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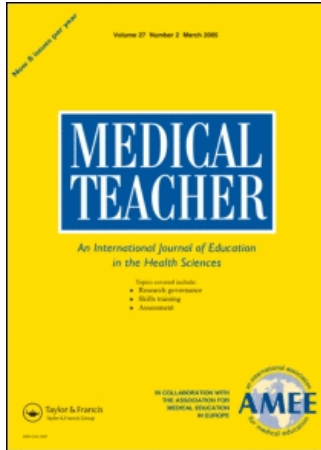
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## Medical Teacher

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title-content=t713438241>

### Use of script concordance test to assess pharmaceutical diabetic care: a pilot study in Thailand

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To cite this Article: Panrasri Khonputsu, Kathleen Besinque, Dixie Fisher PhD, Assistant Professor and William C. Gong, 'Use of script concordance test to assess pharmaceutical diabetic care: a pilot study in Thailand', Medical Teacher, 28:6, 570 - 573

To link to this article: DOI: 10.1080/01421590600825292

URL: <http://dx.doi.org/10.1080/01421590600825292>

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Previous studies in general patients suggest they are reluctant to discuss personal or emotional issues. This is not replicated in our patients who mildly disagreed that they were embarrassed by topics discussed or that topics were raised that they preferred not to discuss. Patients thought that learning on real patients was important and agreed to see a student to help with their learning. Mentally ill inpatients see medical students for similar reasons to other patients.

Although our patients reported anxiety before the interview and upset during the interview these both dissipated with patients reporting positive feelings afterwards. They felt they had benefited from seeing a student with only three reporting any detriment. This is reassuring, given the importance of medical students gaining experience in seeing real patients and reflects the findings of previous authors.

### Conclusion

Previous studies have explored the experiences of patients when being seen by medical students. This study extends this research to hospitalized mentally ill patients who have been interviewed by medical students.

We aimed to explore the opinions and experiences of mentally ill patients who saw medical students for their learning. We achieved this using a questionnaire. The study has some limitations in that the response rate from the patients was borderline low and our findings are based on a sample from one hospital. Therefore, caution must be exercised in generalizing the results.

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## Use of script concordance test to assess pharmaceutical diabetic care: a pilot study in Thailand

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**ABSTRACT** *The script concordance (SC) test is an assessment tool designed to probe whether knowledge of examinees is efficiently organized for clinical actions. The aim of this study was to develop an SC test, and determine whether it could be used to differentiate*

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novices from expert pharmacists in their ability to carry out clinical actions in the area of diabetes mellitus. The SC test was developed and validated according to guidelines proposed previously. Data analysis was performed using a post-hoc test and ANOVA. The test developed had 31 items. Participants included 54 students, six new graduates, and 16 clinical pharmacists. Average scores and standard deviations for students, new graduates and clinical pharmacists were 18.54 (2.90), 20.27(1.42) and 21.09(2.89), respectively. The group differences were significant ( $p < 0.05$ ). It is concluded that the SC test could accurately differentiate examinees according to levels of experience. It could be a useful tool to measure students' progress in the area of diabetes mellitus.

## Introduction

Competence is a person or group's capacity to perform job functions. It is concerned with whether or not the person has the required knowledge, skills, behaviors and personal characteristics necessary to function well in a given situation (Katz, 1998). In most situations, clinical care competence requires technical skills, critical thinking skills and interpersonal skills (Wolgin, 1998). Critical thinking skills are at the core of professional competence (Charlin, Tardif *et al.*, 2000). It depends on the content of knowledge and its structures. Researchers argued that differences between experts and novices lay primarily in experts' recall of meaningful relationships and patterns, that is, in the structures of the knowledge rather than in a problem-solving strategy. In addition, they postulated that problem-solving expertise was case-specific and highly dependent on the clinician's mastery of a particular content domain (Jensen *et al.*, 2000).

A structure or organization of knowledge adapted to meet the goals of clinical tasks is called a 'script'. That kind of knowledge is neither visible nor tangible, and it cannot be evaluated easily by using multiple-choice questions. It is revealed only in action, in authentic situations when practitioners have to reflect on real concerns (Charlin, Brailovsky *et al.*, 2000).

The script concordance (SC) test is an assessment tool designed to probe whether knowledge of examinees is efficiently organized for clinical actions (Charlin, Brailovsky *et al.*, 2000). Previous studies using SC tests with different contents (i.e. gynecology, radiology and surgery) showed that SC tests could accurately reflect levels of clinical experiences of students, residents and faculty groups with the students' scores being lowest and the faculty participants' scores being highest (Charlin & van der Vleuten, 2004). To date there has been no SC test that is used to evaluate knowledge of clinical pharmacy of students, pharmacy residents or faculty groups.

Pharmacy has recently adopted the popular paradigm of pharmaceutical care, which holds the professions responsible for achieving appropriate patient outcomes and an improved quality of life. The patient is the focus of this care and the pharmacist must be actively involved in therapeutic decision-making. The pharmacy practitioner uses cognitive thought to create a rational decision for drug therapy when he or she provides pharmaceutical care for a patient (Cipolle *et al.*, 1998).

Presently, the pharmacy profession is in a unique position to have a favorable impact on a number of chronic disorders including diabetes mellitus. Diabetes affects approximately 14 million Americans and is the fourth leading cause of death by disease in the United States (Ponte, 1994). The direct medical costs for persons with diabetes are almost four times those for people without diabetes, and diabetes mellitus costs the United States government approximately US\$100 billion annually (Testa & Guthrie, 1999).

Similarly, a rising number of hospital pharmacists in Thailand provide pharmaceutical care to patients with diabetes. Courses on clinical pharmacy are developed and adopted into the curriculum throughout the country. Thus, it is important for Thai teaching institutes to be able to measure students' progress in critical thinking ability for pharmaceutical care.

Therefore, this project aimed to develop a script concordance (SC) test and determine whether this SC test could be used to differentiate students from experts in their ability to use their knowledge efficiently for clinical actions in the area of diabetes mellitus.

## Objectives

There were two aims:

- to develop a script concordance test focused on pharmaceutical diabetic care;
- to use an SC test to compare levels of expertise in this area of students, intermediate and experienced clinical pharmacists.

## Methods

### *Development of PSC*

The construction of clinical vignettes and test items followed the guidelines proposed by Charlin, Brailovsky *et al.* (2000). Briefly, the test was developed by informal interviews with an instructor in diabetes at the University of Southern California School of Pharmacy in order to gather information that could be used for the construction of clinical vignettes and test items. The instructor was also asked to specify for each situation: (a) the relevant hypothesis, investigation strategies or treatment options; (b) the questions he asked, physical examinations he performed, and tests he ordered to solve the problem; and (c) what clinical information, positive or negative, he would look for in these inquiries. Then, test items were built using the material obtained at this stage.

### *Validation of the test*

The test developed was validated by five US pharmacist experts (certified diabetes educators) who identified confusing or irrelevant items, which were later discarded or rewritten. Next, the test was translated into Thai, and a group of 14 clinical pharmacist experts (clinical pharmacists seeing patients with diabetes on a regular basis and who had seen more than 100 patients) in Thailand were asked to complete the test. Their choices were used to prepare key scores in the elaboration of the scoring system.

*Elaboration of the scoring system*

In each item, answers were assigned a weight corresponding to the proportion of the experts who selected it, according to the SCT method. Credits for each answer were transformed proportionally to get a maximum score of 1 for modal experts' choice(s) on each item, other experts' choices receiving a partial credit. Answers not chosen by experts received zero (Charlin & van der Vleuten, 2004).

*Use of PSC test*

The test was administered in Thailand to volunteer participants:

- fifth-year students at Khonkaen University School of Pharmacy prior to the first clinical rotation;
- new graduates who had completed all clinical rotations before graduation from this university;
- pharmacy practitioners in certain hospitals.

The data were used to compare the expertise of students prior to and after clinical rotations (students before the first rotation vs. new graduates), that of students with clinical pharmacists, and that of new graduates with experienced clinical pharmacists.

**Data analysis**

Data were analyzed using descriptive analysis (mean, standard deviation). An analysis of variance was performed to verify whether the mean group differences among the three groups were significant. A post-hoc test was performed to determine whether the differences between each were significant.

**Results**

The test developed initially had 36 items. Five items were discarded because they contained choices that were too obvious (i.e. all five experts chose the same answer to each item) leaving the revised test with 31 items. Fifty-four students, six new graduates and 16 clinical pharmacists participated in the study. It was found that clinical pharmacists obtained higher scores than new graduates, and new graduates obtained higher scores than students, respectively.

The differences among the three groups and between each pair of groups were significant ( $p < 0.05$ ). Table 1 illustrates number of participants and their average scores and standard deviation.

**Discussion and conclusion**

The limitation of this study might include self-selection of new graduates and clinical pharmacists when compared with the student group as the latter were asked to complete the questionnaires within their classroom by their teacher. Nevertheless, the first two groups were comparable and their scores showed significant difference. Therefore, it can be concluded that the SC test has discriminant validity, which is an important dimension of construct validity. The findings

**Table 1.** Average scores on PSC test.

	Size	Mean (max. = 31)	SD
Clinical pharmacists	16	21.09	2.89
New graduates	6	20.27	1.42
Students	54	18.54	2.90

support more development and validation of this kind of test for future uses.

**Acknowledgement**

The authors would like to thank Dr Bernard Charlin and Dr Kaaren Hoffman who provided useful guidance. Their thanks go also to Dr Wiwat Akrawichien and Dr Aporanee Wongchaikam of KhonKaen University, who kindly helped administer the test to students at this university. They would also like to thank their many collaborators throughout Thailand for help in distributing and collecting questionnaires to and from their pharmacist colleagues. Life-Scan, Inc. is also thanked for partial financial support for questionnaire distribution.

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## Conceptions of problem-based learning: the perspectives of students entering a problem-based medical program

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**ABSTRACT** *Effective learning in higher education is associated with students' perceptions of clear goals and standards of an educational program. In programs using problem-based learning (PBL), students' conceptions of what PBL is about could determine how well they perceive the clarity of goals and standards of their program. In this study the authors aim to investigate the relationship between the nature of first-year students' conceptions of PBL and their perceptions of the clarity of goals and standards of a graduate-entry, problem-based medical program. Results are that most students conceive of PBL as mainly working collaboratively to solve and understand a problem, and place less emphasis on PBL as learning independently. There is no relationship between students' conceptions and perceived clarity of course goals and standards. It is suggested that teachers not only need to help students develop their understanding of what PBL is about but also need to help students learn how to self-regulate their learning in PBL programs.*

### Introduction

Previous research on students' conceptions of problem-based learning (PBL) in a university nursing program suggests that there is variation in the way students in problem-based programs conceive of PBL (Duke *et al.*, 1998). Conceptions range from PBL being about developing individual problem-solving skills to it being about developing a contextualized understanding through engaging with authentic problems.

When students do not fully understand the nature of PBL they may perceive the course context as not providing sufficiently clear goals and expected levels of knowledge and skill. Effective learning is associated with students' perceptions of clear goals and standards of an educational program (Ramsden, 2003). This study explores the relationship between the nature of first-year medical students' conceptions of PBL and their perceptions of the clarity of goals and standards in the graduate-entry, problem-based University of Sydney Medical Program (USydMP).

### Method

#### Sample

The subjects were all students in Year 1 of the USydMP.

#### Procedure

The study used a combination of phenomenographic analysis and self-report questionnaire methods during the period 2003–05.

In 2003 a questionnaire containing two open-ended questions was distributed to all students in Year 1 of the USydMP ( $n=219$ ) during their course orientation week. Students were asked to think about their previous university studies and write responses to the following question: 'What do you think problem-based learning is about?' The variation in students' conceptions of PBL was determined by phenomenographic analysis, which focuses on describing participants' "experiences of phenomena through their own discourse" (Tan & Prosser, 2004, p. 269). From the consensus we reached on descriptions of the different ways that students conceive of PBL, items were developed for inclusion on a questionnaire. The Conceptions of PBL Inventory consisted of 14 items rated on a five-point Likert scale (from 5 = matches my understanding very well to 2 = is a poor match with my understanding, and 1 = can't decide).

In 2004 the Inventory was distributed to all students in Year 1 of the USydMP ( $n=255$ ) at the beginning of the information session on PBL tutorials during the course orientation week. Students' discussion of their results formed part of the session's activities. The response rate was 80% ( $n=205$ ). We performed a principal component analysis using varimax rotation and Kaiser normalization on the

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