
# Diabetes mellitus and treatment outcomes in Palestine refugees in UNRWA primary health care clinics in Jordan

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# Diabetes mellitus and treatment outcomes in Palestine refugees in UNRWA primary health care clinics in Jordan

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**Setting:** Six primary health care clinics in Jordan, serving Palestine refugees diagnosed with diabetes mellitus (DM).
**Objectives:** To report on the number and characteristics of new DM patients registered in the second quarter of 2013 and of all DM patients ever registered by 30 June 2013, with treatment outcomes and cumulative burden of late-stage complications.
**Design:** A descriptive cohort study using routine data collected through e-Health.
**Results:** Of the 288 new patients in Q2 2013 and 12 548 patients ever registered with DM by 30 June 2013, smoking, physical inactivity and obesity were recorded in 19%, 50% and 47%, respectively. In Q2 2013, 9740 (78%) patients attended a clinic, with >99% having undergone disease control measures: of these, 72% had postprandial blood glucose ⩽ 180 mg/dl, 71% had blood cholesterol < 200 mg/dl, 82% had blood pressure < 140/90 and 40% had body mass index < 30 kg/m$^2$. Late-stage complications were present in 1130 (11.6%) patients who attended a clinic, with cardiovascular disease and stroke being the most common. Several differences in outcomes were found between males and females.
**Conclusion:** There is a high burden of disease due to DM at primary health care clinics in Jordan. Cohort analysis using e-Health is a vital way to assess management and follow-up.

The United Nations Relief and Works Agency for Palestine Refugees (UNRWA) has been working in the Near East for 62 years, and provides education, health and social services for over 5 million Palestine refugees in Jordan, Lebanon, Syria, the West Bank and the Gaza Strip. Diabetes mellitus (DM) is a major problem among the population it serves. Registered numbers of patients with DM have increased from almost 73 000 in 2005 to 115 000 in 2011, and the current prevalence of DM among persons aged ⩾40 years attending UNRWA health facilities is 11.0%.[1]

In 2012, we reported on the value of cohort analysis and the use of real-time electronic medical record systems at the point of care (e-Health) for monitoring incidence, prevalence and treatment outcomes of Palestine refugees with DM in Nuzha Primary Health Care (PHC) Clinic, Amman, Jordan.[2] The system also allowed a quarterly assessment of clinic performance to be undertaken, and deficiencies were noted in the proportion of patients recorded as having routine measurements of blood glucose, blood pressure, foot examinations and eye care.[2] Following the report, a decision was made to improve the practice and recording of routine clinic measurements and to expand the use of cohort analysis to other PHC clinics that already had e-Health.

The aim of the present study was to use the principle of cohort analysis to report on the burden of DM and treatment outcomes of patients with DM registered at six PHC clinics in Jordan. Specific objectives were to report on 1) the number and characteristics of new patients with DM registered in the second quarter (Q2) of 2013 and of all patients with DM ever registered up to the end of June 2013; and 2) the treatment outcomes of patients ever registered up to the end of June 2013, along with measures of disease control and cumulative burden of disease-related complications, stratified by sex.

## METHODS

### *Study design*

This was a descriptive study of a quarterly and cumulative cohort of patients monitored using an e-Health record system.

### *Setting*

The study was conducted in six PHC clinics in Jordan, a country of 6 million inhabitants that also houses 2 million registered Palestine refugees, of whom 17% live in 10 official camps. UNRWA has 24 PHC clinics in Jordan, and in 2012 served a population of 1 175 021 refugees. The six PHC clinics (Nuzha, Taybeh, Marka, South Baqaa, Baqaa and Suf) situated in or near Amman, the capital city, served 302 539 (26%) refugees in 2012. Each clinic is staffed by up to four doctors and a variable number of nurses; all services are provided free of charge.

### *Persons with diabetes mellitus and their management*

Palestine refugees who attend the clinic are screened annually for DM and 6-monthly for hypertension if they are aged ⩾40 years, at risk of non-communicable diseases (NCDs) or are pre-conception or pregnant women. DM screening is performed by measuring random blood glucose on attendance at the clinic; if it is ⩾126 mg/dl (⩾7.0 mmol/l), then two fasting blood glucose (FBG) measurements are performed within a week, both of which must be ⩾126 mg/dl for diagnostic confirmation of DM.[3,4] Those with FBG between 100 and 125 mg/dl (6.0–6.9 mmol/l) are further screened for DM using an oral glucose tolerance test.[5]

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**KEY WORDS**
diabetes mellitus; Palestine refugees; Jordan; cohort reports; e-Health

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Persons diagnosed with DM are assessed at baseline and annually for additional risk factors for NCDs, late-stage complications and comorbidities such as hypertension, and these along with other patient data are recorded in the e-Health system (see below). Patients are categorised into three main groups: DM type 1, DM type 2 and DM and hypertension, and further classified as new or previously diagnosed.

Patients are managed according to a standard algorithm with diet and lifestyle advice, oral hypoglycaemic drugs (glibenclamide, gliclizide and metformin) and insulin, and are assessed as having controlled or uncontrolled DM, based on monthly or quarterly measurements of 2-h postprandial blood glucose (PPBG). Patients with uncontrolled DM (PPBG > 180 mg/dl) are seen weekly or monthly until their 2-h PPBG declines below the threshold. The follow-up schedule for patients with controlled DM is a clinic visit every 3 months, during which assessments are made of body mass index (BMI), blood pressure, urine for glucose and albumin, measurement of 2-h PPBG and the presence/absence of late complications (blindness, end-stage renal failure [defined as serum creatinine persistently ⩾2.0 mg/dl], myocardial infarction, congestive cardiac failure, stroke and above-ankle amputation). Once a year, all DM patients undergo foot assessments, an ophthalmologist referral and blood tests for total cholesterol and serum creatinine.

### *Electronic Health System at Nuzha Primary Health Care clinic*

The Electronic Health System (e-Health) was set up in 2009 in Nuzha PHC Clinic and piloted for 6 months. The system was then adopted and has been further expanded to other PHC centres. E-Health is currently operational in six UNRWA clinics in Jordan and has been described elsewhere.[2] In brief, clinicians and nurses use password-protected computers that are available in every work station to enter patient information during clinical encounters at the point of care. Patients have a health card and identification number, and these are used to trace the patients' electronic data files at the clinic visits. All computers are connected to a central server where the data are stored.

All DM patients at Nuzha PHC clinic seen since October 2009 have their data entered in e-Health. In the other five clinics, all DM patients seen since mid-2011 have their data entered in e-Health. For patients who died, were lost to follow-up or transferred out before these dates, no data have been entered.

### *Patient population*

All patients with DM who were registered and entered into the e-Health system from October 2009 in Nuzha PHC clinic and from mid-2011 in the other five clinics, up to 30 June 2013, were included in the study.

### *Sources of data, variables, cohort reporting formats and analysis*

Patient data were obtained from the clinic e-Health systems. Variables included age, sex, category of DM, new or previously known diagnosis of DM, smoking status, physical activity, BMI, and, as of 30 June 2013, treatment outcome, measures of disease control and presence or absence of late-stage complications recorded in Q2 2013. The definitions of variables are shown in Table 1.

For the study, the cohorts included new patients registered between 1 April and 30 June 2013 (the quarterly cohort) and all patients ever registered up to 30 June 2013 (the cumulative cohort), with treatment outcomes of the cumulative cohort censored in Q2 up to 30 June 2013. Risk factors, treatment outcomes and late-stage complications were compared between males and females using the $\chi^2$ test, with odds ratios and 95% confidence intervals. Levels of significance were set at 5%.

**TABLE 1** Definitions for the management and recording of patients with diabetes mellitus at six primary health care clinics in Jordan

| | |
|---|---|
| Quarterly and cumulative registrations | |
| New diagnosis | Date of registration within 4 weeks of date of diagnosis |
| Previous diagnosis | Date of registration 4 weeks or later from date of diagnosis |
| Transferred in | Previously registered in another UNRWA clinic and now transferred to the current clinic |
| Smoker | Currently smoking cigarettes from one cigarette per week upwards |
| Physical inactivity | Less than 20 min of exercise three times per week |
| Obesity | Body mass index ⩾30 kg/m$^2$ |
| Hypertension | Blood pressure ⩾140/90 mmHg on two or more occasions in 1 week |
| Cumulative treatment outcomes | |
| Attended the clinic in Q2 2013 | Seen by a doctor or nurse in the clinic during Q2 2013 |
| Did not attend the clinic in Q2 2013 | Not seen by a doctor or nurse in the clinic during Q2 2013 |
| Dead | Died at any time from any cause |
| Transferred out | Permanently transferred out from the clinic to another clinic |
| Lost to follow-up | No clinic attendance in the last 12 months |

UNRWA = United Nations Relief and Works Agency for Palestine Refugees in the Near East.

### *Ethics approval*

Approval for the study was obtained from the UNRWA Headquarters, Jordan, and as this was regarded as a routine programme audit, no local ethics approval was required. Ethics approval for the publication of the study was obtained from the Ethics Advisory Group of the International Union Against Tuberculosis and Lung Disease, Paris, France.

## RESULTS

The number and characteristics of the 288 new patients with DM registered in the Q2 2013 are shown in Table 2. The majority were females, and nearly 90% were aged ⩾40 years; type 2 DM accounted for 98% of all patients, with 60% of these having associated hypertension. There was an almost equal division of new and previously known DM, and transfer-ins were low, at 2%.

The number and characteristics of the 12 548 patients with DM ever registered up to the end of June 2013 are shown in Table 3. Characteristics were similar to those observed for new registrations, except that a higher proportion of patients had associated hypertension, which, among those with type 2 DM, was just over 75%. Additional risk factors identified at the time of registration are shown in Table 4. Nearly 20% of the DM patients were current smokers and 50% were physically inactive, with a significantly higher prevalence of both risk factors in males than females. Nearly 60% of the DM patients were obese, with a significantly higher prevalence in females.

Treatment outcomes and measures of disease control in patients ever registered up to the end of June 2013 are shown in Table 5. The majority (78%) of the patients attended the clinic during the period April to June 2013, with less than 5% having died, been lost to follow-up or transferred out. A sizeable proportion of patients (17%) failed to attend the clinic during the quarter. In males, there was significantly reduced clinic attendance in the quarter, and this was associated with significantly increased

**TABLE 2** Number and characteristics of patients registered with DM at six PHC clinics for Q2, April–June 2013 (quarterly cohort registration), Jordan

| Patient characteristic | Nuzha PHC Clinic *n* | Taybeh PHC Clinic *n* | Marka PHC Clinic *n* | South Baqaa PHC Clinic *n* | Baqaa PHC Clinic *n* | Suf PHC Clinic *n* | All clinics *n* (%) |
|---|---|---|---|---|---|---|---|
| Newly registered with DM | 76 | 50 | 49 | 40 | 62 | 11 | 288 |
| Male | 40 | 21 | 22 | 18 | 22 | 5 | 128 (44) |
| Female | 36 | 29 | 27 | 22 | 40 | 6 | 160 (56) |
| Age group at registration, years | | | | | | | |
| <20 | 1 | 0 | 1 | 0 | 1 | 0 | 3 (1) |
| 20–39 | 8 | 3 | 6 | 4 | 7 | 0 | 28 (10) |
| 40–59 | 45 | 28 | 32 | 27 | 37 | 5 | 174 (60) |
| ⩾60 | 22 | 19 | 10 | 9 | 17 | 6 | 83 (29) |
| Disease category | | | | | | | |
| DM type 1 | 2 | 1 | 1 | 1 | 1 | 0 | 6 (2) |
| DM type 2 | 24 | 17 | 19 | 20 | 32 | 4 | 116 (40) |
| DM type 2 with hypertension | 50 | 32 | 29 | 19 | 29 | 7 | 166 (58) |
| Type of patient | | | | | | | |
| New diagnosis | 29 | 21 | 26 | 27 | 41 | 7 | 151 (52) |
| Previously known diagnosis | 47 | 29 | 23 | 13 | 21 | 4 | 137 (48) |
| Transferred in | 0 | 5 | 0 | 0 | 0 | 1 | 6 (2) |

DM = diabetes mellitus; PHC = primary health care.

**TABLE 3** Number and characteristics of patients ever registered with DM at six PHC clinics up to 30 June 2013 (cumulative cohort registration), Jordan

| Patient characteristic | Nuzha PHC Clinic *n* | Taybeh PHC Clinic *n* | Marka PHC Clinic *n* | South Baqaa PHC Clinic *n* | Baqaa PHC Clinic *n* | Suf PHC Clinic *n* | All clinics *n* (%) |
|---|---|---|---|---|---|---|---|
| Newly registered with DM | 3273 | 1738 | 2263 | 1798 | 2880 | 598 | 12 550 |
| Male | 1515 | 693 | 936 | 757 | 1045* | 237 | 5 183 (41) |
| Female | 1758 | 1045 | 1327* | 1041 | 1835 | 361 | 7 367 (59) |
| Age group at registration, years | | | | | | | |
| <20 | 55 | 32 | 49 | 41 | 49 | 12 | 238 (2) |
| 20–39 | 293 | 204 | 307 | 242 | 325 | 91 | 1 462 (12) |
| 40–59 | 1912 | 1037 | 1386 | 1103 | 1743 | 366 | 7 547 (60) |
| ⩾60 | 1013 | 465 | 521 | 412 | 763 | 129 | 3 303 (26) |
| Disease category | | | | | | | |
| DM type 1 | 84 | 54 | 67 | 67 | 61 | 19 | 352 (3) |
| DM type 2 | 658 | 429 | 628 | 524 | 782 | 133 | 3 154 (25) |
| DM type 2 with hypertension | 2531 | 1255 | 1568 | 1207 | 2037 | 446 | 9 044 (72) |
| Type of patient | | | | | | | |
| New diagnosis | 1028 | 669 | 1198 | 957 | 1951 | 493 | 6 296 (50) |
| Previously known diagnosis | 2245 | 1069 | 1065 | 841 | 929 | 105 | 6 254 (50) |
| Transferred in | 128 | 83 | 27 | 16 | 19 | 3 | 276 (2) |

DM = diabetes mellitus; PHC = primary health care.

**TABLE 4** Additional risk factors recorded at the time of registration in all patients registered with DM at six primary health care clinics, Jordan

| Additional risk factor | All patients *n* (%) | Males *n* (%) | Females *n* (%) | OR (95%CI)* | *P* value |
|---|---|---|---|---|---|
| All patients registered with DM | 12 550 | 5183 | 7367 | | |
| Current smokers | 2 394 (19) | 1869 (36) | 525 (7) | 7.4 (6.6–8.2) | <0.001 |
| Physical inactivity | 6 265 (50) | 3013 (58) | 3252 (44) | 1.8 (1.6–1.9) | <0.001 |
| Obesity (body mass index ⩾30 kg/m$^2$) | 7 347 (59) | 2250 (43) | 5097 (69) | 0.34 (0.32–0.37) | <0.001 |

*OR when males are compared with females, with 95%CI and *P* value when significant.
DM = diabetes mellitus; OR = odds ratio; CI = confidence interval.

non-attendance in the quarter and an increase in death and transfer out. Of those who attended the clinic, ⩾99% had appropriate measurements performed. Of these, 72% had postprandial blood glucose ⩽ 180 mg/dl, 71% had blood cholesterol < 200 mg/dl, 82% had blood pressure < 140/90, but 60% were obese, with BMI ⩾ 30 kg/m$^2$. While the proportion of males and females with blood glucose ⩽ 180 mg/dl was similar, there were gender differences in the other parameters (Table 5).

The cumulative burden of late-stage complications is shown in Table 6. Almost 12% of the patients had one or more late

**TABLE 5** Cumulative cohort treatment outcomes and measures of disease control in patients with DM ever registered at six primary health care clinics, Jordan, up to 30 June 2013

| Treatment outcome | All patients *n* (%) | Males *n* (%) | Females *n* (%) | OR (95%CI)* | *P* value |
|---|---|---|---|---|---|
| All DM patients ever registered up to 30 June 2013 | 12550 | 5183 | 7367 | | |
| Principal outcome on 30 June 2013 | | | | | |
| Attended the clinic in Q2 2013 | 9741 (78) | 3828 (73.9) | 5913 (80.2) | 0.7 (0.6–0.8) | <0.001 |
| Did not attend the clinic in Q2 2013 | 2181 (17) | 1033 (20.0) | 1148 (15.6) | 1.4 (1.3–1.5) | <0.001 |
| Dead | 435 (3.5) | 222 (4.3) | 213 (2.9) | 1.5 (1.3–1.8) | <0.001 |
| Transferred out | 168 (1.4) | 92 (1.8) | 76 (1.0) | 1.7 (1.3–2.4) | <0.001 |
| Lost to follow-up | 25 (<1) | 8 (<1) | 17 (0.3) | 0.7 (0.3–1.6) | |
| Of those who attended the clinic in Q2 2013 | 9741 | 3828 | 5913 | | |
| PPBG measured | 9691 (99) | 3789 (99) | 5902 (99) | 1.1 (0.9–1.1) | |
| PPBG ⩽180 mg/dl | 6278 (65) | 2483 (66) | 3837 (65) | | |
| Blood cholesterol measured | 9724 (99) | 3817 (99) | 5907 (99) | 1.7 (1.6–1.9) | <0.001 |
| Blood cholesterol <200 mg/dl | 6174 (63) | 2715 (71) | 3459 (58) | | |
| Blood pressure measured | 9736 (99) | 3824 (99) | 5912 (99) | 0.8 (0.7–0.9) | <0.001 |
| Blood pressure <140/90 | 8469 (87) | 3274 (86) | 5195 (88) | | |
| BMI measured | 9741 (100) | 3828 (100) | 5913 (100) | 2.9 (2.7–3.1) | |
| Non-obese (BMI <30 kg/m$^2$) | 3854 (40) | 2102 (55) | 1752 (30) | | <0.001 |

*OR when males are compared with females, with 95%CI and *P* value when significant.
DM = diabetes mellitus; OR = odds ratio; CI = confidence interval; PPBG = postprandial blood glucose; BMI = body mass index.

**TABLE 6** Cumulative complications in patients with DM ever registered at six primary health care clinics, Jordan, up to 30 June 2013

| Complications of DM | All patients *n* (%) | Males *n* (%) | Females *n* (%) | OR (95%CI)* | *P* value |
|---|---|---|---|---|---|
| Attended the clinic in Q2 2013 | 9741 | 3828 | 5913 | | |
| One or more late complications | 1130 (11.6) | 559 (14.6) | 571 (9.7) | 1.6 (1.4–1.8) | <0.001 |
| Myocardial infarction | 446 (4.6) | 277 (7.2) | 169 (2.9) | 2.6 (2.2–3.2) | <0.001 |
| Congestive cardiac failure | 422 (4.3) | 162 (4.2) | 260 (4.4) | 0.96 (0.8–1.2) | |
| Stroke | 319 (3.3) | 149 (3.9) | 200 (3.4) | 1.2 (0.9–1.4) | |
| Blindness | 48 (0.5) | 22 (0.6) | 26 (0.4) | 1.3 (0.7–2.3) | |
| End-stage renal disease | 26 (0.3) | 17 (0.4) | 9 (0.15) | 2.9 (1.3–6.6) | <0.01 |
| Above-ankle amputation | 22 (0.25) | 9 (0.24) | 13 (0.22) | 1.1 (0.5–2.5) | |

*OR when males are compared with females, with 95%CI and *P* value when significant.
DM = diabetes mellitus; OR = odds ratio; CI = confidence interval.

complications of disease, with cardiovascular disease and stroke being the most common. Complications, particularly myocardial infarction and end-stage renal disease, were significantly more common in males.

## DISCUSSION

This report from six UNRWA PHC clinics in Jordan, using cohort analysis and e-Health, shows the quarterly and cumulative burden of DM. Altogether, over 12000 patients with DM were registered; as nearly 300 new patients were registered in Q2 2013, the predicted additional caseload each year is over 1000 patients. This is valuable information for the clinics, as it enables them to plan accurately for an ever increasing burden of patients in terms of logistics, laboratory reagents, drugs and staffing levels. About half of the patients were newly diagnosed, confirming the importance of regular annual screening for DM carried out at UNRWA clinics. Furthermore, as a large proportion of patients with DM had associated hypertension, this needs to be screened for routinely at the same time, and attention should be paid to the management of both diseases in the same person.

It was of concern to see the high proportion of patients with additional risk factors for NCDs such as cigarette smoking, physical inactivity and obesity, with over one third of males being smokers, 60% of males being physically inactive and 70% of females being obese. There are ways to help people to quit smoking,[5–10] or to improve physical activity and reduce obesity,[11–14] and considerations are needed about introducing these at UNRWA clinics along with appropriate sex specificity and annual monitoring.

It was encouraging to see that nearly 80% of patients who were ever registered in the clinics attended in Q2 2013 for follow-up, although the results were better for females than males. Less than 5% of patients had died, been lost to follow-up or transferred out, suggesting an overall good patient management and tracking system.[15] We have previously discussed the need for a more proactive approach to getting patients to attend clinic on a quarterly basis, which includes the use of mobile phones.[2,16] This has yet to be done on a routine basis either in Jordan or, as far as we know, elsewhere in diabetes clinics, but it might help in reducing the proportion of patients, particularly males, who fail to attend their quarterly scheduled visit. Of those who attended the clinic in Q2 2013, it was also encouraging to see that in almost all patients, males and females, specific measurements of disease control were performed, and this was a significant improvement in what was recorded in Nuzha PHC the year before. Although just over 70% of patients achieved a blood glucose or total cholesterol below the established threshold, about 30% had blood glucose or cholesterol levels that were too high and needed more aggressive treatment.

Finally, just over one in 10 patients had developed late-stage complications, with cardiovascular disease and stroke being the most common. Males were more affected than females, likely due to a higher prevalence of additional risk factors. With over 40000

patients with DM in UNRWA clinics in Jordan and over 120 000 in UNRWA clinics in the region (Jordan, Syria, Lebanon, Gaza Strip and the West Bank),[17] this extrapolates to a large number of patients with chronic disability needing long-term additional medical and community care; how well this happens requires further operational study.

The strengths of this study are the large number of patients registered for care, which from the six clinics constitutes over one quarter of UNRWA's DM patients in Jordan. The findings are therefore probably representative of the situation in the country. Although when e-Health was first used for cohort analysis in 2012, the issue of incomplete recording practices was raised,[2] 1 year later the e-Health systems were in good working order, with data that were clean and ready for immediate use. The study also followed STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines for the reporting of observational data.[18] Study limitations are mainly related to the use of already collected data, which may be wrongly entered or inaccurate. Patients who transfer in or out risk being counted twice; however, in both quarterly and cumulative cohort analyses these numbers were small and unlikely to impact on the overall findings.

The implications of the study are clear. First, it endorses the use of e-Health and cohort analysis for monitoring and managing patients with DM and hypertension, and adds to the growing body of literature supporting the use of this method in Jordan and other countries for NCDs.[19,20] Second, e-Health also enforces adherence to UNRWA technical guidelines, as it is impossible to move from the current to the next screening page without completing the requested assignments, and we feel that this is partly responsible for the excellent performance of disease control measurements seen in Q2 2013. Nevertheless, it needs to be asked whether PPBG is the best monitoring method or whether this could be replaced by glycated haemoglobin, which is more convenient and reliable as a measure of diabetes control, although more costly.[21] Third, the best ways of reducing the quarterly clinic attendance failures need to be determined and implemented. Finally, further operational research into how patients with complications and disability are faring in the community is needed.

In conclusion, this study shows the high burden of disease from DM at PHC clinics in Jordan and endorses the use of cohort analysis through e-Health. Patient management and follow-up were satisfactory, but more needs to be done to ensure better quarterly clinic attendance.

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**Contexte :** Six dispensaires de soins de santé primaires en Jordanie, au service de réfugiés palestiniens chez qui a été porté le diagnostic de diabète sucré (DM).

**Objectifs :** Faire rapport sur le nombre et les caractéristiques des nouveaux patients atteints de DM, enregistrés au cours du deuxième trimestre 2013 et sur l'ensemble des patients DM enregistrés jusqu'au 30 juin 2013, y compris les résultats finaux du traitement et le fardeau cumulatif des complications tardives.

**Schéma :** Etude descriptive de cohorte au moyen de données de routine colligées grâce au système électronique d'enregistrement de la santé (e-Health).

**Résultats :** Au cours du deuxième trimestre 2013, 288 nouveaux patients ont été enregistrés ; au total 12 588 patients avaient été enregistrés comme DM au 30 juin 2013. On a enregistré le tabagisme, l'inactivité physique et l'obésité respectivement chez 19%, 50% et 47% des patients. Au cours du deuxième trimestre 2013, au total 9740 patients (78%) sont venus au dispensaire et chez plus de 9% de ceux atteints par la maladie, on a recouru à des mesures de contrôle : parmi ceux-ci, 72% avaient un glucose sanguin postprandial $\leqslant$ 180 mg/dl, 71% un cholestérol $<$ 200 mg/dl, 82% une pression artérielle $<$ 140/90 et 40% un index de masse corporelle $<$ 30 kg/m$^2$. On a noté des complications tardives chez 1130 (11,6%) des patients fréquentant le

dispensaire ; les plus courantes d'entre elles étant des maladies cardiovasculaires et des accidents vasculaires cérébraux. On a trouvé quelques différences de résultats finaux entre les hommes et les femmes.
**Conclusion :** Dans les dispensaires de soins de santé primaires de Jordanie, le fardeau des DM est élevé. Une analyse de cohorte utilisant e-Health est une manière importante pour évaluer leur prise en charge et leur suivi.

**Marco de referencia:** Seis consultorios de atención primaria en Jordania, a los cuales acuden los refugiados palestinos con diagnóstico de diabetes sacarina (DM).
**Objetivos:** Notificar el número y las características de los nuevos pacientes registrados con diagnóstico DM en el segundo trimestre del 2013 y de todos los pacientes registrados alguna vez por DM hasta el 30 de junio del 2013, los desenlaces terapéuticos y la carga de morbilidad acumulada por complicaciones de la fase tardía de la enfermedad.
**Métodos:** Se llevó a cabo un estudio descriptivo de cohortes, a partir de los datos recogidos mediante el sistema de registro electrónico en el punto de atención (e-Health).
**Resultados:** En el segundo trimestre del 2013 se registraron 288 casos nuevos de DM y el total de casos registrados alguna vez, hasta el 30 de junio del mismo año, fue 12 548. En 19% de los pacientes se registró tabaquismo, en 50% inactividad física y en 47% obesidad. Durante el segundo trimestre del 2013, acudieron al consultorio 9740 pacientes (78%) y en más del 99% de los casos se practicaron medidas de seguimiento de la enfermedad, cuyos resultados fueron los siguientes: 72% presentaron una glucemia posprandial $\leqslant$ 180 mg/dl, en 71% la colesterolemia fue $<$ 200 mg/dl, en 82% la tensión arterial fue $<$ 140/90 y en 40% el índice de masa corporal fue $<$ 30 kg/m$^2$. Se encontraron complicaciones de fase tardía de la DM en 1130 de los pacientes que acudieron al consultorio (11,6%), de las cuales las más frecuentes fueron la enfermedad cardiovascular y el accidente cerebrovascular. Se observaron varias diferencias en los desenlaces clínicos entre los hombres y las mujeres.
**Conclusión:** Existe una alta carga de morbilidad por DM en los consultorios de atención primaria de salud en Jordania. El análisis de cohortes mediante el sistema e-Health constituye un método primordial de evaluación de los tratamientos y el seguimiento clínico.

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