

# Job Satisfaction Scores of Lebanese and Jordanian Nephrologists and Their Association with Age, Gender, Workload and Income

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## Research

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# Abstract

**BACKGROUND:** The main challenges that nephrologists are facing worldwide are lower income, dissatisfactory payment models, long work hours and burnout. This study aimed to identify factors associated with nephrologists' satisfaction in Lebanon and Jordan.

**METHODS:** A survey was sent to Lebanese and Jordanian nephrologists about demographics, job satisfaction (5-Likert scale), workload and reimbursement.

**RESULTS:** Sixty-seven nephrologists responded, 59 were complete. Mean age was  $46.9 \pm 12.5$  years, 39% women. Mean total job satisfaction score was  $3.39 \pm 0.45$ . Respondents reported low rates of satisfaction towards job opportunities (20%), income (25%) and administrative support (32%) and high satisfaction rates in relationship with patients (78%) and colleagues (73%). 62.7% of respondents were paid fee for service and income was significantly higher among males ( $p < 0.001$ ). Lebanese nephrologists had payment delays of 12 months and it was significantly associated with lower work-life balance ( $p = 0.038$ ). 61% of respondents worked > 30 hours weekly and 22% followed > 40 dialysis patients. Using regression analysis, older age, working > 10 hours per week and monthly income > 5000 US\$ were significantly associated with higher total job satisfaction score ( $p = 0.002, 0.004$  and  $0.028$  respectively). Satisfaction towards income was significantly lower among females ( $p < 0.024$ ). Finally, gender discrimination was significantly perceived by women ( $p < 0.001$ ).

**CONCLUSIONS:** Younger age, less workload, lower income and payment delays are associated with dissatisfaction among the surveyed nephrologists. Gender differences are significant with lower satisfaction among women. Decision makers need to address payment delays, support women and regulate students' entry to nephrology programs to avoid unemployment.

## Background

Job satisfaction is a widely used indicator of contentment at workplace. In healthcare institutions, it helps assess the well-being and motivation of healthcare providers [1, 2]. Satisfaction of physicians has been shown to be associated with better productivity and improved quality of care [3, 4]. In addition, physician's well-being can enhance patients' satisfaction and adherence to therapy [3, 4]. This has been clearly shown in a recent systematic review that evaluated the impact of physicians' well-being on the quality of care offered to patients [3]. Ultimately, the fulfillment of physicians and patients will contribute to the amelioration of health outcomes [5].

Among all physicians, nephrologists are the most entitled to follow the same chronic patients on the long term. Worldwide, nephrologists are mainly taking care of chronic dialysis patients and to a lesser degree of kidney transplant patients. The job satisfaction of nephrologists may be dependent on several factors and a huge interest emerged in the last years towards strategies that can help preventing nephrologists' emotional exhaustion and burnout [6]. The main challenges that nephrologists are facing worldwide are lower income compared to other specialties, dissatisfactory payment models, long work hours and

working in different sites [6]. A Japanese survey showed a high dissatisfaction of dialysis healthcare workers secondary to poor salaries and welfare conditions [7]. A survey of US adult nephrology fellows regarding their career choice showed a high rate of dissatisfaction associated with long work hours and low income [8, 9]. Moreover, in the last decade and in several countries, there has been an increased governmental intrusion into nephrologists' daily practice through restrictive regulations [6].

In the Middle-East, nephrologists' job satisfaction has never been studied. Factors enhancing their satisfaction may be different between a country and another depending on the number of patients, reimbursement schemes and dialysis unit management. Lebanon and Jordan are two Middle-Eastern countries that differ regarding the ratio of nephrologists to dialysis patients. This ratio is estimated to be 160 / 4200 and 90 / 5000 in Lebanon and Jordan respectively. In Lebanon, although the majority of physicians are reimbursed through private insurances or out of pocket payment [10], nephrologists are among the few specialists that are principally paid by the public sector. In Jordan, the reimbursement of nephrologists depends on both private and public resources. Despite these differences, the two countries have a similar national policy that limits the number of reimbursed dialysis patients to 40 per nephrologist. Therefore, several questions could be raised regarding nephrologists' satisfaction in these countries. There is uncertainty whether nephrologists are satisfied with the limitation to 40 dialysis patients or they would prefer to follow more patients. It is also unclear if they prefer a payment model based on fee for service (FFS) or salary. Understanding the factors that enhance the satisfaction of nephrologists could inform policymakers to establish better strategies for reimbursement and patients' distribution.

The aim of this study is to evaluate the association between different payment models, workload and job satisfaction of nephrologists in Lebanon and Jordan.

## Methods

### Population setting and participants

This study addressed all nephrologists working in Lebanon and Jordan. The Lebanese participants were included if they were registered at the Lebanese Order of Physicians and the Lebanese Society of Nephrology and Hypertension. The Jordanian ones were included if they were registered at the Jordanian Order of Physicians and Jordan Society of Nephrology and Renal Transplantation.

An official request for nephrologists' emails was sent to the two presidents of the Lebanese and Jordanian Societies of Nephrology. The two societies shared these emails directly with the Institutional Review Board (IRB) of the American University of Beirut (AUB). The IRB office gave their approval to upload these emails to the LimeSurvey of AUB.

### Questionnaire

The survey included six sections (Supplementary, Questionnaire). The section addressing job satisfaction was based on a 5-point Likert scale questionnaire that was validated and used for assessment of US nephrologists' career satisfaction [8]. The other sections included questions on demographics and educational background, past and current work, academic activities, workload and payment, and burnout.

The questionnaire was sent to nephrologists' email addresses through the online survey (LimeSurvey) between February and March 2020.

## **Statistical analysis**

Data was analyzed using SPSS, version 25. Categorical variables were reported as numbers and percentages. Continuous variables were reported as mean and standard variation (SD) if normally distributed and median and interquartile range (IQR) if data were skewed. Chi Square test was used to compare the categorical data between two groups and t independent test used to compare continuous data if normally distributed. Mann-Whitney U test was used to compare medians between two groups when variables are skewed. Cronbach's alpha was used to assess the reliability of the job satisfaction questionnaire. Spearman's Rho coefficient was used to assess the correlation between two continuous variables. Job satisfaction items were reported in two ways: as categorical data divided into satisfied, dissatisfied or neutral; and as continuous data in a scale from 1 to 5. We used the continuous scale to analyze the association of job satisfaction with other variables. Simple linear regression was used to estimate the association between different job satisfaction components and other variables. *P*-value was considered significant if  $< 0.05$ .

## **Ethical considerations**

The survey was distributed to all nephrologists working in Lebanon and Jordan, through their respective orders of physicians, hence covering all parts of the two countries without discrimination. This study received the IRB approval of the AUB before releasing the questionnaire online (IRB number SBS-2019-0481). It followed the general ethical rules of research in public health. Ethical issues that were addressed were confidentiality and privacy of the participants. The electronic questionnaire was submitted anonymously. Nephrologists were informed about the aim of the study, about their right of declining or withdrawing at any time and that by answering the online survey they were giving their informed consent to participate.

## **Results**

### **General characteristics and work setting**

Emails were sent to 250 nephrologists. Sixty-seven nephrologists responded to the survey (27% of response). Fifty-nine out the 67 participants completed more than 75% of the questionnaire and were included in the analysis. They were divided into 51 Lebanese and 8 Jordanian nephrologists. Table 1 summarizes the general characteristics of the 59 participants. Their mean age was  $46.9 \pm 12.5$  years with

39% of females. The Jordanian group included a majority of males and they were older than the Lebanese sample.

Table 1  
General characteristics of Lebanese and Jordanian nephrologists

	Lebanese n=51	Jordanian n=8	Total n=59	<i>P</i>
<b>Age</b>	45.36±11.24	56.71±16.12	46.92±12.46	0.024 <sup>a</sup>
Mean ± SD	42 [36.2 -53.7]	56 [40 -77]	42 [37 -57]	
Median [IQR]				
<b>Gender, n (%)</b>	22 (44)	6 (75)	28 (47.5)	0.207 <sup>b</sup>
Male	22 (44)	1 (12.5)	23 (38.9)	
Female	7 (12)	1 (12.5)	8 (13.6)	
Unanswered				
<b>Years of practice, n (%)</b>	11 (21.6)	1 (12.5)	12 (20.4)	0.661 <sup>b</sup>
<5	20 (39.2)	2 (25)	22 (37.3)	
5-10	9 (17.6)	2 (25)	11 (18.6)	
11-20	11 (21.6)	3 (37.5)	14 (23.7)	
>20				
<b>Marital Status, n (%)</b>	31 (60.8)	6 (75)	37 (62.7)	0.844 <sup>b</sup>
Married	11 (21.6)	1 (12.5)	12 (20.3)	
Single	2 (3.9)	0 (0)	2 (3.4)	
Other	7 (13.7)	1 (12.5)	8 (13.6)	
Did not answer				
<b>Children, n (%)</b>	30 (58.8)	6 (75)	36 (61)	0.634 <sup>b</sup>
Yes	14 (27.5)	1 (12.5)	15 (25.4)	
No	7 (13.7)	1 (12.5)	8 (13.6)	
NA				
<b>Exercise once per week, n (%)</b>	25 (49)	2 (25)	27 (45.8)	0.278 <sup>b</sup>
Yes	17 (33.3)	5 (62.5)	22 (37.3)	
No	9 (17.6)	1 (12.5)	10 (16.9)	
NA				

Note. <sup>a</sup>T Independent test; <sup>b</sup>Chi-Square test

	Lebanese n=51	Jordanian n=8	Total n=59	<i>P</i>
<b>Minutes of driving daily to work, n (%)</b>	9 (17.6)	3 (37.5)	12 (20.3)	0.390 <sup>b</sup>
1-2 hours	26 (51)	2 (25)	28 (47.5)	
Less than 1 hour	7 (13.7)	2 (25)	9 (15.3)	
More than 2 hours	9 (17.6)	1 (12.5)	10 (16.9)	
NA				
<b>Governorates, n (%)</b>			33.9	NA
Beirut			11.9	
Amman			28.8	
Mount Lebanon			1.7	
Aqaba			11.9	
North of Lebanon			5.1	
South of Lebanon			3.4	
Beqaa				
<i>Note: <sup>a</sup>T Independent test; <sup>b</sup>Chi-Square test</i>				

Supplementary Table S1 illustrates the different aspects of nephrology work in both countries. The majority of the sample worked in a private setting (71%). Jordanian nephrologists followed more transplant patients whereas Lebanese nephrologists treated more peritoneal dialysis patients. Lebanese nephrologists worked in a fewer number of hospitals than Jordanian ones ( $P = 0.06$ ). Lebanese worked more than Jordanian nephrologists in hospitals that ensured training of medical students ( $P = 0.04$ ). Only 3.3% worked in units run by dialysis companies and 59.3% had no desire in working in facilities managed by dialysis companies. Men spent more time in their practice than women ( $P < 0.001$ ).

## Educational background and academic activities

The majority of nephrologists in both countries were trained in general nephrology and hemodialysis. Supplementary Table S2 describes countries they graduated from, the reasons for choosing nephrology as a specialty and their current academic activities. Majority of Jordanian and Lebanese nephrologists chose this career because they found nephrology an interesting subject or field. Half of Lebanese nephrologists were influenced by their mentors, this was seen to a lesser degree in Jordan. The majority were involved in teaching, 40% did not have any publication and very few did not read regularly. There was a significant difference between female and male nephrologists regarding academic activities with

more women spending time on teaching ( $P < 0.001$ ), more women with academic position ( $P < 0.001$ ) and more women with publications ( $P < 0.001$ ).

## **Workload**

The majority (61%) of participants worked more than 30 hours per week (Table 2).

Table 2  
Workload of nephrologists in both countries

	Lebanese n=51	Jordanian n=8	Total n=59	P
<b>Number of non-dialysis inpatients seen per week</b>	14.60 ± 9.02	14.14 ± 9.49	14.54 ± 8.99	0.875 <sup>a</sup>
Mean ± SD				
Median [IQR]	15 [7.5,20]	10 [5, 20]	20 [7.25,20]	
<b>Number of non-dialysis outpatients seen per week</b>	22.02 ± 18.29	30.71 ± 11.70	23.19 ± 17.71	0.068 <sup>a</sup>
Mean ± SD				
Median [IQR]	15 [9,30]	30 [20,40]	20 [10,30]	
<b>Hours per week you give to your nephrology practice? n (%)</b>	4(7.8)	0 (0)	4(6.8)	0.865 <sup>b</sup>
Less than 10	10 (19.6)	2(25.5)	12(20.3)	
11-30	31(60.8)	5(62.5)	36 (61)	
More than 30	6(11.8)	1(12.5)	7 (11.9)	
N/A				
<b>Hours per week spent on managerial and/or administrative activities</b>	7.6 ± 6.74	16 ± 15.74	8.73 ± 8.76	0.072 <sup>a</sup>
Mean ± SD				
Median [IQR]	6 [3, 10]	10 [8, 20]	7 [4, 10]	
<b>Number of night-time travels per month to see a patient at the hospital, n(%)</b>	5 (9.8)	2 (25)	7 (11.9)	0.775 <sup>b</sup>
0	17 (33.3)	2 (25)	19 (32.2)	
1	11 (21.6)	1 (12.5)	12 (20.3)	
2	12 (23.5)	2 (25)	14 (23.7)	
>2	6 (11.8)	1 (12.5)	7 (11.9)	
N/A			7 (11.9)	
<i>Note: <sup>a</sup>Mann-Whitney U test; <sup>b</sup>Chi-Square test</i>				

22% of nephrologists were following more than 40 dialysis patients and 32% of them would like to follow more than 40 dialysis patients (Supplementary Table S3). When asked if fee for service was increased, only 27% would like to follow more than 40 patients (Supplementary Table S4). The main two reasons reported were avoiding loss of patients and higher financial compensation. The majority of the sample

still preferred to follow 30-40 patients to decrease the workload. Regarding the number of dialysis units, 75% of Jordanian vs 49% of Lebanese preferred to work in more than one unit.

## **Payment model or reimbursement**

Regarding reimbursement, 66.7% of Lebanese and 37.5% of Jordanian were paid fee-for-service only (Table 3). There was a significant difference in payment delay between Lebanon and Jordan with Lebanese being reimbursed with a mean delay of 12 months ( $P = 0.011$ ).

Table 3  
Difference in payment characteristics between Lebanon and Jordan

	Lebanese n=51	Jordanian n=8	Total n=59	P
<b>Current reimbursement model</b>	3 (5.9)	1 (12.5)	4 (6.8)	0.369 <sup>b</sup>
Salary	34 (66.7)	3 (37.5)	37 (62.7)	
Fee for Service	8 (15.7)	3 (37.5)	11 (18.6)	
Both	6 (11.8)	1 (12.5)	7 (11.9)	
N/A			7 (11.9)	
<b>Delay in payment</b>	17 (33.3)	0(0)	17 (28.8)	0.011 <sup>b</sup>
Always	17(33.3)	2(25)	19 (32.2)	
Most of the time	5 (9.8)	0 (0)	5 (8.5)	
Not at all	6 (11.8)	5 (62.5)	11 (18.6)	
Sometimes	6 (11.8)	1 (12.5)	7 (11.9)	
NA			7 (11.9)	
<b>Estimated time of delay (in months)</b>	11.61 ± 5.65	5 ± 5.2	10.71 ± 6	0.011 <sup>a</sup>
Mean ± SD		3 [0,12]		
Median [IQR]	12 [9.75,17.25]		12 [6, 12]	
<b>Estimated current monthly income (US\$)</b>	5 (9.8)	1 (12.5)	6 (10.2)	0.999 <sup>b</sup>
Less than 3000	12 (23.5)	2 (25.5)	14 (23.7)	
3000-5000	21 (41.2)	3 (37.5)	24 (40.7)	
5000-10000	7 (13.7)	1 (12.5)	8 (13.6)	
More than10000				
<b>If pay-for-performance (P4P) is a fee for service pro-rated based on the quality of patient's outcome within recommended standards, would you prefer as a payment:</b>	28 (54.9)	5 (62.5)	33(55.9)	0.894 <sup>b</sup>
A fixed fee for service	17 (33.3)	2 (25.5)	19(32.2)	
Pay-for-performance				

Note: <sup>a</sup>Mann-Whitney U test; <sup>b</sup>Chi-Square test

## Job Satisfaction

A total of 22 questions addressed job satisfaction. Table 4 describes the continuous scores of job satisfaction of all participants. The mean overall job satisfaction score of all respondents was  $3.39 \pm 0.45$ . Cronbach's alpha was 0.833 showing a high reliability of the job satisfaction questionnaire in our sample.

Table 4  
Job Satisfaction scores of nephrologists

Question	Mean ±SD
Q1 [I am satisfied with my career trajectory.]	3.78 ±1.101
Q2 [I have work-life balance.]	3.37 ±1.076
Q3 [I am satisfied with my colleagues and work environment.]	3.69 ±1.157
Q4 [I am satisfied with my income.]	3.08 ±1.146
Q5 [My current job is stressful.]	2.08 ±.868
Q6 [I enjoy patient care.]	4.31 ±.812
Q7 [I have a flexible work schedule.]	3.47 ±1.046
Q8 [I perform at my highest potential at work.]	3.82 ±.974
Q9 [My salary reflects my career achievements and contributions.]	2.63 ±1.166
Q10 [I have regrets in choosing nephrology]	4.37 ±.692
Q11 [I have a high degree of autonomy at work.]	3.82 ±.888
Q12 [I view practicing medicine in academic settings as inefficient and bureaucratic.]	3.49 ±1.065
Q13 [There is too much pressure to secure grants, carry out research, and publish in academic medicine.]	2.22 ±.730
Q14 [The low efficiency of academic medicine is a major disincentive to work in this setting.]	2.98 ±1.010
Q15 [A career in academic medicine is compatible with having a family.]	3.33 ±.864
Q16 [I receive adequate administrative support for my patient care activities.]	3.06 ±.947
Q17 [I receive adequate support from other healthcare providers (physician assistants, nurses, medical assistants, etc.) for my patient care activities.]	3.55 ±.879

*Note: negative questions are given reverse scores*

<b>Question</b>	<b>Mean ±SD</b>
Q18 [The opportunity to work with chronic patients in nephrology is appealing.]	3.59 ±.804
Q19 [Working with interdisciplinary teams in clinical care of kidney patients is rewarding.]	3.92 ±.744
Q20 [There is a wide variety of job opportunities for nephrologists]	2.65 ±1.074
Q21 [I feel tired all the time.]	3.24 ±.929
Q22 [More than once a month, I skip going to work because of fatigue.]	4.20 ±.775
<b>Total Satisfaction Score</b>	<b>3.39±0.45</b>
<i>Note: negative questions are given reverse scores</i>	

Supplementary Table S5 includes the percentages of job satisfaction of nephrologists in the two countries. Participants reported low rates of satisfaction in job opportunities (20%), income (25%) and administrative support (32%). On the other hand, 68% reported that nephrology is stressful. High satisfaction rates were found in relationship with patients (78%) and colleagues (73%).

Questions 1 to 22 were regrouped into 9 categories in Table 5. A comparison of the mean and median scores of the two countries showed no significant difference in the job satisfaction between Lebanese and Jordanian nephrologists.

Table 5  
Job satisfaction scores grouped into 9 categories

Category	Lebanese Mean Score ± SD	Jordanian Mean Score± SD	Total Mean Score± SD	<i>P</i>
Career and Opportunities Q1 + Q10 + Q20	3.58±0.68	3.7±0.97	3.6 ± 0.71	0.657
Work-life Balance Q2 + Q15	3.36±0.73	3.28±0.86	3.35 ± 0.73	0.798
Relationship with Colleagues Q3 + Q17 + Q19	3.72±0.57	3.71±0.80	3.71 ± 0.59	0.983
Income Q4 + Q9	2.87±1.08	2.71±1.22	2.85 ± 1.09	0.722
Academia and Research Q12 + Q13 + Q14	2.93±0.65	2.62±0.80	2.89 ± 0.67	0.247
Enjoying patients Q6 + Q18	3.91±0.68	4.21±0.39	3.95 ± 0.65	0.262
Administrative support Q16	2.98±0.92	3.57±0.97	3.06 ± 0.94	0.124
Autonomy and Performance Q7 + Q8+ Q11	3.67±0.65	3.90±0.57	3.7 ± 0.64	0.383
Stress and Burnout Q5 + Q21 + Q22	3.20±0.59	2.95±0.59	3.16 ± 0.59	0.298
<i>Note: the test used is the t independent test</i>				

## Analysis of factors associated with total satisfaction score

Using the univariate linear regression analysis, older age, more than 10 hours per week given to nephrology practice and monthly income more than 5000 US\$ were significantly associated with higher job satisfaction (Table 6). In the multivariate model, only age and weekly hours of work remained significant (Table 7).

Table 6  
Univariate regression analysis of factors associated with total satisfaction score

		<b>Unstandardized Coefficient</b>	<b>95% CI</b>	<b>P</b>
<b>Demographics</b>	<b>Age</b>	0.015	0.006, 0.025	0.002
	<b>Gender</b> <i>Ref male</i>	-0.187	-0.438, 0.064	0.142
<b>Workload</b>	<b>Hours per week given to nephrology practice &gt; 10</b> <i>Ref &lt;/=10</i>	0.648	0.211, 1.086	0.004 <sup>a</sup>
	<b>Number of dialysis patients &gt;30</b> <i>Ref &lt;30</i>	0.168	-0.087, 0.423	0.193
	<b>Number of non-dialysis patients followed weekly</b>	0.004	-0.001, 0.009	0.137
<b>Income</b>	<b>Monthly Income &gt; 5,000 US\$</b> <i>Ref &lt;5,000 US\$</i>	0.280	0.031, 0.529	0.028
	<b>Payment model (FFS)</b> <i>Ref salary</i>	-0.027	-0.307, 0.253	0.847
	<b>Months of delay in reimbursement</b>	-0.007	-0.029, 0.015	0.524
<i>Note: <sup>a</sup>The variable "hours per week given to nephrology practice &gt; 10" remains significant after adjustment for age and gender</i>				

Table 7  
Multivariate regression analysis of factors associated with total satisfaction score

		Unstandardized Coefficient	95% CI	p
Demographics	Age	0.013	0.003, 0.024	0.014
	Gender <i>Ref male</i>	0.057	-0.195, 0.309	0.653
Workload	Hours per week given to nephrology practice > 10 <i>Ref &lt;/=10</i>	0.614	0.187, 1.040	0.006
	Number of dialysis patients >30 <i>Ref &lt;30</i>	-0.006	-0.290, 0.277	0.964
	Number of non-dialysis patients followed weekly	0.000	-0.006, 0.005	0.892
Income	Monthly Income > 5,000 US\$ <i>Ref &lt;5,000 US\$</i>	0.160	-0.126, 0.446	0.265
<i>Note. Variables with a p-value &gt;0.2 in the univariate analysis were included in the multivariate regression model</i>				

## Sub-analysis of factors related to different categories of job satisfaction

### Age and satisfaction towards career, income, work-life balance

We found higher satisfaction towards career, work-life balance, income and enjoying care of patients in participants above 47 years old compared to the younger group. Only 11.8% of nephrologists younger than 40 years old were satisfied with job opportunities vs 32% above 40. Table 8 summarizes the correlation between age and different job satisfaction components. Supplementary Figure S1 illustrates the linear regression between age and satisfaction towards income.

Table 8  
Correlation of different categories of job satisfaction with age

Category	Spearman's Rho Correlation Coefficient	<i>P</i>
Career and Opportunities	0.431	0.002
Work-life Balance	0.341	0.014
Relationship with Colleagues	0.091	0.525
Satisfaction with Income	0.388	0.005
Academia and Research	0.099	0.491
Enjoying patients	0.308	0.028
Administrative support	0.266	0.059
Autonomy and Performance	0.252	0.074
Stress and Burnout	0.171	0.230

## Workload and satisfaction with income

Nephrologists working more than 30 hours per week tended to show higher satisfaction with income but did not reach statistical significance (mean difference 0.65, 95% CI -1.31,0.17,  $P = 0.056$ ). The number of hours spent on managerial activities were correlated with the stress/burnout in Jordanian nephrologists (Spearman's rho -0.736,  $P = 0.05$ ) but not in Lebanese nephrologists.

## Delay in payment and work-life balance

The number of months of delay in payment is significantly associated with work-life balance with  $P = 0.038$  (Figure 1).

## Daily driving hours and satisfaction with income, work-life balance and burnout

Driving more than one hour per day to reach work was significantly associated with dissatisfaction in work-life balance ( $P = 0.029$ ), income ( $P = 0.036$ ), stress and burnout ( $P = 0.016$ ).

## Academic activities and job satisfaction

When we compared nephrologists that spent less than 10 hours per year on teaching to those who spent more than 10 hours, there was no significant difference in any of the job satisfaction items. Having or not published in the last 5 years was not significantly associated with job satisfaction (association with income satisfaction  $P = 0.106$ , mean difference -0.52, 95% CI -1.18, 0.13).

## Gender differences and gender discrimination

The monthly income was significantly higher in male nephrologists than females with 33% of men earning more than 10,000 US\$ vs 4.5% women ( $P < 0.001$ ). The satisfaction regarding income was significantly lower in female nephrologists than males with a mean score difference of  $0.71 \pm 0.30$  (95% CI 0.10,1.32;  $P = 0.024$ ). When we compared workload and payment models between men and women, a higher percentage of men wanted to follow more than 40 patients ( $P < 0.001$ ) and a higher percentage of men chose pay-for-performance over fee for service. 66.1% of the sample reported experiencing gender discrimination with no difference between Lebanon and Jordan. When comparing the two groups of men and women, gender discrimination was perceived mostly and significantly in women ( $P < 0.001$ ).

## Discussion

This is the first study that evaluates nephrologists' satisfaction in the Eastern Mediterranean Region. Contextual factors, such as workplace-related factors and work environment, can highly influence satisfaction and vary between different healthcare systems [4]. This survey of Lebanese and Jordanian nephrologists revealed low satisfaction rates regarding job opportunities (20%), income (25%), administrative support (32%), research (59%) and the majority of respondents agreed that nephrology is a stressful job. On the other hand, our results highlighted high satisfaction rates regarding relationship with patients (78%) and colleagues (73%). There is a paucity of data in the literature regarding job satisfaction of nephrologists worldwide and most of the studies were conducted in the US. A survey of 6590 American physicians classified nephrology as a "less satisfied" specialty [11]. Several of our satisfaction rates are aligned with those of US nephrologists [8], like the high satisfaction regarding patients, the low rate of administrative support and high agreement that nephrology is a stressful job. US nephrologists are experiencing stress and burn-out because of poor work-life balance, they are feeling unappreciated, spending a lot of time travelling between dialysis facilities that are owned by large for-profit dialysis companies and there is little of funds provided to research in nephrology [12, 13]. The time of travel to work was also showed in our sample to be significantly associated with stress and burnout. But the satisfaction of US nephrologists is higher regarding job opportunities, income and career trajectory. Another important finding in most surveys is the low rate of regrets of choosing nephrology: 70% in the US sample and 76% in ours would choose nephrology again. A similar percentage was found in a sample of international specialists [14]. Despite the lack of regret, burnout and stress are still highly perceived for many reasons [13]. One of them is that nephrologists globally are often faced with a lot of ethical challenges regarding their chronic disease patients with dilemma regarding end-of-life care and conservative care leading to what some called "moral distress" [15].

Workload affects the satisfaction of nephrologists differently between a context and another. In Lebanese nephrologists, higher workload was not found to be associated with dissatisfaction although 60% of Lebanese reported to spend more than 40 hours weekly on patient care, a rate similar to the Jordanian group and the US surveyed nephrologists [16]. However, the number of dialysis patients per nephrologist in Lebanon is lower than other countries. And this can explain the higher satisfaction of surveyed nephrologists once the number of hours spent on nephrology practice exceeds the 10 hours weekly. One recent mixed quantitative-qualitative study done in South Africa emphasized the low density

of nephrologists in that country and high workload [17]. In Lebanon, the abundance of physicians is an old issue, still not resolved [10]. Therefore, the higher density of nephrologists in Lebanon compared to South Africa, Jordan and the US can be a reason for the lack of significant association between workload and dissatisfaction in Lebanese nephrologists. In the Jordanian group, administrative work was correlated with more stress. The time spent on paperwork and administration is a growing burden for nephrologists worldwide and the Jordanian nephrologists are aligned with the US results [16]. US nephrologists complain of the great amount of time spent on administrative work and filling electronic medical records instead of encouraging patient-centered care [16].

Dissatisfaction regarding income is an important challenge for physicians globally, even in high-income countries. Income fairness is described as significantly associated with better job satisfaction in Japanese physicians [18]. In Saudi Arabia, a survey of physicians showed a high dissatisfaction rate regarding income [19]. In the Medscape Nephrologist Compensation Report of 2019, US nephrologists' satisfaction with income reached only 66%, despite the fact that they earned 3 times more than our sample, with the same amount of workload and 44% of them were paid fee-for-service. Dissatisfaction with income is more pronounced in low and middle-income countries. In South Africa 39% of nephrologists working in the public sector were dissatisfied with remuneration [17]. In our survey, only 25% felt that they were fairly compensated, a result that is very close to physicians in Mexico [16]. The very high density of nephrologists in Lebanon could be the reason for less income and less remuneration satisfaction. Several reforms to address this issue were suggested 15 years ago but none of them was applied [10].

Our study revealed a strong correlation between older age and some components of job satisfaction such as work-life balance, career and satisfaction with income. A study done in Norway in 2010 described also higher satisfaction rates in older doctors [20]. Another one that compared German to American physicians showed increase of job satisfaction with age [21]. However, this finding is not consistent in the literature and some authors reported better job satisfaction in younger groups of physicians [22]. Overall, young nephrologists seem to experience less satisfaction with varying degrees. Only 11.8% of our young nephrologists (<40 years old) were satisfied with job opportunities and this is much lower than the 34 % in US young nephrologists [23].

The gender-based inequities between men and women are very obvious in our study. This imbalance in incomes and opportunities is reported even in developed countries like the US [24]. The higher amount of income in men physicians is emphasized also in the International Physician Compensation Report of 2019 with men specialists earning 30000-70000 \$ more than women yearly across countries like US, UK, Germany, France, Spain, Brazil and Mexico [14]. Our study showed significantly less income in women and more academic competencies. Men are those who wanted more patients in dialysis even if the reimbursement fee was increased, despite the fact that they see equal number of outpatients and inpatients. Satisfaction with income is significantly lower in women in our study. Several European studies reported statistically significant better satisfaction of male respondents compared to their female colleagues [4]. Our results highlight as well the high perception of gender discrimination in women.

Our study has one major limitation, the low rate of respondents. This low rate of response to the survey estimated at 27 % with even a lower response from Jordan of around 8%. This could be related to a technical issue because the LimeSurvey appeared in the Junk mail of nephrologists. Despite this limitation, the study is very informative and is the first study to assess factors related to nephrologists' job satisfaction in the Eastern Mediterranean Region.

## Conclusions

The implications of this study can be very important and need to be taken into consideration by policy makers at the level of renal societies, medical schools, orders of physicians and ministries of public health. First, it is a call for renal societies and orders of physicians in the Middle-East to support women with more job opportunities and higher income. The significant perception of discrimination towards women nephrologists should be treated first within the renal societies and women should be empowered especially that their academic contributions are significantly higher than men in our sample. Second, it is a call for medical schools to enhance and support the role of mentorship because it is found influential towards the choice of specialty of physicians. Medical schools in collaboration with the ministry of public health have the obligation of assessing the needs of a nation in terms of number of specialists and prevent the high density of nephrologists. Third, when facing a high number of nephrologists, policy makers should consider the increase in reimbursement fee of dialysis sessions that may lead, based on our results, to a lower number of patients followed by each physician and less workload on nephrologists. Advocacy against delay in payments is a must to achieve better work-life balance of physicians. Finally, the very low satisfaction of young nephrologists towards job opportunities indicates the very deep conundrum that we are facing in our region. This requires urgently a revision of regulations and policies and limiting the number of nephrologists trained within or imported to the country as long as work opportunities are not guaranteed.

## Abbreviations

**FFS**

Fee For Service

## Declarations

- **Ethics approval and consent to participate**

This study got the approval of the Institutional Review Board of the American University of Beirut (IRB number SBS-2019-0481).

- **Consent for publication**

Not applicable

- **Availability of data and materials**

All data generated or analyzed during this study are included in this published article [and its supplementary information files].

- **Competing interests**

The authors declare that they have no competing interests

- **Funding**

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- **Authors' contributions**

MA, NB and KK contributed to the design conceptualization. MA and NB worked on the data acquisition and analysis and MA performed the statistical analysis. MA and NB developed the first draft of the manuscript. KK revised the manuscript. All authors read and approved the final manuscript.

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## Figures

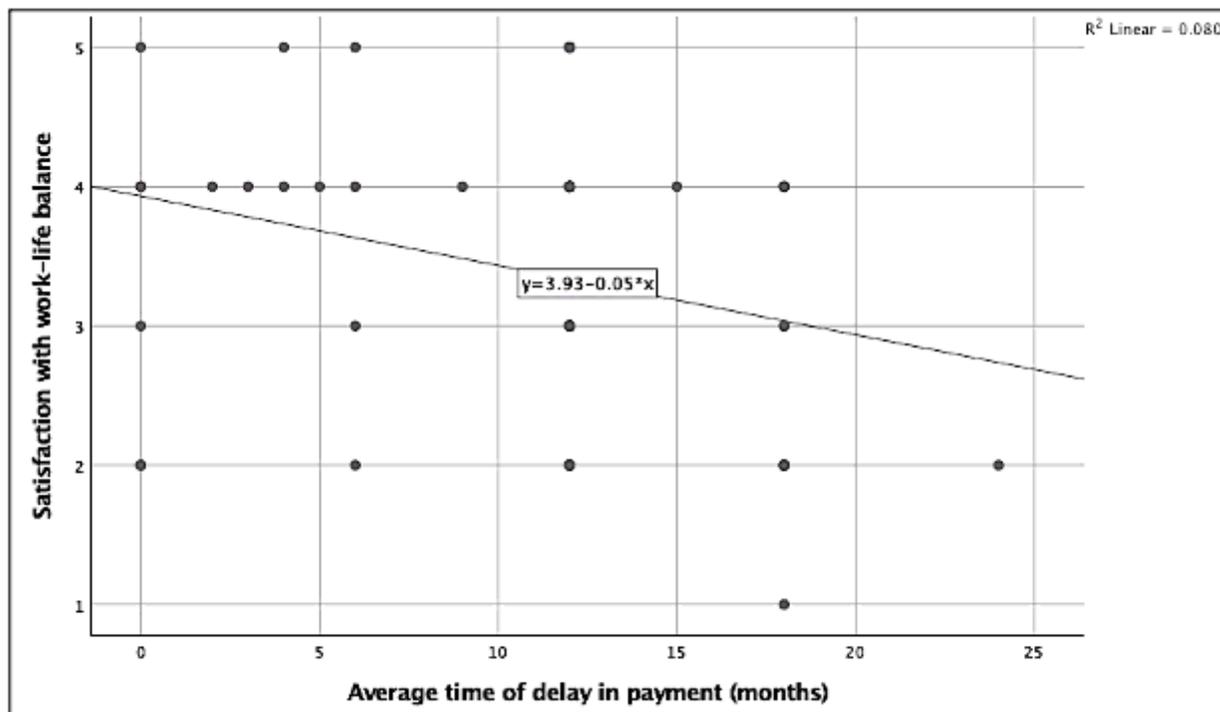


Figure 1

Linear regression between number of months of delay in payment and work-life balance satisfaction