

Morbidity, continuity of care and general practitioner workload: Is there a connection?

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Abstract

Aim: To examine whether morbidity influences the likelihood of patients seeking care from a personal health care provider and to describe the associated workload implications for that provider.

Methods: A random sample was taken from the practice population of a well-established, stable four-doctor suburban practice and divided into a personal provider continuity or discontinuity group, based on their modified continuity index (MCI) score. To be included in the sample, patients had to have attended four or more times between July 1995 and June 1997. The general practice-specific care category (GP-SCC) model was used to place each patient into one of four morbidity groups.

Results: The random sample of the practice population comprised 245 patients (126 males, 119 females) out of a total of approximately 4000. The mean age of the practice population was 42.9 years (confidence interval (CI): 39.6–46.1; range: 0–95). A total of 53.5% (CI: 47.3–59.7) of the practice population had personal provider continuity and 46.5% (CI: 40.3–52.7) did not. The mean number of visits during the study period was 10.67 (CI: 9.62–11.77). Patients in the personal provider continuity group had twice as many visits (14.15 visits, CI: 12.38–15.92) than those in the discontinuity group (6.72 visits, CI: 6.1–7.24, $p < 0.001$). The mean number of health issues discussed during the study period was 13.19 (CI: 11.74–14.63). Patients in the personal provider continuity group had more than twice as many health problems discussed (15.57–20.31 problems) than those in the discontinuity group (7.06–8.40 problems, $p < 0.001$). This pattern of workload distribution between the continuity and discontinuity groups was seen in all four morbidity groups, independent of the patient's age or total number of visits.

Conclusions: This study suggests that morbidity, age and frequency of visits per se are poor indicators of a patient's likelihood for seeking care from one provider. Independent of morbidity, patients who seek care from the same provider double a doctor's workload. Further research is needed to explore which patient, doctor and consultation characteristics explain these findings.

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Key words: casemix, continuity of care, family medicine, general practice, morbidity, utilization, workload.

Introduction

Continuity of care is one of the defining attributes of the discipline of general practice.^{1–3} The concept of continuity includes chronological, geographical, interdisciplinary, interpersonal, informational, accessibility

and stability dimensions.^{4,5} However, little is known about the benefit of personal provider continuity, that is, consulting the one physician for most or all health care needs. Several studies have reported benefits of personal provider continuity in terms of:

- improved patient disclosure of problems⁶
- compliance with appointments and medications⁶
- decreased doctor stress⁶
- increased time spent with the patient in the consultation⁶
- time savings, particularly with children,⁶ the elderly⁷ and those with chronic disease and psychosocial problems.⁷

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Beneficial outcomes include increased patient satisfaction,^{6,8} more expectant management,⁷ fewer laboratory tests⁷ and less use of medications,⁷ more comprehensive care,^{9,10} decreased emergency admissions and decrease in length of hospital stay.¹¹

Australia has an open access primary care system that allows patients to have an individual choice of doctor for each visit. In any 1 year 29.9% of the community see one, and 44.5% see two to four different general practitioners (GP) (who mostly work in the same practice). Only 9.3% see five or more doctors.¹²

Group practices offer patients the opportunity for 'continuity of care' in terms of care by the one GP (chronological, interdisciplinary, interpersonal dimensions), access to care most hours of the day (accessibility and stability dimensions) and an ongoing medical record independent of the doctor consulted (informational dimension).

Study question

In the Australian primary care system many patients see more than one GP, albeit mostly in the same practice. A single group practice can offer a snapshot of how patients use general practice services and the impact this has on the physicians'/practice's workload.

Two patient characteristics were of interest:

- an individual's morbidity profile
- the individual patient's behavior in terms of seeking care from the same GP.

Method

Sample

The study was conducted in a long-established suburban practice on the New South Wales-Central Coast. The four doctors had been in practice for between 5 and 20 years. The estimated practice size was 4000, with the doctors providing approximately 22000 consultations per year.

A random number table was used to identify a representative sample comprising at least 5% of all practice patients. Since the focus of this study was on patients with ongoing care, only patients who attended for at least four consultations between July 1995 and June 1997 were eligible for inclusion in this study.

Study design

Personal provider continuity was measured using the modified continuity index ($MCI = 1 - (\text{number of providers}/(\text{number of all visits} + 0.1))$) which is sensitive to a patient's total number of visits and the total number of different doctors consulted, that is, the more visits to the same number of doctors, the higher the score.¹³

Patients with an index of ≥ 0.66 were classified as having received most of their care from one provider, that is, having personal provider continuity;^{9,10} the others are referred to as the 'provider discontinuity' group. A chart audit identified the total number of visits and total number of doctors consulted, which allowed the calculation of the MCI.

Total morbidity was measured using the general practice-specific care categories (GP-SCC) model,¹³ developed from Weiner's and Starfield's ambulatory casemix concept.^{14,15} Each of the four categories describes a typical morbidity profile,¹³ with category 1 comprising those with the least morbidity, while category 4 contains those with the most (Fig. 1). As had been previously shown, each category has a distinct pattern of workload in terms of the frequency of visits, the number of problems encountered and the mean number of problems discussed during consultations.¹³ All problems discussed in this study were placed in the relevant ambulatory diagnostic group, and subsequently collapsed into one of the four GP-SCC.

Data analysis

Data were analyzed using the SPSS 10.0 statistical software package (SPSS, Chicago, USA). Results were considered statistically significant at a level of 5%. Statistical significance of continuous measures was tested by a two-tailed Student's *t*-test, while categorical data was tested for significance by the χ^2 test. The study was approved by the Standing Committee on Ethics in Research on Humans at Monash University, Melbourne.

Results

The random sample of the practice population comprised 245 patients (126 males, 119 females) out of a total of approximately 4000. The mean population age was 42.9 years (confidence interval (CI): 39.6–46.1; range: 0–95). A total of 53.5% (CI: 47.3–59.7) of the practice population had personal provider continuity and 46.5% (CI: 40.3–52.7) did not. The sample characteristics are representative of the practice population⁹ and are comparable with the population of the Australian Morbidity and Treatment Survey.¹⁸ Table 1 shows the patient characteristics for the practice population grouped by GP-SCC and further broken into personal provider continuity and provider discontinuity groups within each GP-SCC.

Doctor workload

During the 2-year study period doctors conducted approximately 44000 consultations. The average patient consulted 10.67 times (CI: 9.62–11.77) and

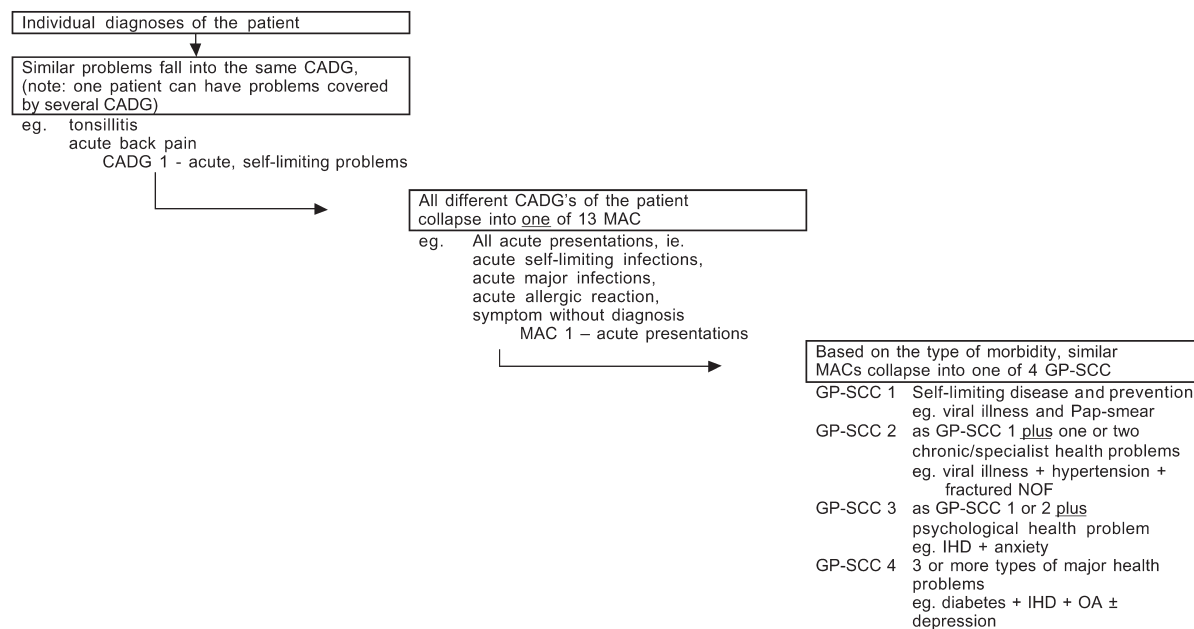


Figure 1 The general practice-specific care category (GP-SCC) model. CADG, collapsed ambulatory diagnostic group; MAC, major ambulatory category.

Table 1 Demographic data of the practice population in each morbidity cohort (GP-SCC) for patients with provider continuity and provider discontinuity (confidence intervals (CI) 95%)

	All	Provider continuity	Provider discontinuity	P-value
Percentage of practice population in each GP-SCC				
Total sample		53.5% (CI: 47.3–59.7)	46.5% (CI: 40.3–52.7)	
GP-SCC1	31.1 (CI: 29.1–35.1)	22.9 (CI: 15.7–30.1)	49.1 (CI: 39.9–58.3)	<i>p</i> < 0.001
GP-SCC2	15.1 (CI: 10.6–19.6)	15.3 (CI: 9.1–21.5)	14.9 (CI: 8.4–21.4)	NS
GP-SCC3	7.8 (CI: 4.4–11.2)	8.4 (CI: 3.7–13.1)	7.0 (CI: 2.0–12.0)	NS
GP-SCC4	42.0 (CI: 35.8–48.2)	53.4 (CI: 47.9–61.9)	29.0 (CI: 21.7–37.3)	<i>p</i> < 0.001
Percentage of male practice population in each GP-SCC				
Total sample	49.6 (CI: 43.5–55.7)	48.9 (CI: 40.5–57.3)	50.0 (CI: 41.3–58.7)	NS
GP-SCC1	60.5 (CI: 50.0–70.1)	53.3 (CI: 36.1–69.8)	64.3 (CI: 51.2–75.5)	NS
GP-SCC2	52.8 (CI: 40.9–71.3)	70.0 (CI: 48.1–85.5)	41.2 (CI: 21.6–64.0)	NS
GP-SCC3	47.4 (CI: 27.3–69.3)	36.4 (CI: 15.2–64.6)	62.5 (CI: 30.6–86.3)	NS
GP-SCC4	42.8 (CI: 33.6–52.4)	42.9 (CI: 32.0–54.5)	42.4 (CI: 27.2–59.2)	NS
Mean age of practice population in each GP-SCC				
Total sample	42.9 (CI: 39.6–46.1)	53.5 (CI: 49.3–57.7)	30.6 (CI: 26.4–34.8)	<i>p</i> < 0.001
GP-SCC1	21.8 (CI: 17.6–26.1)	28.9 (CI: 19.9–38.0)	18.0 (CI: 13.8–22.3)	<i>p</i> = 0.01
GP-SCC2	46.9 (CI: 39.4–54.3)	50.6 (CI: 41.2–60.0)	42.5 (CI: 29.7–55.2)	NS
GP-SCC3	40.8 (CI: 30.6–51.1)	52.0 (CI: 40.3–63.7)	25.5 (CI: 12.0–39.0)	<i>p</i> = 0.004
GP-SCC4	59.3 (CI: 55.5–63.1)	65.1 (CI: 61.0–69.2)	47.2 (CI: 40.6–53.7)	<i>p</i> < 0.001

GP-SCC, general practice-specific care category; NS, not significant.

Table 2 Provider workload for the practice population in each morbidity cohort (GP-SCC) for patients with provider continuity and provider discontinuity (confidence interval (CI) 95%)

	All	Provider continuity	Provider discontinuity	<i>p</i> -value
Mean number of visits				
Total sample	10.67 (CI: 9.62–11.77)	14.15 (CI: 12.38–15.92)	6.72 (CI: 6.19–7.24)	<i>p</i> < 0.001
GP-SCC1	7.80 (CI: 6.81–8.79)	10.13 (CI: 7.71–12.55)	6.55 (CI: 5.88–7.22)	<i>p</i> < 0.001
GP-SCC2	7.51 (CI: 6.37–8.65)	8.40 (CI: 6.30–10.09)	6.47 (CI: 4.95–7.98)	<i>p</i> = 0.09
GP-SCC3	10.79 (CI: 6.02–15.56)	14.00 (CI: 5.96–22.03)	6.38 (CI: 3.81–8.94)	NS
GP-SCC4	14.23 (CI: 12.16–16.31)	17.54 (CI: 14.85–20.23)	7.21 (CI: 6.06–8.36)	<i>p</i> < 0.001
Mean number of problems encountered				
Total sample	13.19 (CI: 11.74–14.63)	17.94 (CI: 15.57–20.31)	7.73 (CI: 7.06–8.40)	<i>p</i> < 0.001
GP-SCC1	8.21 (CI: 7.20–9.22)	10.63 (CI: 8.25–13.01)	6.91 (CI: 6.16–7.66)	<i>p</i> < 0.001
GP-SCC2	8.65 (CI: 7.32–9.97)	9.60 (CI: 7.56–11.64)	7.53 (CI: 5.86–9.20)	NS
GP-SCC3	13.11 (CI: 6.76–19.45)	17.55 (CI: 6.86–28.23)	7.00 (CI: 4.25–9.75)	<i>p</i> = 0.08
GP-SCC4	18.99 (CI: 16.23–21.75)	23.51 (CI: 19.98–27.05)	9.40 (CI: 7.78–11.01)	<i>p</i> < 0.001
Mean number of problems/consultation				
Total sample	1.23 (CI: 1.20–1.26)	1.25 (CI: 1.20–1.29)	1.15 (CI: 1.11–1.19)	<i>p</i> = 0.003
GP-SCC1	1.05 (CI: 1.02–1.07)	1.07 (CI: 1.02–1.12)	1.05 (CI: 1.02–1.07)	NS
GP-SCC2	1.15 (CI: 1.09–1.24)	1.15 (CI: 1.06–1.23)	1.20 (CI: 1.06–1.33)	NS
GP-SCC3	1.21 (CI: 1.13–1.29)	1.25 (CI: 1.12–1.37)	1.11 (CI: 1.00–1.21)	<i>p</i> = 0.08
GP-SCC4	1.33 (CI: 1.28–1.39)	1.35 (CI: 1.28–1.42)	1.31 (CI: 1.20–1.41)	NS

GP-SCC, general practice-specific care category; NS, not significant.

discussed an average of 13.19 problems (CI: 11.74–14.63). The mean number of problems encountered per consultation was 1.23 (CI: 1.20–1.26).

Patients in the high morbidity group (GP-SCC 4) comprised 42.0% (CI: 35.8–48.2) of all patients, accounted for 56.0% (CI: 54.2–57.8) of all visits and 60.5% (CI: 58.8–62.2) of all problems encountered. The relative workload was significantly higher (1.28–1.39) for patients in GP-SCC 4 (highest morbidity group), and significantly lower (1.03–1.08) for those in GP-SCC 1 (low morbidity group).

Patients in the personal provider continuity group had on average twice as many visits (14.15 visits, CI: 12.38–15.92) than those in the provider discontinuity group (6.72 visits, CI: 6.1–7.24, *p* < 0.001). They also presented with a little over twice as many health problems (17.94 problems, CI: 15.57–20.31) than those in the discontinuity group (7.73 problems, CI: 7.06–8.40, *p* < 0.001).

The average number of problems encountered per visit was significantly higher for those in the personal provider continuity group (1.25, CI: 1.20–1.29) than those in the discontinuity group (1.15, CI: 1.11–1.19, *p* = 0.003). The number of visits and the number of problems encountered differed significantly between the personal provider continuity and discontinuity group in all GP-SCC. The number of problems encoun-

tered per visit, however, was not statistically significantly different between the two groups within each GP-SCC (details in Table 2).

Differences between continuity and discontinuity groups

Comparing the means of the MCI for patients in each GP-SCC shows that the mean MCI is significantly higher for those in GP-SCC 4 compared to those in the other GP-SCC.

Dividing the sample within each GP-SCC into three groups (tertiles) according to their attendance frequencies shows no difference in the mean MCI with exception of the highest attendee tertile for those with the greatest morbidity (GP-SCC 4) (Table 3).

The mean age of patients having personal provider continuity is significantly higher than those having provider discontinuity within each GP-SCC (Table 1).

Discussion

The practice characteristics in terms of patient and morbidity mix are consistent with those found in a national general practice survey;¹⁷ however, as this study was conducted on a small population of a single four-doctor practice, the generalizability of the results is limited.

Table 3 Mean MCI for all patients and for all patients within each tertile of total number of visits within each GP-SCC

	GP-SCC 1	GP-SCC 2	GP-SCC 3	GP-SCC 4	Total
All	0.588	0.646	0.670	0.724*	0.660
Low	0.552	0.581	0.642	0.643	0.596
Moderate	0.609	0.666	0.627	0.684	0.651
High	0.606	0.702	0.724	0.798**	0.726*

* $p < 0.0001$ ** $p = 0.001$. GP-SCC, general practice-specific care category; MCI, modified continuity index.

Impact of morbidity on provider continuity

As one would expect, attendance frequencies and the number of health problems encountered increased with age. The burden of morbidity encountered also differed markedly across the age spectrum, with the young attending primarily for self-limiting diseases (e.g. acute viral infections and injuries) and for preventive health care, and the older age groups attending with multiple, mostly chronic, health problems.

With increasing morbidity, the proportion of patients likely to choose personal provider continuity increases significantly. Conversely, independent of their morbidity, those choosing personal provider continuity are considerably older. Further research is required to identify the reasons why older patients prefer a constant provider compared to younger ones, even though both age groups have the same burden of morbidity. It can be hypothesized that these differences may be attributable to a difference in expectation of the type of care needed and the individual's experience of illness. The experience of 'feeling ill' has been shown to be a strong motivator for seeking medical care, regardless of the presence or absence of patho-physiological disease.¹⁸

Another possible explanation is a patient's desire to feel comfortable with a particular doctor, and to know that this doctor knows and understands them. Many older patients within the study paid a reduced fee for consultations, which may have had an impact on the frequency of visits. However, the reduced fee is unlikely to have influenced the choice of doctor consulted from visit to visit as all doctors were available for consultations during opening hours at least once per week.

Overall the frequency of visits to the GP showed little correlation with the level of provider continuity.

Impact of provider continuity on workload

Within every GP-SCC, patients choosing personal provider continuity consult about twice as frequently compared to those choosing provider discontinuity, and in addition complain about more than twice as many health problems. As has been shown, the burden of morbidity alone does not explain these findings.

Further research is needed to explore this issue. Again it can be hypothesized that the differences relate to the individual's perceived impact of their illness on their well-being¹⁸ and a difference in their expectation of the type of care needed.

Another explanation would be the experience of the consultation itself. There is some indirect evidence to indicate that Australian patients visit a different GP if they were dissatisfied with their last consultation. Those who described good communication as the reason for their satisfaction with the last visit were less likely to consult a different practitioner upon subsequent consultations.¹⁹ However, in the context of this single surgery study satisfaction with the consultation alone would not sufficiently explain the difference in workload between the provider continuity and discontinuity group.

Relative workload between the continuity and discontinuity group

The relative demand per consultation, expressed as the mean number of problems encountered per consultation, is similar for the continuity and discontinuity group despite the different attendance frequencies, and number of complaints made. This observation raises the question whether '1.2 issues per consultation' is about all one can 'fit in' to a consultation.

Having personal provider continuity has been shown to lead to increased knowledge about the patient, particularly when this knowledge has been gained on the basis of a high density of visits.²⁰ This improved knowledge about the patient makes the consultations for patients in the continuity group less demanding and more efficient, particularly when dealing with the elderly and patients with psychosocial problems.⁷

Conclusions

This study suggests that morbidity, age and frequency of visits per se are poor indicators to determine a patient's likelihood for seeking care from one provider, that is, seek personal provider continuity. Independent

of morbidity, patients who seek care from the same provider double a doctor's workload. Further research

is needed to explore which patient, doctor and consultation characteristics explain these findings.

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