



Factsheet Complementary and Integrative Medicine

Sex and gender differences

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Preliminary note: This factsheet summarizes the main conclusions from research about sex and gender differences in the use of complementary and integrative medicine, provides examples, and concluding thoughts on the significance for clinical practice.

Slide numbers refer to the corresponding slideset.



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Sex and gender differences in complementary and integrative medicine

1 Definitions

1.1 Complementary and integrative medicine

Systems, therapies and products that are not generally considered part of conventional biomedicine are often summarized under the terms alternative, complementary or integrative medicine (slide 2). Examples for traditional whole medical systems are Chinese medicine (incl. acupuncture, herbs) or Ayurveda (incl. yoga, herbs, diet). Therapies include, for example, osteopathy and mindfulness techniques; and products, i.e. herbal medicines and dietary supplements. The different terms describe more the way how the therapies and products are used.

If a practice, therapy, or product is used instead of conventional approaches, it is often defined as "alternative medicine." If a practice, therapy, or product is used in addition to conventional biomedical care, it is often defined as "complementary medicine".

Evidence-based practices, therapies, or products that are used in addition to conventional biomedical care, are usually defined as "integrative medicine". These kinds of approaches are often integrated in conventional healthcare organizations.

We use "complementary and integrative medicine" as an umbrella term in this factsheet.

1.2 Sex and gender

In this factsheet, the two concepts of sex and gender are used together and refer to the biological sex and different gender identities (non-binary, queer, female, male and any other individual identifications). In the text, the terms "women" is used to refer to both, female sex and gender identity, and the term "man" to male sex and gender identity unless we explicitly state otherwise.

2 Context

Complementary and integrative medicine systems, therapies and products differ significantly depending on countries, regions, cultures and societies.

To date, differences in sex and gender in complementary and integrative medicine have been predominantly researched related to the topics of "use" and "views" of complementary and integrative medicine, and scarcely related to physiological correlations (1-8).

Complementary and integrative medicine is often used by people (all sex and gender) with chronic conditions such as cancer or pain (2, 3, 8, 9).

3 Use of complementary and integrative medicine

3.1 Sex and gender differences in the use of complementary and integrative medicine

Well-educated young to middle-aged women are frequently reported as predominant users of complementary and integrative medicine (1-3, 8-10), but detailed data or statistical analyses about sex and gender differences are rarely published in overviews, such as systematic and narrative reviews.

A literature review of complementary and alternative medicine prevalence in the European Union by Eardly and colleagues of 2012 reported that 86% of the 87 studies reviewed reported gender as demographic information, but no further statistical analyses about sex and gender differences was published (9).

A large repeated national survey in the United States of 2002, 2007, and 2012 (combined data from 88,962 adults) found that women were more likely to use various complementary and integrative medicine therapies than men (11).

A comparative total population health survey in central Norway between 1995-1997 researched profiles of adult people (n= 54 448) visiting only a general practitioner, those visiting only a practitioner of complementary and alternative medicine, and those visiting both (12) (slide 4). Very few visited only complementary and alternative medicine practitioners, but men were found significantly more likely to do this than women. More women than men were general practitioner-only user (12). Women were found significantly more likely to visit both (general practitioners and complementary and alternative medicine practitioners) than men (12).

These results were confirmed in a similar later survey in Norway in 2016 (8).

A narrative review on demographic characteristics and health factors associated with complementary and integrative medicine use by Bishop and Lewith of 2010 is also in line with these results (10). In addition, they concluded, "that while women are more likely than men to use any form of health care, this tendency might be amplified when considering complementary and integrative medicine use" (10).

In Switzerland, based on data from the Swiss Health Survey of 2012, complementary and integrative medicine is used more than twice as often by women than by men (46% vs. 20%, OR 2.560) (7) (slide 3).

The sex and gender identity ratio of the complementary and integrative medicine providers seems to reflect the one of the users with more women being practitioners than men (5).

A national web survey in Switzerland from 2017 with 3638 complementary and integrative medicine providers confirmed women (85.5% vs. men: 17.5%) as predominant non-medical practitioners (13) (slide 3).

3.2 Sex and gender differences in the use of complementary and integrative medicine related to specific conditions (examples: cancer and pain)

To date, researchers did not find a difference in reasons for complementary and integrative medicine use between the general population and populations with specific conditions, but confirm female sex and gender as the predominant complementary and integrative medicine users also in condition specific populations (1).

3.2.1 Cancer

Cancer is the most researched condition relating to sex and gender differences in the use of complementary and integrative medicine (1, 6).

Female sex and gender were identified as the most common demographic predictor of complementary and integrative medicine use in cancer patients in a systematic review by Keene and colleagues in 2019 (6) (slide 5). Additional demographic predictors were in descending order: higher education, younger age, higher income, and previous use of complementary and integrative medicine (6) (slide 5).

Keene and colleagues concluded that being female as the most common demographic predictor of complementary and integrative medicine use in cancer patients could be explained based on two reasons: First, that women in general use health care more often than men. Second, that "women may also be more likely to discuss their health and their diagnosis with friends and family, who have been observed to be common sources of information on complementary and integrative medicine" (6).

A cross-sectional survey among 969 North American cancer patients in 2010 to 2011 investigated if attitudes and beliefs regarding complementary and alternative medicine impact its use among patients with cancer (14). Female sex was associated with a significantly greater expected benefit from complementary and integrative medicine (14).

3.2.2 Chronic Pain

Here, we report example studies on gender differences in the use of complementary and integrative medicine related to chronic back pain, knee osteoarthritis, and rheumatoid arthritis.

A systematic review of complementary and alternative medicine use for back pain of 2015 concluded, that female sex and gender is an important predictor for complementary and integrative medicine use in back pain patients (15).

A North American secondary analyses from 2014 investigated how gender-specific aspects correlate with complementary and alternative medicine use in persons (n=2,679) with radiographically confirmed knee osteoarthritis (16) (slide 6). The authors found that women were more likely to use complementary and integrative medicine alone than men, and twice as likely to use complementary and integrative medicine in combination with conventional medications (16). In addition, women were more likely than men to use mind-body interventions (14.1% vs. 5.7%), topical agents (16.1% vs. 9.5%), and concurrent complementary and integrative medicine strategies (18.0% vs. 9.9%) (16). "Higher quality of life measures and physical function indices in women were inversely associated with any therapy, and higher pain scores were positively associated with conventional medication use" (16). History of hip replacement correlated strongly with

conventional medication use in women, but not in men (16).

In a secondary analysis of cross-sectional data, race and Gender variations in complementary and alternative medicine use for knee osteoarthritis in 517 North American patients were investigated (17). After adjusting for demographic and clinical factors, women were about twice as likely as men to use herbs (OR: 2.42); mind body techniques (yoga, tai chi, or pilates) (OR: 2.09); acupuncture, acupressure, or massage therapy (OR: 2.45); and spiritual activities (OR: 1.68) (17).

In 2014, data was analyzed from the National Institute of Arthritis, Musculoskeletal, and Skin Diseases-funded Consortium for the Longitudinal Evaluation of African Americans with Early Rheumatoid Arthritis (CLEAR) Registry (18). The authors reported significant differences between men and women with regards to the following specific variables: educational level, marital status, smoking, alcohol use, and obesity (18). In addition, women were significantly more likely to use various complementary and integrative medicine activities for rheumatoid arthritis treatment than men. Furthermore, women tended to use heat treatments more likely than men (OR 1.8). With regards to the choice of complementary and integrative medicine providers, women were less likely to consult a chiropractor than men (OR 0.6) (18).

3.3 Sex and gender differences in the use of selected complementary and integrative medicine therapies

In the European Union, predominant complementary and integrative medicine therapies used, independent of specific conditions and indications, are: herbal medicine, homeopathy, manual therapies (i.e. chiropractic, osteopathy), acupuncture, and reflexology (9).

Table 1 displays research examples for sex and gender differences in the use of specific complementary and integrative medicine therapies (19-23) (slide 7).

To summarize, similar to the general use, women tend to use specific complementary and integrative medicine therapies more often than men (19-23). Similar results were reported from a National Health Survey in 2019 in Brazil (24) and from a National Health Survey in 2012 in Switzerland (7).

Table 1: Sex- and genderspecific differences in the use of different complementary and integrative therapies (independent of disease).

Therapy	Sex-/Genderspecific use: Difference in women as compared to men*	Country
Acupuncture	Higher usage	UK (19)
Homoeopathy	Higher usage	D (20)
Osteopathy	Comparable usage	UK (19)
Phytotherapy	Higher usage	UK (19)
	Comparable usage	D (21)
Relaxation techniques	Considerably higher usage	UK (19)
Aromatherapy	Considerably higher usage	UK (19)
Nutritional supplement	Comparable usage	D (23)

* Sex- and genderspecific use was classified using documented differences in prevalence: Comparable usage in both Sex/Gender (<10% difference); higher usage in women than men (10 – 25% difference); considerable higher usage in women than men (>25% difference)

4 Sex and gender differences in effectiveness, safety and adherence to complementary and integrative medicine

Sex and gender differences regarding effectiveness, safety and adherence to complementary and integrative medicine are rarely reported. In this chapter, we report some example studies.

Several large German randomized studies in usual care settings with chronic pain patients showed that women benefit more than men from an acupuncture treatment (25) (slide 8). A secondary data analyses compared patients' and physicians' safety reporting using data from those large acupuncture trials on osteoarthritis of the hip or knee, chronic neck pain, chronic low back pain, chronic headache, dysmenorrhea, or allergic rhinitis or asthma (n= 44,818) (26) (slide 8). Female patients reported adverse reactions about twice often than male patients (OR 1.96) (26).

A Swiss prospective observational study evaluated the feasibility of a mindfulness and relaxation app for cancer patients (27) (slide 8). The researchers found that female sex and gender was one of the four significant predictors for better adherence to use the app continuously over a ten weeks' time (27).

5 Sex and gender differences in the reasons for the use, interest, and knowledge of complementary and integrative medicine

The reasons for sex and gender differences in the use of complementary and integrative medicine cannot be pinned down to a specific cause, but they are frequently related to the topics of knowledge, health consciousness, openness, interest, expectations, and views on complementary and integrative medicine in the respective scientific publications (4, 5).

In a literature review, followed by a thematic analysis in 2014, Keshet and Simchai researched why women are more likely than men to use complementary and integrative medicine, and if this has an impact on gender concepts and power relations in medicine and healthcare (5). Keshet and Simchai concluded, that “gender differences in the use of complementary and integrative medicine reflect gendered patterns of health behavior in general” as women seem to “engage in health issues, seek help from healthcare professionals, and visit physicians more frequently than men” also in complementary and integrative medicine (5). Based on their literature review, Keshet and Simchai discussed, that despite the “realm” of complementary and integrative medicine challenges “power relations and Gender inequalities in healthcare”, “gendered social change” still remains limited, because of “lack of political support, legitimacy, and a solid institutional base, and its use by predominantly white middle- and upper-class women” (5).

In a qualitative interview study with 44 English, white, middle class participants from 2011, Sointu investigated gendered identities in the use and discourse about complementary and integrative medicine (4). Sointu concluded that female users and providers engaged in complementary and integrative medicine adopt a concept of “culturally prevalent ideals of self-fulfilling, authentic, unique and self-responsible subjectivity”, whereas men tend to adhere to “traditional ideas of other-directed and caring femininity” often related to a traditional concept of “hegemonic masculinity” (4).

In the course of a multicenter, cluster-randomized trial about effects of training oncology physicians advising patients on complementary and integrative therapies,

patients were asked to answer three knowledge-testing questions about complementary and integrative therapies for cancer patients (28). On average, 81.3% of women, and 66.4% of men answered the questions correctly (28) (slide 9).

6 Significance for clinical practice

Health professionals can be mindful on two different levels relating to sex and gender differences in complementary and integrative medicine:

- 1) Supporting the predominant users of complementary and integrative medicine – well-educated young to middle-aged women with a chronic condition – in an evidence-informed shared decision making about complementary and integrative medicine therapy options
- 2) Informing the other populations – people of older age, men, and people with a non-binary, queer, or individual gender identification – about effectiveness and safety of complementary and integrative medicine therapy options for their condition

“Information” and “accessibility” are two key terms for clinical practice.

Patients wish easy accessible information about complementary and integrative medicine (29). Structured evidence-based advice on complementary and integrative medicine supports patients in health decision making (28). Both medical and non-medical complementary and integrative medicine practitioners have gatekeeper roles if it comes to the use of complementary and integrative medicine within the healthcare systems (29).

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