

Tools for Gender Mainstreaming in Health and Social-Health Research

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Presentation

In 2022, a group of professors, concerned about the lack of inclusion of the gender perspective in the research we were generating in our Faculty of Health Sciences at the University of La Rioja, decided to develop a tool, in the form of an “activity-book”, which would allow us to improve the quality of our research activity. This tool aims to share with the teaching and research community, in a simple and practical way, the key ideas on sex- and gender-based analysis in research. Our goal is to improve our ability to:

- differentiate and define sex and gender in health research;
- explore hypotheses about sex and gender differences in health problems, their prevention or treatment;
- integrate sex and gender in their research designs, methods and analyses, as well as in the interpretation and/or dissemination of results, where appropriate;
- assess a research protocol or publication in terms of the integration or omission of sex and/or gender.

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“Failing to account to for the differences in the way men and women experience common diseases and respond to therapies can result in inappropriate treatment and poorer quality of care”

Dr. Cheryl Carcel, *The George Institute for Global Health*

Prologue

As a professional trained in gender equality in health, I feel especially proud that we can count on such an exceptional group of professionals and researchers as those who have collaborated in this work. All of them ensure the high quality of the tools they offer us to facilitate the implementation of the gender perspective in a practical way in our research work, both in the health and social-health fields. Congratulations to the coordinators of this work, Dr. Regina Ruiz de Viñaspre Hernández and Dr. Iván Santolalla Arnedo, for the selection of professionals who have participated, all of them of outstanding reputation and experience, such as Dr. Raúl Juárez Vela, Ms. Teresa Sufrate Sorzano, Ms. Beatriz Angulo Nalda, Ms. María Elena Garrote Cámara, Dr. Ángela Durante, Mr. Nicolás Alonso Llorente and Dr. Remedios Álvarez Terán.

The inclusion of sex and especially the gender perspective, as a social determinant of health, in our research work requires a change in the “programmed” or “stereotyped” mentality of the conventional cultural and research context, but only in this way can we reach a new goal in which inclusivity is a reality.

One of the first advances in research studies was the realisation of the importance of including sex as a basic variable in biomedical research studies, either to include the whole population equally or to take into account the difference in outcomes and how it influences health. However, this incorporation has its limitations, and the obtained results were partial or incomplete. Therefore, the next desirable and essential step, and what this work advocates, is the incorporation of the gender perspective in all research related to the health and social-health environment. The availability of rigorous disaggregated information makes it possible to lay the foundations for the construction of gender indicators in health, since women and men do not always share the same risk factors or protective factors for health. The integration of the gender perspective in our research work, with the consideration not only of the biological differences between the sexes, but also the social functions and the family and work conditioning factors that they play,

will allow us to achieve equity in health and, therefore, to provide more objectifiable, real, and higher quality health care.

This work also highlights the fundamental basis of all research, which is the language with which we transmit it. It is crucial to have a special awareness and use of inclusive language as opposed to the habitual use of traditional sexist language. This task will be easier if we follow the practical linguistic tools that the authors propose.

Finally, I would like to congratulate the authors who have created this practical handbook of tools for the inclusion of the gender perspective in research, which will help both newcomers and more experienced researchers to improve their level of investigative skills and to gain a broader perspective on the subject.

Ruth Coteló Sáenz

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Abbreviations

AMI: Acute Myocardial Infarction

COPD: Chronic Obstructive Pulmonary Disease

EASE: European Association of Scientific Editors

GPC: Gender Policy Committee

ICMJE: International Committee of Medical Journal Editors

NHS: National Health System

PI: Primary Investigator

SAGER: Sex And Gender Equity in Research

UN: United Nations.

WHO: World Health Organization.

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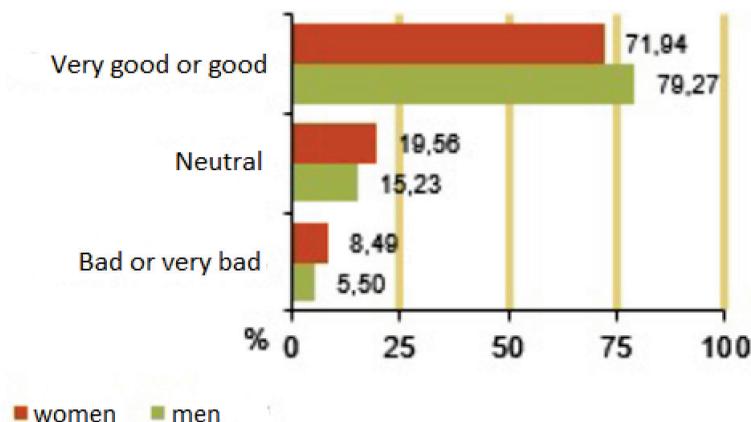
Chapter 1

THE IMPACT OF SEX AND GENDER ON HUMAN HEALTH

Ángela Durante, Remedios Álvarez Terán,
Regina Ruiz de Viñaspre Hernández,
Iván Santolalla Arnedo

Scientific evidence clearly shows the important differences that exist in the morbidity and mortality of men and women. Did you know that, in Spain, women have a longer life expectancy than men, but report a worse perception of their state of health, or that women report chronic health problems more frequently and that these are different from those suffered by men?

Figure 1. Assessment of Perceived Health Status. 2020. Population Aged 15 and Over.



Source. European Health Survey Spain 2020. INE-MSCBS.

Do we know in depth the causes of these disparities, and are we clear about why they occur? The answer is NO. Research and reports on the differences in the way disease manifests itself in men and women, the greater susceptibility to one or the other disease or how we respond to different drugs and therapies are still insufficient.

Let's think about it some more: would it be reasonable to test the efficacy of drugs against prostate cancer only on female cell samples, to design campaigns against alcoholism only for women, or to test the effect of a psychotropic drugs only on men? Clearly, it would not be so. However, this serious error (sex and gender bias) that does not take into account the differences between men and women, or that assumes “a priori” unproven differences, has been constant since the beginning of biomedical scientific research and still persists in a substantial part of current research. Not striving to minimise this bias or to eradicate it is of transcendental importance for people's health, because biomedical research provides the body of scientific knowledge that underpins so-called “evidence-based medicine” and justifies the health policies that decide which healthcare problems are important and how to address them. In this way, the bias introduced in research is translated into clinical practice and health policy.

Men, women, girls and boys are similar in many ways, but when it comes to our health and well-being, our differences matter. Every cell is sexed and every person is gendered. Sex and gender influence our health. The more we understand how sex and gender affect health, the more we can improve everyone's health and well-being.

Sex and gender analysis in research matters because:

1. It offers the opportunity to explore similarities and differences in the epidemiology of diseases and in people's response to different therapies.
2. It avoids or minimises the possibility of harm to people excluded from the research. The obtained results are only applicable to the included population.
3. It creates the conditions for finding differences between people that help to better tailor therapeutic options or health

interventions for women and men, boys and girls, and gender-diverse people.

4. It improves the reproducibility and efficiency of research. When the sex of cells, tissues, animals or humans is not explicitly recorded and reported in publications, it is difficult to reproduce research under the same conditions. When sex and gender are not explicitly taken into account in the design, analysis, publication and implementation plans of knowledge, this can lead to a lack of efficiency.

1.1. Male standardisation of health parameters

Women have for many years been excluded from scientific research. The reasons for researchers' preference to study male specimens in preclinical research or to study only males in clinical research were based on several erroneous assumptions:

- Biological parameters in female mammals are less stable than in males.
- Women had to be excluded from trials to “protect” them from infertility or avoid a likely harm in pregnancy.
- Results obtained in males can also be generalised to females.

Evidence has shown that for any given endpoint the variability is no greater in women than in men, that studying just men not only does not protect women but endangers their health, and that results observed in men cannot be generalised to women and vice versa.

Dr. Kibbe's story illustrates the effect of sex bias in research: when Dr. Kibbe found that the cardiovascular therapy she was studying showed promising results, she discussed it with a colleague. “That's interesting,” her colleague replied, but, “Are there differences in the results for men and women?” She could not answer. As was usual in her field, she had conducted her research only on male rats.

Afterwards, the same colleague received funding to repeat the study in female rats, and found that the cardiovascular therapy studied showed good results only in male rats but had the opposite effect in female rats.

Dr Kibbe herself later verified these results. Aware of the bias she herself had introduced into her research, she is now leading the fight against sex bias in research in the United States.

In 1993, a law was issued that required US researchers to include women in research projects, to include women and men in clinical trials based on disease prevalence, and to provide data on treatment efficacy for each sex. In 2015, to address the underrepresentation of women in biomedical research, the National Institutes of Health (NIH) published a report entitled “Consideration of Sex as a Biological Variable in NIH-funded Research” for applicants for funding to try to explain the potential effect of sex, included as a biological variable, in their studies.

Activities Chapter 1

1. Read this story and analyse the causes of the differences between women and men.

Ana and Juan live in the same city and are both 55 years old. When they wake up, they feel pain in their chest. Juan is a smoker and has a family history of AMI, his father died 3 years ago of AMI and he fears it could happen to him, so he decides to go straight to the hospital emergency room, where he is admitted for tests. Ana does not go to the emergency room, she considers that she is not in poor health in general, although lately she has been feeling more stressed, more tired and her stomach discomfort has increased. She takes her medication for heartburn and as the pain does not go away, she decides to make a telephone appointment with her family doctor. In the conversation with her doctor, Ana emphasises her stress and gastric discomfort, the doctor prescribes a mild anxiolytic and suggests a face-to-face appointment for the following day. In the afternoon, she collapses and is rushed to hospital. Ana and Juan receive their diagnoses. Both have suffered an AMI.

2. See the literature review on Acute Myocardial Infarction in Women (Mehta et al., 2016) which helps to answer the following questions:
 - Describe the differences in the behaviour of the protagonists of our story, Ana and Juan, in the face of the illness and of the health professionals they consult. Which can be attributed to the sex/gender binomial and why.

- The role of lifestyles, in terms of consumption of toxic substances and their influence on the onset of premature infarction, seems to be a determining factor. Are there differences in the prevalence of smoking, AHT, dyslipidaemia, diabetes, obesity, between women and men? Describe them.

- In the proposed review, when they performed the analysis of ethnic differences, they found that black, Hispanic, and American Indian women arrived later at the hospital, received less reperfusion therapy and less revascularisation surgery than men and white women, as well as less secondary prevention efforts, and less adherence to post-discharge treatment. What has the inclusion of “cross-sectional” contributed to this study?

Chapter 2

SEX- AND GENDER-BASED ANALYSIS (SGBA) IN RESEARCH

Teresa Súfrate Sorzano, Regina Ruiz de Viñaspre Hernández,
María Elena Garrote Cámara, Ana Cobos Rincón

For the integration of SGBA, researchers must be able to:

- Distinguish and define sex and gender in health research.
- Identify sex and gender differences in disease pathophysiology, magnitude or treatment.
- Identify methods for integrating sex and gender variables in health research contexts.
- Assess a research protocol or publication in terms of the integration or omission of sex and/or gender.

2.1. The Inclusion of the Variable “Sex” in Research

The study of both sexes should be a guiding principle of biomedical research. Failure to consider sex as a biological variable can undermine the rigour, transparency, and generalisability of research results.

The results of mostly single-sex research, along with those of many other studies that have not reported the sex of animals, cells or tissues used in human health research, have contributed to an uncertain and ambiguous evidence base about the influences of sex on biology and health. Some researchers still assume that fundamental biology includes only those molecular, biochemical, and physiological characteristics that are shared, or the same, between women and men. However, it is increasingly clear that fundamental biology encompasses said characteristics but also others that are manifestly different. Sexual dimorphism is already present at the cellular level and sexual

differences affect every organ and system in the body and are therefore relevant to most human diseases. The scientific community is beginning to realise that differences between men and women go beyond differences in the reproductive system and that sex is a basic variable in biomedical research.

The specificity of men and women in terms of health and illness only becomes clear if the analysis is done separately by sex and the causes of these differences are investigated.

Although gender bias in biomedical research has been more detrimental to women (Lee, 2018), men are also affected by sex bias when they are not taken into account when studying diseases considered primarily female. Osteoporosis is four times more common in women, but it also affects men, and some research shows that men tend to have more complications related to the disease. Most animal models have used females, so the mechanisms of the disease in males are less well understood and the drugs studied are less effective.

2.2. How to Minimise Sex Bias in Biomedical Research

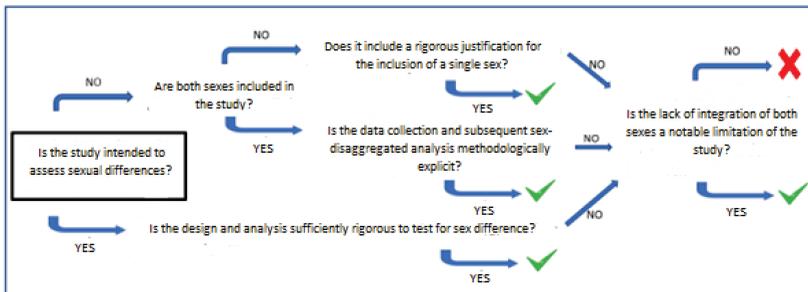
In biomedical research, the sex variable refers to the biological attributes of cells, tissues, animals, and humans. Many cell types such as stem cells, immune cells, heart and lung cells, brain and muscle cells show sex differences and therefore the inclusion of this variable in studies on them is necessary.

The term “sex” should be used as a classification of male or female based on biological distinction (biological variable). In other disciplines, such as testing of technological devices, it should be explained whether they are applied or used on males and females and whether they have been tested considering the sex of the user.

That said, there are some cases in which sex may not be relevant. For example, the study of the structural or molecular biology of proteins, carbohydrates, or lipids; the study of pathogens cultured *in vitro* in an

acellular environment; or in the preclinical design and application of some biomedical technologies. However, those who exclude sex from research design must always provide a compelling justification.

Figure 2. Assessment of sex bias in studies involving vertebrate animals or humans.



Source: Reviewer Guidance to Evaluate Sex as a Biological Variable (SABV). Available at https://grants.nih.gov/grants/peer/guidelines_general/SABV_Decision_Tree_for_Reviewers.pdf

Where sex difference analysis is appropriate, it should:

- Base research on scientific evidence about sex differences and their mechanisms in the field of study.
- Integrate sex as a biological variable of cells, tissues, animals, or humans.
- Recruit cells, tissues, animals or humans of both sexes for the study of diseases affecting women and men.
- Report and analyse the sex of cells, tissues, animals, or humans.
- Design experiments that disaggregate results by sex.

Research lacks inclusion of sex analysis or is weak when:

- It does not provide a compelling rationale for the study of a single sex. It ignores sex differences shown in the scientific literature or does not rely on published data on them.

- Does not report the sex of cells, tissues, animals or humans.
- Does not describe how sex will be accounted for and considered in the analysis plan.
- Does not provide all results disaggregated by sex.
- Merges and/or confuses the terms sex and gender.

2.3. The Inclusion of a Gender Perspective in Human Health Research

There is ample and robust evidence that biological and social differences between women, men, girls, boys, and gender-diverse people contribute to observed differences in health. The risk of developing certain diseases, the response to medical treatment, and the frequency with which we seek health care are just a few examples of the many aspects of our health status that have been shown to differ along sex/gender lines. Sex and gender shape us inside and out, from our cells to our social behaviour. Therefore, including sex-gender analysis in health research has the potential to make the science more rigorous, replicable, and applicable to all.

Gender is a construct that each society elaborates about what it is to be a man or a woman in that society.

Four components of the construct “gender” have been established:

- Gender role: represents the norms of behaviour that society considers more acceptable or reprehensible for men and those that are so for women. In all countries of the world, the norms for men and women are different. If a society criminalises male frailty, men are less likely to admit to sadness, anxiety or depression and more likely to engage in risky health behaviours.
- Gender identity: describes how we define ourselves on a feminine/masculine continuum. Gender identity affects our feelings and behaviours. When gender identity is manifestly different from sexual appearance, it can create situations of

discrimination or belittling that increase people's vulnerability to disease.

- Gender relations: this refers to how we interact with other people. In societies with highly hierarchical gender relations, women may feel more inhibited to discuss men's judgements about their health or to endure violence or sexual harassment.
- Structural gender: Reflects the distribution of power between men and women in political, educational, and social institutions. The institutionalised aspect of gender also shapes the social norms that define, reproduce, and often justify different expectations and opportunities for women and men. Around the world, women earn less than men, are more likely to be engaged in low-productivity activities and to work in the informal sector. In Spain, a large number of women working as assistants and carers fall outside the protection conferred by the workers' statute, with no right to occupational health, sick leave, or unemployment.

The integration of the variable “sex” (or biological variables related to sex) has been better understood by researchers, but the integration of “gender” creates more difficulties. While in the social sciences the concept of “gender” has been taken up by research for decades, in health it has only recently been incorporated into the language. Gender is not a biological variable. Its inclusion as a social variable, a social determinant of health or a unit of analysis, composed of several psychosocial variables that try to apprehend different aspects of the concept of gender, is a challenge for researchers, which forces them to devise or rethink their study design strategies.

Disaggregation of data by sex does not in itself imply that the study incorporates a gender perspective, but it is an essential step.

2.4. When Should Sex/Gender Analysis Be Included in Research?

Both sex and gender should be considered whenever possible in human studies and human health databases. Sex and gender are strongly linked and can be difficult to separate, but they are different notions, and it is important not to confuse them or use them as synonyms.

Only people have gender and therefore their study is not applicable in biomedical research that uses only cells, tissues, and animals. There are some types of research where gender may not be relevant: some clinical studies of disease processes and treatments, for example, certain single-sex studies using existing data sets; or secondary data analyses where it is impossible to create a gendered variable or unit of analysis. Where research does not integrate gender analysis it should justify why it is not possible or relevant to do so.

Activities Chapter 2

Questions on the appropriate use of sex and gender.

1. Select only the sentence that uses the terms sex or gender **correctly**:
 - a. Differences in healthy behaviours of men and women is probably an example of sex differences.
 - b. Gender differences exist in the association between the type of mice injected with human leukocyte antigen (HLA) and gut microbiota.
 - c. In patients with HIV, viral loads vary according to the gender of the patients.
 - d. Sex is an important determinant of hormone levels in vertebrates.

2. Which of the following sentences defines or uses the terms sex or gender **incorrectly**?
 - a. The term sex can be used to refer to gene expression and reproductive/sexual anatomy in humans.
 - b. A review of genome-wide association studies shows a specific lack of sex analysis: only 33% of published studies included the X chromosome.
 - c. The term sex could be applied to experimental material obtained from animals.
 - d. There is no difference in mortality observed between female and male mice in a malaria infection model, therefore, it is concluded that gender does not play a role in determining susceptibility to *P. falciparum*.

3. Which of the following definitions of gender is **incorrect** in a health research context?
- a. Gender roles are social norms of behaviour attributed to men and women.
 - b. Gender identity refers to how an individual sees him/herself as male or female or on a continuum of male/female.
 - c. Gender orientation indicates whether an individual is sexually attracted to a person of the same or opposite sex.
 - d. The term transgender is used to describe individuals whose gender identity differs from the sex they were assigned at birth.

Chapter 3

PROPOSAL FOR INTEGRATING SEX/GENDER ANALYSIS INTO RESEARCH STUDIES

Regina Ruiz de Viñaspre Hernandez, Iván Santolalla Arnedo,
Teresa Súfrate Sorzano, Ignacio Larráyoiz Roldán

It is necessary to familiarise oneself beforehand with the literature that already includes sex/gender analysis in relation to the research topic. This includes knowing what other research in your field has found about sex and gender, and how they measure and take sex and gender into account in their methods of analysis and research design.

3.1. Literature Review

Whenever the topic of study affects people's health, we should try to find out what is known about the influence of sex and gender on that health problem. This entails:

- A clear statement of the known epidemiological differences in relation to the sex/gender of individuals.
- A description of the known mechanisms that explain the impact of sex or gender differences in the research area under study.
- An explicit statement of the lack of knowledge about the differences between men and women or about the mechanisms that explain them when there is a lack of scientific evidence in this respect.

3.2. Hypotheses, Research Questions and Objectives

It is important to ask what differences/similarities there may be between men and women, to formulate hypotheses that allow us to include

sex/gender as a factor, and to establish objectives that help us to verify or refute said hypotheses.

Hypothesis recommendations:

- Include hypotheses that address possible differences and similarities between women and men.
- If the hypotheses refer to only one sex, clearly indicate and justify the decision. And in any case, generalise only to the sex included in the hypotheses.
- Include hypotheses that take into account, on the one hand, the diversity of situations and experiences of women and men and, on the other hand, the possible influence of social, economic, and cultural factors.

Recommendations regarding the research question. A clear articulation of the type of research question being considered with respect to sex and/or gender (some examples):

- Identify sex and/or gender differences.
- Explain sex and/or gender differences.
- Establish sex similarities in the problem under study.
- Study sex/gender as a confounding factor or an interaction variable while testing the main hypothesis of the study.

3.3. Study Design and Methods

Consider sex and gender when deciding on the study design, study population, recruitment of participants, and selection of study variables and questionnaires.

- **Research type** (quantitative, qualitative or mixed methods) most relevant to answering the research question.
- **Sample size:** Testing interactions requires larger sample sizes that allow for sex-stratified analysis. The calculation of sample

power and size should always be determined a priori and take into account the designed sex-gender analysis.

- **Inclusion and exclusion criteria** that consider sex/gender and a diverse population of men and women/boys and girls. In biomedical studies involving experimental animals, tissues or cells: identification of the sex of the cells, tissues or animals used, if applicable.
- **Description of the recruitment method** to include equal numbers of male and female participants for translational research or scientifically sound rationale for proposing a single-sex study, if applicable.
- **Description of variables** or unit of analysis (set of variables related to sex or gender).
 - Sex is a biological variable or set of biological variables, and where possible, the sex of those being studied should be confirmed. It should be reported in the methods section whether the sex of those participating was defined by self-report or assigned to them after external or internal examination of body characteristics, or by genetic testing or other means.
 - A two-step method of asking about sex and gender in which participants are asked to identify their biological sex (indicated on their original birth certificate) as well as their current gender identity may be valid.
- **Data collection:** the way data on exposure and outcome variables are collected may also be gender sensitive. For example, men are less likely to respond to self-reported interviews on family. Conversely, when querying data on workers' compensation for occupational accidents, female workers may be less likely than male workers to file a claim for compensation and/or to have it accepted after an occupational accident. For body mass index calculations, men are more likely to overestimate their height and women are more likely to underestimate their weight.

- Use questionnaires that are validated on men and women, are not gender-biased and are sensitive and responsive to sex/gender issues. Men and women can answer the same survey question in different ways, introducing systematic gender into the available data.
- In qualitative research, sex/gender interactions can affect the dynamics of interviews and the type of information obtained. On the other hand, a plan for analysing the issues addressed in the interview could include interpretation through a gender perspective, i.e., research on risk behaviours (drug use, violent or life-threatening behaviours) could consider the male gender perspective, especially for the investigation of phrases, themes or images consistent with the dominant concept of masculinity, according to the situation and the cultural context.

3.4. Data Analysis

3.4.1. Methods for the Analysis of the Sex Variable

The Health Canada Institute and other regulatory agencies such as the US Food and Drug Administration recommend that a pre-specified plan for assessing sex differences be documented and implemented once the overall effect of a treatment has been shown to be significant. This is extremely important, as drugs such as aspirin have been shown to have different therapeutic effects in men and women, and there is scientific precedent for recommending lower doses of drugs for women and the elderly in order to avoid unnecessary harm from the drugs.

- Stratify by sex

When analyses are presented separately by sex, it provides a clearer picture of where experiences may differ between male and female.

Some examples of stratification would be:

- Creating 2 columns in the table describing the sample studied and including the result of the analysis on statistically significant differences between men and women.
- The effect estimate can be shown separately by sex, using the raw data to construct two separate tables and calculate the mean association between exposure and outcome in men and women separately. For example, one could measure the effect of the interaction between years of smoking, mean number of cigarettes smoked in the past year and age on the development of COPD in men and women.
- Testing the significance of sex using modelling techniques

Modelling is the representation of a data set (“the sample”) by a mathematical equation (“the model”). Modelling methods (simple and multiple regression) can be used to understand the contribution of sex-related variables to differences in observed health outcomes between men and women. This approach will also allow us to estimate the difference between men and women that would remain if other factors, which have also been shown to be associated with the health problem, were equal for men and women, i.e., we adjust the sex variable by other variables (age, alcohol consumption, exposure to toxins, etc.).

Some examples of modelling for sex analysis:

- Estimate the predictive value of the sex variable in the development of type II diabetes in high birth weight for gestational age.
- Find out whether the factors that best explain the development of osteoporosis are the same in men and women.
- Analyse the interaction between sex and age or sex and educational level in the rate of consumption of psychotropic drugs or the interaction between sex and hours of physical activity or sex and obesity in the prevalence of osteoporosis.

Remember: stratifying the results by sex or adjusting the sex variable for other variables is not the same as controlling or adjusting other variables for the sex variable in multivariate regression analysis. Controlling or adjusting the model for sex eliminates the ability to explore data separately for women and men. If the relationship between the variable of interest and the outcome differs between females and males, adjusting for sex will provide an estimate of the average relationship between the variable and the outcome, if sex were held stable, cancelling out its effect. A common mistake is to report sex differences in the table describing the sample variables and then only present the adjusted results in the rest of the results section.

3.4.2. Methods for the Analysis of the Gender Variable

If gender can be characterised as a variable, the same methods described for the analysis of the sex variable can be applied for this analysis.

We can treat gender as a variable:

- if we ask people about their gender identity (cisgender, transgender, gender fluid, etc.).
- if we measure any of the components of the gender construct using scales or questionnaires.

There are already developed and validated scales to measure gender.

Table 1.

Assessed Component	Scale
Gender Identity	- Personal attributes Questionnaire - German Personal Attributes Questionnaire (GPAQ)
Gender Role	- Gender Roles Expectations of Pain. - Gender Role Conflict (O`Neil et al., 1986)

Structural Gender	<ul style="list-style-type: none"> - Conformity to Masculine Norms Inventory (CMNI) - Conformity to Feminine Norms Inventory (CFNI) - Male Role Norms Inventory (MRNI) - MRNI-Revised (2007) - MRNI- Short Form (2013)
Gender relations	<ul style="list-style-type: none"> - Ambivalent Sexism Inventory - Self-perceived and self-Reported Gender Equality

Another option is to create a gender index or gender score to analyse it independently of sex.

To predict the duration to treatment for men and women experiencing early-onset acute coronary syndrome, a Canadian research team created a gender index that included seven variables: (1) information on whether the respondent was the main source of income in their household, (2) their personal income, (3) the number of hours of work in the household, (4) responsibility for household work, (5) level of stress in the household, and (6 and 7) measures of masculinity and measures of femininity using the “Bem Sex Role Inventory”.

- Gender as “unit of analysis”
 - Search for gender history by applying more than one level of disaggregation by sex.

For instance:

First level: data on accidents at work suggest that men suffer more frequently from workplace accidents than women. Based on this information, one could conclude that men should be a priority target for prevention activities.

Second level: When a second stage of disaggregation of data by sex is applied to examine the risk of accidents by working hours, a different story emerges: among shift workers, women have a higher accident rate than men.

Third level: when analysing the proportion of accidents among shift workers, stratified by sex and by the presence of dependent children, it is observed that there are significant differences among those who have dependent children, but no differences when they do not have dependent children.

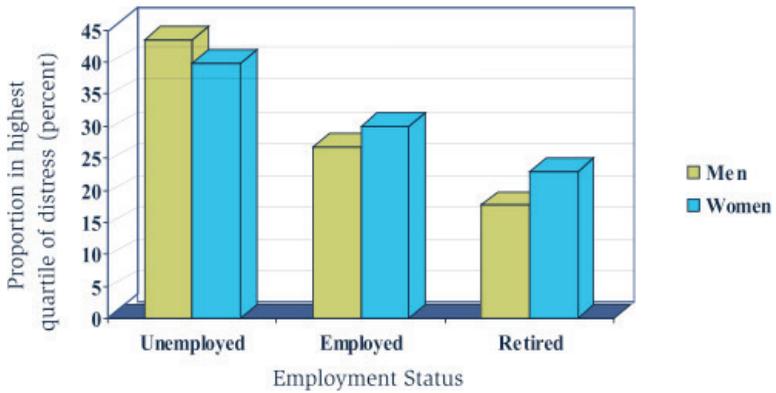
When gender roles and childcare are considered, the risk of accidents associated with shift work increases among women compared to men only among those with dependent children.

- Search for gender history through intersectionality, i.e. measuring the change in the effect of the sex variable when it interacts with other gender-related variables (age, social status, children, hours spent caring, unemployment, etc.).

Uncovering gender histories can better inform social policies that aim to reduce distress and the risk of mental health symptoms among 30-44 years old.

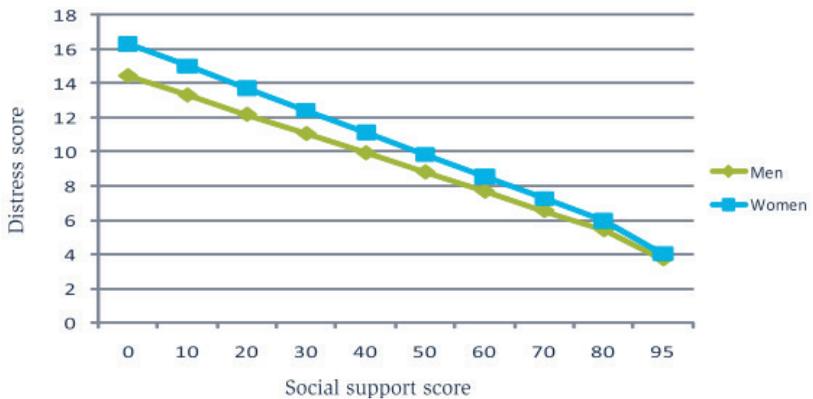
When studying the level of stress in relation to gender-sensitive variables and comparing the results obtained for women and men, it can be observed that the raw data show that women have higher levels of stress more frequently than men (fourth quartile, between the 75th and 100th percentile). When considering other gender-sensitive variables such as employment status or social support, the relationship of high stress levels between men and women changes.

Figure 3. Relationship between high stress levels (fourth quartile) and employment status.



Source: Clow Barbara et al. *Rising to the Challenge: Sex-and gender-based analysis for health planning, policy and research in Canada.*

Figure 4. Relationship between level of stress and level of social support.



Source: Clow Barbara et al. *Rising to the Challenge: Sex-and gender-based analysis for health planning, policy and research in Canada.*

Other studies have found that women and men perceive different levels of time stress, related to the amount of domestic and unpaid work they do.

Table 2. Variables sensitive to gender analysis.

Type of Variable	Variable
Socio-demographic characteristics	<ul style="list-style-type: none"> - Social class - Sex - Head of Household - Age - Highest educational level completed - Match degree between education and job (scale from 0 to 10) - Nationality
Domestic Work (Unpaid)	<ul style="list-style-type: none"> - Household composition: Number of children under 3 years old, between 3 and 5 years old, between 6 and 14 years old. - Number of dependent people in the household, other than children - Household structure (cohabitation): age, sex, relationship of cohabiting partners - Housework: performance of housework (shopping, cooking, cleaning, ironing, etc.) - Distribution of house chores - Care of dependants (children, elderly, disabled): distribution of care work - Availability of external help (family or hired help) to carry out housework and care tasks. - Hours spent on domestic work.
Productive Work (Paid)	<ul style="list-style-type: none"> - Employment status - Occupation or position - Type of contract, length of contract: permanent or temporary - Type of working hours: Full-time or part-time, part-time chosen by own choice or by others, continuous or split working hours, night work, shift work, weekends - Hours worked per week - Frequency of extended working hours - Training activities within the working day - Frequency of working from home - Economic activity of the enterprise

<p>Subjective variables that may influence job performance</p>	<ul style="list-style-type: none"> - Degree of satisfaction with the working day, flexible working hours, rest time during the working day - Degree of satisfaction with holidays and leave, salary, social benefits provided by their company or organisation, with the stability, the organisation of work, the possibility of promotion, how their superiors rate their work, the activity carried out, the level of autonomy or independence in the job, the level of participation in decisions about the tasks carried out, the level of motivation in the job, the training provided by the company, the time devoted to their children, the time they have for their personal life. - Level of stress - Level of monotony or routine - Level of physical strain - Level of difficulty in requesting: days off work and pay for family reasons, leave of absence for family reasons, reduction of working hours for family reasons - Level of difficulty in taking time off work to deal with sporadic private matters
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Source: Montañés, A. *Productividad y empleo II, tipos de jornada y productividad del trabajo*. Universidad de Zaragoza, 2011; y García, M.M. Jiménez, M.L. Martínez, E. *Guía para incorporar la perspectiva de género a la investigación en salud*. Escuela Andaluza de Salud Pública. Consejería de Salud, s/f.

3.5. Results and Discussion

The results should reflect whether there are differences between men and women from a gender perspective. Good research involves identifying where these differences occur, interpreting the results considering these differences, suggesting ways to correct them, and opening up new avenues of research that explore these differences further or seek to clarify them.

Activity Chapter 3

Men are less likely to be diagnosed and treated for depression than women. A qualitative study seeks to better understand whether ideals of masculine toughness, self-reliance, and self-stigma avoidance contribute to delayed care-seeking among men with depression. Which of the following statements about methods for qualitative studies **is incorrect**?

- a. Recruitment of men through Primary Care may introduce selection bias, as men operating under strong notions of traditional dominant masculinity may not access the health care system.
- b. In an interview with men, phrases such as “do you ever feel the need to recharge (batteries)” may be preferable to “do you ever feel that you need help”.
- c. The sex/gender of the research assistant is unlikely to affect the dynamics of the interview.

Chapter 4

TOOL FOR MEASURING THE INTEGRATION OF SEX-GENDER ANALYSIS IN RESEARCH

Raúl Juárez Vela, Ángela Durante, Beatriz Angulo Nalda,
Ignacio Larráyoiz Roldán

In 2012, the European Association of Scientific Editors (EASE) established the Gender Policy Committee (GPC), which was tasked with developing the Sex and Gender Equity in Research (SAGER) guideline. It provides the scientific community with a tool to standardise the sex and gender information that scientific publications should provide, where appropriate, or that reviewers, editors, and funders should take into account when assessing the appropriateness and merit of a publication.

4.1. Checklist for authors who want to report from a gender perspective

The list of questions below is based on the table in the original SAGER article (Heidarí, 2016) in order to make it easier for the scientific community to follow its guidelines.

1. Research approaches

Are the concepts of gender and/or sex used in your research project?

- If yes:
 - Are sex/gender terms used appropriately?
 - Have you explicitly defined the concepts of gender and/or sex?
 - Is it clear what aspects of gender and/or sex are being examined in your study?

- If no:
 - Do you consider this to be a significant limitation?
 - Given existing knowledge in the relevant literature, are there plausible gender and/or sex factors that should have been considered? If you consider sex and/or gender to be highly relevant to your proposed research, the research design should reflect this

2. Research questions and hypotheses

- Does your research question(s) or hypothesis/es make reference to gender and/or sex, or relevant groups or phenomena? (e.g., differences between males and females, differences among women, seeking to understand a gendered phenomenon such as masculinity)

3. Literature review (introduction)

- Does your literature review cite prior studies that support the existence (or lack) of significant differences between women and men, boys and girls, or males and females?
- Does your literature review point to the extent to which past research has taken gender or sex into account?

4. Research methods

- Is the method of sex/gender definition specified (i.e., self-report, genetic testing)?
- Is your sample appropriate to ensure adequate representation of men and women and to capture gender and/or sex-based factors?
- Is it possible to collect data that are disaggregated by sex and/or gender?
- Are the inclusion and exclusion criteria well justified with respect to sex and/or gender?
- Is the data collection method proposed in your study appropriate for investigation of sex and/or gender?

- Is your analytic approach appropriate and rigorous enough to capture gender and/or sex-based factors?
- Does your study design account for the relevant ethical issues that might have particular significance with respect to gender and/or sex? (e.g., inclusion of pregnant women in clinical trials)

5. Reporting of results

- Is the study sample described broken down by sex/gender for all categories considered (Tables include separate rows for male sex/gender, female sex/gender, or other categories if collected)?
- Are the results presented by sex/gender, and are sex/gender differences and similarities measured?
- If applicable, are adverse effects of interventions disaggregated by sex/gender?
- For epidemiological studies, are the effects of other exposures on health problems examined for all genders and critically analyzed from a gender perspective?
- does the discussion of the data capture the possible implications of sex/gender on the study's findings?
- is the extent to which the results can be generalized to all sexes/genders in a population justified in the discussion?
- If a sex/gender analysis is not performed, is this decision and its implications for the interpretation of the results justified?

Activity Chapter 4

As an author, select from the checklist presented in Chapter 4, the most interesting items to carry out in your research.

1. _____
2. _____
3. _____
4. _____
5. _____

Chapter 5

PRESENT AND FUTURE OF THE INCLUSION OF SEX/GENDER ANALYSIS IN HUMAN HEALTH APPROACHES

Remedios Álvarez Terán, Raúl Juárez Vela,
Iván Santolalla Arnedo, Nicolás Alonso Llorente

By introducing the gender perspective in the analysis of health, we recognize that there are differences in the state of health and disease between women and men. These differences are attributable to lifestyles, economic factors, education, age, and gender, and not only to biology. The WHO calls the differences generated in this way inequities and attributes a moral and ethical dimension to them, as they are unnecessary, avoidable, and unjust.

Health is one of the factors that most affect people's quality of life, but we cannot lose sight of the fact that the determinants of health and disease are not the same for women and men. Women and men access and control health resources differently, which leads to inequalities in the patterns of risk of disease, in the use of health services and in health outcomes.

In health research, it is necessary to introduce the sex and gender perspective so that the results are more accurate, sensitive, and relevant. International, European and National health institutions have been working to promote the inclusion of sex/gender analysis in research that affects human life and health.

5.1. International Outlook

To understand the causes and consequences of inequalities between women and men in the world, the UN has organized international forums since 1975. In 2015, 17 goals were established to achieve sustainable development to be met by the end of 2030. The third,

Health and well-being, and the fifth, Gender equality, cut across all research related to both fields of knowledge.

In 1990, the UN also created the Human Development Index. A tool to relate longevity, knowledge or educational attainment and standard of living of populations. Finally, to deepen the analysis of the differences between women and men, the Gender Inequality Index was implemented, which reflects the inequality between women and men in three dimensions: reproductive health, empowerment, and labor market.

5.2. Spanish Outlook

Spanish legislation recognizes that gender is a determinant of health and, consequently, has been incorporating regulations to give effect to the various international commitments made.

The Madrid Statement of 2001 assumed the need to advance equality on the basis of the following premises:

- All people have the same right to health. However, in order to achieve the best possible standards, health policies must recognize that women and men, due to their biological differences and gender roles, have different needs, obstacles and opportunities.
- Gender is one of the determinants of inequitable health status.

In 2003, Law 16/2003 on the Quality of the National Health System provided for the elaboration of comprehensive plans on the most prevalent and relevant pathologies or those that increase the social and family burden. As well as the need to provide comprehensive care: prevention, diagnosis, treatment and rehabilitation (Law 16/2003)

Law 1/2004 on Measures against Gender Violence recognized that this scourge is the problem that most brutally shows the inequality of Western societies. This violence is directed at women for the very fact of being women, and radically affects their health. The regulation determined the following measures for awareness, prevention, detection, and intervention in healthcare (Law 1/2004):

1. The Spanish NHS should promote health actions for the early detection of this violence.
2. Programs should be developed to raise awareness and continuous training of healthcare professionals to improve and promote early diagnosis, care and rehabilitation of women who are victims of this violence.
3. The incorporation in the curricula of the social and health professions of content aimed at research, prevention, detection, intervention, and support for these women.
4. The inclusion of comprehensive prevention and intervention in gender-based violence in all National Health Plans.

Organic Law 3/2007, for gender equality, incorporated cross-cutting health guidelines:

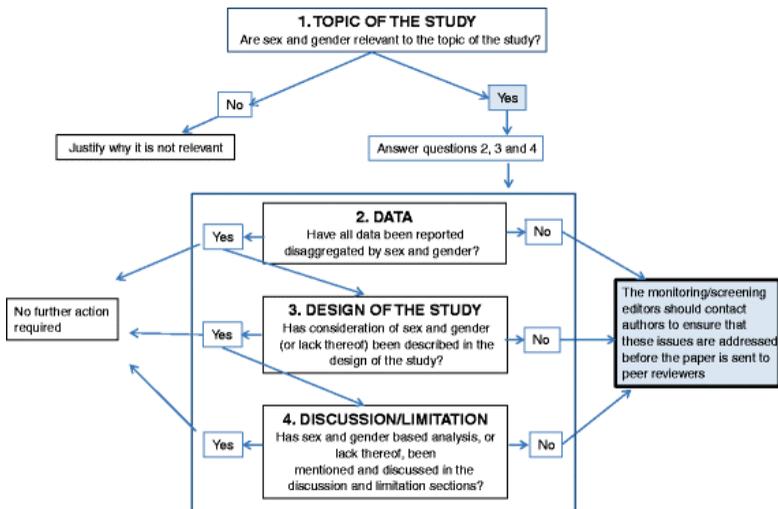
- a) Systematic adoption, within health education actions, of initiatives to favor the promotion of women's health and prevent their discrimination.
- b) Encouragement of scientific research on the differences between women and men, to protect their health, especially in diagnosis and treatment, both in terms of clinical trials and health care.
- c) Consideration, within the protection, promotion and improvement of occupational health, of sexual harassment and gender-based harassment.
- d) Integration of the principle of equality in the training of personnel in the service of healthcare organizations, guaranteeing in particular their ability to detect and deal with situations of gender-based violence.
- e) The balanced presence of women and men in management positions and positions of professional responsibility in the NHS as a whole.
- f) The collection and processing, disaggregated by sex, whenever possible, of the data contained in registries, surveys, statistics or other medical and healthcare information systems.

Following the legal mandate, the Women's Health Observatory was created in 2004, which had among its objectives to generate, disseminate, and promote gender analysis and equity and its inclusion in health policies and systems. It was abolished in 2014 and re-launched in April 2019.

In March 2005, 45 measures were adopted to promote equality. Accordingly, it was decided to draw up an annual report on Health and Gender. The first one dates from the same year, and was subsequently published in 2006, 2007, 2008 and 2009. In the latter, it no longer analyzes health in general, but is dedicated exclusively to gender violence, which, although it is a major factor in generating disease, it is not the only one. In 2020, this analysis will be resumed.

In our environment we have similar examples of commitment to a more inclusive science. The Canadian Institute of Gender and Health established in 2010 the requirement that all grant applications for research projects had to answer mandatory questions about whether or not their research designs included a gender and sex perspective.

Figure 5. SAGER flow diagram of the first editorial screening of received manuscripts.



Source: Heidari et al. *Gaceta Sanitaria*, 2019; 33 (2)

5.3. Descriptors by Gender

The differences in health between women and men are scientifically proven. In 2009, the WHO published the report *Women and Health: Today's Evidence Tomorrow's Agenda* and in 2015 *the Global Strategy for Women's, Children's and Adolescents' Health (2016-2030)*.

Among many other conclusions, both documents make it clear that, despite the progress made, societies continue to fail women at key moments in their lives. They also show that, while women provide most of the health care, they seldom receive the care they need. It also shows that, although they live longer, the extra years are not always accompanied by good health. And that, despite some biological advantages, their health is affected by a worse socioeconomic situation. This means, in short, that changes and policy measures are needed in health and beyond to tackle inequalities.

Some quantitative data could be drawn:

- On average, women live six to eight years longer than men.
- Female life expectancy at birth is over 80 years in 35 countries, but only 54 years in Africa.
- Morbidity and mortality rates begin to differ after childhood: traffic accidents are the leading cause of death among adolescent girls in upper-middle-income countries.
- Girls are much more likely to suffer sexual violence 8.7% of boys compared to 25.3% of girls.
- Women are more exposed to unsafe, unwanted and/or forced sex, which can cause them to contract AIDS and other sexually transmitted diseases. In 2016, there were an estimated 376 million new cases worldwide of the four most common curable sexually transmitted infections (chlamydia, blennorrhagia, syphilis and trichomoniasis).
- Unwanted pregnancies and unsafe abortions are a major cause of mortality among young women aged 15-19 years in developing countries. Abortions performed by non-professionals are a major contributor to these deaths. Every

year, 14 million adolescent girls become mothers. 90% of them live in developing countries.

- More than 10,000 newborns die from preventable complications during pregnancy and childbirth, and 90% of this neonatal mortality occurs in the developing world. Preterm birth, neonatal asphyxia and infections are the leading causes of death during the first month of life, when mortality rates are highest.
- Every day, 1600 women die from preventable complications during pregnancy. Annually, half a million maternal deaths occur, 99% of which happen in developing countries. Despite the increase in contraceptive use over the last 30 years, there is still a large unmet need in all regions. For example, in sub-Saharan Africa, one in four women do not use any method of family planning, even if they want to.
- Globally, cardiovascular disease, often considered a 'male' problem, is the leading cause of female mortality.

In Spain, national health surveys highlight the direct relationship between low income and poor health. There is also a clear relationship between health and age. Spanish women are in poorer health in all age groups, they live longer, but are sicker, and this is attributable to biological, economic, and social causes. (Durán, 2012, 237-243).

Overall, they go to more doctors, dentists and other health professionals and have more diagnostic tests, especially blood tests. There is a percentage of only 3.3%, between 50 and 69 years of age, who have never had a mammogram. Women donate fewer organs, 43% overall, and also receive fewer, 32.6% of them. (Instituto de la Mujer, 2021).

In 2020, 5.53% were severely limited in activities of daily living, compared to 3.87% of men; 2.6% and 1.1%, respectively, were unable to move; 0.5% of women and 0.1% of men were unable to see; and 0.5% of both sexes were unable to hear. Thus, 2% of the women and 1.13% of the men perceived their state of health to be very poor. Indeed, women were and felt less healthy.

Women presented, among their conditions, 7.1% of depressive symptoms, compared to 3.4% of men. In fact, among the medication consumed, tranquilizers, relaxants and sleeping pills accounted for 14.2%, practically double the consumption reported by men. However, with respect to the consumption of alcohol, tobacco, psychoactive substances, self-medication and addictions, women were behind. For example, 64.8% had never used tobacco, a percentage that decreases to 46.4% among men. They also showed a lower prevalence of gambling addiction, 61.5%, compared to 66.8% of men. The prevalence of compulsive Internet use among female students aged 14-18 stood out, at 23.4%, compared to 16.4% among male students. Finally, Sars-CoV-2 killed 35,922 women, including confirmed and suspected cases, and almost as many men, 38,917.

One of the most important challenges of health research is to transfer the accumulated knowledge about the influence of sex and gender on people to new research and health decision-making. The consequence of neglecting this critical part can range from less effective health interventions to increased morbidity and mortality.

Knowledge about sex, gender and health must impact all health care settings: teaching, research, clinical practice, health services and policies, population and public health. For we know that taking into account the sex/gender system leads to improvements in interventions, policies and health outcomes.

Another cornerstone is to continue to train researchers in the tools that facilitate the integration of sex/gender analysis and help them to always keep in mind: sex, gender and diversity in relation to health.

We are tasked with exploring advances and challenges related to bioethics and the translation of knowledge about gender, sex and health into interventions to improve people's lives:

- Open new avenues of knowledge about sex/gender differences in health and their underlying mechanisms.
- Reduce gaps in current knowledge to understand the causes of gender-based health inequity.

- implement health intervention programs (promotion, prevention and rehabilitation) that use up-to-date knowledge on sex, gender and health.

Gender inequalities in health can only be eliminated with the political will to do so, and financial resources are needed to research, analyse and eliminate them through appropriate plans and projects.

Activities Chapter 5

Johnson J.L., 2009, reports that, in reviewing sex-disaggregated data from three studies on anterior cruciate ligament tears, it was found that women are more likely than men to suffer this injury, to report more pain when they do so, and to subsequently develop osteoarthritis more frequently.

What has the disaggregation of the data by sex in these studies yielded?

Having noted these differences, how might the authors seek to understand them? By carrying out...

- a. Prospective studies examining risk factors for ACL injury in men and women.
- b. Retrospective case/control studies to isolate female-specific risk factors.
- c. Experimental or quasi-experimental studies modifying a variable in the male and female groups that may be associated with the risk of cruciate ligament tear. For example, the use of footwear designed to prevent ACL in a particular sporting activity and its effectiveness among men and women in that activity.
- d. All of the above.

Studies have confirmed that there are biological differences in knee laxity, limb alignment, knee notch dimensions and ligament size, and that these differences may explain differences in injury.

What could knowledge of these anatomical differences between men and women be used for?

- a. To direct men and women towards one type of employment activity or another.
- b. To guide women and men towards one type of physical activity or another.
- c. To design knee prostheses taking into account the anatomical differences between men and women.
- d. To estimate the price that men and women have to pay for insurance services.

Could there be biological differences other than the anatomical characteristics between men and women that could be related to the ACL injury?

- a. Hormonal differences
- b. Neuromuscular differences
- c. Biomechanical differences
- d. All of the above

What gender-related aspects of people's daily lives could be investigated to prevent the injury and improve its subsequent evolution?

Borkhoff CM, 2008, found that, in Ontario (Canada), twice as many men were referred for total knee arthroplasty as women, having similar symptoms and level of disability.

How can this finding be explained?

Chapter 6

THE IMPORTANCE OF INCLUSIVE LANGUAGE

Nicolas Alonso Llorente, Beatriz Angulo Nalda,
María Elena Garrote Cámara, Carmen Barrio Ruiz de Viñaspre

The world's population is made up of men and women. Men are always mentioned and alluded to in texts from all periods, in all contexts and in all human expressions (history, culture, politics, arts, administration...) while the presence of women is more doubtful or more difficult to elucidate. When we talk about the men who made the cave paintings in the cave of Altamira, do we assume that they were all men or do we also imagine women? And if so, how many women, a few, several? Using the masculine in a generic way implies assuming that men have been and are there, while the participation of women is left out of the collective imagination.

The Spanish language has been built on a sexist reality maintained for centuries, a less sexist reality should lead to a more egalitarian use of language, but neither reality nor language can be modified without a collective awareness of the need to make women present.

In 2008, the European Parliament was one of the first international organisations to provide guidance for the different languages of its member countries on “gender-neutral language”, also called non-sexist, inclusive, or equitable language. The purpose of the document was to promote among member countries the use of language that avoids lexical choices that can be interpreted as biased, discriminatory, or degrading by implying that one of the sexes or social gender is the normative one. The specific guidelines for Spanish were:

- Use grammatically and stylistically acceptable alternatives to the generic noun, employ grammatical gender splitting when it avoids ambiguity or is relevant, and avoid the word “man” or “men” for more inclusive expressions such as “people” (*las personas* o *la gente*), “human beings” (*los seres humanos*),

“mankind” (*la humanidad*), “the human race” (*el género humano*), “the human species” (*la especie humana*). It is also appropriate to use the adjective “human” instead of “man's” in expressions such as “human body”, “human intelligence”.

- For the names of professions and positions of responsibility, it suggests using the feminine form when they are held by a woman, unless she has expressed a preference to use the masculine form. When the European Parliament refers to a professional category and announces a vacancy, it uses the generic masculine form “translator” followed by a reference (f/m) so that there is no doubt that the post can be filled by a man or a woman.
- Names of professions or positions that refer to one sex or are perceived to exclude the other can be replaced by inclusive terms. Note that in English this does not cause a problem as it is a language with natural gender, in which nouns designating people are usually gender-neutral (the nurse, the doctor) and in which there are gender-specific personal pronouns (he/she; his/her). Nonetheless, when translating from Spanish to English or vice versa we should be very attentive and never assume the gender of a profession.

Examples	Proposals
Flight attendants and pilots <i>Las azafatas y los pilotos</i>	Flight personnel, air crew <i>El personal de vuelo, la tripulación aérea</i>
Cleaning Ladies or Women <i>Las mujeres de la limpieza</i>	Cleaning Staff <i>El personal de limpieza</i>
Doctors and Nurses <i>Los médicos y las enfermeras</i>	Medical and Nursing Personnel <i>El personal médico y de enfermería</i>
Secretaries <i>Las secretarias</i>	Secretarial Staff <i>El personal de secretaria</i>

- Regarding the formulas of treatment, it is suggested to use the term “madam” for all women, in the same way that the term “sir” is used for all men, instead of treating young and single women as “miss” and older and married women as “ladies”.

In 2020, the Royal Academy of the Spanish Language (RAE) issued a report on inclusive language in which it set out its position on linguistic sexism and the feminisation of language. The RAE declared itself against any kind of discrimination against people because of sex or gender. Its academics recognised that sexism is a cultural component of long historical continuity in Spain and that its principle is the supremacy of men over women in all areas of life, with manifestations in the labour and economic, political, social, family and advertising spheres, among others. It admitted the persistence in our society of sexist attitudes that provoke daily abuse and discrimination, but did not acknowledge that the Spanish language, in itself, is sexist.

It is irrefutable evidence that there have been, are and will be sexist messages and even clearly misogynist texts and genres. But such sexism and misogyny are not properties of the language, but uses of the language. (RAE, 2020)

According to the RAE, there is no sexism of the language, there is sexism of the discourse, that is, sexism of the speaker who uses the language. It recognises that sexism of discourse is a daily occurrence and is present in both oral and written communication. It explains that there is sexism in the way a man addresses his female colleague: “For a blonde, you haven’t done so badly” (*Para ser rubia, no lo has hecho tan mal*); in the way the media portrays women: “The English go to the horse races with their wives” (*Los ingleses asisten con sus mujeres a las carreras de caballos*); or in a myriad of popular sayings and proverbs: “They say never trust a limping dog or the tears of a woman” (*Cojera de perro y lágrimas de mujer, no son de creer*); “even the wisest men is spoiled by a woman” (*Al hombre de más saber, la mujer lo echa a perder*), “a woman at the wheel, constant danger” (*mujer al volante peligro constante*) among many other examples.

At the same time that the RAE denies the sexism of the language, it explains the actions it has taken in recent years to clean the dictionary of the sexist residues or misogynist connotations of some Spanish terms, such as the filtering and sexist opinions and expressions in the definitions, the change in the definition of professions from “the man who” to “the person who” or the admission of the feminisation of professions: architect (*arquitecta*), engineer (*ingeniera*), or lawyer

(*abogada*). In English said professions would be specified by adding the word “female” before, but this can result in the focus being shifted to the sex of the person rather than their merits.

With regard to the use of the generic masculine, i.e. the norm of using the masculine term “man” to refer to “men and women”, the RAE reports on the ideological and social debate it provokes in Spain. While for movements demanding women's equality, the generic masculine makes women invisible and is an imposition of the patriarchy, for the RAE, the lexicographical analysis of the language refutes both assumptions, and defends its use because it gives the language greater economy and communicative flexibility. The positions between the academics of the RAE and the social movements in defence of equality are deeply contested. In order to overcome this controversy, the RAE has analysed a series of proposed solutions that do not violate the linguistic system (although it is recognised that in the long run they may influence it) but which may jeopardise the principle of linguistic economy or impoverish its linguistic possibilities

1. Creation of feminine nouns of profession, position or activity. It has been shown that the creation of feminine nouns of profession (*la presidenta, la juez, la arbitra*) is a natural and foreseen process in the language system and that it does not affect the economy of language.
2. Gender splitting or gender doubling. It aims to break down clichés that give rise to stereotypes and interpretations that condition the recall of information and shape people's expectations, which tend to be perpetuated. In Spain, more and more women want the discourse to include female references in order to improve their visualisation and identity recognition. On the other hand, it decreases the risk of ambiguity by preventing the inclusive meaning of men and women in the generic masculine from being confused with the exclusive meaning of the specific masculine that only refers to men. However, its continued and rigid use, both in verbal and written language, is in direct opposition to the economy of the language, producing very long, insufferable and impossible to maintain discourses. The new grammar of the Spanish language explains that split sentences make sense and are

useful in certain contexts in which they provide clarity and specification “he has 3 daughters and 1 son” (*tiene 3 hijas y 1 hijo*) or to establish comparisons or contracts “the incidence of depression was 15% in women and 5% in men” (*la incidencia de la depresión fue del 15% en mujeres y 5% en hombres*) or where values, attitudes or behaviours of one or the other are objectified “Women and men increase their spending on sporting events”. (*Mujeres y hombres incrementan su gasto en eventos deportivos*). The RAE academics consider that splitting is a procedure that can be an effective and aesthetic resource if used wisely and in strategic positions.

3. Substitution of generic masculine nouns with abstract, neutral terms or terms referring to collectivities that are equivalent in content. As in the case of splitting, it is necessary to use them as stylistic variants and always with great care, in order to avoid monotony in the discourse and their incorrect use.

When referring to (EN)	Generic Masculine (ES)	Alternative Term (ES)
The teachers	<i>Los profesores</i>	<i>El profesorado</i>
The students	<i>Los alumnos</i>	<i>El alumnado</i>
The people	<i>Los hombres</i>	<i>Las personas</i>
The citizens	<i>Los ciudadanos</i>	<i>La ciudadanía</i>
The medical staff	<i>Los médicos</i>	<i>El personal médico</i>
The tutors	<i>Los tutores</i>	<i>La tutoría</i>
The director	<i>El director</i>	<i>La dirección</i>
The rector	<i>El rector</i>	<i>El rectorado</i>
The emigrants	<i>Los emigrantes</i>	<i>La emigración</i>
The navigators	<i>Los navegantes</i>	<i>La navegación</i>
The children	<i>Los niños</i>	<i>La infancia</i>
The young people	<i>Los jóvenes</i>	<i>La juventud</i>
The clients	<i>Los clientes</i>	<i>La clientela</i>
The elderly	<i>Los ancianos</i>	<i>La ancianidad</i>
The lawyer	<i>El abogado</i>	<i>La abogacía</i>
The mayor	<i>El alcalde</i>	<i>La alcaldía</i>
The coordinator	<i>El coordinador</i>	<i>La coordinación</i>
The boss	<i>El jefe</i>	<i>La jefatura</i>
The judge	<i>El juez</i>	<i>La judicatura</i>
The volunteers	<i>Los voluntarios</i>	<i>El voluntariado</i>

4. Removal of the article in all cases where it does not cause misinterpretation, i.e. where the context provides sufficient information not to create doubts, e.g. *“la medida va dirigida a estudiantes de ingeniería que quieran hacer prácticas en otro país “* instead of *“ la medida va dirigida a los estudiantes de ingeniería [...]”*
5. Replacement of masculine combinations (*el que, los que, el cual, los cuales* with other relative pronouns or expressions which do not specify gender (quien, quienes) or, along the same lines, also replace masculine pronouns. This use is not ungrammatical but eliminating definitively the sequences “el + que” o “los +que” or the masculine pronouns (alguno, aquel, varios...) can lead to an impoverishment of the stylistic possibilities of the language.

Here are a few examples:

Meaning (EN)	Common use (ES):	Suggested alternative (ES):
Whoever sees it	- <i>El que lo vea</i>	- <i>Quien lo vea</i>
Those who are going to die	- <i>Los que van a morir</i>	- <i>Quienes van a morir</i>
Someone	- <i>Alguno/s</i>	- <i>Alguien</i>
Nobody	- <i>Ninguno</i>	- <i>Nadie</i>
Several	- <i>Varios</i>	- <i>un grupo de</i>

6. Elimination of the subject or replace it with an impersonal construction. This could be used as long as it is verified that the meaning of the sentence is not altered or the information does not suffer, for example, by substituting *“los niños comprarán agua para la excursión”* for *“se comprará agua para la excursión”* the information about who is or are doing the action has been omitted. Nonetheless, systematically resorting to this strategy opens the text to indeterminacy and ambiguity.

Nowadays, it is not easy for Spanish speakers to avoid the generic use of the masculine form. We know that the use of both pronouns (*él o ella*) is tiresome if repeated and also makes sentences too long.

Combined uses («él/ella») are difficult to pronounce, and alternating masculine and feminine forms can be confusing and ambiguous. These difficulties should not prevent us from exploring different alternatives, trying to achieve a more inclusive natural language that can be gradually accepted by the speakers. However, a crucial aspect can be masked in the overzealous pursuit of neutral or inclusive language is what the RAE calls the sexism of discourse. That is, calling women studying computer engineering “female computer scientists” (*ingenieras*) instead of “computer scientists” (*ingenieros*) has not prevented a drop from almost 50% of female students in Spain to the alarming threshold of 20% at present.

It is therefore necessary to analyse the discourse that our young people receive, and which underpins their self-perception and belief in their knowledge and skills. It is the discourse that perpetuates gender stereotypes, for example “mothers whose children grow up and become independent and who no longer have anyone to care for experience sadness, loss, pain, an existential void, called empty nest syndrome”. Analysing and dismantling these narratives allows us to normalise those mothers who felt liberated when they had more time for themselves. Similarly, developing discourses about the value of female mathematicians or engineers helps to create positive images of these professions among girls, and opening all the news in Spain by praising the Spanish national football players after the achievement of the women's football world cup is likely to have encouraged many girls to become football players.

Gender stereotypes are social and cultural in nature. Important progress is being made in the field of science to avoid gender bias, but science communication needs an even greater commitment from researchers, publishers, and funding agencies to fundamentally change the subjects, objects and discourses of science communication.

Activities Chapter 6

1. Find an inclusive alternative for the following statements in Spanish:

“... debe actuar como auditor de las cuentas está muy preparada”.

“Nota para alumnos de Doctorado”.

“Los representantes del profesorado decidieron apoyar la moción”.

2. Find a relevant paper that disarticulates the following sexist statement: “Women during pregnancy show great emotional lability, which makes them more sensitive, dependent and prone to crying”.

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