

EDITORIAL

The associations between menopausal symptoms and mental well-being: the role of types of physical activity

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In this issue of *Menopause*, Bondarev et al,¹ presented cross-sectional findings from a substudy of 1,098 women, aged 47 to 55 years, from the Finnish Estrogenic Regulation of Muscle Apoptosis study. The authors first investigated the relationship of menopausal status with mental well-being, which was measured in four different ways, and then examined the extent that these relationships varied according to physical activity levels.

One of the distinctive aspects of the study is that menopausal status was assessed from hormonal analysis and a bleeding diary to allocate each participant into one of the four categories: premenopausal, early perimenopausal, late perimenopausal, and postmenopausal. In contrast, the presence or absence of menopausal symptoms was simply based on if the women reported experiencing any one of a range of vasomotor, somatic or pain, psychological, or urogenital symptoms.

Overall, the authors found little indication of a relationship between menopausal status and mental well-being. No evidence of an association was found with positive and negative affectivity, and life satisfaction. The study revealed an adverse trend for depressive symptoms based on average scores using the Center for Epidemiological Studies Depression Scale. Postmenopausal women had higher depressive symptoms than premenopausal women (mean difference of 0.07 units), where the scale can range from 0 to 3 units and a score greater than 0.75 (or a score of >15 out of 60 in the Center for Epidemiological Studies Depression Scale) indicates potential clinical depression.

Bondarev et al¹ then investigated whether physical activity modified the associations between menopause status and mental well-being. In their stratified analysis by menopause status, a high level of physical activity was associated with lower depressive symptoms across all groups except for the late perimenopause group. Postmenopausal women with a

medium level of physical activity also reported lower depressive symptoms than the group with a low level of physical activity. Similar results were evident for positive affectivity (but with a stronger association for the late perimenopause group) and life satisfaction. No association was found, however, between physical activity and negative affectivity by menopausal group.

This overall pattern of results indicated that high levels of physical activity were associated with better mental well-being, apart from negative affinity, and this was irrespective of menopausal status. Bondarev et al¹ suggest that physical activity may have the potential to alleviate lower mental well-being during the menopause. As these results are from cross-sectional data, however, it is recognized that a causal relationship cannot be inferred from association. They conclude that future research should examine the causal relationships, not for menopausal status, but between menopausal symptoms, physical activity, and mental well-being.

This point about menopausal symptoms being the focus is interesting, as alongside the main results it is evident that the experience of any menopausal symptoms had a clear and consistent association with lower mental well-being across all four measures. For instance, having menopausal symptoms was associated with higher depressive symptoms (mean difference of 0.12 units), an effect size that was almost twice that for menopausal status and was of the same magnitude as the effect size associated with not working.

In addition, the association between menopause status and depressive symptoms was attenuated when menopausal symptoms were included in the model. This underscores the conclusion of Bondarev et al,¹ as it suggests that menopausal symptoms rather than menopause status per se, may be driving that association. Furthermore, it suggest that factors that reduce the risk of menopause symptoms, or the factors along that pathway, may also reduce the risk of lower mental well-being.

Recent research from the International collaboration for a Life course Approach to reproductive health and Chronic disease Events (InterLACE) study² has used longitudinal data to investigate some of the interactions between menopausal symptoms and other factors, and in their relationship with mental well-being during the menopausal transition. Anderson et al³ used pooled analysis of eight prospective cohort studies participating in the InterLACE consortium and showed that having higher body mass index and being a

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cigarette smoker were associated with a higher risk of vasomotor menopausal symptoms (VMS). When they stratified the analysis by menopausal status, they found that the risk of VMS was only seen in women with overweight/obesity in the pre/perimenopausal group, whereas the effect of smoking was seen across all menopausal status categories. In another article using data from the InterLACE consortium, Chung et al⁴ found that women with severe VMS were more likely to have depressed mood compared with those without VMS. This relationship, however, was entirely attenuated when the degree of sleep difficulties was taken into account.

The evidence on physical activity as a modifiable factor to reduce menopausal symptoms and independently improve mental well-being requires similarly careful consideration. Results from a randomized controlled trial to test the efficacy of exercise to reduce menopausal symptoms detected no difference in menopausal symptoms between the control and the exercise group.⁵ The exercise group did report, however, an improvement in sleep quality, insomnia symptoms, and depression.

Not only the intensity, but the type of physical activity may be an important issue when investigating the relationship between menopausal symptoms and mental health. For instance, an umbrella systematic review and meta-analysis provided evidence that yoga reduced VMS and psychological symptoms.⁶ The meta-analysis of White et al⁷ found that the association between physical activity and mental health may also depend on the domain-specific nature of physical activity. Their review covered physical activity across various domains, from household and work-related, to leisure-time physical activity and school sports. They found that leisure-time physical activity and work-related physical activity had a positive association with mental health. Leisure time and school sports also had an inverse association with mental ill health, whereas work-related physical activity, however, was associated with higher mental ill-health.

In summary, this suggests that to advance the work of Bondarev et al¹ research on physical activity, menopausal symptoms, and their affects on mental well-being should address the following:

- Collection of physical activity data using objective measures and the inclusion of information on the type of physical activity, and which social domain it took place.

- At a minimum, menopausal symptoms should be identified according to the four main categories (vasomotor, somatic or pain, psychological, or urogenital symptoms) and by severity or frequency.
- The inclusion of the clinically meaningful cut points for mental well-being measures will aid in the interpretation of results as a public health strategy.
- Collection of longitudinal data and utilization of techniques such as mediation analysis using the counterfactual framework can help in understanding the causal pathway from menopause status to mental health. For instance, to what extent is the relationship between menopausal symptoms mediated or modified by different types of physical activity?

Clearly these requirements suggest a substantially increased sample size and level of detail in the collection of longitudinal data that would previously have presented a major methodological challenge. With modern physical activity monitors and other personal electronic devices to facilitate real-time data collection on menopausal symptoms and health factors, such as sleep quality and duration, such studies have finally become feasible.

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