Self-reported psychological, somatic and vasomotor symptoms at different stages of the menopause for autistic and non-autistic people

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Running title: Menopause in Autistic and Non-Autistic People

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Keywords

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Abstract

Background: There is growing awareness that the experiences of neurodivergent people during menopause are not well understood. Menopause may be particularly challenging for autistic people due to common co-occurring conditions such as depression and differences in sensory processing. The few (mostly qualitative) studies to explore autism and menopause suggest that autistic traits may be exacerbated.

Methods: In an online cross-sectional survey, we examined self-reported menopause symptoms of 342 people (autistic, n=242 and non-autistic, n=100) at different stages of their reproductive life (pre-menopausal (~20% of sample), menopausal (~30%), post-menopausal (~50%)).

Results: Autistic people reported significantly higher rates of bothersome psychological and somatic menopause symptoms than non-autistic people, but no differences were observed for vasomotor symptoms. Results indicated different patterns of psychological, somatic and vasomotor symptoms between the autistic and non-autistic groups. People in the menopause and post-menopause groups reported negative changes in symptoms, but non-autistic women report these as more negative than autistic women. Whether this finding is related to the observation that autistic people report more bothersome psychological and somatic symptoms before the menopause, requires further investigation.

Conclusion: This cross-sectional analysis suggests that autistic people may experience more bothersome symptoms during the menopause compared to non-autistic people. Longitudinal studies examining change are required to fully understand the variables that impact individual experiences for autistic people.

Autism is a lifelong condition diagnosed based on differences in social communication, repetitive behaviours and sensory sensitivity [1]. Most research to date has focused on the male presentation of autism and on childhood and adolescence [1–3]. In recent years the male-to-female ratio in autism has been questioned [4] and there has been increasing interest in female experiences of autism, [5–7]. Although research including autistic girls and women is increasing, research focused on female-specific issues for autistic people remains relatively rare, see Table 1 for overview of studies to date. There is likewise increasing interest in the experiences of autistic people across the lifespan, reflecting a growing awareness of potentially different experiences and age-trajectories [8–10]. Due to the limited research including autistic people assigned-female-at-birth (AFAB) and in middle-age and older, few studies have examined autistic experiences of menopause.

Menopause typically occurs in middle age, when ovary function begins to change, leading to variability and then lowering of hormone levels [11,12]. During menopause the body produces less oestrogen, progesterone, and testosterone, and more follicle-stimulating hormone and luteinizing hormone [12]. As hormone levels begin to fluctuate symptoms occur which can include psychological (e.g., anxiety, fatigue, low mood), somatic (e.g., headaches, muscle or joint pain), and vasomotor (e.g., hot flushes, night sweats) components [13]. There are large individual differences in experiences of menopause [14–16]. Approximately 80% of people experience vasomotor symptoms, with 62% of people experiencing symptoms that have a significant impact on well-being [17,18]. Although about 20% of people experience very few menopause symptoms, approximately 25% of people experience debilitating symptoms [17,18]. Some studies suggest that hormone fluctuation during menstruation have a significant impact on autistic people AFAB. Research suggests that autistic people AFAB experience high rates of premenstrual syndrome and menstrual pain, and that autism-related difficulties increase during menstruation [19,20]. Therefore, there is growing interest in understanding whether autistic people's sensitivities to hormonal changes through the menstrual cycle, may indicate that menopause might be a particularly difficult experience for autistic people AFAB.

To date, most studies of menopause for autistic people have used interviews and qualitative analysis to explore individual experiences. Studies suggest that menopause exacerbates autistic traits, making it particularly challenging for autistic people [21–24]. As well as experiencing common menopause symptoms such as vasomotor symptoms, low mood, anxiety and reduced cognitive abilities, autistic people also report an increase in sensory sensitivities which impacts daily functioning [22–24]. For some autistic people, however, menopause can be a time for self-reflection, growing self-awareness, and lead to changes in behaviour to improve self-care [22,24]. To our knowledge, only one study has quantitatively compared menopause symptoms for autistic (n=30) and non-autistic (n=35) people [25]. In this study people aged over 40 years old with irregular or absent menstruation patterns were included in the analysis of menopause complaints. Autistic people reported more menopause symptoms compared to non-autistic people, including more psychological and somatic symptoms (but not more urogenital symptoms) [25]. While there is no guarantee that people in this study were in peri-menopause or menopause (people may have irregular periods for other reasons), there are benefits to including people who may be early in menopause and not yet have identify the reason for irregular periods. Although studies are sparse, results suggest that autistic people are significantly impacted by menopause symptoms and that they may experience symptoms at a higher rate than non-autistic people.

The aim of the current study was to examine self-reported menopause symptoms in a large sample of autistic and non-autistic people AFAB. We will also explore symptoms at different stages of menopause, which to our knowledge has not yet been examined. We hypothesise that autistic people will report higher rates of menopause symptoms than non-autistic people, and we will explore differences in symptom level at menopausal stages for autistic and non-autistic people.

Methods

Study Design and Participants

This study uses cross-sectional data from the second wave of the 'AgeWellAutism' study, an online survey exploring ageing on the autism spectrum, conducted in September 2023. Prior to the first wave of the AgeWellAutism study (May 2019), patient and public involvement (PPI) interviews were conducted about the key factors that influence the quality of life of autistic people as they aged. The AgeWellAutism study survey addressed the topics that arose, and further PPI confirmed survey accessibility. Measures were adjusted after wave 1 feedback, and menopause experience questions were added.

Participants were recruited into the AgeWellAutism 2023 study through adverts circulated by Autistica's Research Network, the Cambridge Autism Research Database, the Matthews Hub, and the author's research participation database. These adverts described the study as exploring factors that influence quality of life as autistic and non-autistic people, i.e., not specifically referencing menopause. Participants who completed the first wave of the study were invited to participate via email. Individuals were eligible to take part if they were 1) 40 years of age or older, 2) had access to an internet-enabled device, and 3) could read English. There were no specific exclusion criteria for this study. Participants accessed the survey via Qualtrics. Before beginning the survey, a full information sheet including study aims was presented. Participants gave informed consent and were reminded of their right to withdraw at any time. Participants were presented with demographic and other standardised questionnaires (not included here), and menopause experiences (for people AFAB). Upon completion, participants were presented with a debrief, including links to a range of support services. Participants were entered into a raffle to win one of twenty £20 Amazon gift vouchers. Full ethical approval was received for this study through the University College London Research Ethics Committee (25855/001).

The final sample included in the analysis was 242 autistic and 100 non-autistic people AFAB (aged 40-86 years old). For full disclosure the sample was formed as follows: 738 responses were recorded. 86 responses (12%) were excluded due to either 1) withdrawing via closing the survey before completion, 2) having a very short completion time (i.e., less than 10 minutes), and/or 3) irregular open-text response answers that suggested bot activity [26]. Of the 652 participants, 342 were AFAB and one person self-described as intersex. These 342 AFAB participants were asked about their experience of menstruation and menopause, while the one intersex participant opted not to answer the questions. The final sample was 342 participants. The autistic group (n=242) included 198 people who disclosed an autism diagnosis and 44 who self-identified as autistic. For reference, both diagnosed and self-identified groups scored above the cut-off of 14 on the Ritvo Autism and Asperger Diagnostic Scale (RAADS; diagnosed group, mean=33.9, sd=6.2; self-identified group, mean=30.9, sd=8.2) [27]. [For comparison RAADS-14 scores for autistic people in other studies have been reported as mean=27.9, sd=11.15 and mean=30.8, sd=8.6 [28].] The autistic group had received their autism diagnosis/began to identify as autistic from the current year to early childhood (mean years since diagnosis = 10.05 years). The remaining participants formed a non-autistic comparison group (total non-autistic n=100).

The autistic and non-autistic participants did not differ significantly in age (autistic group, mean age = 56.85; non-autistic group, mean age = 60.53), see Table 2 for statistical comparisons. The autistic group identified as being gender diverse (e.g., non-binary, agender, genderfluid) at significantly higher rates than the non-autistic group and were significantly more likely to endorse non-heterosexual sexuality. The autistic group were single at significantly higher rates than the comparison group. No differences were observed in ethnicity or education. Autistic people were less often employed or unable to work due to health at significantly higher rates compared to non-autistic people. Homeownership was explored as a proxy for socio-economic status (SES); the autistic group were significantly

less likely to own their own home compared to the non-autistic group. See Table 2 for demographic characteristics of the autistic and non-autistic groups.

Materials

Demographic characteristics

Participants provided detailed demographic information including age, sex-assigned-at-birth, gender identity, sexuality, education history, employment status, living situation, ethnicity, and home ownership (as a proxy for SES).

Menopause Stage

Menopause stage was used as a grouping variable. Participants were asked a multiple-choice question about which stage of the menopause they were currently experiencing, "*Are you currently going through the menopause?".* Responses were classified as Yes = menopause; No, I have not experienced the menopause = pre-menopause; No, I have finished the menopause] = post-menopause. Relying on self-report classification of menopause stage means that people early in menopause may categorise themselves as pre-menopause, meaning that the pre-menopause group includes both genuinely pre-menopause and early-menopause people. However, self-report is less likely to mis-classify people in menopause and post-menopause groups.

Menstrual History

For descriptive purposes a series of multiple-choice and open-text questions were used to explore their menstrual history. Participants were asked, "*Do you regularly menstruate / have your period? [responses: Yes, in a regular cycle; Yes, in an irregular cycle; No, I no longer menstruate; No, I have never menstruated]*". If participants reported an irregular cycle or never having a cycle, they would be presented with an open-text question asking if they wished to contextualise this response (e.g., "*You previously answered that you*

have an irregular cycle. If you wish to add any brief comments on this, please use the space below."). Specific information about final menstrual period was not recorded.

Use of Hormone Replacement Therapies (HRT)

Participants were asked open-text questions about their use of HRTs. These open-text questions were "*Are you currently prescribed / taking over-the-counter supplements for the menopause? For example, hormone replacement therapies (HRT). If no, you can leave the box empty*." and "*Are you currently prescribed any birth control / oral contraception? If no, you can leave the box empty*.".

Current symptoms of menopause

Participants reported their experience of symptoms that are associated with menopause using the Greene Climacteric Scale (GCS) [29]. The GCS is a 21-item questionnaire that asks participants to rate how bothered they are by a range of different symptoms on a 4-point scale [0 = Not at all, 1 = a little, 2 = quite a bit, 3 = extremely]. The GCS has three subscales, which examine psychological (11 items; max score = 33), somatic (7 items; max score = 21), and vasomotor (2 items; max score = 6) experiences associated with menopause. The final GCS item (interest in sex) is not included in any subscale. To the authors' knowledge, the psychometric properties of the GCS have yet to be examined in autistic populations. In the current sample, the internal consistency of the GCS was excellent in the autistic group (Cronbach's $\alpha = .90$) and very good in the non-autistic group (Cronbach's $\alpha = .83$).

Change in symptoms of menopause

An additional 'change' scale was added to the GCS questionnaire. This scale explored whether symptoms were typical to them and something they had experienced prior to menopause, or whether the symptom was something newly emerging during or since menopause. After each item in the GCS questionnaire, participants were asked a question dependent on their menopause stage. Menopausal participants were asked "*Has this*

[symptom/experience] changed during the menopause, or is this typical for you?", and post-menopausal participants were asked "*Has this [symptom/experience] changed since the menopause, or is this typical for you*?". The questions were word in this way to allow participants to identify changes that they interpreted as being associated with menopause transition. Pre-menopausal participants were asked about change with the question "*Has this [symptom/experience] changed when menstruating (having your period), or is this typical for you?*", but reported change in symptoms for the pre-menopause group are not included in the analysis. Participants could respond to each symptom as either 'No change / typical for me' (coded as 0), 'changed for the worse' (coded as -1), 'changed for the better' (coded as 1), or 'changed but not better or worse' (not included in coding). Mean change scores for psychological, somatic, and vasomotor symptoms were then calculated for each participant in the menopause and post-menopause groups.

Data Analysis

All statistical analyses were performed using SPSS (version 29) [30]. Differences between the autistic and non-autistic groups in demographic variables, menstrual history, menopause stage, and menopause symptom scores were analysed using analysis of variance (ANOVA) and chi-square (χ^2) tests. A series of 2x3 ANOVA examined differences in menopause symptoms by autism group (autistic vs non-autistic) and menopause stage (pre-, menopause, post-) for each symptom type (psychological, somatic, vasomotor). Post-hoc analyses repeated the 2x3 ANOVA controlling for self-rated anxiety and depression scores. A series of 2x2 (group x menopause stage, menopause and post-menopause only) ANCOVA examined whether current symptoms represented change from previous experiences, for each symptom type (with symptom sub-scale total score included as a covariate). Multiple comparisons were controlled for using the False Discovery Rate (FDR) method [31], with an α-value of 0.034 being used. FDR was applied to all *p*-values, with

adjusted α-values being assigned based on the *p*-value rank. The data analysis plan was pre-registered (https://doi.org/10.17605/OSF.IO/62CZD).

Results

Menstrual history and Menopause Stage

Menstrual history

Chi-square analysis identified a significant group difference in menstrual history, with fewer participants reporting having a regular cycle in the autistic than the non-autistic group. Rates of those no longer menstruating were comparable (~70%). See Table 3 for details on menstrual history and statistical analysis.

Participants could provide context for their irregular cycle; 41/47 (88%) of the autistic group and 5/7 (71%) of the non-autistic group responded. Participants in both groups suspected they may be perimenopausal (autistic n=17, non-autistic n=1), noted that they had always had an irregular cycle (autistic n=14, non-autistic n=1), or that HRT was causing cycle disruptions (autistic n=2, non-autistic n=3). Other participants in the autistic group noted that health conditions caused irregularities (n=6), stress disrupted their cycle (n=1), or they were breastfeeding and not menstruating (n=1).

Menopause stage

Chi-square analysis observed no significant difference between the groups in menopause stage. Approximately 20% of both groups were pre-menopausal, 30% were menopausal, and 50% were post-menopausal (see Table 3).

Use of Hormone Replacement Therapies (HRT)

Participants were asked if they currently or have previously used HRT; 72/242 (30%) of the autistic group and 33/100 (33%) of the non-autistic group responded. Most respondents (82%) currently used HRT (autistic n=59, non-autistic n=27); some no longer

used HRT (autistic n=3, non-autistic n=5), or were considering HRT (autistic n=1, non-autistic n=1). Participants in the autistic group also reported being unable to take HRT due to health conditions (n=4), reluctance to take HRT (n=3), or that they selectively used prescribed HRT (n=1). One autistic participant noted that their doctor would not prescribe them HRT.

Current menopause symptoms

Psychological Symptoms

Main effects of autism group and menopause stage were observed for reported psychological symptoms (see Figure 1 and Table 4). Autistic people reported more bothersome psychological symptoms compared to non-autistic people. Psychological symptom scores were lower in the post-menopause group compared to the menopause group (mean difference=-1.93, p=.037). A significant group by menopause stage interaction was observed. Autistic people reported no differences in psychological symptom scores at the different stages of menopause. In contrast, non-autistic people reported equivalent symptoms between pre-menopause and menopause stages, but lower symptom scores in the post-menopause period (mean difference=6.78, p<.001).

Somatic Symptoms

A main effect of autism group was observed for somatic symptoms, with autistic people reporting more bothersome symptoms than non-autistic people. No significant effect of menopause stage was observed. A significant interaction effect was noted. Autistic people reported lower somatic symptom scores during pre-menopause compared to menopause (mean difference=-1.76, p=.044), but no difference in symptom scores between menopause and post-menopause. For non-autistic people, significantly lower symptom scores were reported post-menopause, compared to the pre-menopause (mean difference=2.88, p<.001) and menopause (mean difference=2.64, p<.001) stages.

Vasomotor Symptoms

No significant differences between the autistic and non-autistic groups were observed for vasomotor symptom scores. A significant effect of menopause stage was observed. Vasomotor symptom scores were lower in pre-menopause compared to menopause (mean difference=-1.53, p<.001) and post-menopause (mean difference=-1.02, p<.001), while reported vasomotor symptom scores were not significantly different in menopause and post-menopause. A significant interaction effect between group and stage was observed for vasomotor symptom scores. Among autistic people, symptom scores were lower in pre-menopause compared to menopause (mean difference=-1.53, p<.001), and there was no difference between menopause and post-menopause symptom scores. A different pattern was seen into the non-autistic group, where vasomotor symptom scores were lower in pre-menopause compared to menopause (mean difference=-1.69, p=.001), and post-menopause symptom scores were lower compared to menopause symptom scores (mean difference=1.60, p<.001).

Post-hoc Analyses

ANOVAs were repeated controlling for self-rated anxiety and depression scores; the pattern of results remained unchanged (see Supplementary Table 1).

Change in menopause symptoms

Change in Psychological Symptoms

After controlling for overall psychological symptom scores, significant differences in the change in psychological symptoms were observed by group and menopause stage. The interaction term did not reach significance. The non-autistic group, on average, reported more change for the worse in psychological symptoms than the autistic group (see Figure 2

and Table 3). For both groups, change scores were worse for those currently in menopause compared to those post-menopause.

Change in Somatic Symptoms

After controlling for overall somatic symptom scores, there was a significant effect of menopause stage on change in somatic symptoms. No significant effect of group or interaction of group by menopause stage was observed. For both groups, change scores were significantly worse for those in the menopause stage vs. post-menopause stage. Autistic and non-autistic groups reported similar patterns of change overall.

Change in Vasomotor Symptoms

After controlling for overall vasomotor symptom scores, significant effects of group was observed, although this result did not survive FDR correction. Non-autistic people reported more negative change in symptoms overall compared to autistic people. A significant effect of menopause stage was observed. Change in vasomotor symptoms were reported as significantly more negative during menopause, with change being reported as less negative at post-menopause. No statistically significant interaction of group by menopause stage was observed.

Discussion

This study examined autistic and non-autistic people's experiences of menopausal symptoms. When considering all autistic participants compared to non-autistic participants independent of menopause stage, the autistic participants reported more bothersome psychological and somatic (but not vasomotor) menopause symptoms. Furthermore, the two groups (autistic vs non-autistic) reported different scores depending on menopause stage. For autistic people, either no differences (in psychological symptom scores) or very small differences (somatic symptom scores) were observed between menopause stages. In

contrast, non-autistic people reported lower scores for symptom severity on psychological and somatic sub-scales for post-menopause compared to pre-menopause and menopause stages, suggesting that symptom severity may differ through menopause for autistic and non-autistic people. Our finding of high self-report scores for somatic and psychological menopause symptoms is in keeping with the only previous study that quantitatively examined menopause symptoms [25] (although note that this study used a different measure, the Menopause Rating Scale [32]). We are not aware of any previous studies that have examined the amount of bothersome symptoms by menopause stage including autistic people.

For autistic people, psychological symptom scores were high before menopause and remained high within other menopause stages. This is in keeping with other studies which have reported high rates of depression and anxiety symptoms among autistic people [33]. In contrast, for non-autistic people psychological symptom scores were reported as high during pre-menopause and menopause, but lower in people who were post-menopausal; a pattern which has been observed elsewhere [34]. For both groups, there was no difference between psychological symptom scores in the pre-menopause and menopause groups. It is possible that people in middle-age who self-identify as pre-menopausal may be beginning to experience psychological symptoms of the menopause, but do not (yet) associate these symptoms as related to menopause. A significant difference in the pattern of results between autistic and non-autistic people, was that post-menopausal non-autistic people reported lower psychological symptom scores compared to other menopause stages, whereas autistic people's post-menopausal psychological symptom scores remained high. Whether this reflects the often observed higher levels of psychological distress across the lifespan among autistic people, or a difference in the experiences, trajectory and "return to normal" of autistic people post-menopause requires further investigation [33,34]. It is worth noting that both autistic and non-autistic groups report fewer negative (but not more positive) changes at post-menopause compared to menopause for all symptom types (see analysis of self-

reported change in symptoms). It is interesting to note that although non-autistic people report lower psychological symptom scores overall, they report a worse negative change in psychological symptoms at the transition to menopause compared to autistic people. This may reflect psychological distress as being a less common experience for non-autistic compared to autistic people, and therefore the onset of psychological symptoms are perceived as more distressing [33,34]. Exploring individual change through longitudinal studies may help to clarify the reasons for this pattern of results.

Autistic people in the pre-menopause group reported lower somatic symptom scores than autistic people in the menopause and post-menopause groups. This is in contrast to the non-autistic group, where the lowest somatic symptom scores were reported by the post-menopause group. In previous studies of menopause in general (with no information about menopause stage), menopause is associated with high rates of somatic symptoms among autistic compared to non-autistic people [25]. Despite these differences in the symptom scores reported by menopause stage, there are no significant differences between autistic and non-autistic people in their ratings of the change in somatic symptoms. Ratings of the change in somatic symptoms suggest that both groups report the change in somatic symptoms to be generally negative, and more negative during menopause compared to post-menopause, and these experiences are similar for autistic and non-autistic people.

Reports of vasomotor symptoms show a different pattern to other symptom types. No group differences in vasomotor symptom scores for autistic and non-autistic people were observed. Although no direct comparison of vasomotor symptoms is available in other studies, vasomotor symptoms contribute to the somatic scale of the Menopause Rating Scale [32], which have been found to be higher for a group of autistic compared to non-autistic people [25]. Interaction effects demonstrate that there are significant differences between the vasomotor symptom scores reported at each menopause stage by autistic compared to non-autistic people. For autistic people, menopause is associated with higher vasomotor symptom scores (compared to pre-menopause), and these scores remain high in the post-

menopause group. For the non-autistic group, menopause is associated with much vasomotor symptom scores compared to the pre-menopause group, but also significantly lower vasomotor symptom scores in the post-menopause group. Among non-autistic people, vasomotor symptoms are reported as more bothersome during menopause compared to both before and after menopause; but autistic people continue to report high vasomotor symptom scores after menopause when symptoms "should" reduce [12]. These results suggest that some autistic people may continue to be bothered by vasomotor symptoms through post-menopause. Although both groups report that the change in vasomotor symptoms is most negative during menopause, overall experiences of vasomotor symptoms are rated as worse by non-autistic compared to autistic people. Previous studies examining autistic people's menopause experiences reported the presence of vasomotor symptoms and that these were particularly bothersome due to sensory sensitivities, but no information from non-autistic people was available for comparison [22,24]. Longitudinal studies, which explore changes in individual symptom experiences over time are required to fully understand how menopause may impact autistic people and other neurodivergent groups.

To our knowledge, no other study has included both a measure of menopause symptoms and information about menopause stage for autistic and non-autistic people, limiting our ability to compare our results with previous findings. The only other study including a measure of self-reported menopause symptoms included people aged over 40 years with irregular or absent menstruation, but did not include further information about menopause stage [25]. Due to the limited research in this field, it is important to apply caution when interpreting the current results. Data was collected as part of an online survey, which may introduce bias in who participates. Participants in online, self-report surveys may be more likely to be better educated or have a higher socioeconomic status, as taking part requires access to a computer, the internet, and a certain amount of confidence using computers. Therefore, participants may not be representative. Being interested in the topic of a study may also introduce participant bias. However, study advertisements did not

mention menopause (data collection was part of a larger study of ageing), so this sample may be relatively representative, rather than including people who have particularly problematic experiences of menopause. The sample size included here is large compared to previous studies, which allows some confidence in the results. A final consideration is that this study included cross-sectional data and individuals were retrospectively reporting on perceived change in symptoms, therefore caution must be exercised when drawing conclusions about change. Longitudinal studies, which collect detailed information about menstrual history and final menstrual period, are required to investigate prospectively the individual differences in change in menopause symptoms over time.

Results from this online survey suggest that autistic people may experience more bothersome psychological and somatic (but not vasomotor) menopause symptoms compared to non-autistic people. Importantly, there appear to be significant differences in symptoms by menopause stage for autistic and non-autistic people that warrant further investigation. Although this study did not measure longitudinal change in symptoms, both autistic and non-autistic people reported that psychological, somatic, and vasomotor symptoms worsened during menopause. Future longitudinal studies should investigate individual differences in experiences at different stages of menopause to better understand the factors that may reduce the impact of negative symptoms.

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REFERENCES

1. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. vol. 5th Edition (American Psychiatric Publishing, Arlington, VA, 2013).
2. Fombonne, E. Epidemiology of pervasive developmental disorders. *Pediatr.Res.* **65**, 591–598 (2009).
3. Mason, D., Stewart, G. R., Capp, S. J. & Happé, F. Older Age Autism Research: A Rapidly Growing Field, but Still a Long Way to Go. *Autism in Adulthood* **4**, 164–172 (2022).
4. Loomes, R., Hull, L. & Mandy, W. P. L. What Is the Male-to-Female Ratio in Autism Spectrum Disorder? A Systematic Review and Meta-Analysis. *Journal of the American Academy of Child & Adolescent Psychiatry* **56**, 466–474 (2017).
5. Lai, M. C., Lombardo, M. V., Auyeung, B., Chakrabarti, B. & Baron-Cohen, S. Sex/Gender Differences and Autism: Setting the Scene for Future Research. *Journal of the American Academy of Child & Adolescent Psychiatry* **54**, 11–24 (2015).
6. Tsirgiotis, J. M., Young, R. L. & Weber, N. A Mixed-Methods Investigation of Diagnostician Sex/Gender-Bias and Challenges in Assessing Females for Autism Spectrum Disorder. *J Autism Dev Disord* (2021) doi:10.1007/s10803-021-05300-5.
7. Young, H., Oreve, M.-J. & Speranza, M. Clinical characteristics and problems diagnosing autism spectrum disorder in girls. *Archives de Pédiatrie* **25**, 399–403 (2018).
8. McQuaid, G. A. *et al.* Increased anticholinergic medication use in middle-aged and older autistic adults and its associations with self-reported memory difficulties and cognitive decline. *Autism Research* **17**, 852–867 (2024).
9. Rumball, F., Brook, L., Happe, F. & Karl, A. Heightened risk of posttraumatic stress disorder in adults with autism spectrum disorder: The role of cumulative trauma and memory deficits. *Research in Developmental Disabilities* **110**, 103848 (2021).

10. Stewart, G. R., Luedecke, E., Mandy, W., Charlton, R. A. & Happé, F. Experiences of social isolation and loneliness in middle-aged and older autistic adults. *Neurodiversity* **2**, 27546330241245529 (2024).
11. Giannini, A., Caretto, M., Genazzani, A. R. & Simoncini, T. Neuroendocrine Changes during Menopausal Transition. *Endocrines* **2**, 405–416 (2021).
12. Harlow, S. D. *et al.* Executive summary of the Stages of Reproductive Aging Workshop + 10: addressing the unfinished agenda of staging reproductive aging. *Menopause* **19**, 387–395 (2012).
13. Greendale, G. A. *et al.* Menopause-associated Symptoms and Cognitive Performance: Results From the Study of Women's Health Across the Nation. *American Journal of Epidemiology* **171**, 1214–1224 (2010).
14. Kronenberg, F. ; Hot Flashes: Epidemiology and Physiologya. *Annals of the New York Academy of Sciences* **592**, 52–86 (1990).
15. Kronenberg, F. Menopausal Hot Flashes: A Review of Physiology and Biosociocultural Perspective on Methods of Assessment. *The Journal of Nutrition* **140**, 1380S-1385S (2010).
16. Woods, N. F. *et al.* Symptom clusters among MsFLASH clinical trial participants. *Menopause* **23**, 158 (2016).
17. Nuffield Health. One in four with menopause symptoms concerned about ability to cope with life. (2017).
18. Hickey, M., Szabo, R. A. & Hunter, M. S. Non-hormonal treatments for menopausal symptoms. *BMJ* **359**, j5101 (2017).
19. Obaydi, H. & Puri, B. K. Prevalence of premenstrual syndrome in autism: a prospective observer-rated study. *J Int Med Res* **36**, 268–272 (2008).
20. Steward, R., Crane, L., Mairi Roy, E., Remington, A. & Pellicano, E. "Life is Much More Difficult to Manage During Periods": Autistic Experiences of Menstruation. *J Autism Dev Disord* **48**, 4287–4292 (2018).

21. Brady, M. J. *et al.* “A perfect storm”: Autistic experiences of menopause and midlife. *Autism* 13623613241244548 (2024) doi:10.1177/13623613241244548.
22. Karavidas, M. & de Visser, R. O. “It’s Not Just in My Head, and It’s Not Just Irrelevant”: Autistic Negotiations of Menopausal Transitions. *J Autism Dev Disord* **in press**, (2021).
23. Moseley, R. L., Druce, T. & Turner-Cobb, J. M. ‘When my autism broke’: A qualitative study spotlighting autistic voices on menopause. *Autism* **24**, 1423–1437 (2021).
24. Moseley, R. L., Druce, T. & Turner-Cobb, J. M. Autism research is ‘all about the blokes and the kids’: Autistic women breaking the silence on menopause. *British Journal of Health Psychology* **26**, 709–726 (2021).
25. Groenman, A. P., Torenvliet, C., Radhoe, T. A., Agelink van Rentergem, J. A. & Geurts, H. M. Menstruation and menopause in autistic adults: Periods of importance? *Autism* **26**, 1563–1572 (2022).
26. Pellicano, E. *et al.* Letter to the Editor: A possible threat to data integrity for online qualitative autism research. *Autism* **28**, 786–792 (2024).
27. Ritvo, R. *et al.* The Ritvo Autism Asperger Diagnostic Scale-Revised (RAADS-R): A Scale to Assist the Diagnosis of Autism Spectrum Disorder in Adults: An International Validation Study. *J Autism Dev Disord* **41**, 1076–1089 (2011).
28. Eriksson, J. M., Andersen, L. M. & Bejerot, S. RAADS-14 Screen: validity of a screening tool for autism spectrum disorder in an adult psychiatric population. *Molecular Autism* **4**, 49 (2013).
29. Greene, J. G. Constructing a standard climacteric scale. *Maturitas* **29**, 25–31 (1998).
30. IBM Corp. *IBM SPSS Statistics for Windows, Version 29.0*. (IBM Corp., Armonk, NY, 2022).
31. Benjamini, Y. & Hochberg, Y. Controlling the FDR: a practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society: Series B Statistical Methodology* **57**, 289–300 (1995).
32. Heinemann, L. A., Potthoff, P. & Schneider, H. P. International versions of the Menopause Rating Scale (MRS). *Health and Quality of Life Outcomes* **1**, 28 (2003).

33. Hollocks, M. J., Lerh, J. W., Magiati, I., Meiser-Stedman, R. & Brugha, T. S. Anxiety and depression in adults with autism spectrum disorder: a systematic review and meta-analysis. *Psychological Medicine* **49**, 559–572 (2019).
34. Clayton, A. H. & Ninan, P. T. Depression or menopause? Presentation and management of major depressive disorder in perimenopausal and postmenopausal women. *Prim Care Companion J Clin Psychiatry* **12**, CC–CC (2010).

Table 1: Summary of Literature Exploring Experiences of Menstruation and Menopause in Autistic People

Author (Year)	Participant groups, *Ns*	Age, years Median / Mean (SD), Range	Gender / Sex Designated at Birth	Aims / Research Questions	Study Design	Measure(s)	Self / Other Report	Findings / Themes
Menstruation								
Lever & Geurts (2016)	ASC, n=138 COM, n=170	ASC *M*=46.5 yrs COM *M*=45.9 yrs	ASC Female, n=42 Male, n=96 COM Female, n=73 Male, n=97	Examined psychiatric symptoms and disorders in young, middle-aged, and older adults with and without ASC in the Netherlands.	Observational	Symptom Checklist-90 (SCL-90) Mini International Neuropsychiatric Interview Plus (MINI-Plus) ADHD Rating Scale	Self-report	20.9% women with ASC met the criteria for PMDD, compared to only 2.7% of the control group.
Pohl et al. (2014)*	ASC, n=415 COM , n=415	ASC *M*=36.39 yrs (SD=11.98) COM *M*=39.96 yrs (SD=11.92)	ASC Female, n=415 COM Female, n=415	Assessed whether women with ASC display elevated steroidopathic symptoms.	Cross-sectional online survey	Testosterone-Related Medical Questionnaire (TMQ)	Self-report	Women with ASC displayed higher frequencies of dysmenorrhea (pain associated with menstruation) and amenorrhea (absent periods).
Simantov et al. (2022)	ASC, n=361 COM , N=869	ASC *M*=38.42 yrs (SD=12.4) Range=15.39-73.42 yrs COM *M*=42.33 yrs (SD=11.44) Range=15.07-77.44 yrs	ASC Female, n=361 COM Female, n=869	Examined the association of autism and autistic traits with conditions and symptoms related to the sex-steroid system in adult women.	Case-cohort	Autism Spectrum Quotient (AQ) Health and Pregnancy Questionnaire	Self-report	Higher rates of reproductive system diagnoses, irregular puberty onset, and menstrual length were associated with ASC diagnosis. Reproductive system diagnoses, menstrual length, irregular puberty onset, excessive menstruation symptoms, and hyperandrogenism symptoms were associated with autistic traits.

Steward et al. (2018)	ASC, n=123 COM, n=114	ASC Range=16-59 yrs COM Range= 16 yrs +	ASC Female (inc. transgender women), n=83 Male (inc. transgender men), n=7 Non-binary, n=26 Other, n=6 Prefer not to say, n=1 COM Female (inc. transgender women), n=96 Non-binary, n=15 Other, n=3	Preliminary investigation of the experiences of post-menarcheal autistic and non-autistic people.	Cross-sectional	Online survey	Self-report	ASC respondents reported many overlapping issues and experiences with non-autistic respondents. ASC respondents also highlighted distinct issues relating to menstruation, especially a cyclical amplification of autistic-related challenges, including sensory differences and difficulties with regulating emotion and behaviour. This had a significant, negative impact on their lives.
				Menstruation and Menopause				
Groenman et al. (2021)	*PMDD* ASC, n=28 COM, n=42 *Menopause* ASC, n=30 COM, n=35	*PMDD* ASC *M*=49.8 yrs (SD=14), Range=31-72 yrs COM *M*=56.2 yrs (SD=15.4), Range= 31-79 yrs *Menopause* ASC *M*=58.5 yrs (SD=8.8), Range=42-73 yrs COM *M*=62.9 yrs (SD=9.2), Range=45-79 yrs	*PMDD* ASC Female, n=28 COM Female, n=42 *Menopause* ASC Female, n=30 COM Female, n=35	Investigated whether ASC women experience more frequent PMDD and increased menopausal complaints.	Cross-sectional	Mini International Neuropsychiatric Interview Plus (MINI-Plus) Menopause Rating Scale (MRS) Symptom Checklist-90 (SCL-90) Adult ADHD Self-Report Scale (ADHD-SR) Autism Quotient (AQ)	Self-report	No statistically significant difference in PMDD lifetime prevalence between ASC women (14.3%) and COM women (9.5%). ASC reported more psychological and somatic menopausal complaints on the MRS than COM women. Higher menopausal complaints on the MRS associated with higher depressive symptoms and autistic traits in ASC women. Higher menopausal complaints associated with depressive symptoms and ADHD traits in COM women.

Menopause								
Karavidas & de Visser (2021)	ASC, n=7	ASC *M*=49.4 yrs, Range=39-63 yrs	ASC Female, n=7	How do autistic people discursively construct their experiences of menopausal change? What are the implications of these constructions for wellbeing, identity and accessing support?	Semi-structured interviews	-	Self-report	*1. Uncertainty about changes*: - Getting ill - Autistic traits come to the surface - Menstrual changes as a material indicator of menopause - Uncontrollable and unpredictable Menopause *2. Growing self-awareness and self-care*: - Pushing on through - Accommodating autism - Awareness of age and ageing *3. Navigating support options*: - Natural versus medical management of menopause - Interactions with clinicians - Subverting taboos - Peer support
Moseley et al. (2020a)	ASC, n=17	ASC *M*=53.5 yrs (SD=5.8), Range= 41-66 yrs	ASC Female, n=16 Agender, n=1	Explored awareness and perception of menopause; menopausal experiences and their impact across individuals' lives; ways that menopause with ASC might differ from a non-autistic menopause; and what optimal support might look like.	Semi-structured interviews	-	Self-report	*1. Journey to self-awareness:* - Growing up different - The face of autism - Milestones along the way - Impact of self-awareness - Emotions after diagnosis/self-identifying *2. Menopausal attitudes and understanding:* - Lack of knowledge/recognition - Stereotypes and ageing female identity - A time of reflection versus a fact of life - Silver linings - Dark clouds *3. Signs, symptoms and multiple impacts of menopause:* - Physiological symptoms - Cognition and daily living

								- Negative emotions and stress reactivity - Social relationships and communication - Sensory changes - Midlife changes - Life beyond menopause - The maze of health-seeking experiences *4. Navigating a neurodiverse menopause:* - Advantages and disadvantages of menopause with autism - Importance of self-identity - Unmet needs and ideal support
Moseley et al. (2020b)	ASC, n=7	ASC *M*=64.5 yrs, Range=49-63 yrs	ASC Female, n=7	Explored the state of knowledge about menopause in ASC, difficulties the menopause might bring, support that might be needed, and what questions require scientific investigation.	Focus group	-	Self-report	*1. Lack of knowledge and understanding:* - Professional versus patient expertise - Negative experiences with professionals - Barriers to progress *2. Cracking the mask and adaptive functioning:* - Menopause amplifies autistic presentation - Communication and relationship difficulties - Sensory heightening and executive decline - Negative emotions and stress reactivity - Sleep, self-care and health behaviours - Midlife identity and life after menopause *3. Finding support:* - Scarcity contrasts with need - Advice and resources - Two-way communication - Embracing individual differences

Brady et al. (2024)	ASC, n=23	ASC *M=50.3 yrs, Range=40-71 yrs*	ASC Female, n=18 Non-binary, n=2 Genderfluid, n=1 Trans male, n=1 Did not disclose, n=2	Explored how autistic people experience menopause and how they can better access services, support and information.	Focus groups and individual semi-structured interviews	-	Self-report	*1. Complexity, multiplicity and intensity of symptoms.* *2. Life experience and adversity converging at midlife.* - Social isolation and past trauma. - Intersections with other life transitions, responsibilities and stressors. - Communication gaps and disconnection. *3. The importance of knowledge and connection.* - Expectations and preparedness for menopause. - Importance of the human connection. *4. Barriers to support and care.* - Pre-emptive factors. - The struggle to access initial healthcare, services and support. - Issues during consultation and follow-up with healthcare professionals.

Note. M= Mean, SD= Standard Deviation, ASC= autism spectrum conditions, COM= Comparison Group, PD= Primary Dysmenorrhea, PMDD= Premenstrual Dysphoric Disorder.

Table 2. Demographic characteristics of the autistic and non-autistic groups.

		Autistic group (n=242)		non-Autistic group (n=100)		Group Difference	Effect Size
Age (years)	*M (SD)*	56.85	(10.94)	60.53	(13.54)	F(1,340) = 3.78, *p* = .053	*g* = 0.23 [-0.01-0.46]
	[95% CI]	[55.46-58.23]		[57.32-61.32]			
	Range	40 - 82		40 - 86			
Gender Identity	*women : nonbinary*	227 : 15		100 : 0		χ^2 = 6.48, *p* = .011*	*v* = .14
	%	93.8% : 6.2%		100% : 0%			
Sexuality	*Heterosexual*	168	(69.4%)	90	(90.0%)	χ^2 = 17.85, *p* = .007**	*v* = .23
	Lesbian	10	(4.1%)	1	(1.0%)		
	Bisexual	19	(7.9%)	5	(5.0%)		
	Pansexual	4	(1.7%)	0	(0.0%)		
	Queer	2	(0.8%)	0	(0.0%)		
	Asexual	35	(14.5%)	4	(4.0%)		
Ethnicity	White	226	(93.4%)	88	(88.0%)	χ^2 = 13.19, *p* = .069	*v* = .20
	Mixed/Multiple Ethnicities	5	(2.1%)	3	(3.0%)		
	Asian	5	(2.1%)	0	(0.0%)		
	Black	2	(0.8%)	2	(2.0%)		
	Hispanic or Latinx	2	(0.8%)	4	(4.0%)		
	Other	1	(0.4%)	3	(3.0%)		
Marital status	*Married / civil partnership*	92	(38.0%)	62	(62.0%)	χ^2 = 26.75, *p* < .001***	*v* = .28
	In a relationship	23	(9.5%)	12	(12.0%)		

	Single	87	(36.0%)	11	(11.0%)		
	Widowed	7	(2.9%)	5	(5.0%)		
	Separated	32	(13.2%)	10	(10.0%)		
Education history	*No formal qualifications*	13	(5.4%)	3	(3.0%)		
	School to 16	28	(11.6%)	6	(6.0%)		
	School to 18	34	(14.0%)	13	(13.0%)	$\chi^2 = 14.63$, $p = .067$	$v = .21$
	Vocational/Professional	62	(19.4%)	19	(36.0%)		
	Undergraduate	55	(22.7%)	21	(21.0%)		
	Postgraduate	64	(26.4%)	21	(21.0%)		
Current employment status	Employed	103	(43.3%)	77	(77.0%)		
	Student/volunteer/carer	33	(13.9%)	4	(4.0%)		
	Unemployed	5	(2.1%)	0	(0.0%)	$\chi^2 = 36.90$, $p < .001$***	$v = .33$
	Unable to work	38	(16.0%)	2	(2.0%)		
	Retired	59	(24.8%)	17	(17.0%)		
Home ownership	Own home	139	(57.4%)	86	(86.0%)		
	Privately rented	38	(15.7%)	9	(9.0%)	$\chi^2 = 31.40$, $p < .001$***	$v = .30$
	Local authority rented	60	(24.8%)	3	(3.0%)		
Autism Diagnosis	*Diagnosed*	198	(81.8%)	0	-	-	-
	Self-identified	44	(18.2%)	0	-		
Years since Autism Diagnosis/Identity	*M (SD)*	10.05	(9.00)		-	-	-
	Range	0 - 54					

Note: Participants could select from a list of genders, or self-describe. Own home includes living in a family home or those with shared ownership agreements. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 3: Descriptive statistics and group differences of menstrual history, menopause stage, and menopause symptom scores of the autistic and non-autistic groups.

		Autistic group (n=242)		non-Autistic group (n=100)		Group Difference	Effect Size
Menstrual History	*Regular cycle*	31	(12.8%)	21	(21.0%)	$\chi2 = 10.67$, $p = .014$*	$v = .18$
	Irregular cycle	47	(19.4%)	7	(7.0%)		
	No longer menstruate	163	(67.4%)	72	(72.0%)		
	Never menstruated	1	(0.4%)	0	(0.0%)		
Menopause Stage	*Pre-Menopausal*	46	(19.0%)	21	(21.0%)	$\chi2 = 0.42$, $p = .817$	$v = .03$
	Menopausal	73	(30.2%)	27	(27.0%)		
	Post-Menopausal	123	(50.8%)	52	(52.0%)		
Menopause Symptom score	*Psychological scale*	17.45 [16.62-18.28]	(6.46)	9.59 [8.38-10.81]	(5.99)	$F(1,331) = 105.13$, $p < .001$***	$g = 1.21$ [0.96-1.46]
	Somatic scale	8.08 [7.46-8.71]	(4.90)	4.44 [3.77-5.10]	(3.27)	$F(1,330) = 44.89$, $p < .001$***	$g = 0.79$ [0.56-1.03]
	Vasomotor scale	2.43 [2.17-2.69]	(2.02)	3.43 [3.23-4.20]	(1.67)	$F(1,329) = 0.01$, $p = .982$	$g = 0.01$ [-0.22-0.24]

Note: Mean (SD) [95% CI]. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 4: Descriptive statistics, group differences, and interactions of menopause symptom and change scores by autistic/non-autistic group and menopause stage.

		Autistic group (n=242)			non-Autistic group (n=100)					
		Pre-Menopausal (n=44)	Menopausal (n=70)	Post-Menopausal (n=121)	Pre-Menopausal (n=21)	Menopausal (n=27)	Post-Menopausal (n=52)	Autism Group Difference	Stage Group Difference	Interaction
Menopause Symptom score (total)	*Psychological*	16.34 (7.35) [13.88-18.34]	17.64 (5.74) [16.27-19.01]	17.89 (6.47) [16.68-19.00]	12.29 (4.51) [10.16-14.11]	13.36 (7.38) [10.32-16.40]	6.58 (3.90) [5.47-7.69]	F(1,332) = 66.26, $p < .001$***	F(2,332) = 7.35, $p < .001$***	F(2,332) = 11.92, $p < .001$***
	Somatic	6.52 (4.50) [5.07-7.77]	8.19 (4.55) [7.10-9.27]	8.64 (5.14) [7.72-9.57]	6.00 (3.48) [4.39-7.43]	5.76 (3.50) [4.31-7.21]	3.12 (2.49) [2.41-3.83]	F(1,331) = 23.70, $p < .001$***	F(2,331) = 1.48, $p = .228$	F(2,331) = 7.75, $p < .001$***
	Vasomotor	1.24 (1.51) [0.79-1.70]	2.77 (1.77) [2.35-3.19]	2.68 (2.17) [2.29-3.07]	1.95 (1.47) [1.29-2.62]	3.64 (1.73) [2.93-4.35]	2.04 (1.46) [1.63-2.45]	F(1,331) = 1.71, $p = .192$	F(2,331) = 12.53, $p < .001$***	F(2,331) = 5.22, $p = .006$**
Menopause Change score (mean)	*Psychological*	-	-0.38 (0.34) [-0.46 - -0.29]	-0.17 (0.34) [-0.23 - -0.10]	-	-0.62 (0.29) [-0.74 - -0.50]	-0.24 (0.25) [-0.31 - -0.17]	F(1,257) = 21.39, $p < .001$***	F(1,257) = 31.00, $p < .001$***	F(1,257) = 1.03, $p = .312$
	Somatic	-	-0.37 (0.36) [-0.45 - -0.28]	-0.14 (0.32) [-0.19 - -0.08]	-	-0.42 (0.38) [-0.58 - -0.26]	-0.15 (0.22) [-0.21 - -0.08]	F(1,253) = 3.18, $p = .076$	F(1,253) = 25.86, $p < .001$***	F(1,253) = 0.01, $p = .996$
	Vasomotor	-	-0.67 (0.47) [-0.79 - -0.55]	-0.23 (0.72) [-0.36 - -0.09]	-	-0.78 (0.41) [-0.95 - -0.61]	-0.48 (0.48) [-0.62 - -0.34]	F(1,242) = 4.17, $p = .043$* †	F(2,242) = 12.68, $p < .001$***	F(1,242) = 2.48, $p = .117$

Note: Mean (SD) [95% CI]. Psychological symptom score range 0 to 33; Somatic 0 to 21; Vasomotor 0 to 6. Change scores range -1 to 1. For symptom score - a similar pattern of group differences and interactions are found when accounting for current symptoms of depression and anxiety. * $p < .05$, ** $p < .01$, *** $p < .001$; † result does not reach significance after FDR correction.

Supplementary Table 1: Descriptive statistics and group differences of menopause symptom scores (covarying for depression and anxiety symptoms) of the autistic and non-autistic groups.

		Autistic group (n=242)	non-Autistic group (n=100)	Group Difference	Effect Size
Menopause Symptom score (total)	*Psychological*	16.218 (0.35) [15.54-16.90]	12.602 (0.57) [11.49-13.72]	F(1,331) = 27.09, $p < .001$***	$g = 0.61$ [0.38-0.85]
	Somatic	7.626 (0.29) [7.06-8.19]	5.548 (0.47) [4.62-6.48]	F(1,330) = 12.82, $p < .001$***	$g = 0.42$ [0.19-0.66]
	Vasomotor	2.323 (0.13) [2.07-2.57]	2.699 (0.21) [2.29-3.11]	F(1,329) = 2.16, $p = .142$	$g = 0.17$ [-0.05-0.41]

Note: Mean (SE) [95% CI]. * $p < .05$, ** $p < .01$, *** $p < .001$

Figure Titles

Figure 1: Rating of menopause symptoms by group and menopause stage.

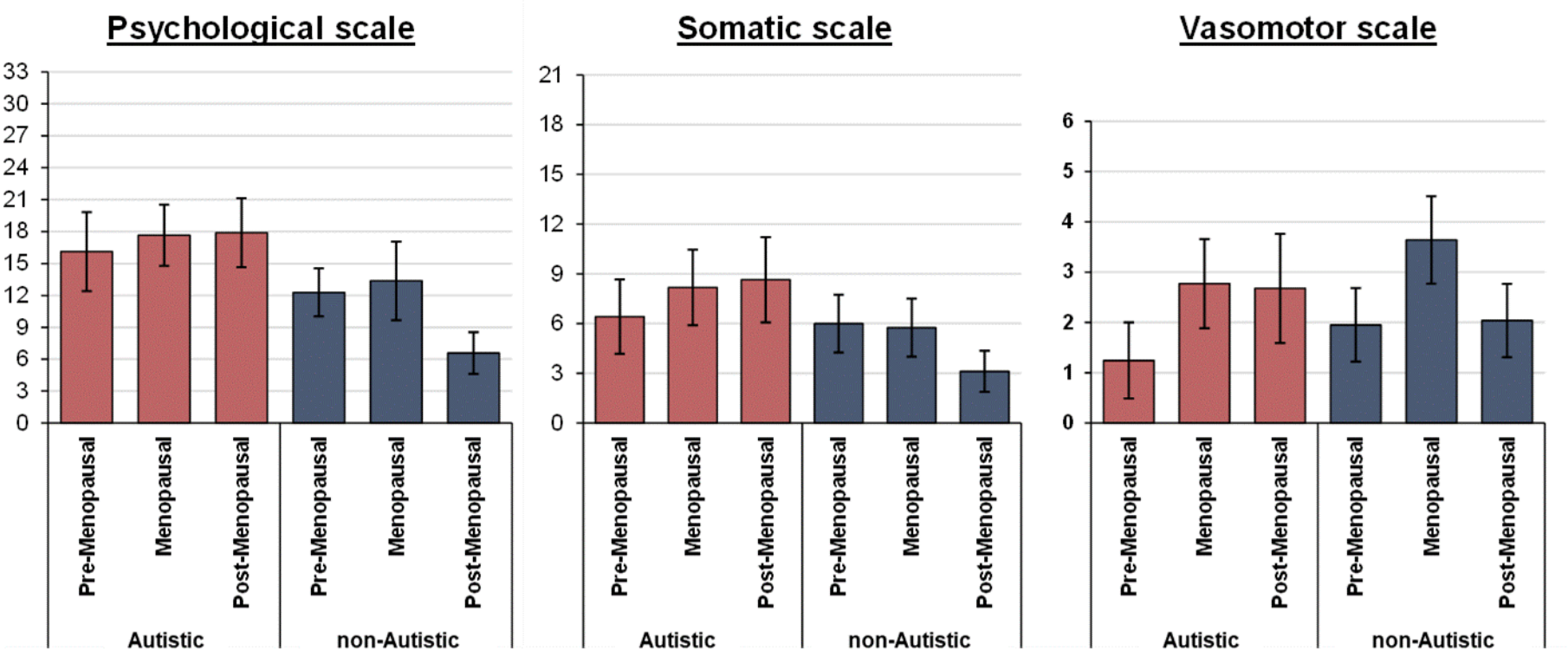

Figure 2: Self-reported change in symptoms by menopause stage for autistic and non-autistic people.