

Barriers to the delivery of diabetes care in the Middle East and South Africa: a survey of 1,082 practising physicians in five countries

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SUMMARY

Aims: Developing countries face a high and growing burden of type 2 diabetes. We surveyed physicians in a diverse range of countries in the Middle East and Africa (Egypt, Kingdom of Saudi Arabia, United Arab Emirates, South Africa and Lebanon) with regard to their perceptions of barriers to type 2 diabetes care identified as potentially important in the literature and by the authors. **Methods:** One thousand and eighty-two physicians completed a questionnaire developed by the authors. **Results:** Most physicians enrolled in the study employed guideline-driven care; 80–100% of physicians prescribed metformin (with lifestyle intervention, where there are no contraindications) for newly diagnosed type 2 diabetes, with lifestyle intervention alone used where metformin was not prescribed. Sulfonylureas were prescribed widely, consistent with the poor economic status of many patients. About one quarter of physicians were not undertaking any form of continuing medical education, and relatively low proportions of practices had their own diabetes educators, dieticians or diabetic foot specialists. Physicians identified the deficiencies of their patients (unhealthy lifestyles, lack of education and poor diet) as the most important barriers to optimal diabetes care. Low-treatment compliance was not ranked highly. Access to physicians did not appear to be a problem, as most patients were seen multiple times per year. **Conclusions:** Physicians in the Middle East and South Africa identified limitations relating to their patients as the main barrier to delivering care for diabetes, without giving high priority to issues relating to processes of care delivery. Further study would be needed to ascertain whether these findings reflect an unduly physician-centred view of their practice. More effective provision of services relating to the prevention of complications and improved lifestyles may be needed.

Introduction

Although the prevalence of diabetes is increasing globally, developing countries are predicted to bear a larger future burden of diabetes than developed nations (1). A substantial burden of diabetes and its complications already exists in countries in the Middle East and South Africa (2). Diabetes is a complex disease to manage and requires the involvement of multidisciplinary teams to reduce the risk and impact of long-term diabetic complications (3). There is thus considerable potential for barriers to optimal diabetes care to arise, and these have been discussed elsewhere, particularly with respect to the aspects of the delivery of care (process issues), access to care

What's known

It is known that the success of care for diabetes depends critically on the delivery of optimised care for diabetic patients. Many barriers to the delivery of such care have been identified. Relatively little is known regarding how these barriers influence the delivery of diabetes care in the Middle East and South Africa.

What's new

Physicians generally followed management guidelines in type 2 diabetes care. Perceived barriers to optimal diabetes care mainly focussed on attributes of patients, rather than process issues in care or aspects of the physicians' practice.

and understating of and adherence to treatments on the part of patients (4,5) Barriers to diabetes care have not been studied extensively in countries in the Middle East and Africa, however, although there is some evidence that addressing barriers related to the process issues (6), education of patients with respect to diabetes therapy or the disease itself (7,8), economic factors (9) or local cultural issues (10) can improve outcomes in diabetes (11).

Increasing our understanding of the barriers to effective diabetes care in these countries will be useful in designing and implementing improved strategies for managing the disease. We have explored the perception of barriers to diabetes care by conducting a survey in a large sample of practising physicians

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responsible for the day-to-day care of patients with diabetes in Egypt, the Kingdom of Saudi Arabia (KSA), United Arab Emirates (UAE), South Africa and Lebanon. In this way, we sought to explore which of a number of potentially important barriers to diabetes care that may influence the routine management of diabetes in these countries.

Methods

The survey was based on a questionnaire developed jointly by the authors (the full questionnaire is provided as Online Supplementary Appendix 1). Questions relating to potential barriers to diabetes care were agreed by the authors, based on the clinical literature (see above) and on their own clinical experience. While the meetings at which the questionnaire was designed were arranged and funded by Merck Serono, the clinical experts in diabetes from countries in the region decided on the questions to be included (all appear as co-authors of this study). The questionnaire was distributed to physicians known to Merck Serono by employees of affiliates of that company in each country. The same employees also collected completed questionnaires for subsequent analysis by an independent market research organisation (GfK Egypt). Physicians completed the survey between February and April 2012. The specialities included were general practitioners (GPs), family physicians, internists and diabetologists or endocrinologists.

All analyses were descriptive in nature and no statistical analyses were performed. All data generated

by the questionnaire are described either in this article or its accompanying online appendix.

Results

Physicians

A total of 1,335 questionnaires were distributed and 1,087 questionnaires were collected after completion; of these five were uncompleted, so that 1,082 physicians provided data (response rate of 81%; Table 1). Numbers (% of total) in each country were Egypt 512 (47%), KSA 326 (30%), UAE 127 (12%), South Africa (SA) 63 (6%) and Lebanon 54 (5%). Overall, 47% were internists, 35% were GPs, 12% were diabetologists or endocrinologists and 7% were family physicians. There were differences in the types of physicians surveyed between countries. For example, there were a higher proportion of GPs in South Africa than in other countries, more physicians in Egypt and KSA were internists relative to other countries, and the proportion of physicians who were specialist diabetologists or endocrinologists was markedly higher in Lebanon, relative to other countries. Slightly more than half of physicians worked in hospitals (55% overall), except in South Africa, which was consistent with the higher proportion of primary care physicians there. Private clinics featured only in Egypt, KSA and, especially Lebanon. The proportion of physicians in specialist diabetes centres was low in all countries.

Most physicians saw private patients (71–98% across countries), although all institutions treated

Table 1 Details of physicians surveyed

	Egypt	KSA	UAE	SA	Lebanon	Overall
a) Speciality						
GP	29	34	45	73	24	35
Family practice	3	7	17	6	15	7
Internist	60	45	25	11	19	47
Diabetologist or endocrinologist	7	14	13	8	43	12
b) Where physicians are based						
Hospital	58	54	65	18	57	55
Private clinic	14	5	0	0	32	10
Dispensary	14	23	16	19	37	18
Outpatient clinic	13	0	6	0	24	8
Diabetes centre	9	6	6	16	7	8
Polyclinic	0	11	0	0	0	4
Medical centre	0	0	0	14	0	1
General practice	0	0	0	38	–	2

All figures are percentages for that country. KSA, Kingdom of Saudi Arabia; UAE, United Arab Emirates; SA, South Africa; GP, general practitioners.

some publicly funded patients (52% of institutions for Egypt, 28–29% for KSA and 5% for UAE, SA and Lebanon). Physicians saw, on average, 128 patients per week (highest for KSA at 174; lowest for Lebanon at 69; 106–115 for other countries), of whom 38% had diabetes (22–43 across countries). Between 20% and 32% of patients in each country had a new diagnosis of diabetes.

Process of care

Most patients visited their physician up to 5 times/year (32%), 6–10 times/year (34%) or 11–15 times/year (20%); 7% visited their physician more than 50 times/year. Visits were least frequent in UAE and SA, with 65% and 87% of patients visiting 5 times or less each year, respectively. Most visits were completed in 20 min or less, (85%) with 27% completed within 10 min. Data for individual countries did not vary markedly, except for a low proportion of visits completed within 10 min in SA (2%) and Lebanon (6%), compared with 32% for Egypt, 31% for KSA and 15% for UAE. Countries with a higher proportion of shorter visits reported more visits of 21–30 min; proportions of visits of 11–20 min were similar (55–65% of visits in each country).

Almost all physicians in all countries (92–99%) reported that they followed management guidelines. Local or regional guidelines were the most commonly followed in SA (55% of physicians), compared with 4–7% of physicians in other countries. Countries other than SA reported strong support for international management guidelines for diabetes (88–98% of physicians).

As would be expected, measures of glycaemia were commonly used at the time of diagnosis of diabetes; overall, 89% of respondents reported measuring fasting blood glucose within their practice, with corre-

sponding figures of 79% for postprandial blood glucose and 76% for HbA_{1c}. Less commonly measured were lipid parameters (45%), testing for microalbuminuria (31%) and other tests (8%; this includes renal or hepatic function tests, urinalysis, eye examinations; thyroid function tests and ECG measurement). Figure 1 shows details of the tests performed by country. Lebanese physicians appeared more likely than others to check for microalbuminuria or dyslipidaemia, and physicians in South Africa appeared less likely to measure postprandial glucose; otherwise there appeared to be little difference between countries.

Overall, 78% reported that they did not encounter problems in referring complicated patients for tertiary care. Results for individual countries were Egypt 69%, KSA 85%, UAE 92%, SA 83% and Lebanon 74%. The nature of problems hindering this care was not articulated clearly.

Diabetes education

The majority of physicians (72%) reported that they were participating in current medical educational activities related to diabetes. The highest proportions of physicians not doing so were in Egypt (35%) and the UAE (41%), and the lowest proportions were in SA (6%) and Lebanon (11%); the corresponding figure for KSA was 19%. Less than half of practices (apart from the Lebanon) had immediate access to a qualified diabetes educator within the practice (Table 2). Apart from SA, the proportion of practices in which diabetes education actually occurred was somewhat lower than the proportion with a diabetes educator. Approximately one third to one half of practices had immediate access to a dietician. The proportion of practices with a diabetic foot specialist was lower, especially in SA.

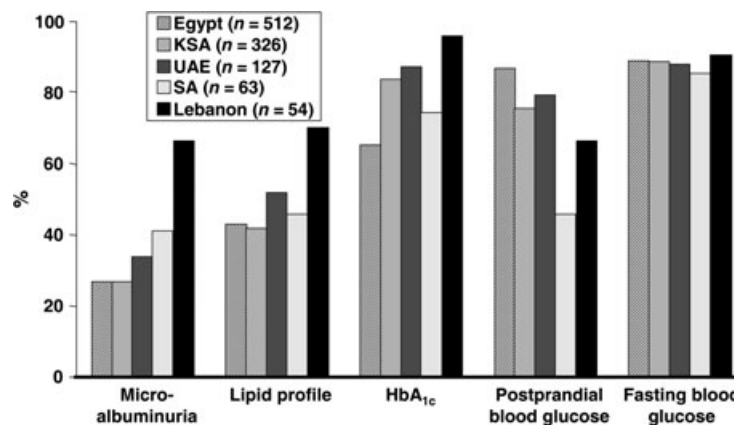


Figure 1 Diagnostic tests performed at the time of diagnosis of diabetes. KSA, Kingdom of Saudi Arabia; UAE, United Arab Emirates; SA, South Africa.

Table 2 Presence within practices of qualified professionals able to deliver different aspects of diabetes education

Egypt	KSA	UAE	SA	Lebanon	Overall
a) Qualified diabetes educator(s) present in the physician's practice					
40	45	47	32	69	43
b) Educational programmes for patients with diabetes take place in the physician's practice					
30	31	22	52	63	32
c) Qualified dietician(s) present in the physician's practice					
33	42	56	21	57	39
d) Qualified diabetic foot specialist(s) present in the physician's practice					
22	27	28	3	48	24

All figures are percentages for that country. KSA, Kingdom of Saudi Arabia; UAE, United Arab Emirates; SA, South Africa.

Management of dysglycaemia

Almost all patients with type 2 diabetes were receiving metformin (97% overall), and about nine patients in 10 (91%) were receiving a sulfonylurea (Table 3). Incretin-based drugs were used widely, especially in the UAE and Lebanon, with the least use of these drugs in Egypt. Insulin analogues were used between about 30% and 60% of patients in each country, with a higher rate of use of other types of insulin. Acarbose was prescribed for 28% of patients in the UAE and 24% in Lebanon, with lower rates of use in other countries studied. Advice to improve lifestyle was given to 96–100% of type 2 diabetes patients in each country (97% overall). With regard to newly diagnosed type 2 diabetes patients, 81% received metformin (if not contraindicated) plus lifestyle intervention in the UAE, compared with 92–95% of these patients in other countries (92% overall). Conversely, 19% of newly diagnosed type 2 diabetes patients in the UAE received lifestyle intervention alone, compared with 4–6% in other countries.

Sixty-seven per cent of all subjects with newly diagnosed impaired glucose tolerance (IGT) received

metformin (where not contraindicated) and lifestyle advice; percentages for individual countries were Egypt 73%; KSA 63%; UAE 51%; SA 52%; Lebanon 80%.

Perceived barriers to optimal diabetes care

Physicians were asked to rank potential barriers to diabetes care, identified from the literature, in order of importance, and 907 physicians provided data on this question (Figure 2). Patient's lifestyle was clearly perceived as the greatest barrier, followed by lack of education on the part of patients and then patients' poor diet. Access to medication, smoking and aspects of compliance were not frequently ranked highly as barriers to optimal diabetes care. All data from individual countries are not shown here for brevity, but are included in Online Supplementary Appendix 2. Patient's lifestyle was ranked consistently high between countries (about 50–70% ranked this aspect as first- or second-most important in each country). Lack of education was ranked first or second by about 40–50% of physicians in countries other than UAE (24%) or SA (23%). Access to medication was not

Table 3 Antidiabetic medications prescribed

	Egypt	KSA	UAE	SA	Lebanon	Overall
Metformin	96	99	95	100	100	97
Sulfonylureas	94	93	81	86	96	91
Thiazolidinediones	32	37	54	22	39	36
DPP4 inhibitors	11	39	53	22	76	28
GLP-1 analogues	16	17	56	27	57	24
Insulin analogues	30	41	58	62	54	40
Insulin	78	77	71	79	70	77
Acarbose	8	10	28	8	24	12

All figures are percentages for that country. KSA, Kingdom of Saudi Arabia; UAE, United Arab Emirates; SA, South Africa.

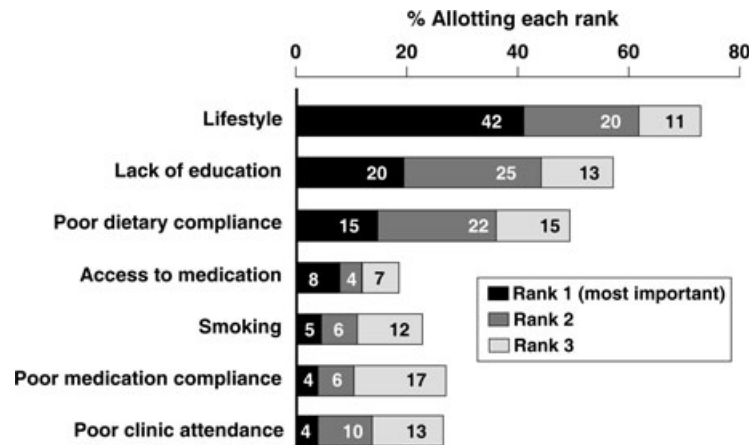


Figure 2 Ranking of potential barriers to optimal diabetes control (pooled data for all countries). Physicians were presented with a lot of potential barriers and asked to rank them in order of importance. Data shown here are from 907 physicians who answered this question.

identified as an issue by any physicians in SA. Only a small minority of Saudi physicians perceived a lack of laboratory facilities as a problem (15% gave this any of the three rankings). Rankings for other potential barriers were relatively similar between countries.

Some physicians indicated additional barriers outside the rankings, or did not rank potential barriers as requested. Although this was not done consistently, the proportions of physicians identifying each potential barrier was calculated for completeness (see Online Supplementary Appendix 3). The results were generally consistent with the rankings, with patient's lifestyle, education and diet featuring most strongly. However, there were also more mentions of low-ranked or unranked parameters, such as use of non-approved/alternative medications (11% in Egypt, 13% in UAE, 10% in SA), and 11% of physicians in Egypt and 17% in Saudi Arabia identified inadequate laboratory facilities as a potential barrier (only KSA included this among the rankings, see above).

Discussion

This survey indicated that most physicians surveyed employ guideline-driven care, although there is a clear difference between SA and other countries, in that SA has its own widely recognised guideline (12). In particular, more than 90% of physicians prescribed metformin (with lifestyle intervention and where contraindications permitted) for newly diagnosed type 2 diabetes in countries other than the UAE, where about 80% prescribed metformin at this time. Lifestyle intervention alone was used where metformin was not prescribed for new type 2 diabetes. Current management recommendations issued

jointly by the American Diabetes Association and European Association for the Study of Diabetes (13,14), or by the International Diabetes Federation (IDF) (15), emphasise the central role of lifestyle interventions in the care of all people with type 2 diabetes. These guidelines also support the use of metformin (where not contraindicated) as initial antidiabetic pharmacotherapy where lifestyle interventions alone are insufficient to achieve adequate control of glycaemia. Sulfonylureas were also prescribed widely (the 2005 global guideline for the management of type 2 diabetes stressed the low cost of these agents for patients within developing nations) (16), while branded medications (such as incretin-based therapies) were relatively little used. However, only a minority of physicians identified access to medicines *per se* as a barrier to optimal diabetes care in this study (and it should be noted that we did not measure the economic status of patients managed by surveyed physicians). Interestingly, there was also strong support for the use of metformin within the management of IGT, although this is not currently an indication for metformin in these countries.

Education (of physicians and patients) has been identified as an important barrier to optimal diabetes care in the region (7,17,18). The high proportion of physicians stated that they were not undertaking any form of continuing medical education, and the relatively low proportions of practices without access to their own diabetes educators, dieticians or diabetic foot specialists may indicate the presence of an important barrier to optimal care (although we do not know to what extent patients receive education elsewhere). Incentives for continuing medical educa-

tion differ between countries and may have contributed to the low uptake of continued medical education in some countries (19,20). In Egypt, for example, where the proportion of physicians not involved in continuous medical education was relatively high, continuing education for healthcare professionals in general has been described as 'fragmented and uncoordinated' in a survey by the World Health Organization in 2006 (20).

Physicians identified the deficiencies of their patients (their unhealthy lifestyles, their lack of education and their poor diet) as the most important barriers to optimal diabetes care, and placed relatively little importance on process issues, such as availability of medicines, ease of referral, etc. Surprisingly, poor compliance with treatment was not highly ranked as a potential barrier, despite an extensive literature suggesting that this is the case, in the region (17,21) and elsewhere (22). Further study would be required to assess whether these findings reflect an unduly physician-centred view of their practice. Access to physicians did not appear to be a problem, as most patients were seen multiple times per year.

The main limitations of this study are as follows. The countries we included in the survey have diverse healthcare systems and populations and the mix of different types of physician varied from country to country. While a substantial number of physicians participated overall (>1000), surveys were not nationally representative of any country (the high response rate of 81% was probably explained by knowledge of physicians that the questionnaire would be collected after completion). Because of the limitations of our sample size, we were also unable to distinguish between the specialities of physicians in each country. This would be of interest for future research in this area as, for example, community-based physicians would likely be in longer term contact with their patients than hospital-based physicians, and this may have influenced their perceptions of barriers to diabetes care. The approach we used

had not been validated by previous studies. We also did not assess the magnitude of the impact of individual barriers in a quantitative manner, although physicians ranked them in their perceived order of importance. Finally, the data described here relate to the perceptions of physicians, and we have no data to compare actual therapeutic outcomes with these; for example, although compliance with therapy was not rated highly as a barrier to optimal therapeutic outcomes, we are unable to provide information on how good the patients' compliance actually was in practice.

In conclusion, physicians in the Middle East and South Africa identified limitations relating to their patients as the most important barriers to achieving optimal care of diabetes, without giving high priority to issues relating to processes of care delivery. The identification of factors relating to patients as the most commonly cited barriers to provision of care for diabetes raises questions concerning the balance between models of care based on compliance or concordance. Furthermore, research is needed to quantify the impact of these barriers on the delivery of diabetes care in these and other developing countries.

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Author contributions

The project as a whole originated from discussions at a meeting to which all authors contributed (see Acknowledgements). All authors were involved in the design of the questionnaire, the interpretation of its results and the preparation of this manuscript.

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

Appendix S1. Copy of the questionnaire.

Appendix S2. Rankings of barriers to optimal diabetes control in individual countries.

Appendix S3. Identification of any barrier to optimal diabetes control in individual countries.

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