Staff knowledge, attitudes and practices in public sector primary care of diabetes in Cape Town

Grant R Goodman, Merrick F Zwarenstein, Illiana I Robinson, Naomi S Levitt

Objective. To audit staff knowledge, attitudes and practices in the interest of improved public sector primary care for diabetics.

Design. External audit using face-to-face, private, questionnaire-based interviews.

Setting. Twelve public sector ambulatory health centres in Cape Town.

Subjects. Non-specialist, principal staff members (N = 35) — 12 doctors, 10 primary health care nurses (PHCNs), 7 registered nurses (RNs) and 6 staff nurses (SNs).

Results. Staff members were long-standing employees (mean — doctors 6 years, PHCNs 8 years, RNs 5 years, SNs 12 years). Few had post-basic training (doctors 25%, PHCNs 20%, RNs 26%, SNs 83%). Knowledge of chronic diabetic complications was adequate, e.g. diabetic eye disease was mentioned by 100% of staff. There were gaps in knowledge of pathophysiology and of signs and symptoms of diabetic emergencies, e.g. < 33% knew control of hypertension to be important in the prevention of diabetic nephropathy. Knowledge of appropriate care of patients with hypoglycaemia (94% mentioned glucose administration) was better than that of hyperglycaemia (69% mentioned intravenous fluids). Problems were reported in inter-staff communication within (approximately 50%) and between (approximately 75%) disciplines by doctors, PHCNs and RNs. Staff/patient communication problems were reported by approximately 75% of staff. Solutions suggested by staff included meetings between staff members and with management, in-service training programmes and appointment systems for patients. Despite logistic, organisational and communication-related problems, most staff enjoy and believe in the value of their work.

Centre for Epidemiological Research in South Africa, South African Medical Research Council, Parowvallei, W. Cape, Department of Medicine, University of Cape Town, and Columbia University College of Physicians and Surgeons, New York, USA

Grant R. Goodman, MB ChB

Merrick F. Zwarenstein, MB BCh, MSc (Med), MSc

Illiana I. Robinson, MD, MPH

Naomi S. Levitt, MB ChB, MD

Conclusions. **This study reveals deficiencies in in-service training with consequent gaps in knowledge and practice. Recommendations that would lead to improved quality of care and increased staff and patient satisfaction have been given.**

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In the black community in Cape Town[1] diabetes has a crude prevalence of 6.3% and an age-standardised prevalence of 8%, higher than that reported from elsewhere in Africa.[2] Patients with diabetes mellitus require regular and life-long effective medical care to reduce morbidity and postpone mortality. The knowledge, attitudes and practices of clinic staff influence the quality of care,[3-5] which can be improved by continuing medical education[6,7] and by implementation of a set of guidelines[8] as to what comprises current best care, e.g. those of the American Diabetic Association[9] and the St Vincent Declaration.[10]

Internationally, the care of diabetics has gradually changed from hospital (tertiary) care to hospital-supported primary care and finally to autonomously run primary care with inter-referral to tertiary centres,[11-14] reflecting modern primary health care thinking.[15] In the Western Cape, primary care clinics are autonomously run and have an inter-referral system with the tertiary facilities. However, this inter-referral system is undermined by a fragmented health system[16] and the dominance of the tertiary facilities in the area. Even though many diabetics are treated in public sector primary care facilities (day hospitals), the implementation of a policy of primary health care with decentralisation of diabetes care to these clinics is not far advanced.

Most day hospitals have diabetic clinics (so-called diabetic clubs) once or twice a week, and between 25 and 85 patients are seen per session. These clubs are staffed by non-specialist doctors, primary health care nurses (PHCNs), registered nurses (RNs), staff nurses (SNs) and dispensing pharmacists.

Earlier studies of the knowledge, attitudes and practices of diabetes care personnel have indicated deficiencies in most spheres.[17-19] The aim of this study was to audit the knowledge, attitudes and practices of diabetic club staff, as one of the starting points for improving primary care for diabetics in the public sector in Cape Town.

Methods and subjects

An audit of staff knowledge, attitudes and practices in the primary care diabetic clinics was conducted by an external research team. A questionnaire (available from the authors on request) was designed and piloted. Both open-ended and closed questions were included. All staff were asked about: (*i*) knowledge of diabetes; (*ii*) attitudes towards other staff; (*iii*) attitudes to working with diabetic patients; (*iv*) suggestions for improvements in the operation of the club; and (*v*) clinical staff (doctors and PHCNs), who diagnose and treat, were also asked about recognition and care of renal disease, peripheral vascular disease and peripheral neuropathy, as indicators of their clinical practice.

Permission was obtained from the relevant health authorities. Verbal consent was obtained from each of the respondents, who were informed: (*i*) that the interview was confidential and that they would not be judged by their answers; and (*ii*) that the purpose of gathering the information was to obtain a better understanding of the conditions under which they operate, so that discussion for change can be based on correct information.

The questionnaire was administered in a 40-minute private interview to the principal diabetic club staff members identified by the sister-in-charge of the day hospital concerned. Staff members of all the Cape Town day hospitals worked under the authority of the previous Cape Provincial Administration (day hospitals in black areas) and at the larger day hospitals (7 out of 15), defined by patient load, under the authority of the former House of Representatives. The interviewer took full notes of the answers and comments made during the interview. After the survey, all the interviews were reviewed and common themes were extracted. Some representative quotes selected from each theme have been included in the text. The data were analysed using Epi Info software for personal computers.[20]

Results

Description of sample

The sample comprised 35 respondents (12 doctors, 10 PHCNs, 7 RNs and 6 SNs) at 12 day hospitals. Their experience and expertise are outlined in Table I. With the exception of the SNs (83%), few staff members had received post-basic training on signs, symptoms, complications and management of diabetes. Nevertheless, the majority were satisfied with their level of expertise.

Table I. Experience and expertise of staff

	Doctors (N = 12)	PHCNs (N = 10)	RNs (N = 7)	SNs (N = 6)
Years worked in day hospitals (mean and (range))	6 (0.5 - 22)	8 (3 - 22)	5 (0.2 - 18)	12 (0.5 - 21)
Years worked with diabetics (mean and (range))	9 (0.5 - 34)	8 (0.1 - 29)	11 (0.1 - 23)	14 (5 - 21)
Attended post-basic training (%)	25%	20%	26%	83%
Content with their expertise (%)	67%	60%	57%	50%

Staff knowledge

The percentage of staff in each category who could spontaneously and clearly identify the two major forms of diabetes (insulin-dependent diabetes mellitus (IDDM) and non-insulin-dependent diabetes mellitus (NIDDM)) is given in Fig. 1. The majority of staff knew most of the organs affected by diabetes, viz. 100% of staff — eyes, feet and kidneys; 86% of staff — skin; 80% of staff — heart. Cataracts and retinopathy were correctly identified as the commonest diabetes-related eye diseases by 89% and 86% of the staff respectively.

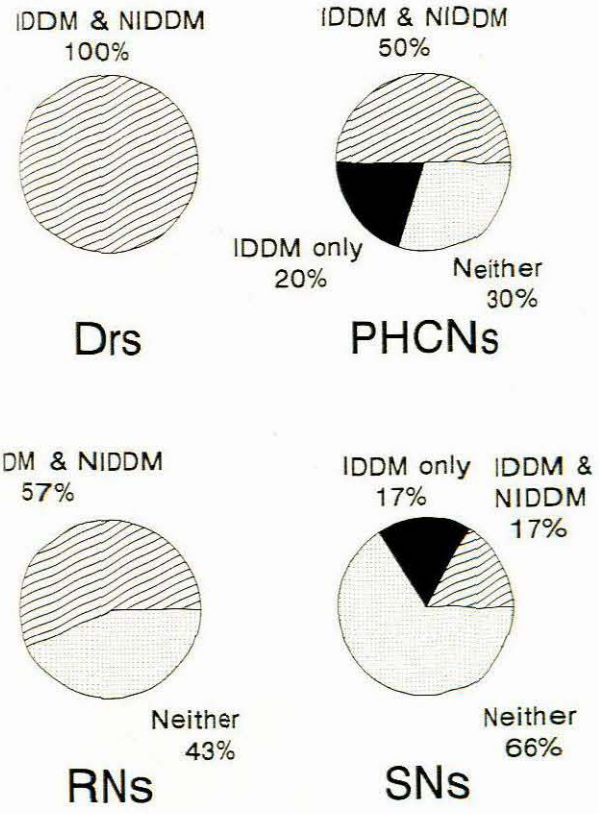

Fig. 1. Percentage of staff identifying the major types of diabetes mellitus.

When asked why blood pressure control is particularly important in the diabetic patient, 46% of staff mentioned protection of the cardiovascular system (doctors 50%, PHCNs 40%, RNs 43 % and SNs 50%), 23% prevention of cerebrovascular complications (doctors 25%, PHCNs 10%, RNs 29% and SNs 33%), 9% prevention of eye complications (doctors 17%, PHCNs 10%, RNs 0% and SNs 0%) and 31% prevention of renal disease (doctors 50%, PHCNs 50%, RNs 0% and SNs 0%).

The commonly mentioned signs and symptoms of diabetic keto-acidosis (DKA) and hypoglycaemia, and the methods used by staff to differentiate between DKA and hypoglycaemic comas, are shown in Table II. While 83% of staff knew one symptom or sign of DKA and 91% of staff knew one symptom or sign of hypoglycaemia, only 50% of staff knew two symptoms or signs of hypoglycaemia.

When asked to name the drugs with which they were familiar, as an indication of diabetic medication knowledge, the mean number of drugs named by all staff was 2.1 insulins and 2.5 oral hypoglycaemic agents (OHAs). Doctors were familiar with more diabetic drugs than were nurses ($P < 0.02$).

Clinical practices

The reported clinical practices of doctors and PHCNs for selected clinical problems are set out in Table III. Renal disease was the most commonly assessed, followed by peripheral vascular disease and peripheral neuropathy.

Table II. Commonly mentioned signs and symptoms of DKA and hypoglycaemia and methods to differentiate between comas

Signs and symptoms of DKA	
Urine ketones	57%*
Change in mental status	57%
Acetone breath odour	49%
Polydipsia	43%
Urine glucose	31%
High blood glucose	29%
Air hunger, polyuria, dehydration, nausea and vomiting, hypotension, anorexia, tachycardia, weight loss and pyrexia	< 20%
Signs and symptoms of hypoglycaemia	
Diaphoresis	60%
Confusion	51%
Faintness	37%
Tremors	20%
Palpitations, headache, hunger, fits, good response to glucose	< 20%
Methods to differentiate between DKA and hypoglycaemic comas	
Blood glucose	66%
Urine ketones	29%
Breath odour	20%
Urine glucose	9%

* Percentage of staff identifying an item.

Table III. Selected indicators of clinical practice (limited to doctors and PHCNs, *N* = 22)

	Reported frequency of testing for indicator		
Complications and indicators	Usually	Rarely	Only if the patient has a complaint
Peripheral vascular disease (PVD)			
Pulse	50%	23%	27%
Skin changes	27%	45%	27%
Peripheral neuropathy			
Insensate foot	14%	45%	41%
Ulcers	27%	41%	32%
Renal disease			
Urinary protein	82%	9%	9%
Serum creatinine	27%	55%	18%

* Categories are mutually exclusive.

Management of DKA. The majority of staff (69%) would give intravenous fluids, half specified normal saline or half-normal saline, and 37% of staff (including 75% of doctors) would administer insulin. Eighty-three per cent of doctors (who are responsible for referrals) would refer the patient to a hospital.

Management of hypoglycaemia. Almost all staff (94%) mentioned glucose, but none mentioned glucagon.

Referral. Staff would send a diabetic patient to a hospital as an emergency in the event of DKA/coma (63%), hyperglycaemia (46%), other comas not otherwise specified (29%), hypoglycaemic coma (20%), vascular problems (peripheral vascular disease, acute vascular occlusion and gangrene) (20%), eye disease (visual problems and ocular disease) (20%) and hypoglycaemia (17%).

Dietary advice. More than three-quarters of staff (77%) stated that they were giving most of their patients dietary advice.

Staff attitudes

Of the sisters (RNs and PHCNs), 47% felt that communication among themselves was ideal and 53% thought it was in need of improvement. Fifty-eight per cent of the doctors felt that communication among themselves was ideal and 42% that it was in need of improvement. Most of the sisters (65%) and doctors (75%) thought that the level of communication between the two professions was in need of improvement.

The majority of the staff (71%) thought that continuity of the patient-staff relationship was good for patient care, 11% thought it detrimental and the remaining 17% thought that it made no difference.

Communication barriers with all patients, including diabetics, were mentioned by 69% of staff: doctors (75%), PHCNs (80%), RNs (71%) and SNs (67%). A barrier with diabetic patients only was mentioned by 6% of staff. Twenty-six per cent of staff reported no barriers between themselves and their patients. Common barriers mentioned are shown in Table IV.

Table IV. Percentage of staff who experience barriers (*N* = 26)

Barriers to communication between staff and patients	
Lack of consultation time	38%
Poor patient attitude*	27%
Socio-economic factors	23%
Language problems	23%
Patient's poor insight/education	15%
Cultural differences, staff's poor comprehension of patients' socio-economic factors/lifestyle†	< 15%
Sample quotes	

* 'Diabetic patients are the most troublesome — they quarrel in the club.'
'Patients are stubborn — if they feel well, they don't take their medicine.'
† 'Not completely understanding the lifestyle of patients.'

Forty-six per cent of staff (doctors 75%, PHCNs 30%, RNs 29%, SNs 33%) enjoy working with diabetics, while 51% of staff were ambivalent (doctors 25%, PHCNs 70%, RNs 57%, SNs 67%). Forty per cent of staff felt that their work was crucial to their patients' health, while the majority of staff (57%) felt that their work made some difference to their patients' health. Fifty-one per cent of staff felt that patients usually adhere to their advice and 43% of staff felt that patients rarely adhere to their advice. This was similar across all strata of staff. Table V records staff suggestions for improving the functioning of the clubs.

Table V. Suggestions made by staff

Staff relations	No.
Feedback meetings between staff, and staff and superiors†	17
Induction and education of staff‡	10
Improved tolerance of each other among staff	6
Less time pressure	2
Patient-staff relationship	
More time with patients/decreased patient load¶	11
Patient education on all aspects of diabetes and primary health care	10
Patient feedback to staff on aspects relating to health and patient/staff interpersonal relationships	4
Cease regularly rotating staff between day hospitals	1
Club social activities for staff and patients	1
The running of the diabetic club	
Having a feasible appointment system	8
Improve patient education	6
Good, simple diet sheets/clinic dietician	5
A patient default/recall system	1
Improving the administrative system	1
Improvement in hospital supplies	1
Sample quotes	

† 'Democratic discussion of ideas.'
‡ 'Attend seminars and talks on diabetes — can then educate better.'
'I would like to know more about diabetes — sometimes I can't answer all the questions.'
¶ 'Don't spend enough time with the patients.'
'Not enough time to sit individually and talk.'
'Need smaller groups.'
* Number of staff making suggestion.

Discussion

This audit study is unusual in that it used self-reporting of information by staff, as the type of information needed was not available in any written record.[21,22] This is a limitation of the study, as staff perceptions (self-reporting) rather than researcher-observed fact have been reported. As with most audit studies, the results obtained are not intended to be generalised beyond the locality studied.

The number of people interviewed was small, but included the principal staff members in each staff category at the majority of the day hospitals in the Cape Town metropolitan area. Communication appears to have been free and full, possibly due to the perception that the interviewers were not part of management.

The staff interviewed were long-standing members of the Day Hospital Organisation with many years of experience in treating diabetics, some of it outside the Day Hospital Organisation. This represents a valuable store of clinical skill and deep knowledge of the day hospital system. The staff is nevertheless not static; several members at each day hospital were newer, and a form of induction, suggested by the staff, would therefore be useful.

The lack of post-basic training evident in the sample, and identified as a problem by the staff, appears to be a universal problem in primary health care.[23,24] It is particularly important because diabetic care is a changing field and needs regular updates. In-service training sessions, tailored to the strata of staff being taught, should be regular events within each day hospital, to give staff easy access. This could, for example, be an opportunity to empower SNs, a very long-serving and extensively trained body of staff, with extra skills to undertake routine examinations and tests. Continuity of SN/patient contact in combination with more knowledge and skills would provide a strong support system for patients, many of whom may feel more comfortable approaching SNs than they do more senior staff.

Basic information such as the classification of diabetes into IDDM and NIDDM was lacking among nursing staff,

ıdicating a need for specific training on the athophysiology of diabetes as relevant to the care of atients. In contrast, basic knowledge of chronic diabetic omplications was better. This suggests that long-serving taff, with little in-service training, gain and retain nformation relevant to practice more easily than hysiological and pathological information and that practice lements in the latter should be emphasised in training.

In view of the importance of diabetic emergencies, there appeared to be a deficiency of knowledge of the signs and symptoms of both hypo- and hyperglycaemia. This is a matter of concern, as staff need to teach patients the relevant signs and symptoms if they are to seek medical attention at an early stage allowing early treatment of diabetic emergencies. The reported management of DKA was also not adequate. This is supported by data from Groote Schuur Hospital, in that 66% of patients admitted with hyperglycaemic emergencies did not receive adequate management at the primary care level (B Levetan — personal communication). A uniform management protocol and appropriate training for emergency care of diabetics need to be developed in consultation with day hospital and referral hospital staff.

The majority of staff were satisfied with their level of expertise; this is unexpected, given lack of post-basic training and apparent knowledge deficits. The apparent confidence is contradicted by the frequent suggestions from staff that in-service training be provided.

The American Diabetes Association[9] and St Vincent's Declaration[10] offer guidelines in respect of continuing care. Although these guidelines may need to be modified for the South African setting, it is inescapable that the self-reported practices of staff do not compare well with these guidelines. For example, few clinical staff reported regular checking for peripheral vascular disease or peripheral neuropathy. This is a serious problem, as regular examination for complications forms an essential component of the care of the diabetic patient,[24,25] and can avoid or retard sequelae. The lack of a preventive medical approach may reflect problems as diverse as time pressures and attitudes towards dealing with patient's feet.

That most doctors and nursing sisters felt that inter-staff communication is in need of improvement requires attention, as inter-staff communication is an important factor in the 'team approach' to patient care and to the level of satisfaction at work. This team approach, involving doctors, nurses, dieticians, pharmacists, opticians, chiropodists[18,23] and the patient,[18] is a good method of achieving treatment goals. Further, the proposal by a staff member that a permanent core of both medical and nursing staff be maintained at each diabetic club (and not rotated to other day hospitals) would facilitate the development of team relationships and communication. This could improve continuity of staff/patient relations, allowing patients to see the same carer or small team of carers for an all-encompassing comprehensive service.

Staff/patient communication barriers hamper treatment. The barriers mentioned included logistic/organisation aspects (e.g. lack of time), patient-related aspects (e.g. poor educational level), as well as those of staff (e.g. language problems), each of which need different solutions. In this regard (in particular, patient education) the development of a more effective and formalised interpreter system and logistic problems (e.g. high patient load, lack of appointment and patient notification/recall systems) should be addressed.

Despite barriers, most staff enjoy their work and believe that it makes a difference to their patients' health. This belief contrasts starkly with another widely held belief, that patients do not adhere to advice. The concurrent presence of contradictory beliefs, which may undermine the confidence of staff in the value of their work and affect daily functioning, needs further investigation.

This study drew on staff perceptions to reveal several areas for improvement in public sector health care for diabetics. Patient perceptions should be obtained to complete this picture.

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