

# GP registrar consultations addressing menopause-related symptoms: a cross-sectional analysis

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## Abstract

**Objective:** To investigate the prevalence and associations of general practitioner registrars' (trainees') management of women with menopause-related symptoms.

**Methods:** A cross-sectional analysis from the Registrar Clinical Encounters in Training (ReCEnT) cohort study. In ReCEnT registrars collected data of 60 consecutive consultations on three occasions during training. The outcome factor was menopause-related problems/diagnoses (compared with other problems/diagnoses). Associations of registrar, patient, practice, and consultation-independent variables were assessed by univariate and multivariable logistic regression.

**Results:** In all, 1,333 registrars conducted 189,774 consultations involving 295,017 problems/diagnoses. Of these, there were 1,291 problems/diagnoses (0.44% of all problems/diagnoses) relating to menopause. Significant multivariable independent associations of a problem being menopause-related were registrar female sex (odds ratio [OR] 2.74, 95% confidence interval [CI] 2.30-3.26) and registrars working part-time (OR 0.84, 95% CI 0.72-0.98 for full-time work). Consultation-related associations included an increased number of problems addressed in the consultation (OR 1.29, 95% CI 1.21-1.37), and menopause-related problems/diagnoses not being new (OR 0.75, 95% CI 0.66-0.86). Significant educational associations were increased odds of recourse to in-consultation sources of information or assistance (OR 2.09, 95% CI 1.80-2.44) and of generating learning goals (OR 3.15, 95% CI 2.66-3.72).

**Conclusions:** Registrars seek more assistance and further knowledge about menopause compared with other problems. Thus, they may find the area particularly challenging and could benefit from further education regarding managing menopause. Our findings may help inform the design of measures aimed at improving the delivery of menopause training for general practice registrars.

**Key Words:** Climacteric – Epidemiology – General practice – Medical education – Menopause.

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Menopause is a transition experienced by all women at midlife. Menopause-related symptoms are varied and have diverse impacts on a woman's quality of life,<sup>1</sup> with some symptoms and sequelae persisting into postmenopausal years. Menopause is a reasonably common

problem presenting to general practice, with 4.5% of consultations with women aged 45 to 64 years discussing a menopause-related symptom.<sup>2</sup> Symptoms include vasomotor symptoms such as hot flushes (community prevalence 30%-80% of peri to postmenopausal women) and night sweats

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(20%-50% at perimenopause), vaginal atrophy (16%-46% of postmenopausal women), and associated sexual dysfunction (up to 75% of menopausal women), psychological and emotional distress (10%-60% of menopausal women).<sup>3-5</sup>

The management of menopause is complex. Since the release of the Women's Health Initiative initial report, the risks and potential benefits of hormone therapy (HT) have caused confusion and concern.<sup>6-9</sup> Although more recent studies suggest HT has less associated risks than initially thought,<sup>10</sup> menopausal management still requires a comprehensive understanding of the current evidence and guidelines by health practitioners, and careful discussion with women.<sup>11</sup> Studies have shown that clinicians have limited knowledge about menopause physiology and management, and report the necessity for further education in these areas.<sup>9,12</sup> These studies, however, are primarily based around the education of obstetrics and gynecology clinicians, with limited data on general practice registrars (specialist trainees in general practice or family medicine).

The Royal Australian College of General Practitioners (RACGP) stipulates the expected knowledge of general practitioners (GPs) in managing menopause-related problems in their Core Skills Curriculum.<sup>13,14</sup> Most GP/family medicine trainees (registrars) have had limited exposure to menopause diagnosis and management in their early clinical years during primarily hospital-based prevocational training. It is therefore important that the experience of managing menopause-related problems during training is adequate to prepare registrars for independent post-fellowship practice.

The prevalence and associations of GP registrars' exposure to care of women with menopause-related symptoms have not been reported. In this study, we sought to establish the prevalence of menopause-related symptoms presenting to a contemporary cohort of Australian general practice registrars. We also sought to establish the associations of registrars' clinical experiences with menopause-related symptoms, including associations with consultation factors and actions arising from the consultation.

## METHOD

This analysis was conducted on data from the Registrar Clinical Encounters in Training (ReCEnT) study.

### ReCEnT

ReCEnT is an ongoing prospective cohort study of GP registrar consultations. It is a multisite study with GP registrars training with five of Australia's 17 regional training providers (RTPs) in five Australian states (2010-2015), and (from 2016) with three of Australia's nine regional training organizations (RTOs) in three states (in late 2015 there was a major restructure of Australian general practice training). The methodology has been described in detail elsewhere.<sup>15</sup>

Registrars collect data once every 6-month (full-time equivalent) training term resulting in three collections during training. The data are collected as part of the registrars' educational program, and individual written feedback is given

to facilitate reflection on individual registrar's clinical and educational experiences. Informed consent is sought for registrars' data to be also used for research purposes.

Initial data collection involves demographic data and characteristics of the practice, and also education and work experience of the registrars. Registrars then record the details of 60 consecutive clinical consultations on paper-based encounter forms. Data collection is designed to reflect a "normal" week in general practice, and so includes only office-based consultations and excludes specialty clinics, for example, vaccination clinics.

The collected data address four broad areas: patient demographics, problems/diagnoses, investigations/management, and educational training details. Problems/diagnoses are coded with the International Classification of Primary Care (second edition) classification system (ICPC-2 PLUS).<sup>16</sup>

### Outcome factor

The outcome factor in this study was whether a problem/diagnosis was menopause-related. Menopause-related problems/diagnoses were defined by 23 ICPC-2 codes (see Table, Supplemental Digital Content 1, <http://links.lww.com/MENO/A280>, which lists the ICPC-2 codes included within the analysis).

### Independent variables

Independent variables related to registrar, patient, practice, and consultation.

Registrar factors were sex, age, country of medical qualification, training term, full-time/part-time work, and whether the registrar had worked at the practice previously.

Patient factors were age, identification as Aboriginal and/or Torres Strait Islander, non-English-speaking background (NESB), and patient/practice status (whether the patient was an existing patient, new to the registrar, or new to the practice).

Practice factors included practice size (based on number of full-time equivalent GPs), bulk billing status (whether the practice routinely charged no consultation fee to the patient), RTP/RTO, rurality (based on the Australian Standard Geographical Classification Remoteness Area [ASGC-RA] classification),<sup>17</sup> and Socioeconomic Index for Area (SEIFA) index decile (SEIFA Relative Index of Disadvantage).<sup>18</sup>

Consultation factors were the consultation duration, the number of problems managed in the consultation, whether the problem was new, if any imaging or pathology was ordered, if any referrals were made, if any follow-up was organized, and if any medications were prescribed. Educational factors arising during the consultation included whether the registrar sought clinical information or assistance for the problem (such as from a clinical supervisor, specialist, electronic source, or hard-copy source), and if any personal learning goals were generated by the registrar.

### Statistical analysis

This was a cross-sectional analysis of consultations from the longitudinal ReCEnT study. Included in the analysis were

14 rounds of data from 2010 to 2016. Data of two populations were analyzed.

The primary analysis included all problems/diagnoses; a sensitivity analysis included all problems/diagnoses of females aged 25 years and older. The primary analysis addressed our main research questions: “What are the prevalence and the associations of GP registrars’ management of women with menopause-related symptoms.” We were particularly interested in how frequently registrars encounter menopause-related symptoms during their training and what are the associations of gaining this experience. This is best achieved by comparing menopause to all other problems/diagnoses encountered. We also compared menopause-related problems with other problems/diagnoses in a restricted population, females aged 25 years and older, when considering differences in the content and outcome of consultations. The rationale for conducting the sensitivity analysis, including only women aged 25 or older, was that in this more homogeneous population, unmeasured confounding in the associations of problems/diagnoses being menopause-related with the content and outcome of consultations would be less likely. The age restriction reflected the age distribution of menopause-related problems in our data.

To test associations of a problem/diagnosis being menopause-related, univariate and multivariable logistic regression were used within a generalized estimating equation (GEE) framework to account for clustering of repeated measures of patients within registrars. Analysis was at the level of problem/diagnosis. All variables with a *P* value <0.20 in the univariate analysis were included in the multivariable regression model (the full model). After testing variables for removal via backward elimination the model did not change significantly compared with the full model, so the full model was used.

To examine our research questions, three models were built for each population, each with “menopause-related problem/diagnosis” as the dependent variable.

To examine the associations of a problem/diagnosis seen by the registrar being menopause-related, patient, practice, and registrar-independent variables were entered into the regression model.

To examine how consultations involving menopause differ from other consultations, the above variables were entered in a model along with the following additional variables: consultation duration, if the problem is new, the number of problems addressed during the consultation, and if any sources of information or advice were consulted.

To examine how outcomes differ in consultations involving menopause compared with other consultations, all variables entered in the previous models were entered in a new model along with the following additional variables: if any imaging or pathology was ordered, if any medications were prescribed, if any referrals were made or follow-up organized for the diagnosis/problem, and whether the registrar generated any learning goals from the consultation.

The rationale for building three models was that a woman presenting with a menopause-related problem/diagnosis will plausibly be influenced by patient, registrar, and practice factors, but evaluation of these influences may be compromised by inclusion in the multivariable model of factors operating once the consultation is progressing. Similarly, evaluation of the content of the consultation may be compromised by the inclusion in this model of outcomes arising from the consultation.

In a post hoc analysis, to facilitate comparison of our GP registrar findings with those in a study of established GPs, we calculated the percentage and 95% confidence interval (CI) of problems/diagnoses and consultations with women aged 45 to 64 years with menopause-related symptoms.

Analyses were programmed using Stata 13.1.

### Ethics approval

Ethics approval was obtained from the University of Newcastle Human Research Ethics Committee, Reference H-2009-0323.

## RESULTS

Data were provided by 1,333 individual registrars during 14 rounds of data collection, from 2010 to 2016 (response rate 95.8%).

The demographics of the participating registrars and practices are presented in Table 1.

### Primary analysis

The primary analyses included 189,774 consultations involving 295,017 problems/diagnoses. In this population,

**TABLE 1.** Participating registrar, registrar-term, and practice characteristics

Variable	Class	n (%)
Registrar variables (n = 1,333)		
Registrar sex	Female	871 (65.3)
Qualified as a doctor in Australia	Yes	1,064 (80.5)
Registrar-term <sup>a</sup> and practice-term variables (n = 3,195)		
Registrar Age, Years	Mean ± SD	32.6 ± 6.3
Registrar training term	Term 1	1,233 (38.6)
	Term 2	1,140 (35.7)
	Term 3	822 (25.7)
Registrar worked at the practice previously	Yes	2,418 (77.6)
Registrar works full-time	Yes	561 (17.9)
Practice routinely bulk bills <sup>b</sup>	Yes	1,064 (34.2)
Number of FTE GPs working at the practice	1-5	2,045 (65.8)
	6+	1,833 (57.4)
Rurality of practice	Major City	839 (26.3)
	Inner Regional	519 (16.3)
	Outer Regional or Remote	
SEIFA <sup>c</sup> index (decile) of practice	Mean ± SD	5.6 ± 2.9

FTE, full time equivalent; GP, general practitioner; SEIFA, Socioeconomic Index for Area.

<sup>a</sup>“Registrar-term” means the number of individual terms undertaken by all registrars.

<sup>b</sup>“Bulk bills” means no financial cost to the patient.

<sup>c</sup>Socioeconomic Index for Area (SEIFA) relative index of disadvantage.

**TABLE 2.** Menopause-related problems

Problem	Frequency (% of menopause problems)	% of all problems
Menopause/postmenopause	502 (38.9)	0.17
Atrophic vaginitis	225 (17.4)	0.076
Perimenopause/premenopause	180 (14)	0.061
Hormone therapy	130 (10.1)	0.044
Bleeding postmenopausal	91 (7.1)	0.030
Menopausal symptom/syndrome	69 (5.4)	0.023
Hot flushes—menopausal	64 (5.0)	0.021
Menopause—premature	29 (2.3)	0.0098
Bleeding—menopausal	1 (0.1)	0.0003
Total	1,291	

menopause-related problems/diagnoses occurred in 0.68% (95% CI 0.64%-0.73%) of consultations. In all, 1,291 menopause-related problems/diagnoses were managed, equating to 0.44% (85% CI 0.41%-0.47%) of all problems/diagnoses.

The most common menopause-related problems/diagnoses were menopause/postmenopause (38.9% of all menopause problems), atrophic vaginitis (17.4%), and perimenopause/premenopause (14%). All relevant ICPC-2 codes considered in this analysis and their respective frequencies of presentation are listed in Table 2.

The associations of a problem being menopause-related are presented in Table 3.

The multivariable logistic regression model with “menopause-related problem/diagnosis” as the outcome (primary analysis: all patients included) is presented in Table 4.

Patient factors significantly associated with a menopause-related problem/diagnosis included being in the 45 to 54-year age category (odds ratio [OR] 0.05, 95% CI 0.04-0.06) for age 0 to 44 years; and OR 0.40, 95% CI 0.35-0.45 for age 55+ years). Patients from NESB background were less likely to present with menopause-related symptoms (OR 0.73, 95% CI 0.54-0.98 for NESB).

Registrar associations of problems/diagnoses being menopause-related included registrar female sex (OR 2.74, 95% CI 2.30-3.26) and registrars working part-time (OR 0.84, 95% CI 0.72-0.98 for full-time workload).

Other significant associations of menopause-related problems/diagnoses included an increased number of problems addressed in the consultation (OR 1.29, 95% CI 1.21-1.37). Menopause-related problems/diagnoses were also less likely to be new (OR 0.75, 95% CI 0.66-0.86), and a referral was less likely to be made (OR 0.41, 95% CI 0.31-0.53). Significant educational associations were increased odds of recourse to in-consultation sources of information or advice (OR 2.09, 95% CI 1.80-2.44) and of generating learning goals (OR 3.15, 95% CI 2.66-3.72).

### Sensitivity analysis

In the sensitivity analyses, there were 80,959 consultations with women aged 25 years and over, entailing 135,108 problems/diagnoses. In this population, 1,264 menopause-related problems/diagnoses were managed equating to 0.94% (95% CI 0.90%-1.00%) of problems/diagnoses.

The multivariable logistic regression models of the sensitivity analysis with “menopause-related problem/diagnosis” as the outcome are presented in Table 5. Results were very similar to the primary analysis, though NESB was no longer statistically significant, ordering pathology was no longer included in the model, and the OR for registrar female sex was somewhat lower (1.92, 95% CI 1.61-2.29 vs 2.74, 95% CI 2.30-3.26).

In a post hoc analysis, there were 976 menopause-related problems/diagnoses managed with women aged 45 to 64, equating to 2.04% (95% CI 1.91-2.17) of problems/diagnoses and 3.5% (95% CI 3.29-3.72) of consultations.

## DISCUSSION

To the best of our knowledge, this is the first report of clinical exposure of GP registrars to menopause-related problems/diagnoses. We identified multiple associations of registrar experiences with women presenting with menopause-related symptoms, including registrar, patient, and consultation factors. The most notable associations included registrar female sex, working part-time, increased generation of learning goals, and recourse to in-consultation sources of information.

### Comparison with existing literature

The GP registrars appear to see somewhat fewer menopause-related problems/diagnoses than established GPs. An Australian study of GPs found 4.5% of consultations with women aged 45 to 64 years included menopause-related symptoms compared with our finding of 3.5% for GP registrars.<sup>2</sup>

We found significant educational associations of a problem/diagnosis being menopause-related, including increased odds of recourse to in-consultation sources of information or assistance and of generating learning goals. A study of American medical students found that only 60% of students were being exposed to women with menopause-related symptoms during their obstetrics and gynecology clerkship.<sup>19</sup> A different American study of obstetrics and gynecology residents found 67.1% of participants self-reported that they needed to learn more about menopause physiology and 68% wanted to learn more about HT.<sup>12</sup> Therefore, there is a common theme for clinicians to have limited exposure and knowledge of menopause.

Menopause-related problems were significantly associated with registrar female sex. This is consistent with literature showing that women were more likely to have a sex-concordant consultation in general practice consultations with registrars.<sup>20</sup> Part-time registrar status was also a significant association, even after adjusting for registrar sex (noting that female registrars are more likely to work part-time).<sup>21</sup>

Significant consultation-related associations included an increased number of problems addressed in the consultation, and menopause-related problems/diagnoses being less likely to be new and registrars less likely to refer a menopause-related problem. There is no literature with which to compare these findings of associations of registrars' exposure to menopause.

**TABLE 3.** Characteristics associated with menopause-related problems/diagnoses (N = 295,017)

Variable	Class	Menopause		P
		No (n = 293,726)	Yes (n = 1,291)	
Patient age, y	0-44	155,301 (99.9)	113 (0.1)	
	45-54	39,537 (98.5)	609 (1.5)	
	55+	98,888 (99.4)	569 (0.6)	<0.001
Aboriginal and/or Torres Strait Islander	No	271,913 (99.6)	1,209 (0.4)	
	Yes	4,347 (99.8)	10 (0.2)	0.035
NESB	No	259,319 (99.6)	1,171 (0.5)	
	Yes	19,186 (99.7)	56 (0.3)	0.001
Patient/practice status	Existing Pt	125,070 (99.5)	594 (0.5)	
	New to registrar	142,268 (99.6)	617 (0.4)	
	New to practice	19,456 (99.7)	50 (0.3)	<0.001
Registrar sex	Male	98,832 (99.8)	211 (0.2)	
	Female	194,894 (99.5)	1,080 (0.5)	<0.001
Registrar FT or PT	Part-time	65,730 (99.5)	347 (0.5)	
	Full-time	220,837 (99.6)	909 (0.4)	<0.001
Training term/post	Term 1	155,640 (99.6)	499 (0.4)	
	Term 2	103,117 (99.6)	461 (0.4)	
	Term 3	74,969 (99.6)	331 (0.4)	0.854
Qualified as doctor in Australia	No	54,627 (99.6)	207 (0.4)	
	Yes	236,937 (99.5)	1,079 (0.5)	0.015
Worked at the practice before	No	212,040 (99.6)	920 (0.4)	
	Yes	77,611 (99.6)	348 (0.4)	0.602
Practice size	Small	99,456 (99.5)	455 (0.5)	
	Large	186,490 (99.6)	796 (0.4)	0.239
Practice routinely bulk bills	No	237,853 (99.5)	1,069 (0.5)	
	Yes	51,455 (99.6)	205 (0.4)	0.114
Rurality	Major city	168,610 (99.6)	688 (0.4)	
	Inner regional	76,875 (99.5)	370 (0.5)	
	Outer regional/remote/very remote	47,952 (99.5)	233 (0.5)	0.010
RTP	1	82,333 (99.5)	381 (0.5)	
	2	35,987 (99.4)	208 (0.6)	
	3	39,905 (99.6)	177 (0.4)	
	4	125,137 (99.6)	477 (0.4)	
	5	10,364 (99.5)	48 (0.5)	<0.001
Is the problem new	No	119,188 (99.4)	690 (0.6)	
	Yes	149,404 (99.7)	517 (0.3)	<0.001
Any sources used	No	247,629 (99.6)	982 (0.4)	
	Yes	46,097 (99.3)	309 (0.7)	<0.001
Any imaging ordered	No	271,286 (99.6)	1,206 (0.4)	
	Yes	22,440 (99.6)	85 (0.4)	0.154
Any referrals made	No	257,581 (99.5)	1,204 (0.5)	
	Yes	36,145 (99.8)	87 (0.2)	<0.001
Any pathology ordered	No	240,348 (99.6)	1,028 (0.4)	
	Yes	53,378 (99.5)	263 (0.5)	0.041
Any learning goals generated	No	233,161 (99.7)	780 (0.3)	
	Yes	47,463 (99.1)	448 (0.9)	<0.001
Any follow-up organized	No	164,157 (99.6)	689 (0.4)	
	Yes	129,569 (99.5)	602 (0.5)	0.069
Any medications prescribed	No	161,317 (99.6)	666 (0.4)	
	Yes	132,409 (99.5)	625 (0.5)	0.016
Registrar age	Mean (SD)	32.5 (6.3)	32.1 (5.9)	0.0232
SEIFA decile	Mean (SD)	5.5 (2.9)	5.4 (2.9)	0.4005
Consultation duration	Mean (SD)	19.0 (9.9)	21.5 (10.1)	<0.0001
Number of problems	Mean (SD)	2.0 (1.0)	2.4 (1.0)	<0.0001

NESB, non-English-speaking background; RTP, regional training provider; SEIFA, Socioeconomic Index for Area.

### Interpretation of the findings

Compared with established GPs, registrars appear to see fewer women with menopause-related problems. The frequency of managing menopause-related problems may also seem relatively low when considering the high prevalence of menopause-related symptoms in the community. This could be due to registrars being new to the practice and seeing younger patients with more acute problems. Another possibility is due to the chronic and sensitive nature of menopause-

related symptoms, suggesting women prefer to discuss this with their long-term GP.

The association with registrar female sex could be due to women preferring a female doctor for menopausal symptoms. It may also be that female registrars are more aware of menopausal problems than male registrars and more likely to elicit them in a consultation.

The most common problem documented by registrars being the more general terms of ‘‘menopause’’ or ‘‘postmenopause’’

TABLE 4. Associations of seeing and managing menopause

Variable	Class	Simple		Adjusted	
		OR (95% CI)	P	OR (95% CI)	P
Q1. Seeing a woman with menopause					
Patient age	0-44	0.05 (0.04-0.06)	<0.001	0.05 (0.04-0.06)	<0.001
Referent: 45-54	55+	0.38 (0.33-0.43)	<0.001	0.40 (0.35-0.45)	<0.001
Aboriginal and Torres Strait Islander	Yes	0.51 (0.25-1.03)	0.059	0.62 (0.31-1.26)	0.186
Patient non-English-speaking background	Yes	0.65 (0.49-0.88)	0.004	0.73 (0.54-0.98)	0.039
Patient/practice status	New to Registrar	0.92 (0.82-1.03)	0.166	1.02 (0.91-1.15)	0.721
Referent: Existing Pt	New to Practice	0.54 (0.41-0.72)	<0.001	0.81 (0.61-1.09)	0.165
Qualified as doctor in Australia	Yes	1.18 (0.99-1.40)	0.06	1.19 (0.98-1.44)	0.072
Age of registrar		0.99 (0.98-1.00)	0.035	0.99 (0.98-1.00)	0.120
Rurality of practice	Inner regional	1.21 (1.04-1.41)	0.014	1.12 (0.93-1.36)	0.239
Referent: Major city	Outer Regional/remote/very remote	1.20 (1.01-1.44)	0.042	1.01 (0.80-1.28)	0.907
RTP	2	1.24 (1.00-1.54)	0.051	1.30 (1.03-1.65)	0.027
Referent: 1	3	0.95 (0.77-1.17)	0.611	0.87 (0.70-1.09)	0.228
	4	0.82 (0.70-0.96)	0.013	0.88 (0.73-1.06)	0.170
	5	1.00 (0.69-1.46)	0.994	1.10 (0.75-0.98)	0.620
Registrar full-time	Yes	0.79 (0.68-0.92)	0.002	0.84 (0.72-0.98)	0.029
Registrar sex	Female	2.61 (2.22-3.06)	<0.001	2.74 (2.30-3.26)	<0.001
Q2. Differences within the consultation					
Consultation duration		1.02 (1.02-1.03)	<0.001	1.00 (1.00-1.01)	0.114
Number of problems		1.51 (1.43-1.59)	<0.001	1.29 (1.21-1.37)	<0.001
Is the problem new	Yes	0.60 (0.53-0.68)	<0.001	0.75 (0.66-0.86)	<0.001
Sources used	Yes	1.74 (1.51-1.99)	<0.001	2.09 (1.80-2.44)	<0.001
Q3. Difference in outcomes from the consultations					
Imaging ordered	Yes	0.85 (0.68-1.07)	0.163	0.64 (0.48-0.84)	0.001
Referral made	Yes	0.51 (0.40-0.64)	<0.001	0.41 (0.31-0.53)	<0.001
Pathology	Yes	1.12 (0.98-1.30)	0.104	0.84 (0.82-0.99)	0.042
Generated learning goal	Yes	2.95 (2.59-3.37)	<0.001	3.15 (2.66-3.72)	<0.001
Follow-up organized	Yes	1.11 (0.98-1.25)	0.091	0.92 (0.80-1.06)	0.245
Medication prescribed	Yes	1.16 (1.03-1.30)	0.014	1.16 (1.02-1.32)	0.028

CI, confidence interval; OR, odd ratio; RTPs, regional training providers.

TABLE 5. Associations of seeing and managing menopause in females &gt;25 years old (secondary analysis)

Variable	Class	Simple		Adjusted	
		OR (95% CI)	P	OR (95% CI)	P
Q1. Seeing a woman with menopause					
Patient age	25-44	0.08 (0.07-0.10)	<0.001	0.09 (0.07-0.11)	<0.001
Referent: 45-54	55+	0.39 (0.35-0.45)	<0.001	0.41 (0.36-0.47)	<0.001
Aboriginal and Torres Strait Islander	Yes	0.60 (0.30-1.21)	0.152	0.64 (0.62-1.29)	0.208
Patient non-English-speaking background	Yes	0.65 (0.48-0.87)	0.004	0.76 (0.57-1.03)	0.074
Patient/practice status	New to registrar	1.04 (0.93-1.17)	0.488	1.07 (0.95-1.20)	0.275
Referent: Existing Pt	New to practice	0.71 (0.53-0.95)	0.023	0.89 (0.66-1.20)	0.453
Age of registrar		0.99 (0.98-1.00)	0.048	0.99 (0.98-1.00)	0.138
Rurality of practice	Inner Regional	1.16 (1.00-1.35)	0.046	1.13 (0.93-1.36)	0.213
Referent: Major city	Outer regional/remote/very remote	1.19 (1.00-1.40)	0.049	1.05 (0.83-1.33)	0.664
RTP	2	1.25 (1.02-1.53)	0.033	1.28 (1.02-1.61)	0.037
Referent: 1	3	0.99 (0.81-1.21)	0.915	0.87 (0.69-1.08)	0.206
	4	0.87 (0.74-1.01)	0.075	0.90 (0.75-1.08)	0.264
	5	1.07 (0.77-1.51)	0.680	1.14 (0.78-1.66)	0.498
Qualified as doctor in Australia	Yes	1.15 (0.98-1.36)	0.094	1.15 (0.96-1.39)	0.137
Registrar full-time	Yes	0.83 (0.72-0.96)	0.014	0.85 (0.73-0.99)	0.034
Registrar sex	Female	1.86 (1.59-2.18)	<0.001	1.92 (1.61-2.29)	<0.001
Q2. Differences within the consultation					
Consultation duration		1.02 (1.01-1.02)	<0.001	1.00 (1.00-1.01)	0.377
Number of problems		1.32 (1.26-1.40)	<0.001	1.27 (1.19-1.35)	<0.001
Is the problem new	Yes	0.70 (0.62-0.79)	<0.001	0.73 (0.64-0.83)	<0.001
Sources used	Yes	1.90 (1.66-2.18)	<0.001	2.19 (1.87-2.55)	<0.001
Q3. Difference in outcomes from the consultations					
Imaging ordered	Yes	0.76 (0.60-0.95)	0.017	0.59 (0.45-0.78)	<0.001
Referral made	Yes	0.48 (0.38-0.61)	<0.001	0.41 (0.32-0.54)	<0.001
Generated learning goal	Yes	3.07 (2.69-3.50)	<0.001	3.27 (2.77-3.85)	<0.001
Medication prescribed	Yes	1.19 (1.05-1.34)	0.005	1.17 (1.03-1.34)	0.019

CI, confidence interval; OR, odd ratio; RTPs, regional training providers.

suggests women are presenting with multiple symptoms of menopause rather than isolated problems such as hot flashes.

Registrars were less likely to see women of NESB for menopause-related problems. While differences in the prevalence of symptoms have been shown between different ethnic groups, this association is complex and not well understood.<sup>22,23</sup>

The associations of increased number of problems addressed in the consultation and menopause being less likely to be a new problem may reflect the chronic nature of menopause-related problems. Women with menopause are more likely to be in an older age category, and are more likely to have multimorbid chronic conditions that also need addressing during a consultation.<sup>24</sup>

The higher levels of recourse to in-consultation sources of information or assistance and of generating learning goals may reflect the lack of exposure of junior doctors to menopause-related symptoms during prevocational training. The chronic and low-risk nature of menopause-related symptoms suggests they are more likely to be addressed in general practice and not referred on; however, there is a lack of Australian data on this topic.

### Strengths and limitations

The large size of the study (189,774 problems) and high response rate (95.8%) are strengths of the study. The response rate is particularly high for a study recruiting GPs.<sup>25</sup> The generalizability of the study is strong as it includes data from a wide geographic area including five of Australia's six states, and also registrars from practice locations across all urban/rural classifications. The large sample size and the large number of independent variables collected enable a large multivariable examination of the associations of registrars' consultations with women with menopause-related symptoms.

A limitation of the study is that, while we have detailed data on individual consultations, we do not have data on contextual factors such as comorbidities that were not addressed within the index consultation. Thus, our interpretations concerning number of problems addressed and multimorbidity must be interpreted with caution.

As our study is cross-sectional, we can hypothesize on possible reasons for the associations we have found, but cannot infer causality from our data.

### Implications for educational practice

Our data suggest that GP registrars find menopause a challenging area requiring further development of knowledge. This is likely due to limited exposure and formal teaching around menopause during prevocational hospital-based work. Therefore, educational changes could be aimed at this training stage. Quality menopause management will be crucial as any negative repercussion has the capacity to impact women for the lengthened postmenopausal period.

Although there is a learning need regarding menopause, curricula and educational programs are crowded, and registrars' needs regarding menopause must be balanced against

other demands. The undergraduate curricula are similarly crowded. Exposure of students to menopause is difficult due to funding and time constraints, limiting clinical exposure to women with menopause-related symptoms.

A menopausal clinic has been proposed as an innovative way to enhance medical education regarding menopause.<sup>26</sup> The clinic accepted peri and postmenopausal women and provided health maintenance and education that was followed by a team review of cases and education for clinicians. The results showed that menopause clinics can increase clinician knowledge regarding menopause and can be a way to better care for menopausal women and therefore may have a role in future training. This model of segmented care, though, may not be the most appropriate strategy in Australia that focuses on a more holistic healthcare approach.

A specific menopause curriculum adapted to fit within the GP training curricula could also be a way to educate general practice registrars. An American study found a 2-year menopause curriculum including only a small number of lectures and tutorials with case studies effectively improved menopause knowledge of clinicians.<sup>27</sup> This could have a role in registrar training due to the low time commitment required of registrars.

Strategies instigated by GP registrar supervisors could have the most significant impact on increasing GP registrar exposure to women with menopause. Australian general practice training is based on the apprenticeship model where registrars train while clinically supervised by a designated GP supervisor.<sup>28</sup> Targeting the registrar-supervisor dyad for educational interventions may be efficacious for menopause as it is in other areas.<sup>29</sup>

### Implications for future research

Review of the current curriculum regarding menopause and the delivery of this to both medical students, general practice registrars, and general practice clinical supervisors would help ensure the increasing need of menopausal women is being met.

It would be beneficial to investigate the accessibility of menopause care for women considering the prevalence of menopause-related problems presenting to general practice is so different to the prevalence of menopause in the community. It would also be of interest to investigate if there are barriers for women of NESB accessing health care for menopausal symptoms.

Investigation into the low rate of referrals and the appropriateness of referral and nonreferral could further inform as to the quality of registrar knowledge of menopause-related problems.

## CONCLUSIONS

Menopause affects all women at midlife, and women with menopause-related symptoms present commonly to Australian general practice. Registrars see fewer women who present with menopause-related symptoms than do established GPs, and are more likely to require assistance or set learning goals to learn more about menopause, suggesting they find the topic

particularly challenging. Our findings may help inform the design of interventions aimed at improving the delivery of training and increasing clinical exposure to menopause for general practice registrars.

## REFERENCES

- Gartoulla P, Bell RJ, Worsley R, Davis SR. Moderate-severely bothersome vasomotor symptoms are associated with lowered psychological general wellbeing in women at midlife. *Maturitas* 2015;81:487-492.
- Bayram C, Pollack A, Wong C, Britt H. Obstetric and gynaecological problems in Australian general practice. *Aust Fam Physician* 2015;44:443-445.
- Gartoulla P, Islam MR, Bell RJ, Davis SR. Prevalence of menopausal symptoms in Australian women at midlife: a systematic review. *Climacteric* 2014;17:529-539.
- Berecki-Gisolf J, Begum N, Dobson AJ. Symptoms reported by women in midlife: menopausal transition or aging? *Menopause* 2009;16:1021-1029.
- Anderson D, Yoshizawa T, Gollschewski S, Atogami F, Courtney M. Relationship between menopausal symptoms and menopausal status in Australian and Japanese women: preliminary analysis. *Nurs Health Sci* 2004;6:173-180.
- Rossouw JE, Anderson GL, Prentice RL, et al. Risks and benefits of estrogen plus progestin in healthy postmenopausal women: principal results From the Women's Health Initiative randomized controlled trial. *JAMA* 2002;288:321-333.
- The Women's Health Initiative Steering Committee. Effects of conjugated equine estrogen in postmenopausal women with hysterectomy: The Women's Health Initiative randomized controlled trial. *JAMA* 2004;291:1701-1712.
- Rolnick SJ, Jackson J, Kopher R, Terese A. Provider management of menopause after the findings of the Women's Health Initiative. *Menopause* 2007;14:441-449.
- Wang YJ, Yang X, Li XD, He XJ, Zhao Y. Knowledge and personal use of menopausal hormone therapy among Chinese obstetrician-gynecologists: results of a survey. *Menopause* 2014;21:1170-1172.
- Manson JE, Aragaki AK, Rossouw JE, et al. Menopausal hormone therapy and long-term all-cause and cause-specific mortality: The Women's Health Initiative randomized trials. *JAMA* 2017;318:927-938.
- Burg MA, Fraser K, Gui S, et al. Treatment of menopausal symptoms in family medicine settings following the Women's Health Initiative findings. *J Am Board Fam Med* 2006;19:122-131.
- Christianson MS, Ducie JA, Altman K, Khafagy AM, Shen W. Menopause education: needs assessment of American obstetrics and gynecology residents. *Menopause* 2013;20:1120-1125.
- Royal Australian College of General Practitioners. Curriculum for Australian General Practice 2016-CS16 Core skills unit. In: RACGP, ed. Melbourne, Victoria; 2016.
- The Royal Australian College of General Practitioners. *Standards for General Practice Training*. Melbourne: RACGP; 2015.
- Morgan S, Magin PJ, Henderson KM, et al. Study protocol: the Registrar Clinical Encounters in Training (ReCEnT) study. *BMC Fam Pract* 2012;13:50.
- Britt H. A new coding tool for computerised clinical systems in primary care: ICD-10 plus. *Aust Fam Physician* 1997;26 (Suppl 2):S79-82.
- Australian Standard Geographical Classification (ASGC) 1216.0 2011. Available at: [http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/32FBEDE1EA4C5800CA25791F000F2E1C/\\$File/att98dqt.pdf](http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/32FBEDE1EA4C5800CA25791F000F2E1C/$File/att98dqt.pdf). Accessed November 12, 2017.
- An Introduction to Socio-Economic Indexes for Areas (SEIFA) 2039.0; 2006. Available at: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/2039.0/>. Accessed November 12, 2017.
- Schnatz PF, Marakovits K. The next generation of menopause providers: are medical students being properly prepared? *Menopause* 2008;15:871-874.
- Thomson A, Morgan S, Tapley A, et al. Prevalence and associations of gender concordance in general practice consultations: a cross-sectional analysis. *Eur J Person Centred Healthcare* 2015;3:470-477.
- Lachish S, Svirko E, Goldacre MJ, Lambert T. Factors associated with less-than-full-time working in medical practice: results of surveys of five cohorts of UK doctors, 10 years after graduation. *Hum Resour Health* 2016;14:1-11.
- Tepper PG, Brooks MM, Khoudary SRE, et al. Characterizing the trajectories of vasomotor symptoms across the menopausal transition. *Menopause* 2016;23:1067-1074.
- Avis NE, Stellato R, Crawford S, et al. Is there a menopausal syndrome? Menopausal status and symptoms across racial/ethnic groups. *Soc Sci Med* 2001;52:345-356.
- Magin P, Morgan S, Henderson K, et al. Family medicine trainees' clinical experience of chronic disease during training: a cross-sectional analysis from the registrars' clinical encounters in training study. *BMC Med Educ* 2014;14:9.
- Bonevski B, Magin P, Horton G, Foster M, Girgis A. Response rates in GP surveys: trialling two recruitment strategies. *Aust Fam Physician* 2011;40:427-430.
- Jiang X, Sab S, Schnatz PF, Diamen S. Menopausal medicine clinic: an innovative approach to enhancing the effectiveness of medical education. *Menopause* 2012;19:1092-1094.
- Christianson MS, Washington CI, Stewart KI, Shen W. Effectiveness of a 2-year menopause medicine curriculum for obstetrics and gynecology residents. *Menopause* 2016;23:275-279.
- Thompson JS, Anderson KJ, Mara PR, Stevenson AD. Supervision - growing and building a sustainable general practice supervisor system. *Med J Aust* 2011;194:101.
- Magin P, Tapley A, Morgan S, et al. Reducing early career general practitioners' antibiotic prescribing for respiratory tract infections: a pragmatic prospective non-randomised controlled trial. *Fam Pract* 2018;35:53-60.