ORIGINAL ARTICLE

Morbidity and Process of Care in Urban Malaysian General Practice: The Impact of Payment System

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Summary

Background: The majority of primary care consultations in Malaysia occur in the general practice clinics. To date, there is no comprehensive documentation of the morbidity and practice activities in this setting.

Objectives: We reported the reasons for encounter, diagnoses and process of care in urban general practice and the influence of payment system on the morbidity and practice activities.

Methods: 115 clinics in Kuala Lumpur, Ipoh and Penang participated in this study. General practitioners in these clinics completed a 2-page questionnaire for each of the 30 consecutive patients. The questionnaire requested for the following information: demographic data, reasons for encounter, important physical findings, diagnoses, investigations ordered, outpatient procedures performed, medical certificate given, medication prescribed and referral made. The morbidity (reasons for encounter and diagnoses) was coded using ICPC-2 and the medication data was coded using MIMS Classification Index.

Results: During 3481 encounters, 5300 RFEs (152 RFEs per 100 encounters) and 3342 diagnoses (96 diagnoses per 100 encounters) were recorded. The majority of the RFEs and diagnoses are in the following ICPC Chapters: Respiratory, General and unspecified, Digestive, Neurological, Musculoskeletal and Skin. The frequencies of selected aspects of the process of care (rate per 100 encounters) were: laboratory investigations 14.7, outpatient procedures 2.4, sick certification 26.9, referral 2.4, and medication prescription 244. Consultation for chronic diseases and acute infections were influenced more by demographic variables (age, employment) rather than payment system. Cash-paying patients were more likely to receive laboratory investigations and injections.

Conclusion: This study demonstrated the breadth of clinical care in the general practice. Relatively fewer patients consulted specifically for preventive care and treatment of chronic diseases. The frequencies of outpatient procedures and referrals appeared to be low. Payment system results in important differences in patient mix and influences some types of practice activities.

Key Words: Morbidity, Family practice, Practice patterns, Payment

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Introduction

Primary care in Malaysia is provided at both government health centres and private general practice clinics. The National Health and Morbidity Survey[1] conducted in 1996 reported that respondents with recent illness/injury (past 2 weeks) sought care at private clinics, government clinics and hospitals (both government and private) in the proportions 57.2%, 19.0% and 23.8% respectively. The payment system in private general practice is essentially fee-for-service with three different modes of payment: out-of-pocket, panel and managed care, the last two being paid for by the employers of the patients.

Although the majority of the consultations in primary care occurred in the private general practices, there are few reports of the profile of the practitioners and activities in these clinics. Khoo et al[2], in a mailed questionnaire survey of 1172 general practitioners throughout Malaysia, reported that 30% had ≥ 15 years of general practice experience, 75% were solo practitioners, 88% dispensed medications and their average workload was 45 patients per day. To date, there is only isolated morbidity study conducted in general practice[3].

The data in this study was drawn from the study "Cost and Quality of Care in Three Urban Areas in Malaysia". The influence of payment system on the morbidity and process of care in general practice is reported.

Materials and Methods

Study setting and sampling

This study was conducted in three large urban centres in 1999. The detail of the sampling method used has been described by Syed et al[4]. In Malaysia medical practitioners are registered with the Malaysian Medical Council for the purpose of obtaining the Annual Practising Certificate (currently practitioners are not required to supply information about medical specialties). The list of registered medical practitioners in 1995 was perused and a list of private general practice clinics was created based on the clinic addresses and qualification of the practitioners. From this list, a sample of 150 clinics was randomly selected. The location and number of clinics sampled were: Kuala Lumpur 101, Penang 25 and Ipoh 24. These clinics were approached by mail and later visited personally by research assistants. Clinics that refused to participate were replaced by adjacent practices.

Questionnaire and definitions

In the morbidity component of this study, participating general practitioners were requested to complete Data Encounter Form for each of the 30 consecutive patients seen.

The Data Encounter Form is a 2-page questionnaire that asked for the following information from the clinical encounter: demographic data, reasons for encounter (RFEs, up to 5), physical findings, diagnoses (up to 2), investigations ordered, outpatient procedures performed, medical certificate given, medication prescribed (up to 8, but only a maximum of 5 items were analysed), and referral made.

The sources of payment were originally coded as cash (out-of-pocket payment by patients), panel (patients or clinics claiming the consultation fee from the employers) and managed care (payment is paid via a managed care organisation). Panel system and managed care were recoded as "non-cash" as subsequent analyses showed that they are similar for patient's demographic characteristics, morbidity and process of care. We selected three chronic diseases (hypertension, diabetes and asthma) and three acute infections (upper respiratory tract infection, urinary tract infection and acute gastroenteritis) for comparison because of their relative frequency.

Data analysis

SPSS version 10 was used for data entry and analysis. The initial data entry by a research

assistant was checked by the investigators. The morbidity data was coded using ICPC-2,[5] this was facilitated by using ICPC-2 plus Demonstrator[6]. The medication data was coded using MIMS Classification Index[7] as this drug index is widely used in Malaysian general practice.

Statistical comparison of categorical and continuous variables was done using χ^2-test, t-test/ANOVA respectively. Statistical significance is set at $p<0.001$ (to reduce the possibility of Type I error due to the large sample size). Multinomial logistic regression (age as covariate) is used to assess the influence of payment system (cash versus non-cash) on chronic disease and process of care (investigation, injection, sick certification).

Quality of recording

As the Data Encounter Form has several free-text entries, the legibility and completeness of recording are important issues. As seen in Table I, the number of illegible recording by the participating doctors is relatively small. However, there were substantial missing data, especially for physical finding.

Results

Participating clinics and doctors

One hundred and twenty five clinics participated in this morbidity study (response rate 83.3%). Information on the clinics and doctors were available for 115 clinics. Seventy-six clinics (66.1%) were owned by solo practitioners, 110 (95.7%) of them have employer/company panels ("panel clinic"), 102 clinics (88.7%) were registered with managed care organisations and 15 clinics (13%) provided 24-hour clinic service. Other characteristics of the clinics and doctors are given in Table II.

Demographic data of patients

3481 patient encounters were recorded in this morbidity study. The median number of encounters recorded per clinic was 29 (range 1-90). The number and proportion of encounters from the three urban areas were: Kuala Lumpur 2554 (73.4%), Ipoh 644 (18.5%) and Penang 283 (8.1%). The number and proportions of patients in the three payment systems were: cash 1493 (43.1%), panel 1619 (46.8%) and managed care 349 (10.1%). The mean age of patients was 35.5 years (range 18-90 years, SD=13.2 years). The cash-paying patients were older (cash, mean age 39.0 years; non-cash, mean age 32.8 years, $t=13.14$, $p<0.001$). Other differences in the demographic characteristics are shown in Table III.

Reasons for encounters (RFEs)

During 3481 encounters, 5300 RFEs were recorded (152 RFEs per 100 encounters). Most RFEs were either symptoms or diagnoses (Table IV); components 2-6 contributed less than 5% of the RFEs. The RFEs by ICPC Chapters were given in Table V. The top 5 Chapters (Respiratory, General and unspecified, Digestive, Neurological, Musculoskeletal) contributed 81.77% of all RFEs. The frequencies of the first symptom in the top 5 Chapters did not differ by payment system (χ^2 = 5.57, df=1, p=0.234). There were 229 categories of RFEs. The top 20 individual RFEs contributed 74.37% of all RFEs.

Problem managed

During 3481 encounters, 3342 diagnoses were recorded (96 diagnoses per 100 encounters). The diagnoses by ICPC Chapters were given in Table VI. The top 5 Chapters (Respiratory, Digestive, General and unspecified, Musculoskeletal, Skin) contributed 72.56% of all diagnoses. The frequencies of the first diagnosis in the top 5 Chapters did not differ by payment system (χ^2 = 4.59, df=1, p=0.332). There were 217 categories of diagnoses. The top 20 individual diagnoses contributed 66.22% of all diagnoses. Six hundred and twenty-two diagnoses (18.6%) were undifferentiated symptoms (e.g. muscle pain, fever). Chronic diseases (hypertension, diabetes or asthma) were recorded in 258 encounters (7.4% of

all encounters). Chronic diseases were significantly more common among the older patients and those who were unemployed, while acute infections were significantly more common among the employed and younger patients. The frequencies of chronic diseases and acute infections were similar in cash-paying and non-cash paying patients after adjustment for demographic characteristics.

Management

The number and frequency of selected aspect of management is given in Table VII (with comparison with studies in Sri Lanka[8] and Australia[9], see Discussion). Five hundred and twelve laboratory investigations were performed or ordered in 432 encounters. Pathological tests (blood tests, urine tests and pap smears) and imaging studies (X-rays and ultrasound) contributed 78.1% and 17.6% of all laboratory investigations recorded. Eighty-two procedures were recorded. The top three types of procedures were (in decreasing order of frequency): dressing, toilet and suture, and ear syringing.

Eight thousand and five hundred and two drug items were recorded. The top 10 drug items prescribed were: paracetamol, mefenamic acid, diphenhydramine, amoxycillin, diclofenac, chlorpheniramine, hyoscine, dextropheniramine, vitamin C and co-trimoxazole. Injections were given in 194 encounters (5.6% of all encounters). Cash-paying patients were more likely to receive injections (cash 8.3%, non-cash 3.6%, χ^2 = 36.2, df=1, p<0.001) and get investigations (cash 16.8%, non-cash 10.0%, χ^2 = 33.9, df=1, p<0.001) but less likely to receive medical certificate (cash 15.6%, non-cash 37.4%, χ^2 = 192.5, df=1, p<0.001). The differences above persisted despite adjusting for demographic characteristics. The frequencies of procedures, referral and medication prescription were similar in cash and non-cash payment groups.

Table I: Number (%) of illegible recording and missing data

Category	Illegible recording (%)	Missing data (%)
First symptom	13 (0.4)	384 (11.1)
First physical finding	165 (4.7)	1039 (29.8)
First diagnosis	35 (1.0)	389 (11.1)
First medication	4 (0.1)	473 (13.6)

Table II: Characteristics of clinics and doctors

Characteristics	Mean (SD)	Range
Patient load per day	43 (26)	9-120
Number of doctor per clinic	1.7 (1)	1-6
Age of doctors	48 (8)	34-75
Years of experience	16 (9)	3-45

Table III: Patient encounters: demographic data

Characteristics	Cash	Non-cash
Age groups*		
18-30	565 (37.9)	975 (49.2)
31-50	570 (38.3)	905 (45.6)
51-70	289 (19.4)	98 (4.9)
>70	6.5 (4.4)	5 (0.3)
χ^2 =266.03, p<0.001		
Gender		
Male	628 (42.1)	1054 (53.0)
Female	865 (57.9)	954 (47.0)
χ^2 =40.98, p<0.001		
Ethnic groups		
Malay	652 (43.7)	1210 (60.9)
Chinese	509 (34.1)	374 (18.8)
Indian	248 (16.6)	306 (15.4)
Others	84 (5.6)	98 (4.9)
χ^2 =127.19, p<0.001		
Employment**		
Yes	818 (61.1)	1845 (93.8)
χ^2 =544.75, p<0.001		

* N=3472;
** N=3304 (unemployed group includes retirees, housewives and students)

Table IV: RFEs by ICPC Components

Components	Number	%
1. Symptoms	4561	86.06
2. Diagnostic, screening and preventive	163	3.08
3. Medication, treatment, procedures	13	0.24
4. Test results	3	0.06
5. Administrative	1	0.02
6. Referrals and other reasons	10	0.19
7. Diagnoses/diseases	549	10.36
Total	**5300**	**100.00**

Table V: RFEs by ICPC Chapters (including individual RFEs >0.5% in frequency)

ICPC Chapters/Rubrics	No.	% of all encounters	Rate per 100 encounters
General and unspecified	1004	18.94	28.84
Fever	625	11.79	17.95
Pain, general	120	2.26	3.45
Medical examination/health evaluation - partial	60	1.13	1.72
Chest pain, NOS	52	0.98	1.49
Accident/injury, NOS	34	0.64	0.98
General weakness/tiredness	50	0.57	0.86
Blood, blood-forming organs and immune mechanism	7	0.13	0.20
Digestive	666	12.57	19.13
Abdominal pain/cramp, general	176	3.32	5.06
Diarrhoea	154	2.91	4.42
Vomiting	123	2.32	3.53
Stomach function disorder	55	1.04	1.58
Disease of mouth/tongue/lips	27	0.51	0.78
Eye	91	1.72	2.61
Eye pain	33	0.62	0.95
Ear	28	0.53	0.80
Circulatory	101	1.91	2.90
Hypertension, uncomplicated	59	1.11	1.69
Musculoskeletal	370	6.98	10.63
Back symptom/complaint	98	1.85	2.82
Knee symptom/complaint	49	0.92	1.41
Arm symptom/complaint	41	0.77	1.18
Neurological	440	8.30	12.64
Headache	304	5.74	8.73
Vertigo/dizziness	108	2.04	3.10
Psychological	64	1.21	1.84
Disturbance of sleep/insomnia	42	0.79	1.21
Respiratory	1854	34.98	53.26
Cough	731	13.79	21.00
Sneezing/nasal congestion	458	8.64	13.16
Throat symptom/complaint	393	7.42	11.29
Upper respiratory infection, acute	148	2.79	4.25
Abnormal sputum/phlegm	30	0.57	0.86
Shortness of breath/dyspnoea	29	0.55	0.83
Wheezing	27	0.51	0.78
Skin	292	5.51	8.39
Pruritus	103	1.94	2.96
Rash localised	74	1.40	2.13
Endocrine, metabolic and nutritional	57	1.08	1.64
Urological	74	1.40	2.13
Painful urination	36	0.68	1.03
Pregnancy, child bearing, family planning	93	1.75	2.67
Medical exam/health evaluation - complete pregnancy	33	0.62	0.95
Female genital	152	2.87	4.37
Menstruation absent/scanty	52	0.98	1.49
Menstruation irregular/frequent	31	0.58	0.89
Male genital	5	0.09	0.14
Social problems	2	0.04	0.06
Total	**5300**	**100**	**152**

Table VI: Diagnoses by ICPC Chapters (including individual diagnoses >0.5% in frequency)

ICPC Chapters/Rubrics	No.	% of all diagnoses	Rate per 100 encounters
General and unspecified	343	10.26	9.85
Viral disease, NOS	88	2.63	2.53
Medical exam/health evaluation - partial	62	1.86	1.78
Fever	49	1.47	1.41
Allergy/allergic reaction NOS	31	0.93	0.89
Trauma/injury NOS	27	0.81	0.78
Abdominal pain/cramp, general	25	0.75	0.72
Blood, blood-forming organs and immune mechanism	14	0.42	0.40
Digestive	372	11.13	10.69
Gastroenteritis, presumed infection	157	4.70	4.51
Stomach function disorder	91	2.72	2.61
Disease of mouth/tongue/lips	22	0.66	0.63
Dyspepsia/indigestion	17	0.51	0.49
Eye	67	2.00	1.92
Conjunctivitis, infectious	46	1.38	1.32
Ear	19	0.57	0.55
Circulatory	179	5.36	5.14
Hypertension, uncomplicated	155	4.64	4.45
Musculoskeletal	306	9.16	8.79
Muscle pain	85	2.54	2.44
Low back symptom/complaint	32	0.96	0.92
Sprain & strain of joint NOS	29	0.87	0.83
Back symptom/complaint	25	0.75	0.72
Osteoarthrosis, other	25	0.75	0.72
Injury musculoskeletal NOS	24	0.72	0.69
Neurological	148	4.43	4.25
Migraine	55	1.65	1.58
Headache	34	1.02	0.98
Vertigo/dizziness	26	0.78	0.75
Tension headache	21	0.63	0.60
Psychological	56	1.68	1.61
Sleep disturbance/insomnia	19	0.57	0.55
Respiratory	1175	35.16	33.75
Upper respiratory infection, acute	897	26.84	25.77
Tonsillitis, acute	59	1.77	1.69
Asthma	58	1.74	1.67
Acute bronchitis/bronchiolitis	32	0.96	0.92
Cough	29	0.87	0.83
Sinusitis, acute/chronic	27	0.81	0.78
Influenza	27	0.81	0.78
Skin	119	6.85	6.58
Dermatitis, contact/allergic	64	1.92	1.84
Dermatophytosis	37	1.11	1.06
Boil/carbuncle	17	0.51	0.49
Endocrine, metabolic and nutritional	96	2.87	2.76
Diabetes, non-insulin dependent	57	1.71	1.64
Gout	18	0.54	0.52
Urological	68	2.03	1.95
Cystitis/urinary infection, other	62	1.86	1.78
Pregnancy, child bearing, family planning	154	4.61	4.42
Pregnancy	86	2.57	2.47
Medical exam/health evaluation - complete pregnancy	17	0.51	0.49
Female genital	109	3.26	3.13
Menstrual pain	39	1.17	1.12
Male genital	4	0.12	0.11
Social problems	3	0.09	0.09
Total	**3342**	**100**	**96**

Table VII: Comparison of morbidity and process of care in Malaysia, Sri Lanka and Australia (rate per 100 encounters)

	Malaysia	Sri Lanka	Australia
RFEs			
Respiratory	35.0	31.6	25.3
Digestive	12.6	11.8	10.1
Pregnancy, child bearing, family planning	1.8	1.6	3.8
Diagnoses			
Circulatory	5.1	2.7	16.3
Endocrine, metabolic and nutritional	2.8	1.3	9.1
Psychological	1.6	1.2	10.5
Process of care			
Laboratory investigations	14.7	NA	13.8
Outpatient procedures	2.4	NA	12.5
Sick certification	26.9	NA	NA
Referral	2.4	NA	10.2
Medication	244	NA	94

NA: Not available

Discussion

Representativeness

To a large extent, the profile of general practitioners in our study was similar to the general practitioners in Peninsular Malaysia (Personal communication: Associate Professor Khoo EM, Department of Primary Care Medicine, University of Malaya). However, the setting of this study (urban general practice clinics only) and the demographic characteristics of patients (all patients were adults, in two-third of them the patients' medical expenses were covered by the employers) may reduce the representativeness of this study. Nonetheless, this survey is the largest morbidity survey of Malaysian general practice to date.

Data accuracy

The accuracy of data in this survey is highly dependent on the completeness of recording by the participating clinics; in particular accurate recording of the unmodified reasons of encounter as expressed by the patients[10]. Poor recording is noted for those items in the questionnaire requiring free-text entries. This is especially true for the recording of physical findings. The medication data was not recorded in 13.6% of the encounters. We recoded all medications using generic names (based on the main active ingredient), as the information was originally recorded in either proprietary or generic names.

Reasons for encounter and problems managed

There is considerable breadth of RFEs (229 categories) and diagnoses (217 categories) as expected in general practice. Most of them were symptoms or diseases in the following ICPC Chapters: Respiratory, General and unspecified, Digestive, Neurological, Musculoskeletal, Skin. Chronic diseases were overshadowed by acute minor illnesses. The problems in the following ICPC Chapters were rare (<1% of all diagnoses): Blood/immunological, Ear, Male genital and Social problems. Very small proportion of patients

(about 3% of encounters) consulted primarily for preventive care (Diagnostic, screening and preventive component).

This morbidity study, in keeping with similar studies elsewhere, [8,9] gives a fairly accurate indication of the demand for care from the community. However, it is less sensitive in picking up conditions that are not of immediate concern to the patients and health care providers even though they may be common and of major public health importance. This can be shown by the relatively low recording for psychological problems (prevalence in general practice is about 25%[11]) and no recording for smoking as a RFE and diagnosis in this study (prevalence in Malaysian adults is 24.8%[1]).

In terms broad categories (at the level of ICPC Chapters, Table VII), the morbidity in Malaysian and Sri Lankan general practice was fairly similar. However, the Australian general practice appeared to have higher consultations for pregnancy, circulatory, endocrinological and psychological problems. Various reasons may account for this differences, among them demographic profile of patients (aging population in Australia with higher prevalence of chronic diseases) and payment system. In this study, the cash-paying patients had higher consultation for chronic diseases because they tend to be older. The low prevalence of chronic diseases in this study is due to the preference of patients to seek long-term treatment from the government facilities (Data from National Health and Morbidity Survey[1]: Proportion of hypertensive, diabetic and asthmatic patients seeking treatment from government facilities were 68.1%, 68.4% and 54.5% respectively.)

Process of care

Cash-paying patients were more likely to receive injections and get laboratory investigations. The lower rate of sick certification in the cash-paying patients is probably due to the lower proportion of employed in this group. In keeping with other studies,[12,13] we have demonstrated the effect of payment system on certain aspects of management in general practice. The relationship between the process of care and type of payment system is not straightforward, however, as there is considerable differences in the patient mix.

As a whole the general practices in this study had lower rates of procedures and referral but higher rate of medication prescription when compared with the Australian study (Table VII). The differences in these rates are multifactorial, among them differences in the morbidity patterns, payment system and the interplay of patients' demand and behaviours of general practitioners. Issuance of sick certificate was a common activity of general practitioners in our study; this is most likely to due to the high proportion of patients in the employed category. Drug prescription rate is 2.6 times higher in Malaysia compared to that of Australia; to a large extent this is probably due to the dispensing general practice in Malaysia.

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