



Research paper

Common mental health diagnoses arising from or coinciding with menopausal transition and prescribing of SSRIs/SNRIs medications and other psychotropic medications

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ABSTRACT

Background: Women with menopausal transition (MT) have an elevated risk of experiencing common mental health diagnoses (CMHD: depression or anxiety). There is no recent data comparing the rate, and treatment, of CMHD between men and women.

Methods: In this population-based study, incidence rates (IR) per 100 person-years-at-risk (PYAR) for men and women ≥ 45 years registered with an UK primary care practice between 2010 and 2021 were estimated. Incidence rate ratios (IRR) with 95 % confidence intervals (CIs) of CMHD were estimated using men as a reference. We measured first prescriptions for psychotropic medications received within 12 months after CMHD. For selective serotonin reuptake inhibitors (SSRIs) /selective norepinephrine reuptake inhibitors (SNRIs), we measured the IR of prescribing per 100 PYAR, by 10-year bands. Proportion of SSRIs/SNRIs prescribing was estimated per 100 persons.

Results: Rates of anxiety and depressive disorders were 1.68 and 1.69 per 100 PYAR in women aged 45–54 years-old compared to 0.91 and 1.20 per 100 PYAR in men, with IRR of 1.84 (95 % CI 1.72–1.97) and 1.44 (1.35–1.53) respectively. SSRIs/SNRIs were the most prescribed medication; in 2021, IRs for SSRIs/SNRIs were 13.4 per 100 PYAR in both sexes. In 2021, the proportion of SSRIs/SNRIs prescribing was 50.67 per 100 women and 41.91 per 100 men.

Limitations: MT is assumed based on women's age as menopause onset is rarely recorded in primary care databases.

Conclusions: Women ≥ 45 years experienced more CMHD compared to men, especially 45–54 years-olds, which coincides with MT. The proportion of SSRIs/SNRIs prescribing was higher in women.

1. Introduction

Common mental health diagnoses (CMHD) are defined by the National Institute of Health and Care Excellence (NICE) as depression, generalised anxiety disorder, panic disorder, obsessive-compulsive disorder (OCD), post-traumatic stress disorder (PTSD) and social anxiety disorder (NICE, 2011). CMHD are experienced by up to 17 % of all people aged 16 years and older in England and are more common in women than men, possibly due to differences in neurophysiology between the sexes (Cohen et al., 2006; Bromberger et al., 2003; Office for

Health Improvement and Disparities, 2017). Sex-based differences in prevalence of CMHD are particularly high in mid-life (Carl Baker, 2024). The overall prevalence of mental health morbidity in persons aged 45–54 years is 19 %, but for women in this age group the self-reported prevalence of CMHD is 24 %, compared to 14 % of all men of the same age (McManus et al., 2016).

In women, the risk of an episode of new or pre-existing mental illness is notably increased during the menopausal transition (Bromberger et al., 2003; Bromberger et al., 2011; Badawy, 2024; Bogren et al., 2018; Adji et al., 2023). The median age of Western women experiencing their

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last menstrual period, known as menopause onset, is 51 years old (Gold et al., 2001). However, women may start experiencing symptoms arising from the menopausal transition up to seven years prior to the onset of menopause (McNeil and Merriam, 2021; Davis et al., 2015). A 2024 meta-analysis found that women going through a menopausal transition had a higher risk of CMHD compared with premenopausal women (Odds Ratio [OR] 1.40, 95 % CI: 1.21–1.61) (Badawy, 2024). CMHD and mood symptoms associated with menopause are associated with a reduced quality of life and lower work productivity (Dibonaventura et al., 2012; House of Commons Women and Equalities Committee, 2022). Given the potential impact of CMHD on the wellbeing of women, effective treatment for CMHD and mood symptoms associated with menopause is important to prevent harm. The need for appropriate treatment of CMHD experienced by women in mid-life is particularly urgent as in the UK national rates of suicide are highest in women between 40 and 49 years (Office for National Statistics, 2022). Low mood or anxiety resulting from menopause and perimenopause can be treated with menopausal hormone therapy (MHT) alone or in combination with other pharmacotherapies (Stute et al., 2020; Tseng et al., 2023; Sarah and Louise, 2024). The first-line treatment for CMHD is cognitive behavioural therapy (NICE, 2011). Moderate to severe CMHD can be treated with antidepressants, and first-line treatments include selective serotonin reuptake inhibitors and selective norepinephrine reuptake inhibitors (SSRIs/SNRIs) (NICE, 2011; Stute et al., 2020).

Very little work using longitudinal data has been published on the treatment of CMHD in mid-life, and no studies have looked at potential differences in treatment patterns by age and gender. There have been calls in the literature to consider MHT as a first-line treatment for mood symptoms arising from (peri)menopause to limit the frequent prescribing of antidepressants (Sarah and Louise, 2024); this recommendation is supported by the NICE management of menopause guideline (National Institute for Health and Care Excellence, 2019). In light of these recommendations, further studies are needed to evaluate the frequency of prescribing of psychotropic medicines and MHT to UK women in mid-life. To better understand the incidence and pharmacological treatment of CMHD in men and women aged 45 years and older, we conducted a descriptive study in a large sample of the UK population using primary care data from 2010 until 2021.

This study aimed to 1) measure and compare the incidence rate of CMHD in women aged ≥ 45 years in comparison with men of the same age, 2) measure the type and proportion of psychotropic medications and MHT prescribed within 12 months after diagnosis of CMHD, 3) measure and compare the prescribing rates of SSRIs/SNRIs in men and women with CMHD.

2. Methods

2.1. Data source

De-identified data were extracted from the IQVIA Medical Research Database (IMRD-UK) (IQVIA Medical Research Data (IMRD), 2022) in December 2021. IMRD incorporates data from the Health Improvement Network (THIN), a Cegadim Database (IQVIA Medical Research Data (IMRD), 2022). IMRD holds longitudinal anonymised primary care data collected from general practitioners across the UK (Blak et al., 2011). In 2021, IMRD contained data from over 20 million individuals (NHS Business Services Authority, 2022). This includes information on patient diagnoses, prescription records and other demographics. Only patient data from practices that met the IMRD quality standards were included. Ethical approval was obtained from the IMRD-UK scientific review committee (reference number 21SRC012).

2.2. Study population

The study population comprised perimenopausal and postmenopausal women aged 45 years or older with a new recording of

CMHD. Our comparison group consisted of men aged 45 years and older with a new recording of CMHD. The study period was eleven years, from 1st January 2010 to 2nd November 2021. This study refers to women and men by sex assigned at birth as recorded on the database.

2.3. Study variables

CMHD were categorised into anxiety and depressive disorders. The following disorders were grouped together as “Anxiety disorders”: General anxiety disorder (GAD), post-traumatic stress disorder, obsessive-compulsive disorder and social anxiety disorder. The following disorders were grouped together as “depressive disorders”: Low mood, and depression. Appendix A shows the code lists used to identify CMHD in this study.

The date of the first CMHD recording after age 45 was considered the incident date for diagnosis. In this study, CMHD incidence refers to the first record of a CMHD to appear on a patient’s electronic primary care record in IMRD. Men and women were excluded if the first recording of CMHD occurred within 12 months of practice registration because these were more likely to be prevalent cases. Psychotropic medications were grouped as SSRI/SNRI medications, other antidepressants, antipsychotics, and anxiolytics/hypnotics. Drug codes for psychotropic medications were derived from British National formulary (BNF) legacy chapters 4.1, 4.2.1 and 4.3. In women-specific analyses, we included systemic MHT as a treatment option for CMHD arising from menopausal transition (National Institute for Health and Care Excellence, 2019). Appendix B shows the medication codes used for identifying psychotropic medications and MHT. New use of a medication was defined as the first prescription following a 12-month period of non-use. Age was grouped into 10-year bands: 45–54, 55–64, 65–74, and ≥ 75 years.

2.4. Statistical analysis

2.4.1. Incidence of CMHD

Annual incidence rates (IRs) of CMHD were estimated per 100 person-years at risk (PYAR) with 95 % confidence intervals (CI) between 2010 and 2021 for anxiety and depressive disorders separately. This was calculated by totalling the number of persons aged 45 and older with the first recorded CMHD in each year and dividing this number by the total PYAR in the same period. Results were reported separately by sex. Differences in rates of CMHD between men and women were compared using incidence rate ratios (IRRs) and 95 % CIs, using men as the reference group. In the last year of data collection (December 2020–November 2021), IRs were further stratified by 10-year age groups for each sex.

2.4.2. Proportion prescribed MHT and psychotropic medications

In men and women with CMHD, we described the first recorded prescription for a psychotropic medication within 12 months after diagnosis. First new prescriptions for a psychotropic medication or MHT received within 12 months after a recording of a CMHD were described and reported as percentages. When a person was prescribed a combination of psychotropic medications it was reported as “multiple psychotropic medications”. Percentages were presented separately for men and women and stratified by 10-year age groups.

2.4.3. Incidence and proportion of prescribing of SSRIs/SNRIs in persons with CMHD

New prescribing was estimated by measuring the incidence rate. The incidence rate was measured by dividing the number of persons with a new prescription for SSRIs/SNRIs by the PYAR. Results were reported separately by sex. The rate for the last year of data collection (December 2020–November 2021) was stratified by both age group and sex. To compare the prescribing between genders, we calculated IRRs with 95 % CIs using the incidence rate of men as the reference group.

The annual proportion of prescribing of SSRIs/SNRIs in persons with

CMHDs was estimated by dividing the number of persons with CMHD with at least one prescription by the mid-year population estimate of persons with CMHD. Results were reported separately by sex. The annual proportion was expressed per 100 persons. All analyses were performed using STATA version 17. GraphPad Prism version 9 (GraphPad Software, n.d.) was used for graphical visualisation.

3. Results

During our study period, 477,371 persons aged ≥45 years had recorded CMHD. The proportion of women was 60.43 % (288,491), and 39.57 % (188,880) were men. On the date of diagnosis of anxiety or depression, women had a median age of 54.05 years (Interquartile range (IQR);47.99–66.66), and men had a median age of 54.68 years (IQR;48.52–65.26).

3.1. Incidence rate of common mental health diagnoses and incidence rate ratios

For both men and women, the incidence rates of anxiety and depressive disorders decreased from 2010 to 2021 (see Fig. 1). The difference between men and women in the incidence rate of diagnoses of CMHD decreased between the years 2010 to 2021. The incidence rates of anxiety and depressive disorders in the last year of data collection for both men and women are presented in Fig. 2, Appendix C.1.

For 2021, the rates of new CMHD were stratified by sex and age group. Women aged 45–54 years had higher rates of anxiety disorders than men in the same age group. The incidence rate of anxiety in women in this age group was 1.68 per 100 PYAR (95 % CI 1.61–1.75), whereas the incidence rate of anxiety in men aged 45–54 was 0.91 per 100 PYAR (95 % CI 0.86–0.96). Using men as a reference group, the incidence rate ratio was 1.84 (95 % CI 1.72–1.97). The IR of anxiety in women aged 55–64 years was 1.16 per 100 PYAR (95 % CI 1.10–1.22), compared with 0.61 per 100 PYAR (95 % CI 0.57–0.66) in men; with an incidence rate ratio of 1.90 (95 % CI 1.74–2.06).

The rate of depressive disorders in women aged 45–54 years was 1.69 per 100 PYAR (95 % CI 1.61–1.76), compared with 1.20 per 100 PYAR (95 % CI 1.14–1.26) in men; with an incidence rate ratio of 1.44 (95 % CI 1.35–1.53). In women aged 55–64 years old, the IR was 1.04 per 100 PYAR (95 % CI 0.98–1.11) compared with 0.79 per 100 PYAR (95 % CI 0.74–0.84) in men; IRR 1.34 (95 % CI 1.23–1.45) (see Table 1).

3.2. Proportion of psychotropic medications prescribed after the recording of CMHD

Table 2 shows the proportion of psychotropic medications prescribed within 12 months after the recording of new CMHD. Psychotropic medications were prescribed within two days after a recording of CMHD for 75 % of both sexes. Forty-six percent of all men with CMHD did not

receive any pharmacological treatment. Men who received prescriptions for CMHD mainly received SSRIs/SNRIs (37.30 %), followed by other antidepressants (6.88 %) and anxiolytics/hypnotics (6.46 %). Just under half of all women (45.71 %) were not prescribed any psychotropic medication or MHT. Of all prescriptions received by women, most were for SSRIs/SNRIs (35.94 %). Anxiolytics/hypnotics were received by 7.23 % of women with CMHD, and a small percentage of women (2.39 %) received multiple psychotropic medications. Within 12 months of being diagnosed with CMHD, 1.73 % of all women received MHT. When proportions of prescriptions received were analysed by age groups, most women aged 45–54 years received prescriptions for SSRIs/SNRIs (36.59 %), followed by anxiolytics/hypnotics (7.14 %) and MHT (2.94 %).

3.3. Annual incidence of prescribing of SSRI/SNRI medications in persons with CMHD

In women with a recording of CMHD, the rate of new SSRIs/SNRIs prescriptions increased from 12.21 (95 % CI 12.00–12.42) per 100 PYAR in 2010 to 13.40 (95 % CI 12.89–13.93) per 100 PYAR in 2021. A similar increase was seen for men (see Fig. 3-A and Appendix C.2). For 2021, rates of SSRI/SNRI prescribing were stratified by sex and age group (see Fig. 3-B and Appendix C.3). For women aged 45–54 years, the rate of new prescriptions was 11.33 per 100 PYAR (95 % CI 10.77–11.92) compared to 11.03 per 100 PYAR (95 % CI 10.77–11.92) in men of the same age. For the last year of data collection, there were no significant differences between age-specific IRs of new SSRIs/SNRIs between men and women.

3.4. Annual proportion of prescribing of SSRI/SNRI medications in persons with CMHD

In 2010, the proportion of women with CMHD and prescribed SSRIs/SNRIs was 37.22 % compared with 25.56 % in men (see Fig. 4 and Appendix C.4). In 2021, the proportion of women with CMHD prescribed of one or more SSRIs/SNRIs was 50.67 %, compared with 41.91 % of men.

4. Discussion

4.1. Summary

In this large electronic health records study, we calculated and compared the incidence rates of anxiety and depressive disorders between men and women from 2010 until 2021. In a population diagnosed with common mental health disorders, we described the first recorded prescription for a psychotropic medication within 12 months after diagnosis. We described and compared the incidence and proportion of SSRI/SNRI prescriptions between women and men aged 45 years and older. To our knowledge, this is the first study to report on annual

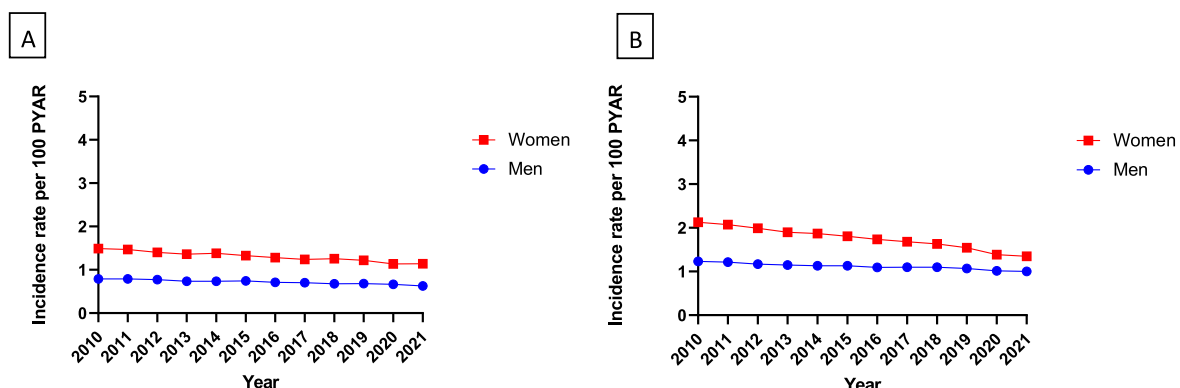


Fig. 1. A) Annual Incidence rate of anxiety disorders B) Annual Incidence rate of depressive disorders, stratified by sex.

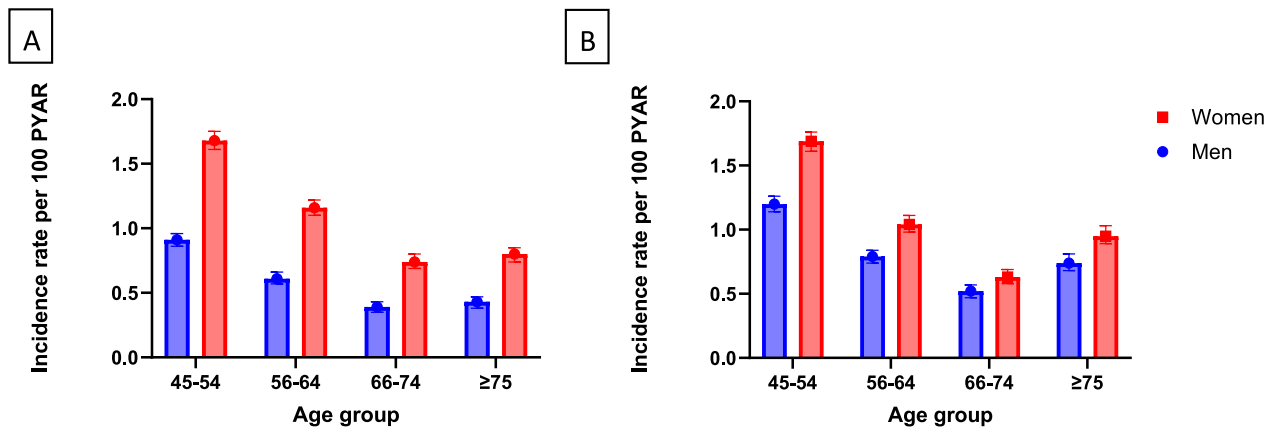


Fig. 2. Incidence rate for A) Anxiety disorders B) Depressive disorders, stratified by age and sex for the last year of data collection (2021).

Table 1
Incidence rate of common mental health diagnoses by age groups and incidence rate ratios.

Age group	Incidence rate per 100 PYAR in women	Incidence rate per 100 PYAR in men	Incidence rate ratio (men as reference group) (95%CI)
Anxiety disorders			
45–54	1.68 (1.61–1.75)	0.91 (0.86–0.96)	1.84 (1.72–1.97)
55–64	1.16 (1.10–1.22)	0.61 (0.57–0.66)	1.90 (1.74–2.06)
65–74	0.74 (0.69–0.80)	0.39 (0.35–0.43)	1.90 (1.70–2.15)
≥75	0.80 (0.74–0.85)	0.43 (0.38–0.47)	1.87 (1.64–2.12)
Depressive disorders			
45–54	1.69 (1.61–1.76)	1.20 (1.14–1.26)	1.44 (1.35–1.53)
55–64	1.04 (0.98–1.11)	0.79 (0.74–0.84)	1.34 (1.23–1.45)
65–74	0.63 (0.58–0.69)	0.52 (0.47–0.57)	1.23 (1.09–1.38)
≥75	0.95 (0.89–1.03)	0.74 (0.68–0.81)	1.27 (1.14–1.41)

incidence rates of CMHD for UK women and men aged 45 years and older using electronic health care records. From 2010 until 2021 the difference in rates of CMHD between men and women decreased. In the last year of data collection (2021) we found that women experienced CMHD at a significantly higher rate than men in all age groups. The difference between men and women was particularly pronounced in the youngest age group (45–54 years); the IRR for women, compared to men, was 1.84 (95 % CI 1.72–1.97) for anxiety symptoms and 1.44 (95 % CI 1.35–1.53) for depressive symptoms. We found that SSRIs/SNRIs were the most common medication prescribed for CMHD in women (35.94 %) and men (37.30 %). Between the years 2010 and 2021 prescribing of SSRIs/SNRIs increased, but sex-based differences in SSRI/SNRI prescription rates decreased. In 2021, 50.67 % of women and 41.91 % of men with CMHD were prescribed SSRIs/SNRIs.

4.2. Interpretation and comparison with literature

Women aged 45 and older are nearly twice as likely to be diagnosed with anxiety disorders and 1.5 times more likely to be diagnosed with depressive disorders, compared to men of the same age. The increased rate of CMHD in women aged 45–64 years coincides with the menopausal transition and menopause. The menopausal transition, or perimenopause, occurs between 45 and 55 years, with a median age of onset of 47.5 years (McNeil and Merriam, 2021). Hormone changes during the menopausal transition may contribute to an increase in anxiety and depressive symptoms in women, as well as an increased risk of relapse for women with ongoing or historic episodes of mental illness (Badawy, 2024; Freeman et al., 2006). However, we cannot attribute the increase in CMHD in women solely to menopausal transition. Other reasons that could contribute to the high rate of CMHD in mid-life

Table 2
Proportion of psychotropic or MHT medications prescribed after the recording of CMHDs.

Medications	45–54	55–64	65–74	≥75	Overall
Women n (%)					
No psychotropic medications	65,988 (44.58)	26,429 (44.38)	16,758 (47.38)	22,698 (49.84)	131,873 (45.71)
SSRIs/SNRIs	54,162 (36.59)	22,301 (37.45)	11,988 (33.89)	15,227 (33.44)	103,678 (35.94)
Other antidepressants	8,363 (5.65)	3,847 (6.46)	2,536 (7.17)	3,594 (7.89)	18,340 (6.36)
Antipsychotics	684 (0.46)	252 (0.42)	238 (0.67)	690 (1.52)	1,864 (0.65)
Anxiolytics/hypnotics	10,574 (7.14)	4,571 (7.68)	2,998 (8.48)	2,707 (5.94)	20,850 (7.23)
Menopausal hormone therapy	4,348 (2.94)	530 (0.89)	82 (0.23)	21 (0.05)	4,981 (1.73)
Multiple psychotropic medications	3,910 (2.64)	1,619 (2.72)	773 (2.19)	603 (1.32)	6,905 (2.39)
Men					
No psychotropic medications	42,062 (45.16)	20,511 (44.53)	12,073 (49.09)	12,300 (49.05)	86,946 (46.03)
SSRIs/SNRIs	35,669 (38.29)	17,944 (38.96)	8272 (33.63)	8575 (34.19)	70,460 (37.30)
Other antidepressants	6207 (6.66)	3190 (6.93)	1698 (6.90)	1899 (7.57)	12,994 (6.88)
Antipsychotics	619 (0.66)	248 (0.54)	203 (0.83)	386 (1.54)	1456 (0.77)
Anxiolytics/hypnotics	5888 (6.32)	2891 (2.48)	1844 (7.50)	1586 (6.32)	12,209 (6.46)
Multiple psychotropic medications	2704 (2.90)	1272 (2.76)	506 (2.06)	333 (1.33)	4815 (2.55)

include financial hardships, single parenthood, children leaving home, and domestic violence (Butterworth et al., 2009; Kim et al., 2018; Oram et al., 2017; Bougea et al., 2019). In mid-life, men also experience a decline in reproductive hormones; testosterone declines steadily after the age of 40, and low testosterone levels are also associated with low mood (Bhasin et al., 2000; Hauger et al., 2022). Our results show that the sex-based differences in rates of CMHD have decreased over time, but remain significant. Moreover, our results show that sex-based differences are more pronounced for anxiety disorders. In contrast to the results of the 2014 English Adult Psychiatric Morbidity Survey, we found that the sex-based difference in CMHD remained high after mid-life, with the biggest sex-based difference in anxiety disorders measured in men and women aged 55–64 years (McManus et al., 2016). However, there are a few key differences between our study and the

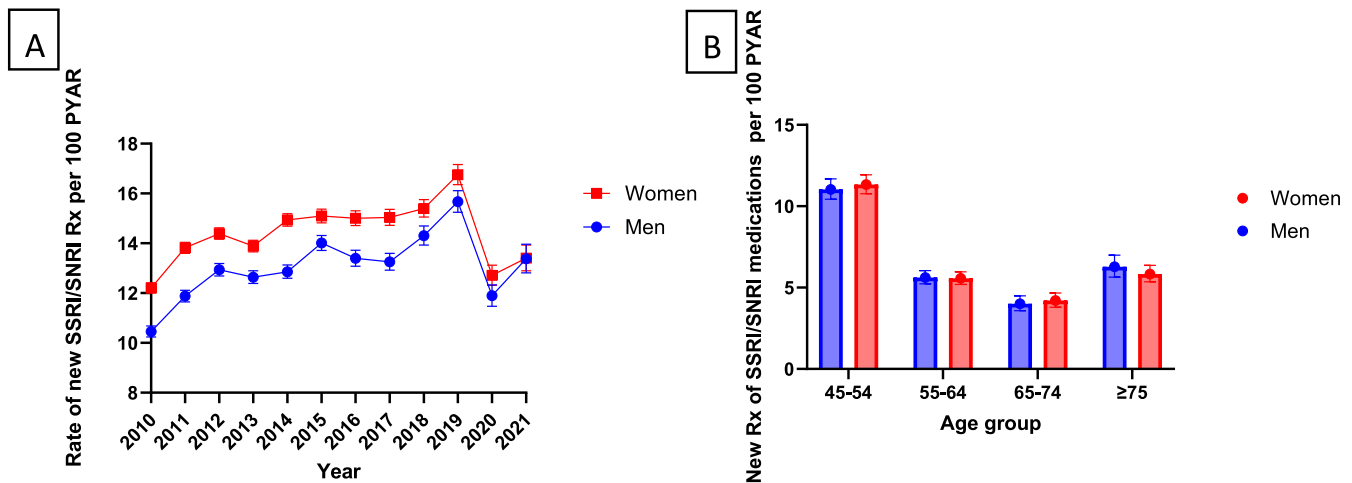


Fig. 3. Rate of new prescriptions of SSRIs/SNRIs in persons with CMHDs A) Annual rate B) stratified by age and sex for the last year of data collection (2021).

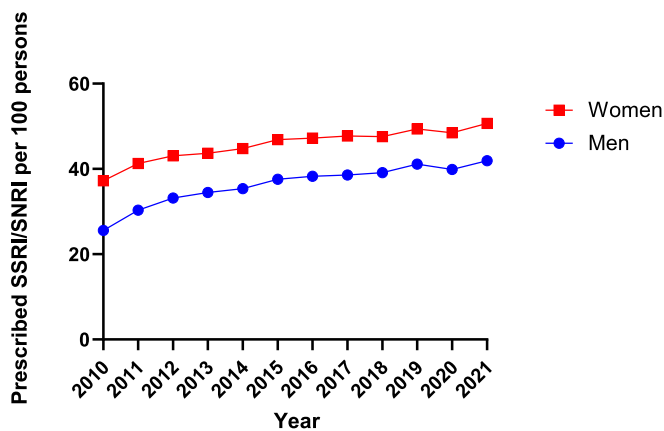


Fig. 4. Annual proportion of persons with SSRIs/SNRIs prescriptions in persons with CMHDs.

psychiatric morbidity survey which is based on self-reported mental health. Self-reported mental health, with a look-back period of several days or weeks, gives a measure of prevalence, rather than incidence, and this may explain why a cross-sectional analysis of the 2014 Adult Psychiatric Morbidity Survey found that self-reported GAD in women did not increase during or after the menopausal transition (Adji et al., 2023). Severity of depression and anxiety is a relevant consideration, and studies in which men and women with severe mental illness were included found similar incidence rates of mental health disorders between sexes around and after mid-life (Faravelli et al., 2013; Plana-Ripoll et al., 2022; Best et al., 2021).

Our results show a decline in the incidence rates of CMHD between the ages of 54 years to 75 years for both sexes. For women, this is consistent with studies showing that the rate of depressive symptoms arising from menopausal transition decreases after the final menstrual period (Adji et al., 2023; Freeman et al., 2014; Mishra and Kuh, 2012). Our results are similar to the results of a cross-sectional Spanish survey study showing higher rates of anxiety and depression in men and women aged 45–64 years, compared to other age groups. However, contrary to our results, their results showed greater rates of anxiety and depression after the age of 65 (Bacigalupe and Martín, 2021).

We analysed which medications were first prescribed after diagnoses of anxiety and depression and found that pharmacological therapy was not given to 45.71 % of women and 46.03 % of men. This is in line with NICE guidelines for treatment of mental disorders in which it is recommended to use non-pharmacological treatment options as first line

treatment for mild to moderate anxiety and depressive disorders (National Institute for Health and Care Excellence, 2022). The most prescribed group of medications were SSRIs/SNRIs medications. Only a small percentage of women were prescribed MHT after a diagnosis of depression or anxiety. We found that MHT was prescribed for 2.94 % of women aged 45–54 years old who had a record of CMHD. Women in this age group may experience mood symptoms arising from or coinciding with the menopausal transition. NICE guidelines recommend the prescribing of MHT for mood symptoms during menopausal transition and do not recommend the prescribing of SSRIs/SNRIs medications unless there is an underlying depressive disorder (National Institute for Health and Care Excellence, 2019). Our findings suggest that health care practitioners need to be aware of the optional use of MHT for CMHD arising from menopause (Sarah and Louise, 2024). Primary care physicians could consider SSRIs/SNRIs as second-line agents for women with contraindications to MHT or those who do not wish to take MHT, or combine MHT with SSRIs/SNRIs for severe cases of CMHD during the menopausal transition (Leonhardt, 2019).

We described and compared the annual rates of SSRI/SNRI use in men and women with CMHD. The overall proportion of SSRI/SNRI medications received by men and women with CMHD increased annually. The increase could be a proxy for increased recognition of CMHD and long-term use of these medicines. Antidepressants are the most prescribed psychotropic medicines (Hafferty et al., 2019) with data showing its prescribing has increased in high-income countries by 30–60 % between the years 2008 and 2019 (Brauer et al., 2021). In the UK, a Scottish sample showed the prevalence of SSRI/SNRI prescribing increased around the age of 45–54 years for both sexes (Hafferty et al., 2019). Our data have no information on SSRI/SNRI prescribing in men and women younger than 45 years. Therefore, a direct comparison with the results of this Scottish study could not be made. The increase in the prescribing of SSRIs/SNRIs may be driven by the increase in their prescribing for anxiety disorders (Archer, 2022).

The difference in prescribing rates for SSRIs/SNRIs between sexes decreased over the study period: For the latest year of data collection (2021), there was no statistically significant difference. However, the overall proportion of women in receipt of one or more SSRI/SNRI prescriptions is higher in women compared to men. Similar to our results, Hafferty et al. (2019) found differences in SSRI use between Scottish men and women. Using a cohort study design, Hafferty et al. found that 11 % of adult men were prescribed SSRIs compared to 21.4 % of adult women (Hafferty et al., 2019). A Swedish cross-sectional study by Sundbom et al. (2017) found that women were prescribed antidepressants, mainly SSRIs, at a higher rate compared to men, with 11.6 % of women aged 45–64 prescribed antidepressants versus 6.4 % of men

(Thunander Sundbom et al., 2017). The sex-based differences in SSRI prescribing in mid-life could be explained by differences in CMHD: Women have a higher risk of disease recurrence and experience longer episodes of poor mental health than men, which warrants a longer duration of use of SSRIs/SNRIs (Richards, 2011). Sex-based differences in SSRI prescribing may be exacerbated by oestrogen's effect on the expression and binding of serotonin to its receptors, with women potentially having a better therapeutic response to SSRIs/SNRIs, and therefore longer duration of use, than men (Keers and Aitchison, 2010).

During the study period, the annual incidence rates of CMHD and SSRI/SNRI prescribing declined in the last two years of data collection (2020 and 2021). This could be a consequence of the COVID-19 pandemic. According to recent reports, primary care contacts for anxiety and depression decreased during the years 2020 and 2021, especially in persons aged 45–64 years (Mansfield et al., 2021; Carr et al., 2021). Prescribing rates of SSRI/SNRIs increased again in 2021, our last year of data collection and we speculate it will continue to increase based on the published UK statistical reports (NHS Business Services Authority, 2022).

4.3. Limitations

Our study has several limitations. We could not analyse the relationship between menopausal transition and the increased incidence rate of CMHD experienced by women aged 45–54 years because the source database lacks complete recording of menopausal onset (Alsugeir et al., 2022). CMHD experienced by women aged 45 to 54 years could be related to menopausal transition, but other reasons for CMHDs cannot be excluded. Several risk factors for CMHD, such as physical activity, marital status, financial status, educational level, general health, and severity of menopausal symptoms, were not measured in our data source and, therefore, could not be controlled for in our results. In addition, we assumed new prescriptions of hormonal therapy were for the treatment of CMHD arising from menopausal transition, but hormonal therapies could have been prescribed for other gynaecological indications or for contraception (Voedisch and Ariel, 2020) and misclassified in our study as prescribed as MHT. Measuring the prevalence of CMHD in electronic health records databases is challenging because the end of a depressive or anxiety episode is not typically recorded. Because we were unable to estimate when an episode was resolved, we chose not to measure the prevalence of CMHDs as part of this study.

4.4. Implications and recommendations

This study provides insight into common mental health diagnoses in men and women during and after mid-life. Careful consideration is warranted while supporting women with CMHD who are going through menopausal transition with regards to the use of psychotherapy, non-pharmacological treatment modalities, and prescribing of MHT or SSRIs/SNRIs medications if needed.

We found that both men and women aged 45 years and older are prescribed SSRI/SNRI medications frequently. SSRI/SNRI medications are known to increase the risk of fractures and cardiovascular events (Panay, 2012). Women during and after the menopausal transition are vulnerable to the effects of declining oestrogen levels, such as bone loss, cardiovascular disease and cognitive symptoms (Panay, 2012). Therefore, the increased use of SSRIs/SNRIs medications in women older than 45 years of age could predispose women to potential health complications. Studies on the safety of SSRIs/SNRIs medications in this population are needed.

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CRedit authorship contribution statement

Dana Alsugeir: Writing – original draft, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Matthew Ade-suyan:** Writing – review & editing. **Vikram Talaulikar:** Writing – review & editing. **Li Wei:** Writing – review & editing, Supervision. **Cate Whittlesea:** Writing – review & editing. **Ruth Brauer:** Writing – review & editing, Supervision, Methodology, Conceptualization.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Dana Alsugeir reports financial support was provided by Saudi Arabian Cultural Bureau. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendices. Supplementary data

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