

Compensation and Satisfaction in Orthopaedics

ABSTRACT

BACKGROUND Sex-based income disparities have existed for decades within the medical field and most prominently within surgical specialties. While other surgical specialties have documented sex-based income disparities, orthopaedic surgery lacks a current study of this kind that includes hours worked for compensation. The purpose of this study is to 1) determine whether a sex-based income gap exists and possible reasons behind this gap, and 2) determine current overall career satisfaction within the field.

METHODS A survey was created and approved by the Survey Manager of the American Academy of Orthopaedic Surgeons (AAOS) to assess income and job satisfaction. Board-eligible practicing orthopaedic surgeons were recruited via email from three orthopaedic surgery residency program alumni lists over the past ten years. Demographic data was also included, including age, gender, marital status, number of children, employment state and practice state.

RESULTS When looking at univariate associations with salary, males were found to have a significantly higher reported salary than females ($p < 0.0005$). When considering all variables from the univariate analysis, along with interaction effects, only sex ($p < 0.0001$), age group ($p = 0.0003$), and the interaction between these two variables ($p = 0.0072$) were significant. This analysis confirmed that even after controlling for other collected variables, there was a highly significant greater reported salary for males than for females. When assessing the association between career satisfaction and income, we found a significant correlation between higher income and feelings of males and females being compensated evenly ($p < 0.05$), as there was a significant association between income and personally feeling compensated fairly ($p < 0.0007$).

CONCLUSION Male orthopaedic surgeons have a significantly higher income compared to female orthopaedic surgeons even after adjusting for other factors, such as hours worked. However, female orthopaedic surgeons were not significantly less satisfied with their career or income compared to their male counterparts.

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Income disparities between genders have existed for decades within the medical field and most prominently within surgical specialties. With second wave feminism beginning in the 1960's, women dramatically increased workplace equality. However, a sex gap still exists within the field of orthopaedics. Despite 49% female enrollment in medical school, only 5.1% of orthopaedic surgeons were women as of 2012.^{1,9}

Based on previous studies performed in other surgical specialties, income and overall career satisfaction may differ between the sexes.^{2-4,7,10,12} Sex-based income disparities have been previously documented within the specialties of primary care, plastic surgery and colorectal surgery.^{4,10-12} However, not all of these studies accounted for hours worked. A study conducted among pediatric surgeons determined that women overall felt an increased household responsibility.³ Negative attitudes towards female orthopaedic surgeons were reported by 43% within a study done by Bucknall et. al. and were most often caused by a patient or colleague questioning family responsibilities.²

When assessing overall career satisfaction through a simple survey, a much greater proportion of male plastic, colorectal and general surgeons were reported to be married with children compared to females.^{4,7,12} A study also demonstrated that more female colorectal surgeons would change their career if given the opportunity when compared to men.¹² The same study also found women to be more sensitive to colleagues' opinions of their capabilities as compared to men among colorectal surgeons.¹² Based on this information, one possible conclusion could be that women in the field of colorectal surgery tend to have lower career satisfaction than men. A recent study published in the *Journal of Bone and Joint Surgery* concluded that women had equal satisfaction to men within orthopaedic surgery.⁶

While other surgical specialties have documented sex-based income disparities, this data is lacking in the field of orthopaedic surgery. The purpose of this study was to: 1) determine if a sex-based income gap exists and possible reasons behind this gap and 2) determine current overall career satisfaction within the field.

MATERIALS & METHODS

A prospective self-report survey was created and approved by the Survey Manager of the American Acade-

my of Orthopaedic Surgeons (AAOS) to assess income and job satisfaction (**Appendix 1***). The survey was sent via email through REDCap electronic data capture tool on January 22, 2013 and all data was collected using REDCap Data Export. For individuals not responding to the initial email, one follow up email was sent approximately one month later.

Board-eligible practicing orthopaedic surgeons were recruited via email from three orthopaedic surgery residency program alumni lists over the past ten years. Members of Ruth Jackson Orthopedic Society and Massachusetts Orthopaedic Association were also recruited via email. Subjects were enrolled on a voluntary basis. Explanation of the study within the initial e-mail and voluntary response was defined as subject consent.

Study data was collected and managed using REDCap (Research electronic data capture) tools.⁵ REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing: 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources.

Respondents were asked to report their salaries as one of five categories. Demographic data was also included, such as age, gender, marital status, number of children, employment state and practice state.

A total of 259 responses were recorded. Self-reported salary was the variable of interest for the first research question. Respondents were asked to report their salaries as one of five categories. Analysis was then performed using statistical methods that treat this variable as a continuous variable. For the univariate analysis, independent t-tests were used to test statistical significance when comparing two groups, while Analysis of Variance (ANOVA) methods were used for multiple group comparisons. For continuous variables (i.e. hours worked per week), univariate regression analysis was performed. For the second phase of the analysis, we created a multivariate regression model by considering all variables that had $p < 0.20$ from the univariate analysis. A significance level of 0.05 was used for all tests. For the second research question, categorical methods of analysis, i.e., chi-square methods, were used to investigate the hypotheses of interest. SAS Version 9.3 was used for all analyses.

RESULTS

TABLE 1 Comparison of total professional revenues and revenues per operative time by type of procedure

Total Responses	Male		Female	
	#	%	#	%
Age				
30-35	21	20.2	37	23.9
36-40	22	21.2	30	19.4
41-45	18	17.3	28	18.1
>45	43	41.3	60	38.7
Practice Location				
Northeast	86	82.7	50	32.3
South	7	6.73	34	21.9
Midwest	4	3.85	37	23.9
West	7	6.73	34	21.9
Practice Setting				
Private Practice	44	42.3	58	37.4
Academics	32	30.8	60	38.7
Private w Academic	20	19.2	9	5.81
Other	8	7.69	28	18.1
Fellowship				
No	21	20.2	19	12.3
Yes	83	79.8	136	87.7
Fellowship Type¹				
Sports Medicine	25	-	36	-
Shoulder & Elbow	8	-	3	-
Joints	9	-	7	-
Spine	6	-	3	-
Trauma	10	-	13	-
Pediatrics	3	-	28	-
Hand	24	-	30	-
Tumor	4	-	10	-
Foot & Ankle	4	-	13	-

¹Some responses indicated multiple fellowships

To determine factors predicting overall career satisfaction, the questions assessing personal satisfaction with compensation and selecting the field of orthopaedics again were used to create an overall aggregate variable. The question regarding recommending the profession to surgeon's child was excluded because 81 values were missing for individuals not having children. This new variable was termed "satisfaction new".

Overall, 40.2% (n=104) of surgeons surveyed were male and 59.8% (n=155) were female and most were over the age of 45 (39.8%; n=103). The majority of respondents were from the northeast region (52.5%; n=136), private practice (39.4%; n=102) was the most common practice setting and most pursued fellowship after residency (84.6%; n=219) with sports medicine being the most common fellowship selected (n=61) (**Table 1**).

Males surveyed were in practice longer than females (13.9±12.5 years vs. 10.6±9.1 years), worked more hours per week (58.2±14 hours vs. 53.8±12.2 hours) and had more children on average (2.02±1.37 children vs. 1.14±1.08 children).

Overall, the most common personal and family income range was \$250,000-500,000 (66%) and was based upon a salary plus bonus income model (41.3%) with similar results for both males and females (**Table 2**). In assessing univariate associations with salary, males were found to have a significantly higher reported salary than females (p<0.0005). However, there were no significant income differences based on practice region (p=0.25), years in practice (p=0.64), completion of a fellowship (p=0.19) or fellowship type completed (p=0.13). Those whose income is based upon an "income and volume" practice had a significantly higher income than those who had a "salaried" set up (p<0.02). Increased hours worked per week also were associated with significantly higher income (p<0.02). Surgeons falling within the age range of 41-45 had the highest income and it was significantly higher than those in the 30-35 and >45 age range (p<0.004) demonstrating a normal bell-curved distribution. For social factors as they relate to pay, surgeons who were married had a significantly higher income than those single or divorced (p=0.02); however, spouse occupation was not associated with income differences. Surgeons who had more children also had a significantly higher income (p<0.0006) (**Table 3**).

When considering all variables from the univariate analysis, along with interaction effects, only sex (p<0.0001), age group (p=0.0003), and the interaction between these two variables (p=0.007) was different with statistical significance. This analysis confirmed that even after controlling for other collected variables

TABLE 2 Overall results for financial demographics				
	Male		Female	
	#	%	#	%
Personal Annual Income				
<\$250,000	9	8.65	17	11
\$250,000 - 500,000	56	53.9	115	74.2
\$500,000 - 750,000	27	26.0	18	11.6
\$750,000 - 1,000,000	10	9.62	4	2.58
>\$1,000,000	2	1.92	1	0.645
Family Annual Income				
<\$250,000	4	3.85	10	6.45
\$250,000 - 500,000	53	51.0	93	60
\$500,000 - 750,000	30	28.8	28	18.1
\$750,000 - 1,000,000	9	8.65	18	11.6
>\$1,000,000	8	7.69	6	3.87
Salary Model				
Salary	10	9.62	40	25.8
Salary plus bonus	49	47.1	58	37.4
RVU's	9	8.65	14	9.03
Hourly	1	0.96	1	0.645
Income based (volume/revenue)	36	34.6	40	25.8
Other	7	6.73	2	1.29
Decr Hrs/Advance Career				
Decr Hrs	62	59.6	90	58.1
Advance Car	42	40.4	65	41.9
Choose Ortho?				
Yes ortho	80	85.6	134	86.5
No, other surgery	2	1.92	2	1.29
No, non op	3	2.88	4	2.58
No, no med	10	9.62	15	9.68
Men/Women Fair Pay				
Yes, men more than women	31	29.8	95	61.3
No, women more than men	1	0.96	0	0
Men same as women	72	69.2	60	38.7
Do you feel you are compensated fairly?				
No	29	27.9	50	32.3
Yes	75	72.1	105	67.7

(such as hours worked), there was a highly significant greater reported salary for males than for females. For males, salary tended to increase with age significantly

TABLE 3 Independent associations for income and variables possibly associated with income		
Variable	Statistical Test	P Value
Sex	Satterthwaite's t-test	<0.0005
Regional differences	One-factor ANOVA; pairwise testing using tukey adjustment	0.25
Years in practice	Univariate regression	0.64
Fellowship vs. not	T-test with pooled variance	0.19
Fellowship type	One factor ANOVA	0.13
Single/divorced vs. married	T-test with pooled variance	<0.02
Spouse occupation	One factor ANOVA	0.87
# children	Univariate regression	<0.0006
Salary model	One factor Anova	<0.02
Hours worked per week	Univariate analysis	0.08

faster than for females. No other variables were significant when controlling for the included variables.

When assessing whether career satisfaction was related to income, we found a significant association between higher income and a perception of equal compensation among women and men ($p < 0.05$), as was there a significant association between income and personally feeling compensated fairly ($p < 0.0007$). However, this result did not follow a clear trend across the salary categories. When surgeons were asked "Would you still choose orthopaedics if given the option to choose again?" responses were not associated with income ($p = 0.32$) (Table 4).

For responses relating to sex, we found that there was a significant difference in response to whether men and women are compensated evenly ($p < 0.0001$), with 70% of males compared to 38% of females feeling that both sexes overall are compensated evenly. However, when asked if personally compensated fairly, there was no difference between sexes based upon responses ($p = 0.45$), nor was there a significant difference for whether they would choose the same career again ($p = 0.84$). For current social situations and sex, we found that male orthopaedic surgeons were more likely to be married ($p < 0.01$) and had significantly more children compared to female orthopaedic surgeons ($p < 0.0001$).

TABLE 4 Independent associations for income and variables possibly associated with income		
Variable	Statistical Test	Result
Pay based upon sex	Chochran-Mantel-Haenszel	Significant association ($p < 0.05$) between salary & opinion on equal pay. Higher salaries more inclined to feel sexes compensated equally.
Personally compensated fairly	Chochran-Mantel-Haenszel	Significan association ($p < 0.0007$) between salary and feelings of fair compensation
Career choice if given the option again	Chochran-Mantel-Haenszel	No significant association $p = 0.32$

Using the new aggregate variable for satisfaction (Satisfaction New), an ordinal logistic regression model that evaluated all collected responses simultaneously for significant relationship with the career satisfaction aggregate variable was used. It was found that only salary ($p < 0.0001$) and hours worked ($p < 0.001$) were significant in predicting career satisfaction, but these variables did not follow a clear linear trend. For salary, those with lowest salary tended to be the most satisfied, while those within the range of \$500,000-750,000 tended to be the least satisfied. For hours worked, surgeons who worked up to 50 hours and >70 hours tend to be most satisfied, while lowest satisfaction tended to be those that worked around 60 hours a week (Figure 1). Respondents were also allowed to write comments at the end of each survey. Examples of comments are included within Table 5.

DISCUSSION

Overall, we found that an income gap does exist between sexes among orthopaedic surgeons even after controlling for factors, such as hours worked and years in practice. In our study, male orthopaedic surgeons had a higher income compared to female orthopaedic surgeons for the same number of hours worked regardless of salary model. This income gap has also been previously found in other surgical specialties, including plastic surgery and colorectal surgery.^{4,12} In an article recently published in the New York Times, it was found that female surgeons make 71% of the salary of their male counterparts, which was mostly attributed to the lack of flexibility with hours worked and disproportionate financial gains for individuals willing to work longer hours (i.e. male surgeons without the stereotypical household responsibility of females).⁸ Interestingly, most of the women surveyed were mostly satisfied with their personal income, but believed that there is a sex-difference between male and female colleagues overall. More needs to be done to identify the causes for this income gap in the field of orthopaedics, which will subsequently allow for the development of interventions to increase gender equality.

Age also does interact with the effect of sex on income and takes on a bell-shaped distribution. We believe this may be as a result of physicians beginning practice and having a lower salary as a patient base is built during the ages of 30-35. Once physicians are in the 41-45 age range, most have an established practice with a good referral base and are in the prime of their career salary-wise. Over the

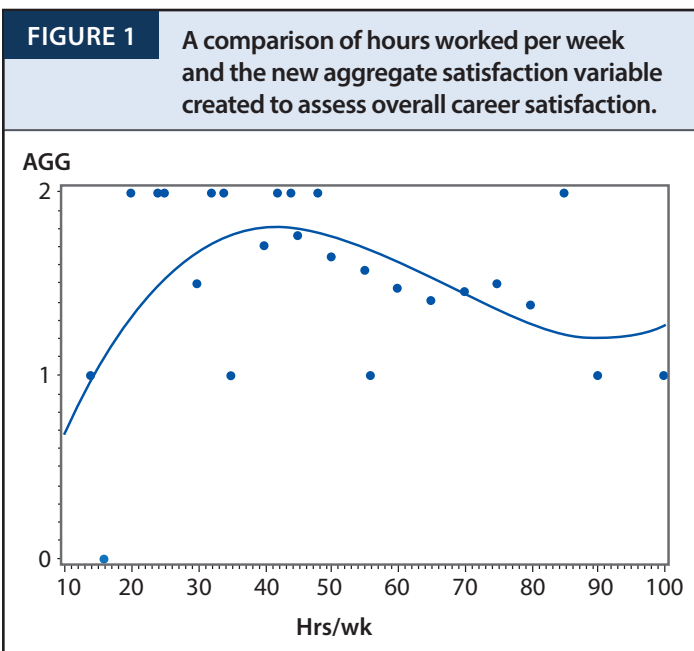


TABLE 5 Examples of comments received by study participants within survey

Partners in my practice are paid on productivity regardless of gender.

I think orthopedic surgeons are compensated fairly regardless of gender - you make a fair market value contingent on your productivity. If anything, it may be easier for a female orthopedic surgeon to get a job or market herself, as there is such a relative glut of male orthopedic surgeons.

I have chosen to limit my hours and patients seen to be home for family and my compensation reflects that. It is a decision that has worked very well for the myself and family and my practice.

I think women are more commonly employed in academic settings, where the reimbursement tends to be lower.

Regardless of compensation, I feel that there is still a pervasive mindset in orthopaedics that women want to work less than men, and they frown upon pregnancy, maternity leave, etc. I have found that men who are married to physicians are more progressive in their thinking and more accepting. I think women are more commonly employed in academic settings, where the reimbursement tends to be lower.

Had a nanny when kids were small. Productivity based formula allows flexibility.

I believe men work more hours than women.

In my state there is a lot of gender discrimination by patients and by other physicians. Beyond compensation it can be a tough environment to carve out a career as an equal.

Insurance companies do not see gender. Women may not negotiate employment deals well but in private practice it's all a level playing field.

I think that men make more in general because they work longer hours and may see more patients/hour. Females tend to spend more time with patients but at least in my situation have fewer suits and higher satisfaction surveys.

I am in a system that is salaried. All surgeons in a given department are paid the same so there is no gender difference.

In the private practice sector I do think that men are paid more than women, however in Academics I think it is fairly equal.

Men and women may be paid on the same scale but more surgical referrals go to men than women in the same group.

At our institution the average male orthopedist sees 60 patients per day of office hours. I have made a deliberate decision to see fewer patients per day and thus make less BUT it is my decision based on the way I wish to practice and the rewards that I receive from my approach.

Technically men are not 'paid' more.....reimbursement for work performed is not gender biased. I would imagine that you would find that women make less because they work less especially in cases where female physicians are also mothers.

We work on a 'eat what you kill' income. Meaning, I work, I bill and then I get paid what I take in minus overhead. If I want to make more, I need to work more. But I get paid equivalent to my male partners.

In our practice, reimbursement is the same for men and women.

age of 45, many surgeons gradually begin to reduce overall patient volume, which has a direct relationship with income.

Those whose income is based upon an “income and volume” practice had a significantly higher income than those who had a “salaried” plan ($p < 0.02$). Most physicians practicing under an “income and volume” practice have a high level of volume and favorable payer mix to sustain a predictably higher income. Salaried physicians most commonly remain salaried because clinical volume and payer mix does not allow for a transition over to an income and volume-based practice. Instead, the hospital contributes to the physician’s overall income under a salaried model. Furthermore, private practice institutions are most commonly “income and volume” set-ups, which also tend to be where physicians are able to make a higher income. Academic settings are more often offer a salary package, particularly when physicians are seeing a lower volume of patients as a result of academic responsibilities and have a less-favorable payer mix.

Increased hours worked per week also were associated with significantly higher income. Physicians who work longer hours also tend to have a higher volume practice, which equates to greater income as a result of more patients seen and more surgeries performed.

Only salary ($p < 0.0001$) and hours worked ($p < 0.001$) were significant in predicting career satisfaction. Those with lowest salary tended to be the most satisfied, while those within the range of \$500,000-750,000 tended to be the least satisfied. Physicians with lowest salary are likely most satisfied because when we consider the demographics in this range, orthopaedic surgeons tend to be in the first few years of practice or are practicing over the age of 45 and working at a reduced volume with a greater quality of life as a result of fewer hours worked.

For hours worked, surgeons who worked up to 50 hours and >70 hours tend to be most satisfied, while lowest satisfaction tended to be those that worked around 60 hours a week. Somewhere around 50 hours a week and below remains a reasonable work-week without sacrificing quality of life. However, when the work week begins to trend past 50 hours a week and enters the 60 hours a week range, demand significantly increases at the expense of other activ-

ities that may be more desirable, such as spending time with family. Individuals that work greater than 70 hours per week remain more satisfied likely because they truly enjoy doing their job above all else and working such a large number of hours is likely a personal choice.

Social factors (marital status, number of kids, etc.) were also assessed and results showed that women were more likely to be single or divorced compared to their male counter parts. They were also more likely to have fewer children. One possible interpretation is that the social toll for women in orthopaedics desiring a family is likely higher than their male counterparts.

This study has a few limitations. First, questionnaires were self-reported with a possible inherent bias, such as concerns about answering questions honestly given that they were intended to be shared, though in a de-identified manner. Second, this study only assesses demographics and opinions of a cross sectional group of individuals. The majority of the female responses came from orthopaedic surgeons that belong to the Ruth Jackson Orthopaedic Society.

CONCLUSION

Our study findings indicate that females earn less than males even after accounting for hours worked and all other potential confounding factors. This sex-gap is concerning and further research is needed to identify ways to address sex-based income difference in orthopaedics. Despite the documented income gap, both sexes are overall satisfied with their career and would choose to pursue the same profession if given the option to so again.

*APPENDIX

Supplementary material available from:

<http://www.orthojournalhms.org/volume16/supplementaryMaterial.html>

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