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Sex and gender gaps in medicine and the androcentric history of medical research

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The truth will set you free, but first it will piss you off – Gloria Steinem[1]

Women live longer than men, however, despite this, women experience poorer health outcomes including higher rates of morbidity and disability.[2] This disparity has been attributed to, at least in part, societal gender inequalities such as the employment and pay gap, making women more likely to have a lower socioeconomic status than men.[2] Lower socioeconomic status (SES) and lower educational attainment have been linked to oppression[3,4] and poor physical health.[5] In Australia, women are more likely than men to be assaulted by an intimate partner. Between 2014 and 2015, 2,800 women and 560 men were hospitalised following an assault by a partner or spouse.[6] One woman per week and one man per month were murdered by a current or former partner between 2013 and 2015.[6] In addition to physical violence, sexual abuse against women is more prevalent than it is against men.[7] These inequities may be a modern manifestation of the historical imbalance of power between the sexes.[8]

Sexual abuse is an ongoing public health issue, highlighted in recent years by the #MeToo movement, where women shared their stories of sexual assault and advocated for change.[9] Statistics from the domestic violence advocacy body White Ribbon Australia reveal that one in every five Australian women have experienced sexual abuse and 85% of women have been sexually harassed.[10] Violence and sexual abuse have clear physical and psychological health impacts on women, contributing to women's general disadvantage and often their lower SES and homelessness.[11] The employment and pay gap contribute significantly to the disadvantage experienced by women.

Gender gaps are observed in societies throughout the world. Caroline Criado Perez notes in her book *Invisible Women*[12] that even town and transport planning display a gender gap and everything in everyday life is built around the needs and lifestyles of males in society. Perez argues that societal gender gaps place women's lives at significant risk.[12] In Australia, women represent 47% of the workforce but only 17% of leadership positions and 30% of management positions. The sex and gender pay gap is 23% and almost 72% of female workers are employed part-time.[13]

Gender gaps in medical research and medicine

Sex and gender inequalities in medicine and medical research are drawing increasing media attention[14,15] and subsequently there is a call for Australian researchers to proportionally increase female representation in medical research.[16] To measure any improvement, sex and gender must be clearly defined. Sex refers to the biological and physiological characteristics that define humans as male, female or intersex.[17] Gender, however, is a societal construct that refers to roles, activities and behaviours, and encompasses a wide range of identities beyond male, female and intersex.[18]

Historically, women have been excluded from clinical trials and biomedical research because researchers considered the presence of menstruation rendered the biological processes within female bodies too variable to glean reliable results,[19] and/or because of fears of harming the prospects of a future pregnancy.[20] Thus, most research data have been collected from males and generalised to females, intersex people, transgender people or gender nonconformists.[18,21] The medical research literature largely excludes gender nonconformists, outside of their sexual, reproductive and psychological health.[22] While academia has been dominated by male researchers, the clinical literature has been dominated by research on male participants and the female body considered to be that of a 'small male', discounting biological differences outside of sexual organ diversity.[23] Subsequently, the differences in male and female health have been largely excluded from the curricula of medical schools,[24] which may have significant consequences for the care of the female patient.

Females and males experience different patterns of illness, different life spans, different metabolic responses to medications and different manifestations of disease.[23] Observational studies of hospital cohorts have shown that women generally wait longer than men for a diagnosis and acute pain relief and are more likely to be discharged or misdiagnosed during serious medical events.[25-27] This is particularly marked in cardiovascular diseases, which have historically been considered to be diseases affecting males more frequently than females. However, statistics demonstrate that heart disease was the leading cause of death in both women and men in Australia in 2018[28] and heart disease rates and mortality are actually increasing in young women.[29]

Women respond differently to medications than men.[30] Differing responses to treatment can be dangerous for female patients, who may experience more significant or potentially life-threatening side effects.[31] Further, women who respond differently to medications may be more likely to be labelled by their doctors as 'difficult'.[32] The perception of females as 'difficult' is embedded within societal, cultural and historical misogyny.[33] 'Difficult' may be considered synonymous with hysteria – a modern manifestation of the hysterical discourse. This can impact on the time it takes to diagnose and treat female patients experiencing pain. Somatoform disorders may be misdiagnosed before the eventual identification of a pathological source of pain.[34,35] Women wait on average 6.7 years from presentation to diagnosis and

treatment with the painful gynaecological condition endometriosis.[36] Young et al. (2018) investigated practitioners' perceptions of women with endometriosis; interviews with four general practitioners and eight gynaecologists revealed that archaic ideas of hysteria persist, particularly when women's symptoms are challenging to treat. Physicians expressed opinions that women with endometriosis were "difficult", had become "consumed" by their condition and were sometimes "mad".[37] These findings demonstrate the persistence of the archaic Freudian 'hysterical discourse' – the idea that women are hysterical and emotional beings. The hysterical discourse is heavily intertwined with the 'Yentyl syndrome'; in order to be taken seriously by medical professionals, a woman must prove herself as unwell as a male counterpart.[38] This is a well-documented cause of delayed or inappropriate care for some female patients.[39-41]

Medicine as a patriarchal institute

The focus of women's health on their reproductive organs serves to reinforce the ideas of the patriarchal society that a woman's sole purpose is reproduction.[31] This is underpinned by stories of women with painful gynaecological conditions being refused hysterectomies despite life-limiting disease.[42] Contrasting this situation is the practice of the forced sterilisation of marginalised women such as ethnic minorities, disabled women and women of low socioeconomic status, often following procedures such as abortion or caesarean section.[43] The Disabled People's Organisation of Australia reports that forced sterilisation of disabled women is an ongoing practice that remains legal but is against human rights.[44,45] Imperialism, capitalism and the patriarchy influence the socioeconomic standards by which people and particularly women and their fertility are valued.[46]

Medicine holds social power, and patriarchal values are reflected in the institutional structures,[31] where women currently dominate the ground-level workforce but continue to be under-represented in leadership and senior roles.[47] Barriers to female advancement in the profession are largely owing to the 'unconscious (gender) bias' existing at systems and policy levels as well as the individual level.[48] Upholding inequality results in unconscious bias against the female patient, where the testimony of suffering by the female patient is often deemed incredible, and knowledge of female health is inadequate. These factors combine to potentially reduce the outcomes and experiences of female patients. In circumstances where research has focused on women's health, outcomes have improved, as observed in breast cancer, where research on the molecular and cellular level has combined with clinical trials to produce measurable improvements in outcomes and quality of life.[49]

The future of women's health

For women's health to improve, it is imperative that the research gap be addressed alongside addressing the culture of dismissing women as 'difficult'. Not only may including more women in clinical research improve patient outcomes but systematic review and meta-analysis has also demonstrated that simply participating in research significantly improves the health of female participants compared with those who do not participate.[50] It is important that the extent of the research gap in Australian published literature is ascertained and that women are not only included in medical research but that results are also analysed by sex and gender. Additionally, there needs to be greater inclusion of gender nonconformists in clinical trials. The real-life impact of the gender gap in research must be quantified and analysed. Aspects of the 'hidden curriculum' may be addressed within medical schools by incorporating awareness and feminist theory into the curriculum.[24]

If women are to truly become equals in modern society, sex and gender gaps need to be thoroughly explored and addressed. As collaborative professionals, medics and public health specialists must unite to learn about the gender gap, consider the underlying culture that perpetuates the gender gap and the consequential adverse outcomes for female patients, and finally advocate for the closure of the gap.

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