

Gender-Specific Variations in Professional and Personal Aspects among Senior Urology Physicians at German Centers: Results of a Web-Based Survey

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Keywords

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Abstract

Introduction: Senior urology physicians represent a heterogeneous group covering various clinical priorities and career objectives. No reliable data on gender-specific variations among senior urology physicians are available concerning professional and personal aspects. **Methods:** The objective of this study was to analyze professional perspectives, professional and personal settings, and individual career goals. A Web-based survey containing 55 items was designed which was available for senior physicians at German urologic centers between February and April 2019. Gender-specific differences were evaluated using bootstrap-adjusted multivariate logistic regression models. **Results:** One hundred and ninety-two surveys were evaluable including 29 female se-

nior physicians (15.1%). Ninety-five percent would choose urology again as their field of specialization – with no significant gender-specific difference. 81.2% of participants rate the position of senior physician as a desirable career goal (comparing sexes: $p = 0.220$). Based on multivariate models, male participants self-assessed themselves significantly more frequently autonomously safe performing laparoscopic, open, and endourologic surgery. Male senior physicians declared 7 times more often to run for the position of head of department/full professor. **Conclusion:** This first study on professional and personal aspects among senior urology physicians demonstrates gender-specific variations concerning self-assessment of surgical expertise and future career goals. The creation of well-orchestrated human resources development strategies especially adapted to the needs of female urologists seems advisable. © 2019 S. Karger AG, Basel

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Introduction

In the light of the ongoing demographic change, a shortage of skilled staff members in the healthcare sector has been discussed for some time. According to a study of PricewaterhouseCoopers (PwC) in cooperation with the Wirtschaftsforschungsinstitut (WifOR), a skill shortage of 106,000 physicians is predicted for 2030 in Germany (defensive projection). For surgical specialties, authors estimated a 23% gap of staffing schedules among specialists [1]. Throughout Germany, an increase in recruitment problems has become obvious [2]. Possible reasons include changing economic circumstances and non-family-friendly working conditions resulting in a rather unattractive assessment of the medical profession by younger generations [3].

On the other hand, feminization of medicine in Germany is ongoing [4]. Among medical students in Germany, the proportion of women reached 61% in the winter session 2017–2018 [5]. A long-term study on physicians found no gender-specific differences at the start of specialization in terms of qualification, self-confidence, and professional expectations [6]. However, in the course of their career, male physicians tend to be more successful regarding the professional positions they hold. The rate of women in leading positions persists unchanged at just under 30% for years. Concerning full professors, the proportion of women accounts for only 10%, with urology coming last among all specialties at just 3% [7]. Women complete specialization less frequently as opposed to their male counterparts [8]. To overcome this trend, efforts were made in recent years especially at the level of residency to fulfill the demand for structured postgraduate training and for opportunities to achieve compatibility of family and career even in times of poor flexibility [9, 10].

A structured ongoing training beyond residency is lacking so far in Germany. However, the position of senior physician remains an attractive career goal. According to a survey study among German residents in urology, 40% declared this position to be a desirable option [11] which is associated with a variety of future development potentialities. For some physicians, the position of senior physician represents the definitive career goal, while others perceive this position as an essential interim stage on the way to become head of a department or full professor. In addition, some senior physicians try to achieve certain development objectives to meet specific requirements of industrial companies or prior to settling down in a private practice.

To ensure functionality of urologic departments in the future, it will be essential to recruit enough senior staff members for leading positions. The high proportion of female residents may represent one opportunity to overcome the threatening shortage of senior staff members if a rise in the proportion of female senior physicians will be achieved as well. To date, there are no reliable data on gender-specific variations among senior urology physicians in terms of professional and personal aspects. However, this information is urgently needed to enable future-oriented, gender-specific approaches designed to ensure an increase in the attractiveness of leading positions in this specialty in times of worsening shortage of specialists in urology. Therefore, a Web-based survey containing 55 items was established to perform a cross-sectional study which was then forwarded to senior physicians at German centers using the mailing list of the German Society of Urology.

The objective of this study was to analyze gender-specific professional perspectives, professional and personal settings, specific job-related activities and individual professional goals among German senior urology physicians.

Material and Methods

Design of the Survey and Study Population

Upon an initiative of the board of the German Society of Urology (DGU), the “working group of senior physicians in German urology” was constituted in October 2018. The aim of this group is to support senior urology physicians in the course of their career and to offer assistance in professional questions or difficulties. The first activity of this working group was to establish a survey designed to capture data on professional perspectives, professional and personal settings, specific job-related activities, and individual professional goals. The German-language survey consisted of 55 items (single and multiple choice) and was developed as a Web-based cross-sectional study. The survey was tested for content comprehensibility prior to the study by performing 10 structured interviews.

Items of the survey were then transcribed into a SurveyMonkey® (Palo Alto, CA, USA) and an appropriate link was sent to the heads of all departments of urology in Germany using a mailing list of the German Society of Urology in February 2019 in combination with a cover letter explaining the project and requesting to forward the link to all senior physicians of each given center.

This procedure was repeated once after a time span of 4 weeks. The otherwise anonymized SurveyMonkey® was programmed to block repetitive access using the same internet protocol address. After a period of 8 weeks, SurveyMonkey® was closed on April 15, 2019 hereby terminating data collection. To ensure data quality, only surveys with a minimum of 75% evaluable items ($\geq 42/55$) were included into the analysis. Therefore, 7 surveys were excluded due to insufficient completion resulting in a study population of 192 senior urology physicians.

The survey, the application, and the recruitment letter were presented to the Institutional Review Board at the University of Regensburg, and the project was granted exempt status.

Development and analysis of the survey, interpretation of results, and manuscript writing were performed according to the criteria listed in the STROBE checklist (Strengthening the Reporting of Observational Studies in Epidemiology) [12]. The only deviation from the STROBE statements was the fact that no response rate was reported as the actual sample size could not have been estimated due to the study design.

Study Goals and Statistical Analysis

The objective of this study was to analyze gender-specific variations concerning the different items. Depending on characteristic attributes, Fisher's exact test (2×2) or Pearson's χ^2 test ($>2 \times 2$) was applied. For the analysis of gender-specific variations concerning the items with an ordinal scale or a 5-point Likert scale, a two-sample t test was used after testing for standard distribution (by the Shapiro-Wilk test).

Respecting the prerequisites of the model, especially the collinearity of predictors, the independent impact of gender on 25 pre-specified endpoints was tested by various bootstrap-adjusted multiple logistic regression models. The gender variable was adjusted with the following 6 criteria in each multivariate model: (1) status of the center (dichotomized in university vs. others), (2) family status (dichotomized in married vs. others), (3) position (dichotomized in chief senior physician or managing senior physician vs. others), (4) extent of active working hours (dichotomized in full-time vs. others), number of children (continuously), and time span of holding the position of senior physician (categorized in intervals of 4 years). However, presentation of results was reduced to the impact of gender on each endpoint. Internal validity of models was evaluated by bootstrapping with 1,000 resamples. Significance level was set to $p < 0.05$. Whenever available, two-sided tests were applied. All statistical analyses were performed using SPSS® Version 25 (IBM, Armonk, NY, USA).

Results

Univariate Gender-Specific Analysis of Personal, Position-Linked, and Professional Criteria (Table 1)

A total of 192 surveys were evaluable with a proportion of female participants of 15.1% ($n = 29$). Significantly more women as opposed to men were aged <39 years at the time of the survey (48.3 vs. 27.0%, $p = 0.028$). Female senior physicians were unmarried significantly more frequently (58.6 vs. 12.9%) and had no children (48.3 vs. 17.2%) or less children than their male colleagues (all $p < 0.001$).

Although no significant difference in terms of time span of holding the position of senior physician was observed between sexes ($p = 0.080$), male participants held the position of a chief senior physician or managing senior physician significantly more often (35.4 vs. 10.3%, $p = 0.003$).

Mean weekly active working time varied between 41 and 56 h in 45.3% and between 57 and 72 h in 40.6% of participating senior physicians with no significant gender-specific difference ($p = 0.069$). 41.4% of female senior physicians and 10.4% of male senior physicians stated that they worked part-time ($p = 0.003$).

The majority of participants (51.3%) was on call between 5 and 8 times a month with male senior physicians being significantly more often on call ($p = 0.001$). About a quarter of female senior physicians did not render any on-call duties.

In terms of facultative additional professional qualifications and the highest academic degree, no significant gender-specific differences were observed.

Analysis of the self-assessment of professional priorities revealed that male senior physicians declared surgical interventions significantly more frequently ($p = 0.014$), while female senior physicians specified diagnostic work-up ($p = 0.015$) and discussions with patients ($p = 0.015$) more often in this context.

Univariate Gender-Specific Analysis of Statements Concerning the Surgical Spectrum (Table 2)

Except for laser enucleation of the prostate ($p = 0.132$), retroperitoneal lymphadenectomy/residual tumor resection ($p = 0.075$), and tape procedures for urinary stress incontinence ($p = 0.962$), male senior physicians self-assessed themselves as autonomously safe in performing all prespecified index procedures significantly more frequently as opposed to their female counterparts. Regarding surgical subdomains, male participants self-assessed themselves autonomously safe more often in laparoscopic ($p = 0.012$), open ($p < 0.001$), and endourologic surgery ($p < 0.001$) with no significant differences concerning robotic ($p = 0.233$) and plastic-reconstructive surgery ($p = 0.310$).

Univariate Gender-Specific Analysis of Satisfaction with Various Personal and Professional Aspects (Table 3)

Male senior physicians presented themselves significantly more satisfied with their surgical expertise (very satisfied or satisfied in 63.7 vs. 40.7%, $p = 0.004$). Female senior physicians stated significantly more often to be at least satisfied with the therapy spectrum of their department (85.2 vs. 79.9%, $p = 0.036$). No significant gender-specific difference could be demonstrated in another 15 items concerning satisfaction. 59.3% of female and 66.9% of male participants were very satisfied or satisfied with their individual professional perspectives ($p = 0.613$).

Table 1. Descriptive analysis of personal, professional, and position-linked items (separated by sex)

Criteria	Whole cohort (<i>n</i> = 192), <i>n</i> (%)	Female (<i>n</i> = 29), <i>n</i> (%)	Male (<i>n</i> = 163), <i>n</i> (%)	<i>p</i> value
Age (<i>n</i> = 192)				0.081
<33 years	9 (4.7)	2 (6.9)	7 (4.3)	
<33–38 years	49 (25.5)	12 (41.4)	37 (22.7)	
<39–44 years	51 (26.6)	5 (17.2)	46 (28.2)	
<45–50 years	36 (18.8)	4 (13.8)	32 (19.6)	
<51–56 years	34 (17.7)	6 (20.7)	28 (17.2)	
<57–62 years	10 (5.2)	0	10 (6.1)	
>62 years	3 (1.6)	0	3 (1.8)	
Family status (<i>n</i> = 192)				<0.001
Unmarried	38 (19.8)	17 (58.6)	21 (12.9)	
Married	145 (75.5)	10 (34.5)	135 (82.8)	
Divorced	9 (4.7)	2 (6.9)	7 (4.3)	
Number of children (<i>n</i> = 192)				<0.001
No children	42 (21.9)	14 (48.3)	28 (17.2)	
1	34 (17.7)	9 (31.0)	25 (15.3)	
2	74 (38.5)	5 (17.2)	69 (42.3)	
3	31 (16.1)	1 (3.4)	30 (18.4)	
4	11 (5.7)	0	11 (6.7)	
Position of senior physician (<i>n</i> = 191)				0.003
Chief senior physician	54 (28.3)	3 (10.3)	51 (31.5)	
Managing senior physician	8 (4.2)	0	8 (4.9)	
Senior physician	115 (60.2)	20 (69.0)	95 (58.6)	
Upcoming senior physician	14 (7.3)	6 (20.7)	8 (4.9)	
Time span of holding the position of senior physician (<i>n</i> = 192)				0.080
0–3 years	67 (34.9)	17 (58.6)	50 (30.7)	
<4–7 years	40 (20.8)	4 (13.8)	36 (22.1)	
<8–11 years	37 (19.3)	2 (6.9)	35 (21.5)	
<12–15 years	25 (13.0)	3 (10.3)	22 (13.5)	
<16–19 years	12 (6.3)	1 (3.4)	11 (6.7)	
>19 years	11 (5.7)	2 (6.9)	9 (5.5)	
Number of on-call duties per month (<i>n</i> = 191)				0.001
0	7 (3.7)	7 (24.1)	0	
<1–4	12 (6.3)	2 (6.9)	10 (6.2)	
<5–8	98 (51.3)	13 (44.8)	85 (52.5)	
<9–12	60 (31.4)	4 (13.8)	56 (34.6)	
<13–16	11 (5.8)	2 (6.9)	9 (5.6)	
>16	3 (1.6)	1 (3.4)	2 (1.2)	
Mean active working hours per week (<i>n</i> = 192)				0.069
≤40	14 (7.3)	6 (20.7)	8 (4.9)	
<41–56	87 (45.3)	11 (37.9)	76 (46.6)	
<57–72	78 (40.6)	11 (37.9)	67 (41.1)	
<73–87	13 (6.8)	1 (3.4)	12 (7.4)	
Compensation for additional active working hours (<i>n</i> = 192)*				
Compensatory time off	109 (56.8)	17 (58.6)	92 (56.4)	1.000
Financial compensation	78 (40.6)	9 (31.0)	69 (42.3)	0.308
No compensation	51 (26.6)	10 (34.5)	41 (25.2)	0.361

Table 1 (continued)

Criteria	Whole cohort (<i>n</i> = 192), <i>n</i> (%)	Female (<i>n</i> = 29), <i>n</i> (%)	Male (<i>n</i> = 163), <i>n</i> (%)	<i>p</i> value
Extent of contractual active working hours (<i>n</i> = 192)				0.003
Full-time	163 (84.9)	17 (58.6)	146 (89.6)	
90% part-time	3 (1.6)	1 (3.4)	2 (1.2)	
80% part-time	14 (7.3)	7 (24.1)	7 (4.3)	
70% part-time	2 (1.0)	1 (3.4)	1 (0.6)	
60% part-time	6 (3.1)	3 (10.3)	3 (1.8)	
50% part-time	1 (0.5)	0	1 (0.6)	
<50% part-time	3 (1.6)	0	3 (1.8)	
Facultative additional professional qualifications (<i>n</i> = 192)*				
FEBU	49 (25.5)	7 (24.1)	42 (25.8)	1.000
Systemic medical tumor therapy	93 (48.4)	11 (37.9)	82 (50.3)	0.234
Andrology	24 (12.5)	1 (3.4)	23 (14.1)	0.135
Specialized urologic surgery	18 (9.4)	1 (3.4)	17 (10.4)	0.319
Diagnostic X-ray of the urinary system	128 (66.7)	17 (58.6)	111 (68.1)	0.393
Specialty-linked genetic counseling	29 (15.1)	3 (10.3)	26 (16.0)	0.579
Palliative medicine	16 (8.3)	2 (6.9)	14 (8.6)	1.000
Psychosomatic basic support	18 (9.4)	2 (6.9)	16 (9.8)	1.000
Acupuncture	2 (1.0)	1 (3.4)	1 (0.6)	0.280
Master of business administration (MBA)	5 (2.6)	1 (3.4)	4 (2.5)	0.563
Medical quality management	11 (5.7)	1 (3.4)	10 (6.1)	1.000
Antibiotic stewardship	10 (5.2)	2 (6.9)	8 (4.9)	0.649
Proctology	1 (0.5)	0	1 (0.6)	1.000
Highest academic degree (<i>n</i> = 192)				
Professor	5 (2.6)	1 (3.4)	4 (2.5)	0.563
Habilitation	22 (11.5)	3 (10.3)	19 (11.7)	1.000
Dr. med.	110 (58.9)	19 (65.5)	91 (55.8)	0.416
Dipl.-Med.	1 (0.5)	0	1 (0.6)	1.000
No academic degree	54 (28.1)	6 (20.7)	48 (29.4)	0.379
Professional priorities (<i>n</i> = 192)*				
Surgical interventions	168 (87.5)	21 (72.4)	147 (90.2)	0.014
Conservative therapy	90 (46.9)	18 (62.1)	72 (44.2)	0.105
Diagnostics	91 (47.4)	20 (69.0)	71 (43.6)	0.015
Discussion with patients	79 (41.1)	18 (62.1)	61 (37.4)	0.015
Documentation	68 (35.4)	15 (51.7)	53 (32.5)	0.058
Administrative activities	90 (46.9)	17 (58.6)	73 (44.8)	0.226
Research activities	25 (13.0)	3 (10.3)	22 (13.5)	0.773
Status of center (<i>n</i> = 192)				0.866
Standard care	40 (20.8)	5 (17.2)	35 (21.5)	
Hospital center	45 (23.4)	6 (20.7)	39 (23.9)	
Maximum care hospital center	46 (24.0)	7 (24.1)	39 (23.9)	
University center	61 (31.8)	11 (37.9)	50 (30.7)	
Hospital operator (<i>n</i> = 192)				0.911
Public	119 (62.0)	19 (65.5)	100 (61.3)	
Non-profit-organization/church (confessional)	59 (30.7)	8 (27.6)	51 (31.3)	
Private sector	14 (7.3)	2 (6.9)	12 (7.4)	

* Multiple answers possible.

Table 2. Various aspects concerning the surgical spectrum (separated by sex)

Criteria	Whole cohort (<i>n</i> = 192), <i>n</i> (%)	Female (<i>n</i> = 29), <i>n</i> (%)	Male (<i>n</i> = 163), <i>n</i> (%)	<i>p</i> value
Surgical spectrum: radical prostatectomy (<i>n</i> = 189)				0.002
Autonomously safe	74 (39.2)	5 (18.5)	69 (42.6)	
Performed with backup	31 (16.4)	1 (3.7)	30 (18.5)	
Not autonomously safe (at most partial aspects performed)	19 (10.1)	5 (18.5)	14 (8.6)	
Not part of the own surgical spectrum	65 (34.4)	16 (59.3)	49 (30.2)	
Surgical spectrum: kidney surgery with transabdominal approach (<i>n</i> = 189)				<0.001
Autonomously safe	95 (50.3)	3 (11.1)	92 (56.8)	
Performed with backup	36 (19.0)	7 (25.9)	29 (17.9)	
Not autonomously safe (at most partial aspects performed)	27 (14.3)	4 (14.8)	23 (14.2)	
Not part of the own surgical spectrum	31 (16.4)	13 (48.1)	18 (11.1)	
Surgical spectrum: kidney surgery with lumbar approach (<i>n</i> = 189)				<0.001
Autonomously safe	122 (64.6)	8 (29.6)	114 (70.4)	
Performed with backup	27 (14.3)	6 (22.2)	21 (13.0)	
Not autonomously safe (at most partial aspects performed)	23 (12.2)	4 (14.8)	19 (11.7)	
Not part of the own surgical spectrum	17 (9.0)	9 (33.3)	8 (4.9)	
Surgical spectrum: radical cystectomy (<i>n</i> = 189)				<0.001
Autonomously safe	78 (41.5)	3 (11.1)	75 (46.6)	
Performed with backup	35 (18.6)	4 (14.8)	31 (19.3)	
Not autonomously safe (at most partial aspects performed)	22 (11.7)	4 (14.8)	18 (11.2)	
Not part of the own surgical spectrum	53 (28.2)	16 (59.3)	37 (23.0)	
Surgical spectrum: urinary diversion-ileal neobladder (<i>n</i> = 189)				0.005
Autonomously safe	71 (37.6)	4 (14.8)	67 (41.4)	
Performed with backup	23 (12.2)	1 (3.7)	22 (13.6)	
Not autonomously safe (at most partial aspects performed)	27 (14.3)	5 (18.5)	22 (13.6)	
Not part of the own surgical spectrum	68 (36.0)	17 (63.0)	51 (31.5)	
Surgical spectrum: urinary diversion-pouch (<i>n</i> = 189)				0.035
Autonomously safe	32 (17.3)	1 (3.7)	31 (19.6)	
Performed with backup	24 (13.0)	1 (3.7)	23 (14.6)	
Not autonomously safe (at most partial aspects performed)	28 (15.1)	4 (14.8)	24 (15.2)	
Not part of the own surgical spectrum	101 (54.6)	21 (77.8)	80 (50.6)	
Surgical spectrum: urinary diversion-ileal conduit (<i>n</i> = 189)				<0.001
Autonomously safe	101 (53.4)	4 (14.8)	97 (59.9)	
Performed with backup	24 (12.7)	6 (22.2)	18 (11.1)	
Not autonomously safe (at most partial aspects performed)	15 (7.9)	3 (11.1)	12 (7.4)	
Not part of the own surgical spectrum	49 (25.9)	14 (51.9)	35 (21.6)	
Surgical spectrum: percutaneous nephrolithotomy (<i>n</i> = 189)				<0.001
Autonomously safe	122 (64.9)	7 (25.9)	115 (71.0)	
Performed with backup	30 (15.9)	5 (18.5)	25 (15.4)	
Not autonomously safe (at most partial aspects performed)	16 (8.5)	5 (18.5)	11 (6.8)	
Not part of the own surgical spectrum	21 (11.1)	10 (37.0)	11 (6.8)	
Surgical spectrum: laser enucleation of the prostate (<i>n</i> = 188)				0.132
Autonomously safe	48 (25.5)	2 (7.4)	40 (28.6)	
Performed with backup	11 (5.9)	2 (7.4)	9 (5.6)	
Not autonomously safe (at most partial aspects performed)	14 (7.4)	2 (7.4)	12 (7.5)	
Not part of the own surgical spectrum	115 (61.2)	21 (77.8)	94 (58.4)	

Table 2 (continued)

Criteria	Whole cohort (n = 192), n (%)	Female (n = 29), n (%)	Male (n = 163), n (%)	p value
Surgical spectrum: retroperitoneal lymph node dissection/residual tumor resection (n = 187)				0.075
Autonomously safe	46 (24.6)	3 (11.1)	43 (26.9)	
Performed with backup	26 (13.9)	2 (7.4)	24 (15.0)	
Not autonomously safe (at most partial aspects performed)	23 (13.9)	3 (11.1)	23 (14.4)	
Not part of the own surgical spectrum	89 (47.6)	19 (70.4)	70 (43.8)	
Surgical spectrum: urethroplasty (n = 188)				0.040
Autonomously safe	37 (19.7)	4 (14.8)	33 (20.5)	
Performed with backup	30 (16.0)	3 (11.1)	27 (16.8)	
Not autonomously safe (at most partial aspects performed)	25 (13.3)	0	25 (15.5)	
Not part of the own surgical spectrum	96 (51.1)	20 (74.1)	76 (47.2)	
Surgical spectrum: tapes for urinary incontinence (n = 189)				0.962
Autonomously safe	72 (38.3)	10 (37.0)	62 (38.5)	
Performed with backup	30 (16.0)	4 (14.8)	26 (16.1)	
Not autonomously safe (at most partial aspects performed)	16 (8.5)	3 (11.1)	13 (8.1)	
Not part of the own surgical spectrum	70 (37.2)	10 (37.0)	60 (37.3)	
Surgical spectrum: robotic surgery (n = 186)				0.233
Autonomously safe	23 (12.4)	1 (3.8)	22 (13.8)	
Performed with backup	5 (2.7)	0	5 (3.1)	
Not autonomously safe (at most partial aspects performed)	16 (8.6)	4 (15.4)	12 (7.5)	
Not part of the own surgical spectrum	142 (76.3)	21 (80.8)	121 (75.6)	
Surgical spectrum: laparoscopic surgery (n = 188)				0.012
Autonomously safe	47 (25.0)	1 (3.7)	46 (28.6)	
Performed with backup	29 (15.4)	6 (22.2)	23 (14.3)	
Not autonomously safe (at most partial aspects performed)	27 (14.4)	2 (7.4)	25 (15.5)	
Not part of the own surgical spectrum	85 (45.2)	18 (66.7)	67 (41.6)	
Surgical spectrum: open surgery (n = 188)				<0.001
Autonomously safe	112 (59.6)	6 (22.2)	106 (65.8)	
Performed with backup	41 (21.8)	7 (25.9)	34 (21.1)	
Not autonomously safe (at most partial aspects performed)	20 (10.6)	6 (22.2)	14 (8.7)	
Not part of the own surgical spectrum	15 (8.0)	8 (29.6)	7 (4.3)	
Surgical spectrum: endourologic surgery (n = 189)				<0.001
Autonomously safe	174 (92.1)	18 (66.7)	156 (96.3)	
Performed with backup	9 (4.8)	6 (22.2)	3 (1.9)	
Not autonomously safe (at most partial aspects performed)	0	0	0	
Not part of the own surgical spectrum	6 (3.2)	3 (11.1)	3 (1.9)	
Surgical spectrum: plastic-reconstructive surgery (n = 187)				0.310
Autonomously safe	48 (25.7)	3 (11.5)	45 (28.0)	
Performed with backup	49 (26.2)	7 (26.9)	42 (26.1)	
Not autonomously safe (at most partial aspects performed)	31 (16.6)	6 (23.1)	25 (15.5)	
Not part of the own surgical spectrum	59 (31.6)	10 (38.5)	49 (30.4)	

Concerning their choice of urology as field of specialization, 96.2 and 91.3% of female and male senior physicians selected these 2 answer categories, respectively ($p = 0.801$). 65.4 and 78.5% of female and male participants ($p = 0.495$) showed to be at least satisfied with their managing competence.

Univariate Gender-Specific Analysis of Various Aspects in the Context of Career Management and the Assessment of the Urologic Specialty and the Position of Senior Physician (Table 4)

Ninety-five percent of the study population would choose urology again as their field of specialization if

Table 3. Individual satisfaction with various aspects of personal and professional settings (separated by sex)

Criteria	Whole cohort (<i>n</i> = 192), <i>n</i> (%)	Female (<i>n</i> = 29), <i>n</i> (%)	Male (<i>n</i> = 163), <i>n</i> (%)	<i>p</i> value
Satisfaction with choice of urology as field of specialization (<i>n</i> = 176)				0.801
Very unsatisfied	0	0	0	
Unsatisfied	9 (5.1)	1 (3.8)	8 (5.3)	
Indifferent	5 (2.8)	0	5 (3.3)	
Satisfied	43 (24.4)	8 (30.8)	35 (23.3)	
Very satisfied	119 (67.6)	17 (65.4)	102 (68.0)	
Satisfaction with current professional activities (<i>n</i> = 180)				0.937
Very unsatisfied	14 (7.8)	1 (3.7)	13 (8.5)	
Unsatisfied	6 (3.3)	1 (3.7)	5 (3.3)	
Indifferent	27 (15.0)	5 (18.5)	22 (14.4)	
Satisfied	102 (56.7)	18 (66.7)	84 (54.9)	
Very satisfied	31 (17.2)	2 (7.4)	29 (19.0)	
Satisfaction with own surgical expertise (<i>n</i> = 181)				0.004
Very unsatisfied	29 (16.0)	9 (33.3)	20 (13.0)	
Unsatisfied	9 (5.0)	2 (7.4)	7 (4.5)	
Indifferent	34 (18.8)	5 (18.5)	29 (18.8)	
Satisfied	74 (40.9)	8 (29.6)	66 (42.9)	
Very satisfied	35 (19.3)	3 (11.1)	32 (20.8)	
Satisfaction with the appreciation shown by senior clinical staff members (<i>n</i> = 182)				0.725
Very unsatisfied	16 (8.8)	2 (7.4)	14 (9.0)	
Unsatisfied	8 (4.4)	1 (3.7)	7 (4.5)	
Indifferent	34 (18.7)	7 (25.9)	27 (17.4)	
Satisfied	73 (40.1)	12 (44.4)	61 (39.4)	
Very satisfied	51 (28.0)	5 (18.5)	46 (29.7)	
Satisfaction with the appreciation shown by managing staff members of the hospital (<i>n</i> = 182)				0.699
Very unsatisfied	44 (24.2)	8 (29.6)	36 (23.2)	
Unsatisfied	29 (15.9)	1 (3.7)	28 (18.1)	
Indifferent	47 (25.8)	8 (29.6)	39 (25.2)	
Satisfied	50 (27.5)	8 (29.6)	42 (27.1)	
Very satisfied	12 (6.6)	2 (7.4)	10 (6.5)	
Satisfaction with the appreciation shown by their own patients (<i>n</i> = 180)				0.764
Very unsatisfied	4 (2.2)	0	4 (2.6)	
Unsatisfied	3 (1.7)	0	3 (1.9)	
Indifferent	13 (7.2)	1 (3.8)	12 (7.8)	
Satisfied	90 (50.0)	18 (69.2)	72 (46.8)	
Very satisfied	70 (38.9)	7 (26.9)	63 (40.9)	
Satisfaction with own managing competence (<i>n</i> = 180)				0.495
Very unsatisfied	5 (2.8)	1 (3.8)	4 (2.6)	
Unsatisfied	3 (1.7)	0	3 (1.9)	
Indifferent	34 (18.9)	8 (30.8)	26 (16.9)	
Satisfied	109 (60.6)	13 (50.0)	96 (62.3)	
Very satisfied	29 (16.1)	4 (15.4)	25 (16.2)	

Table 3 (continued)

Criteria	Whole cohort (<i>n</i> = 192), <i>n</i> (%)	Female (<i>n</i> = 29), <i>n</i> (%)	Male (<i>n</i> = 163), <i>n</i> (%)	<i>p</i> value
Satisfaction with the available time for training of residents and specialists (<i>n</i> = 181)				0.761
Very unsatisfied	48 (26.5)	10 (37.0)	38 (24.7)	
Unsatisfied	16 (8.8)	0	16 (10.4)	
Indifferent	56 (30.9)	6 (22.2)	50 (32.5)	
Satisfied	57 (31.5)	11 (40.7)	46 (29.9)	
Very satisfied	4 (2.2)	0	4 (2.6)	
Satisfaction with the therapy spectrum of own department (<i>n</i> = 181)				0.036
Very unsatisfied	10 (5.5)	0	10 (6.5)	
Unsatisfied	2 (1.1)	0	2 (1.3)	
Indifferent	23 (12.7)	4 (14.8)	19 (12.3)	
Satisfied	90 (49.7)	9 (33.3)	81 (52.6)	
Very satisfied	56 (30.9)	14 (51.9)	42 (27.3)	
Satisfaction with current salary (<i>n</i> = 181)				0.862
Very unsatisfied	23 (12.7)	5 (18.5)	18 (11.7)	
Unsatisfied	10 (5.5)	0	10 (6.5)	
Indifferent	40 (22.1)	2 (7.4)	38 (24.7)	
Satisfied	95 (52.5)	19 (70.4)	76 (49.4)	
Very satisfied	13 (7.2)	1 (3.7)	12 (7.8)	
Satisfaction with the own individual professional perspectives (<i>n</i> = 181)				0.613
Very unsatisfied	13 (7.2)	2 (7.4)	11 (7.1)	
Unsatisfied	8 (4.4)	1 (3.7)	7 (4.5)	
Indifferent	41 (22.7)	8 (29.6)	33 (21.4)	
Satisfied	95 (52.5)	14 (51.9)	81 (52.6)	
Very satisfied	24 (13.3)	2 (7.4)	22 (14.3)	
Satisfaction with individual options for further postgraduate education (<i>n</i> = 181)				0.862
Very unsatisfied	30 (16.6)	4 (14.8)	26 (16.9)	
Unsatisfied	5 (2.8)	0	5 (3.2)	
Indifferent	47 (26.0)	8 (29.6)	39 (25.3)	
Satisfied	80 (44.2)	14 (51.9)	66 (42.9)	
Very satisfied	19 (10.5)	1 (3.7)	18 (11.7)	
Satisfaction with work-life balance (<i>n</i> = 178)				0.865
Very unsatisfied	46 (25.8)	8 (29.6)	38 (25.2)	
Unsatisfied	20 (11.2)	4 (14.8)	16 (10.6)	
Indifferent	64 (36.0)	5 (18.5)	59 (39.1)	
Satisfied	41 (23.0)	8 (29.6)	33 (21.9)	
Very satisfied	7 (3.9)	2 (7.4)	5 (3.3)	
Satisfaction with the current active working hours act (<i>n</i> = 181)				0.145
Very unsatisfied	39 (21.5)	3 (11.1)	36 (23.4)	
Unsatisfied	13 (7.2)	2 (7.4)	11 (7.1)	
Indifferent	71 (39.2)	11 (40.7)	60 (39.0)	
Satisfied	48 (26.5)	9 (33.3)	39 (25.3)	
Very satisfied	10 (5.5)	2 (7.4)	8 (5.2)	

Table 3 (continued)

Criteria	Whole cohort (<i>n</i> = 192), <i>n</i> (%)	Female (<i>n</i> = 29), <i>n</i> (%)	Male (<i>n</i> = 163), <i>n</i> (%)	<i>p</i> value
Satisfaction with the implementation of the current active working hours act in the own department (<i>n</i> = 181)				0.417
Very unsatisfied	39 (21.5)	9 (33.3)	30 (19.5)	
Unsatisfied	21 (11.6)	3 (11.1)	18 (11.7)	
Indifferent	58 (32.0)	4 (14.8)	54 (35.1)	
Satisfied	51 (28.2)	8 (29.6)	43 (27.9)	
Very satisfied	12 (6.6)	3 (11.1)	9 (5.8)	
Satisfaction with the available time for the individual professional development (<i>n</i> = 181)				0.208
Very unsatisfied	53 (29.3)	12 (44.4)	41 (26.6)	
Unsatisfied	15 (8.3)	0	15 (9.7)	
Indifferent	64 (35.4)	10 (37.0)	54 (35.1)	
Satisfied	42 (23.2)	4 (14.8)	38 (24.7)	
Very satisfied	7 (3.9)	1 (3.7)	6 (3.9)	
Satisfaction with the available time for private affairs (<i>n</i> = 181)				0.309
Very unsatisfied	67 (37.0)	8 (29.6)	59 (38.3)	
Unsatisfied	28 (15.5)	5 (18.5)	23 (14.9)	
Indifferent	50 (27.6)	6 (22.2)	44 (28.6)	
Satisfied	31 (17.1)	6 (22.2)	25 (16.2)	
Very satisfied	5 (2.8)	2 (7.4)	3 (1.9)	

asked again – with no significant gender-specific difference ($p = 0.136$). 85% of participants tend to stay in a hospital throughout their future career, and 81.2% rate the position of senior physician as a desirable career goal (comparing sexes: $p = 0.999$ and $p = 0.220$, respectively). As opposed to their female counterparts, male senior physicians aim to become head of a non-university department significantly more frequently (27 vs. 6.9%, $p = 0.018$). 70.4 and 60.3% of female and male participants, respectively, had no specific postgraduate education preparing them for managing and executing tasks ($p = 0.423$).

Multivariate Gender-Specific Analysis of Various Prespecified Endpoints (Table 5)

Twenty-five endpoints were prespecified prior to study initiation, at which gender did not demonstrate any significant impact in 21 cases (84%; Table 5). Male senior physicians self-assessed themselves as autonomously safe concerning laparoscopic (OR 7.90, $p = 0.036$), open (OR 8.05, $p = 0.004$), and endourologic surgery (OR 13.72, $p = 0.001$) significantly more frequently as opposed to their female counterparts. Male senior physicians stated 7 times more frequently that they were running for the position of head of department or full professor (OR 7.28, $p = 0.007$).

Discussion

In the light of the ongoing demographic change, German healthcare system in general and urology in particular are subject to a continuous transformation. In line with other surgical specialties, urologic departments were dominated by male senior staff members almost exclusively until a few decades ago. To secure the future of our specialty, it seems essential to fill senior positions with a higher proportion of female urologists in the future. In this context, it seems promising that the proportion of women in the field of urology has increased by 7.5% in 2018 compared to the preceding year [8], although this fact must still be transferred to senior staff members as well. For future orientation of the urologic specialty, it is therefore important to know the needs and perspectives of future female leading staff members as they might differ from the ones of their male counterparts. Reliable data on gender-specific professional perspectives, professional and personal settings, specific job-related activities, and individual professional goals of German urologic senior physicians are lacking. The objective of this study was to generate these data for the first time.

Our results may represent the basis to various discussions on the systemic setup of the actual healthcare sys-

Table 4. Various aspects concerning career goals and assessment of the urologic specialty and the position of senior physician (separated by sex)

Criteria	Whole cohort (<i>n</i> = 192), <i>n</i> (%)	Female (<i>n</i> = 29), <i>n</i> (%)	Male (<i>n</i> = 163), <i>n</i> (%)	<i>p</i> value
Career goal (<i>n</i> = 192)*				
Full professor	9 (4.7)	0	9 (5.5)	0.360
Head of a non-university department	46 (24.0)	2 (6.9)	44 (27.0)	0.018
Managing or supervising senior physician	71 (37.0)	10 (34.5)	61 (37.4)	0.837
Senior physician	40 (20.8)	10 (34.5)	30 (18.4)	0.079
Outpatient medical office	30 (15.6)	2 (6.9)	28 (17.2)	0.264
Industry	1 (0.5)	0	1 (0.6)	1.000
Another career goal	10 (5.2)	1 (3.4)	9 (5.5)	1.000
No definitive career goal	22 (11.5)	4 (13.8)	18 (11.0)	0.751
On the way to habilitation (<i>n</i> = 179)				
Yes	26 (14.5)	5 (18.5)	21 (13.8)	0.936
No	104 (58.1)	15 (55.6)	89 (58.6)	
Not decided yet	22 (12.3)	3 (11.1)	19 (12.5)	
Already habilitated	27 (15.1)	4 (14.8)	23 (15.1)	
Would choose urology again as field of specialization (<i>n</i> = 180)				
	171 (95.0)	24 (88.9)	147 (96.1)	0.136
Tendency to stay in a hospital along the future career (<i>n</i> = 180)				
Yes	153 (85.0)	23 (85.2)	130 (85.0)	0.999
No	20 (11.1)	3 (11.1)	17 (11.1)	
Not intended	7 (3.9)	1 (3.7)	6 (3.9)	
Senior physician in urology represents a desirable career goal (<i>n</i> = 181)				
Yes	147 (81.2)	25 (92.6)	122 (79.2)	0.220
No	9 (5.0)	0	9 (5.8)	
As an interim stage only	25 (13.8)	2 (7.4)	23 (14.9)	
Had specific postgraduate education concerning management and executing tasks (<i>n</i> = 181)				
No (was not offered)	109 (60.2)	19 (70.4)	90 (58.4)	0.423
No (was offered but not attended)	3 (1.7)	0	3 (1.9)	
Yes (organized by the hospital)	28 (15.5)	5 (18.5)	23 (14.9)	
Yes (organized individually)	15 (8.3)	0	15 (9.7)	
Yes (organized by the hospital and individually)	20 (11.0)	3 (11.1)	17 (11.0)	
Yes (scheduled but not yet attended)	6 (3.3)	0	6 (3.9)	
* Multiple answers possible.				

tem. Fortunately, 92% of senior urology physicians participating in the study are at least satisfied with their choice of field of specialization, and only 5% do not assess the position of senior physician a desirable career goal (not even as an essential interim stage). Although no significant gender-specific difference in terms of the time span of holding the position of senior physician was observed ($p = 0.080$), male participants held the position of

a chief senior physician or managing senior physician significantly more often (35.4 vs. 10.3%, $p = 0.003$).

Descriptive analysis revealed that female senior physicians were aged <39 years significantly more often (27 vs. 48.3%, $p = 0.028$). However, no significant difference in terms of age was observed when all age categories were considered ($p = 0.081$). Nevertheless, female senior physicians were unmarried significantly more frequently (58.6

Table 5. Impact of gender on various predefined endpoints based on results of multivariate logistic regression models

Endpoints	OR (95% CI), male (Ref.: female)	<i>p</i> value	<i>p</i> ^{BS}
Number of on-call duties per month 9+ (vs. a maximum of 8)	1.98 (0.66–5.97)	0.224	0.248
Mean active working hours per week 57 h+ (vs. a maximum of 56 h)	0.86 (0.30–2.49)	0.777	0.782
Holding an academic degree (vs. no academic degree)	0.43 (0.13–1.42)	0.166	0.197
Habilitated or on the way to habilitation (vs. others)	0.37 (0.06–2.49)	0.307	0.365
Autonomously safe concerning robotic surgery (vs. other options)	1.50 (0.15–14.62)	0.729	0.431
Autonomously safe concerning laparoscopic (vs. other options)	7.90 (0.95–65.97)	0.056	0.036
Autonomously safe concerning open surgery (vs. other options)	8.05 (1.99–32.56)	0.003	0.004
Autonomously safe concerning endo-urologic surgery (vs. other options)	13.72 (2.83–66.43)	0.001	0.001
Autonomously safe concerning plastic-reconstructive surgery (vs. other options)	3.83 (0.82–17.97)	0.088	0.076
(Very) satisfied with choice of urology as field of specialization (vs. other options)	0.27 (0.03–2.74)	0.270	0.155
(Very) satisfied with current professional activities (vs. other options)	0.83 (0.26–2.63)	0.745	0.735
(Very) satisfied with own surgical expertise (vs. other options)	1.40 (0.48–4.07)	0.538	0.491
(Very) satisfied with own managing competence (vs. other options)	1.13 (0.37–3.47)	0.837	0.839
(Very) satisfied with the therapy spectrum of own department (vs. other options)	0.35 (0.09–1.42)	0.142	0.088
(Very) satisfied with current salary (vs. other options)	0.59 (0.20–1.76)	0.343	0.367
(Very) satisfied with the own individual professional perspectives (vs. other options)	0.89 (0.31–2.54)	0.821	0.823
(Very) satisfied with individual options for further postgraduate education (vs. other options)	0.69 (0.25–1.94)	0.485	0.502
(Very) satisfied with the work-life balance (vs. other options)	1.39 (0.43–4.44)	0.583	0.591
(Very) satisfied with the current active working hours act (vs. other option)	0.65 (0.23–1.85)	0.421	0.437
(Very) satisfied with the available time for the individual professional development (vs. other options)	2.15 (0.65–7.15)	0.212	0.202
(Very) satisfied with the available time for private affairs (vs. other options)	0.96 (0.30–3.14)	0.952	0.948
Tendency to stay in a hospital along the future career (vs. other options)	0.83 (0.20–3.57)	0.807	0.809
Position of senior physician is a desirable definitive career goal (vs. other options)	0.29 (0.06–1.54)	0.146	0.075
Career goal: head of department or full professor (vs. other options)	7.28 (1.39–38.10)	0.019	0.007
Had specific postgraduate education concerning management and executing tasks (vs. other options)	1.18 (0.40–3.47)	0.758	0.741

In addition to the gender variable, each model was adjusted for the following criteria: (1) status of the center (dichotomized in university vs. others), (2) family status (dichotomized in married vs. others), (3) position (dichotomized in chief senior physician or managing senior physician vs. others), (4) extent of contractual active working hours (dichotomized in full-time vs. others), number of children (continuously) and time span of holding the position of senior physician (categorized in intervals of 4 years). BS, bootstrapping; CI, confidence interval; OR, odds ratio; Ref., referent.

vs. 12.9%) and had no children (48.3 vs. 17.2%) or less children than their male colleagues (all $p < 0.001$).

Carr et al. [13] could show that women as opposed to men postpone parenthood to avoid risk for their career perspectives significantly more often. Buddeberg-Fischer et al. [14] revealed an adverse impact of parenthood on career opportunities exclusively for women. This fact might be explained by society-triggered gender-specific stereotypes demonstrating the contemporary lack of future-oriented and emancipated role models. Generally, women are involved in educational homogametic partnerships more often [15]. In addition, women switch to work part-time at the beginning of their parenthood more frequently as opposed to their

male partners. Consistently, the present study illustrates that female senior urology physicians work part-time more often. Analyzing various careers of physicians, the Karmed study showed that career courses are particularly associated with forficate patterns as soon as women reduce their active working hours despite best qualification and motivation features [16, 17]. For the sake of the future of the urologic specialty, it seems inevitable to facilitate compatibility of family and job in the urologic field by tailoring flexible working schedules to the needs of female senior physicians. Furthermore, family-friendly measures such as the organization of childcare by the clinical centers may represent a reasonable support.

Gender-specific stereotypes also appear in the analysis of the self-assessment of professional priorities as male senior physicians declared surgical interventions as such significantly more frequently ($p = 0.014$), while female senior physicians specified diagnostic workup ($p = 0.015$) and discussions with patients ($p = 0.015$) more often in this context. Male senior physicians self-assessed themselves as autonomously safe concerning laparoscopic (OR 7.90, $p = 0.036$), open (OR 8.05, $p = 0.004$), and endourologic surgery (OR 13.72, $p = 0.001$) significantly more frequently as opposed to their female counterparts (Table 5). Accordingly, male senior physicians self-assessed themselves as autonomously safe in performing most of the prespecified index procedures significantly more frequently (Table 2). The urologic specialty offers a broad range of conservative and surgical approaches resulting in various attractive possible part-time opportunities in the future. The supposed lack of clarity and predictability may result in reduced disposition of part-time colleagues to operation theater schedules. Beside individual characteristics of surgical learning curves, self-confidence in surgical procedures will always be based on repeating training and experience resulting in routine [18]. In this regard, well-orchestrated human resources development strategies beyond residency are urgently needed providing transparency and planning certainty concerning ongoing training contents to all staff members. These efforts may be accompanied by simulator training and Web-based teaching modules. Moreover, women appear to benefit most from one-on-one teaching models [19]. Gender-specific variations should be considered when creating individual concepts for support programs starting at the completion of specialization. However, part-time working hours do not justify gender-specific differences in individual career options. For progression within a given career, a clear professional perspective might also be a decisive factor. More frequently than their female counterparts, male senior physicians seem to perceive the position of senior physician as an essential interim stage on the way to their definitive goal (head of a department or full professor).

The higher proportion of male senior physicians self-assessing themselves autonomously safe concerning surgical procedures may explain that male participants stated 7 times more frequently that they were running for the position of head of department or full professor (OR 7.28, $p = 0.007$). Urology represents a specialty associated with a broad range of surgical approaches and techniques resulting in the fact that the position of head of department is reserved for those who acquired a comprehensive surgical experience in the course of their training.

Our study has several methodic limitations that have to be considered when results are discussed. The exact amount of female and male senior physicians in German urologic centers is unknown. The invitations to participate in the survey were sent to the heads of the departments using a mailing list of the DGU. Therefore, it remains unclear, how many senior physicians were actually reached by this approach. Consequently, we cannot estimate whether the proportion of participating senior physicians is representative of this professional group and whether our results are generalizable. As a result, a top priority of the DGU working group of senior urology physicians will be the creation of an up to date nationwide mailing list comprising all senior urology physicians in cooperation with the DGU. Finally, these results are based on a cross-sectional study at one given point of time. Thus, further studies will have to elucidate which improvements may be achieved by administering appropriate actions.

Conclusion

The German healthcare system is changing. In view of the looming shortage of skilled staff members especially for senior positions within urologic departments, it seems essential to fill these senior positions by female urologists in a higher percentage to secure the future of our field. Among other measures, the somewhat rising proportion of female residents has to be transferred to senior positions in the future. To achieve this goal, data on needs and perspectives of female senior staff members in urology are urgently required. Results of this study reflect stereotypes and role expectations concerning senior urology physicians. Significant gender-specific variations were demonstrated especially in terms of professional priorities, the self-assessment of surgical expertise, and the choice of working schedules. These differences seem to be caused by systemic conditions rather than individual performance. To assure future orientation of the urologic specialty, a change of thinking among both sexes and especially among managing staff members seems necessary. Measures concerning working conditions including flexible active working hours, an emancipated empowerment within the selection process of future senior staff members also considering part-time employees for leading positions, an increase in gender-specific competence among managing staff members, and well-orchestrated human resources development strategies may help to preserve the attractiveness for senior staff members in the urologic field.

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Statement of Ethics

This study was conducted in accordance with the Declaration of Helsinki in its latest version. This article does not contain any studies with animals performed by any of the authors. Analyzed data were completely anonymized and derived from established databases with rigorous data protection measures. Hence, informed consent was not required.

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