

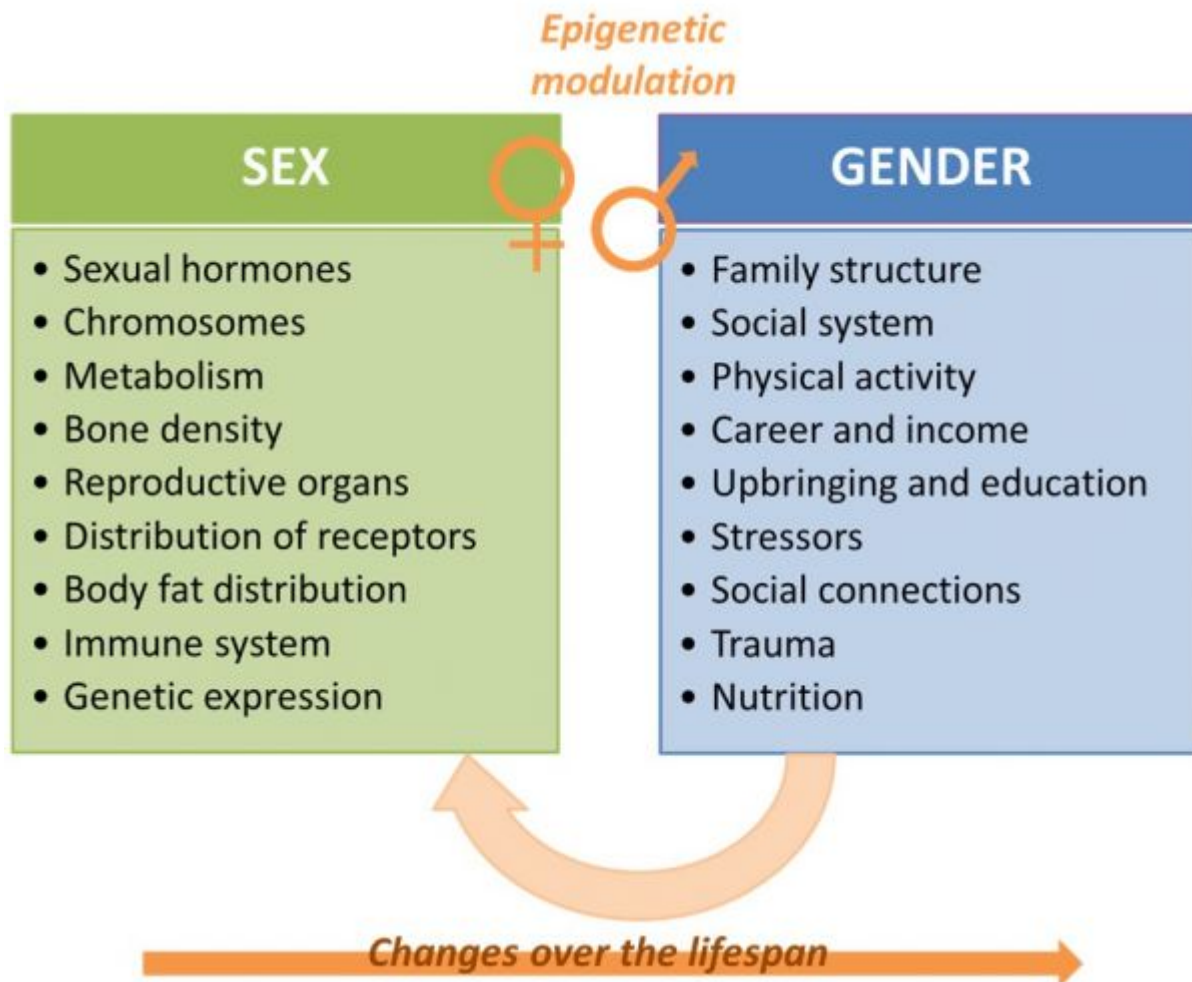
# Module 1: Sex and Gender in medicine/Expert

## Sex and Gender Medicine - What is it?

There is an increasing theoretical and practical relevance for sex and gender sensitive medicine, particularly with application of the individualized care concept. Classified as a potential risk factor for the development and course of disease, sex and gender factors have significant influence on the entire treatment process. Sex and gender-sensitive medicine is not represented as a single discipline but rather an interdisciplinary approach to care, creating newfound dimensions and perspectives within almost every area of medicine. The concept underlying this perspective is self-evident: Women and men differ in many ways. It is important to recognize that these differences are by no means limited to anatomical and physiological characteristics. Rather, biological (sex) and social differences (gender) with regard to aspects such as disposition, prevalence, coping strategies and therapy adherence must be taken into account in order to ensure adequate treatment plans. The care process is not only affected by the sex and gender of the patient but can also be influenced by the sex and gender of the medical personnel providing care. <sup>[1]</sup>



The English terminology for gender (as opposed to the German term “Geschlecht”) provides a clear distinction between social and biological factors. The term “gender” describes social factors and thus refers to gender-specific roles which are influenced by environmental factors such as socio-cultural expectations und educational structures in child rearing. In contrast, biological factors (for example chromosomes, sex hormones, the immune system and metabolism) are associated with the term “sex”. Sexual dimorphism describes the appearance of two distinctly different manifestations of the same trait in male and female individuals of the same species. <sup>[1]</sup>



**Chart 1. Interaction between sex and gender [Quelle: GenderMed-Wiki, nach: Kindler-Röhrborn & Pfeleiderer (2012)]**

Most importantly, sex and gender should not be regarded as separate entities but rather a composite of lifelong interactions on biological and social levels. These interactions play a significant role in most illnesses (see chart 1). Practitioners face the challenging task of incorporating this interaction of biological and social factors into the treatment process. Inclusive to this is the understanding of how the course of disease is affected by these factors. For example, the respective hormonal level can influence individual mood and perception processes and increase depressive or anxious symptoms. On the other hand, one's emotional state can also influence perceptual processes: Anxiety and depression (much more common in women than men) can lower individual pain thresholds and increase subjective pain perception.<sup>[2]</sup> Consequently, specific biological and social factors interact in a complex manner and influence the prevalence, severity, course and success of treatment of diseases. Sex and gender should therefore be the base of modern individualized health care with multidisciplinary cooperation.<sup>[3]</sup>

## Development of a scientific discourse

In 1998, the Federal Statistics Office published the first health report for Germany which showed a clear deficit: only very few of the processed data were differentiated according to sex, although 20 years of research and experience with women's health already existed.<sup>[4]</sup> However, those results were not included in the general health report. The specific deficits in the report encouraged a

nationwide discourse regarding sex and gender in medicine. Only a few years later (in 2001), the German Department for families, elderly, women and youth published a report on the health of women based on the bio-psycho-social understanding of gender and health or illness and it is still seen today as an important milestone in the development of sex and gender-sensitive medicine.

<sup>[5]</sup> The discourse in Germany led to connection with international health policies and in 2002 the World Health Organization (WHO) of Europe published a statement emphasizing the importance of sex and gender in health research. <sup>[6]</sup> Although sex and gender-sensitive medicine is far from being sufficiently implemented in medical theory and practice, the topic of “Sex and gender in health” has made significant strides since 2002. Progress can be observed both in medical and interdisciplinary research as well as sex and gender-sensitive care. Sex and gender sensitive health reporting and care practice have developed substantially and now include the topic of men’s health as well. <sup>[7]</sup>

Detailed information on the origin and development of scientific and political discourse on sex and gender and medicine can be found here.

## Sex and Gender sensitive medicine over the lifespan

Providing patient-oriented care includes the evaluation of symptoms and complaints in correlation with the patient’s situation. The respective life situation differs not only between individuals, but also intra-individually within the phases of a person’s life. Throughout their lifespan, men and women differ in terms of their biological and social development and often face different health challenges.

In childhood and adolescence, the aspects of growth, learning and the search for identity are crucial. The physical growth of boys is slower and more irregular than that of girls. Boys often have growth spurts, while girls grow more steadily. Similarly, emotional and cognitive development in boys is slower and more irregular than in girls. In terms of language development, boys are 12 to 18 months behind girls. A more highly developed frontal cortex enables girls to control impulses better than boys. <sup>[8]</sup> Adulthood is characterised by relationships, (possibly) starting a family and participation in the workforce. Many (sex/gender-specific) health problems can manifest themselves in adulthood. An association seems to exist between social integration and health. For example, the fact that women are more likely to suffer from health impairments and have lower subjective health values than men has a negative impact on participation in the labour force and other social areas. <sup>[9]</sup> In old age, health and everyday functionality decreases and participation in society changes. Although women live longer on average, they have just as many years of good health as men. This indicates that during the years which women live longer, they often suffer from chronic diseases and report a low disease-related quality of life with significant functional limitations (see also: life expectancy). <sup>[10]</sup> Sex and gender-specific communication styles can (among other things) significantly influence medical care in the last phase of life and justify the question of whether women and men die differently. For example, compared to male patients with an oncological disease in the final stage, female patients are much more likely to recognize their condition is terminal. They are also able to verbalise this better and communicate with their medical care provider about prognosis and life expectancy. Male patients in the same situation are less likely to understand the goal of treatment is no longer curative and generally have a less accurate understanding of the disease. <sup>[11]</sup>

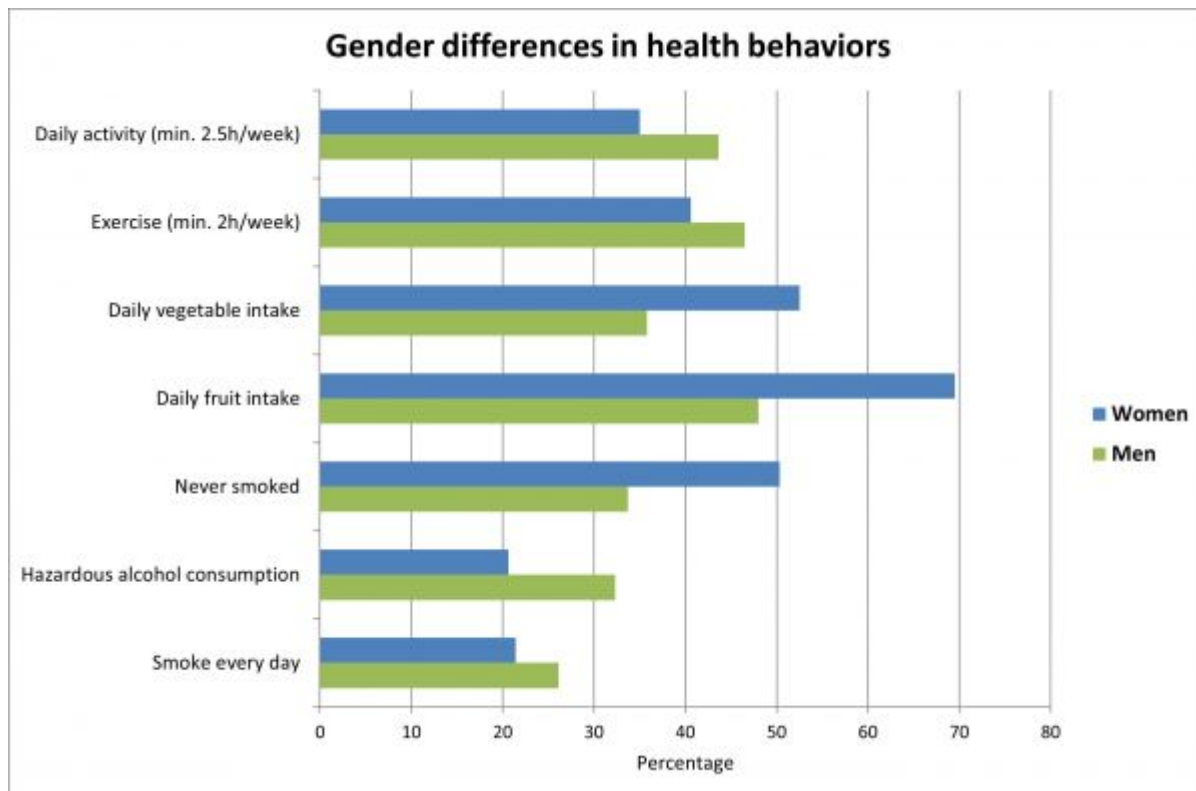
# Relevance of sex and gender in health care

In view of the high cost of health care, the health care system should not disregard such a distinctive characteristic as the sex and gender of the patient and doctor in relation to diagnosis and therapy. Unfortunately, providers still pay too little attention to sex and gender-sensitive differences or similarities. The implications of this practice include many incorrect diagnoses and failure to initiate suitable therapies resulting in serious consequences such as higher mortality rates. <sup>[1]</sup> Sex and gender-sensitive knowledge must be integrated into medical teaching curriculum, medical practice and public health policy and not be limited to women-specific health aspects or men-specific health aspects. <sup>[12]</sup> Medical treatment is not sex and gender-neutral. Not only the sex of the patient is an influencing factor in the care process, but also sex of the medical personnel can be significant (see also the article on sex and gender of the medical personnel). Studies confirm an often unconscious "gender bias", which can refer to the sex of the patient, the sex of the doctor, as well as the gender ratio in the treatment situation. For example, male patients with type 2-diabetes seem to receive significantly less preventative care for the reduction of secondary complications than their female counterparts. In addition, female physicians provide better care for patients with type 2 diabetes including more intensive prognostically important prevention management than male physicians. Female physicians are more successful than their male colleagues in lowering blood sugar and lipid levels. <sup>[13]</sup>

## Health behaviours

A healthy lifestyle can reduce the risk of disease and significantly impact treatment results. Specific factors which influence a healthy lifestyle include smoking, physical activity, safe sex, consumption of alcohol and dietary habits. Both men and women have the potential to positively impact the condition of their health through sensible decision making thereby reducing their risk of acquiring diseases such as diabetes mellitus, cardiovascular illnesses or cancer. However, lifestyle and health-related behaviour differs between the sexes. According to a Dutch study from 2013, men consume more alcohol than women, smoke more frequently and are opioid-dependent significantly more often. The underlying cause relates to the differing interaction with stimulants. Based on the current DAK Health Report (2016), Table 2 shows differences in health behaviour between the sexes. <sup>[14]</sup>

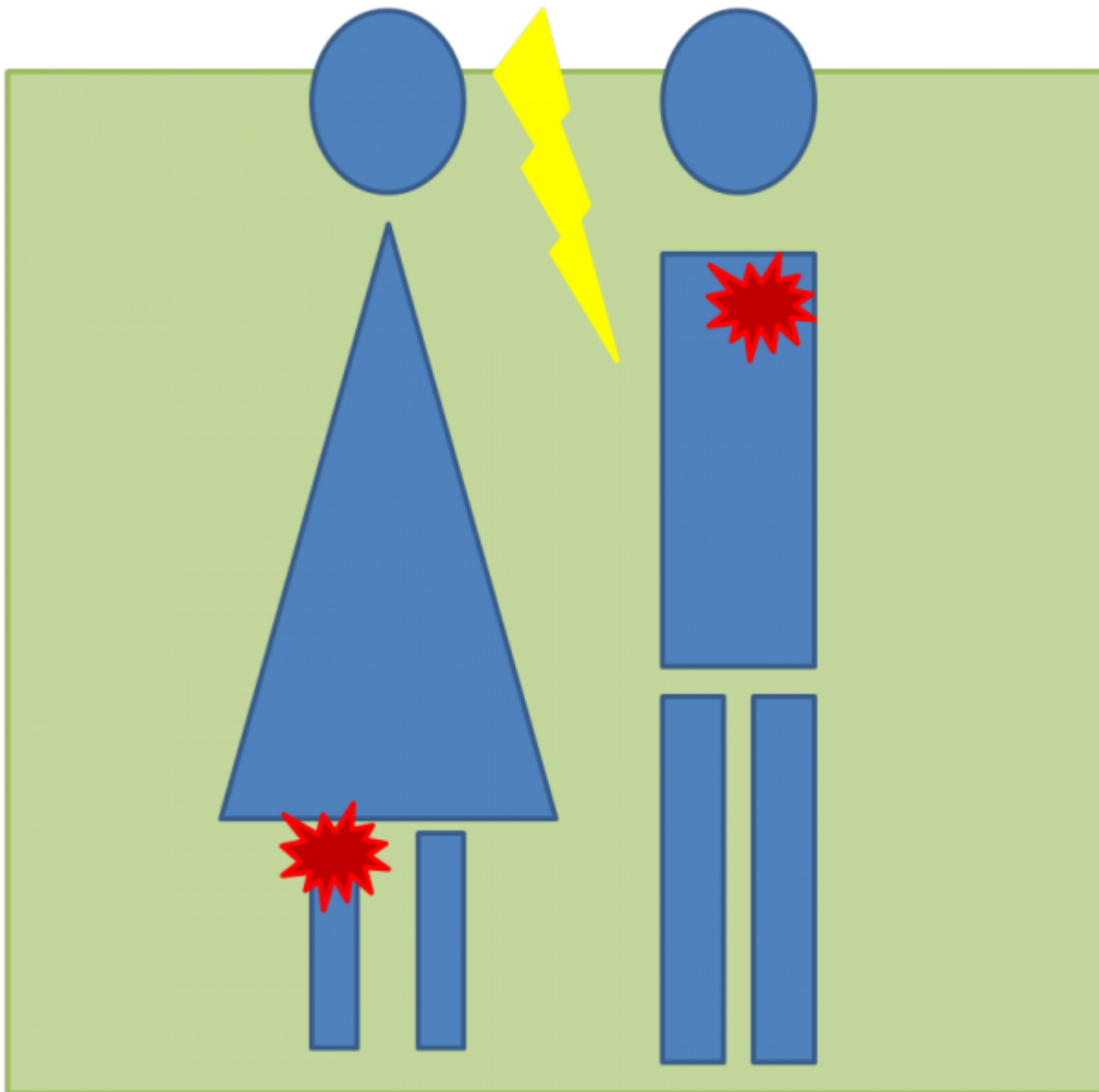
**Table 2: Health behavior of men and women in Germany [Source: GenderMed-Wiki, nach: DAK-Gesundheitsreport (2016)].**



Moreover, women and men differ in their assessments regarding health and illness. There also seems to exist a difference between the sexes with regards to the perception and interpretation of bodily functions. Also, male and female patients communicate differently and present or rather describe their symptoms in different ways (or fail to do so). Men, for instance, are more prone than women to deny health complaints (including psychological problems) or attempt to find their own solution. On the other hand, women outline their health problems earlier and more frequently. In addition, a sex difference seems to exist regarding problem mastery (health-related or otherwise). This results from differing conducts regarding the consultation and use of professional help. It remains unclear whether women “excessively” use health services (women cause higher health costs) or men use health services “insufficiently”.

Male and female patients express diverse needs regarding their medical care and treatment. For example, a 2010 study found that women with oncological disease are more concerned than men about waiting times, nurse behaviour, medical support and counselling, and continuity of care. They are more attentive to their disease status, undergo necessary examinations more frequently and are more willing to investigate potential oncological symptoms.<sup>[15]</sup> In addition, 15.5 million female, but only 3.5 million male insured persons in Germany use cancer screening services. The introduction of sex and gender-sensitive prevention programs seems urgently necessary to reach the target group of men. Among other things, the information on preventive medical care provided in doctor’s offices is proving problematic. The language and pictorial material used in the literature does not seem to appeal to men. In addition, men visit medical practitioners less frequently than women. There appears to be a need for other incentives to raise awareness in men of their health. Ultimately, practitioners in the health care system need to consider how women and men perceive, interpret and present physical complaints differently. Behaviour within the medical community can then be modified to ensure the necessary individualized treatment is provided.<sup>[16]</sup>

## Symptomatology



**Knee arthrosis - predominantly female? Cardiovascular disease - predominately male? Stereotypical classifications can prevent appropriate treatment. [Source: GenderMed Wiki (2016)]**

The female sex can be a risk factor for late or missed diagnosis of certain diseases.<sup>[17]</sup> For example, in women diagnoses of myocardial infarct<sup>[17]</sup> or HIV<sup>[18]</sup> are made at a much later stage than men. One reason for this is the assumption that these diseases are classified as "atypical" for women and symptoms are not immediately recognized. Myocardial infarcts seem to be predominantly characterized as a "male disease". It is not common knowledge that symptoms of a myocardial infarction can differ significantly between the sexes. While the classic symptoms occur in men (e.g. tightness in the chest and pain radiating down the arm), a myocardial infarction in women can manifest as a slow onset of nonspecific symptoms: Pain in the jaw and back as well as vasovagal complaints (sweating, nausea and shortness of breath) are common.<sup>[19]</sup> The inequality of chances for adequate cardiological treatment and intervention between men and women (women with an acute infarction are transferred to the hospital about 40 minutes later) is made clear in statistical data review of the cause of death: More women than men die as a result of cardiovascular disease, even though it is regarded as a classic "male disease".<sup>[20] [21]</sup>

AIDS is still often considered a disease affecting primarily homosexual men or drug addicts.



However, women make up more than 50 percent of AIDS patients. In contrast, stereotypical female diseases such as osteoporosis (often affecting postmenopausal women) are often overlooked in men and little research is done (for example, (young) women are often used as a reference group for bone density in older men).<sup>[22]</sup>

## Intervention and Rehabilitation

Women are still often treated according to medical guidelines based on research involving only male participants. A systematic integration of sex and gender has yet to be appropriately implemented. Based on the assumption that the results of health research are sex and gender-neutral, female laboratory animals are often excluded from the research process in an effort to reduce distortions based on hormonal differences (e.g. menstrual cycle). In everyday medical practice, such research designs are therefore flawed and can lead to consequences for female patients such as late or incorrect diagnosis, inadequate medication treatment or a high degree of psychological stress. The long-term effects thereof include unnecessary illnesses, rising health care costs and (in extreme cases) avoidable deaths.<sup>[23]</sup> Rehabilitation programs are beginning to offer more sex and gender-specific treatment options. For example, obese women avoid exercising with male participants and prefer same-sex sports. In general, men have less knowledge related to nutrition and health and therefore require a more fundamental and comprehensive approach to patient education than women. In addition, men tend to express themselves more openly and to a greater extent in psychological group therapies which are exclusively male as opposed to gender-mixed groups.<sup>[1]</sup>

## Sex differences in the brain

Both structural and functional sex differences can also be observed in the human brain.<sup>[24]</sup> The structural differences are observable both macro- and microscopically. For example, the male brain is about 15 percent larger and heavier than the female brain even after taking the differing body size into account. In addition, the male cortex displays in all four lobes a higher number and density of neurons and a larger cortical volume. Women, on the other hand, exhibit a higher cortical complexity. Structural differences in cortical substructures cannot always be replicated, for example in women the left-sided asymmetry of the temporal planum, which is associated with speech functions as part of the Wernicke area. It is also largely unclear to what extent potential structural sex differences are related to specific cognitive abilities. Nevertheless, the evidence suggests that functional differences do exist in the brain. Among other things, a higher level of interhemispheric interaction is presumed in women.<sup>[25]</sup>

In 2019, a US study published new findings on sex differences in brain metabolism.<sup>[26]</sup> Female brains, when classified according to their metabolism, appear to be not only younger than their actual age, but also younger than the brains of men of the same age group. These results could explain why in old age the memory of women, generally speaking, functions better than that of men. This however does not imply that men's brains age faster. Even as young adults, in terms of metabolism, men's brains appear three years "older" than those of women. This difference remains consistent throughout the lifespan.

# Sex and gender-sensitive research

The development of sex and gender-sensitive health care requires a rethinking of scientific-medical research. Currently, our medical knowledge is primarily based on the male organism (male subjects and male laboratory animals). For example, in 22 to 42 percent of physiological, neuroscientific and biological studies, the sex of the test animals is not apparent to the recipients.<sup>[27]</sup> Research on the male organism is primarily intended to avoid distortions due to hormonal differences.<sup>[28]</sup> For example, the female hormone level fluctuates during the menstrual cycle and can then interact with experimental results. Sex specific aspects also need to be increasingly investigated within cell research.<sup>[29] [30]</sup> In fact, cellular sex differences are not only due to hormonal causes. For example, female and male embryonic neurons exhibit differences in their stress response even before stimulation with sex hormones.<sup>[31]</sup>

The systematic exclusion of female organisms from scientific studies not only applies to fundamental research and drug studies, but to the entire spectrum of medical health care (aside from women-specific health aspects). As a result, inevitable negative consequences have occurred and continue to occur including misdiagnoses and incorrect drug dosing in women (based, among other things, on differences in pharmacokinetics and pharmacodynamics). Increased sex and gender-sensitive research on humans, animals and cells is therefore a necessity and an increasingly vital focus of science particularly through the advancement of individualised medicine. Methodological approaches must not only consider sex and gender separately, but also their interaction with one other.<sup>[32]</sup>

## External Links

- Datenbank Gendermedizin der Charité - Pilotprojekt "Geschlechterforschung in der Medizin"
- Stanford Edu: Gendered Innovations in Science, Health & Medicine, Engineering and Environment
- Deutsche Gesellschaft für Geschlechtsspezifische Medizin e.V. (DGesGM)
- Anna Fischer: Gender in Medicine
- EU-Büro des BMBF: Online-Trainingsmodule für gendersensible Gesundheitsforschung
- Österreichische Gesellschaft für geschlechterspezifische Medizin (ÖGGSM)

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[Click here to expand literature references.](#)

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