

HEALTH SERVICES RESEARCH IN SOUTH AFRICA

FOR CHRONIC DISEASES OF LIFESTYLE

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1. MODEL FOR PREVENTING AND MANAGING CDL IN POPULATIONS

The model for successfully preventing and managing chronic diseases of lifestyle (CDL) involves two complementary approaches. The first is the promotion of healthy lifestyles for the whole population, and the second calls for the early diagnosis and cost-effective management of risk factors and disease. The successful promotion of a healthy lifestyle through inter-sectoral collaboration across organisations in South Africa will reduce the population's risk profile. Effective health service initiatives need to identify those patients with high-risk levels for CDL and those with early manifestations of these diseases to prevent or delay the onset of complications.

2. HEALTH PROMOTION APPROACHES TOWARDS THE ENTIRE POPULATION

2.1 Impact of tobacco legislation

South Africa's tobacco products control act of 1993 and its subsequent modifications in 1999 has significantly reduced the prevalence of tobacco use, as well as the amount of tobacco products sold in the country. This will significantly reduce the impact of tobacco-related morbidity and mortality in South Africa. In Chapter 5, Saloojee describes the impact of this national initiative.

2.2 Impact of the Soul City 4 series with hypertension as a theme

The Soul City Institute for Health and Development Communication is a South African non-governmental organisation, which uses the power of mass media for social change.¹ This organisation describes their edutainment activities as follows: "Soul City's approach to health communication is informed by the Soul City model of social change which is an eclectic integration of existing models of social and behavioural change – such as Social Learning Theory, the Theory of Reasoned Action, the Johns Hopkins Steps to Behaviour Change model, Social Network Theory, the Diffusion of Innovation Model, the Stages of Change Model, and the BASNEF Model. Soul City further bases its intervention on the Ottawa Charter of Health Promotion, and maintains a human rights focus."

"The Soul City 4 intervention set out to impact positively on health and social outcomes by addressing the broader social and community environment (e.g. policy implementation, public debate as reflected in the media nationally, community action and collective efficacy, community norms and access to services) and the immediate interpersonal environment (e.g. social norms and peer pressure, support-giving behaviour, as well as interpersonal dialogue and debate) in addition to influencing individual determinants of health (e.g. knowledge and awareness, personal attitudes, self-efficacy, perception of risk, support-seeking behaviour and intention to change) in the behaviour change process."

"The Soul City 4 core multi-media edutainment vehicle consisted of a 13-part prime time television drama, a 45-part radio drama in 9 languages, and three full-colour information booklets of each - one million were distributed nationally. This material has been available since 1999. The vehicle dealt with the following topics: violence against women (domestic violence and sexual harassment); AIDS (including youth sexuality and date rape); small business development and personal savings; and hypertension."

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An extensive evaluation of Soul City 4 was designed to assess the extent to which the series (and its partners) succeeded or failed as a comprehensive health promotion intervention.² The evaluation consisted of many interlinked components, which were all contracted to external researchers or research organisations - including the overall evaluation management. The quantitative and qualitative analyses were methodologically rigorous and complied with international standards and data analysis conventions as applied in this particular field of study. The evaluation was supported by an international and local panel of experts with respect to evaluation, communication, and entertainment-education.

The evaluation of the impact of the hypertension theme³ is based on the following components of the overall evaluation of Soul City 4:

A national survey: baseline (pre-intervention) and post-intervention, data collection comprised standardised, face-to-face interviews conducted on different (but largely comparable) random samples of 2000 respondents for each survey. The samples were statistically representative of the national Soul City target population.

Sentinel Site Study, conducted in two sites; a rural KwaZulu-Natal site and an urban Gauteng site: a survey was conducted and comprised repeated measurements of a panel (or cohort) of respondents in each site (representing Soul City's target audience). There were four measurements - pre-intervention (baseline), two measurements during the time Soul City was on air, and a post-intervention (evaluation) measurement. Standardised, face-to-face interviews were conducted on a sample of 500 respondents per site, with an additional 100 interviews to control the research effect. A standardised questionnaire was used in the National Survey and Sentinel Site Surveys, with the panel questionnaire adapted slightly to take the study design and specific study objectives into account.

National Qualitative Impact Assessment: data collection comprised 31 qualitative focus group interviews, and individual interviews conducted among Soul City's target audience. Approximately two-thirds of the fieldwork was conducted in the two Sentinel sites, and the other third was extended to a further four provinces (i.e. fieldwork was conducted in six of the nine provinces). Respondents in the Sentinel sites were part of the panel (cohort) described under the Sentinel Site Study, They were recruited because of similarities in their responses to a selection of items in the Sentinel Site Survey. Respondents in the other four provinces were selected based on exposure to Soul City. A further 30 semi-structured interviews were conducted with community members representing leadership, services and civil society in the two Sentinel sites. Respondents were recruited in their organisational or leadership capacity, and participated because of their availability.

The results of the evaluation included increased knowledge and/or awareness of the following:

- High blood pressure (BP) can seriously harm people if not treated properly.
- You [do not]* only need to take medication for high blood pressure until you feel better.
- You can[not]* feel if you have high blood pressure.
- Where to have one's BP checked.
- People should ask health workers to check their BP every time they visit a clinic or hospital.

Knowledge about adopting a healthy lifestyle to treat and prevent hypertension.

No evidence of change was observed in the following two items:

- High BP cannot be treated; there is nothing you can do to make it better.
- If you have high BP, you need to take medication every day.

Responses from people who did, and did not have contact with a health worker about high BP during exposure to Soul City suggest that Soul City was an effective substitute for face-to-face communication between people and health care providers regarding accurate knowledge on hypertension.

There was also qualitative evidence suggesting that Soul City is associated with hypertension support-giving behaviour over the evaluation period. However, this observation is not supported by the quantitative results.

Both the sentinel site and national survey data analysis also suggests that exposure to Soul City is associated with positive change in intention and its maintenance (to seek information and to have one's BP checked) and in actual behaviour change (having one's BP checked, and in trying to adopt a more healthy lifestyle). Thus, despite decreases in positive observations from baseline to evaluation measurement generally observed in the national survey data,

* [authors' insertion]

positive behaviour was significantly associated with exposure to Soul City where respondents *did* display positive/desirable intention and behaviour over the evaluation period.

There was no quantitative evidence of a direct association between Soul City and increased perception of personal risk. Decreases in perception of risk and information-seeking behaviour were observed that might be related to increased knowledge, positive intention and positive actual behaviour associated with exposure to Soul City. Further analysis is necessary to substantiate or refute this hypothesis. Qualitatively, Soul City is associated with increased perception of risk: "new" knowledge that hypertension can affect anyone have been attributed to Soul City."

2.3 Focus of studies: health-care provider, health services structure and related factors

The lessons we learn from tobacco legislation and from Soul City is the impact of appropriately planned multi-sectoral health promotion interventions targeting the entire population. Both interventions were underpinned by broad-based research for identifying the determinants of behaviour needing to be addressed. Furthermore, the target group that needed to be reached was clearly defined and studies were developed ahead of the relevant aspects of the interventions.

3. MODEL OF HEALTH SERVICES RESEARCH

In studying the health services provided for patients with CDL, the information should be considered with respect to the following three interrelated factors:

- Health-care provider-related factors;
- Health-service structure-related factors;
- Patient-related factors.

Published studies on evaluating factors related to the health-care providers usually also address health-care service-related factors. Consequently, this review will focus on these two topics simultaneously, while patient-related factors, where patients with chronic conditions were studied, will be reported in the next section.

3.1 Focus of studies: health-care provider, health services structure and related factors

Since 1994, it has been the National Department of Health (DOH) policy to develop the primary health-care services for all South Africans which at present are seriously inadequate. This has resulted in a reduction of funding for secondary and in particular tertiary care. The latter is perceived to having been over-emphasised previously. Consequently, there has been a shift of large numbers of patients to primary health-care services in the community. Very few studies have evaluated the impact of these changes or assessed the contribution and function of the health-care providers and health service structures in relation to the quality of care patients with CDL have received since 1994.

In Gauteng, Kalk *et al.*⁴ conducted a rapid assessment of hospital-based services for four chronic diseases (diabetes, hypertension, asthma, and epilepsy) at eight hospitals through a postal survey in 1994. They concluded that services for chronic diseases at non-academic hospitals in Gauteng were characterised by perceptions of inadequate staff numbers and training, short consultation times (mean duration being 9 minutes), infrequent use of management guidelines and standardised assessments, little patient education with regard to self-care, and low rates of regular attendance and compliance with medication. A folder audit at one hospital revealed that there was a low rate of hypertension control and unsatisfactory rates of acceptable glycaemic and BP control among people with diabetes. In essence, all other studies conducted in the country identified similar problems with the public sector.

3.1.1 *Quantitative studies in the public health-care sector*

A situational analysis conducted in the Limpopo Province defined specific problems in more detail. In this study in a random sample of 24 clinics in the six districts and six hospitals in 2002,⁵ professional nurses (n=62) and doctors (n=6) who were involved in the management of chronic diseases were interviewed. In addition, two assistant directors from the Information Management section and the Epidemiology section were interviewed about the flow of information from facility level to the Provincial DOH. A clinician questionnaire elicited information about the criteria used to diagnose hypertension and initiate treatment, first-line drug choices for hypertension care, familiarity of health workers with the hypertension management guidelines, as well as training in the management of patients with hypertension.

The data from the Limpopo report⁵ are discussed in some detail to identify the main themes found in the results of this and other studies reported in this Chapter.

The knowledge of the staff, particularly the professional nurses, regarding hypertension management was less than optimal. For example, less than half of the staff knew that patients needed to sit for 5 minutes before having their BP measured or that hypertension needs to be treated at lower BP levels in patients with diabetes or those with target-organ damage, compared to other patients. Only 12.9% of the staff had received training for the management of hypertension during the previous two years and all of the study participants felt that they would benefit from additional training to manage patients with hypertension. Questions regarding the availability of formal guidelines for managing hypertension revealed that there were five different types of guidelines available in the different clinics. The Hypertension Guidelines of the National DOH were available in 93.1% of facilities. The Primary Health Care formulary was available in only a few of the hospitals, while the Primary Clinical Care manual was found in very few of the clinics. The staff described the many guidelines as being confusing and even contradictory at times. The need for a single set of guidelines for primary-care settings was clearly identified.

Patients with newly diagnosed hypertension were frequently referred to hospital for initiating treatment. More than half the patients were provided with some advice about lifestyle modification to control hypertension. Routine investigations, such as weight measurements, urinalyses, and eye examinations were not done routinely in all patients.

The staff members were asked about problems they experience with managing hypertension. Their responses were categorised as those relating to patients, staff, and to administrative issues. Most complaints related to patients' non-compliance with prescribed medication (66.2%) and a few commented on the patient's lack of compliance with lifestyle modification. Staff-related problems that were identified were staff shortages (47.7%) across all facilities, breakdown of communication among different staff categories, the lack of social workers to deal with patient problems, and particularly a shortage of ophthalmic nurses. Administrative problems included antihypertensive medication shortages (38.5%), late deliveries from hospital dispensaries (18.5%) and lack of functional equipment, such as baumanometers or broad BP cuffs. Of the facilities, 38% had non-functional or broken baumanometers, while 59% never had these equipment services.

Availability of recommended antihypertensive medication was checked across all facilities. Hydrochlorothiazide (73%) and atenolol (47%) were available at most clinics. Reserpine, a cheap drug, was only available at 37% of clinics, while methyldopa, an expensive drug, which has many side-effects and is not recommended, was available at 73% of the facilities.

A report focusing on the knowledge, attitudes, and practices of staff caring for patients with diabetes in Cape Town was published in 1997.⁶ Very few staff had any in-house training in diabetes care after their basic training, yet their knowledge about chronic diabetes complications was reasonable. However, there were critical gaps in their knowledge of the signs and symptoms of diabetic emergencies. This study also found that about 50% of the staff interviewed reported inter-staff communication problems involving doctors, primary health-care nurses and registered nurses, and about 75% reported that communication problems between the staff and patients impeded optimal chronic disease care.

A study of the quality of diabetes care among 34 nursing staff at 10 semi-rural and 12 rural clinics in the Alfred Nzo District, Eastern Cape, revealed major impediments to good diabetes care (Bantubani unpublished data). A questionnaire on diabetes care and a checklist were used to record the availability of equipment and medication required at primary-care clinics. Fifty-nine percent of these nurses were not confident that their knowledge of diabetes care was adequate to provide good care for their patients. Indeed, the nurses demonstrated poor knowledge on the management of diabetes; this confirmed that the majority were not sufficiently competent to treat patients with diabetes. The monitoring of glycaemic control depended totally on urine glucose dipsticks, with only about 40% of clinics having a glucometer to test blood glucose levels. The measurement of HbA_{1c} was not available at any of the clinics. The regular examination of patients with diabetes was inadequate, particularly with respect to surveillance of the feet. This examination is essential to prevent the development of foot ulcers and eventually leg amputations. According to 53% of the nurses, this is attributable to the fact that facilities for clinical examinations at their clinics are limited. Most clinics had the following equipment available to monitor diabetes: urine glucose strips, a mercury baumanometer with a standard cuff, stethoscope, tape measure, height measure and a scale. However, equipment for measuring blood glucose levels was not always available, as was a broad

BP cuff for patients with large arm circumferences. Snellen charts to test eyes were only available in about 50% of clinics. Metformin was the only diabetes drug available at all the clinics, with glibenclamide supplied at between 70% and 83% of the clinics. Insulin was unavailable at any rural clinics and at 60-80% of the semi-rural clinics. Patients had to travel to the nearest hospital to receive insulin, which they could often not afford. There were no dedicated diabetes clinics at 21 of the 22 primary-care clinics, and therefore patients with diabetes were seen along with all others. Only 27% of the clinics had diabetes treatment guidelines available, while 12% had posters on diabetes or hypertension. The diabetes posters were written in English, a language not spoken by most patients in this region.

A validated questionnaire was used by Talip *et al.*^{7,8} to evaluate the knowledge and practice of doctors and nurses regarding healthy lifestyles, with a focus on nutrition, physical activity and smoking cessation. A random sample of 61 doctors, 149 nurses, and nine health promotion officers working in the public community health centre (CHC) sector was surveyed. The overall knowledge score of the health professionals for the three aspects of a healthy lifestyle was low, with 6% scoring < 40%, 40% had mediocre scores (40%-59%), 48% had scores between 60%-79% and only 6% scored more than 80%. Doctors had higher scores than nurses. The health professionals identified mass media as their main source of information on smoking (36%) and physical activity (27%), while 33% identified textbooks as their main source of nutrition information. Lack of time, poor patient compliance, and language were frequently cited as barriers to health education. Most health professionals indicated that they did not have access to, or consult with experts on physical activity or smoking cessation. Only 18% reported that they were aware of any smoking cessation services in the community. Furthermore, only 39% indicated that they often have access to dieticians, compared to 26% who indicated that they actually consult dieticians. Further analyses of the knowledge tests indicated that while health professionals had sufficient knowledge on broad-based information (e.g. 'eat[ing] less fat') their practical knowledge for counselling patients was very limited. These data clearly suggest that culturally appropriate material should be developed to support health professionals to provide practical, detailed information to their patients who are in need of lifestyle modification counselling.

Smoking during pregnancy can have a dire impact on the pregnancy, and the infant. In the South African coloured community, smoking rates of 47% have been reported for pregnant women. Seventy-five midwives working in five South African cities, providing antenatal care for pregnant coloured women completed questionnaires regarding smoking cessation.⁹ Midwives' overall attitudes towards giving smoking cessation advice during pregnancy were positive. They perceived this as part of their responsibility as they were convinced of the health benefits of smoking cessation for both mothers and babies. They felt powerless when pregnant women showed lack of appreciation and interest as well as resistance to health education on smoking. They consequently felt their lack of knowledge and education about adequate smoking cessation intervention and their lack of counselling skills as important barriers to successful intervention among pregnant women who smoked. Those midwives who know more about the dangers of smoking to the mother, the pregnancy, and the unborn child more frequently provided smoking cessation advice to pregnant women compared to those with lower levels of knowledge about the dangers of smoking.

3.1.2 Qualitative studies conducted in the public health-care system

Qualitative studies are particularly valuable to assess the personal experiences of study participants regarding the topics being investigated.

In 2003, two qualitative studies were conducted using semi-structured interviews with a purposeful sample of doctors, professional nurses and pharmacists for hypertension and diabetes management in the public health-care sector in Cape Town to gain insight in the determinants of hypertension and diabetes care delivered to patients with these conditions.^{10,11} Both these studies showed that health-care providers perceived diabetes and hypertension care as important issues. Yet, the quality of care that was provided for these two conditions was not optimal. Staff experienced their working conditions as extremely demanding. The barriers included increasing patient numbers, dramatic budget cuts and acute staff shortages. Staff, particularly nurses, felt inadequately trained and not capable of handling what was expected of them. Frequently, the necessary equipment and sufficient medication were not available at the clinics and staff felt that the authorities were not addressing these problems in an effective way. This resulted in progressive

disorganisation in the primary health-care setting and high levels of staff frustration and morale.

One doctor summarised his position as follows, "We are controlled by the government, as a doctor you cannot do what you think might be best. You will just have to use what the government is giving you."

The barriers experienced in the clinics hampered health workers using the diabetes and hypertension guidelines, investing time in educating the persons, and screening for complications. Frequently, patients spoke a different language to that of the health-care providers. The latter also expressed their dissatisfaction with patients' non-compliance with treatment regimens. They acknowledged that patients experienced many barriers to being compliant, and felt that education was essential to improve patient compliance. However, their patient education attempts were not perceived to be effective. Most health-care providers did not adjust their health messages to the patient's readiness to change. Furthermore, their communication approach with patients was quite prescriptive and not patient centred. Such an approach has been shown to be counter-productive and often evokes resistance in patients.

The National DOH has expended much energy formulating many management guidelines for common chronic conditions since 1994. This has been done in collaboration with many experts in the field of the particular condition under scrutiny. These guidelines were distributed widely in the public health sector without a systematic educational intervention, a prerequisite for change in the practice of health-care providers.^{12,13} Daniels *et al.*¹⁴ investigated the attitudes of health professionals in primary care to assess their responses to receiving the guidelines, and to determine their attitudes to guideline implementation in an urban setting. The authors used focus group discussions, in-depth interviews, and clinical observations. It was found that there was no systematic process of implementation of the guidelines and that staff consulted these infrequently. They had negative feelings about the lack of consultation and the introduction of the guidelines without formal preceding educational sessions. The content of the guidelines were sometimes in conflict with their usual practice and were found to have limited local applicability. Some aspects of the guidelines did not take cognisance of the limited local resources and would increase their already excessive workload. The health professionals felt that if they had been consulted, the guidelines might have been more appropriate for their setting. They also reported time constraints and an ever-increasing patient load. They felt that their communication with patients was not effective, particularly about lifestyle modifications and was influenced by the education gap between patients and doctors. There also was a dearth of appropriate educational material for patients.

These data suggest that the adoption of guidelines would be improved if the barriers identified are addressed and the passive dissemination of guidelines was accompanied by appropriate consultations and support for the staff using the guidelines.

The majority of patients with type 2 diabetes in Cape Town who attend primary-care community health centres have poor glycaemic control. Despite this finding, insulin is rarely prescribed although this was indicated in patients with maximum oral glucose-lowering agent therapy. Haque *et al.*¹⁵ conducted focus group discussions and in-depth semi-structured individual interviews with 46 doctors providing care for patients with type 2 diabetes to identify the barriers to initiating insulin therapy in the primary-care public sector setting. Barriers that were identified related to the doctor's lack of knowledge or experience with introducing insulin at outpatient settings. The doctors reported that undergraduate training focused on managing diabetic emergencies and not the ongoing care of patients in these settings. Many were concerned that patients do not have sufficient knowledge and understanding of the disease to use insulin safely, and feared events of hypoglycaemia. Language barriers also hampered sufficient communication with patients. This lack of confidence resulted in patients who needed insulin occasionally being referred to a hospital for their first treatment. Doctors reported that patients were reluctant to begin insulin treatment, and feared needles and the pain of injections. Poor socio-economic conditions of public sector patients exacerbated doctor's fear of hypoglycaemic events, and they thought that glucometers were beyond most patients' means. Older patients were seen to be unable to manage insulin therapy. Excessive workload, short consultation times and rapid turnover and lack of continuity of care by the same doctor were barriers identified by all doctors, as was occasional inadequate supply of insulin. Different guidelines were available at the clinics and doctors were distrustful of the conflicting messages. The constraints on ordering glycated haemoglobin, because of expense, and consequently relying on a single random blood glucose, further increased doctors' concern for initiating insulin treatment.

Another study was conducted in the Western Cape to assess attitudes and practices of doctors regarding smoking cessation during pregnancy.¹⁶ Semi-structured, one-to-one interviews were held with doctors providing antenatal care for pregnant women who smoke. They tended to underestimate the magnitude of the risk of smoking during pregnancy, and thought that other pressing priorities in antenatal care, especially HIV infections, should receive their attention. They often felt pessimistic about their ability to influence the smoking behaviour of pregnant woman, especially in poor disadvantaged women who face multiple barriers to health-enhancing behaviour. They were also unaware of the guidelines, which offer clinicians brief, structured approaches to counsel pregnant women on smoking cessation. However, most doctors were open to adopting new approaches or tools that could assist them in improving their communication with pregnant women about smoking. Perceived barriers to provide these interventions included a lack of counselling skills and educational resources. They also experienced spending too little time with patients, and having a high stress level because of staff and budget cuts in public sector hospitals and consequently poor working conditions.

3.1.3 Research in the private and non-governmental health-care services

A descriptive study was undertaken by Bradley¹⁷ in the three major 'black townships' of Cape Town, namely Langa, Gugulethu and Khayelitsha among 22 general practitioners (GPs) to assess the quality of care and current clinical practice for diabetes care. This assessment was evaluated in terms of the Guidelines for the management of type 2 diabetes published by the DOH in 1977. The data collection comprised questionnaires, and a record review of 51 patients with diabetes was done in three of the practices.

The median time that the GPs had been practicing in the townships was five years and most dispensed medicine to their own patients. The median number of patients seen per month was 600. The data revealed that the GPs saw relatively small numbers of patients (< 30 per month) with diabetes and that a large proportion of the patients with diabetes attended both the private GPs and the public sector services where medication was provided free of charge. A number of GPs stated that if patients did not belong to a medical aid/scheme they were encouraged to attend the local public sector primary-care facilities because of financial constraints.

At many practices, staff trained by the GPs performed a number of measurements on the patients and also provided some nutrition education. None of the GPs was using the DOH diabetes management guidelines. Between 73% and 86% of the GPs reported measuring BP and doing capillary blood glucose and glucose urine analyses every three months. Annual HbA_{1c} measurements were reported by 34% of the GPs and 23% reported doing annual examinations of the feet and eyes. The GPs reported that they achieved target blood glucose levels in 82% of their patients. The record review of the patients indicated that these procedures were recorded considerably less frequently than GPs reported. The actual level of blood glucose control recorded in the patient record was between 17% and 29%, highlighting that GPs had an unrealistic understanding of the level of blood glucose control achieved at their practices. Furthermore, their overall level of service provision did not comply with the management guidelines for diabetes care published by the DOH. Half of the GPs identified having limited communication skills with their patients and felt they needed more training in this regard. They also felt strongly that inadequate culturally appropriate patient training material was available for patients with diabetes.

Work conducted at the University of the Western Cape has been focusing on the role that community health workers (CHWs) could play in extending the care that of the public sector health professionals provide for patients with chronic lifestyle diseases. This is of great importance, as the national DOH has accepted the principle to use trained people from the community as CHWs to extend the reach of doctors, nurses and other allied health professionals.

Sengwana *et al.*¹⁸ conducted focus group discussions with 17 CHWs who were members of the community and working at the non-governmental organisation (NGO) Zanempilo. They were asked about their beliefs and attitudes on hypertension. In addition, interviews were conducted to assess their knowledge about causes, prevention, and control of the condition. The findings suggested that the CHWs were unclear about the causes of hypertension, and they found it difficult to grasp that people without risk factors, such as obesity, could be hypertensive. They believed that traditional medicines and home-brewed beer were effective treatment for the condition, and they were suspicious of prescribed antihypertension medication that needed to be used long term. The CHWs reported that patients perceived that the pharmaceutical agents were often associated

with severe complications. Furthermore, CHWs reported that people with traditional beliefs from the black township communities had difficulty with the concept of a 'chronic condition'. People usually visited both western doctors and traditional healers looking for a 'cure' for their conditions. Consequently, they concluded that western drugs requiring ongoing use are not effective.

On evaluating the height and weight of 44 of the CHWs in the same setting, all but two were overweight, obese or severely obese.^{19,20} In addition, these CHWs with limited knowledge of hypertension (as described above) who were expected to educate the community about chronic diseases of lifestyle, perceived moderately overweight women as attractive and associated with dignity, respect and confidence. Puoane and Bradley¹⁹ also showed that the food preparation methods of the CHWs were unhealthy and excessively large portions of food were usually served. They added oil to maize porridge and vegetables in the preparation, and used various kinds of salt and sodium-containing condiments to improve taste. The nutrition knowledge of the CHWs was extremely limited. They were scared of doing physical exercises, as they feared losing weight which might cause people to think that they have HIV/AIDS. The stores in their townships mostly provided cheap and unhealthy fatty foods (including tripe, sausages, chicken skin, pig's feet, and fat cakes) with very little vegetables and fruit. The latter were also relatively expensive. The street vendors also sold very fatty meat at modest prices.

These data show that the CHWs in this urban township had minimal knowledge of chronic diseases and their risk factors, had many misconceptions on management of these conditions, and their environment was not conducive to promote a healthy lifestyle.

3.2 Focus of studies: patients attending primary health-care services

The study of patients with chronic conditions have received much more attention than the study of health-care providers or the factors related to the health service functioning.

3.2.1 First demographic and health survey 1998

The largest study conducted in adults, 15 years and older, in South Africa is the first national demographic and health survey (DHS 1998).²¹ An adult health module was developed for this survey, and data were collected in a random sample of 13 826 urban and non-urban adults in all the provinces. The questionnaire inquired about visits to a range of health-care facilities during the last 30 days.

Of the total population, 18.6% and 13.3% attended either the public or the private sector health-care facilities respectively during the previous 30 days.²¹ Table 17.1 shows the proportion of those who attended such facilities and were dissatisfied with the services they received, as well as the reasons for their dissatisfaction. The long waiting times at CHCs were the most common reason for dissatisfaction, while staff who were offensive was reported by 22% of these people. It is interesting to note the similar number of people dissatisfied with CHCs and traditional healers.

Table 17.1. Proportion of users dissatisfied with services at health-care centres and the reasons for dissatisfaction²¹

	Public Sector		Private Sector		
	Community health centre %	Clinic/Hospital %	Doctor %	Chemist %	Traditional healer %
Dissatisfied	12.1	11.7	5.9	3.8	13.8
Reasons:					
Long waiting times	41	26.1	8.2	14.9	27.4
Staff offensive	22.7	16.6	9.3	9.8	16
Short consultation	7.6	12.3	22.3	4.4	29.9
Did not see a doctor	9.4	14.7	4.0	n/a	n/a

The use of prescribed drugs for common chronic conditions in the DHS 98 is described by Steyn *et al.*²² for the research team of the South African DHS.

Table 17.2 provides the socio-demographic determinants of people taking prescribed drugs for common chronic conditions as identified by logistic regression analysis. This showed that women, wealthier and older people, as well as those with medical insurance

used drugs for chronic diseases more frequently compared to men, younger or poor people, or those without medical insurance. The African group used these drugs less frequently than other ethnic groups. Even though this group has less chronic diseases than other South African groups, this pattern of drug use may identify an inequitable distribution of drug use for chronic disease.

Table 17.2. Logistic regression analysis of socio-demographic variables and taking prescribed drugs for common chronic conditions

Socio-demographic characteristics	Number of observations	Odds ratio	95% Confidence interval
	Using drugs = 1285	Not using drugs = 12406*	
Asset index (Quintiles)			
Poorest group	2252	1.00	-
Second poorest	2827	1.21	0.83 - 1.75
Middle group	2908	1.64	1.17 - 2.31
Fourth poorest	3030	2.72	1.83 - 4.04
Richest group	2674	3.01	1.96 - 4.63
Education (number of years)			
None	1929	1.00	-
1 - 7	4015	1.19	0.96 - 1.49
8 - 12	6888	1.09	0.83 - 1.44
> 12	859	0.76	0.500 - 1.14
Age group (years)			
15 - 24	3918	1.00	-
25 - 34	2699	3.82	2.09 - 6.96
35 - 44	2386	9.75	5.60 - 16.97
45 - 54	1784	30.28	17.22 - 53.25
55 - 64	1450	43.63	24.97 - 76.23
≥ 65	1454	51.21	29.41 - 89.17
Population group			
African	10384	1.00	-
Coloured	1761	1.49	1.12 - 2.00
White	1089	1.84	1.33 - 2.57
Asian	457	2.41	1.71 - 3.38
Geographic setting			
Urban	7678	1.00	-
Rural	6013	0.86	0.66 - 1.12
Gender			
Men	5691	1.00	-
Women	8000	1.47	1.26 - 1.71
Medical Aid			
Membership	2018	1.00	-
Non-membership	11673	0.75	0.58 - 0.96

Table 17.3. Prevalence of reported use of drugs for chronic conditions and listing of prescribed drugs for six categories of common chronic conditions (asthma and chronic bronchitis, diabetes, hyperlipidaemia, hypertension and other drugs for atherosclerosis or stroke-related conditions) in South Africa in 1998

	Men	Women	Total
Total Number	5671	8155	13826
% Who reported taking prescribed drugs regularly	12.5	18.4	15.9
% Of participants where themselves or family paid for their drugs	34.2	33.1	33.4
% Of participants where medical aid covered most of the cost of their drugs	29.1	25.9	27.6
% Of participants who received most of their drugs from public sector health facilities	34.3	38.5	36.9
% Who had listed drugs for one of the common chronic conditions	8.0	11.4	10.0
% With Asthma & Chronic Bronchitis drugs (AT Code = R03)	2.0	1.6	1.8
% With Diabetes drugs (AT Code = A10)	1.4	2.0	1.7
% With Hyperlipidaemia (AT Code = C10A)	0.3	0.3	0.3
% With Hypertension (AT Codes = C02/3, C07/8/9)	4.1	6.8	5.7
% With Atherosclerosis- and Stroke-related drugs (AT Codes = B01AC, C01A/B/D/A)	1.0	1.0	1.0
Number of prescribed drugs *	845	1705	2550
% Asthma and Chronic Bronchitis drugs *	22.8	10.9	14.9
% Diabetes drugs *	11.6	12.6	12.3
% Hyperlipidaemia drugs *	1.8	1.2	1.4
% Hypertension drugs *	50.5	66.4	61.0
% Atherosclerosis- and Stroke-related drugs	10.5	7.9	8.8
Number of persons with drugs for common chronic conditions †	452	930	1382
% With one listed drug †	37.2	31.7	33.6
% With two to three listed drugs †	44.7	47.0	45.9
% With four or more listed drugs †	18.1	21.3	20.5
Number of persons using diabetes drugs ‡	76	163	239
% Who knew what condition the drug was taken for ‡	90.3	89.6	89.8
% Who said they could name the drug ‡	56.8	54.6	55.3
% Who named at least one appropriate drug ‡	55.0	48.8	50.8
Number of persons using hypertension drugs §	230	558	788
% Who knew what condition the drug was taken for §	81.4	89.3	87.0
% Who said they could name the drug §	56.9	54.9	55.1
% Who named at least one appropriate drug §	54.6	52.8	53.7
Number of persons using Asthma and Chronic Bronchitis drugs	110	131	241
% Who knew what condition the drug was taken for	75.2	75.1	75.1
% Who said they could name the drug	48.4	55.2	51.9
% Who named at least one appropriate drug	43.3	53.0	48.5

* † ‡ § || Denotes the number used as the denominators for the reported percentages

Table 17.3 shows the prescribed drug use for asthma and chronic bronchitis, diabetes, hyperlipidaemia, hypertension and other drugs for atherosclerosis or stroke-related conditions. Most people taking drugs for chronic diseases received these free of charge at public sector facilities. These sectors provide health care for 80% of the population. The least number of people had medical insurance, which paid for their drugs. Men used drugs most frequently for hypertension, asthma or chronic bronchitis, while in women it was for hypertension and diabetes. Although most patients said they knew the condition for which they were taking the drugs, less than half could name a minimum of one correct drug for their condition. Additional analyses of those patients who were taking drugs for their hypertension, who know what the drug was for, and who could name at least one correct drug to lower BP had significantly higher levels of BP control than those with hypertension who could not correctly name their medication (Steyn, unpublished data). This clearly

shows that patients who are sufficiently empowered to know their antihypertension medication were better controlled than those who are not. This difference needs further investigation to understand the factors affecting BP control in these patients.

The pattern of individual drug use for the different conditions revealed that the prescribing patterns for the six common chronic conditions in many cases did not comply with the recommended best medical practice.

Of all the participants taking chronic medication, 1.8% had regular prescribed medication for asthma and/or chronic bronchitis recorded (Table 17.3). This accounted for 17.5% of the people taking prescribed medication regularly. More asthma drugs were paid for by the private sector than by the public sector. The inhalants, particularly, were used more frequently by the private sector patients.

Additional analysis of the asthma and chronic bronchitis medication showed that systemic salbutamol accounted for 27% of asthma drugs used, while only 10.9% was salbutamol inhalers. The second most frequent drug recorded is theophylline (20%) followed by aminophylline (10%) and beclomethasone (10% of drugs used for asthma and chronic bronchitis). The first-line drug suggested for asthma is an anti-inflammatory inhalant, such as beclomethasone, which ensures that the underlying pathology is best controlled. From these data it is clear a large proportion of drugs prescribed for asthma are not according to the recommended guidelines of the DOH or the expert guideline recommendations for asthma management.

The finding that only 1.7% of the adults had listed drugs for diabetes is surprising and suggests a serious degree of undertreatment of this condition. The predominance of the use of oral hypoglycaemic agents is not surprising and is in keeping with type 2 diabetes being the dominant form of diabetes in the country. Sulphonylurea was commonly used, but may not always have been the appropriate monotherapy since most type 2 diabetic patients are overweight or obese. Insulin, the sole therapy for type 1 diabetes and increasingly used in type 2 diabetes, comprised 20% of the hypoglycaemic agents used.

A mere 37 (0.3% of all the participants) persons recorded using drugs for hyperlipidaemia. Furthermore, only 1.4% of the chronic disease drugs was prescribed for hyperlipidaemia. This is a remarkably low rate of treatment as it has been estimated that about 4.5 million South Africans have hyperlipidaemia imparting risk for atherosclerosis-related conditions, such as angina and heart attacks. Treating people with extremely high levels of total cardiovascular disease (CVD) risk has been shown to be highly cost-effective. This includes people who have suffered a heart attack or stroke and those who have familial hypercholesterolaemia. It is estimated that in South Africa about 90 people survive a heart attack per day. Unfortunately, the essential drug list (EDL) for public sector primary health-care services in South Africa does not include any medication for this condition, despite the fact that the patent for HMG-CoA reductase inhibitor, Simvastatin, has lapsed and a much cheaper generic version is available.

While national guidelines for the management of hypertension in the primary health-care setting have been developed and launched, the findings of the survey suggest that these are not being widely implemented. This is reflected in the poor level of control of hypertension that was achieved across the country in the first South African DHS (Chapter 8). Diuretic agents are recommended as the first-line drug for all patients with hypertension. However, diuretics accounted for only 43% of the antihypertensive agents used. Reserpine is the cheapest second-line agent suggested in the guidelines but only about 5.5% of the anti-hypertensive medication contained reserpine. The guidelines do not recommend methyl dopa for hypertension, except for pregnant women. This agent is expensive and has many side effects, but still accounted for 14.8% of all antihypertensive medications used. This was used more frequently by women and in the public sector. In 1998, no generic ACE-inhibitor was available in South Africa and it was a surprising finding that these expensive agents were used with equal frequency in the public and private health-care sectors.

The use of aspirin after an atherosclerosis- or stroke-related event has been shown to save lives. In 1998, less than 1% of the study population was using aspirin. The high mortality rates found for CVD in South Africa suggests many South Africans who have suffered a heart attack or stroke would benefit from regular aspirin use to reduce the risk of repeat events.

3.2.2 Hypertension care

The following studies focused on patients with hypertension. The first study reviewed the treatment of patients with hypertension in the private sector.²³ The data were available from a private drug utilisation review consultancy, called Quality Health Services, and used by a wide range of medical schemes in South Africa. Edwards *et al.*²³ reviewed the prescribing patterns and assessed the effectiveness and cost-effectiveness of the treatment of 11 696 patients cared for by 3 503 private practitioners. The level of BP control achieved was 34.7% with a BP below 140/90 mmHg and another 42% with higher levels but below 160/95 mmHg. At the time of the study (1993-1995) the recommended target BP for hypertension control in South Africa was 160/95 mmHg. The most frequently prescribed drug class was ACE inhibitors (32%). Beta-blockers accounted for 21% and calcium antagonists for 14% of all prescriptions. Thiazide and related diuretics, the recommended first-line treatment, alone accounted for 7.8% of the prescriptions. However, a further 13.8% of prescriptions contained diuretics in combination with other drug classes. Diuretics of all classes, taken alone or in combination, were used by 33.9% of patients. These data showed that almost half of the prescriptions were for the newer and more costly antihypertensive drugs, although at that time, their effectiveness in reducing long-term complications was still unproven. Furthermore, the pattern of prescriptions did not conform to those recommended by the South African Hypertension Society's management guidelines, another example of private practitioners' lack of compliance to prescribing according to therapeutic guidelines.

Two studies were conducted in the public CHC sector to assess hypertension care for predominantly coloured patients.^{24,25} Lunt *et al.*²⁴ studied 1 098 patients with hypertension during a 12-month period at one CHC. More than half the patients were 65 years or older and 82% female. The level of control achieved was much poorer than that found in private patients reported above, with only 14.5% with BPs below 140/90 mmHg and 28.8% with higher levels but below 160/95 mmHg. Women had significantly higher rates of BP control than males. These patients' rate for defaulting was 19.4%, thereby attending less than the expected number of visits to collect medication or see clinic staff. The compliance rate, defined as the proportion of patients who were expected to have collected drugs at all 12 visits, was high (76.9%) and loss to follow up over the 12-month period was 8.1%. The data suggest that poor levels of BP control were achieved in a group of patients who had relatively high rates of compliance.

In a smaller study at another CHC, Steyn *et al.*²⁵ found similar levels of poor BP control; 41.6% of patients had BPs at 140/90 mmHg or above. The patients had little knowledge of either the consequences of hypertension or the actions needed to ensure that complications were prevented. Home remedies were suggested by 31% of patients as effective antihypertensive medication. Most patients were satisfied with the treatment they received, but 30% requested the return of the dedicated hypertension clubs that had previously operated at this CHC. Other complaints recorded were long waiting times (47%), doctors who did not examine them adequately (37%), and insufficient medication supplied to last until their next appointment (15.5%). Urine and eye tests had been conducted infrequently during the previous 2 years. Conditional logistic regression models indicated that patients who expressed the need to make proposals to the clinic staff about their care had better BP control than those who did not. This suggests that higher levels of patient participation and patient-centred care may result in improved levels of BP control at the CHC.

Similar studies at three CHCs and private GP practices in the townships of Guguletu, Cross Roads and Langa in Cape Town, investigated the determinants of hypertension care in 403 black patients with hypertension. Preliminary analyses suggest that the overall burden of CVD risk factors was high in these patients.²⁶ Hypercholesterolaemia was found in 50%, diabetes (random glucose and/or taking antidiabetic medication) in 18%, excessive alcohol use (positive Cage questionnaire) 32%, smoking tobacco in 11%, and levels of BP control were inadequate. It is therefore not surprising to find high levels of target organ damage²⁷ with 44% of patients showing left ventricular hypertrophy on ECG, 15% having renal insufficiency (serum creatinine > 100 $\mu\text{mol}/\ell$) and 4% of women and 1% of men having proteinuria (urine Alb/Creat \geq 34 mg/mmol). These data also show that despite attending primary-care facilities for hypertension care, good levels of BP control were not achieved. Regression analyses found that a higher level of education and a positive Cage score (excessive alcohol use) was associated with poor levels of BP control. Analyses of the physical activity patterns revealed that higher levels of work related physical activity were associated with better BP control in both men and women.

3.2.3 Diabetes care

In 2000, files of 335 patients with diabetes attending the Universitas hospital diabetic clinic in Bloemfontein were reviewed to assess their diabetes and related CVD risk factor control.^{28,29} The median HbA_{1c} was 9.4% and only 14% of patients had an optimal level of 7% or less; demonstrating a poor level of diabetes control. Factors related to poor diabetes control were younger age ($p=0.0599$), male sex ($p=0.044$), longer duration of diabetes ($p=0.00008$) and a high insulin dosage ($p=0.0088$). This study shows how difficult it is to achieve the levels of control suggested by diabetes treatment guidelines. Associated CVD risk factors were also frequently diagnosed in these patients, i.e. hypertension was found in 68.9%, while only 37% of them had a controlled BP. Those with longer duration of diabetes had poorer levels of BP control. Fifty percent of the patients had recorded lipid profiles, while 13.6% were on lipid-lowering agents, and only 28% had a total cholesterol level of under 5.1 mmol/L. The review highlights the multiple risk factors found in these patients and suggests that their global CVD risk level will be exceedingly high.

A similar retrospective study of folders of patients with diabetes in five Cape Town CHCs revealed that diabetes care was inadequate as were patient attendance and the identification of treatable complications.³⁰ Only 35% of patients attended regularly finger-prick blood glucose values were recorded for 98.4% of all visits and BP at 74.1% of visits. Urinary dipstick results were recorded at 84.6% of visits. However, fundoscopy was recorded in only 6% and examination of the feet at only 4.7% of visits. Fewer than half the visits resulted in a change of management and polypharmacy for conditions other than diabetes was frequent.

A subsequent study was conducted in which 240 patients with diabetes had a clinical examination, 1-year retrospective record reviews, and an interview in three Cape Town CHCs. This revealed the common occurrence of complications, such as retinopathy, peripheral neuropathy and elevated albumin-creatinine ratios, largely unrecorded in the previous year's notes, in addition to suboptimal glycaemic and BP control. It is also a matter of concern that over half of the participants felt they were not treated with respect by the staff.³¹

There are limited data, based on examination of patients' knowledge and experience of diabetes and its complications. This is concerning, for example Huddle and Kalk³² pointed out that lower limb amputations are about 20 times more common in diabetic compared to non-diabetic populations.

In the Eastern Cape, Matwa³³ conducted in-depth interviews and wrote field notes in response to observational studies with 15 patients with diabetes drawn from the Umtata hospital diabetic clinic. The question, "Please tell me what it is like to have and live with diabetes and as a diabetic person, how do you take care of your feet?" was asked in isiXhosa. The observations involved watching the process of participants cutting their toenails, using instruments that they were familiar with, as well as observing appropriateness of footwear, cleanliness of the feet and the presence of other abnormalities, such as corns, calluses, deformities and ulcers or amputations. Most of the participants could recognise the symptoms of hyperglycaemia, such as excessive thirst, drinking plenty of fluids, polyuria, hunger, and general malaise. Many females suffered vulval pruritis and vaginal discharge with hyperglycaemia. Only a few patients knew the symptoms of hypoglycaemia or knew what to do when these symptoms were present. For men impotence was a major concern. The participants demonstrated limited knowledge of chronic diabetic complications; lower limb amputations, ulcers, blindness, and stroke were mentioned by 5 participants and only one mentioned stillbirths or abortions as an association of diabetes. Only 6 participants understood the importance of diet as a part of the treatments for diabetes, but all understood the importance of complying with their medical treatment. One participant used traditional medicines to control her diabetes. Only three participants mentioned the importance of exercise in the prevention of complications and only three patients expressed fear of complications of diabetes. Feelings of worthlessness were more pronounced among impotent men who could not fulfil their masculine role in their families. Five participants associated diabetes, ulcers, amputations, and impotence with witchcraft; hence, traditional ways of treatment were sought. Participants had little trust in the western medication for diabetes as no permanent cure was effected. They did not think the medicine was effective if they did not pay for it, as it was part of the Xhosa culture to pay for traditional medication before it was deemed effective.

A lack of finances for travelling to clinics was found to be an impediment to regular clinic visits. The rural clinics frequently did not have the required antidiabetic medication, thus patients had to travel to the nearest hospital, which they could ill afford, to receive their medication. They complained about the equipment for testing blood sugar mostly being out of order, and that hospital staff were too busy to discuss and teach patients

about diabetes. Fear of loss of employment also kept patients away from regular clinic visits.

Overall, this analysis revealed limited knowledge of diabetes and negative experiences in the internal and external environments of the persons with diabetes, as well as poor foot-care knowledge and practices. Traditional beliefs also impeded optimal diabetes care.

De Heer conducted a similar study in the coloured community in Cape Town. People with diabetes with and without foot complications were interviewed in depth. The major findings were limited knowledge about foot care, low perceived risk for their feet unless they had already experienced a foot complication and generally negative feelings about their diabetes. Their understanding of diabetes and foot complications indicates a strong 'Western' model and thus acceptance of the causation provided by the health professionals.

Another study conducted in the Eastern Cape, among 60 patients with diabetes, attempted to understand their practices and perceptions of verbal and written messages provided at six randomly selected primary health-care facilities in the Buffalo City region.³⁴ The methods used included a questionnaire to determine patients' practices regarding diabetes, exit interviews to assess their perceptions about the messages given by health professionals when interacting with patients, content analysis of a poster on diabetes provided by the DOH of the Eastern Cape, and focus group discussions to explore their views about the content of good messages. Most patients understood that they should use their antidiabetic drugs daily; however, 63% of them supplemented their treatment regimen with different remedies, mostly from traditional healers. Poor adherence was given to the recommended diet for diabetes. Fruit and vegetables were not consumed by 58% and 45% of patients, respectively, during the last week. Acute complications and their management are poorly understood by the patients. Most patients 62% ascribed sweating, restlessness and double vision to high blood sugar and only 38% suggested low blood sugar as the cause of the symptoms. When asked what actions to take with these symptoms only 33% suggested eating sweets or jam.

The exit interviews showed that most of the patients could recall and understood the health education messages provided by the health professionals, however they did not seem to put the advice into practice. The content analyses of the diabetes poster with 6 pictures suggesting symptoms of diabetes revealed that patients misunderstood the pictorial representation of the symptoms of diabetes about half the time. Those who could read the Xhosa subtitles of the pictures did better. These findings clearly indicate the problems of conveying the clinical presentation of diabetes to illiterate patients with pictures. The analyses of the focus group found that patients preferred not only posters that explained the factors leading to the diagnosis of diabetes, but also ones that would teach them how to manage the condition and the prevent complications. They preferred messages to be easy to understand, short, clear, interesting and should suggest actions. The writing should be bold, culturally appropriate and the pictures explicit for illiterate people to understand. The focus group participants stated that traditional healers were now observed in the clinics and they requested that there should be a guide for the patients regarding traditional medicines.

A smaller study at the Church of Scotland Hospital in KwaZulu-Natal was conducted by Khoza and Kortenboud³⁵ with 30 diabetes patients to assess factors that may influence compliance. Of the patients 30% reported that financial problems affected their ability to follow the prescribed diet, not surprising when it is considered that 86% were either on a pension or unemployed. The study found that the cost of travelling to hospital was prohibitive and that during the rainy season few patients attended clinic and consequently many patients ran out of drugs between hospital visits. Older persons frequently had multiple drugs prescribed and they reported that many side effects were experienced, and, consequently, they did not take all the drugs, and older people in particular forgot to take their medication. Long waiting times at the clinic were frustrating. Compliance to dietary recommendations was poor and 33% of the patients used alcohol regularly.

In two Tswana hospitals Westaway and Seager³⁶ conducted interviews with 95 African-speaking patients and 81 Afrikaans-speaking patients with diabetes to identify the underlying dimensions of treatments satisfaction as measured by the Diabetes Treatment Satisfaction Questionnaire (DTSQ). Principal component analyses identified the six factors related to patient satisfaction for both groups. Patient satisfaction was found to be significantly associated with fewer incidents of hyperglycaemia and hypoglycaemia, higher general well-being and better health for the African-speaking patients. For the

Afrikaans-speaking patients, greater patient satisfaction was significantly associated with fewer incidents of hyperglycaemia, general well-being, and better health. These findings were consistent with those reported in the United Kingdom and Sweden and confirmed that the DTSQ can be used in multicultural settings.

An extension of this study in 263 black patients with diabetes attending two hospital outpatient clinics investigated the interpersonal and organisational dimensions of patient satisfaction with diabetes care.³⁷ In this study the health status of patients were measured by the general and mental health subscales from the 20-item abbreviation of the Rand Medical Outcomes Study (SF-20).³⁸ Detailed analyses of the patients' satisfaction scales identified 19 items falling into two major categories, which accounted for 71.6% of the variance of patient satisfaction. The first category comprised items reflecting interpersonal dimensions of patient satisfaction. The major items were 'providers who let me talk', 'providers who listen to me', 'supportive providers', 'considerate providers', 'friendly providers, helpful providers, and encouraging providers. The second category comprised items reflecting service characteristics, and was interpreted as the organisational dimension of patient satisfaction. The major items included were waiting times, availability of a seat in the waiting area, availability of a toilet in the waiting area, follow-up service, and cleanliness at the clinic. The interpersonal subscale was significantly related to mental health, whereas the organisational scale was significantly related to both mental and general health.

According to the analyses of the SF-20 data 50% of patients were in the poor general health category and 28% were in the poor mental health category. Poor mental health was associated with high levels of HbA_{1c} suggesting poor glycaemic control. Not one of the patient satisfaction subscales was significantly related to age, gender, marital status education, or employment status. In addition, they were not associated with HbA_{1c}, BMI, or BP control. Finally, this analysis suggested that patients in poor general health are less satisfied with the organisational quality of their care than are patients in good general health; in contrast, patients in poor mental health were less satisfied with the interpersonal quality of their care than do those in good mental health.

3.2.4 Diabetes and hypertension care

In the Cape Peninsula, a study was conducted in 18 CHCs reviewing the care received by 923 patients with hypertension and 455 patients with diabetes. Despite all these patients attending the clinics for management of their condition, only 33% of the patients with hypertension had a BP below 140/90 mmHg and of the patients with diabetes only 21.3% had a BP below the recommended level of <130/85 mmHg. For those with diabetes only 42% had a random blood glucose level below 11.1 mmol/l, and 76% had a HbA_{1c} level \geq 1% of the upper limit of normal. These findings clearly indicate a poor level of control of these chronic disease risk factors. Furthermore, most patients have multiple CVD risk factors and consequently a high level of CVD risk. The data also demonstrate that the treatment of the other CVD risk factors is inadequate. Co-morbid conditions occur often and a significant level of target organ damage is identified.

Patient knowledge about these conditions, their treatment and their complications was extremely poor. Only about 20% could correctly name at least one drug that had been described for them for either hypertension or diabetes. Many patients frequently forgot to take their prescribed medication. Without understanding the need for medication and what difference regular treatment makes to long-term outcome, it is difficult for patients to be motivated to use their medications regularly. Very few could identify the necessary actions required to prevent emergencies developing and for preventing severe acute and long-term complications. The requirements for the necessary lifestyle modifications for good control of hypertension and diabetes are poorly understood.

An audit of the folders of these patients revealed that the records kept did not reflect good routine patient care for hypertension and diabetes. This could either be because the notes were incomplete or that the required actions had not taken place. The poor level of BP and blood glucose control observed in these patients make it particularly worrying that their records also showed limited assessment for target organ damage. This suggests that despite attending the clinics, the patients were not receiving the quality of care necessary to improve BP and blood glucose control, and thus prevent the target organ damage that would lead to major morbidity and premature mortality (Steyn & Levitt, unpublished data).

These data clearly emphasise that the optimal chronic disease care model focussing on the role of the patient along with that of the health-care system has not been achieved in the community health clinics in the Cape Peninsula. Bodenheimer³⁹ stated, "An effective

chronic care model is achieved when a prepared, proactive practice team interacts with an informed, activated patient”.

3.2.5 Care of other chronic conditions

In the Agincourt field site in Mpumalanga, a study was conducted by Thorogood *et al.*⁴⁰ This examined the prevalence of risk factors and the experiences of interventions in stroke survivors in order to identify barriers to secondary prevention in this rural setting. Of 103 stroke survivors, 71% had hypertension, however only 8% were taking anti-hypertensive medication. Of these patients, 91% had sought help, which involved allopathic health care for 79%, 42 patients had sought help from traditional healers and churches, while another 13 people only sought help from those sources. In-depth interviews were conducted with 35 stroke survivors to assess the impact on their families and their health-seeking behaviour. Barriers to secondary prevention included costs of treatment, reluctance to use pills, difficulties with access to drugs, and lack of equipment to measure BP. A negative attitude to allopathic care was not an important factor.

Tobacco smoking rates in South Africa are highest in the coloured population. This extends to women during pregnancy with the consequent negative impact on both the mother and the baby. In preparation for developing an intervention, two studies were conducted by Petersen⁴¹ to identify pregnant coloured women's knowledge, practices and beliefs regarding smoking during pregnancy. These cross-sectional surveys were conducted on 796 pregnant coloured women in public sector antenatal clinics in six South African cities using a questionnaire. The results revealed that 45.9% of the subjects smoked during the pregnancy, 14.7% had quit and 39.4% were non-smokers. A significantly higher proportion of non-smokers and quitters (compared with smokers) were found to have education beyond primary school (7 years of schooling). The results also suggest that smoking is positively related to lack of financial support from a partner, and smoking is less common among those who are married or living with a partner. Furthermore, more quitters than smokers had family members who were perceived as emotionally supportive during pregnancy. Women who did not plan their pregnancies were more frequently smokers compared to quitters or non-smokers. Smokers also used alcohol more frequently. It is therefore not surprising that smokers have elevated rates of infants with foetal alcohol syndrome.

The women who smoked tended to conceal their smoking status or the amount they smoked. This is mainly to avoid criticism from clinic staff and society. Of the smoking women, only 21% said that they had never attempted quitting and 10% said they do not intend quitting, suggesting that, the vast majority of the smoking pregnant women would like to quit. However, they felt their knowledge was limited and the techniques of quitting were not known to them. The magnitude of the harm to themselves, their pregnancies, and their babies was also not known to the smokers. Only 55% of the smokers said that they talk freely to the midwife about their smoking, 33% said they never talk to the midwives about their smoking and 28% said they were too afraid to ask midwives questions regarding their smoking. Among the quitters 7% said they intend smoking again after the pregnancy.

Of the smokers, 74% were either in the preparation or action stage phase of quitting smoking. All these women were mostly satisfied with the services they received at the antenatal clinics and they felt strongly that the midwives were the right people to provide them with smoking cessation intervention. This study along with those described earlier will form the backbone of information on which to base the development of a culturally appropriate intervention to be evaluated.

An additional study conducted by Petersen⁴¹ involved in-depth interviews with 12 pregnant coloured women to confirm some of the findings reported above from the quantitative survey. These revealed that the women had a poor knowledge of the harm caused by smoking and passive smoking to their pregnancy. Although women expressed an interest in quitting, they lacked the self-efficacy to speak to midwives about smoking; they feared being harshly judged. The concept of an 'unworthy woman' identified the essence of how women who smoked felt in their relationship with the midwives.

Although a national policy for cervical screening has been formulated, these services have failed to reach many poor women. A household survey by Bradley *et al.*⁴² was conducted in predominantly black African women living in low-income townships of Cape Town to ascertain the characteristics of women who reported never having been screened. Of the 664 women who participated in the study 45% reported that they had been screened. Those who had not received a pap smear were older, poorer, less educated and unemployed or working in the informal sector. They tended to live in non-permanent

dwelling without partners. They did not know anybody who had been screened for cervical cancer and had not recently sought care for other ailments, or used contraception.

4. INTERVENTIONS

Despite the information available on the status of the management of chronic diseases of lifestyle, very few intervention studies have been published or conducted during the past decade to evaluate means of improving the poor level of care that is currently provided for these conditions.

The National DOH has formulated a national cervical cancer screening policy for primary-care facilities in the public sector. The Cervical Health Implementation Project (CHIP), a collaborative initiative of the Women's Health Project, the Women's Health Research Unit, and EngenderHealth, was undertaken in three pilot districts in Gauteng, Limpopo and Western Cape provinces during January 2001 to May 2003.⁴³ The purpose of CHIP was to identify implementation challenges; and make appropriate recommendations for the effective implementation of the national cervical cancer screening policy.

An assessment of the health worker and management capacity to implement cervical screening services evaluated for CHIP found that health-care providers at primary-care level were not aware of the cervical screening policy, or were resistant to implementing it. They were also not adequately equipped with relevant knowledge and skills to implement screening services. Limited management capacity to plan, co-ordinate, and monitor screening services was an important impediment to delivery of screening service. The study demonstrated that it is possible to expand the availability of screening services by training health workers to understand the rationale for the national screening policy, and to equip them with knowledge and skills to provide screening. The project published a 2-volume manual to address gaps in health worker and management capacity. Volume I: A Guide for Programme Managers provides overall guidance for programme managers wanting to set up screening services in the South African context.⁴⁴ Volume II: A Guide for trainers is targeted at trainers of health-care providers at the primary-care level.⁴⁵

The mainstay in cervical cancer prevention is ensuring timely diagnosis and treatment of women with pre-cancerous lesions (HSIL results). A pilot project to evaluate implementation of the cervical screening policy in three provinces of South Africa found that women's access to treatment for HSIL is hampered by weak referral systems, poor linkages between levels of care, and limited availability of treatment facilities.⁴⁶ The study found that for a selected period of evaluation, only 14 of 28 (50%) women with HSIL accessed treatment within 6 months; 9 were lost to follow-up before they got treated, while 4 waited up to 9 months for an appointment.⁴⁶ Though numbers are small, the observations are worrying because this highlights that retaining women in the system after a pap smear is a problem. The study attributed these problems to the following weaknesses in the health system:

Multiple and unnecessary levels of referral – the pathway from clinic to treatment facility can be long and tortuous. This discourages retention in the programme.

Limited geographical and economic access – some women had to travel long distances to get treatment because services for treatment of pre-cancerous lesions are mainly located in specialised, urban academic hospitals.

Poor tracking and monitoring systems – this, compounded by poor or absent linkages between levels of care meant that once women left the primary-care level, there were no mechanisms in place to keep track of them.

Unless efforts are made to strengthen referral pathways and linkages between levels of care and to decentralise services for the treatment of precursor lesions available beyond academic hospitals, the goal of cervical cancer prevention will probably not be achieved.

A cluster randomised controlled trial was conducted in private general practices in the Cape Peninsula in order to evaluate an educational outreach package for doctors in order to reduce the severity of asthma in children.⁴⁷ Children (n=318) who were attending 43 private practices in Mitchell's Plain outside Cape Town with moderate to severe asthma were entered into the study. The 21 practices randomised to the intervention group received 30-minute educational outreach visits by a trained pharmacist and were given materials describing and facilitating key interventions to improve asthma care. The educational outreach consisted of eight key messages (based on barriers to good practice, identified in a nearby community). The messages were based on the use of a treatment algorithm related to the severity of the asthma, appropriate inhaler therapy with use of homemade spacers, good follow-up, and encouragement of parents to avoid smoking near asthmatic children. The control group received a copy of the then current South African childhood asthma guideline. The main outcome measure was asthma severity measured in a community-based survey administered through schools using the frequency of symptoms and a severity scale. At follow-up 271 children from all the practices were evaluated. There was a substantial decline in reported symptoms over one year in both the intervention and controls groups. The difference in

decline was significantly greater in the intervention group (0.84 points on a 9-point scale; $p=0.03$). This educational outreach programme improved asthma care for children in the community and should be a model for promoting better management of the condition.

A quasi-experimental design was used by Van Zyl and Rheeder⁴⁸ to evaluate a physician education programme in two similar diabetes clinics in Kalafong Hospital near Pretoria. At baseline, a patient folder audit was done to assess frequency of patient visits, quality of patients care and duration of the consultation per patient. The intervention included an interactive training programme for doctors and a structured consultation schedule for the next year's visits of the patients. The training consisted of quarterly non-compulsory meetings including theoretical knowledge transfer as well as discussion of practical aspects of outpatient diabetes care. The intervention material was based on the Society for Endocrinology, Metabolism and Diabetes of South Africa (SEMDSA) Guidelines for the management of type 2 diabetes. The topics for the training sessions included glycaemic control in type 1 and type 2 diabetes, prevention and diagnoses of foot problems, eye problems, risk reduction of macrovascular disease, microalbuminuria and educating patients on diabetes self-care. Each topic was covered immediately before the structured consultation schedule called to the doctor to focus on the specific topic. The structured consultation schedule for the doctor's activities changed the previous independent approach to a structural treatment plan for one year. This was accompanied by a standardised easy-to-complete clinical record form. Each patient was scheduled to attend the clinic quarterly, with a different focus at each visit. The timing of the visit was less frequently scheduled than in the past. The first visit focused on proper foot examination and home care by the patient. HbA_{1c} was also done. The second visit focused on patient education on their medication and the need to take drugs regularly. A dietician assessed their BMI and provided counselling on diet and obesity management and other cardiovascular risk factors and lifestyle. A urine test for micro-albuminuria, a lipid profile, serum creatinine, and HbA_{1c} were done at the third quarterly visit. The fourth visit focused on eye problems, including visual acuity and direct fundoscopy and referred if required. An ECG was also done at this visit. Finally, an audit of patient records were done to assess the frequency of process measures recorded. These included a foot examination, an eye examination, a urine test for albuminuria, dietary counselling, an HbA_{1c} test, and a lipid profile. The number of clinic visits during the year, any hospitalisations during the year and the current therapy. The duration of all the clinic visits was also recorded. The main outcome measure was the level of the HbA_{1c} test.

After the intervention period the HbA_{1c} level of patients at the clinics improved, however the intervention clinic improved more although the differences between the two clinics were not statistically significant. With regard to the process measures, the intervention clinic scored significantly better than the control clinic. The mean number of visits decreased significantly at the intervention clinic, while they remained the same at the control clinic. However, the duration of the visits at the intervention clinics were longer than those at the control clinic were. Clearly, a better quality of care was provided at the intervention clinic where the required processes of patient care were practiced. Overall, diabetes patient care improved at both clinics and contamination of the intervention between the two clinics at the same hospital must be considered as a cause for the lack of significant differences observed between intervention and control clinics.

At a CHC in Cape Town, a before-and-after intervention study was conducted to evaluate the impact of introducing treatment guidelines for hypertension and by restricting availability of less cost-effective drugs on overall hypertension treatment costs and BP control.⁴⁹ Of the patients attending a CHC, 1 084 with hypertension were entered into the study if they had at least two prescriptions for lowering BP during a one-year period. During the following year, an intervention was instituted by applying the 1990 Groote Schuur Hospital guidelines for the treatment of hypertension. This involved a stepped-care approach in which the objective was to control BP with the least expensive treatments and minimum number of drugs. The recommended steps were: 1) to use as first-choice, hydrochlorothiazide, amiloride, propranolol or reserpine; 2) combine two first choice drugs; 3) add a vasodilator (hydralazine or verapamil); and 4) add enalapril or captopril in addition to the other drugs or in place of the vasodilator. Step 4 recommended drugs that were much more expensive. The doctors at the clinic agreed to change to more cost-effective drugs whenever possible. In all cases, treatment decisions were taken by the attending doctor, and treatment changed only where thought to be clinically justified.

After one year, a mean of 1.7 active drugs were prescribed per patient visit. The most frequently prescribed drugs were thiazide-like diuretics (44.8%), centrally acting agents (28.4%) and beta-blockers (13.2%). The mean monthly drug costs per patient decreased significantly by R1.99 (24.2%) from R8.24 to R6.25 between the first and last prescription for each patient. This was attributable to reduced prescribing of the more expensive drugs being withdrawn from routine use, and a 51.1% increase in prescribing of the most cost-effective drugs. The overall annual cost-saving of the changes for this CHC was estimated at R75 150. Blood pressure control did not change significantly.

This study for the first time illustrated the potential for improving cost-effectiveness of hypertension care in primary health-care settings.

A nurse led chronic disease service based on diagnostic and clinical protocols based on essential drugs and appropriate technology in a resource-poor area of South Africa in the Hlabisa district in KwaZulu-Natal was evaluated by Coleman *et al.*⁵⁰ The convenience of management for the patient was highlighted. The control of hypertension, type 2 diabetes and asthma was achieved in 68%, 82%, and 84% respectively. The management of CDL of 79% of patients who came from areas served by village or mobile clinics was transferred from the district hospitals to such clinics. Patient-reported adherence to treatment increased from 79% to 87% ($p=0.03$) over the 2 years that the service was operating. This study provides a model of CDL care that could be applied to very resource-poor areas with outlying clinics.

A quality improvement cycle was initiated at Khayelitsha CHC in 1996 that included four components. Three-monthly visits as opposed to monthly visits, and an annual summary sheet were introduced, a clinic guideline for the clinical nurse practitioners developed, and an educational package (Zakhe Programme, Boehringer Mannheim) to be administered by the clinic nurse was introduced. The results of the cycle showed that 11 of the 12 standards for structure were achieved, e.g. presence of scale for weight measurements, and sphygmomanometers with a range of cuff sizes. In contrast, only one of the standards for success, (i.e. 90% of patients weighed at the last clinic visit) met the agreed level of performance. Three of the six standards for outcome were achieved though two of the three probably reflected a poor level of detection and not good quality care (e.g., less than 10% of patients had retinopathy detected). Because of this cycle, there were a number of improvements in the processes of care and the staff planned to continue to improve the care provided.⁵¹

The poor level of implementation of therapeutic protocols found in many primary-care CHCs and the inadequate patient record keeping have been identified as an impediment to good care for diabetes and hypertension in the CHCs in the Western Cape. This prompted the development of three structured patient records based on the published management guidelines for diabetes and hypertension. The three guidelines developed and piloted by the research team of the Chronic Diseases of Lifestyle Unit of the MRC in close collaboration with CHC staff consisted of a diabetes, a hypertension and a combined diabetes and hypertension guideline for this group of patients.⁵² The CHC staff had clear ideas about the format and content of the structured record. The preferred design features were simplicity of use, a single sheet with tick boxes to reduce recording time and clarity to allow easy visualisation of previous consultations. The form was designed to record routine visits and procedures over a one-year period. Non-routine visits for other medical condition were recorded in the usual notes to avoid cluttering the structured record. The instrument in A4 format was placed into the folder with the existing notes for photocopying on completion. Several process indicators that could influence optimal management were included. These were the detection of risk factors, screening for complications, the establishment of treatment goals, therapy defined by the guidelines and participation in patient education to encourage modification of risk factors. Result indicators were blood glucose, BP, BMI, and urinalysis. Space was also provided to the results of HbA_{1c}, serum creatinine, lipid, ECGs, and chest radiograph. Structural factors related to the organisation of care were not addressed.

The effectiveness of these structured records with prompts was tested in a randomised controlled trial in 18 CHCs in the Cape Peninsula. The introduction of the structured records with prompts at the nine intervention clinics was accompanied by educational session by two clinician experts in hypertension and diabetes care. The logistics of the introduction of the records were extensively discussed with the staff at the clinics, supply lines for the records and incorporation on the inside of the front page of the patient folders were negotiated. The experts visited all the intervention clinics on a number of occasions during the year. Despite these initiatives, after one year there was no difference in the control of either diabetes or hypertension in the intervention clinics compared to the control clinics (Steyn & Levitt, unpublished data). At the time of the RCT the CHC were undergoing major restructuring, experienced an acute shortage of staff and staff morale was very low. At many clinics, it was found that the structured records with prompts were never introduced in the patient's folders. In-depth interviews with the clinic staff after the survey revealed that there were serious staff shortages, major budget cuts and the freezing of essential vacant posts. This occurred in the face of ever-increasing numbers of patients who were no longer seen at the tertiary-care institutions. Patient loads were enormous and consequently staff expressed feelings of anger and frustration. The introduction of any additional activities was considered futile under the given circumstances (Everett, unpublished data). Furthermore, staff felt that the structured records with prompts could not replace the usual folder notes and consequently required additional work for them and unnecessary duplication. Some doctors were clearly reluctant to relinquish their system because they were familiar with it and it had evolved over time to suit their peculiar

requirements. The majority of the staff did not continue using the structured records at the end of the research project. Further, the staff perceived the structured records to have minimal or no impact on the care of their diabetes and hypertension patients.

Many lifestyle-related risk factors predispose to the development of hypertension. The most important nutrition-related risk factor is a high intake of sodium and a low intake of potassium, calcium, and magnesium. When recently evaluated in Cape Town, all persons working in a large municipal organisation were found to consume high levels of sodium and insufficient potassium, calcium and magnesium.⁵³ This finding was followed by the conduct of a randomised controlled trial using food usually consumed by the black people living in the townships around Cape Town. The intervention consisted of such foods specially modified by the food industry to reduce sodium and increase potassium, calcium and magnesium. The foods were bread, soup powder, soup cubes, maas, and low-sodium salt enriched with potassium. The trial involved 78 persons randomised to special or normal food. The primary outcome measure was BP measured electronically as well as by ambulatory 24 hr recorders. Analyses of the data indicated that the systolic BP was significantly lower (6.2 mmHg, $P=0.021$) in the intervention group compared to the control group. However, between the two groups the diastolic BP was not significantly different. These findings are supported by the BP reductions measured by 24 hour ambulatory BP monitoring with the day wake systolic BP 5.1 mmHg ($P=0.036$) lower in the intervention group than in the control group. The wake diastolic BP was 2.7 mmHg ($p=0.072$) lower in the intervention group than the control group (Charlton, unpublished data).

5. STUDIES ON SCREENING OR RESEARCH TOOLS FOR HEALTH SERVICE EVALUATIONS

A number of small studies have been conducted with the exclusive purpose of developing tools to support health service attempts to improve care for patients or in keeping with CDL in South Africa.

In a rural district of KwaZulu-Natal, Gill *et al.*⁵⁴ created a chronic diseases register over a 6-week period for 2 455 patients. This was done using the technique of electronic data linkages and capture-recapture techniques. The conditions entered were hypertension, diabetes, asthma, and epilepsy. Basic patient details were recorded into Epilinfo software from the main hospital clinic at Hlabisa, as well as ten peripheral clinics. The register was created using electronic data linkage of lists from the main hospital, the peripheral clinics, and repeat prescription cards. This allowed the description of the patient load for the four conditions showing that of all the patients in the register 62% had hypertension 16% epilepsy, 13% asthma, and 12% diabetes. Matching by name, age and diagnosis among the various sources of data proved feasible, although a small degree of overlap was found, suggesting that this easy and inexpensive method can be used in resource scarce settings to create a chronic diseases register for a given region.

Additional work by the same group focused on identifying the cost-effective methods to assess diabetic control in resource-poor settings.⁵⁵ They examined the reliability of random venous or capillary blood glucose testing, random urine glucose testing, and a current symptom history in predicting a high HbA_{1c} level in 235 type 2 diabetes patients. They found that the strongest association with HbA_{1c} was found with random venous blood glucose tests results. For a cut-off point of HbA_{1c} above 8%, for random venous plasma glucose of ≥ 14 mmol/l (present in 47% of subjects), specificity was 97.1%, sensitivity 56.8% and positive predictive value 98.9%. Therefore, when resources are short, random glucose testing will detect a significant proportion of those with the worst control with a high degree of specificity enabling staff to modify treatment safely.

Capillary blood glucose or urine testing with reagent strips identified fewer patients accurately, who need treatment modification. A symptom history of polyuria/nocturia was insufficient to replace biochemical testing.

The performance of South African laboratories for accurately testing HbA_{1c} was evaluated by an External Quality Assurance scheme.⁵⁶ A number of laboratories and methods do not meet the required analytical standards. South African laboratories should adopt measures similar to other regional and national initiatives to significantly improve laboratory performance and bring about harmonisation of HbA_{1c} assays.

The measurement of patient compliance to prescribed lifestyle and drug treatment for chronic conditions remains a challenge. A high BP therapy scale was developed and validated in the USA to assess compliance with hypertension management.⁵⁷ The questionnaire used to create this scale was modified to suit the local setting and vernacular of patients, translated into Xhosa, and tested in a group of 98 black patients with hypertension attending public sector CHC in Cape Town.⁵⁸ To validate the scale for use in a South African primary health-care setting item analyses were conducted to determine internal consistency of the modified scale. The resulting compliance scores were compared to the actual level of BP measured in these patients. The evaluation led to

modification of the scale to ten items and it was found that poor levels of compliance predicted higher diastolic BPs and that medication non-compliance tended to predict higher systolic BPs.

6. CONCLUSIONS

The data presented in this chapter show that a significant number of studies were conducted, which addressed the health service provision for chronic diseases of lifestyle in South Africa since 1994. Many of the studies were small, but the overall picture that emerged has clearly identified those aspects of chronic disease care that should receive attention from health-care policy makers.

These factors encompass structures, logistics, and organisational aspects of health-care services, which will require modification beyond purely chronic disease care. Staff shortages, poor staff morale, severe overcrowding, and a lack of specific planning to cater for the different needs of patients with chronic conditions have been identified. With respect to staff-related issues inadequate knowledge for the management of chronic diseases, conflict between different cadres of staff in inappropriate communication styles of staff with patients are all contributing to poor chronic disease care. In as far as patient related factors that contribute to poor chronic disease care, non-compliance, lack of patient empowerment, lack of patient knowledge and lack of effective lifestyle modification all contribute.

Despite many positive aspects of the initiation of the restructuring primary health-care services in South Africa during the last ten years these findings highlight how much more needs to be done to improve patient care for those with CDL.

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