

Menopause, a curse or an opportunity? An evolutionary biological view

When entering menopause, many women face several questions. What shall happen to me? Will I manage to maintain my physical and mental health or will I get seriously ill? How will it affect my work, will I be able to keep my job, will I be able to continue developing professionally or will I slowly lose my abilities, my attention span and memory? As I lose my fertility, will I also lose my attractiveness?

Despite these worries, menopause can also be seen as an opportunity. With menopause comes no need for contraception, no premenstrual dysphoria, and end of menstrual bleeding problems.

What is the purpose of menopause though? Can evolutionary biology offer any hypothesis?

In most animal species, individuals continue to reproduce until death because the reproductive system ages at same rate as somatic tissues. However, in human females the reproductive system ages at faster rate than somatic tissue and women may live many decades after discontinuing reproduction. Although humans are the only primates that are known to experience menopause and an extended post reproductive life span, we are not unique among mammals. Extended post-reproductive life span also occurs among four species of toothed whales: killer whales, short-finned pilot whales, beluga whales and narwhals.¹ What is commonality between humans and toothed whales? The most probable answer is a long childhood with dependency of the offspring on their mother. Accordingly, is there some benefit to menopause?



Due to a long childhood in humans, it has been suggested that to ensure a better existence, at a certain point it becomes more advantageous for a woman to redirect her reproductive effort into increased support of already existing children and grandchildren rather than continuing her own reproduction. By ceasing reproduction, the woman avoids pregnancy-related mortality risks, which increase in older age especially. Thus, she will most likely live longer. In addition, as a grandmother, she can help in gathering food for her grandchildren, which would allow her daughters or sons to have more children, more quickly. This hypothesis is called the grandmother hypothesis and was originally presented by G.C Williams.²

There is empirical evidence supporting this hypothesis. For example, studies using church records collected from the 18th and 19th century in Finland and Canada, found that families in which grandmothers lived longer after menopause had more grandchildren; two additional grandchildren for every 10 years of survival after menopause.³ A more recent study on Finns found that maternal grandmothers aged 50-75 increased grandchild survival after weaning, but the presence of an older grandmother was not as beneficial.⁴ Furthermore, co-residence

with paternal grandmothers with poor health was associated with lower grandchild survival.⁴ A study using an exceptionally detailed dataset of pre-industrial French settlers in the St. Lawrence Valley during the 17th and 18th centuries, found that the grandmother effect decreased as grandmother-daughter geographic distances increased, suggesting that the potential for help may be related to geographic proximity.⁵ Studies in contemporary humans have shown that grandmothers transfer knowledge, help in household tasks and child care, thus increasing grandchildren's nutrition and survival.^{6,7}

Although it seems that the menopause has evolved as adaptation in previous generations, this does not automatically mean that it is adaptive anymore in all situations, or beneficial for mental or physical well-being. Women today entering menopause live a very different kind of lifestyle and in different social environments than their ancestors where grand-mothering presumably developed. Extended families (where grandparents live in same household) are rare; many women in the Global North have limited opportunity to contribute daily to the care of their grandchildren and many women in their 50's and 60's are still be looking to find a long-term partner. Furthermore, although, in evolutionary history, the reduced metabolic rate due to menopause was presumably beneficial and prolonged women's post reproductive life span, this may actually lead to health problems in postmenopausal women currently living in the Global North. Thus, from an evolutionary psychological point of view, it seems that adaptation is outdated with regard to the lifestyle of many women today.

The central tenet in evolutionary psychology proposes that our lifestyle has changed faster than our bodies and mind have adapted. Thus, many physical and mental health problems of those living a modern lifestyle are a result of this mismatch.^{8,9} Perhaps this is also the case with the problems and worries caused by menopause? Nowadays, women on average live substantially longer than their ancestors in evolutionary history and their postmenopausal era comprises almost one-third of their lifespan. Taking this additional time into account, one would assume that they have extensive opportunity to perform grand-mothering as described above. However, our modern world has produced a new type of postmenopausal woman: active in work and at home, independent in her choices and actions. Postmenopausal women are valuable members of modern society: they have knowledge and skills accumulated through life experience. We should see these qualities as an opportunity and resource.

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