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**Quality of interaction between primary health-care providers and  
patients with type 2 diabetes in Muscat, Oman**

Licentiate thesis

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## ABSTRACT

**Objectives:** This study aimed at exploring the quality of interactions between health-care providers and type 2 diabetic patients at primary health-care level in Muscat, Oman, focusing on the consultation environment, care and information, and how the patients perceived these interactions.

**Methods:** Two cross-sectional sub-studies were performed using quantitative and qualitative research methods. Data for the first sub-study was collected through direct observations of 90 consultations with 23 doctors and 85 consultations with 13 diabetes nurses in six primary health-care centres (PHCCs), using checklists developed from the National Diabetes Guidelines and other studies on patient-provider interaction. Consultations were assessed as optimal if more than 75% of observed aspects were fulfilled, sub-optimal if less than 50% were fulfilled and intermediate if the level of fulfilments was 50-75%. Data for the second sub-study was collected through focus group discussions (FGDs) among women and men with type 2 diabetes, attending the PHCCs. Qualitative content analysis was applied.

**Main findings:** In 48% of the consultations there was an optimal environment, care and information. The score of fulfillment was lower for shorter consultations. Overall scoring of the individual doctors' consultations showed that only ten doctors were optimal in their interactions with the patients, both creating a positive consultation environment and providing optimal care and information. The quality of the diabetes nurses' interactions was sub-optimal in about 75% of their consultations. Some important aspects of positive interactions were poorly fulfilled by doctors and nurses such as: consultation privacy; encouraging the patients to ask questions; attention; emphasis on patients understanding of the provided information; and inquiry about adverse effects of medicines, and about risky habits like smoking or alcohol consumption. There was a low referral to health educators or dieticians, and the diabetes nurses provided health education for a few patients. The combined scores of all aspects for both doctors and diabetes nurses showed that they interacted optimally with the patients in only one health centre.

Participants of FGDs identified several weaknesses with regard to patient-provider communication such as: unfriendly welcoming, interruption of privacy and poor attention. Moreover, the patients expressed their inability to participate in the medical dialogue or express concerns, and they discussed other problems and difficulties related to a patient-centred approach. Furthermore, some patients perceived the doctors and nurses neither to be experts, nor as competent enough in diabetes care. In addition, the patients were dissatisfied with issues related to the organization of the diabetes clinics and access to care such as: long waiting time; lack of care continuity and poor health education.

**Conclusions and recommendations:** The interactions of the doctors and diabetes nurses with type 2 diabetes patients were not optimal in relation to the national guidelines and there was poor collaboration between the diabetes team members. Furthermore, the patients' were to a great extent dissatisfied with the services at PHCCs in Muscat. The role of diabetes nurses, dieticians and health educators should be enhanced. Better utility of the resources and patients' awareness of these resources within the practice could be achieved through a multidisciplinary team approach and training of the providers to upgrade their skills regarding communication and care with emphasis on patient-centred care and empowerment approach. Barriers to compliance with the guidelines need to be further explored. The results of this study can serve as a point of departure for the policy makers in Oman and countries with similar health systems, for improving the quality of diabetes care, and for further improvement in the organizational efficiency of diabetes services.

**Keywords:** Diabetes; Patient-doctor interaction; Patients' perceptions; Primary health-care; Oman

## **PUBLICATIONS**

This thesis is based on the following articles, which will be referred to by their Roman numerals.

- I. Abdulhadi N, Al-Shafae MA, Östenson CG, Vernby Å, Wahlström R.  
Quality of interaction between primary health-care providers and patients with type 2 diabetes in Muscat, Oman: An observational study. *BMC Fam Pract.* 2006;7:72.
- II. Abdulhadi N, Al-Shafae MA, Freudenthal S, Östenson CG, Wahlström R.  
Patient-provider interaction from the perspectives of type 2 diabetes patients in Muscat, Oman: A qualitative study (Submitted).

Article I has been reprinted with permission from the editor.

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## **ABBREVIATIONS**

AIDS	Acquired Immunodeficiency Syndrome
BMI	Body Mass Index
DALE	Disability Adjusted Life Expectancy
EMAN	Eastern Mediterranean Approach to Non-communicable Diseases Network
FGD	Focus group discussion
GDP	Gross Domestic Product
IFG	Impaired fasting glucose
IGT	Impaired glucose tolerance
MOH	Ministry of Health
NCDs	Non-communicable diseases
PHC	Primary health-care
PHCC	Primary health-care centre
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization

## **PREAMBLE**

I am a medical doctor by training. After my graduation from Khartoum University, Sudan, I worked in the primary health care in Muscat, Oman from 1996-2003. I was later given the opportunity by the Ministry of Health in Oman to study at Karolinska Institutet, the Division of International Health.

My interest in the quality of care for persons with diabetes was stimulated before I started my research at ICHAR. During my work as a GP in primary health-care centres in Muscat, I noticed that most of the patients with type 2 diabetes had high blood sugar levels. I seldom met a well controlled diabetic patient or a patient without associated risks such as hypertension or hyperlipidaemia, despite their regular follow up, routine investigations and medications. The concerned health-care providers had access to guidelines for diabetes care and the clinics were well equipped.

I started thinking about the reasons and how the quality of diabetes care could be improved in the Omani context. My personal experience and observations guided my thinking towards the interaction between the patients, doctors and other diabetes team members. I decided to start with the quality of provider-patient interaction and communication, which I believe is a first step towards a proper diabetes care.

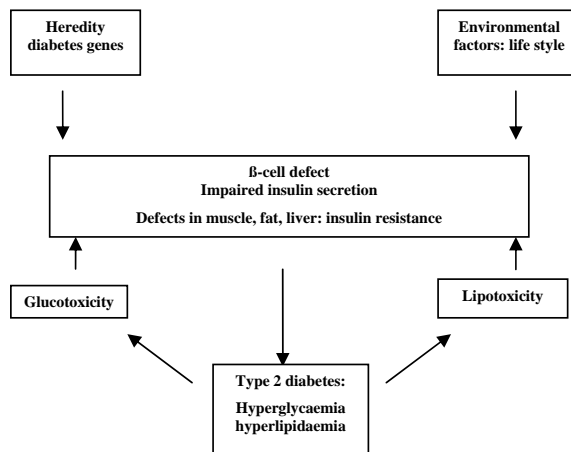
This thesis is an effort to increase my personal knowledge and improve my understanding of quality of care and interaction, through research and evidence-based knowledge for practice. I hope that the findings of this study and the recommendations will be useful to the health policy makers and my colleagues in Oman.



## 1 INTRODUCTION

### 1.1 Diabetes Mellitus

Diabetes is a chronic disease that is characterized by hyperglycaemia and occurs when the pancreas does not produce enough insulin that regulates blood sugar, or alternatively, when the body cannot effectively use the insulin it produces due to insulin resistance or decreased insulin sensitivity (1). There are two common forms of diabetes. Type 1 diabetes (previously known as insulin-dependent or childhood-onset) is characterized by a lack of insulin production and is rapidly fatal without daily administration of insulin (2). Type 2 diabetes (formerly called non-insulin-dependent or adult-onset) is a heterogeneous disorder also characterized by chronic hyperglycaemia. The aetiological heterogeneity is suggested by its polygenetic inheritance and its interplay with environmental factors. Impaired insulin secretion and decreased insulin sensitivity are the main pathophysiological features, responsible for development of hyperglycaemia in type 2 diabetes. The pathogenesis of diabetes is shown in figure 1 (1). Note that hyperglycaemia and hyperlipidaemia may further impair both beta-cell function and insulin sensitivity due to glucotoxic and lipotoxic effects, respectively.



**Figure 1.** Proposed pathogenesis of type 2 diabetes (1)

Type 2 diabetes comprises 90% of people with diabetes around the world, and is largely precipitated by factors such as excess body weight and physical inactivity, causing decreased insulin sensitivity. Until recently, type 2 diabetes was seen only in adults but it is now also occurring in obese children (2). Another type of diabetes is gestational diabetes mellitus that usually disappears after pregnancy, but forebodes a high risk of type 2 diabetes in the future (2). Impaired Glucose Tolerance (IGT) and Impaired Fasting Glycaemia (IFG) are intermediate conditions in the transition between normality and diabetes. People with IGT or IFG are at high risk of progressing to type 2 diabetes (3).

Type 2 diabetes is a complex condition with dyslipidaemia occurring in up to three fourths of those with diabetes and hypertension present in up to 70% of patients. Hyperglycaemia, or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to the heart, blood vessels, eyes, kidneys, and nerves (3). The quality of life for people with type 2 diabetes can be largely preserved, and their risk of long term complications reduced, through proper control of glycaemia, lipidaemia and blood pressure, and through provision of effective health education (3).

### **1.2 Global burden of diabetes**

Type 2 diabetes is one of the major contributors to ill health and premature mortality worldwide. Globally, it is estimated that around 171 million people have diabetes and that at least 1 in 20 deaths is attributable to diabetes. In adults aged 35 to 64 years the estimated proportion is at least 1 in 10 deaths. It is also estimated that by 2030 the number of people with mainly type 2 diabetes will approximately be more than 300 millions if the current trend continues. Most of this increase will be due to a 150% increase in middle and low income countries, where the greatest burden will fall on men and women in their economically productive years (3).

In 1990, among all burden of diseases in low and middle income countries, about half of them (49%) resulted from communicable diseases, maternal and perinatal conditions and nutritional deficiencies, while the non-communicable diseases, injuries and neuropsychiatric disorders caused 27%, 15% and 9%, respectively. According to current projections, those proportions are set to alter dramatically by the year 2020. While communicable diseases, maternal and perinatal conditions and nutritional

deficiencies are expected to fall to 22%, the non-communicable diseases are then likely to cause 43% of all burden of diseases (4).

The changes brought about by demographic and epidemiologic transition in the Gulf states have had a profound impact on the health patterns. Chronic conditions such as diabetes are increasing dramatically due to unhealthy diet, obesity and physical inactivity. This causes a burden on families, health systems and countries (4). By 2020, these conditions are expected to contribute to 60% of the disease burden in the Gulf area. Data on risk factors provided by Gulf member states shows that among people aged 25-65 years, the range of prevalence of selected risk factors for non-communicable diseases including diabetes, varies from 16-70% (Table 1).

**Table 1.** Prevalence of risk factors for non-communicable diseases in the Gulf among people aged 25-65 years

<b>Risk factor</b>	<b>Prevalence (range)</b>
Smoking	16-45%
Hypertension	20-30%
Overweight-obesity	40-70%
Hyperlipidaemia	20-45%

*Source: WHO: Report from Regional Office for the Eastern Mediterranean Region, 2003.*

In response to this challenge, the World Health organization (WHO) Regional Office established the 'Eastern Mediterranean Approach to Non-communicable Diseases Network' (EMAN) during the year 2001 to promote collaboration and capacity building in relation to prevention and control of non-communicable diseases (NCDs).

EMAN aimed at linking Eastern Mediterranean countries including the Gulf countries through community based programmes to raise community awareness about smoking, hypertension, diabetes, obesity and physical inactivity. It also aimed at facilitating capacity building for implementation of standardized NCD risk factor surveillance, and to build up capacity at the primary health-care (PHC) level to improve the management and care of chronic conditions. With respect to diabetes care, EMAN emphasizes on: health education programmes that are appropriate to local needs and

conditions, within the framework of a national diabetes control programme; continuous medical/nursing education to ensure that health professionals at all levels of health care are motivated and up-to-date concerning knowledge and skills for optimal education and management of diabetes; and lifestyle changes including weight control and increased physical activity for patients with type 2 diabetes. These changes also play a role in reducing heart disease and high blood pressure (4).

### **1.3 Global diabetes control strategy**

To help preventing type 2 diabetes and its complications, people should achieve and maintain healthy body weight through adequate food intake and physical activities (at least 30 minutes of regular, moderate-intensity activity 3-4 times per week). Treatment of diabetes involves lowering blood glucose and the levels of other known risk factors that damage the blood vessels. Tobacco cessation is also important both in diabetes prevention and to avoid influence on onset and magnitude of diabetic complications (2).

Interventions that are both cost saving and feasible in middle and low income countries include: blood glucose control with oral medications for people with type 2 diabetes or insulin if required, and provision of specialised foot care. Other cost saving interventions include: screening for retinopathy, lipid control and screening for early signs for diabetes-related kidney disease. These measures should be supported by a healthy diet, regular physical activity and maintaining a normal body weight (2).

WHO aims to stimulate and support the adoption of effective measures for the surveillance, prevention and control of diabetes and its complications, particularly in low and middle-income countries. To this end, WHO provides scientific guidelines for diabetes prevention; develops norms and standards for diabetes care; builds awareness on the global epidemic of diabetes including partnership with the International Diabetes Federation in the celebration of World Diabetes Day (14 November); and conducts surveillance of diabetes and its risk factors. Furthermore, the WHO Global Strategy on Diet, Physical Activity and Health is focusing on population-wide approaches to promote healthy diet and regular physical activity, thereby contributing to reduce the growing global problem of overweight and obesity. This strategy calls upon all stakeholders to take action at the global, regional and local levels and aims to lead to a significant reduction in the prevalence of diabetes and other chronic diseases (2).

#### **1.4 Diabetes management**

It has been concluded that the quality of care for patients with type 2 diabetes remains sub-optimal worldwide regardless of the country's level of development, efficacious treatments available, health-care system, or population characteristics (5). Due to the nature and complexity of type 2 diabetes, a comprehensive and integrated care should be made accessible and affordable for the patients to attain high quality management of diabetes. This includes the identification and treatment of risk factors and provision of health education with emphasis on self-management and behaviour change such as adherence to medications, self-monitoring of blood glucose levels, and proper education about nutrition (6).

Effective health education should be provided with respect to the patients' level of education and variations in their understanding of the illness (7, 8), since patients with diabetes who had low literacy level and lower knowledge about diabetes and self-management had poorer health outcomes (9). Furthermore, patients' knowledge and consideration of their expressed demands are necessary for improvements of diabetes care (10). It has been suggested that understanding diabetes patients' views and perceptions of their own role in disease management, their motivations and barriers to good management, is important in order to tailor the health education to individual needs (11). Three simple questions to the patients were identified as helpful in this regard. These questions are: 1) what is your role in your diabetes management, 2) what is your goal with your diabetes management, 3) What kind of support do you need for your diabetes management (11).

Moreover, to meet the high demands of patients with diabetes and to better utilize resources, there is evidence that a multidisciplinary team approach is more effective and efficient for diabetes management (12). It has been suggested that the team members including a diabetes nurse and a dietician, focusing on patient education, can lighten the load for physicians and improve diabetes outcomes (13). In particular the presence of diabetes specialists nurses who have both the skill and time to address patient's needs has a positive effect on the quality of diabetes care (14).

### **1.5 Patient-provider interaction**

The medical encounter is a core clinical skill for all health-care providers particularly at primary-care level (15). Physicians and other health care providers need to have quality communication skills and good relationship with diabetes patients to support their learning and effectively manage their illness (7, 16). It has been suggested that for management of chronic diseases like diabetes, it is important to emphasize on other providers in the health care team regarding skills in patient-provider interaction, instead of focusing only on the doctors (17).

There are different definitions of good communication and several verbal and non-verbal types of behaviour that have been found to be important for creating a good patient-provider communication during consultations at primary care level (18). It has been concluded in several studies that friendliness and doctor's courtesy; attentive listening; eye contact with less gazes; positive facial expression; social talk; information giving and seeking; emphasis on patient's understanding to the presented information; uninterrupted consultation, and consultation lengths are important components for good patient-doctor communication and relationship (7, 15, 18, 19). These types of behaviour are objectively measurable and have been linked in empirical studies with favourable patient outcomes such as satisfaction and recall, intermediate outcomes such as adherence, and long-term outcomes such as symptom resolution and better quality of life (15). Furthermore, Pendleton et al listed seven tasks in their consultation map that support a more patient-centred approach and ensure a positive consultation environment. Some important aspects for the doctor are to actively enquire about the patients' beliefs and fears in relation to symptoms and signs, and their interpretation of the disease and what they think should be done to improve their well-being (20).

Some problems in communications can arise during history taking or during discussion of how the patient's complaints should be managed. These problems may be related to a lack of communication skills on the part of either the physician or the patient (21). Furthermore, some of physician barriers to good interaction could be related to lack of knowledge; lack of support from other trained providers; lack of beliefs in treatment guidelines; poor patient adherence or poor response to treatment; and unsuccessful efforts to encourage the patients to achieve life style changes. Patient barriers include: no

acceptance and absence of symptoms; divergent cultural concepts; chronicity of the disease; specific expectations and beliefs; and co-morbid conditions (13). Low education level among patients has been considered as a barrier for good communication and health outcomes due to its negative effect on patients' ability to communicate their history and on physicians' ability to solicit information (22).

Patient-provider interaction is also affected by the social and cultural background of provider and patient. Culture has an important influence on many aspects of a person's life such as behaviour, beliefs and attitudes to illness and health and on dietary beliefs and practices that sometimes are difficult to change. Culture must always be seen in its particular context which is made up of historical, religious, ritual, family structure, diet, social and geographical elements that mutually influence culture and are also influenced by culture (23). In addition, linguistic barriers and different ways of interpreting experience with illness and treatment can cause problems in the communication and understanding when the patient and health-care provider come from different cultures (24). In this respect, to help patients gain real and better control over their diabetes, health-care professionals need to understand patients' health beliefs, how they perceive the disease, and other social norms (25). Moreover, providers should support patients and facilitate their empowerment by encouraging them to make informed personal decisions in their everyday life with diabetes and to enhance their participation in the consultations. This requires major changes in provider-patient interaction from an authoritarian towards a more sharing and supportive approach (25, 26). Diabetes patients who had medical encounters characterized by patient-centred care and continuity of care were found to be more satisfied and had better health outcomes (27, 28).

### **1.6 Patient-centred care**

Patient-centred care is an important aspect of the interaction and regarded to be a key factor to improve outcomes (25). The concept has a wide range of somewhat different definitions. Some researchers have described patient-centred care as "understanding the patient as a unique human being", while some others have stressed the importance of eliciting each patient's expectations, feelings and fears about the illness. Another definition is that the doctor uses the patient's knowledge and experience to guide the interaction during the consultation. Others have described it as an approach or consulting

style that is opposite to a physician-dominated and illness-oriented style where physicians are aiming only at diagnosis and treatment of the diseases, not the whole person (29).

Mead and Bower identified five conceptual dimensions of patient-centred care: 1) the biopsychosocial perspective, a perspective on illness that includes consideration of social, psychological as well as biomedical factors; 2) the 'patient-as-person'-understanding experience and personal meaning of illness for each individual patient; 3) sharing power and responsibility, sensitivity to patients' preferences for information and shared decision-making; 4) the therapeutic alliance, developing common therapeutic goals and enhancing a patient-doctor relationship based on care and empathy; 5) the 'doctor-as-person'-awareness of the influence of the personal qualities and subjectivity of the doctor on the practice of medicine (30). Factors related to clinical settings such as workload pressure in the clinics and time allotted for the visits may limit the propensity of health-care providers to adapt the patient-centred approach. Furthermore, patient attitudes and expectations, personality, gender, age, knowledge and nature of problems are important factors that potentially influence patient-centred care (30).

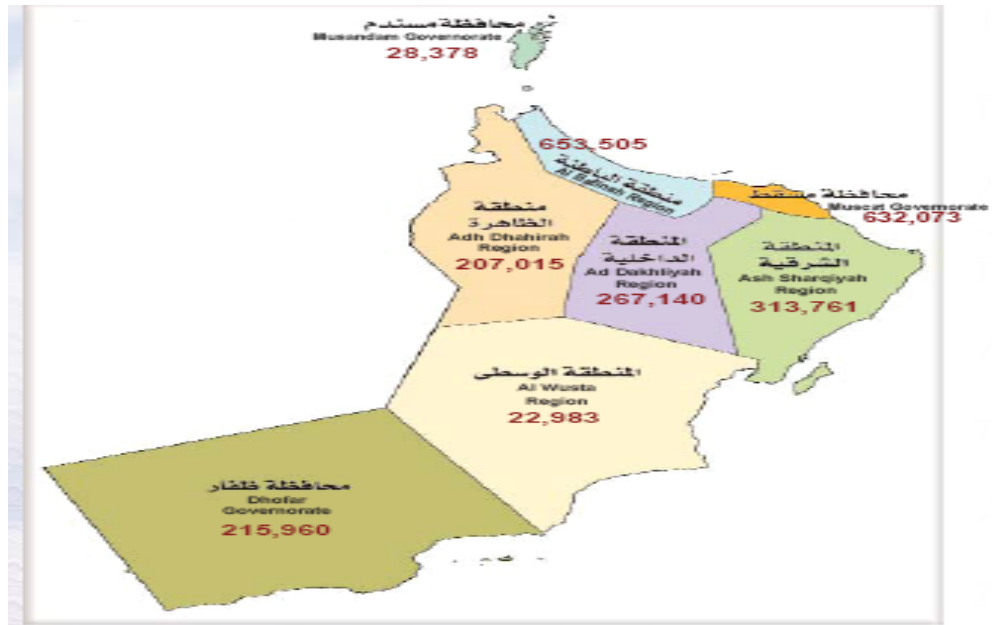


## 2 BACKGROUNDS

### 2.1 Country profile

The Sultanate of Oman locates in the southeast of the Arabic peninsula. The total area of Oman is around 310 square kilometres. It is bordered by United Arab Emirates, Saudi Arabia and Yemen, and surrounded by the Oman Gulf, Persian Gulf and Arab Sea. Oman is divided into five regions and three governorates which are further sub-divided into 59 districts. The total population of Oman is 2.3 millions of which 24% are from other nationalities. Around 632 000 (27%) of the total population were living in Muscat, the capital of Oman, according to the statistics done in the year 2003 (31). Population distribution in the Sultanate of Oman is shown in figure 2 (31).





**Figure 2.** Distribution of the population of the Sultanate of Oman according to the statistics of the year 2003 (31).

Historically, Omanis were seafarers and traders who dominated regional commodity trading in the Indian Ocean, East Africa and the Arabian Gulf. There was thus a succession of migrations resulting in the growth of settlements along some parts of the East African coast. Prior to the stream of oil in 1964, the country was dependent on the agricultural sector and on fishing activities. In 1970, Oman had just 3 kilometres of asphalted roads. His Majesty Sultan Qaboos took over power in 1970. Since then the country has been modernized and educational programmes for all ages have been successfully implemented (32). The main economic sources are oil and gas (31).

## 2.2 Demographics and social indicators

The ratio between women and men in Oman is 0.96 (49% are women, 51% men). Life expectancy at birth was estimated to be 73 and 75 years for men and women respectively in the year 2004. Forty percent of the Omani population are between 0-14 years; 56% are 15-64 years and 3 % are over 65 years or over. The total fertility rate has decreased from 6.9 in 1993 to 3.1 in 2004. The crude death rate per 1000 Omani has declined from 13.3 in 1980 to 2.60 in the year 2000.

The infant mortality rate has also declined from 159 per 1000 live births in 1970 to 10 in 2004 (31). The Gross Domestic Product (GDP) per capita was 13.651 US Dollars in 2004 (33).

In spite of the economic success some challenges remain. For instance, unemployment is high among the young and a recent report showed that about 25% of Omani households consume less than 250 Omani Riyals (1OR=US\$ 2.60) a month which is half the monthly mean expenditures of households nationally (34). Total expenditure on health as percentage of GDP was 3.2% in the year 2003. The health system in Oman is dominated by the public sector. The government covers all public sector employees while expatriates in the private sector are by law covered by employers (34).

The adult literacy rate was 78% (men 85%, women 71%) in the year 2003. All Omani nationals enjoy free education through post-secondary school, vocational and higher education (31). Moreover, the Personal Status Law guarantees Omani women equal rights in both education and employment and that women all over Oman should contribute in the process of economic and social development (32).

### **2.3 Health care in Oman**

During the early 1970s, there were limited resources and several defects in the health infrastructure. There was a high prevalence of childhood illnesses such as poliomyelitis, tetanus, diphtheria, measles, mumps and pertussis, and other communicable diseases such as pulmonary tuberculosis, malaria, hepatitis, trachoma, leprosy and acute gastroenteritis (35). This situation influenced the Government to realize the importance of health in the social and economic developments and that improved health would contribute to economic growth by reducing production losses.

The Government made the commitment to develop a modern welfare state including the promotion of health of the Omani people (35). A Royal Decree was issued to establish the Ministry of Health (MOH) in August 1970. The MOH was able to build a modern national system that offers all Omani citizens universally accessible health services free of charge. Such developments were only possible through proper health planning and therefore the MOH developed Five-year plans, the first of which started in 1976.

The late 70s coincided with the crystallization of the policy goals and objectives of the World Health Organization (WHO) designated "Health for All by the Year 2000". The Sultanate of Oman was among the first countries to adopt such objectives. Reforms undertaken during the 80s included the establishment of well-defined, realistic, achievable policies and health programs based on valid information. Among the very early health programs were the "Malaria Control Program" in 1975, the "Expanded Program on Immunization" in 1981, and the "Tuberculosis Control Program" in 1981. These were followed in 1982 by the program of "Prevention of Blindness", which was directed to a highly prevalent communicable disease at that time due to trachoma.

There has been a need to speed up the process of control of communicable diseases to catch up with other parts of the world that have started their developments earlier. With the beginning of the 1990s, the health system was tuned to the control of childhood diseases, and to a greater extent other communicable diseases mentioned above. Several other health programs were introduced directly targeting communicable diseases with the beginning of the plan in 1991. These included the "School Health Program", the "Program for Prevention and Control of Viral Hepatitis B", the "Program for Prevention of AIDS", the "Program of Promotion of Environmental Sanitation" and the "Program of Strengthening Epidemiological Surveillance System" (35).

The Country Cooperation Strategy team has acknowledged the impressive health gains achieved in Oman particularly for health policy and planning, health financing, primary health care, monitoring and control of communicable diseases, human resources development and environmental health. It concludes that collaboration between Oman and WHO is a good model of cooperation between the WHO Secretariat and Member States (34). Moreover, according to WHO indices for 1997, Oman was ranked first among all member states in health system performance on health level, which was defined as the ratio between achieved levels of health and the levels of health that could be achieved by the most efficient health system. This performance reports how efficiently health systems translate expenditure on health as measured by disability-adjusted life expectancy (DALE). Furthermore, Oman ranked number eight for the overall performance among all member states and this refers to the relation of overall health system achievement to the health system expenditure (36).

## **2.4 Organisation of health services**

The MOH has expanded its services to all the regions through a network of health facilities providing high quality services easily accessible to everyone in the country. At present, the MOH is operating 47 hospitals of which 13 are considered referral hospitals. At least one Regional Referral Hospital has been established in each region to provide such care to the people of that region (37). There are three major hospitals in Muscat Governorate: the Royal Hospital, Khoula Hospital and Al Nahdha Hospital provide highly specialized care and act as referral hospitals for the whole country. The Ibn Sina hospital, also in Muscat Governorate, is a major highly specialized psychiatric hospital. Furthermore, the MOH is currently operating 116 health centres of which 53 have maternity beds, while 8 are extended health centres (secondary care) to provide specialty care in certain disciplines. Communities around these health institutions are assigned as the catchment population. Primary health care institutions refer patients from their catchment area to secondary health care and tertiary care hospitals for specialized care (37). Decentralization of the health services is in progress (37).

Outside the MOH, there are 5 hospitals and 46 health centres distributed over the country under the auspices of various organizations such as the Ministry of Defence, Royal Oman Police, Sultan Qaboos University, and Petroleum Development of Oman. The private health sector consists of three hospitals, 491 clinics and 302 pharmacies (37). In the year 2004, physicians' density per 1000 population was 1.3 while nurses' density per 1000 population was 3.5 (37).

It has been reported that the health-care in Oman is heavily dependent on expatriate workers. Recently, Omani health professionals have been trained by the Medical College at Sultan Qaboos University and various MOH training institutes. During the year 2005, 27% of physicians and 59% of nurses were Omani. A high influx of young and less experienced Omanis taking over posts from qualified expatriates may adversely affect the quality of health services (34).

## **2.5 Diabetes situation in Oman**

Currently, the Sultanate of Oman is witnessing an epidemiological transition to non-communicable and life style related diseases. The health system in Oman has to change gear and face the challenges of the 21<sup>st</sup> century in combating chronic illnesses, such as

diabetes. Non-communicable diseases constituted 55% of outpatient morbidity and 41% of inpatient morbidity in MOH institutions in 1998. For instance, cancer cases among inpatients accounted for 9 per 10 000 inhabitants, cardiovascular diseases accounted for 63 and diabetes mellitus accounted for 14 per 10 000. Such non-communicable diseases are usually difficult and require more time and costs to manage because they are highly related to life style such as poor nutritional habits, physical inactivity and smoking. However, in spite of impressive economic development in Oman, general health awareness among the population is not optimal (34, 35). The control of diabetes in Oman has been identified as one of the priority health programmes and it is the collective responsibility of the family, community, government, voluntary agencies and media to ensure high standard of care (38).

During the last few years the MOH has supported improvement in diabetes care, through financial support and by developing detailed guidelines for primary care facilities, where diabetes care is mainly delivered (38). These guidelines describe the responsibilities of each health-care provider in the diabetes team (the doctor, diabetes nurse, health educator and dietician). Some of these responsibilities are: greeting of the patients and ensuring their privacy during consultations; assessing patients' health condition and their compliance with the treatment; keeping records and maintaining the diabetes registry; detection of defaulters; collaboration with each other under team work in provision of individual health education and reinforcing the health education during follow-up-visits; screening for associated risk factors and diabetes complications; and revision of treatment strategy. There are other details regarding types of medicines to use, blood investigations and referral of complicated cases to secondary or tertiary care level for expert opinions (39). However, the guidelines included only a limited number of aspects with regards to patient-provider relationship or communication manners.

The National Health Survey in 2000 showed that the prevalence of diabetes was, 11.6%, while the prevalence of IFG was 6.1%. More than 90% of diabetes cases in Oman are due to type 2 diabetes (38). Furthermore, a cross-sectional survey conducted during 2001 showed that the age-adjusted prevalence of the metabolic syndrome was 21.0% (23.0% among women and 19.5% among men) (40). Another study in Oman concluded that diabetes affects a much greater proportion of the urban (18%) than rural (11%)

population and that crude estimates indicate that illiterate and less educated individuals are more likely to have diabetes (41). High rate of fasting blood glucose together with high rates of overweight and obesity among the Omani population make it likely that diabetes will continue to be a major health problem in Oman (42).

## **2.6 Culture and health in Oman**

The influence of culture on the Omanis' behaviour and beliefs with regard to health issues and nutrition cannot be ignored. Religion is one of the dimensions of culture and social structure that affect the expressions, patterns, and practices of care within a culture (43, 44). In this respect, consumption of dates served with coffee in Oman is a main delight that remains a symbol of Omani hospitality throughout the country. Dates in Oman and in other Gulf states might be taken frequently during the day. There is a strong cultural and religious belief about its nutritional and economic value. These beliefs about the dates are due to that the date palm is mentioned more than any other fruit-bearing plant in the holy Qur'an, and it is considered as a blessing fruit, e.g., placed in the mouths of newborn babies, eaten at wedding celebrations and at the beginning and end of each day of fasting in Ramadan. Dates are also believed to be of benefit to pregnant women and it is also recommended in the post-partum period.

It is important to know that the sugar content of ripe dates is about 80%, while the remainder consists of protein, fat and mineral products including copper, sulfur, iron, magnesium and fluorine acid. Dates are high in fiber and an excellent source of potassium. The required quantity of minerals and amino acids for the body can be obtained by eating few dates per day (45).

There seem to be some misunderstandings and misbehaviour with regard to amount of food intake and to healthy nutrition in Oman (46). The whole concept of culture itself should not be misused and too broad generalizations in explaining people's beliefs and behaviours should be avoided, as there are other individually influencing factors such as age, gender, education, including education into a religious sub-culture, personality, intelligence, experience, occupation and socio-economic factors (23). It should be mentioned that Islam considers health to be one of the greatest blessings. The preservation of this blessing can only be achieved through taking good care of one's physical and mental health and taking every measure to maintain and enhance it (46).

Moreover, a healthy diet should be promoted, as well as not eating too much, with emphasis on wholesome food (46).

Women in Oman play a pivotal role in nutrition in terms of their role in the selection and preparation of food for the whole family. In this respect, several rapid assessment surveys were carried out in Oman during the period 1988-1991 to determine the food habit of preschool children, adolescent girls and mothers in Muscat and the southern region in Oman. Geographical location, occupation of inhabitants, cultural and ethnic factors may be responsible for the found variation in dietary habits between the two regions. Several unsound food practices during pregnancy and puerperium were reported in both regions. In general, dietary patterns of mothers and children were unhealthy. Duration of breastfeeding had declined and infant formula as well as commercial weaning foods were introduced at an early time of infants' lives. This showed that the trend of consumption of food for infants, adolescent girls and mothers is in the direction of unhealthier eating habits, as foods rich in fat, cholesterol, refined sugar and salt had been commonly consumed. This food pattern may contribute to diet-related chronic diseases such as obesity, diabetes, hypertension and heart disease (47). These findings indicate that health and nutritional education to Omani women are needed to correct the unhealthy food beliefs and habits in Oman.



### **3 RATIONALE FOR THE STUDY**

The fact that type 2 diabetes is a major and growing health problem in the Omani population supports the rationale for this study. Furthermore, nothing is known about the quality of care or interactions between the primary health-care providers and type 2 diabetes patients in Oman, despite the major role of primary care facilities in managing and controlling diabetes.

The medical interview is a core clinical skill for all health care providers, especially for primary care disciplines. A communicative provider-patient relationship is especially important in the management of chronic diseases, such as diabetes (15). In addition, patients' perspectives and expectations are important tools for the patient-physician interaction regarding diabetes care. Health-care providers need to have communication skills to cope with patients' expectations and evidence based goals in a tailored approach to diabetes care (48).

This study was performed because we need to get some basic information about the quality of provider services in order to achieve more efficacious and productive medical encounters in diabetes clinics. Moreover, the study aimed to elucidate any need of revisions of the guidelines for diabetes care.

## **4 AIMS OF THE STUDY**

### **4.1 General aim**

To explore the quality of interaction between primary health-care providers and patients with type 2 diabetes in Muscat, Oman.

### **4.2 Specific objectives**

1. To observe the health-care providers' performance during their interaction with type 2 diabetic patients focusing on the consultation environment, some aspects of provided care and health education (I).
2. To explore the views of patients with type 2 diabetes on the medical encounters and their interactions with the primary health-care providers (II).

## **5 MATERIAL AND METHODS**

### **5.1 Study design**

This is a cross-sectional study using quantitative and qualitative research methods. The two sub-studies presented in this thesis are parts of a larger study including interviews with the health-care providers and the collection of metabolic parameters.

### **5.2 Setting and sample selection**

In the Muscat region, there are 18 primary health-care centres (PHCCs), which provide free health-care for the citizens. Six PHCCs were chosen to represent different geographical areas within the region. Five of the health centres belonged to the institutions of MOH, while one health centre was part of the Sultan Qaboos University, Department of Family Medicine and Public Health, providing outpatient care to the university staff and their families who live inside and outside the Muscat region.

The five PHCCs under MOH ran a diabetes clinic two days per week with 2-4 doctors working alternately, and 1-3 diabetes nurses, who met the patients prior to the doctor's consultations. In three PHCCs, the diabetes nurses shared the office with the doctor.

The appointment lists included 17-25 patients per day. The health centre at the university ran a diabetes clinic once a week with six doctors alternately, and one diabetes nurse, and with 3-6 patients per day on the appointment list. In four health centres there was one health educator, and three health centres had one dietician, who received the patients on referral base. However, these two categories of providers were not included in the observational study as they were not present in all health centres at the time of data collection and the available ones had a limited number of interactions with type 2 diabetes patients. Ideally there should be a health educator or a dietician in each of these PHCCs according to the MOH recommendations but this was not the case at the time of data collection due to organizational reasons or reasons related to the staff such as maternity leaves.

In sub-study I, all the doctors and diabetes nurses concerned with provision of care for the patients with diabetes in the six PHCCs agreed to participate. They included 23 general practitioner (14 men, 9 women), and 13 women diabetes nurses.

The doctors were of different nationalities (four Omani citizens, ten from other Arab countries, and nine from Asian and European countries), aged from 29 to 55 years, with general work experience not less than three years. Five doctors from the University PHCC had international diplomas regarding diabetes management after one year training, 15 doctors from the other PHCCs had participated in short-term training (one week), while three doctors had no special training in diabetes management. Ten of the diabetes nurses were Omani and three were of other Asian origin, aged from 25 to 40 years, with minimum three years of nursing experience, and with special local training in diabetes care. A total of 90 patients participated in the observation study, using the following criteria: Omani nationality, from both sexes and with type 2 diabetes. In sub-study II, twenty-seven patients with the same inclusion criteria participated in the focus group discussions.

### **5.3 Data collection**

Data for sub-study I was collected from January 2004 to August 2004 through direct observations using a checklist, while sub-study II was conducted between July and August 2005 using focus group discussions (FGDs).

#### **5.3.1 Direct observation**

The observation method (participant or non-participant) involves a systematic, detailed observation of behaviours and talk, watching and recording what people do and say. Observations are particularly well suited for the study of the working of organizations and how the people within them perform their functions. In addition, observations may uncover behaviours and routines of which the participants themselves may be unaware (49).

Direct observations of a setting have several advantages. First: the observer is better able to understand and capture the context within which people interact. Second: firsthand experience with the people in the setting allows the inquirer to be discovery oriented and inductive because by being on-site the observer has less need to rely on prior written conceptualizations or verbal reports. A third strength of observations is that the inquirer has the opportunity to see things that may routinely escape awareness among the people in the setting (50).

In sub-study I, the principal investigator performed all the observations in the six facilities. The observer sat inside the consultation rooms and placed the chair in a corner that allowed less intrusion or disturbance and tried to be out of field of vision to both provider and patient as much as possible (20). Each patient was followed during consultations with the nurse and doctor. The health centres were visited on more than one occasion to enable observations of all concerned staff. In each PHCC, 15 consultations were observed, divided among the doctors who provided the diabetes care. Each doctor and diabetes nurse consulted different number of patients which ranged between 2-10 patients for both doctors and nurses (median= 6 patients).

The observations were structured by the use of checklists. The checklists were developed by the research team, commented on by some heads of PHCCs, and thereafter modified. They included nine aspects of environment and atmosphere for doctors and nurses; eleven aspects of care provided by the doctors, including health education; and 19 aspects of care by the nurses including health education (Appendices 1 and 2). Use of interpreter by the non-Arabic speaking doctors and also consultation time were also recorded.

All aspects of care and a few aspects regarding consultation environment were obtained from the clinical guidelines for diabetes management at primary health-care level, provided by the MOH in Oman. These guidelines describe the duties of the diabetes team and include a detailed list of recommendations for good quality care and health education that ought to be followed in each PHCC. The university PHCC had similar guidelines for diabetes management. Most of the aspects of consultation environment were obtained from other similar studies, and adjusted to the Omani context (7, 15, 27, 51-53).

The consultations were recorded using audiotapes for corroboration of some of the verbal communication aspects of the observations. Video-tapes were not used as this was unfamiliar to the primary health care providers and were assumed to have much influence on the consultations.

The audio-tapes were also used by the Arabic-speaking members of the research team and two independent examiners for testing the reliability of the observations. The reliability of the observer's scorings was checked by comparison with the two

independent examiners, who made their ratings after listening to 33% (n=30) of the audiotapes of the doctors' consultations (five at each PHCC) and 20% (n=17) of the nurses' interactions. Some aspects that could not be observed through listening to the audiotapes were excluded.

### **5.3.2 Focus groups discussions (FGDs)**

In focus groups, the discussions aim at exploring a specific set of issues among a homogenous group of people. FGDs are distinguished from group interviews by explicit use of group interaction to generate data. This method is open and flexible. Hence, it is ideal for exploring people's experience, opinions, wishes and concerns about a specific topic. Combining FGDs with quantitative methods can be fruitful (54).

In sub-study II, purposive selection of the FGD participants was performed. The principal investigator, with the help of doctors and nurses in the health centres, identified 57 Omani patients with type 2 diabetes and from both sexes, who attended the six PHCCs. These patients were assumed to generate the most productive discussions and provide the most meaningful information in terms of the project goals. They were considered to be what Patton calls 'information-rich' cases (50). After being contacted, 42 patients agreed to participate, but finally only 27 patients (14 women and 13 men) were able to participate in the study. Main reasons for declining as expressed by the patients were time constraints and social obligations. Some did not show up on the fixed dates for FGDs due to sudden illness or death of some members in the family. Decline could also be due to hesitation or other unknown reasons because the experience of conducting FGDs was new in Oman. The 30 patients who declined were similar to the participants in terms of demographic characteristics such as gender, age and education level.

Four FGDs (two women and two men groups) with 6-8 participants in each group were organized. The participants agreed to conduct the FGDs in a meeting room in a secondary health-care centre in Muscat, which all participants perceived as familiar and convenient and where they also felt free to talk. Thematic guides for the FGDs were developed from the results of our observations of the health-care providers in sub-study I.

Key areas explored included: patients' expectations, experiences, and views on the consultation environment and the provided care; the experience with the diabetes

nurses, dieticians and health educators; and recommendations for future improvement in the interaction and care (Appendix 3). The discussions were moderated by one member of the research team, who is an experienced researcher in conduction of focus group discussions. The author of this thesis took notes of the discussions and gathered information on the non-verbal communication and on the interaction between participants.

The duration of the discussions was limited to two hours including around twenty minutes for greetings, warming up and introductory chat to create a relaxing atmosphere between investigators and participants and amongst the participants themselves. At the end of every focus group, there was a debriefing discussion between moderator and assistant moderator.

## **5.4 Data analysis**

### **5.4.1 The observations (I)**

We found an acceptably high correlation between the observer and the two external examiners for the doctors' consultations expressed by a Spearman's rank correlation coefficient of 0.74 and 0.81 between the Observer and Examiner 1 and 2, respectively. There was a similar level of correlation for ratings of the nurses' interactions (0.78 and 0.87) between the Observer and Examiner 1 and 2. The correlation coefficients between Examiner 1 and Examiner 2 were 0.78 and 0.81, respectively.

Each consultation with a doctor or diabetes nurse received a score for each aspect of the two areas of consultation environment and care, including health education. The score assessed the level of fulfilment or absence of the observed aspect. Each observed aspect was granted 1 point if completely fulfilled; 1.5 points if partly fulfilled and 2 points if not fulfilled. The total score per consultation was divided by the number of aspects in each consultation and mean values of scores were calculated for all consultations for each individual doctor and diabetes nurse.

Optimum interaction in each consultation by doctors and nurses was considered if the missed aspects were less than 25%, intermediate level of interaction for those who fulfilled 50-75% of the aspects and sub-optimal interaction if the health-care provider fulfilled less than 50% of the aspects.

At the PHCC level, the scores for all providers were summed up and divided by the total number of doctors and nurses respectively in each PHCC. The range for optimum, intermediate and sub-optimal performance was determined using the same cut-off levels as for individual patients/consultation.

The data were at first entered into Microsoft Office Excel. Association between performance and doctors' nationality, age, general work experience and special training in diabetes was analyzed with SPSS version 14, by using Fisher's Exact Test. Furthermore, association between performance and gender of doctors and patients was analyzed with Minitab program version 13, by using the Mann-Whitney U test on the median scoring of the doctors who received patients of the same sex versus those who received patients of different sex. Consultation time and patients' educational levels in relation to doctor's performance were analyzed using the Kruskal-Wallis test.

#### **5.4.2 The FGDs (II)**

Qualitative content analysis was applied within the structure of the thematic guide and for the data that emerged from the materials (55). The transcripts were read through several times to obtain a sense of the whole. Then the text was divided into meaning units. Next, the meaning units were identified and condensed. The condensed meaning units were then abstracted and labelled with codes. The various codes were compared on the basis of differences and similarities and sorted into categories. The categories were further discussed by the authors for identification and formulation of themes and sub-themes.

#### **5.5 Ethical approval**

Ethical clearance and approval for both studies was obtained from the Medical Research and Ethics Committee of Oman. Information sheets were sent to the heads of the PHCCs and to the health-care providers before the study started and their written consents were obtained. Verbal consents from the patients with type 2 diabetes were obtained after explanation of the study objectives and their guaranteed anonymity.



## 6 MAIN FINDINGS

### 6.1 The observations (I)

#### 6.1.1 Consultations (patients)

All the 90 diabetic patients were consulted by the doctors, and 85 of them were seen by the trained diabetes nurses. Five patients in one health centre were not consulted by the diabetes nurse. Hence, a total of 175 consultations were observed with the doctors and diabetes nurses. The age range of patients was 35-75 years (mean =53 years). Sixty percent of the patients were female, 51% were illiterate, 24% had primary education, and 24% had intermediate to university level education.

#### 6.1.2 The performance of the doctors

Some important aspects of good communication and interaction were fulfilled in only about half of the doctors' consultations, such as ensuring privacy and avoiding interruptions by other patients, encouraging patients to ask questions or express concerns, and paying attention to the patients while talking and emphasising on their understanding to the provided information (Table 2).

**Table 2.** Fulfilment of aspects of environment and atmosphere during 90 consultations with the doctors and 85 consultations with diabetes nurses

Consultation environment and atmosphere	Doctors' consultations	Nurses' consultations
	%	%
Friendly welcoming	74	48
Introductory chat	81	46
Ensured privacy during consultation	49	13
Encouraged patients to ask questions	47	11
Attention all times	52	23
Gestures to continue	80	26
Eye to eye contact	49	22
Emphasis on understanding and follow up	52	16
Friendly closing and fare well	70	19

On the other hand, the doctors fulfilled most aspects of care and provided health education in more than 75% of the consultations, yet they inquired about the adverse events of medications and smoking habits or alcohol consumption in less than 10% of the

consultations. Furthermore, doctors referred only a few patients to the health educators or dieticians (Table 3).

**Table 3.** Fulfilment of aspects of care and information during 90 consultations with 23 primary care doctors

Aspects of care and information	Consultations %
Asked about diet compliance	84
Inquired about physical activities	84
Emphasized on blood sugar control	83
Advised on healthy life (health education)	82
Asked about medicine compliance (81 patients)*	80
Asked about symptoms	79
Described how to use the medications (83 patients)*	78
Physical examination	71
Referred the patient to health educator or dietician	18
Asked about smoking and alcohol habits	9
Asked about adverse effects of medication (81 patients)*	9

*\*Nine patients were on diet control only; two of them were prescribed oral hypoglycaemic agents on the day of observation; seven patients were on insulin; 74 patients were on oral medication mainly sulphonylureas (76%).*

The overall scoring of the consultations showed that only ten doctors were optimal in their interactions with the patients, both creating a positive consultation environment and providing optimal care and information. Nine doctors and four doctors performed at an intermediate or sub-optimal level, respectively. Forty-three (48%) of the patients had an optimal consultation environment and received optimal care and information, while the consultations were of an intermediate standard for 26 (29%) and of sub-optimal standard for 21 (23%).

Regarding all aspects, the doctors' performance was significantly better if they were over 40 years old ( $p=0.003$ ), and if they had more formal training in diabetes management ( $p=0.004$ ). However, there was no significant association between the doctors' performance and their nationality, their general work experience, or regarding the educational level of the patients. Four non-Arabic speaking doctors asked for

interpretation from local health workers or colleagues in nine consultations. Nonetheless, they interacted optimally with their diabetic patients. Furthermore, there were no significant differences in performance when male or female doctors interacted with a patient of the same or other sex. Consultations of less than ten minutes' length had significantly lower scores than longer consultations ( $p < 0.001$ ).

### 6.1.3 The performance of the diabetes nurses

The diabetes nurses created a friendly consultation environment in less than 50% of their consultations with regard to all the nine observed aspects as shown in table 2, and they had limited interactions and short consultations with the patients regarding the aspects of care and health education. Almost all the diabetes nurses measured weight, height, blood pressure and blood sugar of the patients in consistent manner, while the body mass index (BMI) was calculated in much fewer consultations. Health education was provided for few patients in less than 30% of the consultations (Table 4).

**Table 4.** Level of fulfilment of some aspects of information provided by the diabetes nurses

Aspects of information	Consultations (%)
Education on foot care and self-hygiene	28
Provided printed educational materials	23
Importance of self-management	20
Importance of diet control	19
Education on diabetes (symptoms, complications, management)	18
Importance of exercise	11
Importance of metabolic control	3
Education on hypoglycaemia	1
Importance of annual review for screening of complications	1

None of the diabetes nurses asked for interpretation. They either spoke the patient's language or used few Arabic words in a way that was familiar to the patients. However, all the diabetes nurses spent few minutes with the patients and the communication was short and quick in most consultations.

The overall summary score for the diabetes nurses showed that none of them performed optimal while ten nurses interacted in a sub-optimal manner. Only one patient

had an optimal consultation, 20 (24%) consultations were at an intermediate level and 64 (75%) were sub-optimal (Table 5).

#### 6.1.4 Performance at the level of the PHCCs

The combined score for doctors and diabetes nurses in each PHCC showed that both doctors and diabetes nurses interacted optimally with type 2 diabetic patients in only one PHCC, which was the university health centre, while the interaction was sub-optimal in four of the other PHCCs and at an intermediate level in one. Table 5 summarizes the level of performance during doctors and nurses consultations and also shows the number of individual providers and PHCCs at each level of performance.

**Table 5.** Level of performance for the doctors and nurses consultations, for individual providers and at the level of PHCCs

<b>Consultations</b>	Optimal performance	Intermediate performance	Sub-optimal performance
Doctors	48 %	29%	23%
Diabetes nurses	1%	24%	75%
<b>Providers and health centres</b>			
Doctors (n=23)	10	9	4
Diabetes nurses (n=13)	0	3	10
Health centres (n=6)	1	1	4

## 6.2 The FGDs (II)

Some of the patients' demographic characteristics are shown in Table 6. The participants had experiences with health-care providers from different nationalities including Arabic and non-Arabic speaking staff and many of them had experience in more than one health centre due to change in their home addresses and thus the catchment area.

**Table 6.** Demographic characteristics of participants in FGDs

	FGD1	FGD2	FGD3	FGD4
<b>Number of participants</b> ( total = 27)	6	7	8	6
<b>Gender</b>	Men	Men	Women	Women
<b>Mean age</b> ( range 26- 70 years)	52 years	56 years	50 years	40 years
<b>Education level</b>	primary- university	illiterates- secondary school	illiterates- primary school	illiterates- university
<b>Mean duration of diabetes</b> (range 2 months-32 years)	15 years	6 years	3 years	4 years

There was interaction between group participants who commented on each others' experiences and points of view, asked questions during the sessions and raised other related issues that were not presented for discussions.

The patients identified some barriers to good patient-provider interactive communication such as: unfriendly welcoming by the doctors and diabetes nurses regardless of their nationalities, gender or cultural background; interrupted privacy during doctors' consultations by other patients or staff members; and poor attention and eye contact by the doctors because they were busy with writing the visit notes in the computer. A few women had no negative perceptions towards use of computers during consultations because they felt that the doctors looked at them and listened to them while talking. In addition, aspects related to patient-centred care were discussed, such as that the doctors did not encourage the patients to ask questions or express concerns during consultations, and there was no information transfer mainly with regard to blood test results and medicines use or adverse events. In this respect, a few patients were educated

about self-monitoring of blood glucose concentrations and hypoglycaemia. Moreover, some patients expressed their inability to afford the glucose meters and test strips.

Some patients from both gender perceived the doctors and nurses as not being experts nor competent in managing diabetes. Reasons for this perception were: brief consultations, infrequent physical examination, doctors did not deal with diabetes as a serious disease or care about blood sugar control, and they did not care about patients' other symptoms or health problems. Furthermore, the patients expressed that most of the nurses mainly checked the vital signs with no further communication or health education.

Both women and men were not satisfied with some aspects related to access to care such as long waiting times; lack of continuity of care and poor access to health education. Furthermore, patient barriers to good diabetes management were discussed.

Long waiting times was related to organizational reasons inside the diabetes clinics like one doctor in the clinic or disorganization from responsible staff regarding the queues. Patients' non-adherence to the given appointment was another reason. However, a few women expressed that they adapted to long waiting time by talking together or watching television in the waiting area. They added that it would be better if they received health education during waiting time.

Several patients from both gender, addressed their need to build up ongoing relations with certain doctors to avoid the variations in doctors' attitudes and in provision of information. In this respect, there was no preference with regard to doctor's gender, except for one woman who preferred to be seen by a women doctor for cultural reasons.

Most of the patient mentioned that they were not referred to health educators or dieticians. A few patients had experiences with the dieticians in the first few months of their diabetes diagnosis, while some said that they never knew about the availability of dieticians or health educators in the PHCCs, or about their role as team members. In addition, the patients expressed that they usually received written educational materials that were also available in the doctors' and nurses' shared offices, and they perceived as useless because most of the patients were illiterates.

Patient barriers to good diabetes management were mainly related to some cultural perspectives and patients' own beliefs such as poor compliance with diet control, because Omanis usually stick to their traditional unhealthy food and some families are

not supportive to their diabetic members in terms of the way of preparing food. The patients addressed a need for education to family members and community as well in this regard. Furthermore, some women with low literacy felt that doctors should decide and it would be better if they kept silent during encounters because they are perceived as illiterates and thus their behaviours or arguments during consultations might not be acceptable.

## **7 DISCUSSION**

Overall slightly more than half of the interactions between doctors and type 2 diabetes patients were not optimal in relation to the national guidelines, and three out of four consultations with diabetes nurses were suboptimal. Less than half of the doctors and none of the nurses performed optimally in their individual consultations. Four PHCCs scored sub-optimally, while both doctors and diabetes nurses interacted optimally with type 2 diabetic patients in only one health centre, which was the university health centre where only 3-6 patients were listed for each diabetes clinic day. In addition, most of the doctors in this health centre had international diplomas in diabetes management. Reasons for the sub-optimal performance could be related to the number of patients cared for (56), the competence of the individual provider (57), and that one out of four of the doctors' consultations and all consultations with nurses were shorter than ten minutes. However, defining the optimal size of practice is a complex decision in which the views of doctors, patients, and health service managers may be at variance (56). It has been suggested that good doctor-patient communication inevitably takes more time. Compression of consultation time for any reason may only be possible at the cost of the quality of care (58).

Several issues with regard to the quality of provider-patient interaction and services in the diabetes clinics were identified. Some differences between women and men in their perceptions were reflected during the FGDs with regard to waiting times, use of computer during consultations, patients' behaviour and ability to participate in the medical encounters. However, gender-related differences in perception of health-related issues (59), and satisfaction with health services are expected in any setting, such as that in a survey undertaken in family practice in US, women were more satisfied with physician-related items than men, while men were more satisfied with issues related to access to care such as waiting time, relative to women (60).

### **7.1 Provider-patient interaction**

Our findings revealed several weaknesses with regard to communication and interaction between the primary health-care providers and type 2 diabetic patients. Common findings were identified like interrupted consultation privacy and poor attention and eye contact. Other aspects that were not fulfilled and that compromises a good interaction were:



encouraging the patients to participate in the medical dialogue, express concerns, sharing or transferring the medical information and verifying of their understanding of the provided information. In particular, there was poor inquiry about adverse effect of medicines and risky habits like smoking or alcohol consumption. Furthermore, the patients expressed dissatisfaction with the manner of welcoming by the doctors and nurses and said that the use of computers during doctors' consultations was on the cost of attention and interactive patient-doctor communication.

A good consultation and patient-doctor communication demands uninterrupted privacy and undivided attention to the patient (19). Furthermore, friendly welcoming and hospitality are important for good interpersonal relationship in patient-provider communication. A study among diabetes patients in Sweden, showed that encounters with professionals who made diabetes patients feel attended and who were friendly and welcoming were seen as satisfying, while on the other hand, patients described the dissatisfying encounters as being characterized by ignorance, including being treated unkindly or being made to feel unwelcome (27). Attentive listening to what the patients say, giving encouragement and using of non-verbal skills are necessary components of effective communication (61). In this respect, if the doctors want to use the computers during consultations it would be better if they maintained verbal and eye contact with the patients (62).

Another main purpose of medical communication is promoting the exchange of information between the doctor and the patient. This include information-giving and information-seeking, which can be seen as a contribution by both parties to the verbal interactions and a facilitating mechanism for a patient-centred approach (15, 61). In this context, doctors should be careful to take a good medical history including medicines use and adverse effects because these effects might reduce patients' compliance. Better understanding of the drugs and dissemination of the information to doctors and patients has been shown to reduce the number of hypoglycaemia reactions caused by the sulphonylureas (63). Regarding risky habits, the doctors might have neglected to ask about smoking and alcohol due to religious reasons for both gender. It could also be related to cultural beliefs about behaviour appropriate to each gender, such as alcohol consumption and smoking being regarded as natural for men, but not for women (23). It

was not clear if the patients had been questioned on these issues during previous consultations, but it should still be considered during regular visits for both men and women as recommended in the national guidelines (39).

## **7.2 Patient-centred care**

The results of this study show that the medical encounters in the health centers were characterized by more of physicians' dominance and less of attention to the patients' concerns, expectations and role in their own diabetes management and self-monitoring. However, patient-centred care is a process of interaction between the doctor and the patient and refers to seeking and accepting the patients' ideas, encouraging them to ask questions and making decisions in response to the individual patient perspective (64). Furthermore, an approach of facilitating patient empowerment during health education is intended to enable patients to make informed decisions about their own diabetes care and to be fully responsible members of the health-care team (65).

Despite that the patients in this studying general addressed the need of patient-centred approach during doctors' consultations, there were some women with low education, who expressed negative concerns and felt that doctors should decide. One possible explanation for this perception might be the power imbalances and inequalities in the doctor-patient relationship that could make doctors showing biases towards patients and treat them according to their backgrounds (17). Another explanation could be due to cultural reasons or the social pattern of female disempowerment that could make the women feel inferior specially in front of male doctors (66). It has been concluded that patient participation in medical encounters depends on patient's personal characteristics such as gender and education, physician's communication style, and contextual factors (67). On the other hand, sharing information and power appears to be a cultural phenomenon that is positively influenced by younger age, female sex, and higher education (68).

It has been argued that the ideal medical interview integrates the patient-centred and physician-centred approaches: the patients should lead in areas where they are the experts (symptoms, preferences, concerns), the doctors should lead in their domain of expertise (details of disease, treatment). However, before patients share decision-making power, they must first be offered by their doctors the choice of participation in the

medical encounters and be provided with the medical information they need (61). Physicians could more effectively facilitate patient involvement by more frequently using partnership building and supportive communication (67).

It has been concluded that, focusing on improving diabetes patients' behaviour and enhancing their participation in the consultations is more effective than focusing only on provider behaviour to change their consulting style into a more patient-centred one (25). Another conclusion is that a combination of approaches possibly has got a considerable potential to produce even better and lasting outcome improvement, and this could be achieved by: enhancing patient participation; improving provider participatory behaviour in consultation and health education; supporting the provider to improve organization and quality of care by feedback of outcomes, and additional education (25).

Modification of the patient-centred approach model to the Omani context and its implication at primary care level is a realistic possibility if existing barriers on both the provider and patient side are well identified and recognized by the policy makers, as well as the barriers related to the organization of the clinics. Moreover, educational interventions seem to have the potential of being useful at the level of the health-care providers to promote a patient-centred approach during consultations and at the level of the patients by providing structured and continuous health education, to improve their perceptions, motivations and self-management. In particular, self-monitoring of blood glucose should be emphasized. Furthermore, it would be better if the national guidelines more directly include aspects related to the need of a patient-centred approach to attain high quality care.

### **7.3 Teamwork approach**

The diabetes nurses had limited interactions with diabetes patients regarding the aspects of consultation environment, care and health education despite the description of their role and responsibilities in the national guidelines (39). Furthermore, the referral to the dieticians and health educators was low and the doctors provided health education themselves during consultations. These findings indicate a weakness in the team work approach. The reasons could partly be that the diabetes nurses, in the studied health centres, either shared the room with the doctors or counselled the patients in the nurses' joint office. Interruptions by other nurses and patients occurred in both situations, but

were more common in the nurses' offices than in the doctors' offices. Another reason with regard to poor role of health educators and dieticians is that they were not available all the time during diabetes clinic days. In addition, it could be due to doctors' own preference (69).

Diabetes care requires a diffusion of responsibility for the care from physicians to nurses, dieticians, and patients. This responsibility for diabetes treatment is often carried out within a team, whose members should be supportive to each other, in contrast to that some doctors tend to see themselves being in charge of the diabetes care and may not refer patients to dietician or health educator (70). Diabetes nurses can make an important contribution for effective diabetes management in primary care (71). It has been suggested that provision of health education to diabetes patients throughout and not only in the first few months of diagnosis, is a necessary component of care and should be adjusted to the patient's own individual needs. Diabetes nurses can respond to much of these needs (69). Furthermore, it has been proposed that the appropriate use of simple and attractive visual tools during health education is effective and positively associated with health outcomes (72).

Providing special rooms for diabetes nurses in the PHCCs in Muscat may be helpful in ensuring privacy, contribute to increasing the autonomy and responsibilities of the diabetes nurses and allowing interactive participation in teamwork through patients' counselling and provision of health education. Ideally, diabetes nurses can contribute to the teamwork by providing health education, and take over some of the responsibilities of the physicians, if they are trained with detailed management protocols available (73). Moreover, the role of health educators and dieticians should be enhanced. The reasons behind their poor contributions in health education need further exploration.

We cannot relate the overall low standard of care provided by the diabetes nurses in this study to language barriers despite the acknowledged problems that may occur if the provider speaks a different language (24), as there were only a few non-Arabic speaking diabetes nurses. However, the performance of the non-Arabic speaking doctors was not affected by the language barrier or by the presence of the informal interpreter either from the patients' family members or local health workers. Similarly, in a study in U.K. (74), it was found that many immigrant diabetic patients received poor quality care,

although this appeared to be related less to language difficulties than to professional attitudes and methods of working. Furthermore, despite that the presence of an interpreter could be to some extent on the cost of direct patient-doctor communication, it was found to be supportive, and provided better understanding of advice and instructions (74).

#### **7.4 Organizational efficiency and speciality of the diabetes clinics**

During the FGDs, some of the patients expressed criticism of the provided services such as long waiting times and lack of care continuity. In addition, the patients questioned the doctors and nurses competency in diabetes management. Short waiting time for patients with diabetes has been found to be positively associated with patients satisfaction (75), and this plays a crucial role in the process of health quality assurance or quality management (76). The combined effect of patients' adherence to actual appointment times and lowering the patient:doctor ratio is important for reducing waiting times and improving the quality of diabetes care (77). This approach could be implemented in the primary health-care settings in Oman.

A definition with multiple dimensions for the concept of continuity of care has been proposed. It was recently organized into a hierarchy ranging from availability of accurate information from one health care encounter to another or information transfer (informational continuity), through a pattern of health care utilization at a particular site of care (longitudinal continuity), to an on-going personal doctor-patient relationship (interpersonal continuity) (78). It has been concluded that continuity of care with a primary care provider is associated with better glucose control among patients with type 2 diabetes, and that this relationship appears to be mediated by changes in patient behavior regarding diet (79). Moreover, interpersonal continuity with certain physicians seems to be important for patient-doctor relationship and lead to the development of trust and confidence. Thus doctors and health-care managers should consider incorporating patients' preference for continuity into their office scheduling procedures (80). Furthermore, it has been found that good diabetes care with significantly better outcomes depends on the competency and motivations of the individual provider and the doctors' special interest in diabetes (57, 81, 82).

Our findings show that compliance with the national guidelines on diabetes care is partly sub-optimal. It is known from previous research that dissemination of guidelines

alone is not enough to change provider behaviour permanently (83). Lack of compliance with guidelines may indicate short-comings in physician knowledge, implementation problems, lack of belief in guidelines, or problems in patient compliance (84). We suggest that attention and further exploration should be directed to all these areas before revision of the guidelines. More interactive methods such as audit and feedback can be effective in improving professional practice (85, 86), and should be tried in Oman.

### **7.5 Methodological issues**

The approach of using more than one data source for the same topic regarding the quality of interaction between primary health-care providers and patients with type 2 diabetes could be considered as methodological triangulation (50). This combination of methods might also serve as a way of confirming the validity of quantitative findings and the completeness (credibility) of qualitative data (87-89). May and Pope argued that triangulation may be better seen as a way of ensuring comprehensiveness and encouraging a more reflexive analysis of the data than as a pure test of validity (90).

Reflexivity means sensitivity to the ways in which the researcher and the research process have shaped the collected data, including the role of prior assumptions and experience, which to some extent can influence inductive inquiries. Personal and intellectual biases need to be made plain at the outset of any research reports to enhance the credibility of the findings. The effects of personal characteristics such as age, sex, social class, and professional status on the data collected and on the "distance" between the researcher and those researched also needs to be discussed (90). In this case the principal investigator (myself) is a medical doctor and has worked in primary care, also with diabetic patients. I was familiar with the work situation in a PHCC in Muscat and I have also previously had some professional contacts with a few of the health care providers participating in this study.

In qualitative research the concepts credibility, dependability and transferability have been used to describe various aspects of trustworthiness (55). Credibility deals with the focus of the research and refers to confidence in how well data and processes of analysis address the intended focus. Dependability is the degree to which data change overtime. When data are extensive and the collection extends for long time there is a risk of inconsistency during data collection (55), which could be possible to some extent in

this study as there was one year difference between the two sub-studies, and changes in the setting might have occurred. Another aspect of trustworthiness is transferability which refers to ‘the extent to which the findings can be transferred to other settings or groups’. It is mainly the reader’s decision whether or not the findings are transferable to another context. However, to facilitate transferability, it is valuable to give a clear and distinct description of culture and context, selection and characteristics of participants, data collection and process of analysis (55), which we have attempted in this study. A rich and vigorous presentation of the findings together with appropriate quotations usually also enhances transferability.

### **7.5.1 Sampling**

Sub-study I cannot be generalized to the whole of Oman due to the small sample size and the explorative nature of the study. However, there is no standardized way of calculating sample size for explorative investigations and other studies have used similar numbers of observations per facility (91-93). We decided to explore the situation in some of the health centres that were expected to provide a better standard of care due to their geographical location and their structural facilities. These health centres are located in the Muscat region where the population density is high. In spite of this, our findings provide some indications of how the situation might look like in other health centres with similar facilities or in the remote PHCCs.

In sub-study II, the constraints mentioned in section 5.3.2, were barriers to conduct more FGDs. However, the number of FGDs in this study can be regarded as acceptable, as it complies with the rule of thumb that of 3-5 groups are usually sufficient. This number is based on the claim that more groups seldom provide meaningful new insights and new understanding (94). The strategy to select participants, who are expected to contribute ‘rich information’, may have some limitations (50). The information available prior to selection may be inadequate and there might be a risk that the participants are selected too much on grounds of verbal competence. However, in this study we succeeded in recruiting participants with variation regarding education and verbal expression. It should be noted, that the sampling strategy must be selected to fit the purpose of the study, the available resources, the questions being asked and the constraints being faced to assemble the groups (50).

### **7.5.2 Observational bias**

Disadvantages of the observation method include the possibility that the observer may affect the people being observed as they may behave differently regardless of how sensitively observations are made (50, 95). In addition, observations are limited in focusing only on external behaviour as the observer cannot see what is happening inside people. Furthermore, a caution should be taken when observing non-verbal behaviour such as facial expression, eye contact, touch, gestures and extra linguistic behaviour because misinterpretation is easy due to cross-cultural ways of interactions (50).

A certain degree of observational bias is possible in this study as all observations were made by only one individual. Being observed can make people self-conscious and generate anxiety, especially when observations are part of an evaluation (50). Therefore, as these kinds of observations have not been done before in the health care services in Oman, we highly judged the importance of being as little intrusive as possible, favouring using only one observer. Some advantages of using only one observer are that all observations are made in a similar way and that the health care providers only need to meet one other person, who will then become less of a stranger and thereby probably influence the actual performance to a lesser extent. However, we estimated the observational bias by the reliability test done by two independent examiners and found an acceptable concordance.

### **7.5.3 Limitations of the FGDs**

Limitations of this method include that the minority opinions may not always be expressed due to dominance of certain members in the groups which can affect the participation of other members who might tend not to be highly verbal (50, 94). Thus, in the selection of participants, common background variables such as age, gender, education level and other characteristic similarities should be considered in order to minimize such problems when conducting FGDs (94). It is also known that the discussions and quality of data could be affected by the moderator's own judgments and assumptions which may close the exploration. Hence, the moderator needs skills in balancing between keeping quiet and knowing when to intervene; clarifying ambiguous statements; encouraging everyone to participate and ensuring that interesting and unexpected avenues are pursued. One of the key skills is ensuring that interaction



between research participants is encouraged. In addition, knowing about the cultural meanings in particular groups is crucial for both group facilitation and subsequent data interpretation (54).

Other limitations could be related to the connection of investigators with the authority or institution under study. Patient fear of disclosure or fear of making revelations to members of their own social circle is also possible (54). Furthermore, there was some heterogeneity with regard to characteristics of some group members in terms of education level and age. The heterogeneity of the participants regarding their social background is known to have a potential negative impact on the discussion. The purpose of homogeneity is to make the participants feel comfortable and able to talk to each other (94). However, despite the cited problems, we found that the discussions in the groups were productive as they seemed able to talk easily to each other. This could be due to sharing the same experience of being diabetic patients (54).

Another potential limitation is that a man moderator conducted also the women FGDs, which could inhibit the discussion in contrast to if the moderator was from the same sex. However, the topics raised and the scope of the discussion was of similar character in the men and women groups, which may indicate that the field of exploration was not too sensitive to create uncomfortable feelings among the women in the presence of a man moderator. In addition, the presence of certain young and educated women in the groups seemed to stimulate the others, who were less educated and more shy. Furthermore, we conducted separate groups with men and women, to avoid the known bias of mixing groups by sex (94).

## **8 CONCLUSIONS AND RECOMMENDATIONS**

The interactions of the doctors and diabetes nurses with type 2 diabetes patients were not optimal in relation to the national guidelines. The role of diabetes nurses was limited to technical work and there was poor collaboration between the diabetes team members. Furthermore, the patients expressed dissatisfaction with the services and they identified several problems in relation to access to care, quality of communication and interaction with the health-care providers. The patients also expressed criticism regarding the competence of individual providers in diabetes management. The two methods used in data collection were supportive to each other and revealed similar findings, thus supporting our interpretations.

We recommend enhancing the role of diabetes nurses, dieticians and health educators in building well functioning teams for diabetes management at the primary health-care centres. Better utility of the resources and patients' awareness of these resources within the practice could be achieved through a multidisciplinary team approach and training to the providers to upgrade their skills regarding communication and care with emphasis on patient centred-care and an empowerment approach. Barriers to compliance with the guidelines need to be further explored.

The results of this study can serve as a point of departure for policy makers in Oman and countries with similar health systems, for improving the quality of diabetes care, including strengthening the role of the diabetes nurses and for further improvement of the organizational efficiency of diabetes services.

Exploration of the views of the health-care providers in the interaction with the patients and difficulties or barriers to good quality care is our scope in a coming study. In addition, potential correlation between the quality of interaction and metabolic control will be analysed in another sub-study.

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11 APPENDICES

**Appendix 1. Checklist for the doctors**

• Nationality of the doctor			
• Asked for interpretation	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Friendly welcoming ( <i>indicated if doctor; greeting with a smile, called by names or shake hands</i> ).	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Introductory chat	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Ensured privacy of consultation	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Asked about symptoms			
• Inquired about diet compliance	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Inquired about medicine compliance	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Inquired if patient had any adverse events to medicine	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Inquired about physical activities	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Inquired about risky habits ( <i>such as smoking or alcohol consumption</i> )	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Performed physical examination	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Encouraged the patient to ask questions	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Paid attention to the patient	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Partly
• Performed eye contact with the patient while talking	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Partly
• Did some gestures to encourage patient to continue ( <i>such as head nodding, vocal intonation etc</i> )	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Advised on healthy life	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Emphasised on patient's understanding and follow up	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Emphasized on blood sugar control	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Referred the patient to health educator or dietician	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Described how to use the medicine	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Friendly closing and fare well	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• Consultation length (in minutes)	<input type="checkbox"/> 0-9 min.	<input type="checkbox"/> 10-20 min.	<input type="checkbox"/> 20-30 min. <input type="checkbox"/> > 30 min.

## Appendix 2. Checklist for the diabetes nurses

- Nationality of the nurse
- Asked for interpretation  Yes  No
- Friendly welcoming (*indicated if the nurse; greet the patient with a smile, called by names or shake hands*)  Yes  No
- Introductory chat  Yes  No
- Ensured the privacy of consultation  Yes  No
- Took the basic measurements  Weight  Height \*  BMI  B. Sugar  B.P
- Reviewed the previous readings  Yes  No
- Commented on the readings  Yes  No
- Inquired about diet compliance  Yes  No
- Inquired about medicine compliance  Yes  No
- Inquired about physical activities  Yes  No
- Provided basic education about diabetes (*symptoms, complications, management etc*)  Yes  No
- Explained the importance of self-management and monitoring\*\*  Yes  No
- Explained the importance of diet control  Yes  No
- Explained the importance of physical activities  Yes  No
- Explained the importance of good metabolic control and its relation to complications  Yes  No
- Explained the importance of annual review for screening of complications  Yes  No
- Educated about foot care and self-hygiene  Yes  No

- Educated about hypoglycaemia & how to deal with it  Yes  No
- Emphasized on the patient's follow up and understanding to the provided information  Yes  Yes
- Encouraged the patient to ask questions  Yes  No  Partly
- Did some gestures to encourage the patient to continue   
 (such as head nodding, vocal intonation, etc)  Yes  No
- Performed eye contact with the patient while talking  Yes  No  Partly
- Paid attention to the patient  Yes  No  Partly
- Provided printed educational materials  Yes  No
- Warm closing & fare well†  Yes  No

\* The height was checked on the same day of observation for some patients or checked once in the first visit of the patient. This was considered during observations and the investigator obtained this information from the diabetes booklet of the patients whom their heights were not checked on the day of observation

\*\*Self-management refers to changes/modifications in life style that help controlling the blood sugar like cooking process and preparing meals, amount of dates to be taken, exercise, stress management, home glucose monitoring, keeping record and monitor blood pressure

† Was considered if the provider had some social talks with the patients at closing of the encounters or emphasised on what was discussed during the encounters; reassured the patient; asked the patient if anything else; said goodbye and thanked the patients.

### **Appendix 3. Guide topics for the FGDs**

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1-We want you to discuss about your opinions and views on the interaction with the health-care providers and what you expect to get when you meet them during consultations. It is an open discussion and we want you to feel at ease and free to talk. We want to hear from all of you. We will start with the doctors, please tell us what you feel when you meet the doctors from the beginning of the consultation to the end of it, and what you like and what you do not like.

(Checklist for the moderator included: welcoming, consultation privacy, attention, eye contact, encouraging questions asking, and consultation length).

2-What is your opinion about the provided care?

(Checklist for moderator included: history taking, physical examination and role of the diabetes nurses).

3-Please tell us about your experience with the dieticians and health educators in your health centres?

4-A question for the females groups; How you perceive the encounters with male doctors?

5- What are your suggestions to improve the quality of interaction with the health-care providers?

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