

Perspective

Does patient–surgeon sex discordance impact adverse events following primary total hip arthroplasty?

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The Editors' perspective

The question, “does patient–surgeon sex discordance impact adverse events following primary total hip arthroplasty?” is the topic of an article recently published in *Acta Orthopaedica* (1). It should be taken seriously as we want to understand how we achieve a good outcome with low numbers of adverse events. Whether the sex of the surgeon and the patient may have an impact must be discussed.

Diversity in orthopedics and traumatology (O&T) is, as in all parts of society, important and has been debated during recent years. One advocate of cultural and gender diversity is the International Orthopaedic Diversity Alliance (IODA), which was formed in 2019 by a network of orthopedic surgeons. Their mission is “to champion diversity, equity and inclusion in orthopaedics worldwide” (2).

The United Nations has also focused on the topic. In 2015 they presented the Sustainable Development Goals (SDGs). **Goal number 5**, “Gender Equality,” is the main topic of this perspective. “To achieve gender equality and to empower all women and girls” both have fundamental importance on a global scale. Apart from biological sex, the issue also touches on other aspects in relation to gender.

In O&T, the topic is clearly on the agenda. Pregnancy and parenthood are issues where social benefits vary across countries, creating specific cultures and norms shaping recruitment and workplace logics. Work-related risks such as radiation, and biological and chemical hazards are important issues to

consider. However, these are not specific to orthopedic surgeons inasmuch they apply to many parts of the healthcare workforce such as, e.g., scrub nurses and anesthesia staff. When aligning our workplace, the following goals are also important to bear in mind when defining sustainable practice: **Goal number 3**, “Good Health and Well-being:” “Ensure healthy lives and promote well-being for all at all ages”, **Goal number 8**, “Decent Work and Economic Growth:” “Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.”

In the following, two perspectives on women in O&T are presented and discussed.

Li Felländer-Tsai and Søren Overgaard

Surgeon sex and association with patient safety: UK perspective

We read with interest the article from Jolbäck et al. (1) investigating the sex discordance impact on adverse events amongst Swedish hip surgeons. We note that 17% of Swedish orthopedic surgeons are female compared with 8% in the UK. Unfortunately, we can find no existing data within the UK on the percentage of female hip surgeons, but it is likely

to be less than 8%. Jolbäck's study showed that, in Sweden, female patients operated on by female surgeons had the lowest frequency of adverse events, followed by the discordant subgroups in which females are either surgeons or patients, and the highest frequency of adverse events was found in the male concordant subgroup. The percentages were 1.8% higher in the male concordant group compared with the female group (5.2% versus 3.4%), whereas the discordant groups were almost equal (4.3% versus 4.1%).

A similar study by Wallis et al. in Ontario, Canada of surgeon concordance with 25 index surgical procedures had proportionally fewer female surgeons performing orthopedic operations. Their finding that female surgeons had significantly reduced mortality, complications, and readmissions is difficult to extrapolate. In addition, there was no difference in orthopedic procedures (3). Wallis et al. concluded that female patients treated by male physicians had worse outcomes in a further study of sex concordance with postoperative outcomes (4). For orthopedic surgery in Canada, they found no difference in gender concordance (odds ratio 1.04 [95% confidence interval 0.96–1.12]) (4).

Similar studies in patient–physician gender concordance for heart attack patients found a higher mortality for female patients treated by male physicians in the United States (5).

A large study of Medicare data from the United States found 2% of arthroplasty surgeons identified as female and performed 1.4% of the 21,216 arthroplasties studied. The female surgeons averaged fewer arthroplasties and were earlier in their careers than their male counterparts. The study found that male and female surgeons had similar adjusted complication rates with the predictors of increased complications being decreased surgeon volume, THA, increased surgeon's years in practice, and geographical region (6). Considering that female surgeons had fewer arthroplasties and were earlier in their career, this did not have a negative impact on their surgical outcomes (6).

Future projections of total hip and knee arthroplasty in the UK suggest that by 2035 an estimate of 95,877 THAs and 118,666 TKRs will be performed, with projected counts being higher for women than for men (7). In the UK we have no estimates of the current gender distribution within the subspecialty interests of orthopedics apart from anecdotal reports of more female representation within pediatric orthopedics and upper limb surgery.

Unless there is a significant increase in gender parity in orthopedic surgery and specifically amongst arthroplasty surgeons, it is likely that the surgeon–patient discordance will increase. The extrapolation of effect on this patient group is difficult to estimate or mitigate for paucity of data and research in this field; however, it may support recruitment of a more diverse workforce for the future.

Laura Casey, Rachael Clegg, Joanna Maggs, Kate Spacey, Catherine Kellett, and Caroline B Hing

“A(n orthopaedic) surgeon should have the eyes of an Eagle, hands of a Lady and the heart of a Lion.”
(Late Prof Dr R Sethuratnam)

Swedish perspective

Sweden is considered to be a precursor in its effort towards equality between men and women. Women got the right to vote in 1919, in 1974 parental insurance was introduced, and in 1979 the equality act was accepted, giving men and women the same rights in the labor market (8). In the medical field Karolina Widerström was the first woman to become a medical doctor in 1888, and Gertrud Gussander was to become the first female surgeon around 1910 (if we don't include Mamsell Bovall, a midwife who passed the exam as military barber-surgeon in 1863 and hence beat them both) (9). However, the medical profession has been strongly male dominant until recently. Today, close to 50% of practicing doctors in Sweden are female with big differences between specialties (10). In the orthopedic field, 17% of specialists are female, in comparison with 9% in 2002 (10). During the last decade, the majority of students accepted into Swedish medical schools have been women (11). This is also reflected in a higher proportion of female medical school graduates: for the last decade, 55–59% of graduates have been female (11).

Age and sex distribution of members of the Swedish Orthopaedic Association, January 2023. Values are count (%)

Age	< 45	46–55	56–65	> 66
Men	442 (62)	291 (75)	240 (84)	390 (93)
Women	270 (38)	98 (25)	45 (16)	31 (7)

Lack of mentorship, lack of female leadership, and lack of female representation or role models, in combination with reduced exposure to orthopedic surgery, have been proposed as common reasons for women not selecting orthopedics (12). In the Swedish dissertation “It's just a job, a new generation of physicians dealing with career and work ideals” by S. Diderichsen from 2017, men and women in the study seem to have a comparable passion for different specialties. If losing interest in a specialty, men based their preference on new interests or priorities, while women to a greater extent made their choice based on a feeling of being excluded or not wanting to be part of a toxic working environment (13).

There is a common presumption that the clinical work of orthopedic surgeons would be physically too challenging for women. Women might therefore not be selected in a recruitment process. This presumption may also cause female medical students not to consider a career in orthopedic surgery and traumatology before they have even been exposed to it.

In recent years there have been several studies published on the effect of sex discordance on outcome of patient care. The Greenwood study mentioned above found that male physicians with greater experience of treating female patients and working with female colleagues had a better result when treating female patients, suggesting that this is something we can learn and become better at.

Our study raises several questions in the discussion of discordance in sex between surgeon and patient in hip arthroplasty surgeries (1). Are male patients different from female patients when it comes to preparation before and rehabilitation after surgery? Do male surgeons have a higher level of self-confidence than female surgeons (i.e., do women have higher risk aversion than men)? Is there a disparity in conscientiousness and the willingness to ask for help or/and handle everything yourself between male and female surgeons? Are male and female surgeons treated equally by other healthcare professions and hence have equal conditions under which to perform their task?

These questions are universal and thus applicable to all arenas in the orthopedic field. We need to accept that men and women differ, and with conscious responsibility tackle these differences.

In all, there is nothing to support the notion that women are not as skilled orthopedic surgeons as men if offered the opportunity. The orthopedic community needs to actively work on gender diversity and be more attractive to the coming generation of doctors. We want to get the best possible orthopedic surgeons to treat patients in the future, not just a larger proportion of the male minority otherwise eligible to be recruited.

Anne Garland and Per Jolbäck

The Editors' concluding remarks

The importance for a continuous discussion of gender diversity is reflected in that inequality still exists in O&T around the world. The need of women in O&T is evident otherwise the specialty will be threatened as explained by Garland and Jolbäck. Therefore, it is good news that it seems that the Nordic

countries may be overcoming the recruitment problems resulting in increasing numbers of women in the specialty.

The challenges raised by the paper by Jolbäck et al, that the outcome may be influenced by the sex of the surgeon treating the patient and whether there is concordance or not, raises new questions.

We want to improve safety by learning from these findings.

1. **Jolbäck P, Mukka S, Wetterling K, Mohaddes M, Garland A.** Patient–surgeon sex discordance impacts adverse events but does not affect patient-reported satisfaction after primary total hip arthroplasty: a regional register-based cohort study. *Acta Orthop* 2022; 93: 922-9. doi: 10.2340/17453674.2022.6228.
2. **Green J A, Chye V P C, Hiemstra L A, Felländer-Tsai L, Incoll I, Weber K, et al.** Diversity: Women in orthopaedic surgery—a perspective from the International Orthopaedic Diversity Alliance. *JTO (@boa.ac.uk)* 2020; 8 (1): 44-51.
3. **Wallis C J D, Ravi B, Coburn N, Nam R K, Detsky A S, Satkunavam R.** Comparison of postoperative outcomes among patients treated by male and female surgeons: a population based matched cohort study. *BMJ* 2017; 359: j4366. doi: 10.1136/bmj.j4366.
4. **Wallis C J D, Jerath A, Coburn N, Klaassen Z, Luckenbaugh A N, Magee D E, et al.** Association of surgeon–patient sex concordance with postoperative outcomes. *JAMA Surg* 2022; 157(20): 146-56. doi: 10.1001/jamasurg.2021.6339.
5. **Greenwood B N, Carnahan S, Huang L.** Patient–physician gender concordance and increased mortality among female heart attack patients. *Proc Natl Acad Sci U S A* 2018; 115(34): 8569-74. doi: 10.1073/pnas.1800097115.
6. **Chapman T R, Zmistowski B, Votta K, Abdeen A, Purtill J J, Chen A F.** Patient complications after total joint arthroplasty: does surgeon gender matter? *J Am Acad Orthop Surg* 2020; 28(22): 937-44. doi:10.5435/JAAOS-D-19-00740.
7. **Culliford D, Maskell J, Judge A, Cooper C, Prieto-Alhambra D, Arden N K.** Future projections of total hip and knee arthroplasty in the UK: results from the UK clinical practice research datalink. *Osteoarthritis Cartilage* 2015; 23(4): 594-600. doi: 10.1016/j.joca.2014.12.022.
8. **Swedish Gender Equality Agency.** <https://swedishgenderequalityagency.se>. [Online] January 2023.
9. **Wikipedia.** [Online] January 2022.
10. **Ström M.** Andelen kvinnor ökar inom många läkarspecialiteter (in Swedish). *Läkartidningen* 34; August 2021.
11. <https://www.uka.se/statistik--analys/hogskolan-i-siffror.html>. [Online]
12. **Rohde R S, Wolf J M, Adams J E.** Where are the women in orthopaedic surgery? *Clin Orthop Relat Res* 2016; 474(9): 1950-6.
13. **Diderichsen S.** It's just a job, a new generation of physicians dealing with career and work ideals. Umeå University; 2017, id: diva2:1145048.