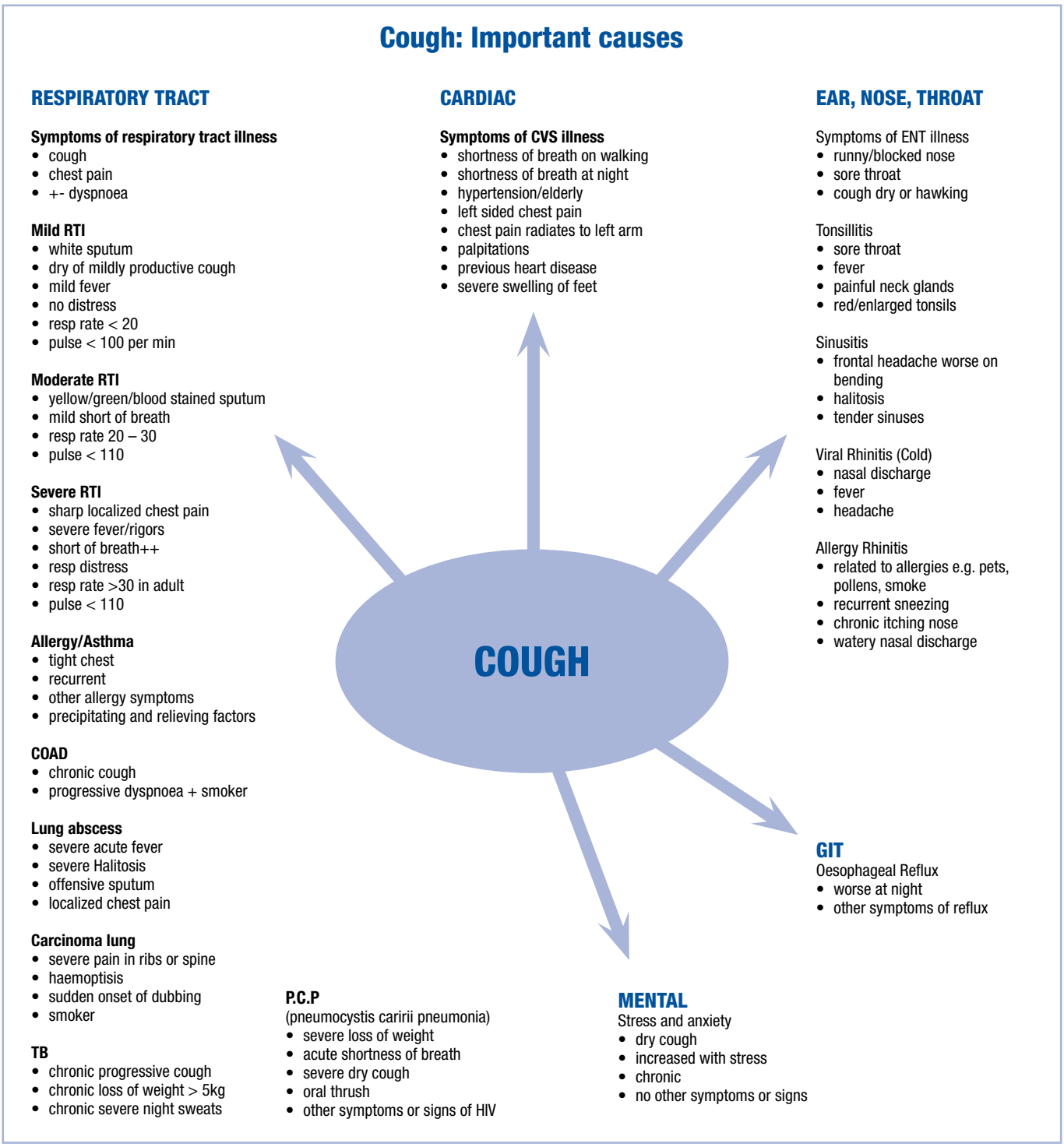
The method entails written tests based on assessing the clinical problem-solving process. Clinical assessment is done using five or six stations with patients. Each station lasts for 10 or 20 minutes, depending on how much the students have to complete. All the students have to complete all the stations. Students are not observed and are marked on what they have written. Patients are clerked by the examiners before being hand-chosen from the available patients in the clinic. Mark guides are generated as far as possible in discussion amongst the examiners. Students have to complete a hypothetico-deductive history, demonstrating the likely causes and disease patterns and generating an appropriate differential diagnosis. The students are given the specific body system that they should examine, including a general examination. They must then complete the relevant examination and draw up final diagnoses. Using real patients from their working situation has been found to encourage students to use the clinical problem-solving cycle.

Results comparing students using different teaching methods

In 2008, two types of teaching were used at the Soweto training centre. One group of 20 students did a one-year full-time course. This group had as their trainer a highly competent and experienced full-time doctor who had been training PHC students for over 30 years. He gives extensive theory lectures and provides support and teaching when the students are seeing patients themselves throughout the course.

Two other groups did an 18-month part-time course. The clinical problem-solving process was used as the basis of teaching. One group had doctor input on one or two days per month, mainly giving teaching regarding the patients. The other group had three to four hours of doctor input per month, mainly on the use of the clinical problem-solving cycle, for the first half of the course. Later in the course, the group had traditional-type lectures one day a week from the doctor teaching the full-time course.

Figure 1. Bonny diagram for a cough in an adult[9]



The full-time and part-time students wrote the same two final summative theory papers of three hours each. These were set by all the nurse tutors involved with the course, and had an external examiner. The average theory mark for the full-time group of 20 students was 57.1. The average mark for the 26 students doing the part-time course was 65.8 (T test value of 0.0006). All student groups were selected randomly. Several of the examiners commented that the part-time group showed deeper understanding of clinical problem solving.

Discussion

Organising the knowledge helps both the teachers and learners. Elstein states the emphasis should be on helping students acquire a functional organisation of content by using clinically usable schemas.[7] Mandin et al comment that successful problem solvers have a way of organising their knowledge. Knowledge needs to be organised to understand and to assist with clinical problem solving. These authors propose that a scheme-driven strategy be used to help students develop a more

organised and logical approach to problem solving.[10] Doshi and Brown noted that there is increasing evidence of the effectiveness of more structured approaches to patient-based teaching.[11]

In discussions, the nurse tutors emphasise the importance of patient-based teaching to facilitate the clinical problem-solving process. The advantages of patient-based teaching are that it is closer to real life and has more relevance for the students' future work situations.[12] This patient-based teaching is strengthened by our students going back into the work situation every alternate week. Many of the students comment that it is easier to learn and remember if the teaching has been based on real patients. Patient-based teaching offers the important aspect of the patient giving direct feedback to the student.[13] We find that the patients promote better behaviour patterns in our students because they challenge the students about impolite behaviour or incorrect approaches. As the students begin to better understand the issues the patients are facing, they become more tolerant in their behaviour. Patients often demonstrate to the students how much they know and how well they have been dealing with their illnesses. This helps the students develop respect for their patients' knowledge and understanding of their diseases. It makes consultations more interesting for the students and the practising nurse clinicians. It also makes health education more effective, as the clinician can concentrate on areas the patient does not know about. We find that teaching around a patient helps to show all the aspects of clinical problem solving in a practical and vivid way. Many different aspects of assessing and managing a patient holistically can be taught around a patient, such as the social or family background or work-related issues.[14]

Interestingly, Doshi and Brown comment on the problem of a dwindling patient base in their environment.[11] One of the privileges of teaching in the primary care situation in South Africa is the amazing variety of patients available at PHC clinics for teaching purposes. Patients sometimes request to be seen at the teaching section, as this may ensure a more comprehensive consultation. However, other patients avoid the teaching section as the consultation takes too long!

Conclusion

A cyclical mind map can develop and enhance the ability of students to use self-learning methods for integrating theory into a clinical problem-solving process. Our experience has been that primary-level nurse instructors and doctors find using the mind map makes teaching easier for them. This method of teaching may be of value to family practitioners who are teaching nurse clinicians.

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Conflicts of interest

There are no conflicts of interest.

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Dr Andrew Truscott sadly passed away in December 2009, not long after this article was accepted for publication.
An obituary will follow in the next edition of SA Family Practice.