

Sex and Gender Bio-psychosocial Differences in Coronavirus Disease 2019 (Covid-19): Men have more Biological Problems, but Women Suffer more Long-Term Serious Psychosocial Consequences and with more Implications for Population

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ABSTRACT

The current outbreak of coronavirus disease 2019 (COVID-19) continues to spread affecting many countries and territories around the world. The COVID pandemic implies that it is the first time that sex and gender differences have become apparent to the world. COVID-19 poses a greater risk to men, by reasons biological and cultural. Men are likely to have more complicated clinical condition and worse in-hospital outcomes and they have more harmful health habits as compared to women. On the other hand, in the COVID-19 pandemic, greater psychosocial effects can be observed in women, in relation to work, family, intra-family transmission and childcare, affectation by quarantine, etc., which is aggravated due to the fact that most health workers are women. The results for women in crisis situations are significantly worse. The differential effects by sex and gender of the COVID-19 outbreak, both direct and indirect, should be considered a priority. Future studies on COVID-19 should incorporate more systematic attention to sex and gender on issues such as ongoing vaccine trials and treatments for coronavirus, research on whether COVID-19 symptoms are the same for men and women, the how we can prevent women from bringing the infection to families, as well as fully incorporate women into the mechanisms of surveillance, detection and prevention of global health security.

Keywords: COVID-19; Women; Gender differences; Conceptual framework; Bio-psycho-social; Epidemiology

INTRODUCTION

The current outbreak of coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which was first detected in Wuhan, China, in December 2019, continues to spread affecting many countries and territories around the world, and WHO having declared it a pandemic on March 11, 2020 [1-3]. His figures are rapidly changing, and when this is written, as of April 9, 2020, the pandemic has infected more than 1,450,000 people and killed more than 83,500 worldwide; The United States has more than 399,000 cases, followed by more than 146,000 in Spain, and more than 135,000 in Italy, which have overtaken China in the total number of COVID-19 cases [4]. In this scenario, COVID-19 pandemic raises many questions related to the

urgency of dealing with the disease. One of them is the different effects by sex and gender and its bio psychosocial consequences.

What do we mean by "sex" and "gender"?

Sex refers to biological differences, while gender refers to socially constructed characteristics instead of being naturally determined (psychological, cultural or social differences such as norms, roles, relationships of and between groups of women and men, etc.). Sex and gender, print their differences in the concepts of health and health care [5,6]. Both biological and gender characteristics influence people's susceptibility to health and disease, as well as about use of health services by people and in life-long health outcomes [7,8].

Although men and women are the same in many aspects, there are important biological and behavioral differences between the

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two genders and both sexes, which are manifested in the epidemiology and pathophysiology of many diseases and the usual approach to healthcare [9,10]. Researchers have found sex differences in each tissue system and organ of the human body [11]. There are sexual and gender differences in cardiovascular, pulmonary, gastroenterological, hepatological, neurological, autoimmune, endocrinological, hematological, neurological and mental and behavioral diseases. Sex / gender differences occur particularly in the frequency of mental health problems: depression, anxiety, psychological disturbances and somatic complaints; Their greater impact on women is due to psychological, social and gender factors, since their role in society exposes them to more tensions, makes it difficult for them to modify their stressful environment, as well as they are subject to a high rate of sexual violence [12].

Gender remains an independent risk factor after other factors such as ethnicity, age, comorbidities, and other biological factors have been taken into account. On the other hand, it is known that there are genetic variants that carry a different risk in women and men [13]. It can be assumed that sex hormones play a key role in the pathogenesis and outcome of disease processes, as well as in the molecular mechanisms associated with physiological phenomena. Gender/sex-specific differences in morbidity and mortality may be mediated in part by genetic factors and by their differential response to the environment [14]. However, the interactions between the psychosocial, economic, medical, and genetic variables remain unclear [15,16].

DISCUSSION

Sex differences from the COVID-19 pandemic

In the six countries that had COVID-19 death registers by sex as of March 20, the proportion of men was higher than that of women. For four of them (China, France, Italy and South Korea), male mortality rates were more than 50% higher than female rates [17]. Since the COVID-19 pandemic began, several studies have been published that have confirmed how it discriminates by age and previous medical history: multimorbidity and being old were associated with increased severity and mortality in patients with COVID-19. But, men tend to be having the disease with a higher level of severity than women, even when the age does not differ between men and women. Although the age of men and women deceased by COVID-19 is similar, the percentage of men who died is higher (70 vs. 50, or according to other data, 64 vs. 36), and for France, Germany, Italy, South Korea and Spain, the figures confirm this pattern. In both Italy and Spain, the two most affected European nations; deceased men make up almost twice as many as women [18,19].

The early evidence leaves little doubt that COVID-19 poses a greater risk to men, but is the reasons biological or cultural? It seems that men are likely to have more complicated clinical condition and worse in-hospital outcomes as compared to women [20]. Part of the reason is behavior: On average, men have more detrimental health habits, such as smoking and drinking. Smoking is particularly suspected to cause the greatest risk in men. Other behavioral differences may also play a role, for example, adherence to hand washing tips. However,

biological differences may also be involved. Men have weaker immune systems and are therefore more susceptible to a variety of infectious diseases. Some pre-pandemic research has already suggested that men have lower innate antiviral immune responses against various types of better-known infections, such as hepatitis C or HIV. That is, they would naturally respond worse to these viruses than women. Studies in mice have suggested that this could also occur when trying to defend against the coronavirus, although it has not yet been possible to study this effect specifically for SARS-CoV-2. In this sense, it has been reported that in the most severe cases, women had a higher level of antibodies than men [21,22].

This could be explained in part by the effects of sex hormones, which differ between men and women, and are involved in the action of the immune system against pathogens. In this way, estrogens increase antiviral responses of the immune system. Furthermore, many genes that regulate the immune system are found on the X chromosome, so they may be more active in women compared to men [17].

Gender Differences from the COVID-19 Pandemic

Gender is a social determinant of health. There are other determinants such as age or social class, but gender is known to be one of the most influential determinants because it constitutes one of the root causes of inequality. Gender differences in health appear constantly, cannot be fully explained, and are nuanced by psycho-social factors. Biological and moral ideologies have served to define the disease as an essentially women's issue. In relation to COVID-19, greater psychosocial effects can be observed in women, in relation to work, family, intra-family transmission and childcare, the affectation by quarantine, etc. With regard to epidemics and infectious diseases, typical gender roles determine the place where women spend time (the house, for example, with dependent people), or health work, and, therefore, the frequency and intensity of exposure to certain infectious agents [23]. Thus, beyond the work of informal care (the reproductive work carried out by women in their private homes), it is observed that those paid occupations that are particularly important in health crises are also feminized jobs [24].

The almost universal role of women as the central element of families and relationships networks, as well as the fact that most health workers are women, are key elements to those are not given due importance in the COVID-19 pandemic. In this sense, it is evident that preventive interventions are essential to prevent women who work in the health sector and that returning to their homes after caring for sick patients, becoming carriers or vectors that spread infections in his community [25]. Thus, for the nursing occupation 85% are women, compared to 15% men. Although medical personnel are also exposed, it has been noted that nurses have higher levels of exposure than doctors, since they are much more involved in the care of patients, and are the ones who perform blood tests or collect samples [26]. In addition, with respect to other fundamental professions in order to cover basic needs and make the system work, like: 1) the most of the pharmacy staff that are women; 2) almost all of the cleaning staff - offices, hotels, houses - are women; and 3) over 80% of workers who serve in supermarkets are also women. According to WHO data, of the more than 8,000 SARS cases - 2003 epidemic - more than half of the infected people were women, and 20% of the cases affected precisely those who worked in the field of health and the cares [27].

It is a critical element to realize how infectious outbreaks affect women and men differently, in order to understand the effects of COVID-19 emergency, and to be able to make decisions, create policies, and implement interventions which are equitable. In this sense, it can be thought that COVID-19 may be an opportunity to reflect on the ways in which bio psychosocial determinants are valued and which are excluded and why, during a health crisis situation, regardless of the genetic elements, the mutations of the virus or population structure [28].

On the other hand, although COVID-19 is a greater biological threat for men, in general, the psychosocial outcomes for women in crisis situations are always significantly worse. However, it is rare for decisions to be made to address psychosocial determinants of health, and thus biological considerations tend to dominate, even during a humanitarian crisis. Specifically, the elements or factors that play a structural role in driving infectious outbreaks, such as gender inequalities and other social determinants of health, are usually neglected in favor of focusing only on immediate biological threats, and are implemented only bio-technical solutions. However, attention must be paid to the fact that different social groups, different genders, sexualities and races, have a different affectation, experience infectious outbreaks in different ways, and lead to responses to the diseases in different ways. Examples are the effects on maternal and child health, on the social and cultural characteristics of the information and education that is implemented, on the interventions that are carried out, as well as the initiatives to combat infectious diseases. Usually, however, when you want to act quickly on an issue, such as an infectious outbreak, it is assumed that taking into account gender, social class or ethical principles is less important than technical aspects, which results in a type of planning or intervention with poor results and its effectiveness is limited [29,30].

The COVID-19 pandemic results in a major economic recession. The great recessions that can be measured by changes in the population's health and quality of life indicators, usually provoke a deepening of inequality and social exclusion. And women are always the most affected group for three reasons: 1) The crisis comes with an intensification of women's work, including paid and, above all, unpaid work; 2) Male employment always recovers before female employment and the latter always ends up even more precarious; and 3) The crisis comes with setbacks in the advances in equality achieved in times of economic boom. Therefore, it is necessary to approach reconstruction after the COVID-19 crisis from a gender perspective, taking into account the different effects on people according to gender, their participation in the health field and the associated risks, the roles of differentiated care or uneven effects depending on vulnerability [31].

The woman in the face of the COVID-19 pandemic

A historical analysis of the response to epidemics shows the frequent appearance of social conflicts and power imbalances [32]. The epidemiological study of ancient epidemics, such as smallpox, measles, typhus, etc., shows that epidemiological interventions influenced power relations between the dominant minority and the dominated majority. Frequently. epidemiological measures taken during an epidemic posed more threats to the expectations of ordinary people than the epidemic itself [33]. In this sense, the closure of schools in China, Hong Kong, Italy, Spain, South Korea and other areas could have a negative differential effect on women, who provide most of the care within families, with the consequence of limiting your work and your economy. Furthermore, travel restrictions cause economic challenges and uncertainty for most foreign domestic workers (for example, many of whom travel to Southeast Asia between the Philippines, Indonesia, Hong Kong and Singapore, and between Latin America and Spain). During the Ebola virus outbreak in West Africa in 2014-16, gender norms meant that women were more likely to be infected with the virus, given their predominant role as caregivers within families and as workers first-line healthcare [34].

Furthermore, women were less likely than men to have decisionmaking power around the outbreak, and their needs were largely unmet. For example, resources for reproductive and sexual health were diverted to the emergency response, which contributed to the increase in maternal mortality in a region with one of the highest rates in the world. During the Zika virus outbreak, power differences between men and women meant that women did not have autonomy over their sexual and reproductive lives, which was compounded by their inadequate access to medical care and financial resources. And, although experts stress the importance of including women and their knowledge in decision-making in responding to an outbreak, there is inadequate representation of women in national and global political spaces of COVID-19 [34].

CONCLUSION

Despite our knowledge of these crucial differences by gender and sex, there is little gender/sex-specific health care; the prevention, management and therapeutic treatment of many common diseases do not reflect the most obvious and most important risk factors for the patient: sex and gender. Although, ultimately, the researchers suggest that there is probably a complex combination of biological factors, lifestyle and behaviors that give rise to this highly differentiated trend between genders and sex in COVID-19 pandemic, it must be borne in mind that women are essential to global development. Women's health is a sensitive indicator of quality of life, and women's health is inevitably connected to women's place in society. Promoting women's health involves undertaking a critical gender-based analysis of women's health status and health needs and the knowledge bases which underlie health promotion action.

The COVID pandemic implies that it is the first time that sex and gender differences have become apparent to the world, and this is a unique opportunity to drive personalized sex and gender medicine. The differential effects by sex and gender of the COVID-19 outbreak, both direct and indirect, should be considered a priority. Future studies on COVID-19 should incorporate more systematic attention to sex and gender, as context and intertwining of social and biological variation. This includes a gender/sex focus on issues such as ongoing coronavirus vaccine trials, research on whether COVID symptoms are exactly the same for men and women, how women can be prevented (who make up the majority of global healthcare providers and also primary caregivers) from carrying the infection to families, etc. Given their front-line interaction with communities, it is worrying that women have not fully incorporated themselves into global health security surveillance, detection and prevention mechanisms. Women are in a privileged position to identify trends at the local level that could signal the start of an outbreak and therefore improve global health security.

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