ORIGINAL REPORT

Medicine utilisation review in selected non-governmental organisations primary healthcare clinics in the West Bank in Palestine

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SUMMARY

Background   Information on prescribing practices in Palestine is lacking, however, still essential for strategic planning.
Purpose   To characterise prescribing patterns and specific medicine use indicators in selected non-governmental organisations' (NGO) primary healthcare clinics/centres (PHC) in the West Bank (WB) in Palestine.
Methodology   A prospective cross-sectional survey of prescribing practices based on medical records of 6032 patients with acute symptoms frequenting 41 NGO PHCs in the WB, between July and September 2004. A systematic random sample of every 10th patient appearing on the patient registration list was selected. Direct observation of consultation and dispensing practices and times in a sub-group of patients was completed utilising special forms.
Results   Respiratory tract infections were the most commonly occurring conditions. On average, 1.9 drugs were prescribed per encounter and antibiotics were the most commonly prescribed medications, followed by Analgesics and NSAIDs accounting for 46 and 20% of the total medications expenditures, respectively. Injections and combined medications use per encounter was 16 and 8%, respectively. Most commonly prescribed medications were of local production. Consultation (6.4 ± 4.6 minutes) and dispensing times (1.6 ± 1.5 minutes) were short with inadequate labelling. Provision of reference sources and treatment guidelines implementation were also inadequate.
Conclusion   The results suggest that prescribing practices could be improved through wider implementation of treatment guidelines, a review of antibiotic prescribing, and increased time spent with patients to promote concordance. Strategies aimed at improving prescribing and dispensing practices should be addressed through new innovative capacity building models based on problem solving and feedback mechanisms. Copyright © 2008 John Wiley & Sons, Ltd.

INTRODUCTION

The promotion of rational use of medicines (RUM) is a core component of the World Health Organisation's

(WHO) policy that all countries need to address. The Palestinian health system is an embryonic one with multiple complexities. Health services are provided through four main actors: (a) the Ministry of Health (the public sector), providing primary and secondary care, with 56% of the population being covered by a public health insurance scheme with minimal premiums and high out-of-pocket payments to the private

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sector sometimes for quality care or care that is unavailable within this sector; (b) the non-governmental organisations (NGOs), providing primary, secondary and tertiary health care at low costs for all the population; (c) the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), providing primary health care (PHC), free-of-charge, to Palestinian refugees only; and (d) the private sector, accessible to the better-off classes of the population. The Palestinian Ministry of Health (MOH) implemented the first essential drug list (EDL) and EDL-Formulary in 2000 and 2002, respectively. Procurement processes are now tied to the EDL and all health workers at the MOH have received appropriate training. In the NGOs, strong efforts were made to rationalise the use of medications and each NGO has its own EDL. Procurement and selling polices differ between the various NGOs, where patients pay higher prices for the medications prescribed than for those available at the MOH but lower than for those prescribed at the private sector. The impact of these initiatives, however, on RUM has not been fully evaluated, largely because of the prevailing unstable political situation.

Existing evidence, mostly from the public sector, indicates that irrational prescribing is an ongoing problem in Palestine. Over-prescribing of antibiotics and of non-steroidal anti-inflammatories (NSAIDs) has been identified.[1–3] Also, short consultation and dispensing times have been reported, suggesting suboptimal patient management.[1,3] Based on the WHO medicine use indicators,[4] the aim of this study is to characterise prescribing patterns and provide information relating to specific medicine use indicators in NGO PHC clinics in the West Bank (WB). This will provide much-needed baseline information on how to develop strategies for improving medicine use across all healthcare sectors.

METHODS

Study setting and sample

A prospective cross-sectional survey was conducted in the WB between July and September of 2004. A total of 6032 patients' records were selected out of 41 NGO PHCs clinics. The clinics were conveniently selected to include those visited as part of another project, in order to facilitate access. Those clinics represented different geographical location, type of care provision and patient load. Every 10th patient appearing on the patient registration list, with acute symptoms, was systematically selected by the attending physician/nurse with 2–3 patients per day for a period of 3 months (a minimum of 150 cases over 3 months was acceptable). The fieldworkers (research trained pharmacists) visited the clinics on monthly basis and monitored the sampling process. Patients were selected from the 41 clinics in the first month. Subsequently three clinics withdrew (one because of internal administrative changes, one because the physician in charge left the clinic, and one because the physician declined to be monitored for the full period). Data from these clinics was included in the final analysis as no bias was evident.

The actual sample size was 6032 cases/patients referred to from this point as 'encounters', in accordance with the WHO indicators. It was important to involve more encounters from more facilities than WHO requires in order to obtain a full picture as possible per individual NGO and to take into account the likelihood of missing information in some encounters.

Data collection

Patient information. A prepiloted data collection form was used to ensure that information was recorded in as complete and consistent manner as possible, given variable recording practices. The parameters recorded from patients files were: name and file number; sex; age; type of visit (first visit or follow-up); main symptoms; diagnosis according to ICD10 (primary and secondary); medication(s) prescribed (number, brand and generic names, dosage form, strength, dosage, duration and cost price); specific remarks/concerns about the patient (i.e. allergies, pregnancy, chronic diseases, etc.). Medications were categorised into their relative therapeutic groups, according to BNF classification, as a percent of the total prescribed medications in all the encounters.

Medicine use indicators

Prescribing indicators. Prescribing indicators for 6032 encounters—drawn primarily from the WHO core medicine use indicators list[4] (Box 1)—were calculated from the collected forms mentioned above, together with percentage of encounters with analgesic and NSAIDs prescribed and cost. Country of origin of the medications prescribed was also recorded

as it may affect procurement policy and availability of medications.

Box 1: Selected medicine use indicators (WHO) used in this study.

Prescribing indicators:
1. Average number of medicines per counter = total medications prescribed/total number of encounters.
2. Percentage of drugs prescribed by generic name = number of medications prescribed by generic name/total prescribed medications × 100%.
3. Percentage of encounters with antibiotic prescribed = number of patients encounters given antibiotics/total number of encounters × 100%.
4. Percentage of encounters with injection prescribed = number of patients encounters with injections/total number of encounters × 100%.

Patient care indicators:
1. Average consultation time = total time for several consultations/number of consultations.
2. Average dispensing time = total time for several dispensing/number of dispensing encounters.
3. Percentage of drugs adequately labelled = number of drugs accurately labelled/total dispensed × 100%.

Health facility indicators:
1. Availability of copy of essential drugs list and formulary = yes, no %.
2. Percentage of medicine costs spent on specific therapeutic groups (antibiotics, NSAIDs).

Complementary medicine use indicators
1. Average medicine cost per encounter.
2. Percentage of medicine costs spent on antibiotics.

Patient care indicators. The fieldworkers used a special checklist developed to directly observe a selected sub-group of encounters from the larger sample (every 3rd patient presenting at the time of fieldworker's visit) and recorded: physician consultation time for 119 patients; dispensing time and pharmacist counselling provided for 108 patients and adequacy of written medication labelling was checked upon exiting the clinic. Four criteria were checked and considered adequate if 3/4 criteria met: patient name, medication name, administration details and medicine expiry date.

Healthcare facility indicators. The fieldworkers visited the 41 clinics and recorded the availability (checked and seen) and usage of the EDL, a formulary, specific disease treatment guidelines and general medical references through directly asking the practitioners about usage in addition to monitoring during consultation. References older than 5 years were not accounted for.

Data handling and analysis

The study was approved by the Institute of Community and Public Health Council, Birzeit University, and the NGOs where the study was completed. Permission to conduct the study was granted from the various parent organisations and/or the clinic head physician. All study participants were provided with written information regarding the study objectives and methodology.

Written instructions on completing the form were provided to practitioners. During monthly visits, fieldworkers provided support, collected forms and checked completeness and validity of data (random sample of forms checked against original records).

Patient names were removed from final records to ensure anonymity and information was stored in a password-protected database to ensure confidentiality of all patient and healthcare staff information.

Cost calculations were based on cost price and expressed in New Israeli Shekel (NIS, 1 USD = 4.5 NIS).

Data were coded, entered into a database (SPSS v15), analysed using descriptive statistics and presented as numbers, frequencies or proportions as appropriate, with central tendency as mean and/or median.

RESULTS

Patient information

Demographic data. Results are presented from 6032 patient encounters. The percentage of women (51%) and children under the age of 15 (48%) was consistent between all clinics with average age of 27 ± 10.2 years and in accordance with the demographic structure of the Palestinian population.[5] Eighty nine percent of encounters were a first visit, 9% were a first follow-up (within 1 week) and 2% repeat follow-up for an acute condition.

Diagnosis. Respiratory tract infections (upper 31% and lower 5%) were the most commonly occurring conditions, with pharyngitis making up 17%, unspecified upper respiratory tract infections 6%, otitis media 4% and bronchitis 3% of respiratory tract

infections. Other conditions included musculoskeletal 10%, non-infected dermatological 9%, and urinary tract infections 8%, of all cases.

Medications prescribed. A total of 11 570 medications were prescribed for the selected encounters, of which 11 426 were analysed (76—details not recorded; 68—illegible) according to therapeutic category (Table 1). Antibiotics accounted for 33% of all medications and were mostly wide spectrum antibiotics (amoxicillin, cephalexin, co-amoxiclav and cotrimoxazole) of which co-amoxiclav comprises the highest cost (Figure 1). Others were a mix of first, second and third generation antibiotics. Antibiotics (37%) were prescribed for children under 5 years and about 15% for patients with infections of likely viral origin (bronchitis, influenza, common cold).

Analgesics and anti-inflammatory agents accounted for 29% of the total prescribed medications and paracetamol, diclofenac and ibuprofen were prescribed most commonly. Corticosteroids made up a further 6% and other classes constituted the remaining 32% (Table 1).

The drugs most commonly administered by injection were dexamethasone and diclofenac given in a single dose for the relief of acute pain, arthritis, muscle or joint pain. Combined medications (containing more than one active ingredient) were prescribed in 8% of the encounters and included GI medications (3%), dermatological (1.6%), analgesic/muscle relaxants (1.1%), anti-cough preparations (1%).

Medicine use indicators

Prescribing indicators. No medication was prescribed in 303/6032 encounters (5%), 290 of whom were referred to other specialists, admitted to hospital or underwent minor medical procedures such as dressing or casting.
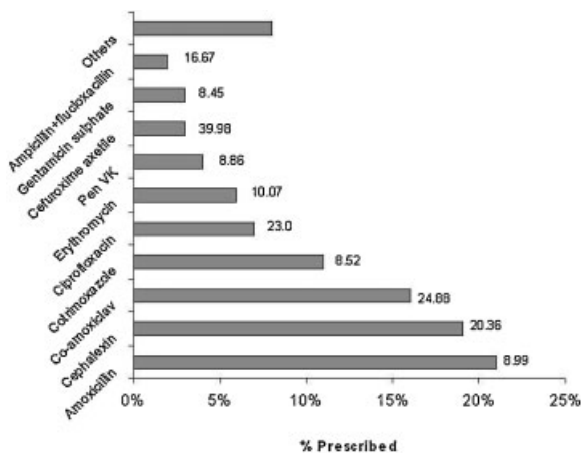

Figure 1. The top 10 prescribed antibiotics in all encounters with their average cost in NIS ($n = 3760$)

The average number of drugs prescribed per encounter was $1.9 + 1.1$, with an average cost of $25.1 + 14.9$ NIS (about \$5) (Table 2). Generic prescribing represented 24% of all medications prescribed, mainly amoxicillin, diclofenac and paracetamol. Antibiotics were prescribed in 59% of encounters, with more than one antibiotic prescribed in 3% of encounters and antibiotics accounted for 46% of total medicine costs. Analgesics and NSAIDS were prescribed in 48% of encounters, accounting for 20% of medicine costs. Medication administered by injection was prescribed in 16% of encounters with only 4% out of these injections were antibiotics (Pen VK as prophylactic). Analysis of those indicators per NGO was consistent with the general results and was shared and discussed with each NGO administration and staff individually.

Patient care indicators. The average consultation time was 6 minutes (range 2–15 minutes, $n = 119$ patients) and average dispensing time 1.7 minutes (range 0.5–3 minutes, $n = 108$) (Table 3). Labelling of

Table 1. Therapeutic classes of prescribed medications in the West Bank

Therapeutic classes	Value (%) ($N = 11\,426$)	Most commonly prescribed medications
Antibiotics	33	Amoxicillin, cephalexin, cotrimoxazole, co-amoxilav
Analgesics and NSAIDs	29	Paracetamol, diclofenac Na; ibuprofen
Corticosteroids	6	Dexamethoasone, prednisone
Anti-amoebic/anthelmintics	4	Metronidazole
Anti-histamines	3	Chlorphineramine, promethazine
GI medications	3	Ranitidine, ORS
Asthma medications	3	Salbutamol
Others*	19	—

*Others include: multivitamins, dermatologicals, anaesthetics, antiseptics, sedatives and hypnotics, anti-convulsants, combined medications.

Table 2. Prescribing indicators in the study, 6032 encounters based on patients' records

Prescribing indicator	Value
Average number of medicines per encounter ($N = 6032$)	$1.9 + 1.1$
Cost per encounter (NIS) ($N = 6032$)	
Mean + SD	$25.1 + 14.9$
Median	19
% Generic prescribing ($n = 11\,570$)	24
% Encounters antibiotic prescribed ($n = 6032$)	59
% Medicine costs on antibiotics ($n = 11\,426^*$)	46
% Encounters with > 1 antibiotic prescribed ($N = 6032$)	3
% Encounters with injection prescribed ($n = 6032$)	16
% Encounters with analgesic/NSAID prescribed ($N = 6032$)	48
% Medicine costs on analgesics/NSAIDs ($N = 11\,426^*$)	20

$N =$ number of encounters.
$n =$ number of prescribed medications (*missing data on 144 drugs).
NIS: New Israeli Shekel.

the dispensed medications was considered adequate in only 60% of encounters and the details most often omitted were patient name and medicine expiry dates. Medication use was always written and expressed numerically (e.g. 1×3). Upon excluding the expiry date from analysis, 50% of the medications dispensed were adequately labelled with the other three criteria (name of the patient, name of the medication and usage). Counselling during consultation and/or dispensing was minimal, and generally confined to very basic instructions for use (e.g. 'one tablet three times daily').

Health facility indicators. From the 41 clinics participated in the study, 45% had an EDL and were operated jointly with the MOH or were part of a larger

Table 3. Patient care indicators in the observed patients (119 consultations, 108 dispensing encounters)

Patient care indicator	Value
Consultation time (minute, $n = 119$)	
Mean + SD	$6.4 + 4.6$
Median	5.0
Dispensing time (minute, $n = 108$)	
Mean + SD	$1.7 + 1.5$
Median	1.1
% Patients receiving drugs adequately labelled* ($n = 108$)	60

*With three out of four criteria being adhered to: name of the patient, name of the medication, usage, expiry date.

Table 4. Health facility indicators in the 41 clinics participated in the study

Health facility indicator	%
Availability of EDL ($n = 41$)	45
Availability of medical references ($n = 41$)	81
Usage of medical references ($n = 33$)	91
Availability of treatment guidelines ($n = 41$)	50
Usage of treatment guidelines ($n = 20$)	68

NGO. However, even where present, the EDL was not expressed as the generic medicine name and was used only for purchasing orders.

In most clinics, the only reference source available was that provided at the field visits.[6] Only half of the clinics had access to treatment guidelines or protocols, and around two-thirds of those with access stated that they were used in practice (Table 4).

Local production sources accounted for 77% of the drugs prescribed, the remainder being of Israeli (12%) or international origin (11%). The top 10 prescribed medications for acute cases are produced locally such as amoxicillin, cephalexin, co-amoxiclav, cotrimoxazole, paracetamol, diclofenac Sod, Ibuprofen, dexamethasone, salbutamol and metronidazole. Primary cost analysis for the most commonly prescribed medications showed that the average cost for local products was lower than the other sources (Table 5).

DISCUSSION

This is the first study conducted in the WB at the NGOs primary care level describing patients frequenting clinics for acute cases/symptoms. Patients with chronic diseases such as CVD and diabetes attend to specialty clinics with separate registration files to facilitate follow-up and medication dispensing process. The study sample of 6032 acute encounters exhibited demographics, conditions and medicines prescribed, consistent with reports describing the public sector in Palestine and other countries.[2,3,7–9]

Table 5. Average cost of selected most commonly prescribed medications according to type of production in NIS*

Medication prescribed	Local (NIS)	International (NIS)	Israeli (NIS)
Amoxicillin	8.8	9.2	13.6
Co-amoxiclav	23.6	30.8	27.2
Cephalexin	17.3	34.2	14.3
Diclofenac Sod	8.8	13.5	10.0
Paracetamol	4.9	5.6	7.4

*1 NIS = 4.5$

Infections were the most common presenting condition; particularly respiratory tract infection followed by musculoskeletal and dermatological disorders to a lesser extent. This morbidity pattern was similar to the annual reports published by those NGOs reflecting the high prescribing patterns for antibiotics, analgesics and anti-inflammatories.

Upon comparing the obtained results with similar studies from other developing and developed countries where high prevalence of patients with acute symptoms are frequenting general clinics with a main complaint of respiratory infections, the mean number of medications prescribed of 1.9, was somewhat lower than what was reported in a number of other similar studies (Uzbekistan 2.9, Jordan 2.3, Cambodia 2.3, Burkina Faso 2.3, Iran 4.4, Pakistan 4.1, India 3.2).[8,10–15] This indicates lower poly-pharmacy and possible adherence to some of the RUM concepts. Generic prescribing was lower than reported in other countries (Uzbekistan 38%; Cambodia 99.8% and India 46%),[8,11,15] although physicians are aware of its importance, yet, quality of available generics remain questionable to them. Moreover, enforcement of generic prescribing is inadequate. Therefore, generic prescribing should be actively promoted to facilitate rational and cost-effective prescribing practices through addressing the above-mentioned points. Medication costs appear low, but these were based on the cost price and do not reflect the selling price to the patient, but the cost to the country as part of the GDP spent on health. Given the current high levels of unemployment (26%)[5] and poverty (67%) in Palestine,[16] medicine costs are likely to present a significant financial burden to patients.

Antibiotics were the most commonly prescribed therapeutic class, as reported in other countries where high prevalence of infection was reported.[10,11,13,15,17,18] Over-prescribing was evident particularly for children and in cases where the infection was of likely viral origin with common prescribing of the first generation and wide-spectrum antibiotics, which are locally produced and less expensive than others, such as amoxicillin, cephalexin and cotrimoxazole, as described in Iran, USA and Croatia.[13,18,19] Second generation antibiotics (co-amoxiclav and ciprofloxacin) use was relatively high, adding to costs and potentially affecting resistance patterns.[19,20] It is interesting to find that a second oral antibiotic was never prescribed; and only in 3% of the cases, only ointments and eye drops containing antibiotics were prescribed instead. Factors affecting the initial decision to prescribe (e.g. patient pressure to prescribe and patients expectations,[21,22] patient load—where it is easier and faster to prescribe to end the consultation,[23] and physician–patient relationship)[24,25] and subsequent selection of antibiotic require further research before a decision is made to limit antibiotic prescribing. Most importantly, microbial resistance patterns for the most commonly prescribed antibiotics should be identified in Palestine. This would facilitate developing evidence-based treatment guidelines.

Analgesics and NSAIDs were generally prescribed with other medication as reported locally[26] and internationally.[9,27] Although this use was considered low compared to adjacent countries such as Saudi Arabia (51%) and Iran (63%)[9,13] still there is a room for further reduction in utilisation, provided appropriate diagnosis confirmed. It is important to analyse 'what was prescribed' against the 'identified diagnosis' if we would promote rational use of medications and support developing new policies that would change practices. Corticosteroid preparations were also used commonly as first-line medication, generally in combination with diclofenac sodium injections, for all types of pain, including toothache. It is unlikely that such use of corticosteroids can be justified and may lead to masking of symptoms.[26] The use of combined preparations was lower than reported elsewhere[15] and the use of injection at those clinics was considered low compared to other countries[8,13,14,17] but still higher compared to other developing countries.[10,11,15] This somewhat low use of combined medications and injections could be explained by the 'transfer effect' of some regulations at the public sector limiting the use of these dosage forms at the primary care level unless for specific indication. However, ways of minimising the use of these categories need to be explored further.

The high level of use of medicines produced locally, which is also found to be cheaper, is encouraging and should help facilitate evidence-based medicine that is also cost-effective along with focusing on the guidelines implementation for the identified acute cases in this study.

Consultation and dispensing times were found to be very short, although longer than what is reported locally in the public sector clinics with similar case load (1–2 minutes for consultation and less than 1 minute for dispensing).[1,3] Similar findings were reported in Cambodia[11] and Jordan.[28] In India,[15] consultation time was shorter; however, this has been compensated for with longer dispensing time. Short time spent with the patient may contribute to suboptimal patient management leading to reduced quality of care provided and could lead to multiple

KEYPOINTS

- Medicine use indicators at the NGOs clinics in Palestine showed sub-optimal practices in medications prescribing, consultation and dispensing with over-prescribing of antibiotics followed by analgesics and NSAIDs accounting for 46 and 20% of the total medications expenditures, respectively.
- Utilising the Ministry of Health EDL and formulary to develop and unify the various EDLs available at each NGO.
- Advanced training on RUM including medicine management cycle and logistics is required to focus on prescribing, dispensing and patients' indicators. This capacity building program should focus on the most commonly used/overused medications such as antibiotics and NSAIDs.
- Devising a reporting/registration system that would facilitate reliable data collection for medicine use indicators, which should also be institutionalised through creating a platform for sharing experiences and discussing the collected indicators from various facilities. This would improve practices and improve quality of care provided.
- The need for a well-structured infield supervision based on problem solving and feedback mechanisms to implement proposed strategies for improvement.

re-consultations. In addition, short counselling times, could affect patient satisfaction leading to further 'shopping around' for health care at other healthcare providers.[24,29,30] Clear, standardised and focused messages on usage, possible interactions and side effects should be given to patients during consultation and dispensing. Appropriate labelling of medications dispensed is essential for patient adherence to treatment, however, this study showed that labelling practices were not adequate which, from observation, could be due to patient over-load and unavailability of the dispensing paper bags where appropriate information/instructions could be written.

It has to be mentioned that this study indicated that routinely collected patients' records could be useful for retrospective surveys provided the implementation of a unified and complete filing systems. These findings also provide evidence of the need to implement strategies and treatment guidelines to regulate prescribing and dispensing practices, especi-

ally for antibiotics. Schemes should be devised to promote longer patient consultation, possibly through widening professionals' knowledge in counselling and introducing an appointment system. Implementation of new strategies could be achieved through applying appropriate infield training programs associated with user friendly monitoring and supervision tools.

The prospective study may be biased due to 'the Hawthorn effect' but this is likely to diminish over time. Moreover, examination of a small retrospective sample from the records showed the same trends. Even if there was an observational bias and increase awareness of prescribers and dispensers for RUM practices through the monthly visits, over-prescribing was evident and the true extent of this is likely to be worse than observed. The study sample size was limited by the withdrawal of three clinics after 1 month, but there was no evidence of under-representation of particular patient, disease or medications sub-groups. Another limitation was missing or poor hand-written data, but this affected a very small proportion of the data and is common in this type of studies.[9,31] Results obtained in this study should not be generalised to other types of health facilities or NGOs not participating in this study, although previous work in the public sector showed same trends in over prescribing and similar top ten prescribed medications. Moreover, it is important to note that seasonal variations were not examined as data collection was restricted to 3 months of the year only, however, and concerning antibiotic use specifically, the high prescribing patterns detected during summer could indicate a much higher prescribing patterns during winter.

In conclusion, in this large cross-sectional survey of prescribing for acute conditions, respiratory tract infection was the most common condition treated and this was reflected in the high number and cost of antibiotics prescribed. There was considerable evidence of sub-optimal prescribing practices, with little application of individual NGO EDL and formulary, lack of use of evidence-based treatment guidelines and lack of time spent in consultation and dispensing.

Strategies to improve medicine use are urgently required to avoid waste of scarce resources and to optimise patient care and the overall quality of healthcare in the WB. Study results have already been disseminated through a series of workshops to get consensus on the key findings and to identify areas needed for change in practice. A robust filing and reporting system accompanied with capacity building activities based on problem solving and feedback mechanisms are essential to underpin current practices.

CONFLICT OF INTEREST

None

REFERENCES

1. Obeidallah W, Mahariq M, Barzeq H, *et al*. *Drug Situation Analysis for the West Bank and Gaza Strip*. World Health Organisation: Switzerland, 2000, 28. WHO/EDM/DAP/2000.1.
2. Khatib R. *A review of antibiotic use and policy development before and during the Palestinian Uprising "Intifada" in the Ramallah District*: *PhD Thesis*. The Robert Gordon University, Aberdeen, UK, 2003.
3. Pharmaciens Sans Frontières (PSF). *Medical and Pharmaceutical Situation Inside the West Bank in Primary Health Care [report]*. PSF: Palestine, 2003.
4. World Health Organization. *How to Investigate Health Facilities; Selected Drug Use Indicators*. Action Programme on Essential Drugs: Geneva, 2003; WHO/DAP/93.1.
5. Palestinian Central Bureau of Statistics (PCBS). *Palestine in Numbers*, 2004; PCBS: Ramallah-Palestine, 2005, 17.
6. Khatib R, Daoud A (eds). *The Most Commonly Used Medications at the Primary Healthcare Level in Palestine Manual*. Institute of Community and Public Health/Birzeit University: Palestine, 2003.
7. Ministry of Health (MOH). *The Status of Health in Palestine, Annual Report 2004, Health Management Information Center*. MOH: Palestine, 2005.
8. Pavin M, Nurgozhin T, Hafner G, Yusufy F, Laing R. Prescribing practices of rural primary healthcare physicians in Uzbekistan. *Trop Med Int Health* 2003; **8**(2): 182–190. DOI:10.1046/j.1365-3156 .2003.00992.x.
9. Irshaid Y, Al-Homrany M, Hamdi A, *et al*. A pharmacoepidemiological study of prescription pattern in outpatient clinics in South-Western Saudi Arabia. *Saudi Med J* 2004; **25**(12): 1864–1870.
10. Otoom S, Batieha A, Hadidi H, Hasan M, Al-Saudi K. Evaluation of drug use in Jordan using WHO prescribing indicators. *East Mediterr Health J* 2002; **8**(4–5): 537–543.
11. Chareonkul C, Khun VL, Boonshuyar C. Rational drug use in Cambodia: Study of three pilot health centers in Kampong Thom Province. *Southeast Asian J Trop Med Public Health* 2002; **33**(2): 418–424.
12. Krause G, Borchert M, Benzler J, *et al*. Rationality of drug prescriptions in rural health centres in Burkina Faso. *Health Policy Plan* 1999; **14**(3): 291–298.
13. Moghadamnia AA, Mirbolooki MR, Aghili MB. General practitioner prescribing patterns in Babol city, Islamic Republic of Iran. *East Mediterr Health J* 2002; **8**(4–5): 550–555.
14. Siddiqi S, Hamid S, Rafique G, *et al*. Prescription practices of public and private healthcare providers in Attock District of Pakistan. *Int J Health Plann Manage* 2000; **17**(1): 23–40. ISSN: 1099-1751.
15. Hazra A, Tripathi SK, Alam MS. Prescribing and dispensing activities at the health facilities of a non-governmental organisation. *Natl Med J India* 2000; **13**(4): 177–182.
16. *Palestine-Human Development Report, 2004*, Development Studies Programme, Birzeit University: Palestine, 2005; 61, ISNB:9950-334-01-2.
17. Nsimba SE, Massele AY, Makonomalonja J. Assessing prescribing practices in church-owned primary healthcare (PHC) institution in Tanzania: A pilot study. *Trop Doct* 2004; **34**(4): 236–238.
18. McCaig LF, Besser R, Hughes M. Trends in antimicrobial prescribing rates for children and adolescents. *J Am Med Assoc* 2002; **287**(23): 3096–3102.
19. Stimac D, Vukusic I, Culig F. Outpatient use of systemic antibiotic in Croatia. *Pharm World Sci* 2005; **27**(3): 230–235. DOI:10.1007/s11096-004-3704-z.
20. Priest P, Yudkin P, McNulty C, Mant D. Antibiotic prescribing and antibacterial resistance in English general practice: Cross sectional study. *BMJ* 2001; **323**: 1037–1041. DOI:10.1136/bmj.323.7320.1037.
21. Bauchner H, Pelton S, Klein J. Parents, physicians and antibiotic use. *Pediatrics* 1999; **103**(2): 395–401.
22. Tomlin Z, Humphry C, Rogers S. General practitioners' perceptions of effective health care. *BMJ* 1999; **318**: 1532–1535.
23. Weiss MC, Fitzpatrick R, Scott DK, Golacre MJ. Pressure on the general practitioner and decisions to prescribe. *Family Practice* 1996; **13**(5): 432–438.
24. Butler C, Rollnick S, Pill R, Maggs-Rapport F, Scott N. Understanding the culture of prescribing: Qualitative study of general practitioners' and patients' perceptions of antibiotics for sore throats. *BMJ* 1998; **317**: 637–642.
25. Avorn J, Solomon D. Cultural and economic factors that mis(shape) antibiotic use: The nonpharmacologic basics of therapeutics. *Ann Intern Med* 2000; **133**(2): 128–135.
26. Sweileh W. Pharmacotherapeutic analysis of non-steroidal anti-inflammatory drugs prescribed at rheumatology/orthopaedic clinics. *J Al-Azhar University Gaza* 2003; **6**(2): 47–56.
27. Paul AD, Chauhan CK. Study of usage pattern of nonsteroidal anti-inflammatory drugs (NSAIDs) among different practice categories in Indian clinical setting. *Eur J Clin Pharmacol* 2005; **60**(12): 889–892. DOI:10.107/s00228-004-0849-6.
28. Otoom S, Batieha A, Hadidi H, Hasan M, Al-Saudi K. Evaluation of drug use in Jordan using WHO patient care and health facility indicators. *East Mediterr Health J* 2002; **8**(4–5): 544–549.
29. Britten N, Stevenson F, Barry C, Barber N, Bradley C. Misunderstandings in prescribing decisions in general practice: Qualitative study. *BMJ* 2000; **320**: 484–488. DOI:10.1136/bmj.320.7233.484.
30. Little P, Everitt H, Williamson I, *et al*. Observational study of effect of patient centeredness and positive approach on outcomes of general practice consultations. *BMJ* 2001; **323**: 908–911. DOI:10.1136/bmj.323.7318.908.
31. Rehan HS, Lal P. Drug prescribing pattern of interns at a government healthcare centre in northern India. *Trop Doct* 2002; **32**(1): 4–7.