

## Pharmacy

Course: Pharmacy

Group of courses: Mathematics, Natural Sciences

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## Course objectives:

Students should be taught which sex/gender differences must be taken into account regarding health and disease and the effects of medications, and how these differences affect the prescription and use of medications. Women and men traditionally have different functions with regard to family health and also display differing health-related behaviour. Students should recognise these differences by direct comparing men and women, and evaluate them with regard to their causes and consequences. This also includes gender-differentiated treatment and advice for men and women in pharmacies.

## Teaching content/subject-specific gender studies content:

Differences in the effects of medications on men and women have both physiological and behavioural causes. Although the need for research in this area has been recognised, the current research situation does not allow final assessments of many of the open questions. We are aware, for example, that men and women often suffer from diseases with different frequency or in different life phases, whereby part of these effects is due to hormonal causes or at least influenced by hormones. However, the reasons for these differences have not yet been sufficiently explained, and often represent a combination of multiple causes.

The following issues and questions should therefore be covered in research and teaching:

### Physiological differences

- What influences do sex-specific differences of weight, volume, body surface area, fat distribution, muscle mass etc. have on the effects of medications and unwanted side effects?
- How different is the metabolism of medications or certain foodstuffs in men and women, and what conclusions can we draw for dosages?
- How can we explain men and women's differing ways of dealing with pain, and what are the consequences for diagnosis and therapy, for example of heart attacks?
- Do women and men react differently to the increase in toxic substances in the environment (e.g. in water and air)?

### Behavioural differences

- What influence does child-rearing have on role behaviour of girls and boys, and what are the consequences for the use of medications (e.g. attitudes and expectations towards medication-based therapy and resulting compliance)?
- How are ethnic and cultural differences between men and women associated with the subjects of health, disease and use of medication?
- Why, and with what consequences, do men and women use different strategies for coping with conflicts?

The consistent overmortality of men in middle age has led to diseases being taken more seriously in men than in women. As a consequence, cardiovascular disorders are diagnosed faster and more effectively in men and are treated with more modern (and often more expensive) methods and drugs. This results in women receiving less treatment for diabetes and cardiovascular disorders, for example. On the other hand, psychotropic drugs are over-prescribed to women especially working in the caring professions, as well as to housewives. Addictions to medication are also more common for women than for men.

The fact that women metabolise drugs more slowly than men and thus experience toxic effects faster has previously only been studied in detail for certain biologically active substances (e.g. alcohol). Future studies to establish dosage levels should therefore pay greater attention to the question of whether gender-specific differences are relevant in the metabolism of drugs and should be taken into account for dosages.

The "medicalisation of female biographies", often cited in feminist literature, is mainly manifested in above-average uses of tranquilisers, particularly benzodiazepines, by women, as well as in the discussion on hormone replacement therapy during and after the menopause. However, attempts to maintain or increase men's general and sexual performance through "anti-aging therapies" are equally questionable.

With regard to health-related behaviour, women are usually significantly more health-conscious than men and also visit health institutions more frequently. Participants in pharmacy-based studies regularly consist of approximately two-thirds women to one-third men. Women are also more open to preventative measures and often hold the function of the "caregiver" in the family. The implications of this also require research.

## **Integration of gender studies content into the curriculum:**

Gender in the sense of differences between men and women is typically relevant across the entire health sector and also in pharmacy. It affects nearly all scientific issues, however with varying relevance. For this reason gender-specific differences should primarily be mentioned where necessary and when they should result in a different treatment of men and women.

A particularly important subject across the discipline is that of "medications during pregnancy and breastfeeding", which is already integrated into pharmaceutical training.

A specific "gender module" is only suitable in areas that still have empirical deficits or basic need for discussion. This applies, for example, for the inclusion of women in clinical studies and the use of medicines during pregnancy and breastfeeding, which is of overarching importance and should also be taken into account in medical training.

A further gender specific subject area suitable for specific treatment is the use of hormones for contraception and as HRT. The methodological focus should always be on comparative risk/benefit analysis of different treatment options.

With regard to the valid regulations on medical registration for pharmacists, the following subject areas are particularly relevant for teaching gender-specific content:

- The physiological causes for sex-based differences in the effects of medications can be addressed during the first stage of the degree ("Basic Pharmaceutical Biology and Human Biology"). This also includes the differing frequencies of disease in men and women.
- Pharmacology and Toxicology should initially focus on the teratogenic effects of biologically active substances, and particular care to be taken in the use of drugs during pregnancy and breastfeeding. Additionally, sex-based differences in drug metabolism should be addressed, most of which can be explained by the differing amounts of cytochrome P 450 enzyme families.
- In Clinical Pharmacy, pharmacoepidemiology has the necessary methods in post-market observation to establish gender-specific differences in drug effects, discuss their causes and

evaluate the consequences. Students should therefore be taught the rules that pharmacoepidemiological study designs have to follow and the criteria used to assess findings. Providing gender and age are included as independent variables, prescription data such as that collected by the German health insurers should also be put to increasing use as a data basis, to uncover gender-specific differences in drug prescription. From the perspective of health-related gender studies, the establishment of a pharmacoepidemiological database should be supported.

- Research into the causes and consequences of differing drug use in men and women is far from established in German pharmacology due to the traditionally science-based training. However, it requires urgent methodological development and appropriate anchoring in teaching and research, as is the case with pharmacoepidemiology.

In general, there should be a close coordination of training in medicine and pharmacy regarding gender-related content.

## **Degree Stage:**

The above content should be integrated as described into initial and specialised stages of degrees, with a focus on the areas of Pharmacology, Clinical Pharmacy and Pharmacoepidemiology.

Master's degrees are ideally suited for greater depth of coverage, which is already possible (e.g. Master's in Health and Society International Gender Studies Berlin).

## **Basic Literature/Recommended Reading:**

- Kolip, Petra, Kuhlmann, Ellen 2005: Gender und Public Health. Grundlagentexte Gesundheitswissenschaften. Juventa
- Kolip, P. & Altgeld, T. (Hrsg.) (2005). Geschlechtergerechte Gesundheitsförderung und Prävention. Theoretische Grundlagen und Modelle guter Praxis. Weinheim: Juventa
- Kuhlmann, E. & Kolip, P. (2005). Gender und Public Health. Weinheim: Juventa
- Hurrelmann, K. & Kolip, P. (Hg.) (2002). Geschlecht, Gesundheit und Krankheit. Frauen und Männer im Vergleich. Bern: Huber
- Olbricht I: Was Frauen krank macht. 2002. Kösel
- Knopf H./Melchert H.-U.: Bundes- Gesundheitssurvey: Arzneimittelgebrauch. Konsumverhalten in Deutschland. Beiträge zur Gesundheitsberichterstattung. Berlin, Robert Koch-Institut, 2003
- Klauber J./Mühlbauer B./Schmacke N./Zawinell A.: Wechseljahre in der Hormontherapie. Wissenschaftliches Institut der AOK. Bonn, 2005
- 8. Glaeske H./Jahnsen K.: GEK-Arzneimittelreport, Bremen-Schwäbisch Gmünd, 2005

## **Journals:**

Journal of Public Health - Zeitschrift für Gesundheitswissenschaften

Forschung und Praxis der Prävention und Behandlung

Zeitschrift für Gerontologie und Geriatrie

Gesundheit und Gesellschaft

## Schriftenreihe zur Gesundheitsanalyse