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ORIGINAL RESEARCH: SHORT REPORT

Multimorbidity in Māori and Pacific patients: cross-sectional study in a Dunedin general practice

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ABSTRACT

INTRODUCTION: Multimorbidity is a major issue in primary health care.

AIM: To determine the prevalence of multimorbidity and polypharmacy in one general practice in relation to age, sex and socioeconomic deprivation in Māori and Pacific patients.

METHODS: A cross-sectional study using data manually extracted from electronic medical records was conducted using a stratified random sample of Māori and Pacific patients aged ≥ 35 years who were enrolled with a large urban Dunedin general practice. The data were analysed to identify the number and type of morbidities, and prevalence of multimorbidity and polypharmacy in relation to age, sex and socioeconomic deprivation.

RESULTS: Half (52.5% [95% CI 44.5–60.4]) of Māori and 64.3% (95% CI 51.9–75.4) of Pacific patients had multimorbidity; 22.8% (95% CI 16.6–30.1) of Māori and 10.0% (95% CI 4.1–19.5) of Pacific patients had physical and mental health co-morbidity. Fewer (13.6% [95% CI 8.7–19.8]) Māori than Pacific patients (32.9% [95% CI 22.1–45.1]) had polypharmacy. The prevalence of multimorbidity in both Māori and Pacific patients increased with age and with increasing levels of socioeconomic deprivation. The eight most prevalent chronic conditions in both Māori and Pacific patients were obesity, anxiety or depression, hypertension, asthma or chronic obstructive pulmonary disease, gout, diabetes, cardiovascular disease and osteoarthritis.

CONCLUSION: The high prevalence of multimorbidity in Māori and Pacific patients requires the New Zealand health system to deliver culturally competent primary health care and to re-orientate health-care delivery around multimorbidity.

KEYWORDS: Primary health care; multimorbidity; Māori; Pacific; cross-sectional study

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Introduction

Multimorbidity (the presence of two or more chronic conditions in a single patient[1]) is one of the biggest challenges facing both the New Zealand (NZ) health system and health systems internationally.[2,3] Multimorbidity is a major issue in primary health care.[4] Epidemiological studies show that multimorbidity is normal for people aged ≥ 65 years,[5] is more frequent and occurs earlier in people living with high socioeconomic deprivation[6] and disproportionately affects indigenous people.[7] Multimorbidity leads to poorer health outcomes; it is associated with high mortality, reduced functional status and quality of life, increased use of inpatient and ambulatory health care, and polypharmacy.[8–10]

There is a limited evidence base on the epidemiology of multimorbidity and polypharmacy in NZ, particularly in relation to primary health care[10] and Māori and Pacific populations.

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WHAT THIS GAP FILLS

What is already known: Multimorbidity increases with age and is more frequent and occurs earlier in people living with high socioeconomic deprivation.

What this study adds: The majority of Māori and Pacific patients aged ≥35 years had multimorbidity. The prevalence of multimorbidity increased with age and with increasing levels of socioeconomic deprivation.

We aimed to determine the prevalence of multimorbidity and polypharmacy in relation to age, sex and socioeconomic deprivation in Māori and Pacific patients enrolled with one Dunedin general practice.

Methods

Study design, setting and participants

A cross-sectional study using electronic medical records (MedTech32 software, www.medtechglobal.com/nz/contact-us-newzealand/) was conducted in January 2016 using a stratified random sample of Māori and Pacific patients aged ≥ 35 years and enrolled with a large urban general practice in the lower South Island of NZ.

The study general practice serves an ethnically and socioeconomically diverse population and has a patient list size of 17,350, of whom 9% (1638/17,530) are Māori and 3% (545/17,530) are Pacific peoples. The proportion of the study population enrolled with the practice is lower than the proportion of Māori (14.9%) and Pacific peoples (7.4%) in the NZ population as a whole.[11]

Data collection

An electronic medical record review was carried out on a stratified random sample of Māori and Pacific patients aged ≥ 35 years. This is the group affected most by multimorbidity in other studies[5] and it also covers the high-needs age range for the NZ cardiovascular disease risk assessment guidance and indicators programme (men aged ≥ 35 years).[12] The total practice population of Māori and Pacific patients aged ≥ 35 years was 602: 70% (422/602) Māori and 30% (180/602) Pacific. We determined the sample size required to give a 5% margin of error on a 95% confidence interval, based on an estimated multimorbidity prevalence of 42% (based on UK data[6]) for the combined group of Māori and Pacific patients, and this gave a total sample size of 232. Māori and Pacific patients were sampled according to their respective proportions in the general practice population.

We selected 30 common morbidities seen in general practice[6] from the list of 40 long-term conditions presented in a Scottish primary care multimorbidity cross-sectional study.[6] These 30 morbidities were selected through discussion between TS and FDN as likely being the most common morbidities for the study population. In addition, we considered it important to consider obesity (defined as body mass index [BMI] > 30) as a further separate morbidity given its high prevalence in the study population.[13] We therefore collected data on 31 morbidities (see Supplementary material Table S1, available at the journal's website). We defined multimorbidity as the presence of two or more of these 31 morbidities in one patient.[6] Polypharmacy was defined when the prescribing section of the electronic medical record indicated that patients concurrently took ≥ 5 medications.[10] Data from the electronic medical records were manually extracted by MA into an Excel spreadsheet (Microsoft Corporation, Redmond, WA, USA).

Statistical analyses

A descriptive analysis was conducted by TS and MA using frequencies and percentages. In addition, we report 95% exact confidence intervals (CIs). These were calculated using Epi Info 7.2.1.0 (Centers for Disease Control and Prevention, Atlanta, GA, USA, www.cdc.gov/).

This study was granted ethical approval by the University of Otago Ethics Committee (HD15/026).

Results

The medical records of 232 patients aged ≥ 35 years were reviewed; 162 were for Māori (69.8%)

Table 1. Prevalence of multimorbidity and polypharmacy by age, sex and NZ deprivation quintile

	n (%)		Mean number of morbidities (SD)		Median number of morbidities (interquartile range)		Percentage (95% CI) with multimorbidity		Percentage (95% CI) with polypharmacy	
	Māori	Pacific	Māori	Pacific	Māori	Pacific	Māori	Pacific	Māori	Pacific
All patients	162 (100)	70 (100)	1.94 (1.79)	2.24 (1.65)	2 (1–3)	2 (1–3)	52.4 (44.5–60.4)	64.3 (51.9–75.4)	13.6 (8.7–19.8)	32.9 (22.1–45.1)
Sex										
Female	86 (53.1)	36 (51.2)	1.83 (1.64)	2.27 (1.60)	2 (1–3)	2 (1–3)	52.3 (41.3–63.2)	69.4 (51.9–83.6)	11.63 (5.7–20.4)	41.7 (25.5–59.2)
Male	76 (46.9)	34 (48.2)	2.07 (1.96)	2.21 (1.72)	2 (0.5–3)	2 (1–3)	52.6 (40.8–64.2)	58.8 (40.7–75.4)	15.79 (8.43–25.9)	23.5 (10.7–41.7)
Age, years										
35–44	72 (44.4)	20 (28.6)	1.50 (1.46)	1.10 (1.07)	1 (0–2)	1 (0–2)	44.4 (32.7–56.6)	40.0 (19.1–64.0)	8.3 (3.1–17.3)	0.00
45–54	57 (35.2)	27 (38.6)	1.77 (1.67)	1.89 (1.42)	2 (1–2)	2 (1–3)	50.9 (37.3–64.4)	55.6 (35.3–74.5)	12.2 (5.1–23.7)	37.0 (19.4–57.3)
55–64	24 (14.8)	13 (18.6)	2.95 (2.05)	3.62 (1.61)	3 (1–4)	4 (2–5)	66.7 (44.7–84.4)	92.3 (63.4–99.8)	29.2 (12.6–51.1)	38.5 (13.7–68.4)
65–74	8 (4.9)	10 (14.2)	4.00 (2.32)	3.70 (0.82)	4 (2–5.5)	3.5 (3–4)	87.5 (47.3–99.7)	100.0 (69.2–100.0)	25.0 (3.2–65.1)	80.0 (44.4–97.5)
75+*	1 (0.7)	0	–	–	–	–	100.00 (–)	–	100.00 (–)	–
***NZ Deprivation quintile* 1 (affluent)**	27 (16.7)	9 (12.9)	1.63 (1.50)	1.44 (1.59)	1 (0–3)	1 (0–3)	48.5 (28.7–68.0)	44.4 (13.7–78.8)	7.4 (0.9–24.3)	22.2 (2.8–60.0)
2	26 (16.0)	9 (12.9)	1.54 (1.47)	1.53 (1.24)	1 (0–3)	2 (2–3)	42.3 (23.3–63.1)	88.9 (51.6–99.7)	7.7 (1.0–25.1)	33.3 (7.5–70.1)
3	34 (21.0)	14 (20.0)	2.47 (2.01)	2.36 (1.65)	2 (1–4)	2 (1–3)	55.9 (37.9–72.8)	64.3 (35.1–87.2)	17.6 (6.7–34.5)	42.9 (17.7–71.1)
4	38 (23.5)	18 (25.7)	1.79 (1.74)	2.11 (1.45)	2 (0–2)	2 (1–3)	52.6 (35.8–69.0)	61.1 (35.8–82.7)	10.5 (2.9–24.8)	22.2 (6.4–47.6)
5 (deprived)	37 (22.8)	20 (28.5)	2.13 (1.97)	2.55 (1.98)	2 (1–3)	2 (1–4.5)	59.5 (42.1–75.3)	65.0 (40.8–84.6)	21.6 (9.8–38.2)	40.0 (19.1–64.0)
Number of chronic conditions										
0	40 (24.7)	12 (17.1)								
1	37 (22.8)	13 (18.6)								
2	35 (21.6)	17 (24.3)								
3	18 (11.1)	12 (17.2)								
4	19 (11.7)	8 (11.4)								
≥5	13 (8.1)	8 (11.4)								

* As there are only one Māori and zero Pacific patients in this age group no, 95% CI can be reported. SD (standard deviation); CI (confidence interval).

and 70 (30.2%) were Pacific. Most (75.3% (95% CI 67.9–81.7)) Māori and 82.9% (95% CI 72.0–90.1) of Pacific patients had at least one chronic morbidity. Table 1 presents the prevalence of multimorbidity and polypharmacy by age, sex and deprivation (NZdep) quintile. Half (52.5% (95% CI 44.5–60.4)) of Māori and 64.3% (95% CI 51.9–75.4) of Pacific patients had multimorbidity; 22.8% (95% CI 16.6–30.1) of Māori and 10.0% (95% CI 4.1–19.5) of Pacific patients had physical and mental health co-morbidity. Fewer Māori than Pacific patients had polypharmacy (13.6% (95% CI 8.7–19.8) and 32.9% (95% CI 22.1–45.1) respectively).

The prevalence of multimorbidity in both Māori and Pacific patients increased with age and with increasing levels of socioeconomic deprivation. The prevalence of polypharmacy in Māori patients increased with age and with increasing levels of socioeconomic deprivation; in Pacific patients, polypharmacy increased with age (Table 1).

The eight most prevalent chronic conditions in both Māori and Pacific patients were obesity, anxiety and/or depression, hypertension, asthma and/or chronic obstructive pulmonary disease (COPD), gout, diabetes, cardiovascular disease (CVD) and osteoarthritis (Table 2). The prevalence of all 31 conditions is reported in Supplementary material Table S1.

Table 2. Prevalence of the eight most common chronic morbidities

	n (%, 95% CI)	
	Māori	Pacific
All patients	162 (100%)	70 (100%)
Obesity	74 (45.7, 37.8–53.7)	33 (47.1, 35.1–59.5)
Anxiety and/or Depression	35 (21.6, 15.5–28.7)	15 (21.4, 12.5–32.9)
Hypertension	33 (20.3, 14.5–27.4)	16 (22.9, 13.7–34.5)
Asthma and/or COPD	30 (18.5, 12.9–25.4)	16 (22.9, 13.7–34.5)
Gout	19 (11.7, 7.2–17.7)	7 (10.0, 4.1–19.5)
Diabetes	16 (9.9, 5.8–15.5)	13 (18.6, 10.3–29.7)
CVD	16 (9.9, 5.8–15.5)	5 (7.1, 2.4–15.9)
Osteoarthritis	16 (9.9, 5.8–15.5)	6 (8.6, 3.2–17.7)

CI (confidence interval); COPD (chronic obstructive pulmonary disease); CVD (cardiovascular disease).

The five most common multimorbidity combinations for Māori (n = 162) and Pacific (n = 70) patients (ranked in order of decreasing prevalence for Māori) were: hypertension and obesity (Māori: 15.4%, 95% CI 10.2–21.9; Pacific: 17.1%, 95% CI 9.2–28.0); diabetes and obesity (Māori: 7.4%, 95% CI 3.9–12.6; Pacific: 15.7%, 95% CI 8.1–26.4); osteoarthritis and obesity (Māori: 7.4%, 95% CI 3.9–12.6; Pacific: 5.7%, 95% CI 1.6–14.0); gout and obesity (Māori 6.8%, 95% CI 3.4–1.2; Pacific: 8.6%, 95% CI 3.2–17.7); and CVD and obesity (Māori: 6.2%, 95% CI 3.0–11.1; Pacific: 2.9%, 95% CI 0.3–9.9).

Discussion

This is the first NZ study to report the epidemiology of multimorbidity in Māori and Pacific patients from a sample of general practice medical records. The majority of Māori (53%) and Pacific (64%) patients aged ≥ 35 years had multimorbidity. The prevalence of multimorbidity in both Māori and Pacific patients increased with age and with increasing levels of socioeconomic deprivation. The eight most prevalent chronic conditions in both Māori and Pacific patients were obesity, anxiety or depression, hypertension, asthma or COPD, gout, diabetes, CVD and osteoarthritis.

Strengths and limitations

A strength of this study is that we conducted a manual review of general practice electronic medical records to describe the epidemiology of multimorbidity in Māori and Pacific patients enrolled in a large urban general practice. Given the time and resource limitations of the study, we were not able to review all the practice population. We appropriately addressed this through using a stratified random sample. The small sample size means that there are wide confidence intervals (CIs) around some subgroup findings, particularly for Pacific patients.

There are several study limitations. First, we did not describe and compare multimorbidity in other ethnic groups, notably the NZ European population. Second, a further potential limitation is the extent to which the findings from Māori and Pacific patients enrolled with the study practice

in Dunedin can be generalised to the total Māori and Pacific NZ population. The NZdep quintiles (Table 1) are less weighted towards the deprived end of the scale than NZdep quintiles for the total Māori and Pacific NZ population.[14] Given that deprivation is associated with increased multimorbidity,[6] it is likely that the prevalence of multimorbidity in the total Māori and Pacific NZ population is higher than reported here.

Comparison with existing literature

Our findings are consistent with NZ hospital[15,16] and cancer registry[17] studies, which show higher levels of co-morbidity in both Māori and Pacific populations. The common co-morbidities reported are also similar.[15] There is also population-level evidence that polypharmacy is higher in older (aged ≥ 65 years) Māori people.[10] The findings are also consistent with international primary care studies showing that multimorbidity is positively associated with age and socioeconomic deprivation,[5,6] and that the most frequent patterns of multimorbidity include CVD, metabolic conditions and osteoarthritis.[5]

Implications for clinical practice and research

The high prevalence of multimorbidity in Māori and Pacific patients found in this study supports the call from related research for the NZ health system to deliver culturally competent primary health care[18,19] and to re-orientate health-care delivery around multimorbidity.[20] There is a need for further primary care research to investigate the epidemiology of multimorbidity across NZ and in all major ethnic groups.

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COMPETING INTERESTS
None.