

Evaluation of exposure to primary care clinics during Family Medicine residency: evidence from a training program in Riyadh, Saudi Arabia

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Summary Background. Evaluation is a crucial element to ensure the achievement of the program objectives, maintenance of training standards and to provide feedback for academic activities.

Objectives. We aimed to examine the extent and patterns of clinical exposure by family medicine residents in a residency training program while they carried out their clinical rotations in accredited urban primary health care centers in Riyadh, Saudi Arabia.

Material and methods. This study involved the Saudi Board of Family Medicine training program under the Department of Public Health, General Directorate of Health Affairs in Riyadh, Ministry of Health, Saudi Arabia. The study was based on a retrospective analysis of data collected during routine supervision of clinical training during family medicine rotations during six months period (November 2018–April 2019). Diagnoses recorded by the residents as free texts were converted to the closest medical diagnosis or ‘presenting complaints’ as per ICD-10. Cases attended are presented as percentages.

Results. During the study period, a total of 41,357 clinical encounters were recorded that included 4,952 clinical sessions. Diseases of the respiratory system were most commonly seen by the residents, accounting for 30% of total cases. Just twenty diagnoses/conditions accounted for approximately 77% ($n = 31,994$) of the total clinical encounters. The five most common conditions were upper respiratory tract infections (16%), vaccinations (12%), diabetes mellitus unspecified (9%) and essential hypertension (6%).

Conclusions. Exposure to the primary care clinical cases reflected the disease pattern in the community at large. The residents were exposed to a low proportion of mental health and behavioral diseases, which are considered to be increasingly relevant in society.

Key words: family practice, internship and residency, primary health care, Saudi Arabia.

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Background

Family medicine is a specialty that has the distinction of offering comprehensive care to a variety of beneficiaries in the community at a very local level [1]. By being the first point of care, the family physician has to deal with a wide range of clinical scenarios regardless of gender, age, disease, or clinical setting. In the new national model of care adopted by the Kingdom of Saudi Arabia, patient care has been envisaged based on a system of care that includes preventive and promotive care, maternal and child care, acute and urgent care, chronic care, planned care, and terminal care [2]. Because the family physician has an integrated role in all these systems, either as the sole provider or as a care coordinator [2], it is highly desirable to ensure proper exposure to primary medical encounters dur-

ing a family medicine residency training period to improve their skills. Furthermore, patient preferences have been found to be significantly affected by family physician skill levels [3].

There are at least 50 clinical conditions listed in the family medicine curriculum as being a priority in the knowledge domain [4]. There is a lack of evidence regarding the length and breadth of clinical exposure for family medicine residents in Saudi Arabia. Evaluation is also a vital component of teaching and training to ensure the achievement of objectives and to maintain standards [5]. These objectives and standard are outlined in the curriculum for Saudi Board Family medicine. At the training program level, a special appointed committee supervises the clinical training of residents [4]. Apart from ensuring the smooth running of the clinical rotation, supervision of clinical training is also desirable to provide feedback for planning academic activities.



Objectives

We aimed to examine the extent and patterns of clinical exposure obtained by both senior and junior level family medicine residents in a Family Medicine residency program run under the Ministry of Health, Riyadh, Saudi Arabia.

Material and methods

Setting and participants

The Family Medicine residency program has been established under the Department of Public Health in the General Directorate of Health Affairs, Riyadh. In this four-year program, a total of ninety-nine residents were distributed as follows: fourth year (08), third year (22), second year (32), and first year (38). Ten accredited primary health care centers (PHCs) were affiliated with the program for training the residents. The residents were posted in these PHCs as per their rotation schedule. This rotation schedule is drafted at the beginning of each academic session, following the SCFHS guidelines for training requirements. The recommended duration of family medicine rotations includes 12 weeks during the first, second, and third year and 42 weeks during the fourth year [3]. This study was conducted as a retrospective data analysis of data collected during the routine supervision of clinical training during the family medicine rotations.

Data collection

A structured form called the 'clinical supervision form' was used by the residents to document the cases seen by them during every clinical session and includes details, such as the main complaints/diagnosis and management, as well as other information. During each clinical session, the residents were posted under a trainer (family medicine specialist/consultant) who was responsible for supervising the clinical training. These trainers verified and approved these forms before submitting them to the program administration. Data over a period of six months (November 2018–April 2019) were analyzed.

Statistical analysis

Data from the clinical supervision forms were entered into MS Excel. Residents entered their findings as free texts which were then converted to the closest medical terminology as either a *diagnosis* or *presenting clinical condition*, following the International Classification of Diseases (ICD-10) coding. Garbage entries that could not be classified were discarded. The coding was performed by three trained ICD-10 coders to ensure accuracy and reliability. In the subsequent step, diagnoses and/or presenting complaints were pooled together under the relevant chapters of ICD-10. The results are presented as the frequency and percentages with a 95% confidence interval.

Ethical considerations

The study was approved by the Central Institutional Review Board, General Directorate of Research and Studies, Ministry of Health, Riyadh, Saudi Arabia.

Results

During the study period, 84 residents were posted in family medicine rotations across the 10 accredited primary health centers. A total of 41,357 cases were recorded during 4,952 clinical sessions, accounting for approximately 8 average cases per session. During the study period, the highest number of cases seen in any PHC was 5515, whereas the highest number of clinical sessions held in any PHC was 710.

Distribution of cases observed from the major disease groups in ICD-10

More than 60% of the total encounters involved three major disease groups: diseases of the respiratory system, factors influencing health status and contact with health services (including vaccination, pre-school examination, and lab follow-up), and endocrine, nutritional, and metabolic diseases (Table 1).

Diseases of the respiratory system were the single most common group, accounting for approximately 30% of cases. Major diagnoses/complaints in this group included URTI (53.5%), common cold (15.3%), asthma (12.4%), pharyngitis/sore throat (12%), and others (6.8%). 'Factors influencing health status and contact with health services, including vaccination, pre-school examination, and lab follow-up ranked second, accounting for approximately 17.8% of total cases. Major conditions recorded in this group included vaccination (67.9%), pre-school check-ups (17%), consultations/follow-ups for laboratory examinations (6%), general health check-ups (2.9%), and others (6.2%).

Endocrine, nutritional, and metabolic diseases accounted for approximately 14.6% of cases. The highest proportion in this group was contributed by 'unspecified diabetes' (60.4%), followed by diabetes with hypertension (32.3%), whereas others included dyslipidaemia (1.9%), thyroid disorder (1.4%), and obesity (1.2%). 'Symptoms, signs, and abnormal clinical and laboratory findings not elsewhere classified' accounted for 6.4% of cases. The major contributions in this group were from unspecified cough (23%), headache (16.1%), abdominal pain (13%), and allergic skin rashes (12.3%).

Diseases of the digestive system accounted for approximately 6.4% with acute gastroenteritis (40%), acid peptic diseases (25%), and IBS (18%) being the most prominent. Diseases of the circulatory system accounted for 6.2%, and the predominant condition in this group was hypertension (94%). 'Diseases of the musculoskeletal system and connective tissue' constituted 5.5% and the rest of the disease groups, and each contributed less than 5%, as shown in Table 1.

Table 1. Level 1 disease groups as per ICD-10, seen by Family Medicine residents during November 2018–April 2019 (n = 41 357)

International classification of Diseases (ICD) Chapter	Frequency	Percentage (%)	95% CI
Diseases of the respiratory system	12 693	30.69	30.3–31.1%
Factors influencing health status and contact with health services (including vaccination, pre-school examination, lab follow up)	7370	17.82	17.5–18.2%
Endocrine, nutritional and metabolic diseases	6044	14.61	14.3–14.9%
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	2635	6.37	6.1–6.7%
Diseases of the digestive system	2626	6.35	6.1–6.6%
Diseases of the circulatory system	2542	6.15	5.9–6.4%
Diseases of the musculoskeletal system and connective tissue	2293	5.54	5.3–5.8%

Table 1. Level 1 disease groups as per ICD-10, seen by Family Medicine residents during November 2018–April 2019 (n = 41 357)

International classification of Diseases (ICD) Chapter	Frequency	Percentage (%)	95% CI
Diseases of the skin and subcutaneous tissue	854	2.06	1.9–2.2%
Diseases of the ear and mastoid process	849	2.05	1.9–2.2%
Injury, poisoning and certain other consequences of external causes	829	2.00	1.9–2.1%
Diseases of the genitourinary system	672	1.62	1.5–1.7%
Diseases of the eye and adnexa	477	1.15	1.1–1.3%
Mental, behavioural and neurodevelopmental disorders	419	1.01	0.9–1.1%
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	322	0.78	0.7–0.86%
Pregnancy, childbirth and the puerperium	314	0.76	0.7–0.8%
Certain infectious and parasitic diseases	235	0.57	0.5–0.6%
Diseases of the nervous system	85	0.21	0.2–0.3%
External causes of morbidity	32	0.08	0.1–0.11%
Neoplasms	10	0.02	0.01–0.03%
Congenital malformations, deformations and chromosomal abnormalities	3	0.01	0–0.02%
Certain conditions originating in the perinatal period	1	0.004	0.9–1.1%

Table 2. Top twenty level 2 diagnosis/conditions dealt seen by Family Medicine residents during November 2018–April 2019 (n = 41357)

Rank	ICD-10 Code	Diagnosis/condition	Frequency	Percentage (%)	95% CI
1.	J06.9	URTI	6790	16.42	16.1–16.8%
2.	Z28.9	Vaccination	5005	12.10	11.8–12.4%
3.	E14	Diabetes Mellitus unspecified	3651	8.83	8.5–9.1%
4.	I10	Essential Hypertension	2462	5.95	5.7–6.2%
5.	E11	Type 2 Diabetes Mellitus with Hypertension	1949	4.71	4.5–4.9%
6.	J00	Common cold	1937	4.68	4.5–4.9%
7.	J45.901	Asthma	1568	3.79	3.6–3.9%
8.	J02.9	Acute pharyngitis	1458	3.53	3.4–3.7%
9.	Z02.0	Pre-school examination	1256	3.04	2.9–3.2%
10.	K52.9	Acute gastroenteritis	1067	2.58	2.4–2.7%
11.	K30	Acid Peptic Disorder	679	1.64	1.5–1.8%
12.	R05	Cough unspecified	602	1.46	1.3–1.6%
13.	J03.90	Tonsillitis	593	1.43	1.3–1.5%
14.	M54.5	Lower Back Ache	483	1.17	1.1–1.3%
15.	M79.673	Pain unspecified	473	1.14	1.0–1.2%
16.	K58.9	IBS	465	1.12	1.0–1.2%
17.	Z00.00	Blood Tests (not otherwise specified)	448	1.08	0.9–1.2%
18.	R51	Headache	425	1.03	0.9–1.1%
19.	R10.9	Abdominal pain	345	0.83	0.7–0.9%
20.	T14.90	Injury unspecified	338	0.82	0.7–0.9%
Total			31 994	77.35%	76.9–77.6%

Top twenty diagnoses/conditions attended by the trainee residents

The individual conditions/diagnoses were reported as recorded by the residents and analyzed individually against the total number of clinical encounters, as shown in Table 2. Just 20 diagnosis/conditions accounted for more than 77% (n = 31,994) of total medical care encounters at the primary health care centers. Upper respiratory tract infection (URTI) accounted for approximately 16% of the total cases, followed by vaccination

visits (12%). Diabetes mellitus unspecified and essential hypertension ranked third and fourth, accounting for approximately 9% and 6%, respectively. Among other diagnoses, each accounted for less than 5% of the total, as shown in Table 2.

Discussion

To our knowledge, no previous study in Saudi Arabia has documented the clinical exposure of family medicine residents in a primary care setting. Clinical exposure among family medi-

cine residents is important for their performance. Karl Iglar et al. reported a moderate level of correlation between the number of cases observed by residents and resident performance as measured by 'in-training scores' [6]. Similarly, the outcomes from family medicine rotation have also been found to be affected by the percentage of cases discussed, as reported by Abu Zuhairah et al. [7]. In this study, we only described the qualitative aspects of clinical rotation in family medicine.

The variety of cases observed by the residents during the 6-month period covered most of the chapters in ICD-10 but with unequal representation. Respiratory diseases were found to be the most common group of clinical conditions. This was similar to that reported by several other authors [8–12]. In our study, this might have been further confounded because the data collection period corresponded with the seasonal influenza period.

Among the individual diagnoses/clinical conditions, diabetes (unspecified) ranked third, after respiratory diseases and vaccination visits, which were first and second, respectively. The 'Global burden of disease' estimates has stated a high blood glucose level as the second leading disease risk for females and third level of risk for males in Saudi Arabia [13].

Moreover, the proportions of diabetes and hypertension cases were corroborated with annual statistics for 2018, as reported by the Ministry of Health, Saudi Arabia. For instance, in Riyadh, approximately 11% patients attended a chronic disease clinic out of the total primary health care visits in the year 2018 [11]. The proportion of antenatal cases seen by residents was approximately 0.7%, which is also comparable to the annual statistics from 2018, which reported ANC visits of approximately 0.8% of the total PHC visits in the year 2018 in Riyadh [14].

These family medicine residents were exposed to a low proportion of certain epidemiologically important categories of diseases. For instance, the behavioral and mental disease group accounted for only 1% of the total cases attended by the residents during the 6-month period. In contrast, in Saudi Arabia, the proportion of patients with mental illness has been estimated to be as high as one third of the total patients who obtain primary health care [15]. World Health Organization has stated that mental, neurological and substance use disorders account for approximately 14% of the global burden of disease [16]. This discrepancy might be because of the high proportion of such cases who visit a service clinic instead of training clinic. However, Karl Iglar et al. also noted that family medicine residents did not attend some of the diagnoses that are important for certification by family physicians of Canada during their 3-month study [6].

We reported only the descriptive component of the clinical exposure for this study. Of note, the diagnoses/clinical conditions were recorded by the residents as free text. It would have been more appropriate for the residents to record them directly as ICD codes or the International Classification of Primary Care (IPC) [17].

Conclusions

Overall, the residents were exposed to a range of clinical conditions reflecting the disease burden in the community. A system should be adopted at the program level to supervise and monitor proper exposure to primary care. Further studies should be carried out to confirm our findings and to examine the relationship between clinical exposure and performance of residents.

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Conflicts of interest: The authors declare no conflicts of interest.

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