

# Compliance with and knowledge about diabetes guidelines among physicians and nurses in Palestine

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## معرفة الدلائل الإرشادية الخاصة بالسكري والتقيدها بين الأطباء والمرضات في فلسطين

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الخلاصة: يُعتقد أن الدلائل الإرشادية الخاصة برعاية المرضى المصابين بالسكري تحسّن الممارسة السريرية ورعاية المرضى. وقد هدفت هذه الدراسة إلى تحليل أنماط العناية بالسكري من قبل الأطباء والمرضات في عيادات الرعاية الأولية في فلسطين، وتقديرهم المبلغ عنه ذاتياً بالدلائل الإرشادية الفلسطينية المحلية. فتم استخدام استبيانات لجمع بيانات من 401 مشاركاً في ثلاث محافظات في الضفة الغربية. فكان - في المجمل - 46.0% من المشاركين على علم بوجود الدلائل الإرشادية الفلسطينية، وحوالي 60% منهم يعتقدون أنها استخدمت بشكل جزئي، في حين أن 32.7% قد تلقوا تدريباً على تطبيق هذه الدلائل الإرشادية. كما أظهر التحليل متعدد المتغيرات أن التدريب على الدلائل الإرشادية كان العامل الوحيد المرتبط - بشكل كبير - مع التقيد المبلغ عنه ذاتياً باستخدام هذه الدلائل. وأفاد المستجيبون (للاستبيان) بوجود التزام شديد باستخدام الدلائل الإرشادية، ولكن مواقفهم وسلوكياتهم اختلفت باختلاف القيود الزمنية وتوافر الدلائل الإرشادية وتوافر الفحوص المختبرية والتدريب على كيفية تطبيق الدلائل الإرشادية.

ABSTRACT Guidelines for the care of patients with diabetes mellitus are believed to improve clinical practice and patient care. This study aimed to analyse the pattern of diabetes care by physicians and nurses in primary care clinics in Palestine and their self-reported compliance with the local Palestinian guidelines. Questionnaires were used to collect data from 401 participants in 3 governorates in the West Bank. In total, 46.0% of participants knew about the existence of the Palestinian guidelines and about 60% believed these were partially used; 32.7% had received training on implementation of the guidelines. Multivariate analysis showed that training on the guidelines was the only factor significantly associated with self-reported compliance with guideline use. Respondents reported high commitment to the use of the guidelines, but their attitudes and behaviour varied with time constraints, availability of the guidelines, availability of laboratory tests and training on how to apply the guidelines.

## Connaissances et respect des recommandations sur le diabète chez des médecins et des infirmières en Palestine

RÉSUMÉ Les recommandations pour les soins aux patients atteints de diabète sont réputées améliorer la pratique clinique et les soins aux patients. La présente étude visait à analyser la tendance des soins aux diabétiques dispensés par des médecins et des infirmières en établissements de soins de santé primaires en Palestine ainsi que le respect autodéclaré des recommandations locales palestiniennes. Des questionnaires ont été utilisés pour recueillir les données de 401 participants dans trois gouvernorats de la Cisjordanie. Au total, 46,0 % des participants connaissaient l'existence des recommandations palestiniennes et 60 % pensaient qu'elles étaient appliquées en partie ; 32,7 % avaient reçu une formation sur leur mise en œuvre. Une analyse multivariée a démontré qu'une formation aux recommandations était le seul facteur significativement associé au respect autodéclaré de l'application des recommandations. Les répondants ont déclaré des niveaux d'engagement élevés concernant l'utilisation de ces recommandations, mais leurs attitudes et leur comportement variaient en fonction des contraintes de temps, de la disponibilité des recommandations, de la disponibilité des analyses de laboratoires et de la formation sur l'application des recommandations.

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## Introduction

Several studies have addressed the role of physicians' compliance with guidelines for improving the quality of care for patients with diabetes mellitus (1–3), including the awareness, attitudes and behaviour of physicians to such guidelines (4–6). However, nurses, who are in direct contact with diabetes patients, have been less targeted in research. In the Diabetes Attitudes Wishes and Needs study in the United States of America (USA), greater involvement by nurses, particularly specialist nurses, was shown to be as important as the role of physicians in managing diabetes (7). Another recent study showed the importance of the nurse's role in diabetes care and prevention (8).

Diabetes and its associated complications constitute a major health problem in Palestine and are listed as the sixth leading cause of death, accounting for 5.7% of all deaths (9). In the past 10 years, there has been an increased demand on primary health care (PHC) services for the care of diabetic patients. Nurses play a critical role in the PHC system. The role and scope of nursing in PHC is continually evolving in response to various changes in the health needs of Palestinian communities, including greater demand on health resources coupled with shortages in the PHC workforce. The multidisciplinary role of the nurse as health care provider, educator and advocate lightens the burden on other PHC resources through integrated practice involving both general practitioners and nurses.

To improve the quality of care of diabetes patients, the Palestinian Ministry of Health (MOH) and the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), the 2 major stakeholders in Palestine, have developed guidelines for the management of diabetes. The MOH guide is devoted to the

management and care of diabetes mellitus, while the UNRWA guide has technical instructions and management protocols on the prevention and control of noncommunicable diseases. Both protocols are based on the World Health Organization (WHO) diabetes care guidelines of 2006, with some differences between the two protocols, and sometimes between them and the WHO guidelines (10). The MOH guide was developed in 2008, in cooperation with WHO and the Austrian Development Cooperation. The MOH adopted the *Quick reference guide for the management and care of diabetes mellitus*, which is called the Quick Guide. However, it is not yet known if these diabetes management guidelines are incorporated into the daily practices of PHC staff. Information about physicians' and nurses' awareness, attitudes and behaviour in implementing these guidelines is also not available. Therefore, this study was conducted to analyse the pattern of diabetes mellitus care by physicians and nurses in PHC clinics and their self-reported compliance with the MOH and UNRWA guidelines. The results will assist the main health care stakeholders to determine whether a multifaceted intervention, such as improving health care staff's compliance with diabetes guidelines, is needed to improve the quality of care for patients with diabetes mellitus.

## Methods

### Study design

This cross-sectional study was conducted in 2011 on physicians and nurses in 3 governorates in the West Bank, Palestine. The study protocol and questionnaires were approved by Al Quds University research ethics committee. Consent was obtained from the various stakeholders to carry out the study in their centres and assess the services in clinics.

### Sampling

A total of 5602 physicians are registered with the Palestinian Medical Association in the West Bank (11). All physicians located in the 3 governorates and dealing with diabetes patients were eligible for inclusion in the study, including general practitioners, internists, endocrinologists, diabetes specialists, nephrologists, ophthalmologists and neurologists. A sample size of 300 physicians (95% confidence level and 0.05 error margin with 5% contingencies related to non-response or recording error) was calculated. The sample was divided equally among the 3 governorates (Nablus, Hebron and Ramallah). From each governorate, the main PHC facility of each health care provider was selected, i.e. the central MOH clinic, one of the UNRWA main clinics and the Palestinian Medical Relief Society nongovernmental clinic. All nurses dealing with diabetes patients in the selected centre/clinic were included in this study.

### Data collection

In each governorate, all physicians and nurses working in the selected participating centres and dealing with diabetes patients were approached and invited to fill in the study questionnaire. Health professionals signed a consent form prior to participation.

Two versions of the study questionnaire were prepared; the physicians' questionnaire consisted of 42 questions and the nurses' questionnaire had 44 questions. Each questionnaire was designed to assess participants' background characteristics; participants' awareness of, attitude and behaviour towards the local Palestinian diabetes guidelines; the availability of supportive resources; and referral and continuity of care for patients with diabetes mellitus. In addition, the health care system arrangements for diabetes patients at these centres were assessed. The questionnaires were based on questionnaires used previously in similar studies

(4,12), with some modifications and additions as suggested by the research team and the major stakeholders themselves. The modified questionnaire was then pilot tested on 20 participants in each governorate. These questionnaires were not included in the study.

A score of self-reported compliance to the guidelines was calculated for each physician and nurse, depending on how many of the guideline recommendations of 10 tests and examinations had been performed in a timely manner (based on their answers to the questionnaire).

### Statistical analysis

The responses obtained were entered into a database and were analysed using SPSS for Windows, version 20. Statistical analysis included the chi-squared test for categorical variables and analysis of variance for the mean continuous variables. All calculated *P*-values were 2-tailed; *P*-values > 0.05 were considered nonsignificant.

For the self-reported compliance score, the *t*-test was used to determine the association with the bivariate variables, and 1-way ANOVA was done with multivariate variables. A linear regression model was done separately and jointly for the scores of physicians and nurses by age, sex, profession (nurse versus physician), place of employment, work experience, years of work, employed at, years of experience with diabetes patients, graduation period, awareness of the guidelines, familiarity with the guidelines, having a copy of the guidelines, undergone training on use of guidelines, availability of an endocrinologist, availability of an ophthalmologist and availability of a nutritionist.

## Results

In this study the response rate from the physicians approached was 84.0% and from the nurses was 98.7%.

### Background characteristics of respondents

Table 1 shows that 61.8% of respondents were male (87.0% of physicians and 18.9% of nurses), with no significant difference in their ages; more than half of the participants in both groups were in the 25–40 years age group. More than half of nurses and physicians had graduated after 1990, but only 15.8% of physicians and 24.1% of nurses had graduated after 2004. Just over half of participating physicians (53.8%) were working at MOH clinics and 30.4% were practising independently. In contrast, 73.6% of nurses were working at the MOH clinics and only 2.7% were nurses in private clinics. Of the physicians, 43.4% had < 10 years of work experience with diabetes patients versus 65.2% of nurses.

A majority of physicians in this sample (60.9%) were general practitioners. Of the specialized physicians, only 12.1% had a specialization in diabetes care and 8.1% were endocrinologists. Interestingly, 60.1% of physicians had obtained their diplomas from the former Soviet Union and eastern Europe, while 29.6% had obtained them from universities in Arab countries. However, most nurses (98.0%) had obtained their diplomas from Palestinian or Arab colleges and universities [data not shown].

### Availability of support health staff at health centres

Figure 1 shows that fairly low proportions of physicians and nurses reported having access to specialized physicians at the centre where they worked, and nurses reported less access to endocrinologists, ophthalmologists and nutritionists than did physicians. A high proportion of physicians and nurses reported the availability of health educators and educational materials, e.g. posters and brochures, but far fewer had group education facilities in their centre.

### Knowledge about and use of the diabetes guidelines

In total, 46.9% of the participants knew about the existence of the local Palestinian guidelines (53.0% of physicians and 37.7% of nurses), but only 35.9% had a copy of the guidelines. Of these, only 34.7% of physicians and 43.4% of nurses knew who had developed these local guidelines. A majority of the participants (79.1%) believed that these guidelines were used only partially or not at all in physicians' daily practice. Overall 32.7% (42.7% of physicians and 23.4% of nurses) reported having had training on the use of these guidelines (Table 2).

When asked about their practice of referring patients, physicians were far more likely to refer diabetes patients to an ophthalmologist than to an endocrinologist (89.3% versus 58.0% respectively), and a similar pattern was seen for nurses. The main reason why physicians did not refer their patients to an endocrinologist was that they did not see the need for it, whereas nurses mostly justified it on the grounds that the specialization was unavailable. However, most physicians and nurses knew that an endocrinologist was available either in the same clinic or in the same city (Table 2). About 70% of physicians had received a report from an ophthalmologist [data not shown]. The lack of an ophthalmoscope (fundoscope) in the clinic was an obstacle to physicians who wanted to test their patients' eyes. Also, 77.1% of physicians reported the need for training on how to use the ophthalmoscope.

Physicians were more knowledgeable about the use of the glycosylated haemoglobin (HbA1c) test than were nurses, but only 69.2% of physicians had requested it for their patients. When asked about reason for not ordering the test, 61.5% of physicians believed it to be unnecessary, while 35.0% believed it to be either expensive or unavailable (Table 2).

**Table 1 Profile of respondents and their experience of care for patients with diabetes mellitus**

Variable	Total (n = 401)		Physicians (n = 253)		Nurses (n = 148)		P-value
	No.	%	No.	%	No.	%	
<b>Sex</b>							
Male	248	61.8	220	87.0	28	18.9	0.001
Female	153	38.2	33	13.0	120	81.1	
<b>Age (years)</b>							
25	4	1.0	3	1.2	1	0.7	0.073
25-40	225	56.1	130	51.4	95	63.9	
41-55	141	35.2	96	37.9	45	30.6	
56-70	31	7.7	24	9.5	7	4.8	
<b>Graduation date (years)</b>							
1960-1974	14	3.5	6	2.4	8	5.5	0.049
1975-1989	123	30.7	84	33.2	39	26.2	
1990-2004	188	46.9	123	48.6	65	44.1	
Post 2004	76	19.0	40	15.8	36	24.1	
<b>Employed at</b>							
Ministry of Health	245	61.1	136	53.8	109	73.6	0.001
United Nations Relief and Works Agency	52	13.0	27	10.7	25	16.9	
Nongovernmental organization	23	5.7	13	5.1	10	6.8	
Private clinic	81	20.2	77	30.4	4	2.7	
<b>Years of work experience</b>							
1-5	156	38.9	107	42.3	49	33.3	0.269
6-10	98	24.4	55	21.7	43	29.1	
11-15	63	15.7	39	15.4	24	16.3	
> 15	84	20.9	52	20.6	32	21.3	
<b>Year of with diabetic patients</b>							
< 10	206	51.4	110	43.4	96	65.2	0.002
10-19	112	27.9	83	32.9	29	19.7	
≥ 20	82	20.4	60	23.7	22	15.2	
<b>Physician's location of graduation</b>							
Western Europe	-	-	24	9.5	-	-	
Eastern Europe	-	-	51	20.2	-	-	
Soviet Union	-	-	101	39.9	-	-	
Arab country	-	-	75	29.6	-	-	
Eastern Asia	-	-	1	0.4	-	-	
United States of America	-	-	1	0.4	-	-	
<b>Type of physician</b>							
General practitioner	-	-	154	60.9	-	-	
Specialized physician	-	-	99	39.1	-	-	
<b>Physician's field of specialty (n =99)</b>							
Endocrinology	-	-	8	8.1	-	-	
Diabetes care	-	-	12	12.1	-	-	
Internal medicine	-	-	30	30.3	-	-	
Ophthalmology	-	-	11	11.1	-	-	
Urology	-	-	8	8.1	-	-	
Paediatrics	-	-	17	17.2	-	-	

**Table 1 Profile of respondents and their experience of care for patients with diabetes mellitus (concluded)**

Variable	Total (n = 401)		Physicians (n = 253)		Nurses (n = 148)		P-value
	No.	%	No.	%	No.	%	
Gynaecology	-	-	8	8.1	-	-	
Orthopaedics	-	-	1	1.0	-	-	
Dermatology	-	-	1	1.0	-	-	
Otorhinolaryngology	-	-	3	3.0	-	-	
<b>Nursing level of education</b>							
Nurse by training	-	-	-	-	9	6.1	
Diploma in nursing	-	-	-	-	83	56.1	
Bachelor degree in nursing	-	-	-	-	49	33.1	
Master/PhD degree nursing	-	-	-	-	7	4.7	

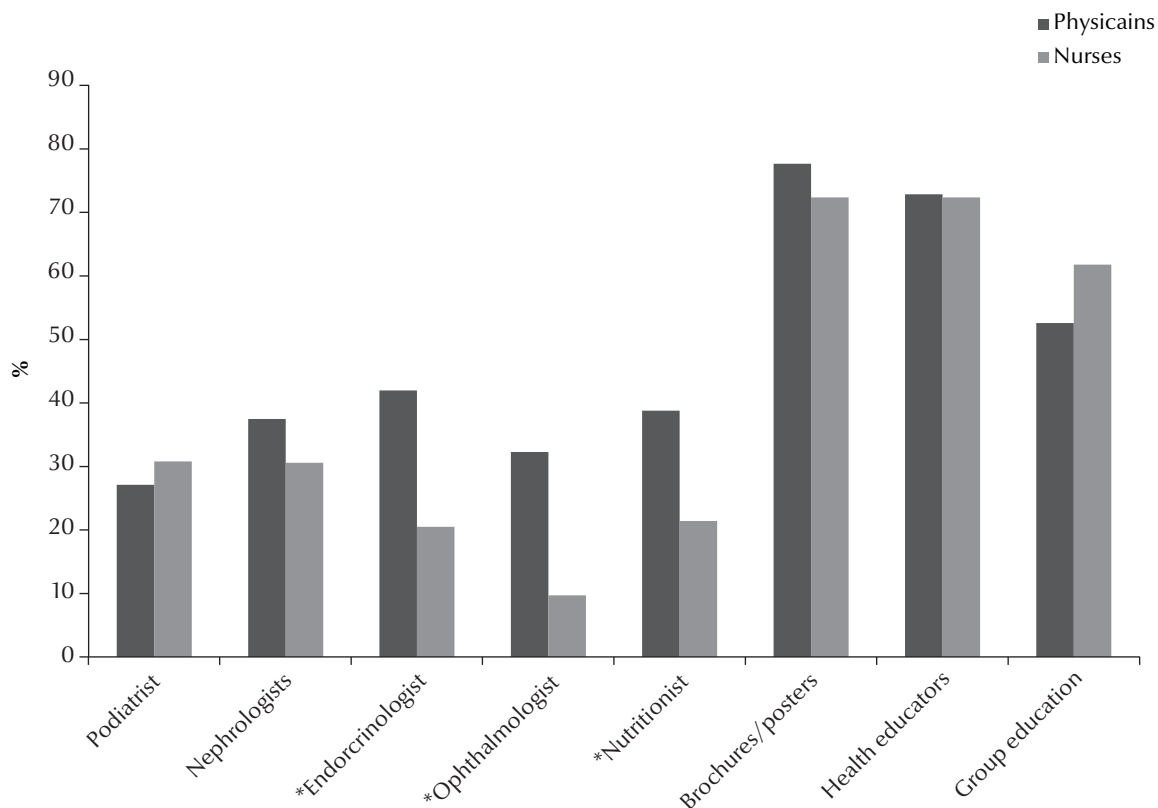
Dashes (-) indicate data not applicable.

### Self-reported compliance with the diabetes guidelines

Table 3 shows the differences between physicians and nurses in their knowledge about some tests but not about the examinations prescribed in the guidelines. According to these

guidelines, which match those of WHO very closely, HbA1c should be performed either every 3 or every 6 months, depending on patients' control of their diabetes; 79.0% of respondents in this study complied with the test on time (79.1% of physician

and 78.8% of nurses). Fewer respondents examined patients' feet on each visit (60.5% of physicians versus 42.0% of nurses). The examination least likely to be conducted by physicians at the clinic was funduscopy (14.1%). Other blood tests (lipid profile, urinary



**Figure 1 Availability of support staff and materials in health care centres according to the surveyed physicians (n = 253) and nurses (n = 148) (\*P < 0.05)**

**Table 2 Respondents' self-reported knowledge about the Palestinian guidelines for the care of patients with diabetes mellitus and their practice of continuity of care**

Variable	Total (n = 401)		Physicians (n = 253)		Nurses (n = 148)		P-value
	No.	%	No.	%	No.	%	
<b>Familiar with the guidelines</b>							
Yes	188	46.9	133	53	55	37.7	0.003
No	209	52.1	118	47	91	62.3	
<b>Have copy of the guidelines</b>							
Yes	144	35.9	106	57.6	38	33.9	0.001
No	152	37.9	78	42.4	74	66.1	
<b>Know who developed the guidelines</b>							
Ministry of Health	107	26.7	61	24.3	46	31.7	< 0.001
United Nations Relief and Works Agency	43	10.7	26	10.4	17	11.7	
World Health Organization	74	18.5	42	16.7	32	22.1	
Palestinian Medical Relief Society	16	4.0	8	3.2	8	5.5	
Not local	11	2.7	9	3.6	2	1.4	
Unaware of existence of guidelines	145	36.2	105	41.8	40	27.6	
<b>Implement the guidelines in workplace (total n = 219)</b>							
Widely	61	21.0	43	25.6	18	14.6	0.036
Partially	173	59.5	98	58.3	75	61	
No	57	19.6	27	16.1	30	24.4	
<b>Trained on use of guidelines</b>							
Yes	131	32.7	97	42.7	34	23.4	0.001
No	241	60.1	130	57.3	111	76.6	
<b>Patient can call physician for counselling</b>							
Yes	290	72.3	188	75.5	102	70.3	0.263
No	104	25.9	61	24.5	43	29.7	
<b>Refer patients to endocrinologist</b>							
Yes	222	55.4	145	58.0	77	55.8	0.675
No	166	41.4	105	42.0	61	44.2	
<b>Reason for not referring to endocrinologist</b>							
Not available	146	36.4	22	22.4	124	86.1	< 0.001
No need	96	23.9	76	77.6	20	13.9	
<b>Distance to endocrinologist's clinic</b>							
Same building	52	13.0	43	17.2	9	45.0	0.004
Same city	176	43.9	165	66.0	11	55.0	
Another city	42	10.5	42	16.8	-	-	
<b>Refer patients to ophthalmologist</b>							
Yes	365	91.0	226	89.3	139	96.5	0.012
No	32	8.0	27	10.7	5	3.5	
<b>Advise patients on glucose home monitoring</b>							
Yes	343	85.5	219	86.6	124	83.8	0.445
No	58	14.5	34	13.4	24	16.2	
<b>Know about HbA1c test</b>							
Yes	367	91.5	244	96.4	123	83.1	0.001
No	34	8.5	9	3.6	25	16.9	

**Table 2 Respondents' self-reported knowledge about the Palestinian guidelines for the care of patients with diabetes mellitus and their practice of continuity of care (concluded)**

Variable	Total (n = 401)		Physicians (n = 253)		Nurses (n = 148)		P-value
	No.	%	No.	%	No.	%	
<b>Physician's reason for not requesting HbA1c test</b>							
Don't know what it is	-	-	1	1.3	-	-	
High cost	-	-	14	17.9	-	-	
Unnecessary	-	-	48	61.5	-	-	
Unavailable	-	-	14	17.9	-	-	
When needed	-	-	1	1.3	-	-	
<b>Physician's evaluation of patients by HbA1c test</b>							
Yes	-	-	175	69.2	-	-	
No	-	-	78	30.8	-	-	
<b>Presence of ophthalmoscope in clinic</b>							
Yes	-	-	81	32.0	-	-	
No	-	-	172	68.0	-	-	
<b>Physician needs training on ophthalmoscope</b>							
Yes	-	-	195	77.1	-	-	
No	-	-	58	22.9	-	-	

Dashes (-) indicate data not applicable; HbA1c = glycosylated haemoglobin.

microalbumin, serum creatinine) and an ECG should be conducted annually and there were no significant differences between physicians and nurses, although physicians tended to conduct the tests more frequently, i.e. according to the guidelines (Table 3).

According to their self-reports, only 3 participants (1 physician and 2 nurses) were compliant with performance of the recommended 10 tests and examinations at the appropriate times. At least half of the tests and examinations were performed on time by 66 (51.0%) physicians and 28 nurses (55.8%). Also, 25.0% of all participants did at least 6 tests on time.

The *t*-test and 1-way ANOVA showed no statistically significant difference between physicians and nurses in their compliance with implementation of the guidelines ( $P = 0.42$ ). The governorate location of the clinic ( $P = 0.014$ ), having training on guidelines use ( $P = 0.001$ ) and possessing a copy of the guidelines ( $P = 0.001$ ) were the only variables

significantly associated with compliance scores in the univariate analysis. Linear regression analysis showed that training on use of the guidelines was the only factor significantly associated with self-reported compliance with guideline use ( $P < 0.05$ ), although it only explained 6.2% of the variability of self-reported compliance to the guidelines (adjusted  $R^2 = 0.062$ ).

### Respondents' attitudes and behaviour towards the guidelines

The respondents reported high commitment to the use of guidelines. However, their attitudes and behaviour towards use of the guidelines varied with the time available, the availability of laboratory tests, the availability of the guidelines themselves and training on how to use them. Respondents also cited the financial inability of patients to perform the tests as a factor that hindered implementation of the guideline recommendations (Figure 2). Commitment to the guidelines was reported by 73.5% of physicians and 45.0% of nurses (Figure 2).

## Discussion

Physicians in several countries have expressed differing views on the importance of diabetes care guidelines. In this study, only half of the physicians and one-third of nurses were familiar with their local guidelines and had them at their disposal. Therefore, a copy of the diabetes guidelines must be made available to every health staff member dealing with diabetes patients and not simply to physicians. The guidelines may directly or indirectly influence the care given by physicians to patients with diabetes (13). A number of studies have shown that the presence of guidelines is not a factor in determining physicians' knowledge and behaviour in the follow-up and treatment of diabetes patients and very few physicians report using them (4,6,14). Rätsep et al. justified this by citing doubts held by some physicians about the guidelines, while others believed that the guidelines had been developed to save costs and not for the benefit of patients (4).

**Table 3 Respondents' self-reported frequency of routine laboratory testing and follow-up examinations based on the Palestinian guidelines for the care of patients with diabetes mellitus**

Test	Total (n = 401)	Physicians (n = 253)	Nurses (n = 148)	P-value
<b>Blood sugar test<sup>a</sup></b>				
1-3 months	94.1	93.2	95.8	0.11
6-12 months	4.6	6.0	2.1	
Never	1.3	0.8	2.1	
<b>Blood pressure<sup>a</sup></b>				
1-3 months	95.4	95.1	95.8	0.33
6-12 months	3.3	4.0	2.1	
Never	1.3	0.8	2.1	
<b>BMI index<sup>a</sup></b>				
1-3 months	46.1	45.0	47.8	0.03
6-12 months	38.5	36.0	42.8	
Never	15.4	18.9	9.3	
<b>Eye examination<sup>a</sup></b>				
1-3 months	14.2	14.1	14.3	0.98
6-12 months	69.8	70.1	69.3	
Never	16.0	15.7	16.4	
<b>Foot examination<sup>a</sup></b>				
1-3 months	53.6	60.5	42.0	0.01
6-12 months	37.6	33.5	44.8	
Never	8.7	6.0	13.3	
<b>HbA1c testing<sup>b</sup></b>				
Monthly	6.8	6.7	6.8	0.28
3-6 months	79.0	79.1	78.8	
Yearly	8.6	7.1	11.0	
Never	5.8	7.1	3.4	
<b>Lipid profile<sup>c</sup></b>				
≤ 6 months	73.4	73.3	73.5	0.78
Yearly	25.1	25.4	24.5	
Never	1.5	1.2	2.1	
<b>Urine for microalbumin<sup>c</sup></b>				
≤ 6 months	73.4	72.7	74.6	0.27
Yearly	16.6	16.1	17.6	
Never	10.0	11.2	7.7	
<b>Creatinine test<sup>c</sup></b>				
≤ 6 months	73.4	73.3	73.5	0.97
Yearly	23.5	23.4	23.8	
Never	3.1	3.2	2.8	
<b>ECG measurement<sup>c</sup></b>				
≤ 6 months	46.8	44.1	51.4	0.38
Yearly	26.1	27.1	24.3	
Never	27.1	28.7	24.3	

Recommended frequency: <sup>a</sup>To be done every visit (per month or 3 months); <sup>b</sup>To be done every 3 to 6 months; <sup>c</sup>To be done yearly.

HbA1c = glycosylated haemoglobin; BMI = body mass index; ECG = electrocardiograph.

Physical examination includes height and weight, vital signs, blood pressure, eye examination, oral examination, cardiovascular including evaluation of pulses and bruits, abdominal examination, foot examination, neurological examination.



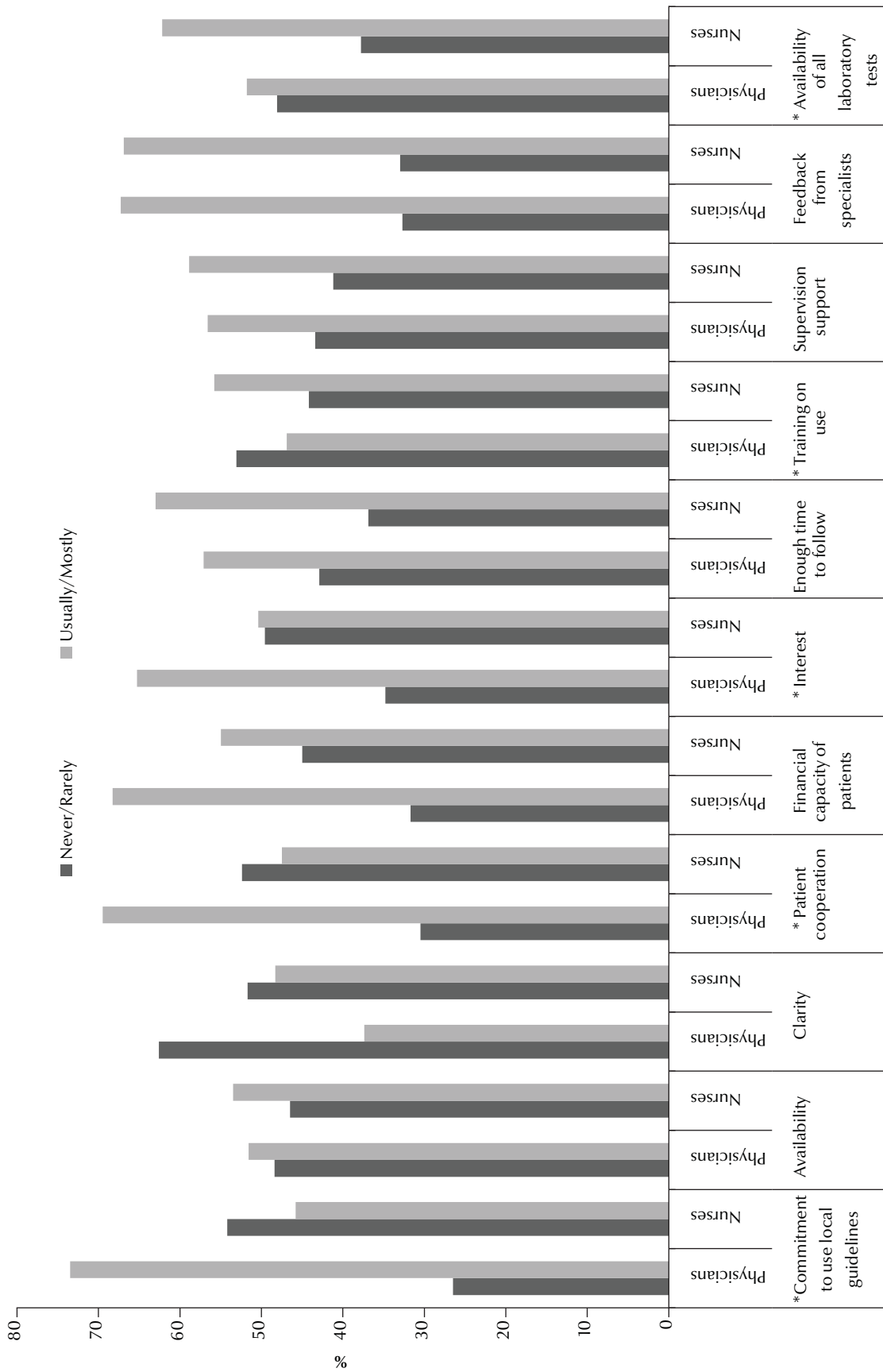


Figure 2 Obstacles to implementation of the Palestinian guidelines for the care of patients with diabetes mellitus according to the surveyed physicians (n =253) and nurses (n =148) (\*P < 0.05)

### Services provided and referral to specialized services

The availability of specialist care services was reported by less than 40% of physicians and nurses in this study; the referral of patients to specialized clinics was not, therefore, as high as might be anticipated. This finding is similar to results found in the study comparing the provision of care for diabetes patients in eastern and western European countries. That comparison showed large inequalities in the use of specialist care services and postgraduate training of physicians and nurses between countries, which ultimately impacts on the provision of services for diabetes patients. These differences were related mainly to poor economic resources and inadequate financial investment in eastern European countries (15,16), a factor that is even more dire in Palestine.

This study found a serious lack of eye examinations at clinics; in particular, there was a problem in accessing ophthalmology services by patients. Only 32.0% of physicians reported having a fundoscope in their clinic and 77.1% reported the need for training on how to perform the test at the clinic. Although 89.3% of physicians said that they referred patients for the examination, only around 70% received ophthalmology reports from those referred annually. This may be justified by the high cost of an eye examination in the ophthalmology clinic; despite being partially covered by the public health insurance and recently added to UN-RWA services, it is not yet accessible in all clinics in the West Bank. Nevertheless, the coverage of ophthalmology reports was better than in other developing countries such as South Africa (13) and India (17) where there are also problems in self-reported compliance with guidelines, but was worse than in other countries such as Estonia (4) and Saudi Arabia (18).

Knowledge about the proper timing for referral of a patient to an

endocrinologist did not vary significantly between physicians and nurses, but referral rates were low. The reasons cited by physicians and nurses varied. A high percentage of physicians believed that there was no need for a patient to consult an endocrinologist, even though an endocrinologist was available in the city. However, many of the nurses believed that this specialization was not available. One possible explanation for not referring patients to an endocrinologist was the belief by physicians that they were doing everything necessary to treat their patients. Another reason could be related to the lack of availability of an endocrinology clinic in the same centre/clinic, which means there would be no insurance cover and therefore high and needless fees for the patient.

Severe foot lesions and foot amputation are a major complication of diabetes. According to the WHO guidelines, "health-care professionals, other than physicians, at PHC level should be trained to identify such individuals and recognize early lesions. Patients with suspected or confirmed abnormalities should be sent for medical consultation" (10). In our study, based on to the local diabetes guidelines, 61% of physicians and 42% of nurses ( $P < 0.05$ ) cited the correct timing of every 1 to 3 months for a regular foot examination. Around 37% of nurses believed that a foot examination should be done yearly or even never. Therefore, nurses require training about foot examinations and the importance of these for ensuring that patients' feet are not neglected and to prevent any unnecessary foot lesions or amputations from occurring.

The most vital test to ascertain the control of diabetes by patients is HbA1c. This study revealed high self-reported compliance to this test by both physicians and nurses (79.0%) every 3 to 6 months. This finding is much better than other countries,

such as Estonia and the USA (4,19), but very similar to general practitioners' practice in South Africa (17).

### Knowledge of and training on use of guidelines

The local Palestinian diabetes care guidelines appear to be used less than they should be. Physicians still relied on their own knowledge, views and expertise in treating their diabetes patients. Physicians and nurses in this survey had graduated from different countries worldwide and the proportion who had been trained on the local guidelines was low (42.7% of physicians versus 23.4% of nurses). Palestinian physicians and nurses who receive training on the guidelines are given a 1- or 2-day workshop; this training is primarily available to staff in the main health care centres. Postgraduate training on diabetes is well established in many countries and specialist training for nurses is being developed (16), but this is not the case in Palestine. The translation of diabetes guidelines into practice is thought to take place through diffusion and partial dissemination strategies (20). The use of local guidelines is only one small strategy to ensure good quality care, but is still an effective tool to improve treatment.

### Self-reported compliance with the guidelines

This study showed that about half of physicians and nurses adhered to 5 out of 11 tests and examinations that should be conducted for the continuity of care for diabetes patients. Older physicians (aged 41–55 years) adhered more to the guidelines than younger physicians (aged 25–40 years or younger). In Estonia, age was not a factor that influenced the use of guidelines (4), but younger physicians in the USA considered diabetes guidelines to be more useful than did older physicians (21). Also, self-reported compliance varied

across the 3 governorates studied in the West Bank [data not reported], although the reason for this variation is not clear.

### Obstacles to implementing the guidelines

The dissemination and implementation strategy of the guidelines could influence the extent of their use. In this study, commitment to the guidelines was reported by more physicians than nurses (73.5% versus 45.0%). When asked what factors might limit the implementation of guidelines, about half of nurses and physicians cited the availability of the guidelines followed by their clarity as major reasons for non-use. Other obstacles included supervision support and feedback from specialists, training and the organization of care such as the availability of laboratory tests. Nevertheless, time constraints and a lack of interest by physicians also played an important role in non-response. Larme and Pugh showed that the attitude of PHC providers towards diabetes was

a major limiting factor in diabetes management (6). Moreover, patient cooperation and financial means were seen as another two reasons that could limit the successful use of these guidelines, especially when a patient requires referral to a specialist.

Finally, diabetes guidelines are not the only source of information for physicians or even nurses, but are one of the strategies that can improve the quality of care. Therefore, it is very important to consider them as a tool to support staff involved in diabetes care, albeit not the sole tool. Also, there are uncertainties in clinical practice that are not taken into account in the guidelines and which should be considered when dealing with diabetes patients.

### Study limitations

Although our study revealed important insights into the reasons why health-care professionals fail to adhere to guideline recommendations, some limitations must be taken into account. The study participants represented those

working in the main centres of the 3 big governorates of the West Bank and who had better access to services. Those working in centres/clinics in villages might have more serious problems with availability of the guidelines and training about them, but they were not included in this study. However, the study still provides valuable information about the compliance and knowledge of both physicians and nurses, particularly the latter, who have more contact with patients and more time to help them. The study highlights the need for improved training of nurses and physicians on the appropriate treatment and follow-up of patients.

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