



Gender differences in depression

Artificial explanations for the difference in rates of depression among women and men

When asked about symptoms of depression, women are more likely to admit to such features than men, a difference usually put down to women being more open and men being more likely to use denial. Similarly, women are more prepared to seek help than men for their depression. Thus, examining sex differences in those who receive treatment is not an appropriate way for determining whether there is a true sex difference.

Another artificial influence is that many measures of depression include items that reflect depression responses and expressions that are more likely to be experienced by women, such as crying, as well as appetite and weight changes. These can artificially inflate scores in women and, if there is a cut-off to decide if an individual is depressed or not, women will then be more likely to be assigned as having 'depression'.

Another influence that has been demonstrated in several studies is that, over time, women are more likely to remember episodes not previously nominated when asked (and to remember more symptoms), while men are more likely over time to 'forget' previously reported episodes. This bias has been described as a 'mood amplification' phenomenon. Differential coping repertoires (e.g. women being more likely to experience depression directly and to ruminate on issues, and men being more likely to distract themselves or to use alcohol or engage in reckless behaviour) have also been suggested.

'Real' reasons for the difference in rates of depression among women and men

These include social influences, socialisation factors and biological issues. Socialisation and sex role factors have long been seen as key influences, with theories suggesting that parents interact with their sons and daughters in differing ways, shaping dimensions of the self that contribute to a greater likelihood of either 'internalizing' (e.g. anxiety and depression) or 'externalizing' disorders, and with daughters then being at greater risk of internalizing disorders.

Others have held that as a consequence of socialisation experiences, women are more likely to focus on their partners and their families, while men are more likely to obtain their self-esteem and exert power across the public sphere. Women with a number of young children and women in unsatisfactory marriages seem to be highly over-represented in depressed samples, results that argue for either a sex role component or the reduced inability of women in such circumstances to obtain assistance or support.



Biological influences

Epidemiological studies highlight two issues of key relevance. Firstly, there is no clear sex difference in childhood, with higher female depression in community study rates appearing only in early adolescence in most Western communities, increasing rapidly over adolescence and early adulthood, and then somewhat lessening – but still remaining significant – over the later years of life. The pattern corresponds closely to that observed for a number of the anxiety disorders and, when the sex difference in anxiety disorders is taken out of the equation, it weakens the sex difference found for depression in community studies. This could suggest that hormonal factors come into operation at puberty and either increase the chance of anxiety which, in turn, increases the chance of depression in women or that such factors simultaneously increase the chance of both anxiety and of depression.

What hormonal factors?

Within the brain, the central neural drive of the reproductive processes in both sexes is the activation of neurons that produce gonadotropin releasing hormone (GnRH). It is probable that there are multiple factors that produce this pubertal awakening and the maintenance of adult functioning of GnRH release, including length of day and seasonal cues, nutrition, as well as various kinds of stress. At puberty, GnRH is released into the hypothalamus-pituitary portal vessels within the median eminence of the hypothalamus, travels to the anterior pituitary where it binds to the gonadotropin receptors causing the release of the gonadotropins, luteinizing hormone and follicle stimulating hormone, and thence into the systemic circulation.

In males, luteinizing hormone stimulates testosterone production. Testosterone stimulates the development of secondary sexual characteristics and supports the functioning of the male secondary sexual organs. With follicle stimulating hormone it acts to stimulate spermatogenesis.

In females, follicle stimulating hormone causes the development of ovarian follicles at the beginning of each ovarian cycle. Follicle stimulating hormone and luteinizing hormone together stimulate mid-cycle ovulation as well as the cyclical production of the female ovarian steroid hormones, estrogen and progesterone hormones which in turn cause the development of, and support for, the female secondary sexual characteristics. The cyclical fluctuations in the circulating gonadal steroid hormones, in turn feedback to modulate the pulsatile release of GnRH, with estrogen having a positive feedback to the hypothalamic pituitary axis.

As previously stated, various types of stress help maintain the adult functioning of the GnRH system. Three primary neurotransmitter systems are considered to mediate anxiety: the locus ceruleus-norepinephrine system, the serotonin system, and the GABA-benzodiazepine receptor system. The female gonadal steroid hormones act to mediate sensitivity to stress. Estrogen acts to reduce



sensitivity to stress. However, the recurrent cyclical estrogen withdrawal starting at puberty and finishing at the menopause may render women more vulnerable to stress by interfering with estrogen's ability to neutralise the effects of glucocorticoids released during stress.