

Task analysis in neurosciences programme design — neurological problems in general practice

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Summary

Defining educational objectives is the key to achieving the goal of professional competence in students. The technique of task analysis was selected to determine components of competence in clinical neurology appropriate to the needs of primary care.

A survey of neurological problems in general practice revealed that these constitute a significant proportion of consultations, and that teaching programmes have failed to provide the appropriate knowledge and skills to manage the commonest problems effectively.

Consideration is given to innovations in curriculum and programme design whereby the graduating student might be more suitably prepared to give primary care.

S Afr Med J 1983; 63: 206-208.

Student learning of professional competence is the central goal of all programmes in the undergraduate curriculum. The teaching strategy to achieve this goal comprises certain key elements, the most important of which are educational objectives; only when these are specified is it possible to determine the contents rationally, select the teaching methods, and devise relevant assessment procedures.¹ These objectives should state the degree of competence the student will be expected to manifest at the end of the course.²

The two main techniques that have been used to determine components of competence are critical incident analysis and task analysis. The former involves the systematic assembly of items of behaviour and incidents observed by qualified experts and judged to represent outstanding or unacceptable performance.¹ This system was used to design the current clinical neurosciences programme at the University of Stellenbosch.

In South Africa, with a ratio of 1 neurologist per 700 000 of the population (excluding the independent Black states), most neurological services must be provided by general practitioners and internists. Consequently, students must have a good knowledge of the problems that occur commonly, are eminently treatable, or require emergency management.

Using the technique of task analysis, in which activities performed by clinicians are determined and the frequency of various disorders and disabilities is estimated,¹ two studies were undertaken to establish clinical neurological competencies essential in

preparing students for primary care practice. One was an analysis of neurological disorders in patients admitted to a university hospital, with an evaluation of the extent to which interns considered their training had equipped them with an effective and confident approach to these patients. The other study, which forms the basis of this report, surveyed the types of neurological problem encountered in general practice and the difficulties experienced in their evaluation and management.

Methods

A two-part questionnaire was designed which included an accompanying statement of objectives. Completion of part I involved recording the main complaint, or diagnosis, of 20 consecutive patients presenting with symptoms referable to nervous system dysfunction, together with the total number of patient consultations during that period. In part II, the practitioner was requested to list in rank order of importance, to a maximum of 5, those aspects of neurology that generated most difficulty in evaluation and/or management. Examples were provided for guidance.

Initially, 288 questionnaires were mailed to practitioners listed in available professional registers, and a further 27 were personally contacted while attending a continuing education course. In view of the small response (21 replies),³ 528 of the remaining medical practitioners not listed as specialists in local telephone directories were also sent a questionnaire.

Results

Forty-seven replies were received. Ninety-six per cent of the 710 presenting complaints and diagnoses could be classified into 21 categories of disorder (Table I). Considerable variation in the types and frequency of disorders occurred between individual practices, but all practitioners recorded patients presenting with vertigo and/or dizziness, and headache and/or facial pain; in 4 cases these latter symptoms constituted 60% (2), 80% and 90% of the 20 consecutive neurological consultations. Thirty-six replies were amenable to analysis of the proportion of neurological disorders among all consultations, yielding a mean frequency of 4.5% (range 1 - 23.5%).

Forty-six respondents completed part II of the questionnaire, providing 182 items, of which 96% could be classified into 15 categories (Table II).

Discussion

If the aim of defining objectives for undergraduate medical education is to design curricula that will ultimately produce a well-trained doctor, the objectives in each discipline and subdiscipline should, *inter alia*, reflect national and community needs.² The information gathered by task analysis provides a quantitative and qualitative estimate of such health care problems of the population.

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TABLE I. NEUROLOGICAL DISORDERS SEEN BY PRACTITIONERS

Category	Frequency* (%)
Headache and facial pain	35
Vertigo and dizziness	16,5
Seizures	8
Neuropsychiatric	
Alcohol and drug abuse, anxiety, depression, hysterical simulation, organic psychosis incl. dementia	7
Limb weakness	4
Cerebrovascular disease	3,5
Radiculopathy incl. sciatica	2,5
Pain — unspecified	2
Peripheral neuropathy	2
Disturbances of sensation	2
Visual and ocular dysfunction	2
Neck and back pain	2
Parkinsonism	1,5
Head injury	1,5
Syncope	1,5
Bell's palsy	1
Involuntary movements incl. tremor	1
Meningitis and encephalitis	1
Tinnitus and deafness	1
Herpes zoster	0,5
Trigeminal neuralgia	0,5
Others	
Muscle spasm, dysarthria, ataxia	
Sleep disorders	4
Bladder and sexual dysfunction	

*Calculated to nearest 0,5%.

Quantitative considerations

The present study reveals that on average 4,5% of consultations in general practice are primarily concerned with neurological disorders. Although obtained from a relatively small (36) sample of practitioners, this estimate is in accord with that recorded from the much larger (118) US study (7%)⁴ and the more comparably sized (25) Canadian survey (between 2% and 10%).⁵

The final compilation of the clinical curriculum reflects a selection of knowledge, skills and attitudes. What criteria should determine this selection?

The frequency of health care problems does not necessarily indicate their importance, but it becomes a more powerful determining factor when combined with an estimation of the seriousness and the significance of intervention on eventual outcome. This has been applied to the various diseases and disorders seen in general practice to provide an 'emphasis score' (frequency x seriousness x intervention),⁶ and could be applied equally to the hospital setting. Emphasis score ranking would provide objective guidelines for determining how much of the clinical curriculum should be apportioned to the major specialties and subspecialties, thereby allowing construction of a training programme more relevant to the future activities of the graduating student. Such an approach could also contribute towards rationalizing the undergraduate curriculum, now critically overloaded with information⁷ to the point of manifestly declining standards of patient management.⁸

Qualitative considerations

Neurological disorders in general practice

Approximately 75% of all neurological problems seen by practitioners in this study were in 6 categories of disorder, headache, facial pain, vertigo and dizziness accounting for over 50%. What

TABLE II. NEUROLOGICAL PROBLEMS FOR WHICH GUIDANCE REQUESTED

Category	Frequency* (%)	Problem details
Headache and facial pain	20,5	Evaluation, treatment
Vertigo and dizziness	20,5	Evaluation, treatment
Neurological examination and interpretation of physical signs	20	Fundus examination, diplopia evaluation, psychological manifestations of cerebral lesions, differentiation organic and simulated deficits
Parkinsonism	7	Differential diagnosis, treatment
Neuropsychiatric	7	Alcoholism — complications; anxiety, depression, confusion, dementia — evaluation, management; psychiatric illness presenting with neurological symptoms
Seizures	5,5	Investigation, when to pension; treatment — whom, prophylaxis, follow-up
Cerebrovascular disease	4	Management — transient ischaemic attack, acute completed stroke
Special investigations	2	Indications, contraindications
Tremor	2	Differential diagnosis, treatment
Backache and neck pain	1,5	Differential diagnosis
Paediatric neurology	1,5	Clumsiness, learning disability, temper tantrums, febrile seizures
Peripheral neuropathy	1,5	Investigation
Meningitis	1	Diagnosis, treatment
Incurable and terminal neurological illness	1	Management
Trigeminal neuralgia	1	Treatment
Others	4	Sleep disorders, paraesthesiae, neuralgias, drug-induced neurological disorders

*Calculated to nearest 0,5%.

are the implications of these findings for undergraduate curriculum design?

Patients with problems similar to the above are frequently referred to neurologists for evaluation and treatment,^{5,9} indicating the difficulties practitioners experience in their management and reflecting the shortcomings of their training. The goal of contemporary undergraduate education is to equip the graduate with sufficient knowledge and skills to allow profit from further study and experience,¹⁰ rather than to produce a fully trained general practitioner.¹¹ Neurosciences programmes should therefore be designed to make the graduating student become proficient in assessing and managing the commoner problems, leaving detailed learning of less common disorders to specialty training.

The frequent occurrence of neuropsychiatric disorders in general practice highlights the need for neurology and psychiatry not to remain isolated in the teaching environment, either conceptually or practically. In this regard, much benefit is likely to accrue with the development of truly integrated curricula. In whatever way the curriculum is modified, however, students will not gain practical experience of these common problems while the major part of clinical teaching centres on inpatients in university hospitals, where neurological disorders tend to be unrepresentative of those in general practice.⁵ Attendance at outpatient clinics would provide the student with experience more appropriate to these needs, but service demands frequently exclude worthwhile teaching opportunities. Even more relevant would be an apprenticeship in general practice,¹² although standards of supervision would need close monitoring if time were to be used effectively. Since it is most improbable that all students could be accommodated in this way, learning concerned with core elements of the curriculum will have to remain hospital-based.

Teachers in a medical school must teach neurology in a way that reflects primary care experience. The present study indicates that these patients mainly present with complaints of disordered form and function, whereas students tend to be taught details of disease entities in isolation. Relevant teaching methods should therefore involve a problem-solving rather than seed-catalogue approach.

Problems encountered by practitioners

Twenty per cent of practitioners indicated that they experienced difficulty in undertaking the neurological examination and interpreting physical signs. Since this item was included as an example for completing part II of the questionnaire, the response should be interpreted as a direct answer to a specific question rather than spontaneous self-analysis. Although Murray⁵ recorded that as many as 65% of practitioners encountered such difficulties, a structured questionnaire was used in his survey, thereby precluding a strict comparison of these results. Nevertheless, it must be concluded that there exist major deficiencies in teaching basic neurological skills. The recent report¹³ of declining standards of clinical competence among candidates presenting for the M.R.C.P. (U.K.) examination indicates that educational failure is multidisciplinary and international.

The implication is clear; if the graduating student is to approach intelligently neurological problems not previously encountered, much more attention in the undergraduate curriculum will have to be devoted to proficiency in diagnosis. This additional emphasis could be accommodated without extra demands on curricular time through more rigorous selection of items of knowledge the student should know. In this context, it is

notable that attendants at the first Neurological Education Workshop¹⁴ were of the opinion that most basic and clinical undergraduate neurology could be covered through discussion of the problems presented by patients with 13 selected disorders.

What conclusions can be drawn from the other difficulties experienced by practitioners? The categories of neurological problems for which further guidance was requested (Table II) show a striking similarity, in content and frequency, to the disorders encountered in practice (Table I), providing further evidence that common problems are not receiving sufficient attention in the curriculum and emphasizing that teaching strategies should incorporate pathophysiological processes rather than nosological patterns.

In the hospital environment the student, as apprentice-observer, sees the consequences of nervous system disorders mainly in the context of disease diagnosis and therapeutic intervention. The need to develop appropriate professional attitudes and communication skills is underlined by those practitioners who recorded difficulty in managing the personal and social implications of neurological illness.

Conclusion

The results of this study are in accord with Murray's⁵ findings, and support his conclusion that general practitioners feel ill-equipped to evaluate and manage common neurological problems. The undergraduate programme in clinical neurosciences should be structured to take more account of the health care needs of the population, emphasizing those activities with which the majority of graduates will be involved. In selecting and teaching those aspects of the curriculum relevant to general practice, consideration should be given to greater practitioner participation¹⁵ and less reliance should be placed on the skills of faculty members with tertiary care, subspecialty experience.

The contributions of those practitioners who participated in this survey are gratefully acknowledged. I wish to thank Mrs D. C. W. Kogler for invaluable secretarial assistance.

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